

Connectors for Cold-Formed Steel Construction

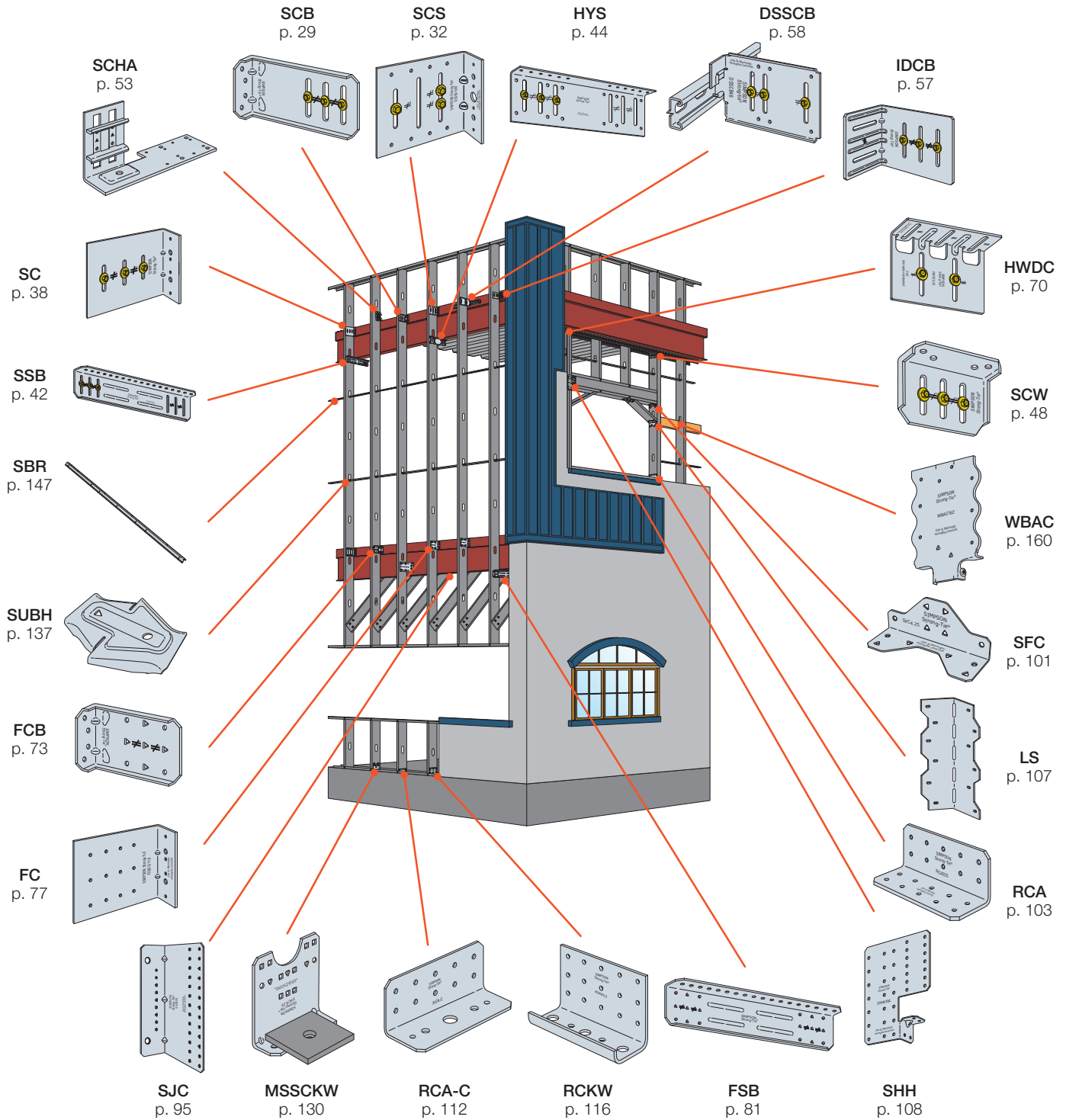
C-CF-2023 | (800) 999-5099 | strongtie.com

SIMPSON

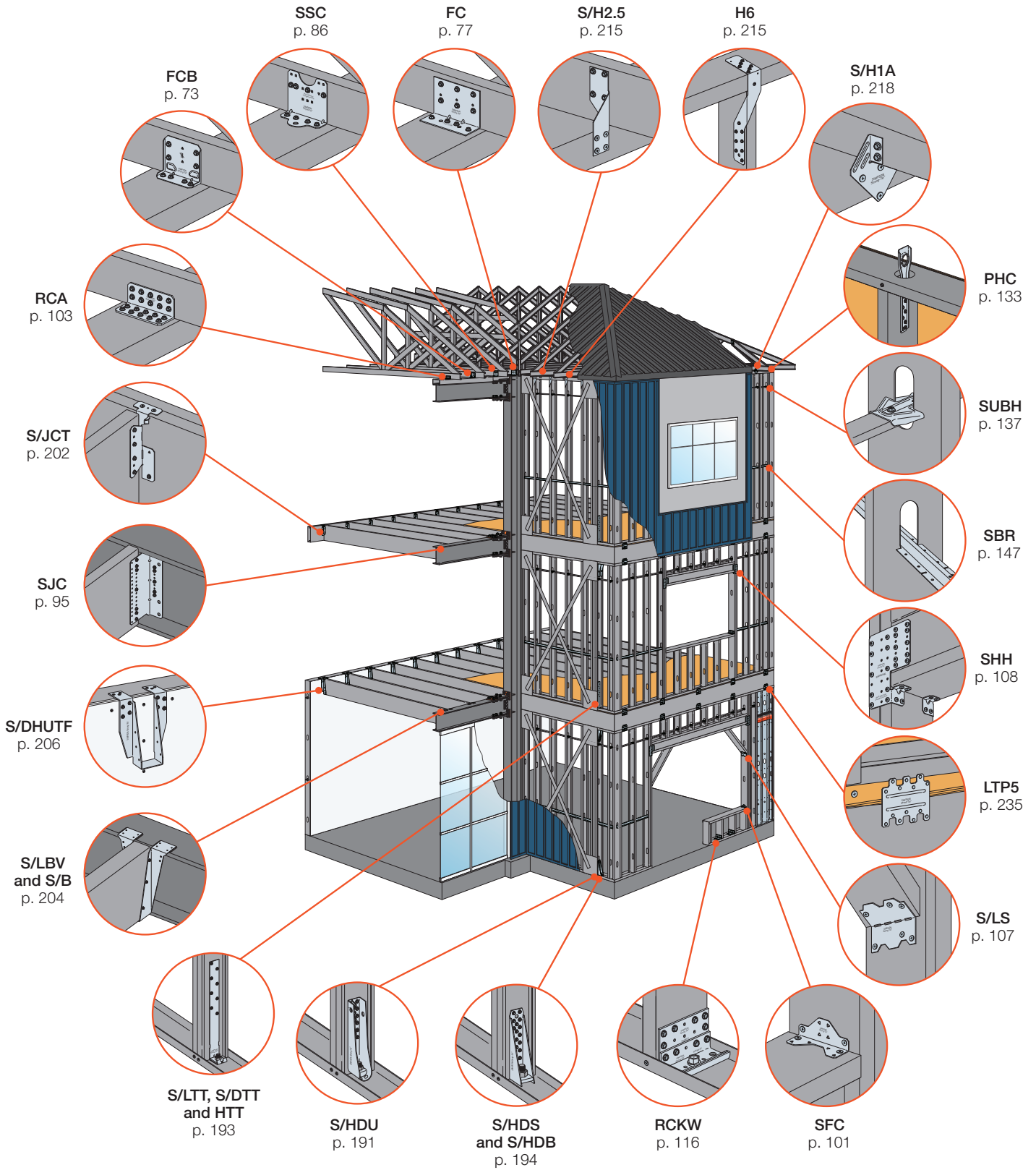
Strong-Tie®



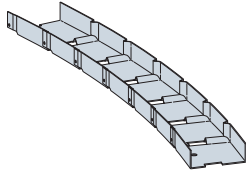
Commercial Connector Solutions



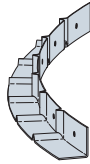
Mid-Rise Connector Solutions



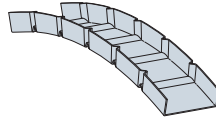
Curved-Wall Solutions



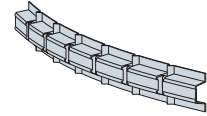
Ready-Track®
Framing
p. 163



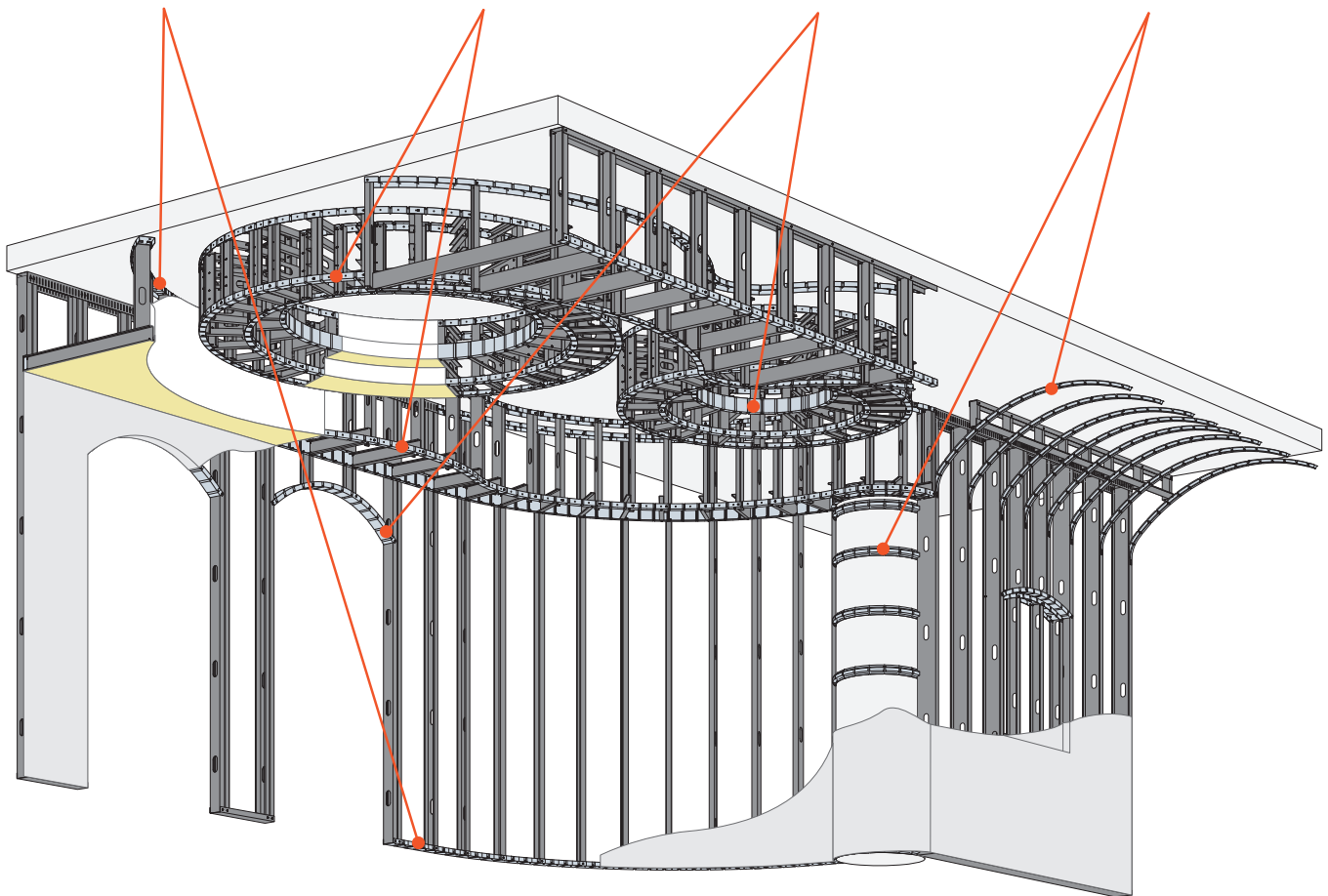
Ready-Angle®
Framing
p. 164



Ready-Arch®
Framing
p. 163



Ready-Hat®
Framing
p. 164



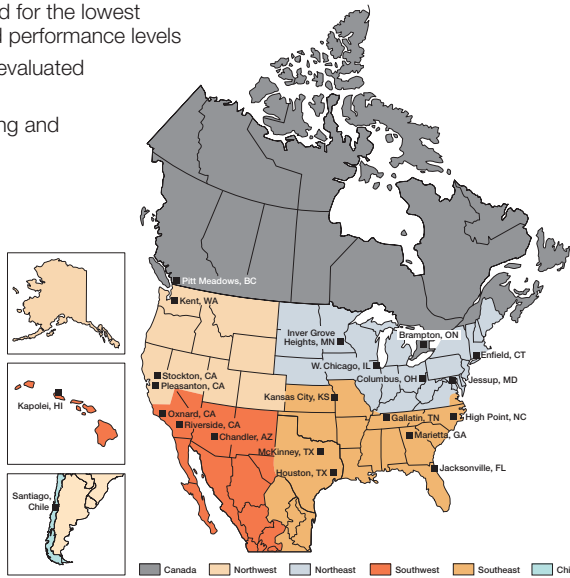
Introduction

For more than 65 years, Simpson Strong-Tie has focused on creating structural products that help people build safer and stronger homes and buildings. A leader in structural systems research and technology, Simpson Strong-Tie is one of the largest suppliers of structural building products in the world. The Simpson Strong-Tie commitment to product development, engineering, testing and training is evident in the consistent quality and delivery of its products and services.

For more information, visit the company's website at strongtie.com.

The Simpson Strong-Tie Company Inc. No-Equal Pledge® includes:

- Quality products value-engineered for the lowest installed cost at the highest-rated performance levels
- The most thoroughly tested and evaluated products in the industry
- Strategically located manufacturing and warehouse facilities
- National code agency listings
- The largest number of patented connectors in the industry
- Global locations with an international sales team
- In-house R&D and tool and die professionals
- In-house product testing and quality control engineers
- Support of industry groups including AISI, AITC, ASTM, ASCE, AWC, AWWA, ACI, AISC, CSI, CFSEI, ICFA, NBMDA, NLBMDA, SBCA, SDI, SETMA, SFA, SFIA, STAFDA, SREA, NFBA, TPI, WDSC, WIJMA, WTCA and local engineering groups



The Simpson Strong-Tie Quality Policy

We help people build safer structures economically. We do this by designing, engineering and manufacturing No-Equal® structural connectors and other related products that meet or exceed our customers' needs and expectations. Everyone is responsible for product quality and is committed to ensuring the effectiveness of the Quality Management System.

Karen Colonias
Chief Executive Officer

(800) 999-5099
strongtie.com

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Getting Fast Technical Support

When you call for engineering technical support, having the following information on hand will help us to serve you promptly and efficiently:

- Which Simpson Strong-Tie® catalog are you using? (*See the front cover for the catalog number.*)
- Which Simpson Strong-Tie product are you using?
- What are your application and load requirement?
- What are the carried and/or supporting members' size, gauge and strength?
















You should consult a qualified design professional familiar with all applicable building codes each time you use a Simpson Strong-Tie product.



FM 767499

| | |
|---|-----------|
| General Information | 12-27 ▶ |
| Deflection Connectors | 28-55 ▶ |
| Drift Connectors | 56-71 ▶ |
| Rigid Connectors | 72-135 ▶ |
| Bridging, Bracing and Backing | 136-161 ▶ |
| Curved Hand-Bendable Framing | 162-165 ▶ |
| Concrete Connectors | 166-171 ▶ |
| Anchors | 172-187 ▶ |
| Fasteners | 188-189 ▶ |
| Holdowns and Tension Ties | 190-199 ▶ |
| Joist Framing Connectors | 200-211 ▶ |
| Roof, Truss and Rafter Connectors, Ties and Straps | 212-229 ▶ |
| Lateral Connectors, Ties and Straps | 230-235 ▶ |
| Lateral Systems | 236-239 ▶ |
| Miscellaneous | 240-241 ▶ |

Alphabetical Index

| | | |
|--|---|---|
| ABS Anchor Bolt Stabilizer 167 | FC Bypass Framing Fixed-Clip Connector 77–80 | LBP Bearing Plate 168 |
| ABL Anchor Bolt Locator 170 |  FCB Bypass Framing Fixed-Clip Connector 73–76 | LS Skewable Angle 107, 209, 227 |
| AHEP Adjustable Hip-End Purlin 227 | FHA Strap Tie 231–233 | LSTA Strap Tie 231–233 |
| Anchor Designer™ Software 187 | FSB Bypass Framing Fixed-Clip Strut Connector 81–82 |  LSTHD Strap Tie Holdown 198–199 |
| Anchor Solutions for CFS Construction 173–174 | H Hybrid Connectors 216–217 | LSTI Strap Tie 231–233 |
| AnchorMate® Anchor Bolt Holder 167 | H Seismic and Hurricane Ties 215 |  LSUBH Bridging Connector 137–146 |
| BP/BPS Bearing Plates 168 | H10S Seismic and Hurricane Tie 215–217, 224–225 | LTA2 Masonry Connector 224–225 |
|  CFS Designer™ Software 8, 25 | HETA Embedded Truss Anchor 220–221 | LTB Bridging 159, 211 |
| CMST Coiled Strap 234 | HHETA Embedded Truss Anchor 220–221 | LTP5 Framing Anchor 235 |
| CMSTC Coiled Strap 234 | HPA Purlin Anchor 196–197 | LTS Twist Strap 222 |
| CNW Coupler Nut 169 | HRS Strap Tie 231–233 | MASA Mud sill Anchor 171 |
| Code Listing Key Chart 13 | HSCNW High-Strength Coupler Nut 169 | MASAP Mud sill Anchor 171 |
| Conversion Charts — Imperial, Metric, Roof Pitch/Slope, Steel Gauge 19 | HTS Twist Strap 222 | META Embedded Truss Anchor 220–221 |
| Corrosion Information 19–23 | HTSM Twist Strap 219 |   MFCB Bypass Framing Fixed-Clip Connector 73–76 |
| CS Coiled Strap 158, 211, 234 | HTT Tension Tie 193 |  MSCB Bypass Framing Slide-Clip 29–31 |
|  DBC Drywall Bridging Connector 156–157 | HU Hanger 208 | MSJC Steel-Joist Connector 95–100, 201 |
|  DBR Spacer Bracer 147–154 | HUC Hanger 208 | MSSCKW Kneewall Connector 130–132 |
| DSP Stud Plate Tie 213 |   HWDC Head-of-Wall Drift-Clip Connector 70–71 | MST Strap Tie 231–233 |
|  DSSCB Bypass Framing Drift Strut Connector 58–69 |   HWSC Head-of-Wall Slide-Clip Connector 50–51 | MSTA Strap Tie 231–233 |
| DTC Head-of-Wall Slide-Clip Application 52 | HYS Hybrid Strut 44–47 | MSTC Strap Tie 231–233 |
| DTC Roof Truss Clip 228 | ICFVL Ledger Connector 210 | MSTI Strap Tie 231–233 |
| DTT1Z Tension Tie 193 | IDCB Drift-Clip Bypass Framing Connector 57 |  MSUBH Bridging Connector 137–146 |
| Fasteners for CFS Construction 189 | L Skewable Angle 209 | MTS Twist Strap 222 |
| Fastening Information 24 | | MTSM Twist Strap 219 |
| | | PA Purlin Anchor 196–197 |

VALUE ENGINEERED



This icon indicates a product that is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

Alphabetical Index

| | | |
|---|---|--|
| PAB/PABH Pre-Assembled Anchor Bolts 185–186 | S/HDU Holddown 191–192 | SSP Stud Plate Tie 213 |
| PDPA Powder-Driven Pin 180–182 | S/HGAM Masonry Connector 224–225 | ✓ SSTB ® Anchor Bolt 183 |
| PDPAT Powder-Driven Top-Hat Pin 180–181 | ✓ S/HJCT Hanger 202–203 | ST Strap Tie 231–233 |
| ✓ PHC Panel Hoist Clip 133–134 | S/HTC Heavy Truss Clip 229 | STC Roof Truss Clip 228 |
| PS Strap Tie 231–233 | ✓ S/JCT Hanger 202–203 | STCT Roof Truss Clip 228 |
| PSPNZ Protecting Shield Plate 241 | S/LBV Hanger 204–205 | Steel Strong-Wall ® Shearwalls 237 |
| ✓ RCA Rigid Connector Angle 103–106 | S/LS Skewable Angle 107, 209, 227 | ✓ STHD Strap Tie Holddown 198–199 |
| ✓ RCA-C Rigid Connector Angle for Concrete 112–115 | S/LTT Tension Tie 193 | StrapMate ® Strap Holder 167 |
| ✓ RCKW Kneewall Connector 116–129 | S/VGT2.5 Variable-Pitch Girder Tiedown 223 | Strong Frame ® Special Moment Frame 238–239 |
| ✓ Ready Product Ready-Angle® Framing 164 | ✓ SB Anchor Bolts 183 | ✓ SUBH Bridging Connector 137–146 |
| ✓ Ready Product Ready-Arch® Framing 163 | ✓ SBR Spacer Bracer 147–154 | TB Bridging 211 |
| ✓ Ready Product Ready-Hat® Framing 164 | SC Bypass Framing Slide-Clip Connector 38–41 | Titen HD ® Heavy-Duty Screw Anchor 175–179 |
| ✓ Ready Product Ready-Track® Framing 163 | ✓ SCB Bypass Framing Slide-Clip 29–31 | TJC Jack Truss and Rafter Connector 226 |
| Ready Bender ™ Ready Track™ Bender Custom Framing Tool 165 | ✓ SCHA Slide-Clip Connector for Horizontal Anchorage 53–55 | TSP Stud Plate Tie 213 |
| Ready Bender ™ Ready Trim™ Bender Custom Framing Tool 165 | SCS Seismic Bypass Framing Connector 32–37 | VGT Variable-Pitch Girder Tiedown 223 |
| RFB Retrofit Bolt 184 | SCW Head-of-Wall Slide-Clip Connector 48–49 | ✓ WBAC Wood Backing Steel Connector 160–161 |
| S/B Hanger 204–205 | ✓ SFC Steel Framing Connector 84–85, 101–102, 155 | WP Hanger 207 |
| S/DHUTF Drywall Hanger 206 | ✓ SHH Header Hanger 108–111 | |
| S/DTT Tension Tie 193 | ✓ SJC Steel-Joist Connector 84–85, 95–100, 201 | |
| S/H Seismic and Hurricane Tie 215 | SP Stud Plate Tie 214 | |
| S/H1A Seismic and Hurricane Tie 218 | Special Order Custom Clips and Connectors 135 | |
| S/HDB Holddown 194–195 | SSB Bypass Framing Slide-Clip Strut 42–43 | |
| S/HDS Holddown 194–195 | ✓ SSC Steel-Stud Connector 86–94, 155 | |

New Products for 2023



Version 5

Simpson Strong-Tie® CFS Designer™ Software

Simpson Strong-Tie CFS Designer gives cold-formed steel (CFS) designers the ability to design CFS beam-column members according to AISI specifications as well as analyze complex beam loading and span conditions. Intuitive design tools automate common CFS systems such as typical walls, openings, floor joists with unbalanced live-load combinations, low wall, spandrel, eight-story load-bearing systems and shearwalls up to eight stories. Version 5 is now equipped with a 2-span opening design.

See p. 25 for more information.



WBAC Wood Backing Steel Connector

The WBAC wood backing steel connector is the ideal solution for connecting wood backing to cold-formed steel studs. Perfect for cabinets, shelves, handrails, heavy wall hangings and more, this versatile connector installs easily and provides tested strength. The WBAC is designed to eliminate alignment issues and reduce installation time. Since stiffness and strength are critical for these applications, the fastening pattern into both steel and wood has been engineered to optimize performance.

See pp. 160–161 for more information.



HWDC Head-of-Wall Drift-Clip Connector

The head-of-wall drift-clip connector is used to secure the head of a wall to the bottom of a slab or beam. They are an optimal solution for adding strength to window or doorjamb at head-of-wall connections. The HWDC5.25 provides anchorage location options with a third slot providing a solution for clips overhanging beam flanges. The unique design allows anchor screws to be installed closer to the bend, providing a stronger and stiffer connection while also allowing horizontal and vertical movement during seismic and high-wind events.

See pp. 70–71 for more information.



MFCB Bypass Framing Fixed-Clip Connectors

The MFCB is part of the FCB bypass framing fixed-clip connector product line. The MFCB connector is made of 68 mil (14 ga.) steel thickness that provides a higher capacity for the use of cold-formed steel curtain wall framings and other variety applications. The connectors are tested and rated for tension, compression, shear and in-plane loads.

See pp. 73–76 for more information.

New Products for 2023



PHC Panel Hoist Clip

The PHC panel hoist clip allows easier installation and lifting of wall panels on the job and at assembly sites. The PHC clip features a small profile design to fit inside holes as small as 1 1/2". Contractors can either drill holes in the track onsite or have the track manufactured with holes for easier installation of the clip through the top track. The rolled edges and rolled hoist-edge-hole provide greater strength and give the capacity needed for heavy panel projects. Maximum and minimum screw patterns give you options for heavier or lighter load needs.

See pp. 133–134 for more information.



RCA Rigid Connector Angles

The rigid connector angle is a general-purpose clip angle designed for a wide range of cold-formed steel construction applications such as with miscellaneous header/sill connections to jamb studs, jamb stud reinforcement at track, u-channel bridging, stud-blocking, bypass curtain-wall framing, joist connections and other versatile options. Easy to install, with prepunched holes for quick and accurate fastener attachment. We now have added two new sizes — RCA229 (9") and RCA 2211 (11").

See pp. 103–106 for more information.



RCA-C Rigid Connector Angle for Concrete

The RCA-C is an ideal solution for attaching stud framing to concrete supports. This connector provides the widest variety of anchor options for attaching to concrete in comparison to other similar connectors on the market. The connector's design includes holes for a 1/2"-diameter anchor screw or bolt, or for two 1/4"-diameter concrete screws, positioned in a wide array of fastening options — thus saving the installer the time and cost of drilling connector holes at the jobsite.

See pp. 112–115 for more information.



HWSC Head-of-Wall Slide-Clip Connector

The HWSC head-of-wall slide-clip connector is specifically designed for simplifying the panelization of 6" printed studs (e.g., FrameCAD®, Arkitech, Howick, Pinnacle and Scottsdale). The connector is designed to replace slotted track with a typical printed track at head-of-wall conditions and is assembly tested to provide optimal strength and performance.

See pp. 50–51 for more information.

New Products for 2023



RCKW3D and RCKW3DS Kneewall Connector

The RCKW3D and RCKW3DS are an extension of the popular RCKW product line of rigid connectors for cold-formed steel kneewalls. The RCKW3D is a 3"-wide RCKW connector similar to the RCKW3 but with two holes designed for 1/2" anchors. The RCKW3DS is a stiffener (sold separately) that nests in the RCKW3D for applications that require increased loads. Together, this line extension was created to enhance strength, resistance to overturning and anchor capacity for heavier load demands on 3 1/2" and 3 5/8" stud framing.

See pp. 116–129 for more information.

New Testing on Products



S/HDU Holdown

The S/HDU series of holdowns combines performance with ease of installation. The predeflected geometry virtually eliminates material stretch, resulting in low deflection under load. Installation using self-drilling tapping screws into the studs reduces installation time and saves labor cost. We have added new testing for single stud attachment for this popular holdown.

See pp. 191–192 for more information.



DSSCB Bypass Framing Drift Strut Connector

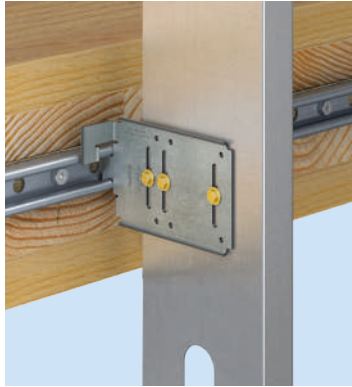
Simpson Strong-Tie has evaluated the DSSCB bypass framing drift strut connector with concert inserts embedded into concrete. Tested capacities for concrete inserts embedded into concrete for attachment of the DSSCB Bypass Framing Drift Strut Connector has been referenced in this catalog.

See pp. 58–69 for more information.

New Products for 2023

Connectors for Cross-Laminated Timber (CLT)

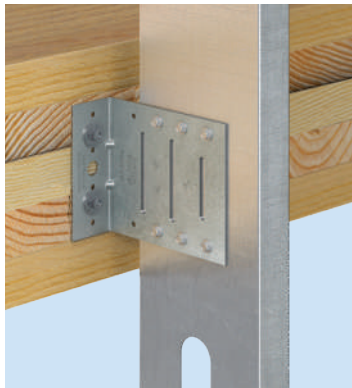
Tested capacities into cross-laminated timber (CLT) with Simpson Strong-Tie® Strong-Drive® screw.



DSSCB Bypass Framing Drift Strut Connector

Simpson Strong-Tie has evaluated the DSSCB bypass framing drift strut connector with the Strong-Drive SDHR31400 Combo-Head screw, a structural fastener designed for cross-laminated timber construction and mass timber construction. Capacities for F₁, F₂, F₃ and F₄ loads are provided.

See pp. 58–69 for more information.




SCS Seismic Bypass Framing Connector

Simpson Strong-Tie has evaluated the SCS seismic bypass framing connector with the Strong-Drive SDWH27400G Timber-Hex HDG screw into cross-laminated timber (CLT) supporting structures. Capacities for F₁, F₂, F₃ and F₄ loads are provided.

See pp. 32–37 for more information.

How to Use This Catalog

New Products

New products are shown with the  symbol. There are also many new sizes within existing model series.



Value Engineered

This icon indicates a product that is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.



Extra Corrosion Protection

The teal arrow icon identifies products that are available with additional corrosion protection (ZMAX®, hot-dip galvanized or double-barrier coating). The SS teal arrow icon identifies products also available in stainless steel. Other products may also be available with additional protection; contact Simpson Strong-Tie for options. The end of the product name will indicate what type of extra corrosion protection is provided (Z = ZMAX, HDG = hot-dip galvanized or SS = stainless steel). Stainless products may need to be manufactured upon ordering. See pp. 19–23 for information on corrosion, and visit our website strongtie.com/info for more technical information on this topic.

Load Table Explanation

Dimensions: This shows the product dimensions (material thickness, length and width in this case.) The product drawing includes these callouts as a cross-reference.

Allowable Design Load: The maximum load imposed on a connection during the life of a structure. There may be multiple design loads acting in different directions (up, down, lateral, perpendicular, etc.) imposed on a connection. When connectors are attached to two CFS members of different thicknesses, the designer shall use the thinner of the two members for selecting allowable loads.

Model No.:

This is the Simpson Strong-Tie product name.

Fasteners: This shows the fastener quantity and type required to achieve the table loads.

Thickness: The thickness of the CFS supporting member to which the product is attached. Allowable load is based on this CFS supporting member thickness.

Code Ref: See p. 13 for the Code Reference Key Chart, to determine which code reports include this product.

| Model No. | Connector Material Thickness mil (ga.) | Dimensions (in.) | | Fasteners (Total) | | | Allowable ASD Tension Load | | | Code Ref. |
|-----------|--|------------------|----|-----------------------------|-----------------|-----------------|----------------------------|-----------------|-----------------|-------------|
| | | W | L | Rafter/Stud/Joist Thickness | | | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | |
| | | | | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | | | | |
| LSTA9 | 33 (20 ga.) | 1¼ | 9 | (8) #10 | (8) #10 | (8) #10 | 705 | 1,120 | 1,190 | IBC, FL, LA |
| LSTA12 | | 1¼ | 12 | (10) #10 | (10) #10 | (8) #10 | 885 | 1,190 | 1,190 | |
| LSTA15 | | 1¼ | 15 | (12) #10 | (12) #10 | (10) #10 | 1,060 | 1,190 | 1,190 | |
| LSTA18 | | 1¼ | 18 | (14) #10 | (12) #10 | (10) #10 | 1,190 | 1,190 | 1,190 | |

Other Catalog Definitions

Deflection: The distance a point moves when a load is applied.

Nominal Tension Load (Strength): The capacity of a structure or component to resist the effects of loads, as determined in accordance with AISI-S100 using specified material strengths and dimensions. Typically taken as the average value of at least three tests.

The Nominal Tension Load should not be compared against design loads (ASD, LRFD), but used only where the AISI Lateral Design Standard requires the holdown to have nominal tension load (strength) to resist the lesser of the amplified seismic load or the maximum force the system can deliver.

Codes

Code Reference Column in Load Tables

Product evaluation agencies play an important role in the building industry providing an independent third-party review of architectural and structural products. Evaluations use publicly developed criteria to determine if the product meets the intent of the building code. Building officials can use product evaluation reports, often referred to as “code reports,” to review and approve product use on a project.

The most prominent architectural and structural building product certification companies are ICC Evaluation Service (ICC-ES) and IAPMO Uniform Evaluation Service (IAPMO UES), which are both ANSI-accredited to ISO Guide 65 “General Requirements for Bodies Operating Product Certification Systems” as product certification entities. Simpson Strong-Tie currently maintains more than 60 ICC-ES ESR and IAPMO UES ER reports evaluated to the 2006, 2009, 2012,

2015 and 2018 International Building Code® (IBC) and International Residential Code® (IRC). We continue to submit product information to evaluation agencies in order to update reports or receive additional reports for products in compliance with the latest codes. Simpson Strong-Tie also has reports for the City of Los Angeles, California and the State of Florida.

We have simplified our code references to make this catalog easier to use. You can quickly determine whether a product has a code report by looking in the Code Reference column of the product load tables. A summary of the code references used is in the table below.

To determine which specific code report applies to a product and download a copy of the code report, you can use our Code Report Finder at strongtie.com/codes.

| Code Reference | Evaluation Agency | Building Code Coverage |
|----------------|--|--|
| IBC | ICC-ES IAPMO UES | International Building Code (IBC) International Residential Code (IRC) |
| FL | Florida Statewide Product Approval | Florida Building Code Visit strongtie.com/codes or floridabuilding.org for accurate and up-to-date product approval and evaluation reports. |
| LA | City of Los Angeles Department of Building Safety | Los Angeles Building Code and Los Angeles Residential Code These products may have either a City of LA Research Report or a City of LA supplement to their ICC-ES or IAPMO UES evaluation reports. |
| PR | Prescriptive | Products that meet prescriptive or conventional construction requirements. |
| — | None | No evaluation report listing. Products are tested and calculated per code. See “How We Determine Allowable Loads” below. |

How We Determine Allowable Loads

Allowable loads in this catalog are determined by calculations and test criteria established by industry, such as ICC-ES Acceptance Criteria, IAPMO UES Evaluation Criteria, and AISI or ASTM test standards.

Cold-formed steel connectors are typically evaluated in accordance with ICC-ES AC261 — Acceptance Criteria for Connectors Used with Cold-Formed Steel Structural Members. Evaluation is based on a minimum of three static load tests in CFS assemblies or structural steel jigs. The published allowable load is the lower of the tested ultimate with a safety factor, load at 1/8" deflection or the fastener calculation limits. Safety factors for ASD and resistance factors for LRFD are in accordance with AISI-S100 Section F.

Cast-in-place concrete products are tested in accordance with ICC-ES AC398 — Cast-in-Place, Cold-Formed Steel Connectors in Concrete

for Light-Frame Construction or AC399 — Cast-in-Place Proprietary Bolts in Concrete for Light-Frame Construction. Tapping screw fasteners are evaluated per AC118 — Acceptance Criteria for Tapping Screw Fasteners Used in Steel-to-Steel Connections.

Where a test standard is unavailable, testing is conducted per sound engineering principles. Some tests include only portions of a product, such as purlin anchor tests, wherein only the embedded hook is tested, not the nailed or bolted section of the strap, which is calculated. Testing to determine allowable loads in this catalog is not done on connection systems in buildings. Testing is conducted in an IAS-accredited laboratory.

For detailed information regarding how Simpson Strong-Tie tests specific products, contact Simpson Strong-Tie.

Important Information and General Notes

General Notes

These notes are provided to ensure proper installation of Simpson Strong-Tie® products and must be followed fully.

- a. Simpson Strong-Tie Company Inc. reserves the right to change specifications, designs and models without notice or liability for such changes.
- b. Steel used for each Simpson Strong-Tie product is individually selected based on the product's steel specifications, including strength, thickness, formability, finish, and weldability. Contact Simpson Strong-Tie for steel information on specific products.
- c. Unless otherwise noted, dimensions are in inches and loads are in pounds.
- d. Unless otherwise noted, welds, bolts, screws and nails may not be combined to achieve highest load value.
- e. Unless otherwise noted, catalog loads are based on cold-formed steel members having a minimum yield strength, F_y , of 33 ksi and tensile strength, F_u , of 45 ksi for 43 mil (18 ga.) and thinner, and a minimum yield strength, F_y , of 50 ksi and tensile strength, F_u , of 65 ksi for 54 mil (16 ga.) and thicker.
- f. Simpson Strong-Tie Company Inc. will manufacture non-catalog products provided prior approval is obtained and an engineering drawing is included with the order. Steel specified on the drawings as $\frac{1}{8}$ ", $\frac{3}{16}$ ", and $\frac{1}{4}$ " will be 11 gauge (0.120"), 7 gauge (0.179"), and 3 gauge (0.239"), respectively. The minimum yield and tensile strengths are 33 ksi and 52 ksi, respectively.
- g. All references to bolts are for structural quality through bolts (not lag screws or carriage bolts) equal to or better than ASTM Standard A307, Grade A.
- h. Unless otherwise noted, bending steel in the field may cause fractures at the bend line. Fractured steel will not carry load and must be replaced.
- i. Top flange hangers may cause unevenness. Possible remedies should be evaluated by a professional and include using a face mount hanger or cutting the subfloor to accommodate the top flange thickness.
- j. Built-up members (multiple members) must be fastened together to act as one unit to resist the applied load (excluding the connector fasteners). This must be determined by the designer or Engineer of Record.
- k. Do not overload. Do not exceed catalog allowable loads, which would jeopardize the connection.
- l. Some model configurations may differ from those shown in this catalog. Contact Simpson Strong-Tie for details.
- m. Some combinations of hanger options are not available. In some cases, combinations of these options may not be installable. Horizontal loads induced by sloped joists must be resisted by other members in the structural system. A qualified designer must always evaluate each connection, including carried and carrying member limitations, before specifying the product. Fill all fastener holes with fastener types specified in the tables, unless otherwise noted. Hanger configurations, height and fastener schedules may vary from the tables depending on joist size, skew and slope. See the allowable table load for the non-modified hanger, and adjust as indicated. Material thickness may vary from that specified depending on the manufacturing process used. W hangers normally have single stirrups; occasionally, the seat may be welded. S/B, S/LBV, W and WP hangers for sloped seat installations are assumed backed.
- n. Simpson Strong-Tie will calculate the net height for a sloped seat. The customer must provide the H1 joist height before slope.
- o. Do not weld products listed in this catalog unless this publication specifically identifies a product as acceptable for welding, or unless specific approval for welding is provided in writing by Simpson Strong-Tie. Some steels have poor weldability and a tendency to crack when welded. Cracked steel will not carry load and must be replaced.
- p. Steel for the framing members must comply with ASTM A1003 Grade 33 minimum. Reference General Note "e" for additional requirements.
- q. Consideration should be given to the screw head specified as this may affect the attached materials.
- r. Do not add fastener holes or otherwise modify Simpson Strong-Tie products. The performance of modified products may be substantially weakened. Simpson Strong-Tie will not warrant or guarantee the performance of such modified products.

Important Information and General Notes

Warning

Simpson Strong-Tie Company Inc. structural connectors, anchors, and other products are designed and tested to provide specified design loads. To obtain optimal performance from Simpson Strong-Tie Company Inc. products and achieve maximal allowable design load, the products must be properly installed and used in accordance with the installation instructions and design limits provided by Simpson Strong-Tie Company Inc. To ensure proper installation and use, designers and installers must carefully read the following General Notes, General Instructions to the Installer and General Instructions to the Designer, as well as consult the applicable catalog pages for specific product installation instructions and notes.

Proper product installation requires careful attention to all notes and instructions, including these basic rules:

1. Be familiar with the application and correct use of the connector.
2. Follow all installation instructions provided in the applicable catalog, website, *Installer's Pocket Guide* or any other Simpson Strong-Tie publications.
3. Install all required fasteners per installation instructions provided by Simpson Strong-Tie Company Inc.: (a) use proper fastener type; (b) use proper fastener quantity; (c) fill all fastener holes; (d) do not overdrive or underdrive nails, including when using powder nailers; and (e) ensure screws are completely driven.

4. Only bend products that are specifically designed to be bent. For those products that require bending (such as strap-type holdowns, straight-end twist straps, etc.), do not bend more than one full cycle.

5. Cut joists to the correct length, do not "short-cut." The gap between the end of the joist and the header material should be no greater than $\frac{1}{8}$ " unless otherwise noted.

Failure to follow all of the notes and instructions provided by Simpson Strong-Tie Company Inc. may result in improper installation of products. Improperly installed products may not perform to the specifications set forth in this catalog and may reduce a structure's ability to resist the movement, stress and loading that occurs from gravity loads as well as impact events such as earthquakes and high-velocity winds.

Simpson Strong-Tie Company Inc. does not guarantee the performance or safety of products that are modified, improperly installed or not used in accordance with the design and load limits set forth in this catalog.

Important Information

In addition to following the basic rules provided above as well as all notes, warnings and instructions provided in the catalog, installers, designers, engineers and consumers should consult the Simpson Strong-Tie Company Inc. website at strongtie.com to obtain additional design and installation information.

General Instructions to the Installer

These general instructions to the installer are provided to ensure proper selection and installation of Simpson Strong-Tie® products and must be followed carefully. These general instructions are in addition to the specific installation instructions and notes provided for each particular product, all of which should be consulted prior to and during installation of Simpson Strong-Tie products.

- a. All specified fasteners must be installed according to the instructions in this catalog. Incorrect fastener quantity, size, type, material, or finish may cause the connection to fail.
- b. Holes for $\frac{1}{2}$ " diameter or greater bolts shall be no more than a maximum of $\frac{1}{16}$ " larger than bolt diameter per AISI S100 Table E3.
- c. Install all specified fasteners before loading the connection.
- d. Some hardened fasteners may have premature failure if exposed to moisture. The fasteners are recommended to be used in dry interior applications.
- e. Use proper safety equipment.
- f. When installing a joist into a connector with a seat, the joist shall bear completely on the seat. The gap between the end of the joist and the connector or header shall not exceed $\frac{1}{8}$ " per ICC-ES AC261, ASTM D1761 and ASTM D7147 test standards, unless otherwise noted.
- g. For holdowns, anchor bolt nuts should be finger-tight plus $\frac{1}{3}$ to $\frac{1}{2}$ turn with a hand wrench. Care should be taken to not over-torque the nut and impact wrenches should not be used. This may preload the holdown.
- h. Holdowns and tension ties may be raised off the track as dictated by field conditions to accommodate an anchor mislocated no more than $1\frac{1}{2}$ ". The holdown shall be raised off the bottom track at least 3" for every $\frac{1}{4}$ " that the anchor is offset from the model's centerline. Anchor bolt slope shall be no greater than 1:12 (or 5 degrees). Contact the designer if the holddown anchor is offset more than $1\frac{1}{2}$ " or raised more than 18". Raised holddown height is measured from the top of the concrete to the top of the holddown bearing plate.
- i. All screws shall be installed in accordance with the screw manufacturer's recommendations. All screws shall penetrate and protrude through the attached materials a minimum of three full exposed threads per AISI S200 General Provisions Section D1.3.
- j. Welding galvanized steel may produce harmful fumes; follow proper welding procedures and safety precautions. Welding should be in accordance with American Welding Society (AWS) standards. Unless otherwise noted, Simpson Strong-Tie connectors cannot be welded.
- k. Temporary lateral support for members may be required during installation.

Important Information and General Notes

General Instructions to the Designer

These general instructions to the designer are provided to ensure proper selection and installation of Simpson Strong-Tie Company Inc. products and must be followed carefully. These general instructions are in addition to the specific design and installation instructions and notes provided for each particular product, all of which should be consulted prior to and during the design process.

- a. Allowable loads are determined per the AISI S100 unless otherwise specified. Other code agencies may use different methodologies.
- b. The allowable load is typically limited to an average test load at $\frac{1}{8}$ " deflection, or an average or lowest test value (nominal load) divided by a safety factor or the calculation value. The safety factor is prescribed by Section K2.1 of the AISI S100.
- c. To achieve the loads shown in this catalog, the designer must verify that the self-drilling screws used for connector installation have P_{SS}/Ω and P_{TS}/Ω values greater than or equal to the values given in the table, Minimum ASD Loads for Screws (lb.), per p. 24 of this catalog.
- d. Allowable simultaneous loads in more than one direction on a single connector must be evaluated as follows:

Design Uplift/Allowable Uplift + Design Lateral Parallel to Track/
Allowable Lateral Parallel to Track + Design Lateral Perpendicular
to Track/Allowable Lateral Perpendicular to Track ≤ 1.0 .

The three terms in the unity equation are due to the three possible directions that exist to generate force on a connector. The number of terms that must be considered for simultaneous loading is at the sole discretion of the designer and is dependent on their method of calculating wind forces and the utilization of the connector within the structural system.
- e. The term "designer" used throughout this catalog is intended to mean a licensed/certified building design professional, a licensed professional engineer, or a licensed architect.
- f. All connected members and related elements shall be designed by the designer.
- g. Unless otherwise noted, member strength is not considered in the loads given and, therefore, one should reduce allowable loads when member strength is limiting.
- h. The average ultimate breaking strength for some models is listed under "nominal tension load."
- i. Simpson Strong-Tie strongly recommends the following addition to construction drawings and specifications: "Simpson Strong-Tie connectors and fasteners are specifically required to meet the structural calculations of plan. Before substituting another brand, confirm load capacity based on reliable published testing data or calculations. The designer or Engineer of Record should evaluate and give written approval for substitution prior to installation."
- j. Verify that the dimensions of the supporting member are sufficient to receive the specified fasteners, and develop the top flange bearing length.
- k. Most of the allowable loads published in this catalog are for use when utilizing the traditional Allowable Stress Design (ASD) methodology. A method for using Load and Resistance Factor Design (LRFD) for cold-formed steel is also included in AISI S100. When designing with LRFD, the nominal connector strength multiplied by the resistance factor must be used. If not listed or noted in a table footnote, contact Simpson Strong-Tie for the LRFD values of products listed in this catalog.
- l. All steel-to-steel connector screws must comply with ASTM C1513.
- m. Screw strength shall be calculated in accordance to AISI S100 Section J4 or shall be based upon the manufacturer's design capacity determined from testing.
- n. Simpson Strong-Tie recommends that hanger height be at least 60% of joist height for stability against rotation while under construction prior to sheathing install.
- o. Local and/or regional building codes may require meeting special conditions. Building codes often require special inspection of anchors installed in concrete and masonry. For compliance with these requirements, it is necessary to contact the local and/or regional building authority. Except where mandated by code, Simpson Strong-Tie products do not require special inspection.
- p. When connectors are attached to two CFS members of different thicknesses, the designer shall use the thinner of the two members for selecting allowable loads.

Additional Instructions for the Installer for Hybrid (Steel-to-Wood) Connections

- a. Bolt holes into wood members shall be at least a minimum of $\frac{1}{32}$ " and no more than a maximum of $\frac{1}{16}$ " larger than the bolt diameter (per the 2015 NDS 12.1.3.2 and AISI S100 Table J3-1, if applicable).
- b. Joist shall bear completely on the connector seat, and the gap between the joist end and the header shall not exceed $\frac{1}{8}$ " per ICC-ES AC261, ASTM D1761 and ASTM D7147 test standards (unless specifically noted otherwise).
- c. For holdowns, anchor bolt nuts should be finger-tight plus $\frac{1}{4}$ to $\frac{1}{2}$ turn with a hand wrench, with consideration given to possible future wood shrinkage. Care should be taken to not over-torque the nut and impact wrenches should not be used. This may preload the holdown.

Important Information and General Notes

Additional Important Information and General Notes for Hybrid (Steel-to-Wood) Connections

These notes are in addition to the previous notes for steel-to-steel connections and are provided to ensure proper installation of Simpson Strong-Tie® products and must be followed fully.

- a. Unless otherwise noted, allowable loads are for Douglas Fir–Larch under continuously dry conditions. Allowable loads for other species or conditions must be adjusted according to the code. The section from the AC13 criteria indicating the range of specific gravity reads as follows: 3.2.3 The species of lumber used shall have a specific gravity not greater than 0.55 as determined in accordance with the NDS. This chart shows specific gravity and perpendicular to grain compression capacities for the different wood species:
- | Species | F _c ⊥ | Specific Gravity |
|----------------------------------|------------------|------------------|
| Douglas Fir–Larch (DFL) | 625 psi | 0.50 |
| Southern Pine (SP) | 565 psi | 0.55 |
| Spruce-Pine-Fir (SPF) | 425 psi | 0.42 |
| Spruce-Pine-Fir South (SPF-S) | 335 psi | 0.36 |
| Hem Fir (HF) | 405 psi | 0.43 |
| Glulam | 650 psi | 0.50 |
| LVL (DF/SP) | 750 psi | 0.50 |
| LSL (E = 1.3 × 10 ⁶) | 680 psi | 0.50 |
| LSL (E ≥ 1.5 × 10 ⁶) | 880 psi | 0.50 |
| Parallam® PSL | 625 psi | 0.50 |
| Western Cedar | 425 psi | 0.36 |
- b. For face-mount hangers and straight straps, use 0.86 of Douglas Fir table loads for Spruce-Pine-Fir.
- c. A fastener that splits the wood will not take the design load. Evaluate splits to determine if the connection will perform as required. Dry wood may split more easily and should be evaluated as required. If wood tends to split, consider pre-boring holes with diameters not exceeding 0.75 of the nail diameter (2015/2018 NDS 12.1.5.3).
- d. Wood shrinks and expands as it loses and gains moisture, particularly perpendicular to its grain. Take wood shrinkage into account when designing and installing connections. Simpson Strong-Tie manufactures products to fit common dry lumber dimensions. If you need a connector with dimensions other than those listed in this catalog, Simpson Strong-Tie may be able to vary connector dimensions; contact Simpson Strong-Tie. The effects of wood shrinkage are increased in multiple lumber connections, such as floor-to-floor installations. This may result in the vertical rod nuts becoming loose, requiring post-installation tightening. (Reference ICC-ES ESR-2320 for information on Take-up Devices.)
- e. Top flange hangers may cause unevenness. Possible remedies should be evaluated by a professional and include using a face mount hanger, and notching the beam or cutting the subfloor to accommodate the top flange thickness.
- f. Built-up lumber (multiple members) must be fastened together to act as one unit to resist the applied load (excluding the connector fasteners). This must be determined by the designer.

Additional Instructions for the Designer for Hybrid (Steel-to-Wood) Connections

- a. Loads are based on the AISI S100 and the 2015 AF National Design Specifications (NDS), unless otherwise specified. Other code agencies may use different methodologies.
- b. Duration of load adjustments for fasteners into wood as specified by the code are as follows:
- Do not alter installation procedures from those set forth in this catalog.
- “FLOOR” and “DOWN” (100) — no increase for duration of load.
- “SNOW” (115) — 115% of design load for 2-month duration of load.
- “ROOF LOAD” (125) — 125% of design load for 7-day duration of load.
- “EARTHQUAKE/WIND” (160) — 160% of design load for earthquake/wind loading.
- c. Some catalog illustrations show connections that could cause cross-grain tension or bending of the wood during loading if not sufficiently reinforced. In this case, mechanical reinforcement should be considered.
- d. Most of the allowable loads published in this catalog are for use when utilizing the traditional Allowable Stress Design (ASD) methodology. A method for using Load and Resistance Factor Design (LRFD) for cold-formed steel is also included in AISI S100. When designing with LRFD, the nominal connector strength multiplied by the resistance factor must be used. If not listed or noted in a table footnote, contact Simpson Strong-Tie for the LRFD values of products listed in this catalog. A method for using Load and Resistance Factor Design (LRFD) for wood has been published in ASTM D5457. For more information, refer to the 2015/2018 NDS Appendix N, which contains a conversion procedure that can be used to derive LRFD capacities. When designing with LRFD, reference lateral resistances must be used.
- e. Pneumatic or powder-actuated fasteners may deflect and injure the operator or others. Unless otherwise noted, powder-actuated fasteners should not be used to install connectors. Pneumatic nail tools may be used to install connectors, provided the correct quantity and type of fasteners are properly installed in the fastener holes. Tools with fastener hole-locating mechanisms should be used. Follow the manufacturer’s instructions and use the appropriate safety equipment. Over driving fasteners may reduce allowable loads. Contact Simpson Strong-Tie as needed.

Important Information and General Notes

Limited Warranty

For the Limited Warranty that applies to Simpson Strong-Tie products, please consult [strongtie.com/limited-warranties](https://www.strongtie.com/limited-warranties). See p. 242 for the Limited Warranty in effect when this catalog was first published. To obtain a copy of the current Limited Warranty, contact us at limited_warranty@strongtie.com, (800) 999-5099 or Simpson Strong-Tie Company Inc., 5956 West Las Positas Boulevard, Pleasanton, CA 94588.

The Limited Warranty contains important disclaimers, limitations and exclusions, and applies only if the products have been properly specified, installed, maintained, and used in accordance with the design limits and the structural, technical, and environmental specifications in the Simpson Strong-Tie Documentation. All future purchases of Simpson Strong-Tie products are subject to the terms of the Limited Warranty in effect as of the purchase date.

Although products are designed for a wide variety of uses, Simpson Strong-Tie assumes no liability for confirming that any product is appropriate for an intended use, and each intended use of a product must be reviewed and approved by qualified professionals. Each product is designed for the load capacities and uses listed in the Simpson Strong-Tie Documentation, subject to the limitations and other information set forth therein. Due to the particular characteristics of potential impact events such as earthquakes and high velocity winds, the specific design and location of the structure, the building materials used, the quality of construction, or the condition of the soils or substrates involved, damage may nonetheless result to a structure and its contents even if the loads resulting from the impact event do not exceed Simpson Strong-Tie's specifications and the products are properly installed in accordance with applicable building codes, laws, rules and regulations.

Terms and Conditions of Sale

Product Use

Products in this catalog are designed and manufactured for the specific purposes shown, and should not be used with other connectors not approved by a qualified licensed/certified building design professional, a licensed professional engineer or licensed architect ("designer"). You should review our website and consult a qualified designer familiar with all applicable building codes each time you use a Simpson Strong-Tie product.

Indemnity

Any designer or other person who modifies any products, changes any installation procedures or designs any non-catalog products for fabrication by Simpson Strong-Tie Company Inc. shall, regardless of specific instructions to the user, indemnify, defend, and hold harmless Simpson Strong-Tie Company Inc. for any and all claimed loss or damage occasioned in whole or in part by such products.

Non-Catalog and Modified Products

Modifications to products or changes in installation procedures should only be made by a qualified professional designer. The performance of such modified products or altered installation procedures is the sole responsibility of the designer. Any person modifying Simpson Strong-Tie products must provide the installer with specific instructions on the modified products' specifications, installation and use.

Consult Simpson Strong-Tie Company Inc. for applications for which there is no catalog product, or for connectors for use in hostile environments, with excessive wood shrinkage, or with abnormal loading or erection requirements.

Non-catalog products must be designed by a qualified designer and will be fabricated by Simpson Strong-Tie in accordance with customer specifications.

Any modified, special order or non-catalog products, or any products that are not installed strictly in accordance with Simpson Strong-Tie installation procedures, are provided "AS IS" and without any representation or warranty of any kind.

Important Information and General Notes

Conversion Charts

Metric Conversion

| Imperial | Metric |
|----------|----------|
| 1 in. | 25.40 mm |
| 1 ft. | 0.3048 m |
| 1 lb. | 4.448N |
| 1 Kip | 4.448 kN |
| 1 psi | 6,895 Pa |

Bolt Diameter

| in. | mm |
|---------------|------|
| $\frac{3}{8}$ | 9.5 |
| $\frac{1}{2}$ | 12.7 |
| $\frac{5}{8}$ | 15.9 |
| $\frac{3}{4}$ | 19.1 |
| $\frac{7}{8}$ | 22.2 |
| 1 | 25.4 |

If Common Rafter Roof Pitch is...

| Rise/Run | Slope |
|----------|-------|
| 1/12 | 5° |
| 2/12 | 10° |
| 3/12 | 14° |
| 4/12 | 18° |
| 5/12 | 23° |
| 6/12 | 27° |
| 7/12 | 30° |
| 8/12 | 34° |
| 9/12 | 37° |
| 10/12 | 40° |
| 11/12 | 42° |
| 12/12 | 45° |

Then Hip/Valley Rafter Roof Pitch becomes...

| Rise/Run | Slope |
|----------|-------|
| 1/17 | 3° |
| 2/17 | 7° |
| 3/17 | 10° |
| 4/17 | 13° |
| 5/17 | 16° |
| 6/17 | 19° |
| 7/17 | 22° |
| 8/17 | 25° |
| 9/17 | 28° |
| 10/17 | 30° |
| 11/17 | 33° |
| 12/17 | 35° |

US Standard Steel Gauge Equivalents in Nominal Dimensions

| Min. Thick. | Design Thick. | Ref. Ga. ² | Thickness of Steel Sheets (in.) | | |
|-------------|---------------|-----------------------|---------------------------------|------------------------|--------------|
| | | | Uncoated Steel | Galvanized Steel (G90) | ZMAX® (G185) |
| mil | in. | | | | |
| 229 | 0.2405 | 3 | 0.239 | — | — |
| 171 | 0.1795 | 7 | 0.179 | 0.186 | — |
| 155 | 0.1668 | 8 | — | 0.167 | 0.169 |
| 118 | 0.1240 | 10 | 0.134 | 0.138 | 0.140 |
| 111 | 0.1163 | 11 | 0.120 | 0.123 | 0.125 |
| 97 | 0.1017 | 12 | 0.105 | 0.108 | 0.110 |
| 68 | 0.0713 | 14 | 0.075 | 0.078 | 0.080 |
| 54 | 0.0566 | 16 | 0.060 | 0.063 | 0.065 |
| 43 | 0.0451 | 18 | 0.048 | 0.052 | 0.054 |
| 33 | 0.0346 | 20 | 0.036 | 0.040 | 0.042 |
| 27 | 0.0283 | 22 | 0.030 | 0.033 | 0.035 |

Use these Roof Pitch to Hip/Valley Rafter Roof Pitch conversion tables only for hip/valley rafters that are skewed 45° right or left. All other skews will cause the slope to change from that listed.

1. Steel thickness may vary according to industry mill standards.
2. Gauge numbers shown are for reference only.

Corrosion Information

Understanding the Corrosion Issue

Metal connectors, fasteners and anchors can corrode and lose carrying capacity when installed in corrosive environments or when installed in contact with corrosive materials. The many variables present in a building environment make it impossible to predict accurately whether, or when, corrosion will begin to reach a critical level. This relative uncertainty makes it crucial that specifiers and users be knowledgeable about the potential risks and select a product suitable for the intended use. When there is any uncertainty about the possible corrosion risks of any installation, a qualified professional should be consulted. Because of the risks posed by corrosion, periodic inspections should be performed by a qualified engineer or qualified inspector and maintenance performed accordingly.

It's common to see some corrosion in outdoor applications. Even stainless steel can corrode. The presence of some corrosion does not mean that load capacity has been affected or that failure is imminent.

If significant corrosion is apparent or suspected, then the wood, fasteners, anchors, and connectors should be inspected by a qualified engineer or qualified inspector. Replacement of affected components may be appropriate.

Because of the many variables involved, Simpson Strong-Tie cannot provide estimates of the service life of connectors, anchors, and fasteners. We suggest that all users and specifiers obtain recommendations on corrosion from the suppliers of the materials that will be used with Simpson Strong-Tie products, in particular, treated wood or concrete. We have attempted to provide basic knowledge on the subject here, and have additional information in our technical bulletins on the topic (strongtie.com/info). The Simpson Strong-Tie website should always be consulted for the latest information.

Corrosion Information

Corrosion Conditions

Corrosion can result from many combinations of environmental conditions, materials, construction design, and other factors, and no single guideline addresses all corrosion possibilities. Nevertheless, important corrosion information can be obtained from the American Wood Protection Association (AWPA), the International Building Code (IBC), International Residential Code (IRC), and local building codes. The following discussion provides general guidelines and approaches for the selection of Simpson Strong-Tie products for various construction conditions, but is not intended to supersede the guidelines of the AWPA, IBC, IRC, or local building codes.

Corrosion issues for Simpson Strong-Tie products generally fall into five categories:

1. Environmental and Construction Factors

Many environments and materials can cause corrosion, including ocean salt air, condensation, duration of wetness, fire retardants, fumes, fertilizers, chlorides, sulfates, preservative-treated wood, de-icing salts, dissimilar metals, soils, and more. Designers must take all of these factors into account when deciding which Simpson Strong-Tie products to use with which corrosion-resistant coatings or materials.

The design, quality of construction, and misinstallation can directly affect the corrosion resistance of products. A product intended and installed for use in dry-service environment may corrode if the structure design or building materials allow moisture intrusion, or expose the product to corrosive conditions, such as moisture or chemicals contained in the construction materials, soils, or atmospheres.

2. Chemically Treated Lumber

Some wood-preservative or fire-retardant chemicals or chemical retention levels create increased risk of corrosion and are corrosive to steel connectors and fasteners. For example, testing by Simpson Strong-Tie has shown that ACQ-Type D is more corrosive than Copper Azole, Micronized Copper Azole, or CCA-C. At the same time, other tests have shown that inorganic boron treatment chemicals, specifically SBX-DOT, are less corrosive than CCA-C.

Because different chemical treatments of wood have different corrosion effects, it's important to understand the relationship between the wood treatment chemicals and the coatings and base metals of Simpson Strong-Tie products.

The preservative-treated wood supplier should provide all of the pertinent information about the treated wood product. The information should include the AWPA Use Category Designation, wood species group, wood treatment chemical, and chemical retention. See building code requirements and appropriate evaluation reports for corrosion effects of wood treatment chemicals and for fastener corrosion resistance recommendations.

With Fire-Retardant (FRT) Wood, the 2015 and 2018 IBC Section 2304.10.5, 2021 IBC Section 2304.10.6, and 2015, 2018 and 2021 IRC Section R317.3.4 refer to the manufacturers for fastener corrosion requirements. In the absence of recommendations from the FRT manufacturer, the building codes require fasteners to be hot-dip galvanized, stainless steel, silicon bronze or copper. Simpson Strong-Tie further requires that the fastener is compatible with the metal connector hardware. Fastener shear and withdrawal allowable loads may be reduced in FRT lumber. Refer to the FRT manufacturer's evaluation report for potential reduction factors.

3. Dissimilar Metals and Galvanic Corrosion

Galvanic corrosion occurs when two electrochemically dissimilar metals contact each other in the presence of an electrolyte (such as water) that acts as a conductive path for metal ions to move from the more anodic to the more cathodic metal. Good detailing practice, including the following, can help reduce the possibility of galvanic corrosion of fasteners and connectors:

- Use fasteners or anchors and connectors with similar electrochemical properties
- Use insulating materials to separate dissimilar metals
- Ensure that the fastener or anchor is the cathode when dissimilar connector metals are present
- Prevent exposure to and pooling of electrolytes

Galvanic Series of Metals

| Corroded End (Anode) |
|---|
| Magnesium, Magnesium alloys, Zinc |
| Aluminum 1100, Cadmium, Aluminum 2024-T4, Iron and Steel |
| Lead, Tin, Nickel (active), Inconel Ni-Cr alloy (active), Hastelloy alloy C (active) |
| Brasses, Copper, Cu-Ni alloys, Monel |
| Nickel (passive) |
| 304 stainless steel (passive), 316 stainless steel (passive), Hastelloy alloy C (passive) |
| Silver, Titanium, Graphite, Gold, Platinum |
| Protected End (Cathode) |

If you are uncertain about the galvanic corrosion potential of any installation, always consult with a corrosion expert. See the product pages for particular parts for more information regarding what coating systems are recommended or required for use with the parts in question.

4. Hydrogen-Assisted Stress Corrosion Cracking

Some hardened fasteners may experience premature failure from hydrogen-assisted stress-corrosion cracking if exposed to moisture. These fasteners are recommended for use only in dry-service conditions.

5. Indoor Swimming Pools

Indoor swimming pool environments are extremely corrosive to steel products. And some stainless steel is highly susceptible to stress corrosion cracking (SCC) under sustained loads in this environment. SCC can result in sudden failures. Instead of stainless steel, it is advised to use a duplex coated, post-hot-dip galvanized or ZMAX® coated low carbon steel for any load-bearing components used in swimming pool environments. Regular maintenance is strongly advised. See strongtie.com/corrosion for additional information.

Corrosion Information

Guidelines for Selecting Materials and Coatings

In the discussion and charts of this section, Simpson Strong-Tie presents a three-step system to determine which product coatings and base metals to use in a range of corrosion conditions. These are general guidelines that may not consider all relevant application criteria. Refer to product-specific information for additional guidance.

Simpson Strong-Tie evaluated the AWPA Use Categories (See AWPA U1-16) and ICC-ES AC257 Exposure Conditions and developed a set of corrosion resistance recommendations. These recommendations

address the coating systems and materials used by Simpson Strong-Tie for fastener, connector, and anchor products. Although the AWPA Use Categories and ICC-ES AC257 Exposure Conditions specifically address treated-wood applications and some common corrosion agents, Simpson Strong-Tie believes that its recommendations may be applied more generally to other application conditions, insofar as the service environments discussed are similar. You should consult with a corrosion engineer concerning the application where advisable.

Step 1 — Evaluate the Corrosion Conditions

- **Dry Service:** Generally INTERIOR applications including wall and ceiling cavities, and in raised floor applications in enclosed buildings that have been designed to prevent condensation and exposure to other sources of moisture. Prolonged periods of wetness during construction should also be considered, as this may constitute a Wet Service or Elevated Service condition. Dry Service is typical of AWPA UC1 and UC2 for wood treatment and AC257 Exposure Condition 1. Keep in mind that dry-service environment may contain airborne salts. AC257 Exposure Condition 2 reflects the presence of airborne salt in a dry-service environment and corrosion hazard to exposed metal surfaces. It does not include effects of treatment chemicals. This condition is generally considered in Elevated and Uncertain assessments.
- **Wet Service:** Generally EXTERIOR construction in conditions other than elevated service. These include Exterior Protected and Exposed and General Use Ground Contact as described by AWPA UC4A. The AWPA U1 standard classifies exterior above-ground

treatments as Use Categories UC3 (A and B) depending on moisture run-off; and for exterior ground-contact levels of protection, it has Use Categories UC4 (A-C). ICC-ES AC257 considers the exterior exposure to be limited by the presence of treatment chemicals, and corrosion accelerators. In general, the AC257 Exposure Condition 1 includes AWPA Use Categories UC1 (interior/dry) and UC2 (interior/damp), while Exposure Condition 3 is a surrogate to UC3A, 3B, and 4A (exterior, above-ground and ground-contact, general use). The ICC-ES AC257 Exposure Conditions 2 and 4 are exposures that are salt environments.

- **Elevated Service:** Includes fumes, fertilizers, soil, some preservative-treated wood (AWPA UC4B and UC4C), industrial-zone atmospheres, acid rain, salt air, and other corrosive elements.
- **Uncertain:** Unknown exposure, materials, or treatment chemicals.
- **Ocean/Water Front Service:** Marine environments that include airborne chlorides, salt air, and some salt splash. Environments with de-icing salts are included.

Step 2 — Determine Your Corrosion Resistance Classification

Corrosion Resistance Classifications

| Environment | Material to Be Fastened | | | | | | FRT Wood |
|-------------------|----------------------------------|---------------------------|---------------------------------|---------------------------------|--------|--------------------|----------|
| | Untreated Wood or Other Material | Preservative-Treated Wood | | | | Other or Uncertain | |
| | | SBX-DOT Zinc Borate | Chemical Retention ≤ AWPA, UC4A | Chemical Retention > AWPA, UC4A | ACZA | | |
| Dry Service | Low | Low | Low | High | Medium | High | Medium |
| Wet Service | Medium | N/A | Medium | High | High | High | High |
| Elevated Service | High | N/A | Severe | Severe | High | Severe | N/A |
| Uncertain | High | High | High | Severe | High | Severe | Severe |
| Ocean/Water Front | Severe | N/A | Severe | Severe | Severe | Severe | N/A |

Additional Considerations

1. Always consider the importance of the connection as well as the cost of maintenance and replacement.
2. If the information about treatment chemicals in an application is incomplete, or if there is any uncertainty as to the service environment of any application, Simpson Strong-Tie recommends the use of a Type 300 Series stainless steel. Simpson Strong-Tie has evaluated the corrosion effects of various formulations of wood treatment chemicals ACZA, ACQ, CCA, MCA, CA, and salt as corrosion accelerators. Simpson Strong-Tie has not evaluated all formulations and retentions of the named wood treatment chemicals other than to use coatings and materials in the severe category. Manufacturers may independently provide test results or other product information. Simpson Strong-Tie expresses no opinion regarding such information.
3. Type 316/305/304 stainless-steel products are recommended where preservative-treated wood used in ground contact has a chemical retention level greater than those for AWPA UC4A; CA-C, 0.15 pcf (pounds per cubic foot); CA-B, 0.21 pcf; micronized CA-C, 0.14 pcf; micronized CA-B, 0.15 pcf; ACQ-Type D (or C), 0.40 pcf. When wood treated with micronized CA-C and micronized CA-B with treatment retentions up to UC4B is in dry service, hot-dip galvanized fasteners and connectors may be suitable.

4. Mechanical galvanizations C3 and N2000 should not be used in conditions that would be more corrosive than AWPA UC3A (exterior, above ground, rapid water run off).
5. Some chemically treated wood may have chemical retentions greater than specification, particularly near the surface, making it potentially more corrosive than chemically treated wood with lower retentions. If this condition is suspected, use Type 316/305/304 stainless-steel, silicon bronze, or copper fasteners.
6. Some woods, such as cedars, redwood, and oak, contain water-soluble tannins and are susceptible to staining when in contact with metal connectors and fasteners. According to the California Redwood Association (calredwood.org), applying a quality finish to all surfaces of the wood prior to installation can help reduce staining.
7. Anchors, fasteners and connectors in contact with FRT lumber shall be hot-dip galvanized or stainless steel, unless recommended otherwise by the FRT manufacturer. Many FRT manufacturers permit low-corrosion-resistant connector and fastener coatings for dry-service conditions.
8. Simpson Strong-Tie does not recommend painting stainless-steel anchors, fasteners or connectors. Imperfections or damage to the paint can facilitate collection of dirt and water that can degrade or block the passive formation of the protective chromium oxide film. When this happens, crevice corrosion can initiate and eventually become visible as a brown stain or red rust. Painting usually does not improve the corrosion resistance of stainless steel.




Corrosion Information

Guidelines for Selecting Materials and Coatings (cont.)

Step 3 – Match Your Corrosion Resistance Classification to the Coatings and Materials Available

Not all products are available in all finishes. Contact Simpson Strong-Tie for product availability, ordering information and lead times.

Coatings and Materials Available for Connectors

| Level of Corrosion Resistance | Coating or Material | Description | |
|-------------------------------|--|---|--|
| Connectors | | | Fastener Material or Finish |
| Low | Gray or Black Paint | Organic paint intended to protect the product while it is warehoused and in transit to the jobsite. | Bright, Hot-Dip Galvanized, Mechanically Galvanized, or Double-Barrier Coating |
| | Powder Coating | Baked-on paint finish that is more durable than standard paint. | |
| | Galvanized | Standard (G90) zinc-galvanized coating containing 0.90 oz. of zinc per square foot of surface area (total both sides). | |
| Medium |  ZMAX [®] G185 | Galvanized (G185) 1.85 oz. of zinc per square foot of surface area (hot-dip galvanized per ASTM A653) total for both sides. Products with a powder-coat finish over a ZMAX [®] base have the same level of corrosion resistance. | Hot-Dip Galvanized, Mechanically Galvanized, or Double-Barrier Coating <i>* Bright fasteners may be used with ZMAX or HDG connectors where low corrosion resistance is allowed.</i> |
| |  HDG GALVANIZED [®] | Products are hot-dip galvanized after fabrication (14 ga. and thicker). The coating weight increases with material thickness. The minimum average coating weight is 2.0 oz./ft. ² (per ASTM A123) total for both sides. Anchor bolts are hot-dip galvanized per ASTM F2329. | |
| High/Severe |  316 Type 316 Stainless Steel | Type 316 stainless steel is a nickel-chromium austenitic grade of stainless steel with 2–3% molybdenum. Type 316 stainless steel is not hardened by heat treatment and is inherently nonmagnetic. It provides a level of corrosion protection suitable for severe environments, especially environments with chlorides. | Type 316 Stainless Steel |

Dry Service



Wet Service



Elevated Service / Severe






Corrosion Information

Guidelines for Selecting Materials and Coatings (cont.)

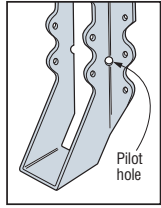
Step 3 – Match Your Corrosion Resistance Classification to the Coatings and Materials Available (cont.)

Not all products are available in all finishes. Contact Simpson Strong-Tie for product availability, ordering information and lead times.

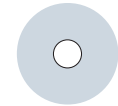
Coatings and Materials Available for Fasteners

| Level of Corrosion Resistance | Coating or Material | Description | |
|-------------------------------|---|---|--|
| Fasteners | | | Applicable Products |
| Low | Bright | No surface coating. | Nails |
| | Electrocoating (E-Coat™) | Electrocoating utilizes electrical current to deposit the coating material on the fastener. After application, the coating is cured in an oven. Electrocoating provides a minimum amount of corrosion protection and is recommended for dry, low-corrosive applications. | Strong-Drive® SDWF, SDW and SDWV Screws |
| | Clear and Bright Zinc, ASTM F1941 | Zinc coatings applied by electrogalvanizing processes to fasteners that are used in dry service and with no environmental or material corrosion hazard. | SD8 Wafer Head Screw |
| | Zinc Plating with Baked-On Ceramic Coating | A baked ceramic barrier coating applied over top of electroplated zinc provides increased protection in mildly corrosive environments. | Titen Turbo™ Concrete and Masonry Screw |
| Medium |  HDG GALVANIZED® ASTM A153, Class D | Hot-dip galvanized fasteners 3/8" and smaller in diameter in accordance with ASTM A153, Class D. Hot-dip galvanized fasteners are compliant with the 2015, 2018 and 2021 IRC and IBC. | Strong-Drive SCN CONNECTOR Nail |
| | Quik Guard® Coating | Quik Guard coatings are proprietary coating systems that consist of an electroplated zinc base layer and organic top coats. The corrosion resistance is equivalent to hot-dip galvanization (ASTM A153, Class D) in some exposures and in most non-marine environments, and described by ICC-ES, AC257 Exposures 1 and 3. | Strong-Drive XL LARGE-HEAD METAL Screw |
| | Type 410 Stainless Steel with Protective Top Coat | Carbon martensitic grade of stainless steel that is inherently magnetic, with an added protective top coat. This material can be used in mild atmospheres and many mild chemical environments. | Titen Stainless-Steel Concrete and Masonry Screw |
| | Mechanically Galvanized Coating, ASTM B695, Class 55 | Simpson Strong-Tie® Strong-Drive SD Connector screws are manufactured with a mechanically applied zinc coating in accordance with ASTM B695, Class 55, with a supplemental overcoat. These fasteners are compatible with painted and zinc-coated (G90 and ZMAX) connectors and are recognized in evaluation reports that can be found on strongtie.com . | Strong-Drive SD CONNECTOR Screw |
| | Double-Barrier Coating | Simpson Strong-Tie Strong-Drive SDS Heavy-Duty Connector screws and Outdoor Accents® structural wood screws are manufactured with double-barrier coating that provides a level of corrosion protection equaling that provided by HDG coating and are recognized in evaluation reports that can be found on strongtie.com . | Strong-Drive SDS HEAVY-DUTY CONNECTOR Screw Outdoor Accents Connector Screw and Structural Wood Screw |
| High/Severe |  HDG GALVANIZED® ASTM A153, Class C | Simpson Strong-Tie Strong-Drive Timber-Hex screws are hot-dip galvanized in accordance with ASTM A153, Class C. These hot-dip galvanized fasteners have a minimum average of 1.25 oz./ft. ² of zinc coating and are compliant with the 2015, 2018 and 2021 IRC (R317.3) and IBC. | Strong-Drive TIMBER-HEX HDG Screw |
| |  316 Stainless Steel | Type 316 stainless steel is a nickel-chromium austenitic grade of stainless steel with 2-3% molybdenum. It provides a level of corrosion protection suitable for severe environments, especially environments with chlorides. Type 316 stainless-steel fasteners are compliant with the 2015, 2018 and 2021 IRC and IBC. | Strong-Drive SCNR CONNECTOR Nail Strong-Drive SDS HEAVY-DUTY CONNECTOR Screw Strong-Drive SD CONNECTOR SS Screw Strong-Drive SDWS TIMBER SS Screw |

Fastening Information



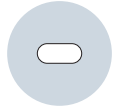
Pilot Holes
Tooling holes for manufacturing purposes. No fasteners required.



Round Holes

Purpose:
To fasten a connector.

Fill Requirements:
Always fill, unless noted otherwise.



Obround Holes

Purpose:
To make fastening a connector in a tight location easier.

Fill Requirements:
Always fill, unless noted otherwise.



Hexagonal Holes

Purpose:
To fasten a connector to concrete or masonry.

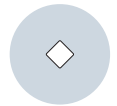
Fill Requirements:
Always fill when fastening a connector to concrete or masonry.



Triangular Holes

Purpose:
To increase a connector's strength or to achieve max. strength.

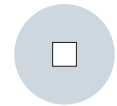
Fill Requirements:
When the designer specifies max. nailing.



Diamond Holes

Purpose:
To temporarily fasten a connector to make installing it easier.

Fill Requirements:
None.



Square Holes

Purpose:
To provide fastening option for unique custom designs

Fill Requirements:
Only when specified by designer.

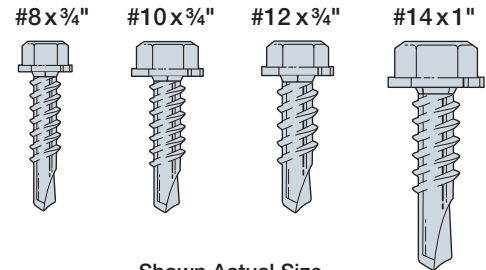
To achieve the loads shown in this catalog, the designer must verify that the self-drilling screws used for connector installation have P_{SS}/Ω and P_{TS}/Ω values greater than or equal to the values tabulated in this table.

Hex head screws shown are required for connectors in this catalog. Where sheathing or finishes will be applied over the screws and low-profile heads are needed (such as with bracing connectors, hurricane ties and stud-plate ties), the designer is to ensure that the minimum screw head diameter complies with ASME B18.6.4.

Minimum ASD Loads for Screws (lb.)

| Screw No. Designation | Nominal Diameter d (in.) | Washer Diameter d _w (in.) | Allowable Screw Shear Strength (P _{SS} /Ω) | Allowable Shear Connection Strength (P _{NS} /Ω, P _{SS} /Ω) | | | | | Allowable Screw Tension Strength (P _{TS} /Ω) | Allowable Tensile Pull-Out Strength (P _{NOT} /Ω, P _{TS} /Ω) | | | | |
|-----------------------|--------------------------|--------------------------------------|---|--|------------------|------------------|------------------|------------------|---|---|------------|------------|------------|------------|
| | | | | Steel Thickness mil (ga.) | | | | | | Steel Thickness mil (ga.) | | | | |
| | | | | 33-33 (20-20) | 43-43 (18-18) | 54-54 (16-16) | 68-68 (14-14) | 97-97 (12-12) | | 33 (20) | 43 (18) | 54 (16) | 68 (14) | 97 (12) |
| #8 | 0.164 | 0.318 | 470 | 165 | 245 | 470 | 470 | 470 | 630 | 70 | 95 | 170 | 215 | 305 |
| #10 | 0.190 | 0.375 | 540 | 175 | 265 | 535 | 540 | 540 | 820 | 85 | 110 | 200 | 250 | 355 |
| #12 | 0.216 | 0.375 | 840 | 190 | 280 | 570 | 805 | 840 | 845 | 95 | 125 | 225 | 285 | 405 |
| #14 | 0.242 | 0.500 | 1,045 | 200 | 295 | 605 | 850 | 1,045 | 1,220 | 105 | 140 | 250 | 320 | 455 |

1. Allowable loads are per AISI S-100 and are for use when utilizing the traditional Allowable Stress Design methodology. The tabulated loads may be multiplied by a Factor of Safety (Ω) of 3 to determine the screw nominal strength. The LRFD load may be determined by multiplying the nominal screw load by a Resistance Factor (φ) of 0.50.
2. Allowable loads may not be increased for wind or seismic load unless otherwise noted.
3. Allowable loads are based on cold-formed steel members with a minimum yield strength, F_y, of 33 ksi and tensile strength, F_u, of 45 ksi for 43 mil (18 ga.) and thinner, and a minimum yield strength of 50 ksi and tensile strength of 65 ksi for 54 mil (16 ga.) and thicker.
4. Allowable loads are based on design steel thickness for 33 mil = 0.0346", 43 mil = 0.0451", 54 mil = 0.0566", 68 mil = 0.0713", and 97 mil = 0.1017" per AISI S240, Table A5-1.
5. Self-drilling tapping screw fasteners for steel-to-steel connections used for connectors in this catalog shall be in compliance with ASTM C1513.
6. Minimum required screw length is the greater of ¾" and the minimum length required for the screw to extend through the steel connection a minimum of (3) exposed threads per AISI S240, Section C4.1 General Provisions Standard, Sect. D1.3.
7. Screw diameters per AISI S240, Table C-B1.5.1.1-1.
8. Size ¼"-diameter self-tapping screws may be substituted for #14 screws.



Shown Actual Size

See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

Screw Suitability

| Screw Point Type | Screw Size | Maximum Material Thickness ^{1,2} | |
|------------------|------------|---|-------|
| | | (in.) | (mm) |
| #2 | #6 | 0.100 | 2.54 |
| | #8 | 0.100 | 2.54 |
| | #10 | 0.100 | 2.54 |
| #3 | #7 | 0.125 | 3.18 |
| | #8 | 0.140 | 3.56 |
| | #10 | 0.175 | 4.45 |
| | #12 | 0.210 | 5.33 |
| #4 | #14 | 0.220 | 5.59 |
| | #12 | 0.250 | 6.35 |
| #5 | #14 | 0.250 | 6.35 |
| | #12 | 0.500 | 12.70 |
| | #14 | 0.500 | 12.70 |

1. Total thickness of all steel, including any spacing between layers.
2. Drill and tap capacities may vary.
3. Table is guideline only; see individual product for specific maximum material thickness.

CFS Framing Member

| Mil | Gauge | Design Thickness | | Minimum Thickness | |
|-----|-----------------|------------------|------|-------------------|------|
| | | (in.) | (mm) | (in.) | (mm) |
| 18 | 25 | 0.0188 | 0.48 | 0.0179 | 0.45 |
| 27 | 22 | 0.0283 | 0.72 | 0.0269 | 0.68 |
| 30 | 20 (drywall) | 0.0312 | 0.79 | 0.0296 | 0.75 |
| 33 | 20 (structural) | 0.0346 | 0.88 | 0.0329 | 0.84 |
| 43 | 18 | 0.0451 | 1.14 | 0.0428 | 1.09 |
| 54 | 16 | 0.0566 | 1.44 | 0.0538 | 1.37 |
| 68 | 14 | 0.0713 | 1.81 | 0.0677 | 1.72 |
| 97 | 12 | 0.1017 | 2.58 | 0.0966 | 2.45 |

1. One "mil" is 1/1000 (0.001) of an inch. Mil thickness measures the uncoated base material.



CFS DESIGNER™

Software Solutions

Overview

Efficient, accurate, AISI-compliant design of cold-formed steel (CFS) structures is made possible by Simpson Strong-Tie CFS Designer software. Powerful tools automate the design of common CFS systems, complicated AISI provisions, complex loading scenarios and more. A modern development platform and intuitive user interface enable fast input and simplify file management, as multiple systems can be saved within a single job file. Output is generated in PDF files that can be saved separately, if needed.

Features

Wall Framing design tools to design load-bearing framing and non-load-bearing curtain walls. Modules include:

- Wall stud
- 1-span opening
- 2-span opening
- Kneewall
- Stacked wall
- Spandrel

Joist Framing design tools for floor that automate pattern loading, and rafter design that designs load combinations and pinched axial loads. Modules include:

- Floor joist
- Rafters

General Framing design tools for general design. Modules include:

- General interaction
- Beam input

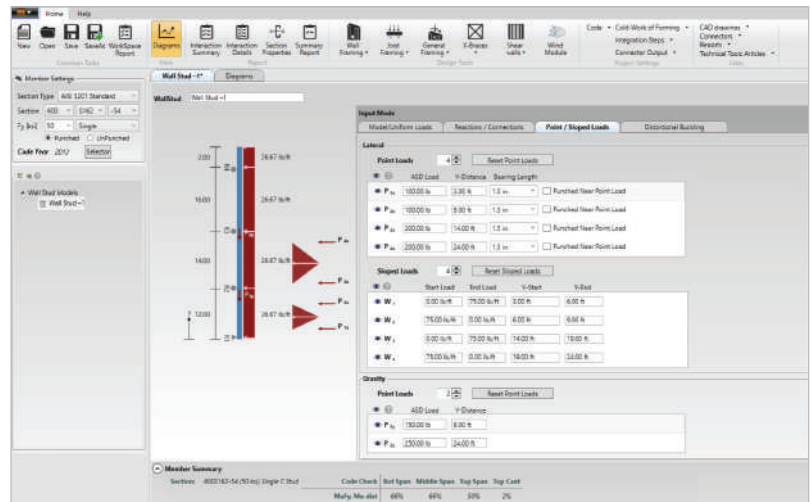
X-Bracing design tools to design elements and components with simple and robust design for LFRS (lateral force resisting system) up to eight stories that incorporate AISI S240 and S400. Modules include:

- Simple
- LFRS

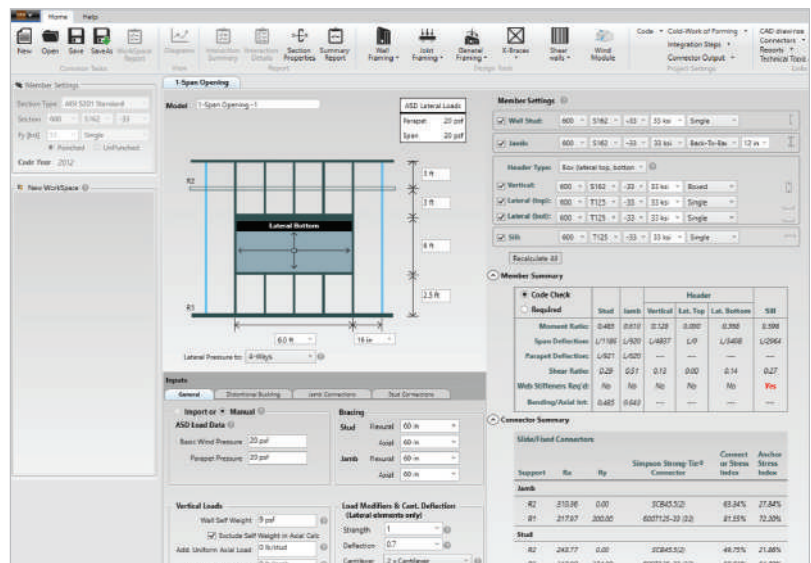
Shearwall design tools to design elements and components with simple and robust design for LFRS up to eight-story shearwall design that incorporate AISI S240 and S400 with the LFRS module. Modules include:

- Simple
- LFRS

Wind Module design tools to design components and cladding loads for walls and roof. Wind module can be imported to wall modules.



Wall Stud design tool allows up to three-span beam with overhangs on each end, importing of wind loads, additional sloped or point loads and design connections.



Wall Opening design tool is a simple and intuitive layout that allows design flexibility in all framing components of the opening.

General Information and Notes

General Information and Notes for Curtain-Wall Framing Connectors

Slide-clip and fixed-clip curtain-wall framing connectors represent key components that comprise a continuous load path between curtain-wall steel-stud framing and primary building structure.

In light-frame cold-formed steel construction, primary building structures typically consist of structural steel or structural concrete base material. Hence, connectors for curtain-wall framing are designed to anchor to steel or concrete to resist tension and compression load, perpendicular to wall, due to wind pressure, shear load due to gravity weight of the CFS framing, and in-plane load, parallel to wall due to earthquake or high wind force.

General Notes

1. Allowable loads are for use when utilizing the traditional Allowable Stress Design methodology. Contact Simpson Strong-Tie for LRFD loads unless otherwise noted.
2. Allowable loads may not be increased for wind or earthquake load.

Allowable loads are based on cold-formed steel members with a minimum yield strength, F_y , of 33 ksi and tensile strength, F_u , of 45 ksi for 43 mils (18 ga.) and thinner, and a minimum yield strength of 50 ksi and tensile strength of 65 ksi for 54 mils (16 ga.) and thicker. (U.O.N.)

3. Clips do not replace lateral or stability bracing. Design of bracing is the responsibility of the designer.
4. It is the responsibility of the designer to verify the adequacy of the stud. Allowable loads are based on clips installed an adequate distance away from penetrations, notches, ends of studs and other conditions that may affect the clip performance.
5. It is the responsibility of the designer to check the adequacy of the supporting structure for loads imposed by connectors.
6. Industry studies show that hardened fasteners can experience performance problems in wet or corrosive environments. Accordingly, use these products in dry and non-corrosive environments only.

Anchorage to Structural Steel

Anchor to structural steel using self-drilling screws, powder-actuated fasteners, or welding are based on installation in a minimum $\frac{3}{16}$ " thick structural steel with $F_y = 36$ ksi. (U.O.N.)

1. Allowable loads for #12–24 self-drilling screws are based on a minimum nominal shear strength, P_{SS} , of 2,520 lb. and nominal tension strength, P_{TS} , of 2,535 lb. It is the responsible of the designer to select the proper length fasteners based on installation need. Screw length must ensure fastener extends through the connection a minimum of three exposed threads.
2. Allowable loads for Simpson Strong-Tie® PDPAT-62KP powder-actuated "tophat" fasteners also apply to alternate fasteners with a minimum shank 0.157", a minimum head diameter of 0.300", a minimum allowable shear of 410 lb. and tension strength of 260 lb. for A36 steel, and a minimum allowable shear of 420 lb. and tension strength of 305 lb. for A572 or A992 steel per ESR-2138. "Tophat" fasteners are recommended to ensure adequate clamping force and consistent installations.
3. Allowable loads for welded connections require E70XX electrodes with a minimum throat size equal to the clip thickness. Welding shall be in compliance with AWS D1.3. Welding galvanized steel may produce harmful fumes; follow proper welding procedures and precautions.

Anchorage to Structural Concrete

Anchor to concrete or masonry such as Titen Turbo™ screws, Titen HD® screw anchor, Strong-Bolt® 2, or various type of epoxy for post installed are based on installation in concrete with a minimum $f'_c = 2,500$ psi and a maximum $f'_c = 4,000$ psi. Reference the current *Anchoring, Fastening, Restoration and Strengthening Systems for Concrete and Masonry* catalog at strongtie.com for more information.

1. Titen Turbo is a screw anchor for use in uncracked concrete as well as uncracked masonry. Titen Turbo is available in $\frac{1}{4}$ " diameter and it includes a drill bit in each box.
2. Titen HD is a heavy-duty screw anchor for use in cracked and uncracked concrete as well as uncracked masonry. Titen HD is available in $\frac{1}{4}$ ", $\frac{3}{8}$ " and $\frac{1}{2}$ " diameter for anchorage used in curtain-wall framing.
3. Strong-Bolt 2 is a wedge-type expansion anchor designed for optimal performance in cracked and uncracked concrete as well as uncracked masonry. Strong-Bolt 2 is available in $\frac{1}{4}$ ", $\frac{3}{8}$ " and $\frac{1}{2}$ " diameter for anchorage.

Innovative Solutions for Curtain-Wall Framing

Simpson Strong-Tie has developed a line of connectors for use with curtain-wall steel stud framing. Curtain-wall projects require a variety of connectors that provide a load path from the curtain wall to the primary structure for wind loads, seismic loads and dead loads. Slide-clip connectors enable the structural building frame to deflect independently of the curtain-wall system. Fixed-clip connectors support the dead load of a curtain wall from the structural frame. Fixed clips have the added benefit of providing connector solutions for load-bearing walls and for roof systems utilizing steel trusses and rafters.

Our connectors for curtain-wall construction accommodate many different bypass framing applications in a variety of standoff conditions. We also offer connectors for head-of-wall and strut applications.

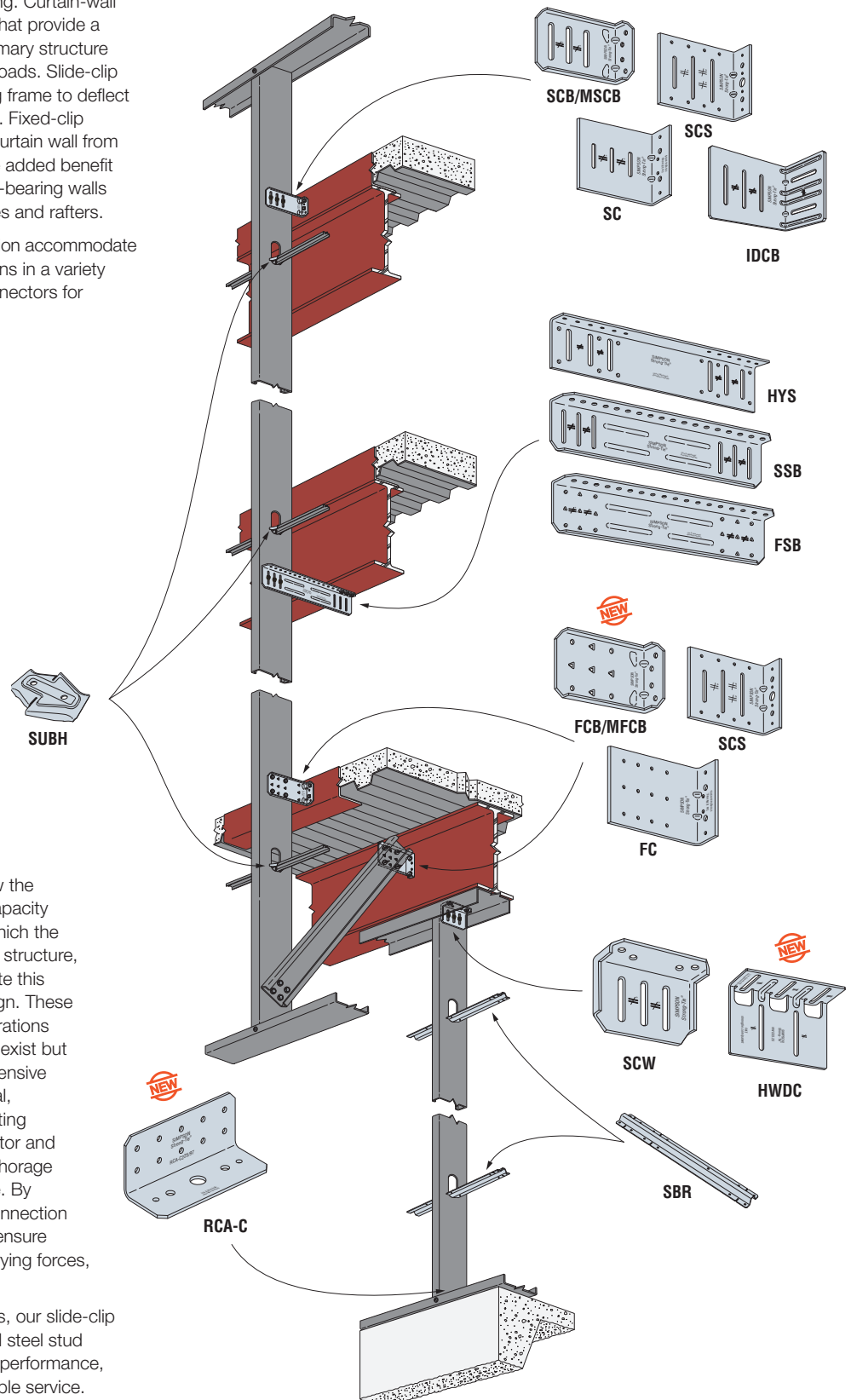
Tailored to Your Design

Our standard slide clips accommodate either $\frac{3}{4}$ " or 1" of both upward and downward movement, equivalent to an L/360 live-load deflection for a 30' span. Our standard clips also accommodate standoffs as large as 25". For deflections greater than 1", or job-specific conditions, Simpson Strong-Tie can provide custom clips to suit most framing needs (see p. 135).

Complete, Tested Solutions

Designers of curtain walls will often know the capacity of a connector, but since the capacity does not take into account the way in which the connector is anchored to the supporting structure, the designer must then manually calculate this important aspect of the connection design. These calculations are complicated by considerations of eccentric and prying forces that often exist but are difficult to predict. Through comprehensive testing Simpson Strong-Tie provides total, code-listed connector solutions. Our testing extends from the capacity of the connector and its attachment to the framing, to the anchorage of the connector to the primary structure. By providing complete data on the entire connection system, we save the designer time and ensure that all forces, including eccentric and prying forces, are adequately considered.

As with all Simpson Strong-Tie® products, our slide-clip and fixed-clip connectors for curtain-wall steel stud framing carry our promise of quality and performance, and are backed by prompt, knowledgeable service.



Deflection Connectors



SCB/MSCB Bypass Framing Slide-Clip Connector



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

The SCB/MSCB slide-clip connectors are high-performance connectors for bypass framing applications designed to reduce design time and overall installed cost. Various anchorage methods have been tested, and the resulting allowable loads eliminate the need to design connector anchorage. The SCB/MSCB can accommodate applications that typically require two parts with a single connector, reducing material and labor cost. These connectors are manufactured in five different lengths to accommodate a variety of standoff conditions and steel-stud sizes.

Features:

- Provides a full 1" of both upward and downward movement
- The precision-manufactured shouldered screws provided with the SCB/MSCB connector are designed to prevent overdriving and to ensure the clip functions properly
- Strategically placed stiffeners, embossments and anchor holes maximize connector performance
- Simpson Strong-Tie® No-Equal® stamps mark the center of the slots to help ensure correct shouldered-screw placement

Material: SCB — 54 mil (16 ga.); MSCB — 68 mil (14 ga.)

Finish: Galvanized (G90)

Installation:

- Use the specified type and number of anchors.
- Use the specified number of XLSH34B1414 #14 shouldered screws (included). Install shouldered screws in the slots adjacent to the No-Equal stamp.
- Use a maximum of one screw per slot.
- For installations to wood framing, see Simpson Strong-Tie engineering letter L-CF-DEFCLIPW at strongtie.com.

Codes: See p. 13 for Code Reference Key Chart

Ordering Information:

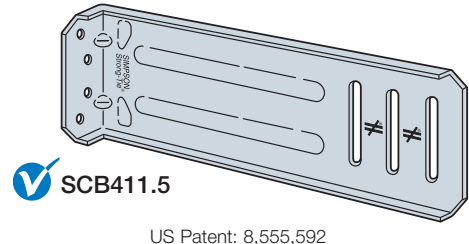
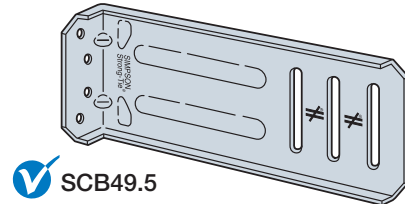
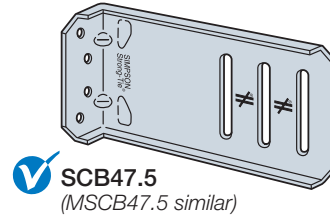
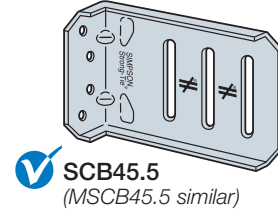
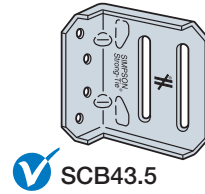
SCB43.5-KT contains:

- 25 connectors
- (55) XLSH34B1414 #14 shouldered screws

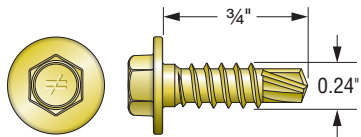
SCB45.5-KT, MSCB45.5-KT, SCB47.5-KT, MSCB47.5-KT, SCB49.5-KT, and SCB411.5-KT contain:

- 25 connectors
- (83) XLSH34B1414 #14 shouldered screws

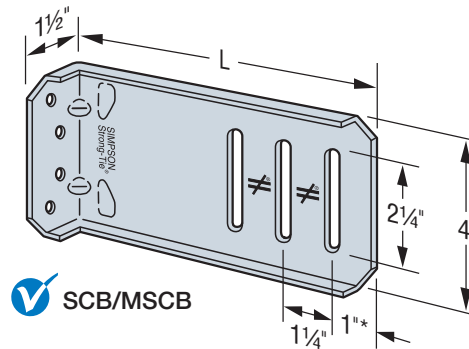
Note: Replacement #14 shouldered screws for SCB/MSCB connectors are XLSH34B1414-RP83



US Patent: 8,555,592

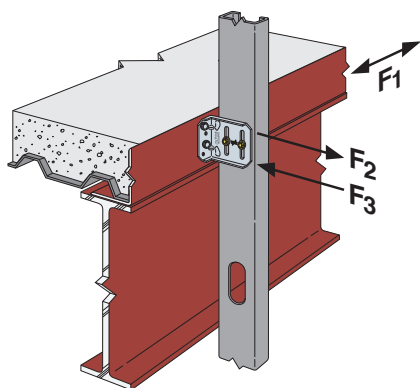


XLSH34B1414
#14 Shouldered Screw for Attachment to Stud Framing
(included)

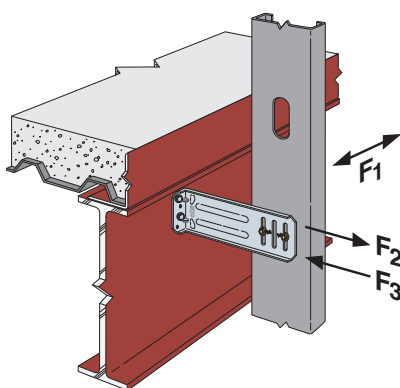


*3/4" for SCB43.5

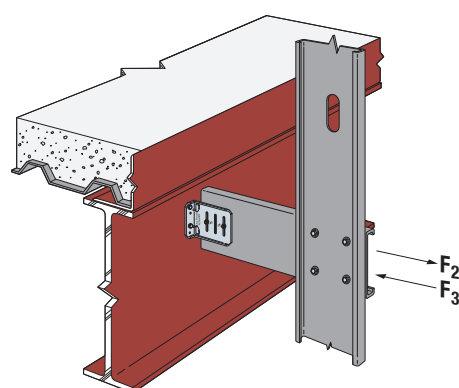
SCB/MSCB Bypass Framing Slide-Clip Connector



Typical SCB/MSCB Installation



SCB/MSCB Installation at Fascia Beam



Typical SCB/MSCB Installation with Stud Strut

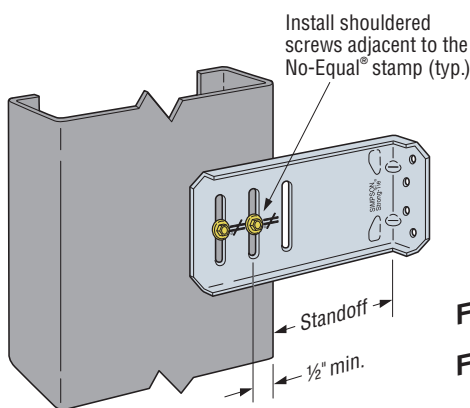
SCB/MSCB Allowable Connector Loads (lb.)

| Model No. | Connector Material Thickness mil (ga.) | L (in.) | No. of #14 Shouldered Screws ¹ | Stud Thickness | | | | | | | | | | | | Code Ref. |
|-----------|--|---------|---|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------|
| | | | | 33 mil (20 ga.) | | | 43 mil (18 ga.) | | | 54 mil (16 ga.) | | | 68 mil (14 ga.) | | | |
| | | | | F ₁ ^{3,4} | F ₂ ² | F ₃ ² | F ₁ ^{3,4} | F ₂ ² | F ₃ ² | F ₁ ^{3,4} | F ₂ ² | F ₃ ² | F ₁ ^{3,4} | F ₂ ² | F ₃ ² | |
| SCB43.5 | 54 (16) | 3½ | 2 | 100 | 520 | 520 | 160 | 610 | 690 | 215 | 760 | 975 | 215 | 760 | 975 | IBC, FL, LA |
| SCB45.5 | 54 (16) | 5½ | 2 | 120 | 490 | 520 | 150 | 610 | 690 | 200 | 760 | 975 | 215 | 760 | 975 | |
| | | | 3 | 120 | 675 | 675 | 150 | 895 | 1,000 | 200 | 990 | 1,260 | 215 | 990 | 1,260 | |
| MSCB45.5 | 68 (14) | 5½ | 2 | 120 | 490 | 520 | 185 | 780 | 690 | 250 | 1,055 | 1,200 | 270 | 1,195 | 1,475 | IBC, LA |
| | | | 3 | 120 | 675 | 675 | 185 | 1,070 | 1,000 | 250 | 1,220 | 1,930 | 270 | 1,365 | 1,930 | |
| SCB47.5 | 54 (16) | 7½ | 2 | 90 | 490 | 520 | 120 | 610 | 690 | 160 | 760 | 945 | 175 | 760 | 945 | IBC, FL, LA |
| | | | 3 | 90 | 675 | 675 | 120 | 895 | 1,000 | 160 | 990 | 1,260 | 175 | 990 | 1,260 | |
| MSCB47.5 | 68 (14) | 7½ | 2 | 105 | 490 | 520 | 140 | 780 | 690 | 190 | 1,055 | 1,200 | 205 | 1,195 | 1,475 | IBC, LA |
| | | | 3 | 105 | 675 | 675 | 140 | 1,070 | 1,000 | 190 | 1,220 | 1,930 | 205 | 1,365 | 1,930 | |
| SCB49.5 | 54 (16) | 9½ | 2 | 90 | 490 | 520 | 110 | 690 | 690 | 105 | 760 | 945 | 110 | 760 | 945 | IBC, FL, LA |
| | | | 3 | 90 | 675 | 675 | 110 | 895 | 1,000 | 105 | 990 | 1,260 | 110 | 990 | 1,260 | |
| SCB411.5 | 54 (16) | 11½ | 2 | 90 | 490 | 520 | 90 | 690 | 690 | 85 | 990 | 920 | 90 | 990 | 920 | IBC, FL, LA |
| | | | 3 | 90 | 675 | 675 | 90 | 860 | 1,000 | 85 | 990 | 1,260 | 90 | 990 | 1,260 | |

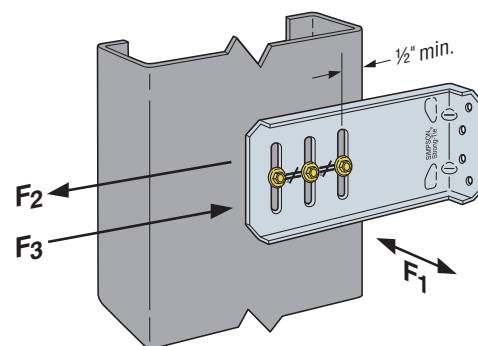
- When the SCB or MSCB connector is used with two shouldered screws, the screws may be installed in any two slots.
- Allowable loads are based on clips installed with (4) #12–14 screws in the anchor leg. For other anchorage installations, the capacity of the connection system will be the minimum of the tabulated value and the allowable load from the SCB/MSCB Allowable Anchorage Loads table on p. 31.
- Anchorage to the supporting structure using welds or a minimum of (2) fasteners is required.
- Tabulated F₁ loads are based on assembly tests with the load through the centerline of stud. Tested failure mode due to screw pullout; therefore compare F₁ against F_p calculated per ASCE 7-16 Chapter 13 with a_p = 1.25 and R_p = 1.0.

SCB/MSCB Standoff Distances

| Model No. | L (in.) | No. of #14 Shouldered Screws | Maximum Standoff (in.) |
|-----------|---------|------------------------------|------------------------|
| SCB43.5 | 3½ | 2 | 1 |
| SCB45.5 | 5½ | 2 | 2¾ |
| | | 3 | 1½ |
| MSCB45.5 | 5½ | 2 | 2¾ |
| | | 3 | 1½ |
| SCB47.5 | 7½ | 2 | 4¾ |
| | | 3 | 3½ |
| MSCB47.5 | 7½ | 2 | 4¾ |
| | | 3 | 3½ |
| SCB49.5 | 9½ | 2 | 6¾ |
| | | 3 | 5½ |
| SCB411.5 | 11½ | 2 | 8¾ |
| | | 3 | 7½ |



SCB/MSCB Installation with Two Shouldered Screws



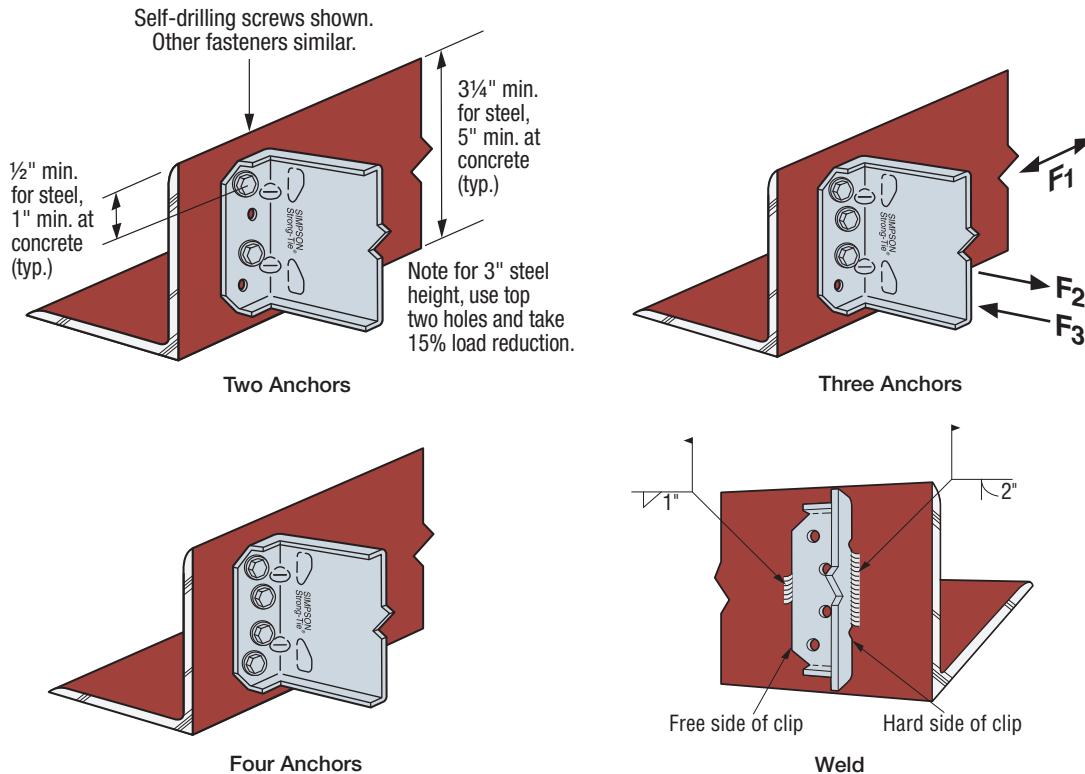
SCB/MSCB Installation with Three Shouldered Screws

SCB/MSCB Bypass Framing Slide-Clip Connector

SCB/MSCB Allowable Anchorage Loads (lb.)

| Anchorage Type | Minimum Base Material | No. of Anchors | F ₂ and F ₃ | |
|---|--|----------------|-----------------------------------|-------|
| | | | SCB | MSCB |
| #12–24 self-drilling screws Simpson Strong-Tie® X and XL Metal screws | A36 steel 3/16" thick | 2 | 1,115 | 1,150 |
| | | 3 | 1,645 | 1,725 |
| | | 4 | 2,230 | 2,300 |
| Simpson Strong-Tie 0.157" x 5/8" powder-actuated fasteners PDPAT-62KP | A36 steel 3/16" thick | 2 | 440 | 520 |
| | | 3 | 585 | 780 |
| | | 4 | 895 | 1,040 |
| Simpson Strong-Tie 0.157" x 5/8" powder-actuated fasteners PDPAT-62KP | A572 or A992 steel 3/16" thick | 2 | 585 | 610 |
| | | 3 | 800 | 915 |
| | | 4 | 1,170 | 1,220 |
| Simpson Strong-Tie 1/4" x 1 3/4" Titen Turbo™ TNT25134H | Concrete f _c = 2,500 psi | 2 | 330 | 330 |
| | | 3 | 460 | 460 |
| | | 4 | 595 | 595 |
| Weld E70XX electrodes | A36 steel 3/16" thick | Hard side: 2" | 1,740 | 4,570 |
| | | Free side: 1" | | |

- For additional important information, see General Information and Notes on p. 26.
- Allowable loads are for clip anchorage only. The capacity of the connection system will be the minimum of the tabulated allowable anchorage loads the allowable load from the SCB/MSCB Allowable Connector Load table on p. 30.
- Allowable loads for #12–24 self-drilling screws and PDPAT powder-actuated fasteners are based on installation in minimum 3/16" thick structural steel with F_y = 36 ksi. PDPAT values are also provided for A572 steel. Values listed above may be used where other thicknesses of steel are encountered or other manufacturers are used, provided that the fastener has equal or better tested values (see p. 26). It is the responsibility of the designer to select the proper length fasteners based on the steel thickness installation.
- For screw fastener installation into steel backed by concrete, predrilling of both the steel and the concrete is suggested. For predrilling use a maximum 3/16"-diameter drill bit.



SCB/MSCB Anchor Layout

SCS Seismic Bypass Framing Connector



The first product of its type to undergo full-scale cyclic research testing to determine its load capacities in real-world conditions, the SCS is a hybrid clip designed specifically to allow both slide-clip or fixed-clip applications in areas of high seismic activity. Everything about the SCS clip — from its heavy-duty 10- and 12-gauge steel manufacturing to its strategically placed darts to the location of its fastener slots and holes — has been engineered to provide exceptional resistance to in-plane seismic loads. Because slide-clip testing shows that attachment at the first slot is most critical to in-plane capacity, the SCS is designed to accommodate two large washer screws (included) at the first slot attached to the stud.

The SCS clip is the most versatile clip on the market making it the ideal clip in seismic and non-seismic areas. This clip has three prepunched oblong slots for slide applications and a pattern of round holes for fixed-clip applications to meet a range of load needs. In addition, the support leg features anchor holes for concrete supports using 1/4"- or 1/2"-diameter concrete screws or bolts, plus smaller holes for steel supports using powder-actuated fasteners such as Simpson Strong-Tie® PDPAT 0.157"-diameter pins or #12 self-drilling Strong-Drive® XL Large-Head Metal screws.

Features:

- 3 1/2", 6" and 8" lengths
- Slide slots used with shouldered washer screws (included) allow a full 1" of vertical deflection
- Precision-located stiffeners enhance strength while allowing ductility
- Simpson Strong-Tie No-Equal® stamps alongside slide slots indicate proper screw placement
- Dual-function clip with prepunched slots for slide application and small round holes for fixed application

Material: 12 ga. (97 mil) and 10 ga. (118 mil), 50 ksi

Finish: Galvanized (G90)

Installation:

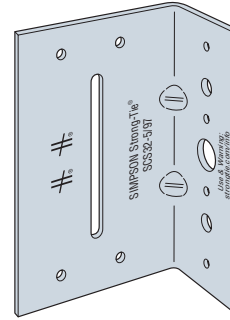
- SCS32-5 permits 1" maximum standoff for fixed applications and 1 1/2" maximum for slide applications. SCS62-5 and SCS82-5 maximum standoff are 2 1/4" for fixed applications and 3" for slide applications.
- Use the specified type and number of anchors.
- Slide applications — Use the specified number of XLSH78B1414 #14 shoulder screws (included). Install the screws in the slots adjacent to the No-Equal stamps.
- Fixed applications — Use the specified number of #10 screws (not included) in the designated screw holes.

Codes: See p. 13 for Code Reference Key Chart.

Ordering Information

| Model No. | Order SKU | Thickness mil (ga.) | L (in.) | A (in.) | B (in.) |
|-------------|------------------|---------------------|---------|---------|---------|
| SCS32-5/97 | SCS32-5/97-KT25 | 97 (12) | 3 1/2 | 1 5/8 | — |
| SCS62-5/97 | SCS62-5/97-KT25 | 97 (12) | 6 | 1 1/8 | 1 1/2 |
| SCS62-5/118 | SCS62-5/118-KT25 | 118 (10) | 6 | 1 1/8 | 1 1/2 |
| SCS82-5/118 | SCS82-5/118-KT25 | 118 (10) | 8 | 1 1/8 | 1 1/2 |

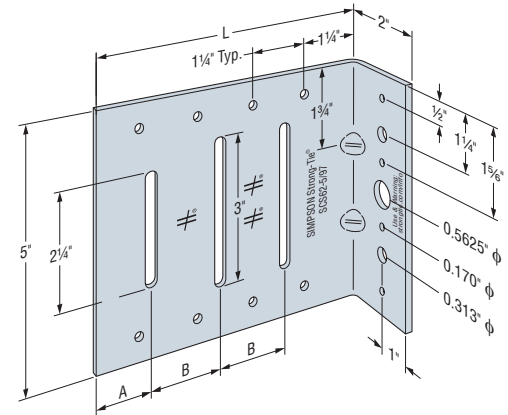
1. Each box contains (25) connectors.
2. SCS32-5/97-KT25 comes with 55 screws for slide-clip applications. All other SCS kits come with 83 screws for slide-clip applications.



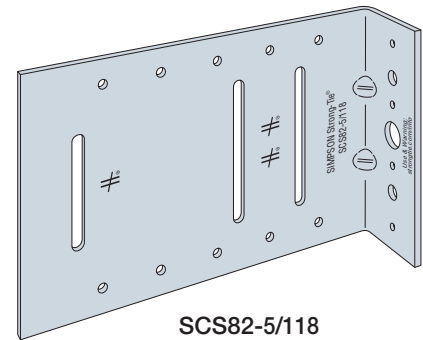
SCS32-5/97

Clip features designed to dramatically increase in-plane resistance. Load rated per ICC-ES AC261.

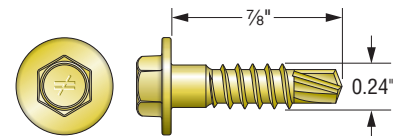
US Patent: 10,749,229



SCS62-5/97, SCS62-5/118



SCS82-5/118

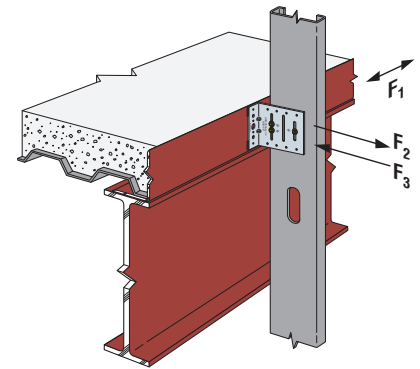


**XLSH78B1414
#14 Shouldered Screw
for Attachment to Stud
Framing Slide Application
(included)**

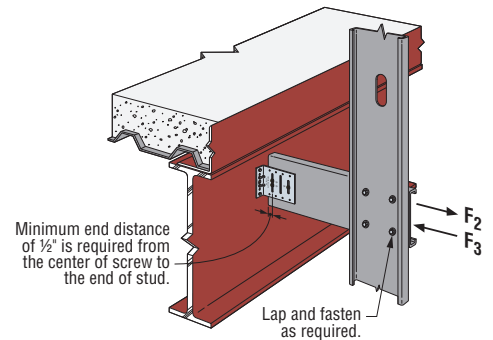
SCS Seismic Bypass Framing Connector

SCS Slide-Clip Allowable Connector Loads (lb.)

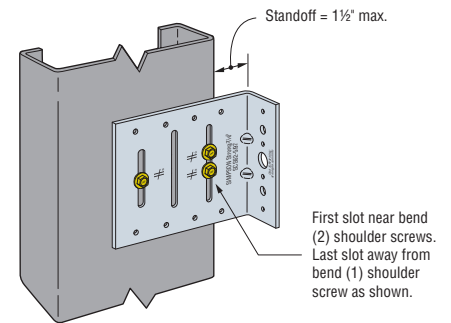
| Model No. | Framing Members Thickness mil (ga.) | Fasteners to Framing Member | | Max. Standoff Distance (in.) | Allowable Load (lb.) | | | Code Ref. |
|-------------|-------------------------------------|-----------------------------|------------------------------|------------------------------|----------------------|--------------------|------------------|-----------|
| | | Fastener Pattern | No. of #14 Shouldered Screws | | In-Plane Load F_1 | Tension Load F_2 | Comp. Load F_3 | |
| SCS32-5/97 | 33 (20) | S1 | 2 | 1½ | 200 | 425 | 425 | IBC, LA |
| SCS62-5/97 | | S1 | 3 | 1½ | 205 | 635 | 760 | |
| SCS62-5/118 | 33 (20) | S2 | 3 | 3 | 205 | 635 | 760 | |
| | | S1 | 3 | 1½ | 270 | 650 | 760 | |
| SCS82-5/118 | 33 (20) | S2 | 3 | 3 | 270 | 650 | 760 | |
| | | S1 | 3 | 1½ | 290 | 540 | 540 | |
| SCS32-5/97 | 43 (18) | S1 | 2 | 1½ | 290 | 540 | 540 | |
| SCS62-5/97 | | S1 | 3 | 1½ | 350 | 895 | 1,165 | |
| SCS62-5/118 | 43 (18) | S2 | 3 | 3 | 335 | 895 | 1,165 | |
| | | S1 | 3 | 1½ | 435 | 940 | 1,165 | |
| SCS82-5/118 | 43 (18) | S2 | 3 | 3 | 435 | 940 | 1,165 | |
| | | S1 | 3 | 1½ | 540 | 890 | 890 | |
| SCS32-5/97 | 54 (16) | S1 | 2 | 1½ | 540 | 890 | 890 | |
| SCS62-5/97 | | S1 | 3 | 1½ | 655 | 1,275 | 1,525 | |
| SCS62-5/118 | 54 (16) | S2 | 3 | 3 | 620 | 1,635 | 1,530 | |
| | | S1 | 3 | 1½ | 655 | 1,825 | 2,085 | |
| SCS82-5/118 | 54 (16) | S2 | 3 | 3 | 620 | 1,825 | 2,085 | |
| | | S1 | 3 | 1½ | 655 | 1,825 | 2,085 | |
| SCS32-5/97 | 68 (14) | S1 | 2 | 1½ | 550 | 925 | 925 | |
| | | SCS62-5/97 | S1 | 3 | 1½ | 685 | 2,065 | 2,155 |
| SCS62-5/118 | 68 (14) | S2 | 3 | 3 | 650 | 2,065 | 1,630 | |
| | | S1 | 3 | 1½ | 705 | 2,065 | 2,220 | |
| SCS82-5/118 | 68 (14) | S2 | 3 | 3 | 670 | 2,065 | 2,220 | |
| | | S1 | 3 | 1½ | 705 | 2,065 | 2,220 | |
| SCS32-5/97 | 97 (12) | S1 | 2 | 1½ | 650 | 925 | 925 | |
| | | SCS62-5/97 | S1 | 3 | 1½ | 975 | 2,065 | 2,155 |
| SCS62-5/118 | 97 (12) | S2 | 3 | 3 | 930 | 2,065 | 1,630 | |
| | | S1 | 3 | 1½ | 975 | 2,065 | 2,220 | |
| SCS82-5/118 | 97 (12) | S2 | 3 | 3 | 930 | 2,065 | 2,220 | |
| | | S1 | 3 | 1½ | 975 | 2,065 | 2,220 | |



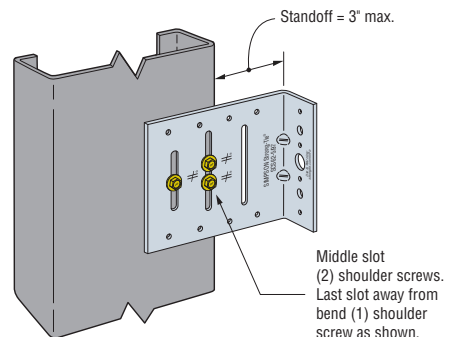
Typical SCS Slide-Clip Installation



Typical SCS Slide-Clip Installation with Stud Strut



SCS62-5
1½" Maximum Standoff
(Pattern S1 — reference p. 35 for all fastener patterns)



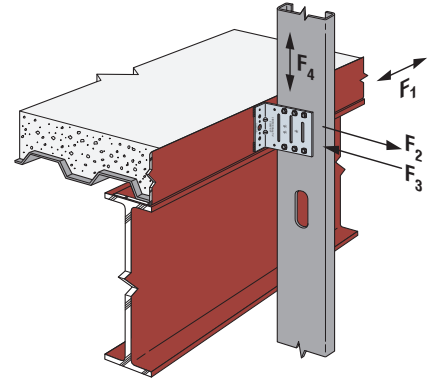
SCS62-5
3" Maximum Standoff
(Pattern S2 — reference p. 35 for all fastener patterns)

- For additional important information, see General Information and Notes on p. 26.
- SCS Allowable Connector Loads are also limited by the SCS Anchorage Load tables on pp. 36 and 37. Use the minimum tabulated values from the connector and anchorage load tables as applicable.
- See illustrations on p. 35 for fastener placement to stud framing.
- Tabulated F_1 loads are based on assembly tests with the load through the centerline of the stud. Tests are governed by fastener connections.
- F_1 loads are based on maximum standoff distances of 1½" or 3" as shown. SCS32-5/97 maximum 1½" standoff.

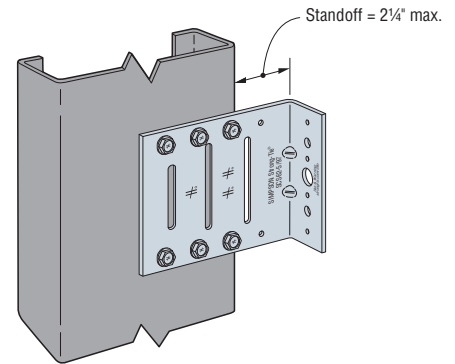
SCS Seismic Bypass Framing Connector

SCS Fixed-Clip Allowable Connector Loads (lb.)

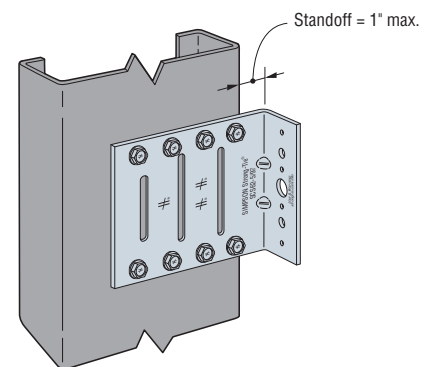
| Model No. | Framing Members Thickness mil (ga.) | Fasteners to Framing Member | | Max. Standoff Distance (in.) | Allowable Load (lb.) | | | | Code Ref. |
|-------------|-------------------------------------|-----------------------------|---------------------------------|------------------------------|------------------------------|-----------------------------|---------------------------|---------------------------|-----------|
| | | Fastener Pattern | No. of #10 Self-Drilling Screws | | In-Plane Load F ₁ | Tension Load F ₂ | Comp. Load F ₃ | Shear Load F ₄ | |
| SCS32-5/97 | 33 (20) | R1 | 4 | 1 | 160 | 705 | 705 | 705 | IBC, LA |
| SCS62-5/97 | | R1 | 6 | 2¼ | 145 | 1,060 | 1,060 | 650 | |
| SCS62-5/118 | 33 (20) | R2 | 8 | 1 | 175 | 1,415 | 1,415 | 995 | |
| | | R1 | 6 | 2¼ | 150 | 1,060 | 1,060 | 650 | |
| SCS82-5/118 | 33 (20) | R2 | 8 | 1 | 175 | 1,415 | 1,415 | 995 | |
| | | R1 | 8 | 2¼ | 150 | 1,415 | 1,415 | 690 | |
| SCS32-5/97 | 43 (18) | R2 | 10 | 1 | 175 | 1,765 | 1,765 | 1,050 | |
| | | R1 | 4 | 1 | 200 | 1,050 | 1,050 | 1,050 | |
| SCS62-5/97 | 43 (18) | R1 | 6 | 2¼ | 190 | 1,580 | 1,580 | 970 | |
| | | R2 | 8 | 1 | 225 | 2,105 | 2,105 | 1,480 | |
| SCS62-5/118 | 43 (18) | R1 | 6 | 2¼ | 195 | 1,580 | 1,580 | 970 | |
| | | R2 | 8 | 1 | 245 | 2,105 | 2,105 | 1,480 | |
| SCS82-5/118 | 43 (18) | R1 | 8 | 2¼ | 195 | 2,105 | 2,105 | 1,025 | |
| | | R2 | 10 | 1 | 245 | 2,630 | 2,105 | 1,565 | |
| SCS32-5/97 | 54 (16) | R1 | 4 | 1 | 395 | 2,135 | 2,135 | 1,405 | |
| SCS62-5/97 | | R1 | 6 | 2¼ | 345 | 3,205 | 2,275 | 1,970 | |
| SCS62-5/118 | 54 (16) | R2 | 8 | 1 | 410 | 4,275 | 3,125 | 3,005 | |
| | | R1 | 6 | 2¼ | 360 | 3,205 | 2,440 | 2,085 | |
| SCS82-5/118 | 54 (16) | R2 | 8 | 1 | 445 | 4,275 | 3,350 | 3,005 | |
| | | R1 | 8 | 2¼ | 360 | 4,275 | 2,440 | 2,010 | |
| SCS62-5/118 | 68 (14) | R2 | 10 | 1 | 445 | 4,540 | 3,350 | 3,180 | |
| | | R1 | 4 | 1 | 445 | 2,160 | 2,160 | 1,405 | |
| SCS32-5/97 | 68 (14) | R1 | 6 | 2¼ | 410 | 3,240 | 2,275 | 1,970 | |
| | | R2 | 8 | 1 | 435 | 4,320 | 3,125 | 3,005 | |
| SCS62-5/118 | 68 (14) | R1 | 6 | 2¼ | 535 | 3,240 | 2,440 | 1,970 | |
| | | R2 | 8 | 1 | 540 | 4,320 | 3,350 | 3,005 | |
| SCS82-5/118 | 68 (14) | R1 | 8 | 2¼ | 535 | 4,320 | 2,980 | 2,085 | |
| | | R2 | 10 | 1 | 675 | 4,720 | 4,095 | 3,180 | |
| SCS32-5/97 | 97 (12) | R1 | 4 | 1 | 635 | 2,160 | 2,160 | 1,405 | |
| SCS62-5/97 | | R1 | 6 | 2¼ | 775 | 3,240 | 2,275 | 1,970 | |
| SCS62-5/118 | 97 (12) | R2 | 8 | 1 | 775 | 4,320 | 3,125 | 3,005 | |
| | | R1 | 6 | 2¼ | 775 | 3,240 | 2,440 | 1,970 | |
| SCS82-5/118 | 97 (12) | R2 | 8 | 1 | 775 | 4,320 | 3,350 | 3,005 | |
| | | R1 | 8 | 2¼ | 775 | 4,320 | 2,980 | 2,085 | |
| SCS62-5/118 | 97 (12) | R2 | 10 | 1 | 775 | 4,720 | 4,095 | 3,180 | |



Typical SCS Fixed-Clip Installation



SCS62-5
2¼" Maximum Standoff
 (Pattern R1 — reference p. 35
 for all fastener patterns)



SCS62-5
1" Maximum Standoff
 (Pattern R2 — reference p. 35
 for all fastener patterns)

- For additional important information, see General Information and Notes on p. 26.
- SCS Allowable Connector Loads are also limited by the SCS Anchorage Load tables on pp. 36 and 37. Use the minimum tabulated values from the connector and anchorage load tables as applicable.
- See illustrations on p. 35 for screw fastener placement to stud framing.
- Tabulated F₁ loads are based on assembly tests with the load through the centerline of the stud. Tests are governed by fastener connections.
- F₁ loads are based on maximum standoff distances of 1" or 2¼" as shown.
SCS32-5/97 maximum 1" standoff.
- XLSH78B1414 #14 shouldered screw may be used to replace #10 screws in a fixed application.

SCS Seismic Bypass Framing Connector

Fastener Patterns

| Model No. | Slide Conditions | | Fixed Conditions | |
|---------------------------|------------------|------------|------------------|------------|
| | Pattern S1 | Pattern S2 | Pattern R1 | Pattern R2 |
| SCS32-5/97 | | | | |
| SCS62-5/97 SCS62-5/118 | | | | |
| SCS82-118 | | | | |



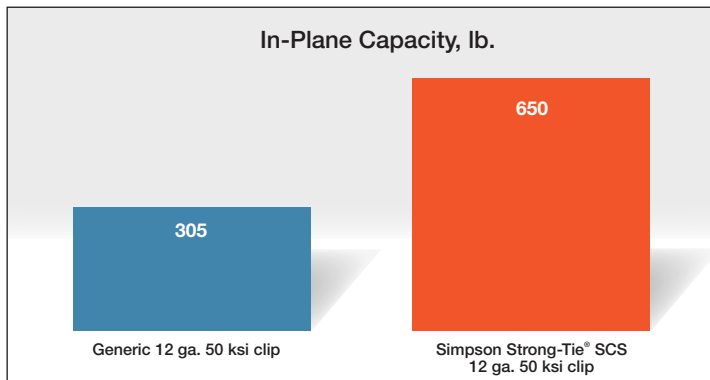
First of Its Kind — Full-Scale Cyclic Testing for Bypass Clips

The Re-Engineered Bypass Clip

Our engineering expertise went into our new SCS seismic bypass clip. All aspects of the clip were evaluated. One significant modification was the location of our screw holes and slots. Our tests showed that in-plane load is not evenly applied to all screws. In-plane load, or seismic shaking along the plane of the wall, applies predominantly to the first row of screws. Our SCS clip was designed to accommodate two shoulder screws at the first screw line, doubling the number of screws effectively resisting in-plane load.

Testing Results Explained

To determine the in-plane performance of our SCS clips, Simpson Strong-Tie conducted full-scale cyclic testing on our uniaxial shake table at our Tye Gilb Research Laboratory in Stockton, CA. The full-scale test results were used to develop a representative component test to determine various combinations of stud/clip in-plane capacities. This first-of-its-kind testing represents something that was sorely needed because of the lack of industry testing and design standards. Our tests also allowed us to re-engineer the bypass clip to significantly increase the in-plane capacities. Prior to our tested values, various unproven calculation techniques have been used to estimate in-plane loads. Our tested in-plane loads eliminate the guesswork and thus mitigate risk for engineers, contractors and building owners.



Test based on 16 ga. 50 ksi stud and 12 ga. generic clip with (3) #14 screws through slot with flat washer tested in same manner as Simpson Strong-Tie SCS 12 ga. 50 ksi clip in slide-clip application.



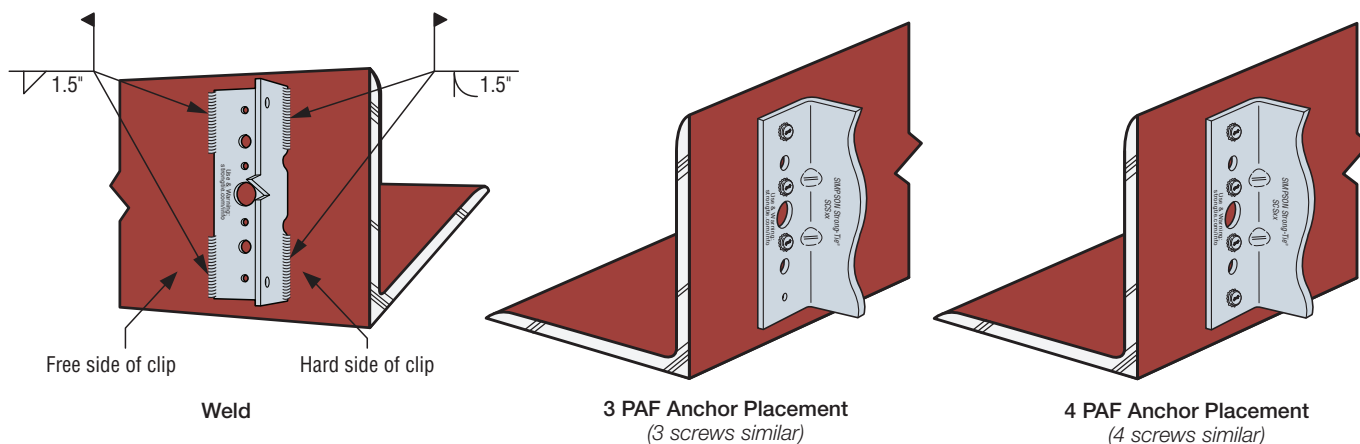
SCS Seismic Bypass Framing Connector



SCS Allowable Anchorage Loads to Steel (lb.)

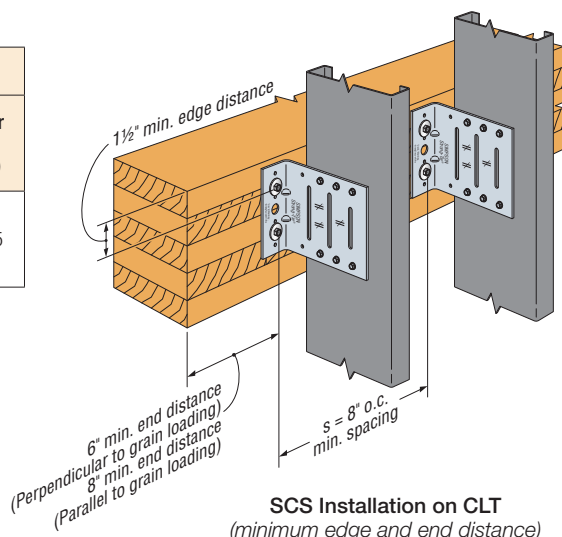
| Anchorage Type | Minimum Base Material | No. of Anchors | Allowable Load (lb.) | | |
|---|---------------------------------------|---------------------|----------------------|-----------------------------------|----------------|
| | | | F ₁ | F ₂ and F ₃ | F ₄ |
| #12–24 self-drilling screws Simpson Strong-Tie® X and XL Metal screws | A36 steel 3/16" thickness | 3 | 730 | 1,910 | 1,590 |
| | | 4 | 975 | 2,545 | 3,180 |
| Simpson Strong-Tie 0.157" x 5/8" powder-actuated fasteners PDPAT-62KP | A36 steel 3/16" thickness | 3 | — | 780 | — |
| | | 4 | — | 1,040 | 1,040 |
| Simpson Strong-Tie 0.157" x 5/8" powder-actuated fasteners PDPAT-62KP | A572 or A992 steel 3/16" thickness | 3 | — | 1,260 | — |
| | | 4 | — | 1,710 | 1,710 |
| Weld E70XX electrodes | A36 steel 3/16" thickness | (2) Hard side: 1.5" | 2,040 | 4,720 | 3,865 |
| | | (2) Free side: 1.5" | | | |

- For additional important information, see General Information and Notes on p. 26.
- Allowable anchorage loads are also limited by the SCS Connector Loads on p. 33 for slide applications and p. 34 for fixed applications. Use the minimum tabulated values from the connector and anchorage load tables as applicable.
- Allowable loads for self-drilling screws and PDPAT powder-actuated fasteners are based on installation in minimum 3/16"-thick structural steel with F_y = 36 ksi. PDPAT values are also provided for A572 steel. Values listed above may be used where other thicknesses of steel are encountered provided that the fastener has equal or better tested values into thicker steel. It is the responsibility of the designer to select the proper length fasteners based on the steel thickness installation.
- For screw fastener installation into steel backed by concrete, predrilling of both the steel and the concrete is suggested. For predrilling, use a maximum 3/16"-diameter drill bit.
- F₁, F₂, F₃ and F₄ load directions are the same as SCS Connector Loads on p. 33 for slide applications and p. 34 for fixed applications.



SCS Allowable Anchorage Loads to CLT (lb.)

| Models | Anchorage Type | Minimum Base Material | Allowable Load (lb.) | | | |
|------------|----------------|--|-------------------------------|------------------------------|----------------------------|----------------------------|
| | | | In-Plane F ₁ (160) | Tension F ₂ (160) | Comp. F ₃ (160) | Shear F ₄ (100) |
| SCS62-5/97 | (2) SDHW27400G | 5-ply (6 7/8") SPF CLT into side or end grain | 560 | 1,260 | 1,260 | 1,295 |

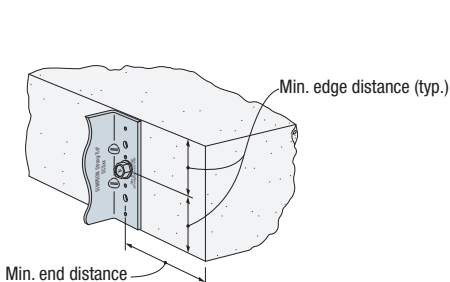


- For additional important information, see General Information and Notes on p. 26.
- Allowable anchorage loads are also limited by the SCS Connector Loads on p. 33 for slide applications and p. 34 for fixed applications. Use the minimum tabulated values from the connector and anchorage load tables as applicable.
- Tabulated values are based on (2) Strong-Drive® SDHW27400G Timber-Hex HDG Screws 0.276" diameter x 4" length. Minimum spacing, end distance, and edge distances for wood screws are shown in the illustration.
- SDHW27400G screw is designed to thread into SCS anchor hole without enlargement of clip hole.
- The SDHW27400G have been increased for wind or earthquake loading (160) in the F₁, F₂ and F₃ direction. No further increase allowed.

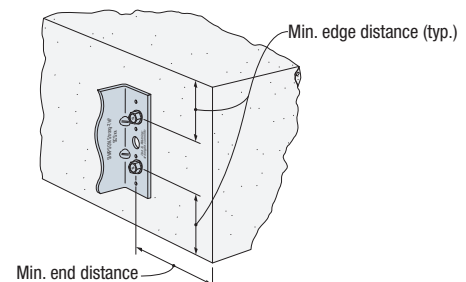
SCS Allowable Anchorage Loads to Concrete (lb.)

| Model No. | Anchor Bolt Quantity and Diameter | Nominal Embed. Depth, h_{nom} (in.) | Minimum Edge Distance (in.) | Minimum End Distance (in.) | Allowable Load (lb.) | | | | | |
|--|-----------------------------------|---------------------------------------|-----------------------------|----------------------------|----------------------|-----------------------------------|----------------|--------------------|-----------------------------------|----------------|
| | | | | | $f'_c = 3,000$ psi | | | $f'_c = 4,000$ psi | | |
| | | | | | F ₁ | F ₂ and F ₃ | F ₄ | F ₁ | F ₂ and F ₃ | F ₄ |
| Uncracked Concrete, Wind and Seismic in SDC A & B^{4,6} | | | | | | | | | | |
| Titen HD® | (2) ¼" | 1½ | 1½ | 2½ | 375 | 725 | 565 | 430 | 840 | 655 |
| | | 2½ | | | 410 | 525 | 565 | 475 | 605 | 655 |
| Strong-Bolt® 2 | (2) ¼" | 1¾ | 4 | 4 | 750 | 1,245 | 750 | 750 | 1,245 | 750 |
| Titen HD | (1) ½" | 3¼ | 2½ | 2½ | 525 | 1,105 | 665 | 605 | 1,245 | 770 |
| | | 3¾ | | | 540 | 1,110 | 690 | 625 | 1,245 | 795 |
| Strong-Bolt 2 | (1) ½" | 2¾ | 4 | 4 | 1,035 | 1,155 | 1,240 | 1,195 | 1,330 | 1,435 |
| | | 3⅞ | | | 1,120 | 1,245 | 1,400 | 1,295 | 1,245 | 1,620 |
| AT-XP® | (1) ½" | 7 | 2½ | 2½ | 1,160 | 1,145 | 1,450 | 1,340 | 1,145 | 1,675 |
| SET-3G™ | | | | | 1,160 | 1,245 | 1,450 | 1,340 | 1,245 | 1,675 |
| Cracked Concrete, Wind and Seismic in SDC A & B^{4,6} | | | | | | | | | | |
| Titen HD | (2) ¼" | 1½ | 1½ | 2½ | 265 | 690 | 405 | 305 | 800 | 465 |
| | | 2½ | | | 295 | 770 | 445 | 340 | 885 | 515 |
| Titen HD | (1) ½" | 3¼ | 2½ | 2½ | 375 | 790 | 475 | 430 | 910 | 550 |
| | | 3¾ | | | 385 | 790 | 490 | 445 | 910 | 565 |
| Strong-Bolt 2 | (1) ½" | 2¾ | 4 | 4 | 740 | 1,225 | 925 | 855 | 1,245 | 1,065 |
| | | 3⅞ | | | 800 | 1,245 | 1,000 | 925 | 1,245 | 1,155 |
| AT-XP | (1) ½" | 7 | 2½ | 2½ | 830 | 1,245 | 1,035 | 955 | 1,245 | 1,195 |
| SET-3G | | | | | 830 | 1,245 | 1,035 | 955 | 1,245 | 1,195 |
| Cracked Concrete, Seismic in SDC C Through F^{5,6} | | | | | | | | | | |
| Titen HD | (2) ¼" | 1½ | 1½ | 2½ | 310 | 605 | 470 | 360 | 700 | 545 |
| | | 2½ | | | 340 | 670 | 520 | 395 | 775 | 600 |
| Titen HD | (1) ½" | 3¼ | 2½ | 2½ | 435 | 690 | 555 | 505 | 800 | 640 |
| | | 3¾ | | | 450 | 690 | 575 | 520 | 800 | 660 |
| Strong-Bolt 2 | (1) ½" | 2¾ | 4 | 4 | 860 | 1,070 | 1,075 | 995 | 1,240 | 1,245 |
| | | 3⅞ | | | 935 | 1,245 | 1,170 | 1,080 | 1,245 | 1,350 |
| AT-XP | (1) ½" | 7 | 2½ | 2½ | 965 | 1,245 | 1,210 | 1,115 | 1,245 | 1,395 |
| SET-3G | | | | | 965 | 1,245 | 1,210 | 1,115 | 1,245 | 1,395 |

1. Allowable anchor capacities have been determined using ACI 318-14 Chapter 17 calculations with a minimum concrete compressive strength (f'_c) of 3,000 and 4,000 psi in normal-weight concrete. Tabulated values shall be multiplied by a factor (λ_a) of 0.51 for adhesive anchor and 0.68 for mechanical anchor for installation in sand light-weight concrete.
2. Load values are for group anchors based on ACI 318, condition B, load factors from ACI 318-14 Section 5.3, no supplement edge reinforcement, $\Psi_{c,v} = 1.0$ for cracked concrete and periodic special inspection.
3. Allowable Stress Design (ASD) values were determined by multiplying calculated LFRD capacities by a conversion factor, Alpha (α), of 0.70 for seismic load and 0.6 for wind loads. ASD values for other combinations may be determined using alternate conversion factors.
4. Tabulated allowable ASD loads for Wind and Seismic in SDC A&B are based on using wind conversion factors and may be increased by 1.17 for SDC A and B only.
5. Design loads shall include the over-strength factor per ASCE7 Section 12.4.3. For fasteners in exterior wall connection systems, $\Omega_o = 1.5$ per Table 13.5-1.
6. Tabulated allowable loads are based on anchorage only. The capacity of the connection system shall be the minimum of the allowable anchorage load and the SCS allowable connector loads on p. 33 for slide applications and p. 34 for fixed applications.
7. Shaded values are limited by connector serviceability and strength in a single-fastener anchorage.
8. For anchor subjected to both tension and shear loads, it shall be designed to satisfy the following:
 - a. For $N_a / N_{all} \leq 0.2$, the full allowable load in shear is permitted.
 - b. For $V_a / V_{all} \leq 0.2$, the full allowable load in tension is permitted.
 - c. For all other cases, $N_a / N_{all} + V_a / V_{all} \leq 1.2$, where
 - N_a = Applied ASD tension load.
 - N_{all} = Allowable F₂ or F₃ load column from SCS allowable anchorage loads to concrete table.
 - V_a = Applied ASD shear load.
 - V_{all} = Allowable F₄ or F₁ load column from the SCS allowable anchorage loads to concrete table.



(1) Anchor, End and Edge Distance



(2) Anchor, End and Edge Distance

SC Bypass Framing Slide-Clip Connector

Ideal for high-seismic areas, Simpson Strong-Tie® SC connectors are the optimal solution for slide-clip bypass framing. SC clips are often welded to the structure in high-seismic zones, but they also feature anchorage holes so that concrete screws or powder-actuated fasteners can be used to attach the clip to the structure. In addition to anchorage versatility, the SC clips include No-Equal® stamps at the center of the slots to ensure proper shouldered screw placement. SC connectors are manufactured using heavy-duty 10- and 12-gauge steel to provide exceptional resistance to in-plane seismic load.

Features:

- The clips come in lengths of 3½", 6" and 8" for use with 3½", 6" and 8" studs, respectively
- The maximum standoff distance is 1" for 3½" studs and 1½" for 6" and 8" studs
- Provides a full ¾" of both upward and downward deflection
- Embossments in the bend line provide increased strength and stiffness in the F₁ and F₂ load directions, but are positioned towards the center of the clip so that 1½" long welds can be applied at the top and bottom of the clip
- Prepunched large-diameter anchor holes accommodate ¼"-diameter concrete screws like the Simpson Strong-Tie Titen HD®
- Prepunched small-diameter anchor holes accommodate powder-actuated fasteners like the 0.157"-diameter Simpson Strong-Tie PDPAT or the #12 self-drilling Simpson Strong-Tie Strong-Drive® XL Large-Head Metal screw
- Precision-manufactured shouldered screws, provided with SC connectors, are designed to prevent overdriving and to ensure the clip functions properly

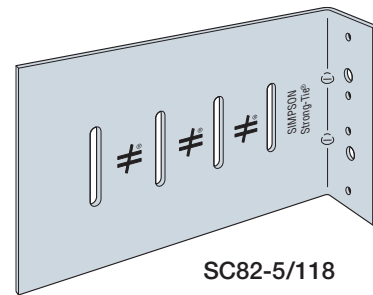
Material: 50 ksi

Finish: Galvanized (G90)

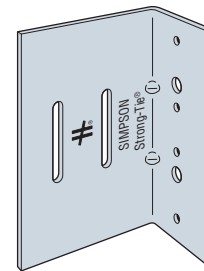
Installation:

- Use the specified type and number of anchors.
- Use the specified number of XLSH78B1414 #14 shouldered screws (included). Install the screws in the slots adjacent to the No-Equal stamps.
- Use one shouldered screw per slot (maximum).

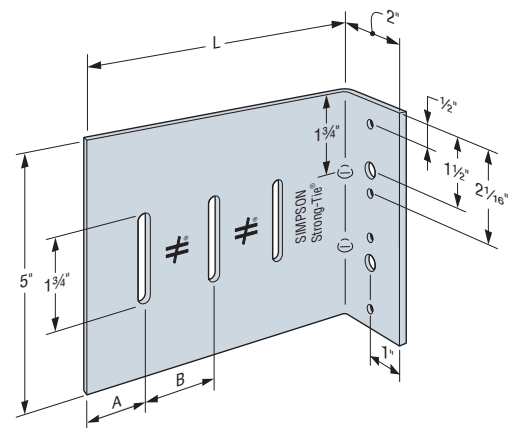
Codes: See p. 13 for Code Reference Key Chart



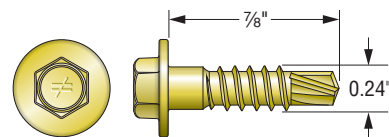
SC82-5/118



SC32-5/97



SC62-5/97
SC62-5/118



XLSH78B1414
#14 Shouldered Screw for Attachment to Stud Framing
(included)

Ordering Information and Dimensions

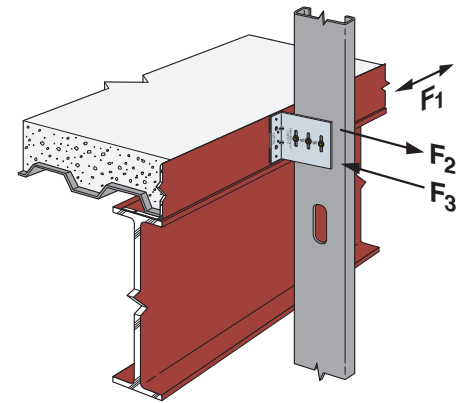
| Model No. | Ordering SKU | Thickness mil (ga.) | L (in.) | A (in.) | B (in.) |
|------------|-----------------|---------------------|---------|---------|---------|
| SC32-5/97 | SC32-5/97-KT25 | 97 (12) | 3½ | 7/8 | 1¼ |
| SC62-5/97 | SC62-5/97-KT25 | 97 (12) | 6 | 1½ | 1½ |
| SC62-5/118 | SC62-5/118-KT25 | 118 (10) | 6 | 1½ | 1½ |
| SC82-5/118 | SC82-5/118-KT25 | 118 (10) | 8 | 1½ | 1½ |

1. Each box contains (25) connectors and enough shouldered screws for installation.
2. Replacement #14 shouldered screws for SC connectors are XLSH78B1414-RP83.

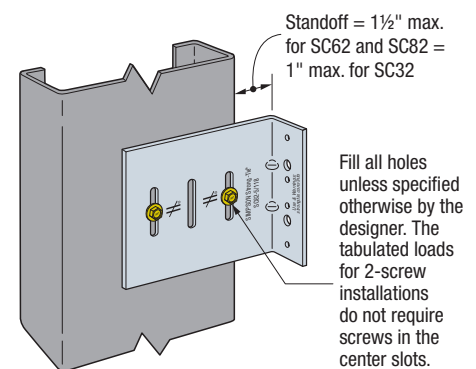
SC Bypass Framing Slide-Clip Connector

SC Allowable Connector Loads (lb.)

| Model No. | Stud Thickness mil (ga.) | Fasteners to Stud | | Allowable Load (lb.) | | | | Code Ref. | | | |
|------------|--------------------------|---|------------------------------|----------------------|--------------|----------------|----------------|-----------|-------|-----|--|
| | | Allowable Pullout per Single #14 Shouldered Screw | No. of #14 Shouldered Screws | F ₁ | | F ₂ | F ₃ | | | | |
| | | | | 1" Standoff | 1½" Standoff | | | | | | |
| SC32-5/97 | 33 (20) | 100 | 2 | 170 | — | 585 | 715 | | | | |
| SC62-5/97 | | | 2 | 100 | 115 | 585 | 715 | | | | |
| SC62-5/118 | | | 3 | 115 | 130 | 880 | 1,070 | | | | |
| | | | 2 | 100 | 115 | 585 | 710 | | | | |
| SC82-5/118 | | | 3 | 115 | 130 | 880 | 1,070 | | | | |
| | | | 2 | 115 | 130 | 585 | 710 | | | | |
| SC32-5/97 | | | 43 (18) | 145 | 2 | 220 | — | | 765 | 930 | |
| SC62-5/97 | | | | | 2 | 135 | 155 | | 765 | 930 | |
| SC62-5/118 | 3 | 150 | | | 175 | 1,145 | 1,395 | | | | |
| | 2 | 135 | | | 155 | 765 | 930 | | | | |
| SC82-5/118 | 3 | 150 | | | 175 | 1,145 | 1,395 | | | | |
| | 2 | 150 | | | 175 | 765 | 930 | | | | |
| SC82-5/118 | 4 | 150 | | | 175 | 1,525 | 2,125 | | | | |
| SC32-5/97 | 54 (16) | 270 | | | 2 | 300 | — | 1,145 | 1,645 | | |
| SC62-5/97 | | | 2 | 255 | 295 | 1,145 | 1,645 | | | | |
| SC62-5/118 | | | 3 | 265 | 305 | 2,120 | 2,345 | | | | |
| | | | 2 | 255 | 295 | 1,405 | 1,685 | | | | |
| SC82-5/118 | | | 3 | 265 | 305 | 2,110 | 2,530 | | | | |
| | | | 2 | 260 | 300 | 1,405 | 1,685 | | | | |
| SC32-5/97 | | | 68 (14) | 410 | 2 | 375 | — | 1,695 | 1,645 | | |
| SC62-5/97 | | | | | 2 | 320 | 370 | 1,695 | 1,645 | | |
| SC62-5/118 | 3 | 335 | | | 385 | 2,540 | 2,345 | | | | |
| | 2 | 330 | | | 380 | 2,165 | 2,040 | | | | |
| SC82-5/118 | 3 | 345 | | | 395 | 3,250 | 3,060 | | | | |
| | 2 | 325 | | | 375 | 2,165 | 2,085 | | | | |
| SC82-5/118 | 4 | 325 | | | 375 | 4,330 | 4,165 | | | | |
| SC32-5/97 | 97 (12) | 725 | | | 2 | 540 | — | 1,695 | 1,645 | | |
| SC62-5/97 | | | 2 | 555 | 555 | 1,695 | 1,645 | | | | |
| SC62-5/118 | | | 3 | 555 | 555 | 2,540 | 2,345 | | | | |
| | | | 2 | 555 | 555 | 2,165 | 2,040 | | | | |
| SC82-5/118 | | | 3 | 635 | 635 | 3,250 | 3,060 | | | | |
| | | | 2 | 465 | 465 | 2,165 | 2,085 | | | | |
| SC82-5/118 | | | 4 | 465 | 465 | 4,330 | 4,165 | | | | |



Typical SC Installation



SC62 with Two Screws
(SC82 similar)

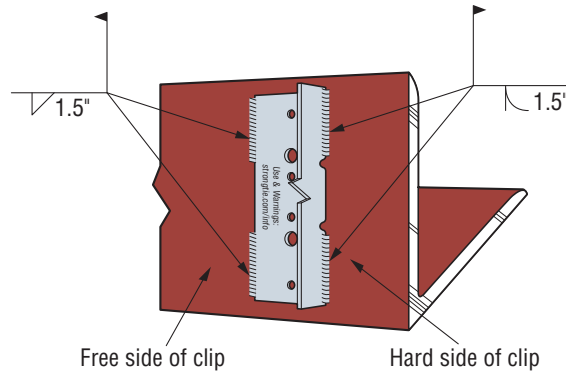
- For additional important information, see General Information and Notes on p. 26.
- SC Allowable Connector Loads are also limited by the SC Anchorage Load tables on pp. 40 and 41. Use the minimum tabulated values from the connector and anchorage load tables as applicable.
- See illustration for fastener placement when using only two shouldered screws to the stud.
- Tabulated F₁ loads are based on assembly tests with the load through the centerline of the stud. Tested failure modes were due to screw pullout; therefore compare F₁ against F_p calculated per ASCE 7-16 Chapter 13 with a_p = 1.25 and R_p = 1.0.
- F₁ loads are based on maximum standoff distances of 1" or 1½" as shown. Other loads are applicable to a 1" standoff for SC32 and 1" or 1½" standoff for SC62 and SC82.
- At the bend line, the gross allowable plastic moment in the F₁ load direction for 97 mil (12 ga.) and 118 mil (10 ga.) SC connectors are 395 in.-lb. and 675 in.-lb., respectively.
- At a vertical slot, the net allowable plastic moment in the F₁ load direction for 97 mil (12 ga.) and 118 mil (10 ga.) SC connectors are 260 in.-lb. and 440 in.-lb., respectively.

SC Bypass Framing Slide-Clip Connector

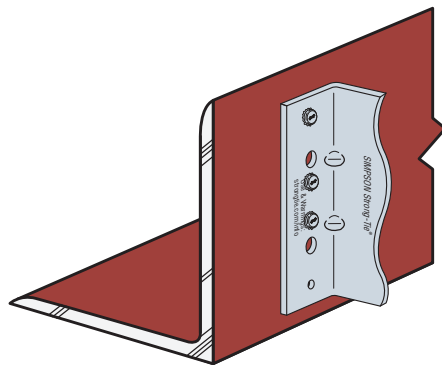
SC Allowable Anchorage Loads to Steel (lb.)

| Anchorage Type | Minimum Base Material | No. of Anchors | Allowable Load (lb.) | |
|---|-----------------------------------|---------------------|----------------------|-----------------------------------|
| | | | F ₁ | F ₂ and F ₃ |
| #12–24 self-drilling screws Strong-Drive® X and XL Metal screws | A36 steel 3/16" thick | 3 | 730 | 1,910 |
| | | 4 | 975 | 2,545 |
| Simpson Strong-Tie® 0.157" x 3/16" powder-actuated fasteners PDPAT-62KP | A36 steel 3/16" thick | 3 | — | 780 |
| | | 4 | — | 1,040 |
| Simpson Strong-Tie 0.157" x 3/16" powder-actuated fasteners PDPAT-62KP | A572 or A992 steel 3/16" thick | 3 | — | 1,260 |
| | | 4 | — | 1,710 |
| Weld E70XX electrodes | A36 steel 3/16" thick | (2) Hard side: 1.5" | 2,040 | 4,720 |
| | | (2) Free side: 1.5" | | |

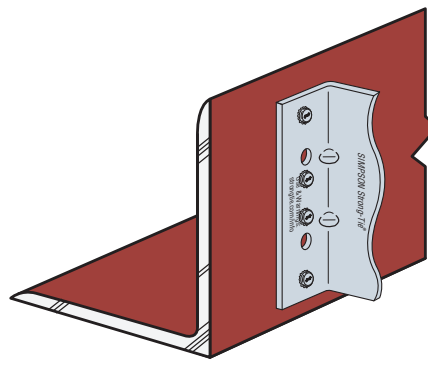
- For additional important information, see General Information and Notes on p. 26.
- Allowable anchorage loads are also limited by the SC Connector Load Table on p. 39. Use the minimum tabulated values from the connector and anchorage load tables as applicable.
- Allowable loads for #12–24 self-drilling screws and PDPAT powder-actuated fasteners are based on installation in minimum 3/16" thick structural steel with F_y = 36 ksi. PDPAT values are also provided for A572 steel. Values listed above may be used where other thicknesses of steel are encountered or other manufacturers are used, provided that the fastener has equal or better tested values (see p. 26). It is the responsibility of the designer to select the proper length fasteners based on the steel thickness installation.
- For screw fastener installation into steel backed by concrete, predrilling of both the steel and the concrete is suggested. For predrilling, use a maximum 3/16"-diameter drill bit.



Weld Anchorage



3 PAF Anchor Placement
(3 screws similar)



4 PAF Anchor Placement
(4 screws similar)

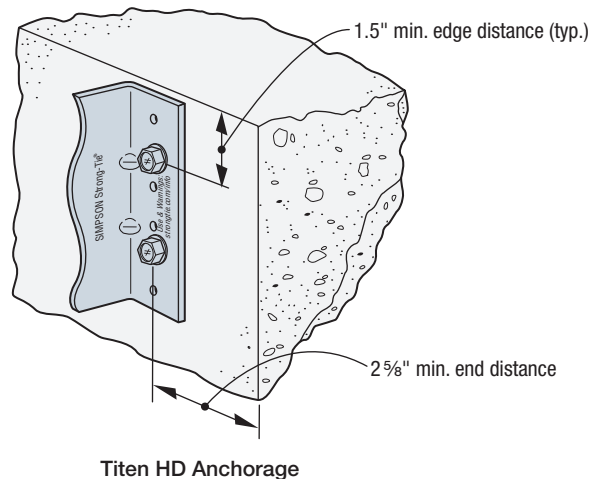
SC Anchor Layout

SC Bypass Framing Slide-Clip Connector

SC Allowable Anchorage Loads into Concrete (lb.)

| Anchorage Type | Nominal Embedment (in.) | Anchor Quantity and Size | f'_c (psi) | Load Direction | Wind and Seismic in SDC A&B | | Seismic in SDC C through F |
|--|-------------------------|--------------------------|--------------|-----------------------------------|-----------------------------|------------------|-------------------------------|
| | | | | | Uncracked Concrete | Cracked Concrete | Cracked Concrete ⁶ |
| Simpson Strong-Tie® Titen HD screw anchor THDB25178H | 1½ | (2) ¼" x 1 7⁄8" | 3,000 | F ₁ | 335 | 240 | 280 |
| | | | | F ₂ and F ₃ | 660 | 630 | 550 |
| | | | 4,000 | F ₁ | 390 | 280 | 325 |
| | | | | F ₂ and F ₃ | 760 | 725 | 635 |
| Simpson Strong-Tie Titen HD screw anchor THDB25234H | 2½ | (2) ¼" x 2 3⁄4" | 3,000 | F ₁ | 370 | 265 | 310 |
| | | | | F ₂ and F ₃ | 475 | 695 | 610 |
| | | | 4,000 | F ₁ | 430 | 305 | 360 |
| | | | | F ₂ and F ₃ | 550 | 805 | 705 |

- Allowable anchor capacities have been determined using ACI 318-14 Chapter 17 calculations with a minimum concrete compressive strength (f'_c) of 3,000 and 4,000 psi in normal-weight concrete. Tabulated values shall be multiplied by a factor (λ_a) of 0.68 for sand light-weight concrete.
- Edge distance is assumed to be 1½", and end distance is 2½".
- Load values are for group anchors based on ACI 318, condition B, load factors from ACI 318-14 Section 5.3, no supplement edge reinforcement, $\Psi_{c,v} = 1.0$ for cracked concrete and periodic special inspection.
- Allowable Stress Design (ASD) values were determined by multiplying calculated LRFD capacities by a conversion factor, Alpha (α), of 0.70 for seismic load and 0.6 for wind loads. ASD values for other combinations may be determined using alternate conversion factors.
- Tabulated allowable ASD loads for Wind and Seismic in SDC A&B are based on using wind conversion factors and may be increased by 1.17 for SDC A&B only.
- Design loads shall include the over-strength factor per ASCE7 Section 12.4.3. For fasteners in exterior wall connection systems, $\Omega_o = 1.5$ per Table 13.5-1.
- Allowable loads for F₁ are based on the governing loading direction which is toward the end of slab.
- For anchor subjected to both tension and shear loads, it shall be designed to satisfy the following:
 - For $N_a / N_{all} \leq 0.2$, the full allowable load in shear is permitted.
 - For $V_a / V_{all} \leq 0.2$, the full allowable load in tension is permitted.
 - For all other cases: $N_a / N_{all} + V_a / V_{all} \leq 1.2$ where:
 - N_a = Applied ASD tension load
 - N_{all} = Allowable F₂ and F₃ load from the SC Allowable Anchorage Loads into Concrete table
 - V_a = Applied ASD shear load
 - V_{all} = Allowable F₁ load from the SC Allowable Anchorage Loads into Concrete table
- Tabulated allowable loads are based on anchorage only. The capacity of the connection system shall be the minimum of the allowable anchorage load and the SC Allowable Connector Loads.



SSB Bypass Framing Slide-Clip Strut Connector

The SSB connector is a versatile strut connector that is commonly used at the bottom of a steel beam to accommodate large standoff conditions. It accommodates 1" of upward and 1" of downward movement.

Material: 54 mil (16 ga.)

Finish: Galvanized (G90)

Installation:

- Use the specified type and number of anchors.
- Use the specified number of XLSH34B1414 #14 shouldered screws (included). Install shouldered screws in the slots adjacent to the No-Equal® stamp.
- Use a maximum of one screw per slot.
- If the SSB intrudes on interior space, it can be trimmed. The trimmed part shall allow an edge distance from the center of the nearest anchor to the end of the trimmed part of 1/2" or greater.
- For installations to wood framing, see Simpson Strong-Tie® engineering letter L-CF-DEFCLIPW at strongtie.com.

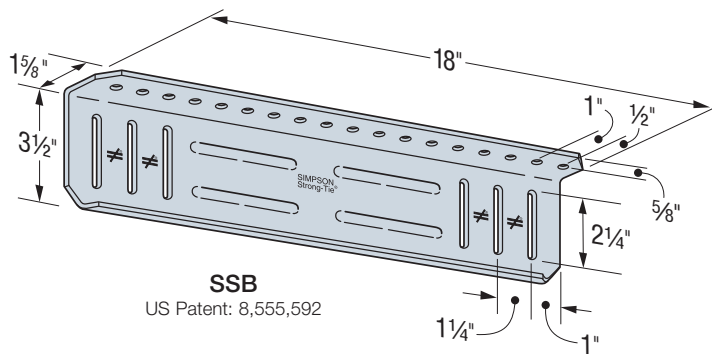
Codes: See p. 13 for Code Reference Key Chart

Ordering Information:

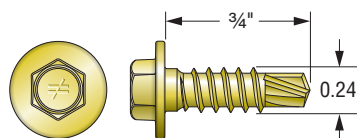
SSB3.518-KT contains:

- Box of 25 connectors
- (83) XLSH34B1414 #14 shouldered screws

Note: Replacement #14 shouldered screws for SSB connectors are XLSH34B1414-RP83.



SSB
US Patent: 8,555,592

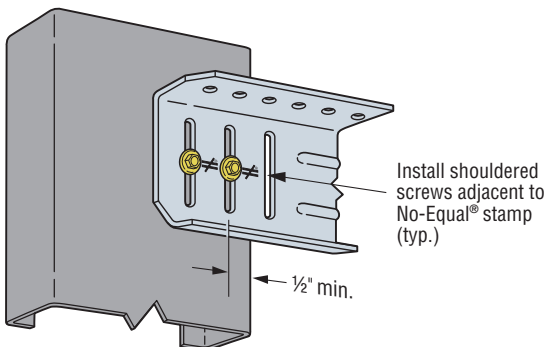


XLSH34B1414
#14 Shouldered Screw
for Attachment to Stud Framing
(included)

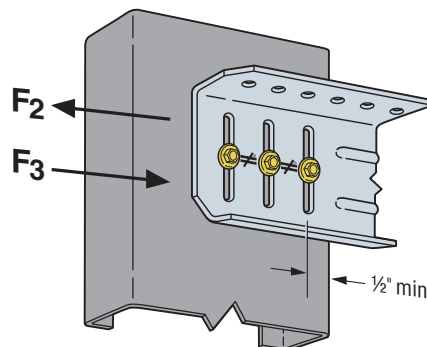
SSB Allowable Connector Loads (lb.)

| Model No. | Connector Material Thickness mil (ga.) | No. of #14 Shouldered Screws | Stud Thickness | | | | | | Code Ref. |
|-----------|--|------------------------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-------------|
| | | | 33 mil (20 ga.) | | 43 mil (18 ga.) | | 54 mil (16 ga.) | | |
| | | | F ₂ | F ₃ | F ₂ | F ₃ | F ₂ | F ₃ | |
| SSB3.518 | 54 (16) | 2 ¹ | 480 | 480 | 640 | 640 | 890 | 890 | IBC, FL, LA |
| | | 3 | 755 | 755 | 955 | 1,000 | 1,235 | 1,370 | |

1. When the SSB connector is used with two shouldered screws, the screws may be installed in any two slots.
2. Allowable loads are based on clips installed with (3) #12-24 screws in the anchor leg. For other anchorage installations, the capacity of the connection system will be the minimum of the tabulated value and the allowable load from the SSB Allowable Anchorage Loads table on p. 43.
3. The maximum standoff for SSB with (2) screws and (3) screws is 1 1/4" and 1 1/2", respectively.



SSB Installation with Two Shouldered Screws



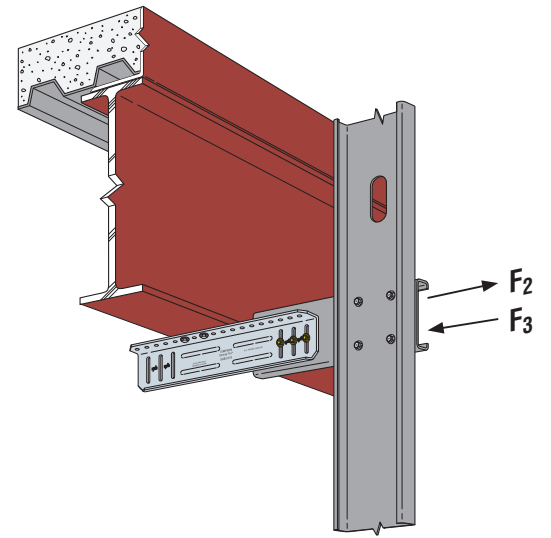
SSB Installation with Three Shouldered Screws

SSB Bypass Framing Slide-Clip Strut Connector

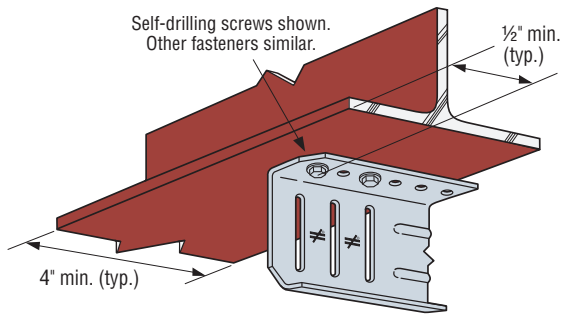
SSB Allowable Anchorage Loads (lb.)

| Anchorage Type | No. of Anchors | Allowable Load F ₂ and F ₃ |
|--|--------------------------------|--|
| #12-24 self-drilling screws | 2 | 1,250 |
| | 3 | 1,875 |
| Simpson Strong-Tie® 0.157" x 5/8" powder-actuated fasteners PDPAT-62KP | 2 | 820 |
| | 3 | 1,225 |
| Weld E70XX electrodes | Hard side: 2" Free side: 1" | 2,455 |

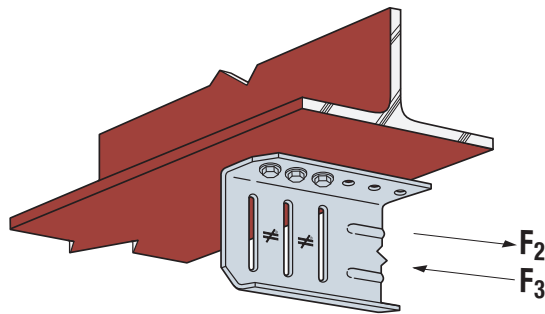
- For additional important information, see General Information and Notes on p. 26.
- Allowable loads are for clip anchorage only. The capacity of the connection system will be the minimum of the tabulated value and the allowable load from the SSB Allowable Connector Loads table on p. 42.



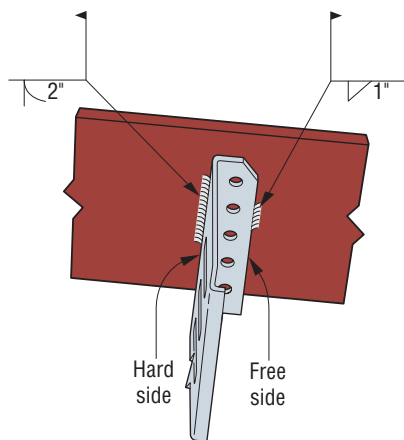
Typical SSB Installation with Stud Strut



Two Anchors

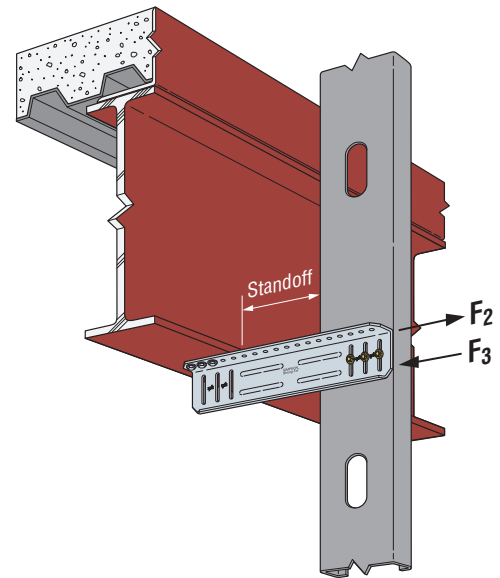


Three Anchors



Weld

SSB Anchor Layout



Typical SSB3.518 Installation

HYS Hybrid Strut

The HYS hybrid strut is the only CFS strut on the market designed and tested for use as either a slide or a rigid clip. Commonly used at the bottom of a steel beam to accommodate large standoff conditions, the HYS strut attaches to the structure with screws, powder-actuated fasteners or welds.

For installation as a slide connection, attach the HYS using shouldered screws through the slotted holes. Precision-manufactured shouldered screws provided with the HYS are designed to prevent over-driving and to ensure that the clip functions properly in the slide application. For installation as a rigid connection to support gravity and lateral loading, attach the clip using the small predrilled holes with #10 screws.

The HYS has undergone comprehensive component, assembly and anchor testing. Tabulated loads were developed from these tests and include capacities based on strength and deflection to assist in mitigating design risk. You can count on the HYS dual-application strut for its versatility and test-verified performance.

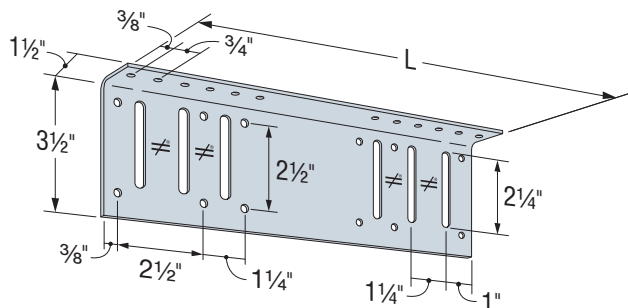
Features:

- Available in lengths of 12", 15", 24" and 30" (for 18" lengths, use SSB and FSB struts)
- Slots are positioned to minimize eccentric load and maximize capacity
- Slide application allows up to 1" of vertical moment in each direction when shouldered screws are used through the center of the slot
- Simpson Strong-Tie® No-Equal® stamps mark the center of the slots to help ensure correct placement of shouldered screws
- Supports gravity and lateral loads when using #10 screws through small predrilled holes

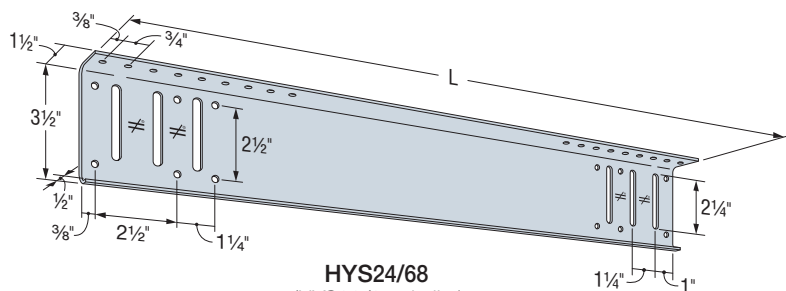
Material: HYS12/68, HYS15/68, HYS24/68 — 68 mil (14 ga.), 50 ksi
HYS30/97 — 97 mil (12 ga.), 40 ksi

Finish: Galvanized (G90)

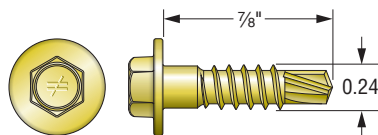
Codes: See p. 13 for Code Reference Key Chart



HYS12/68
(HYS15/68 similar)



HYS24/68
(HYS30/97 similar)



XLSH78B1414
#14 Shouldered Screw for Attachment to Stud Framing Slide Application
(included)

Ordering Information and Dimensions

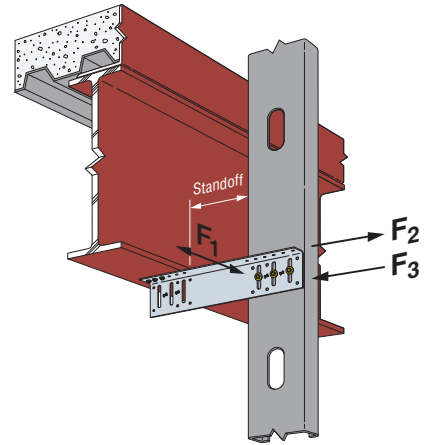
| Model No. | Ordering SKU | Length (in.) | Connectors | Shoulder Screws |
|-----------|---------------|--------------|------------|-----------------|
| HYS12/68 | HYS12/68-KT25 | 12 | 25 | 83 |
| HYS15/68 | HYS15/68-KT25 | 15 | 25 | 83 |
| HYS24/68 | HYS24/68-KT15 | 24 | 15 | 55 |
| HYS30/97 | HYS30/97-KT10 | 30 | 10 | 55 |

1. Replacement of additional shoulder screws for HYS connectors in slide application are XLSH78B1414-RP83.
2. Maximum offsets are for two or three fasteners to primary structure. For four fasteners, reduce by 3/4".

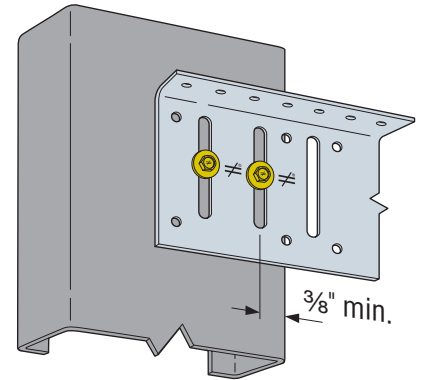
HYS Hybrid Strut

HYS Slide-Clip Allowable Loads (lb.)

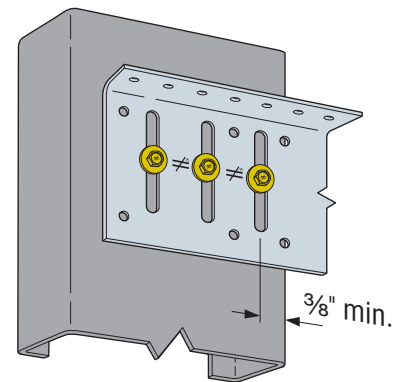
| Model No. | Stud Thickness mil (ga.) | No. of #14 Shoulder Screws (Pattern) | Allowable Load (lb.) | | | Code Ref. |
|-----------|--------------------------|--------------------------------------|------------------------------|-----------------------------|---------------------------|-----------|
| | | | In-Plane Load F ₁ | Tension Load F ₂ | Comp. Load F ₃ | |
| HYS12/68 | 33 (20) | 2 (S1) | 100 | 520 | 520 | |
| | | 3 (S2) | 100 | 815 | 815 | |
| HYS15/68 | | 2 (S1) | 100 | 520 | 520 | |
| | | 3 (S2) | 100 | 815 | 815 | |
| HYS24/68 | | 2 (S1) | 100 | 520 | 460 | |
| | | 3 (S2) | 100 | 815 | 690 | |
| HYS30/97 | 2 (S1) | 100 | 520 | 530 | | |
| | 3 (S2) | 100 | 815 | 795 | | |
| HYS12/68 | 43 (18) | 2 (S1) | 150 | 845 | 620 | |
| | | 3 (S2) | 150 | 1,285 | 1,260 | |
| HYS15/68 | | 2 (S1) | 150 | 845 | 620 | |
| | | 3 (S2) | 150 | 1,285 | 1,260 | |
| HYS24/68 | | 2 (S1) | 150 | 845 | 950 | |
| | | 3 (S2) | 150 | 1,285 | 1,420 | |
| HYS30/97 | 2 (S1) | 150 | 845 | 1,100 | | |
| | 3 (S2) | 150 | 1,285 | 1,640 | | |
| HYS12/68 | 54 (16) | 2 (S1) | 240 | 1,040 | 995 | |
| | | 3 (S2) | 240 | 1,585 | 1,550 | |
| HYS15/68 | | 2 (S1) | 240 | 1,040 | 995 | |
| | | 3 (S2) | 240 | 1,585 | 1,550 | |
| HYS24/68 | | 2 (S1) | 240 | 1,040 | 1,170 | |
| | | 3 (S2) | 240 | 1,585 | 1,755 | |
| HYS30/97 | 2 (S1) | 240 | 1,040 | 1,355 | | |
| | 3 (S2) | 240 | 1,585 | 2,020 | | |
| HYS12/68 | 68 (14) | 2 (S1) | 300 | 1,165 | 995 | |
| | | 3 (S2) | 300 | 1,775 | 1,550 | |
| HYS15/68 | | 2 (S1) | 300 | 1,165 | 995 | |
| | | 3 (S2) | 300 | 1,775 | 1,550 | |
| HYS24/68 | | 2 (S1) | 300 | 1,165 | 1,170 | |
| | | 3 (S2) | 300 | 1,775 | 1,755 | |
| HYS30/97 | 2 (S1) | 300 | 1,520 | 1,520 | | |
| | 3 (S2) | 300 | 2,265 | 2,265 | | |



Typical HYS Slide-Clip Application



Slide Screw Pattern S1
(no screws required in small round holes in slide application)



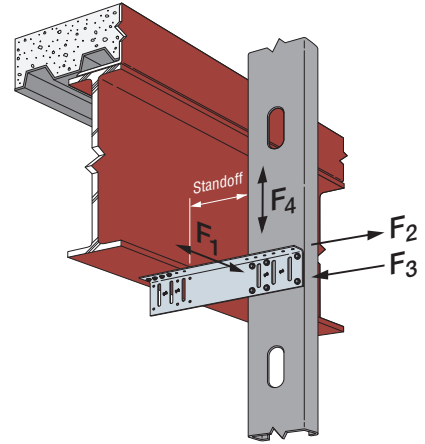
Slide Screw Pattern S2
(no screws required in small round holes in slide application)

- For additional important information, see General Information and Notes on p. 26.
- HYS Allowable Connector Loads are also limited by the HYS Anchorage Load table on p. 47. Use the minimum tabulated values from the connector and anchorage load tables as applicable.
- See illustrations on the side for fastener placement to stud framing.
- Tabulated F₁ loads are based on assembly tests with the load through the centerline of the stud. Tests are governed by fastener connections.

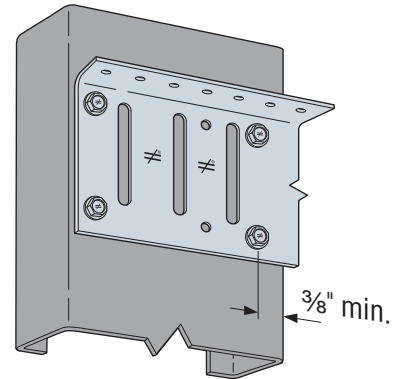
HYS Hybrid Strut

HYS Fixed-Clip Allowable Loads (lb.)

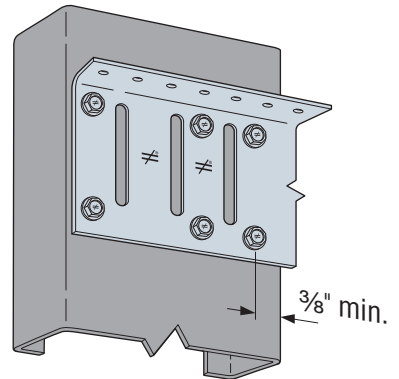
| Model No. | Stud Thickness mil (ga.) | No. of #10 Screws (Pattern) | Allowable Load (lb.) | | | | Code Ref. | | |
|-----------|--------------------------|-----------------------------|------------------------------|-----------------------------|---------------------------|---------------------------|-----------|-----|--|
| | | | In-Plane Load F ₁ | Tension Load F ₂ | Comp. Load F ₃ | Shear Load F ₄ | | | |
| HYS12/68 | 33 (20) | 4 (R1) | 100 | 705 | 705 | 365 | | | |
| | | 6 (R2) | 110 | 1,060 | 1,060 | 365 | | | |
| HYS15/68 | | 4 (R1) | 100 | 705 | 705 | 340 | | | |
| | | 6 (R2) | 110 | 1,060 | 1,060 | 340 | | | |
| HYS24/68 | | 4 (R1) | 100 | 705 | 705 | 140 | | | |
| | | 6 (R2) | 110 | 1,060 | 1,060 | 175 | | | |
| HYS30/97 | | 4 (R1) | 100 | 705 | 705 | 135 | | | |
| | | 6 (R2) | 110 | 1,060 | 1,060 | 135 | | | |
| HYS12/68 | | 43 (18) | 4 (R1) | 125 | 1,040 | 1,050 | | 525 | |
| | | | 6 (R2) | 155 | 1,520 | 1,580 | | 525 | |
| HYS15/68 | | | 4 (R1) | 125 | 1,040 | 1,050 | | 445 | |
| | | | 6 (R2) | 155 | 1,520 | 1,580 | | 445 | |
| HYS24/68 | 4 (R1) | | 115 | 1,040 | 1,050 | 180 | | | |
| | 6 (R2) | | 125 | 1,520 | 1,580 | 230 | | | |
| HYS30/97 | 4 (R1) | | 115 | 1,045 | 1,050 | 175 | | | |
| | 6 (R2) | | 125 | 1,580 | 1,580 | 175 | | | |
| HYS12/68 | 54 (16) | | 4 (R1) | 145 | 2,110 | 1,800 | 560 | | |
| | | | 6 (R2) | 285 | 3,085 | 1,800 | 710 | | |
| HYS15/68 | | | 4 (R1) | 145 | 2,110 | 2,135 | 560 | | |
| | | | 6 (R2) | 285 | 3,085 | 2,630 | 560 | | |
| HYS24/68 | | 4 (R1) | 150 | 2,110 | 2,135 | 225 | | | |
| | | 6 (R2) | 165 | 3,085 | 2,315 | 290 | | | |
| HYS30/97 | | 4 (R1) | 150 | 2,125 | 2,135 | 220 | | | |
| | | 6 (R2) | 165 | 3,190 | 3,205 | 220 | | | |
| HYS12/68 | | 68 (14) | 4 (R1) | 195 | 2,110 | 1,800 | 550 | | |
| | | | 6 (R2) | 385 | 3,085 | 1,800 | 710 | | |
| HYS15/68 | | | 4 (R1) | 195 | 2,110 | 2,160 | 560 | | |
| | | | 6 (R2) | 385 | 3,085 | 2,630 | 560 | | |
| HYS24/68 | 4 (R1) | | 190 | 2,110 | 2,160 | 225 | | | |
| | 6 (R2) | | 210 | 3,085 | 2,315 | 290 | | | |
| HYS30/97 | 4 (R1) | | 190 | 2,125 | 2,160 | 220 | | | |
| | 6 (R2) | | 210 | 3,190 | 3,240 | 220 | | | |



Typical HYS Fixed-Clip Application



Fixed Screw Pattern R1
(no screws required in slot in fixed application)



Fixed Screw Pattern R2
(no screws required in slot in fixed application)

1. For additional important information, see General Information and Notes on p. 26.
2. HYS Allowable Connector Loads are also limited by the HYS Anchorage Load table on p. 47. Use the minimum tabulated values from the connector and anchorage load tables as applicable.
3. See illustrations on the side for screw fastener placement to stud framing.
4. Tabulated F₁ loads are based on assembly tests with the load through the centerline of the stud. Tests are governed by fastener connections.
5. XLSH78B1414 #14 shouldered screw may be used to replace #10 screws in a fixed application.
6. Minimum stud width for fixed application is 6".

HYS Hybrid Strut

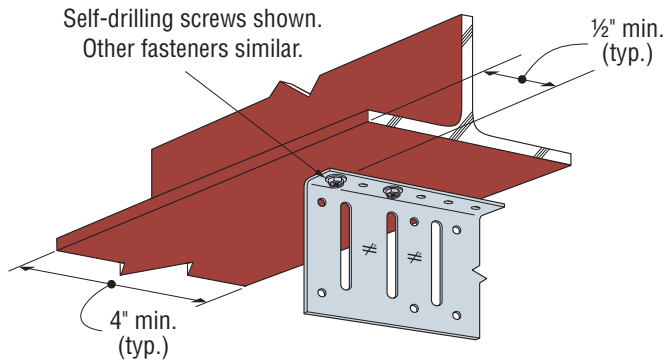
HYS Allowable Anchorage Loads (lb.)

| Anchorage Type | No. of Anchors | Allowable Load (lb.) | |
|--|--------------------------------|-----------------------------------|----------------|
| | | F ₂ and F ₃ | F ₄ |
| #12-24 self-drilling screws | 2 | 1,595 | 565 |
| | 3 | 2,395 | 845 |
| | 4 | 3,190 | 1,125 |
| Simpson Strong-Tie® 0.157" x 5/8" powder-actuated fasteners PDPAT-62KP | 2 | 820 | — |
| | 3 | 1,230 | 520 |
| | 4 | 1,640 | 780 |
| Weld E70XX electrodes | Hard side: 2" Free side: 1" | 2,455 | 1,125 |
| | Hard side: 4" Free side: 1" | 3,190 | 1,125 |

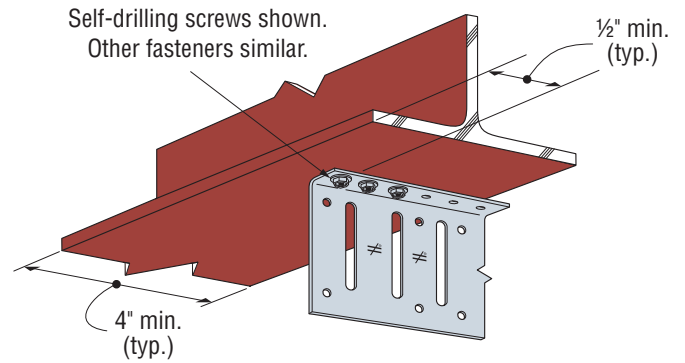
- For additional important information, see General Information and Notes on p. 26.
- Allowable loads are for the clip anchorage only. The capacity of the connection system will be the minimum of the tabulated value and the allowable load from the HYS Allowable Connector Loads on p. 45 for slide applications and p. 46 for fixed applications.

HYS Maximum Standoff Distances (in.)

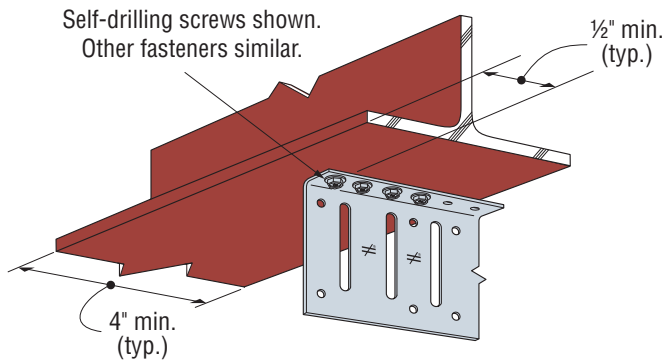
| Model No. | Pattern | No. of Anchors | |
|-----------|----------|----------------|-----|
| | | 2 or 3 | 4 |
| HYS12/68 | S1 | 7 | 6¼ |
| | S2 | 5¾ | 5 |
| | R1 or R2 | 5½ | 4¾ |
| HYS15/68 | S1 | 10 | 9¼ |
| | S2 | 8¾ | 8 |
| | R1 or R2 | 8½ | 7¾ |
| HYS24/68 | S1 | 19 | 18¼ |
| | S2 | 17¾ | 17 |
| | R1 or R2 | 17½ | 16¾ |
| HYS30/97 | S1 | 25 | 24¼ |
| | S2 | 23¾ | 23 |
| | R1 or R2 | 23½ | 22¾ |



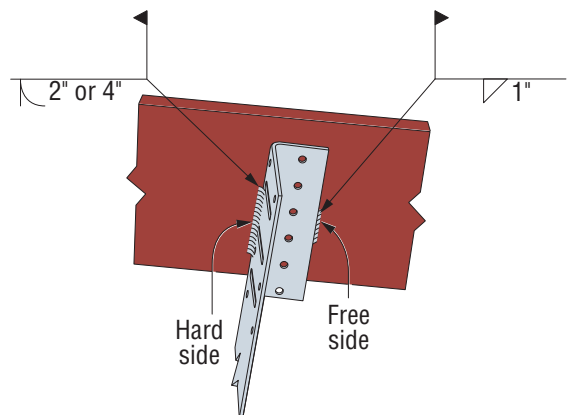
Two Anchors



Three Anchors



Four Anchors



Weld

SCW Head-of-Wall Slide-Clip Connector

The SCW connectors offer 1" of upward and 1" of downward movement. They are primarily used in head-of-wall applications that require vertical movement relative to the structure. SCW connectors are often used to strengthen window and door jambs for projects that utilize slip or slotted track.

Material: 54 mil (16 ga.)

Finish: Galvanized (G90)

Installation:

- Use the specified type and number of anchors.
- Use the specified number of #14 shouldered screws (included). Install shouldered screws in the slots adjacent to the No-Equal® stamp.
- Use a maximum of one screw per slot.
- For installations to wood framing, see Simpson Strong-Tie® engineering letter L-CF-DEFCLIPW at strongtie.com.

Codes: See p. 13 for Code Reference Key Chart

Ordering Information:

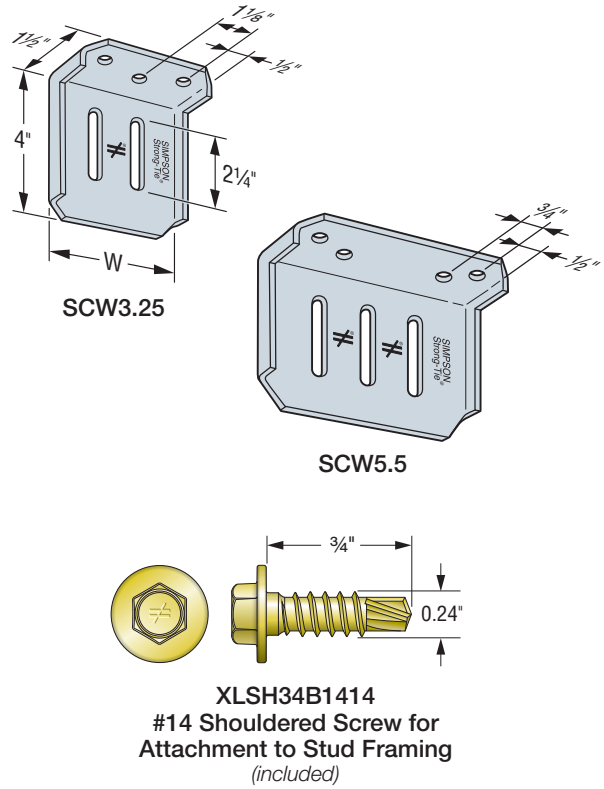
SCW3.25-KT contains:

- Box of 25 connectors
- 55 XLSH34B1414 #14 shouldered screws

SCW5.5-KT contains:

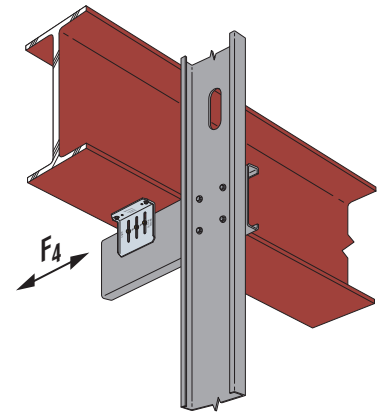
- Box of 25 connectors
- 83 XLSH34B1414 #14 shouldered screws

Note: Replacement #14 shouldered screws for SCW connectors are XLSH34B1414-RP83.



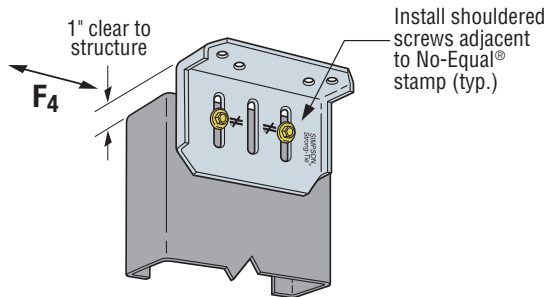
SCW Allowable Connector Loads (lb.)

| Model No. | Connector Material Thickness mil (ga.) | W (in.) | No. of #14 Shouldered Screws | Stud Thickness | | | Code Ref. |
|-----------|--|---------|------------------------------|-----------------|-----------------|--------------------|-------------|
| | | | | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | |
| | | | | F ₄ | F ₄ | F ₄ | |
| SCW3.25 | 54 (16) | 3 3/4 | 2 | 455 | 630 | 755 | IBC, FL, LA |
| SCW5.5 | 54 (16) | 5 1/2 | 2 ¹ | 455 | 630 | 995 | |
| | | | 3 | 455 | 630 | 1,220 ³ | |

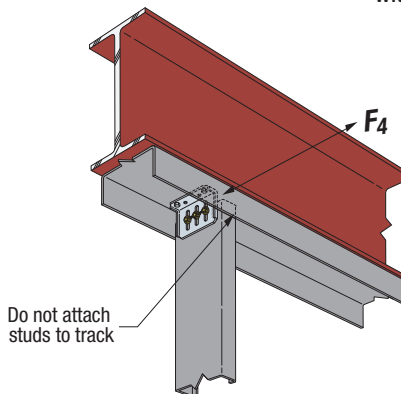


Typical SCW Installation with Stud Strut

1. When the SCW5.5 connector is used with two shouldered screws, install screws in the outermost slots.
2. Allowable loads are based on clips installed with all holes in the anchor leg filled with #12–14 screws. For other anchorage installations, the capacity of the connection system will be the minimum of the tabulated value and the allowable load from the SCW Allowable Anchorage Loads table on p. 49.
3. Tabulated loads are applicable for the following framing widths:
 SCW3.25 — 3 1/2", 3 3/8", 4" and 5 1/2"
 SCW5.5 — 6", 8" (18 ga. min.), 10" and 12" (16 ga. min.)



SCW5.5 Installation with Two Shouldered Screws (three shouldered screws and SCW3.25 similar)



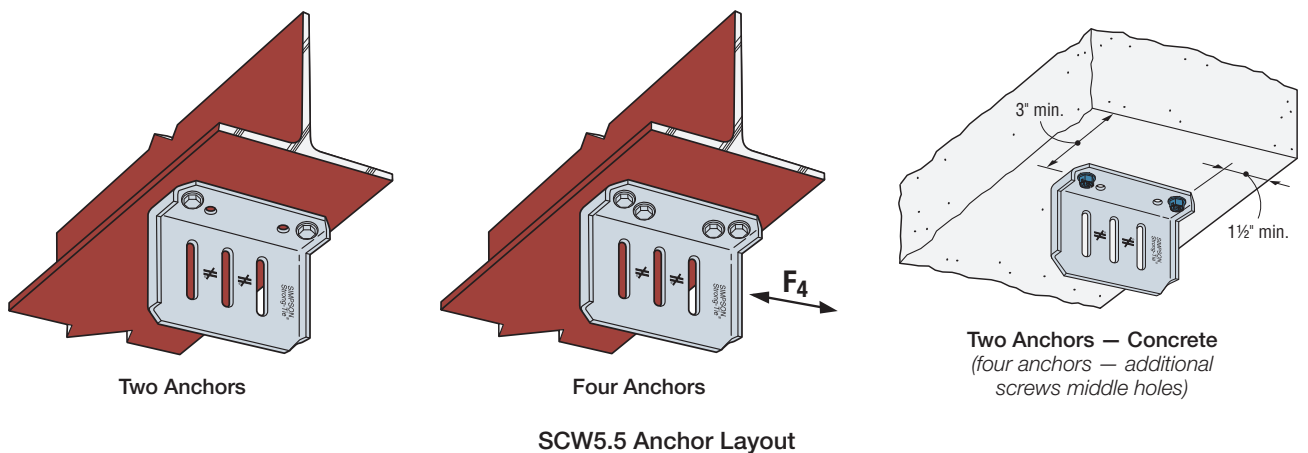
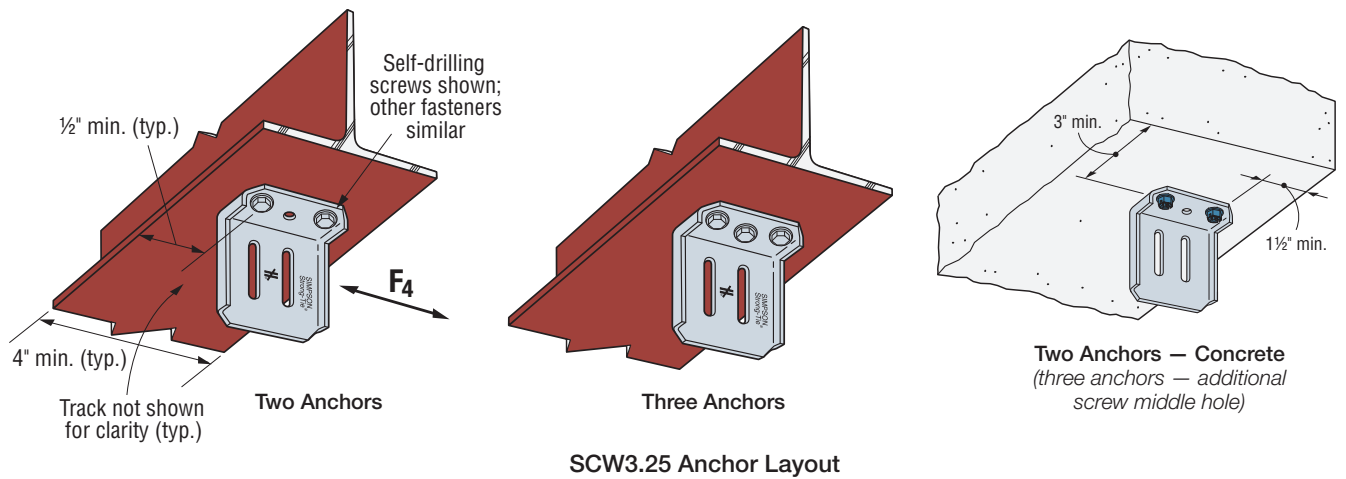
Typical SCW Installation at Stud

SCW Head-of-Wall Slide-Clip Connector

SCW Allowable Anchorage Loads (lb.)

| Model No. | Anchorage Type | Minimum Base Material | No. of Anchors | Allowable Load F ₄ |
|-----------|---|---|----------------|-------------------------------|
| SCW3.25 | #12-24 self-drilling screws | A36 steel 3/16" thick | 2 | 715 |
| | | | 3 | 1,075 |
| | Simpson Strong-Tie® 0.157" x 3/16" powder-actuated fasteners PDPAT-62KP | A36 steel 3/16" thick | 2 | 715 |
| | | | 3 | 1,075 |
| | Simpson Strong-Tie 1/4" x 1 1/4" Titen Turbo™ ³ | Concrete f' _c = 2,500 psi | 2 | 285 |
| | | | 3 | 350 |
| SCW5.5 | #12-24 self-drilling screws | A36 steel 3/16" thick | 2 | 775 |
| | | | 4 | 1,550 |
| | Simpson Strong-Tie 0.157" x 3/16" powder-actuated fasteners PDPAT-62KP | A36 steel 3/16" thick | 2 | 745 |
| | | | 4 | 1,490 |
| | Simpson Strong-Tie 1/4" x 1 1/4" Titen Turbo ³ | Concrete f' _c = 2,500 psi | 2 | 285 |
| | | | 4 | 775 |

- For additional important information, see General Information and Notes on p. 26.
- Allowable loads are for clip anchorage only. The capacity of the connection system will be the minimum of the tabulated value and the allowable load from the SCW Allowable Connector Loads table on p. 48.
- Tabulated values require a minimum 1 1/2" edge distance for masonry screws in concrete.
- See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



HWSC Head-of-Wall Slide-Clip Connector



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

The HWSC head-of-wall slide-clip connector is specifically designed for simplifying the panelization of 6" printed studs (e.g., FrameCAD®, Arkitech, Howick, Pinnacle and Scottsdale). The HWSC is designed to replace slotted track with a typical printed track at head-of-wall conditions. To facilitate installation, a cone-shaped funnel in the clip helps the dimple in the track align properly with the clip's corresponding dimple to hold it in place while a screw is placed in each flange from the track to the clip. The stud is then slid into position, and the clip is attached to the stud with shoulder screws driven through the center of the fastener slots. As an option, fasten the clip through the diamond-shaped hole to stud using a single screw to lock the deflection gap in place temporarily during transport and installation. The optional screw is then removed after installation is complete. The HWSC has been assembly tested to provide optimal strength and performance.

Features:

- An edge stiffener has been rolled into the web and flange of the clip for added strength and for ease of fastening of the screws into the clip flange during installation
- The clip has a unique cone-shaped dimple that guides the track dimple into alignment with the clip, locking the connection in-place while a screw is installed into each flange
- Replaces slotted track that is difficult to panelize with typical printed track
- Allows up to 1" movement up and down

Caution:

- The HWSC connector is specifically designed for use with printed studs and tracks such as FrameCAD, Arkitech, Howick, Pinnacle and Scottsdale
- Not intended for use with typical manufactured studs and tracks

Material: 54 mil (16 ga.), 50 ksi

Finish: Galvanized (G90)

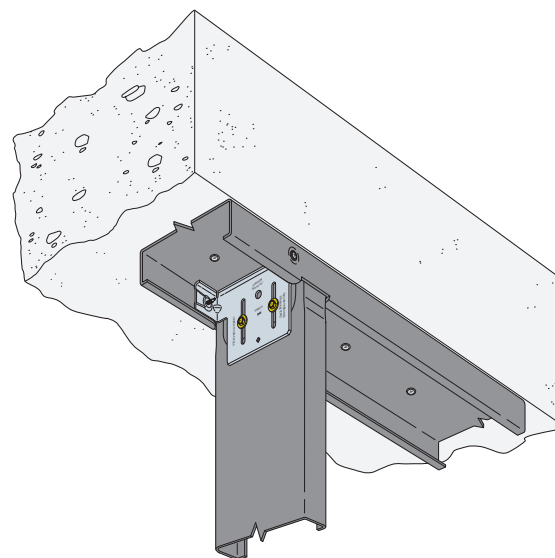
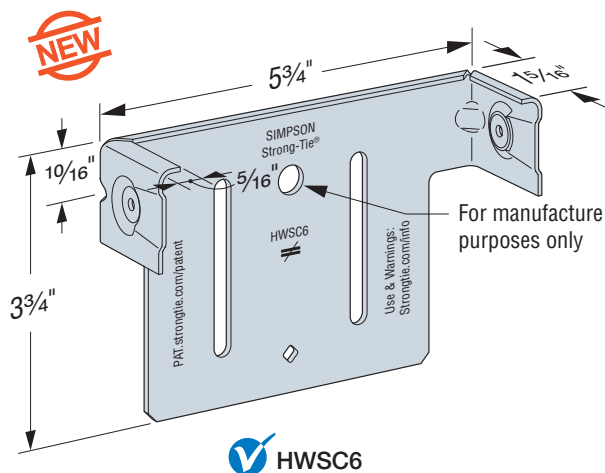
Installation:

- Use (2) XLSH34B1414 #14 shoulder screws (included). Install screws into the center of the slot at No-Equal® logo.
- Use an optional #10 screw to lock deflection gap during panel construction. Remove after installation is complete.

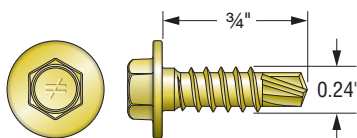
Codes: Testing performed in accordance with ICC-ES AC261. Visit strongtie.com for the latest load values and testing information.

Ordering Information:

- Box of (50) HWSC6-KT connectors
- (2) bags of (55) XLSH34B1414 #14 shoulder screws



Typical HWSC6 Installation



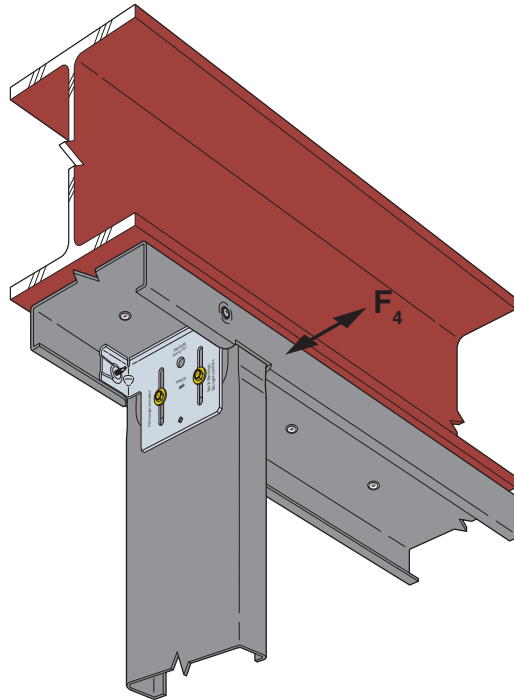
XLSH34B1414
#14 Shouldered Screw for Attachment to Stud Framing
(included)

HWSC Head-of-Wall Slide-Clip Connector

HWSC Allowable Connector Loads, F_4 (lb.)

| Model No. | Track | | Stud Thickness mil (ga.), F_y | | | | | |
|-----------|------------------------|----------------|---|--------|---------|--------|--------------|--------------|
| | Thickness mil (ga.) | F_y (ksi) | 33 (20) | | 43 (18) | | 54 (16) | 68 (14) |
| | | | 33 ksi | 50 ksi | 33 ksi | 50 ksi | 33 or 50 ksi | 33 or 50 ksi |
| HWSC6 | 33 (20) | 33 | Please see the HWSC product page at strongtie.com for load capacities. | | | | | |
| | | 50 | | | | | | |
| | 43 (18) | 33 | | | | | | |
| | | 50 | | | | | | |
| | 54 (16) | 33 or 50 | | | | | | |
| 68 (14) | 33 or 50 | | | | | | | |

1. The HWSC6 has an out-to-out dimension of 5 $\frac{3}{4}$ ". It is designed to fit inside a printed track and attached to the swaged end of the printed stud. Listed capacities are based on tracks with $\frac{1}{2}$ " lips and a maximum lip cutout of 2 $\frac{7}{8}$ " at stud location.
2. Allowable loads are based on the clip installed with (1) #10-16 screw into each track flange and (2) shoulder screws into the stud. Shoulder screws are included with the clip.
3. Tabulated capacities are based on 1" deflection gap. End of stud must be located a maximum of 1" from web of top track.
4. Anchorage to structure designed by others.



Typical HWSC Installation at Stud

DTC Head-of-Wall Slide-Clip Application

DTC clips are a cost-effective solution for light-duty, head-of-wall slide clip applications. The 1 5/8" slot will allow 3/4" movement in each direction.

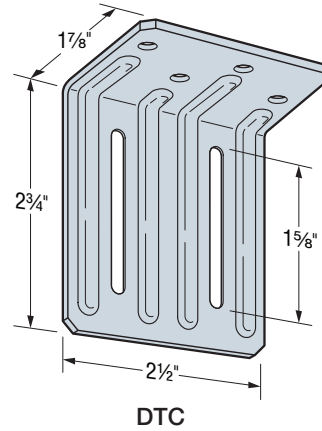
Material: 43 mil (18 ga.)

Finish: Galvanized (G90)

Installation:

- Use specified type and number of anchors per the installation drawing below
- Install (2) #8 screws centered in the vertical slots
- Once tightened, back-out screws 1/2 turn to ensure slip

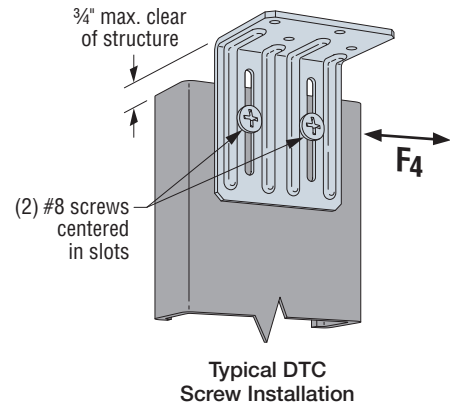
Codes: See p. 13 for Code Reference Key Chart



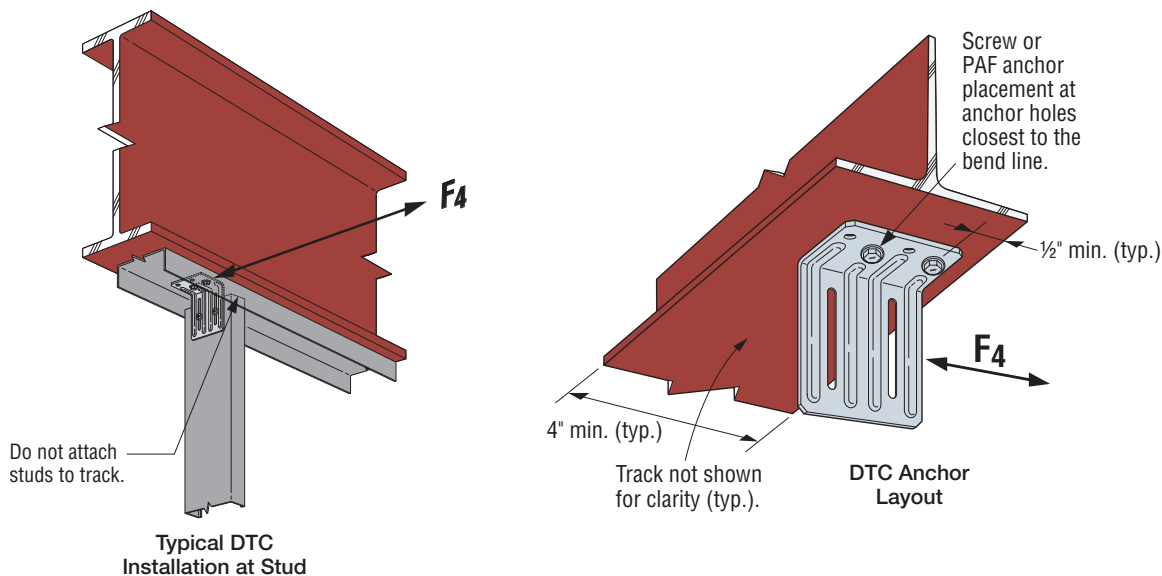
DTC

DTC Allowable Loads (lb.)

| Model No. | Connector Material mil (ga.) | Fasteners | Anchorage | Stud Thickness mil (ga.) | Stud Steel Strength F _y (ksi) | Allowable Load F ₄ | Code Ref. |
|-----------|------------------------------|--|---|--------------------------|--|-------------------------------|-------------|
| DTC | 43 (18) | (2) #8 self-drilling screws ⁴ | (2) 0.157" PDPAT powder-actuated fasteners or (2) #12 self-drilling screws ⁴ | 15 (25 EQ) | 50 | 60 | IBC, FL, LA |
| | | | | 18 (25) | 33 | 70 | |
| | | | | 19 (20 EQ) | 65 | 80 | |
| | | | | 20 (20 EQ) | 57 | | |
| | | | | 30 (20 DW) | 33 | 165 | |
| | | | | 33 (20 STR) | 33 | 170 | |
| | | | | 43 (18) | 33 | 215 | |



1. Allowable loads may not be increased for wind or seismic load.
2. Clips do not replace stud lateral or stability bracing. Design of bracing is the responsibility of the designer.
3. It is the responsibility of the designer to verify the adequacy of the stud. Allowable loads are based on clips installed an adequate distance away from penetrations, notches, ends of studs and other conditions that may affect the clip performance.
4. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.
5. EQ = Equivalent, DW = Drywall, STR = Structural.



SCHA Slide-Clip Connectors for Horizontal Anchorage



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

SCHA connectors are an ideal solution for panelized or stick-frame construction where the CFS framing anchors to the top of a concrete floor slab or the bottom of a steel beam. The connector features a wide support leg to decrease eccentricity on anchors and provide a variety of anchorage options. The included SCVC vertical slider helps to strengthen the connector for the highest tension (F₂) and compression (F₃) loads in the industry.

Features:

- Provides a full 1" of both upward and downward movement
- Tabulated design values for anchorage help mitigate risk and provide ease of specification
- Either face of anchorage leg can be used against the support
- Accommodates standoff distances up to 4¾"
- Can be used with 3½", 4", 6" and 8" studs
- Prepunched anchor holes accommodate ¼"-diameter Titen HD® or other ¼"-diameter concrete screw anchors, and 0.157"-diameter powder-actuated fasteners such as the Simpson Strong-Tie® PDPAT-62KP
- Prepunched anchor holes also eliminate the need for pre-drilling and help ensure accurate anchor placement

Material: SCHA — 118 mil (10 ga., 33 ksi);
SCVS — 97 mil (12 ga., 33 ksi)

Coating: Galvanized (G90)

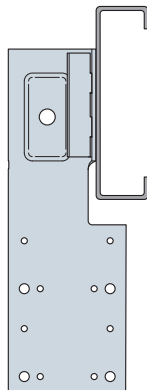
Installation:

- Use all specified fasteners and anchors. Note that the smaller diameter anchor holes are provided for PAF installation, and the larger diameter anchor holes are for ¼"-diameter concrete screw anchors.
- Ensure that the SCVS vertical slider is centered in the SCHA vertical slots by aligning the tic-marks adjacent to the triangle holes on the slider with the ≠ stamp on the SCHA clip.

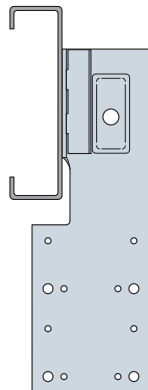
Codes: See p. 13 for Code Reference Key Chart

Ordering Information:

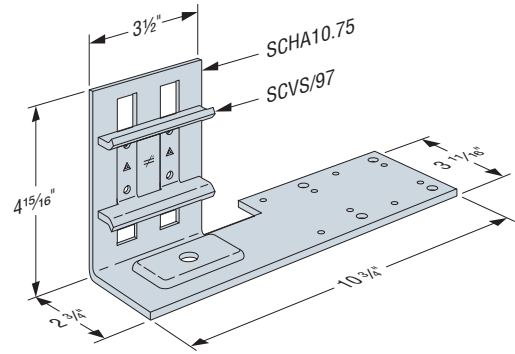
- SCHA10.75-KT15 contains (15) SCHA10.75 connectors and (15) SCVS/97 sliders
- SCHA10.75L-KT15 contains (15) SCHA10.75L connectors and (15) SCVS/97 sliders



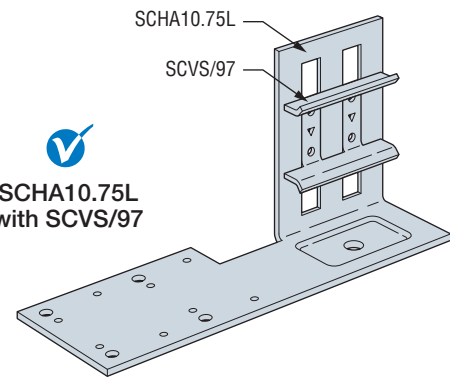
SCHA10.75
(plan view with vertical leg up)



SCHA10.75L
(plan view with vertical leg up)



SCHA10.75 with SCVS/97
US Patent Pending



SCHA10.75L with SCVS/97

SCHA Anchorage Types and Conditions

| Four PDPAT Anchors to Steel | |
|-----------------------------|---------------|
| Front Condition | End Condition |
| | |
| 4" Weld | |
| Front Condition | End Condition |
| | |
| ¼"-Diameter Concrete Screws | |
| Four Anchors | Two Anchors |
| | |

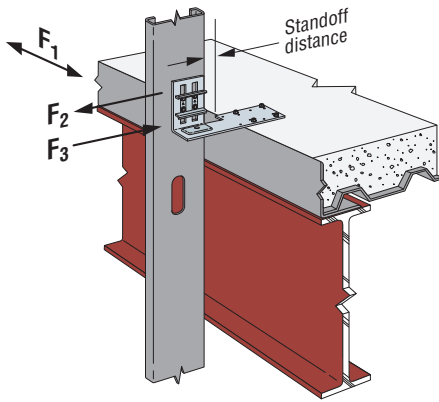
SCHA Slide-Clip Connectors for Horizontal Anchorage

SCHA Allowable Loads (lb.)

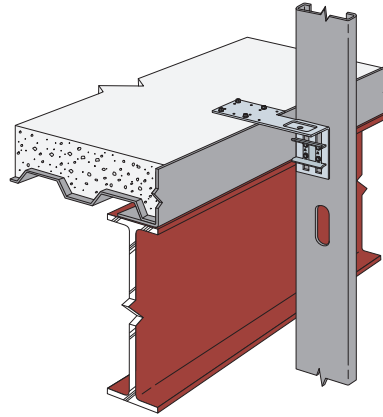
| Primary Structure Base Material | Anchorage | | Fasteners to Stud Self-Drilling Screws | | Stud Thickness mil (ga.) | Maximum Standoff Distance (in.) | Allowable Load (lb.) | | | Code Ref. | |
|---|---|-----------------|--|------------|--------------------------|---------------------------------|----------------------|----------------|----------------|-----------|-----|
| | Qty./Type/Size | Condition | Min./Max. | No. #12-14 | | | F ₁ ' | F ₂ | F ₃ | | |
| Structural steel A36 3/16" thick minimum | (4) 0.157" x 5/8" powder-actuated fasteners PDPAT-62KP or (2) welds – 2" length | Front condition | Min. | 4 | 33 (20) | 2 | 150 | 645 | 490 | — | |
| | | | | | 43 (18) | | 195 | 860 | 610 | | |
| | | | | | 54 (16) | | 235 | 990 | 880 | | |
| | | | 68 (14) | 235 | 990 | 880 | | | | | |
| | | | Max. | 6 | 54 (16) | 2 | 350 | 1,300 | 1,045 | | |
| | | | | | 68 (14) | | 350 | 1,495 | 1,045 | | |
| | | End condition | Min. | 4 | 4 3/4 | 33 (20) | 4 3/4 | 105 | 625 | | 470 |
| | | | | | | 43 (18) | | 110 | 830 | | 570 |
| | | | | | | 54 (16) | | 165 | 830 | | 720 |
| | | | 68 (14) | 165 | 830 | 720 | | | | | |
| | | | Max. | 6 | 4 3/4 | 54 (16) | 4 3/4 | 350 | 1,060 | | 775 |
| | | | | | | 68 (14) | | 350 | 1,060 | | 775 |
| Concrete | (4) 1/4"-diameter concrete screw anchors ³ | 4 anchors | Min. | 4 | 33 (20) | 2 | 105 | 625 | 470 | | |
| | | | | | 43 (18) | | 110 | 830 | 570 | | |
| | | | | | 54 (16) | | 165 | 830 | 720 | | |
| | | | 68 (14) | 165 | 830 | 720 | | | | | |
| | | | Max. | 6 | 54 (16) | 2 | 350 | 1,060 | 775 | | |
| | | | | | 68 (14) | | 350 | 1,060 | 775 | | |
| | (2) 1/4"-diameter concrete screw anchors ³ | 2 anchors | Min. | 4 | 4 3/4 | 33 (20) | 4 3/4 | 105 | 625 | 470 | |
| | | | | | | 43 (18) | | 105 | 830 | 570 | |
| | | | | | | 54 (16) | | 165 | 830 | 720 | |
| | | | 68 (14) | 165 | 830 | 720 | | | | | |
| | | | Max. | 6 | 4 3/4 | 54 (16) | 4 3/4 | 350 | 860 | 745 | |
| | | | | | | 68 (14) | | 350 | 860 | 745 | |

- For additional important information, see General Information and Notes on p. 26.
- Allowable loads are based on connectors installed with tabulated anchorage type, quantity and size into structural steel. For anchorage installations into concrete, the capacity of the connection system will be the minimum of the tabulated value and the allowable load using concrete screws indicated on the table on p. 55. Note that if the designer chooses to calculate concrete anchorage with alternate 1/4"-diameter anchors, then the maximum load shall not exceed the tabulated values in this table. Refer to the figures on p. 53 for anchorage conditions.
- Please refer to the table on p. 55 for Simpson Strong-Tie® Titen HD® anchorage loads.
- Min. fasteners quantity and tabulated values — fill round holes; max. fasteners quantity and tabulated values — fill round and triangular holes.
- The standoff is the distance from the interior flange of the stud to the face of the supporting structure. Note that the interior flange of the stud is assumed to align with the inside vertical edge of the connector as indicated in the illustrations on p. 55.
- Tabulated values are based on 3/8" studs. Web crippling checks for deeper members are the responsibility of the designer.
- Tabulated F₁ loads are based on assembly tests with the load through the centerline of stud. Tested failure modes were due to screw pullout; therefore compare F₁ against F_p calculated per ASCE 7-16 Chapter 13 with a_p = 1.25 and R_p = 1.0.

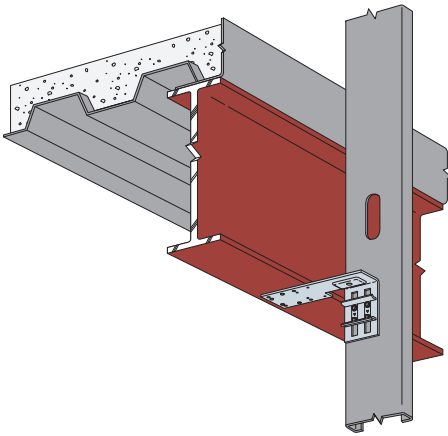
SCHA Slide-Clip Connectors for Horizontal Anchorage



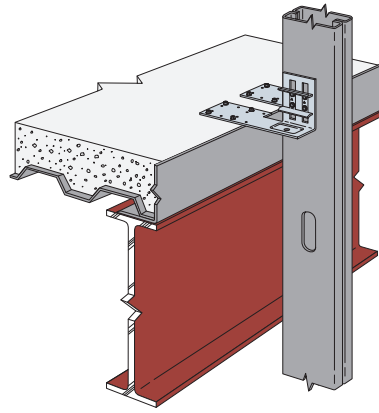
Typical SCHA Installation at Floor Slab



Typical SCHA Installation at Floor Slab (inverted)



Typical SCHA Installation at Beam Flange



Typical SCHA Installation for Built-Up Studs at Floor Slab (SCHA10.75L near side and SCHA10.75 far side)

Allowable Titen HD® Anchorage Loads into Concrete with SCHA Clip (lb.)

| Anchorage Type | Nominal Embedment (in.) | Anchors Quantity and Size | f' _c (psi) | Allowable Anchor Load (lb.) F ₂ and F ₃ | | | |
|--|-------------------------|---------------------------|-----------------------|---|------------------|----------------------------|---|
| | | | | Wind and Seismic in SDC A & B | | Seismic in SDC C through F | |
| | | | | Uncracked Concrete | Cracked Concrete | Cracked Concrete (Ω = 1.0) | Cracked Concrete ⁷ (Ω = 2.5) |
| Simpson Strong-Tie® Titen HD screw anchor THDB25178H | 1½" | (4) ¼" x 17/8" | 2,500 | 1,025 | 730 | 855 | 350 |
| | 1½" | (2) ¼" x 17/8" | 2,500 | 510 | 365 | 425 | 175 |

1. Allowable anchor capacities have been determined using ACI 318-14 Chapter 17 calculations with a minimum concrete compressive strength (f'_c) of 2,500 psi and 5" slab thickness in normal-weight concrete. Tabulated values can be multiplied by a factor (λ_a) of 0.68 for sand-lightweight concrete.
2. Nominal Embedment Depth/Effective Embedment Depth relationship is 1.75" (h_{nom}) / 1.30" (h_{ef}).
3. Edge distance is assumed to be 2", and end distance is 7½".
4. Load values are for group anchors based on ACI 318-14, condition B, load factors from ACI 318-14 Section 5.3, no supplement edge reinforcement, Ψ_{c,v} = 1.0 for cracked concrete and periodic special inspection.
5. Allowable Stress Design (ASD) values were determined by multiplying calculated LRFD capacities by a conversion factor, Alpha (α), of 0.70 for seismic load and 0.6 for wind loads. ASD values for other combinations may be determined using alternate conversion factors.
6. Tabulated allowable ASD loads for Wind and Seismic in SDC A&B are based on using wind conversion factors and may be increased by 1.17 for SDC A&B only.
7. Allowable loads have been divided by an Omega (Ω) seismic factor of 2.5 for brittle failure as required by ACI 318-14 Chapter 17.
8. Allowable F₂ and F₃ loads are based on the governing loading direction, which is toward the edge of slab.
9. Tabulated capacities are based on maximum allowable anchorage loads only. The capacity of the connection system shall be the minimum of the tabulated value and the SCHA Allowable Connector Loads.

Drift Connectors



IDCB Drift-Clip Bypass Framing Connector

The IDCB drift-clip connector is used to secure bypass stud framing to the edge of a slab. The connector will accommodate 1" of lateral drift in each direction and 1" of upward and downward vertical deflection. Tested load values are provided for anchorage to a steel-edge angle using #12 x 1 1/4" Strong-Drive® XL Large-Head Metal screws.

Features:

- Horizontal embossments and corner gussets optimize performance in the F₂ load direction
- Precision-manufactured shouldered screws provided with the IDCB connector are designed to prevent overdriving and to ensure that the clip functions properly
- Simpson Strong-Tie® No-Equal® stamps mark the center of the slots to help ensure correct shouldered screw and anchor placement

Material: 97 mil (12 ga.), 50 ksi

Coating: Galvanized (G90)

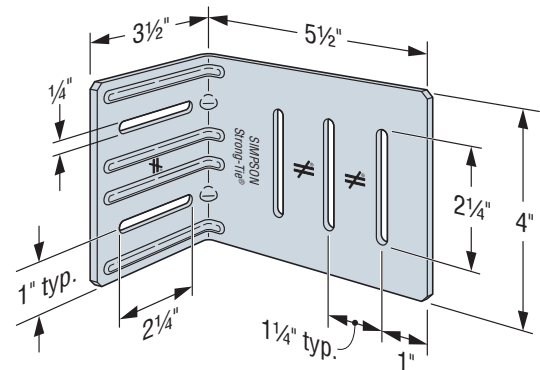
Installation:

- Use the specified type and number of fasteners and anchors.
- In the vertical slots, use the specified number of #14 shouldered screws (included) for attachment to the stud. Install screws to align with the No-Equal stamp.
- For attachment to a minimum 3/16"- and maximum 1/2"-thick steel edge angle, use Simpson Strong-Tie Strong-Drive XL Large-Head Metal screws (XLQ114B1224). Use one screw centered in each horizontal slot. Install screws to align with the No-Equal stamp and back out 1/2 turn.
- For fastener installation into steel backed by concrete, predrilling of both the steel and the concrete may be required. For predrilling, use a maximum 3/16"-diameter drill bit.

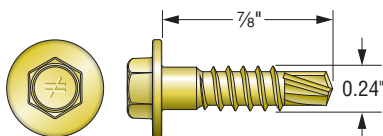
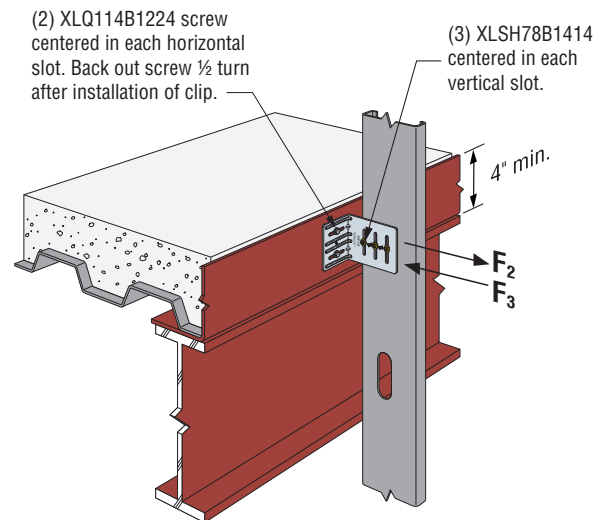
Codes: See p. 13 for Code Reference Key Chart

Ordering Information:

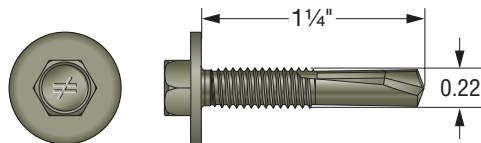
IDCB45.5-KT25 contains (25) IDCB45.5 connectors and (83) XLSH78B1414 #14 shouldered screws



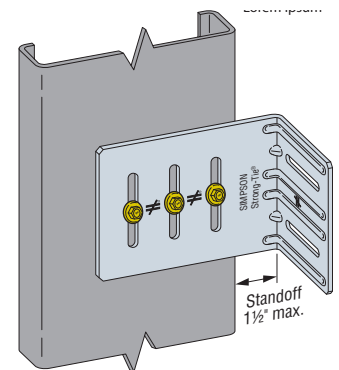
IDCB45.5



XLSH78B1414
#14 Shouldered Screw for Attachment to Stud Framing
(included)



XLQ114B1224 Screw
for Anchorage to Steel Edge Angle
(sold separately)



Standoff Distance

IDCB45.5 Connector Loads (lb.)

| Model No. | No. of #14 Shouldered Screws ¹ | No. of #12 XLQ Screw Anchors ² | Load Direction | Stud Thickness mil (ga.) | Strength ³ (lb.) | | Service Limit ³ (lb.) | | Code Ref. |
|-----------|---|---|-----------------------------------|--------------------------|-----------------------------|-------|----------------------------------|-------------------|-----------|
| | | | | | ASD | LRFD | 1/8" Deformation | 3/16" Deformation | |
| IDCB45.5 | 3 | 2 | F ₂ and F ₃ | 33 mil (20 ga.) | 600 | 900 | 410 | 650 | — |
| | | | | 43 mil (18 ga.) | 680 | 1,060 | 455 | 695 | |
| | | | | 54 mil (16 ga.) | 760 | 1,220 | 500 | 745 | |

1. #14 x 7/8" shouldered screw (model no. "XLSH78B1414") provided with the clips are ASTM C1513 compliant.

2. For additional information on the #12 XL screw (model no. "XLQ114B1224") refer to strongtie.com.

3. The capacity of the connection will be the minimum of Strength Load and applicable Service Limit Load as determined by the designer.

4. For additional important information, see General Information and Notes on p. 26.

DSSCB Bypass Framing Drift Strut Connector



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

The solution to accommodate building drift, the DSSCB, is used to support cold-formed steel bypass framing to the edge of a floor slab. The DSSCB also simplifies installation by allowing installers for panelized construction to install finished panels while working off the top of the slab without the need to predrill or preinstall anchors for each clip. It also eliminates the coordination difficulties associated with pre-anchorage of standard bypass clips. With prepunched slots and round holes, the DSSCB is a dual-function connector that can be used for slide-clip and fixed-clip applications.

Features:

- The clips come in lengths of 3½", 6" and 8".
- Prepunched slots provide a full 1" of both upward and downward deflection.
- Precision-manufactured shouldered screws, provided with DSSCB connectors, are designed to prevent overdriving and to ensure the clip functions properly.
- Works with 7⁄8" and 1½" strut channels as given in the accompanying figures. Common manufactured brands are Unistrut®, PHD and B-Line. Struts are not supplied by Simpson Strong-Tie.
- The maximum slide-clip standoff distance is 3½" for 7⁄8" struts, 37⁄8" for 1½" struts and 2¼" for concrete inserts.
- Depending on the application and the designer's specifications, struts can be either mechanically anchored, welded or cast in place.
- Pre-engineered design solutions are provided for channel strut anchorage.
- Tabulated design values are based on assembly testing to mitigate risk for designers, engineers and architects.
- Optional pre-cast concrete inserts for flush mounting.
- Optional drift stopper, DSHS, for clip alignment flexibility (where drift not required).

Material: DSSCB — 97 mil (12 ga.), 50 ksi;
 DSHS — 97 mil (12 ga.), 33 ksi

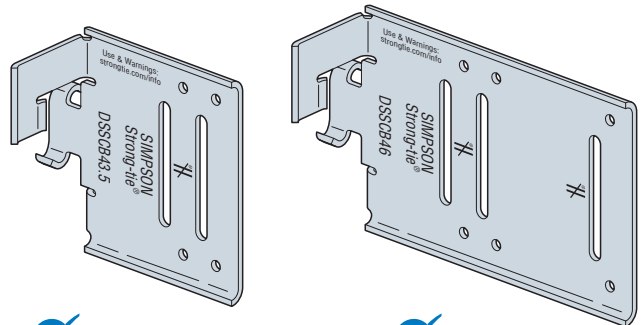
Finish: Galvanized (G90)

Codes: See p. 13 for Code Reference Key Chart.

Ordering Information:

The DSSCB43.5-KT25, DSSCB46-KT25 and DSSCB48-KT25 contain 25 connectors and enough shouldered screws for installation. The DSHS-R100 contains 100 connectors.

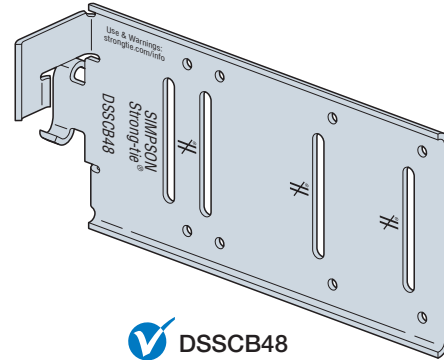
Note: Replacement #14 shouldered screws for DSSCB connectors are the XLSH78B1414-RP83.



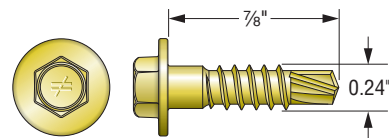
DSSCB43.5

DSSCB46

US Patent
 Pending

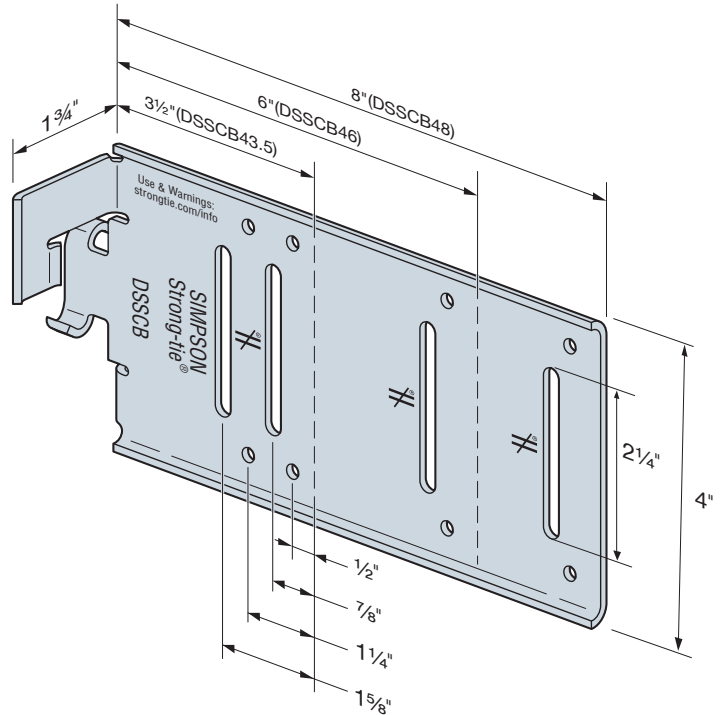
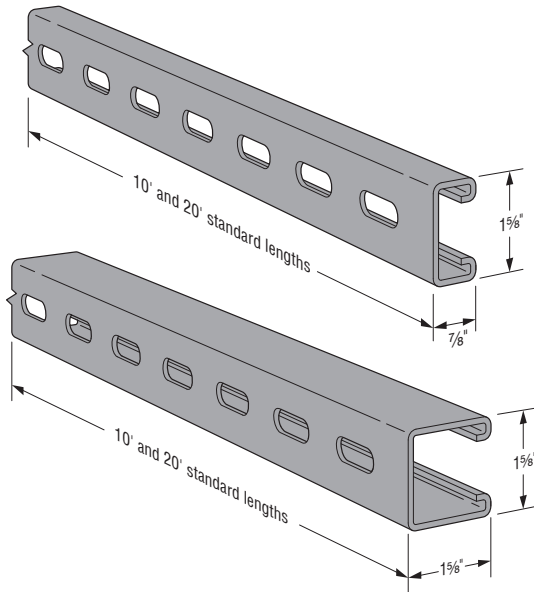
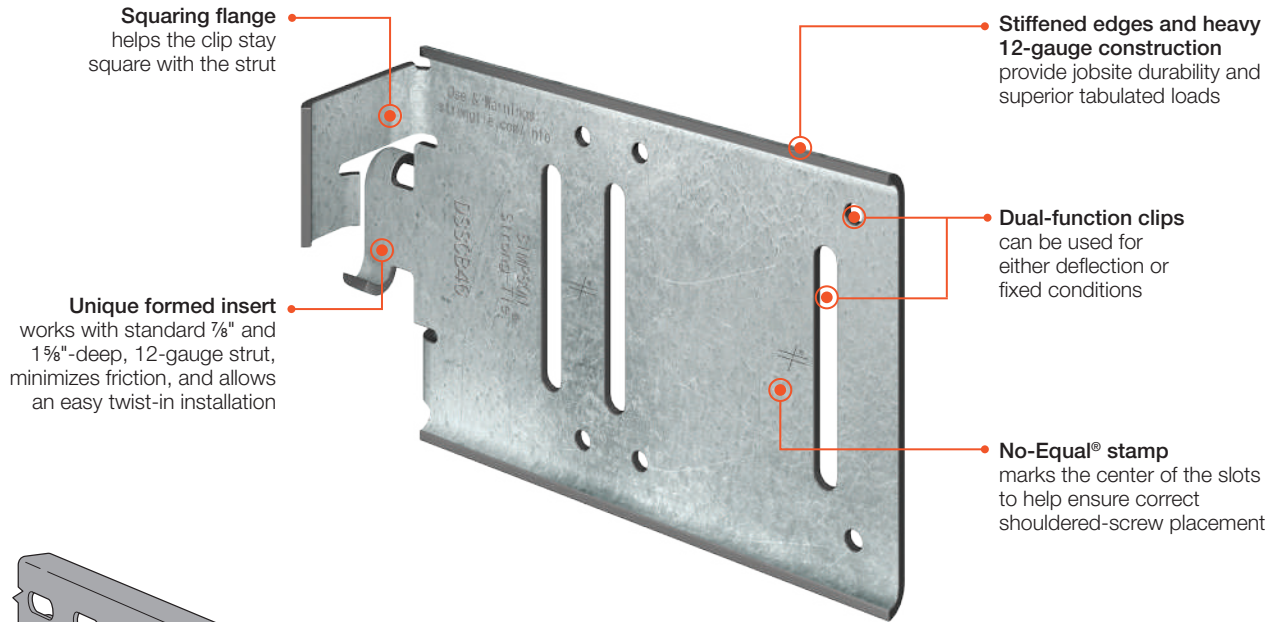


DSSCB48

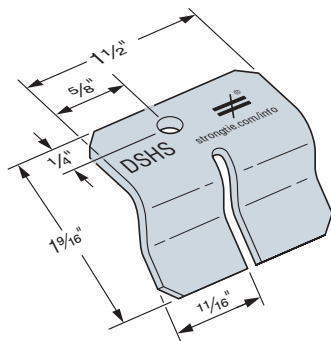


XLSH78B1414
#14 Shouldered Screw for
Attachment to Stud Framing
(included)

DSSCB Bypass Framing Drift Strut Connector



The Simpson Strong-Tie® DSSCB works with 12-gauge standard strut channels (not sold by Simpson Strong-Tie). See p. 68 for strut requirements and p. 66 for concrete insert requirements. See p. 64 for model numbers and capacities.

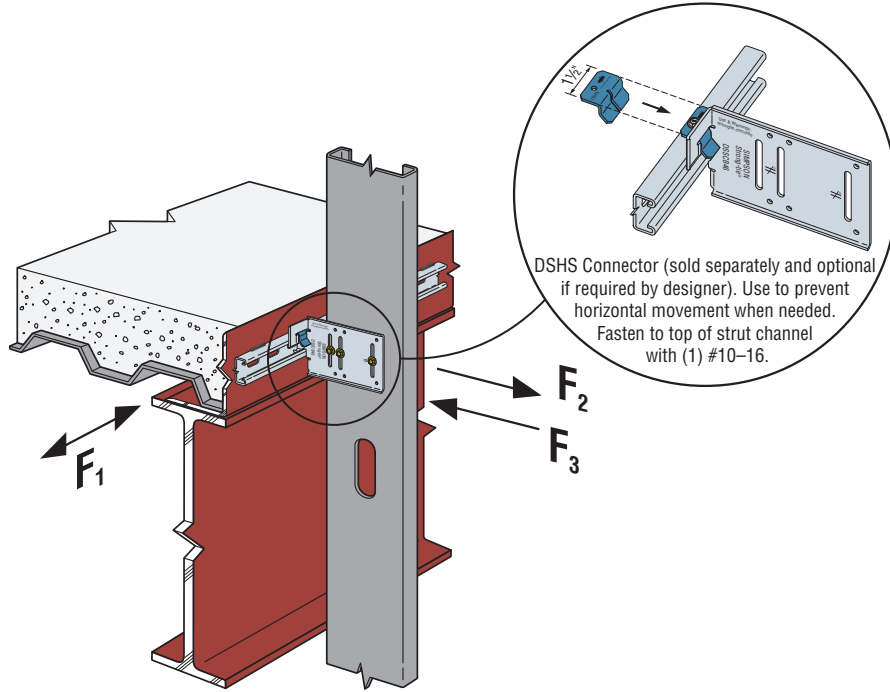


DSHS used to prevent horizontal sliding when needed (sold separately)

DSSCB Dimensions
US Patent Pending

DSSCB Bypass Framing Drift Strut Connector

Drift Connectors



Typical DSSCB Installation
Slide-Clip Application

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 | | | | |

DSSCB Bypass Framing Drift Strut Connector

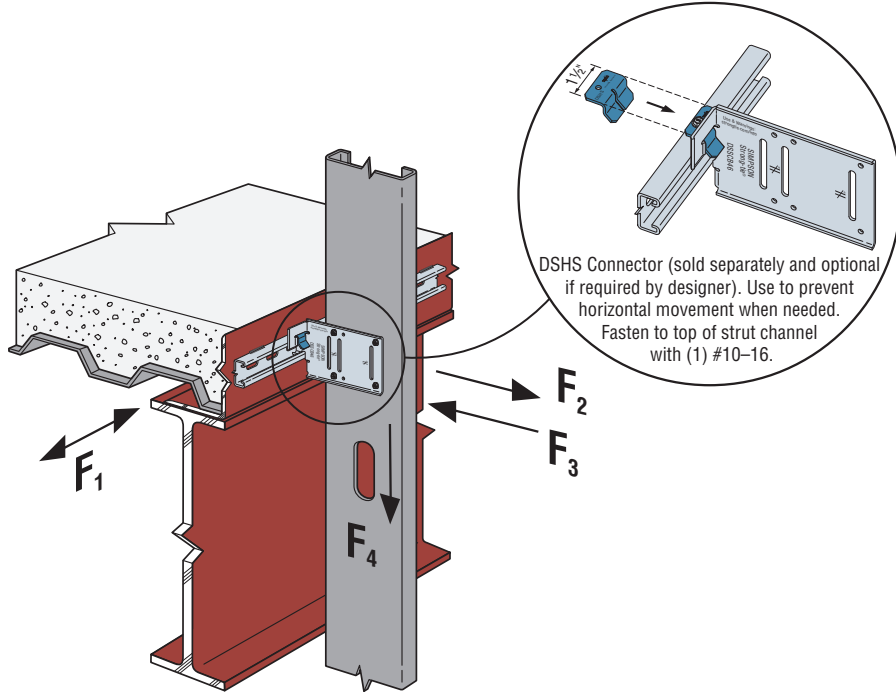
DSSCB Allowable Slide-Clip Connector Loads (lb.)

| Model No. | Stud Thickness mil (ga.) | Fasteners to Stud | | Allowable Load (lb.) | | | Code Ref. |
|-----------|--------------------------|-------------------|------------------------------|----------------------|----------------|----------------|-----------|
| | | Screw Pattern | No. of #14 Shouldered Screws | F ₁ | F ₂ | F ₃ | |
| DSSCB43.5 | 33 (20) | A | 2 | 105 | 515 | 570 | IBC, LA |
| DSSCB46 | | B | 3 | 105 | 765 | 855 | |
| | | C, D | 2 | 105 | 515 | 570 | |
| DSSCB48 | | E | 4 | 105 | 765 | 1,135 | |
| | | F, G | 3 | 105 | 765 | 855 | |
| DSSCB43.5 | 43 (18) | 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 (16) | 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 | 2,560 | |
| | | F, G | 3 | 225 | 1,475 | 1,820 | |
| DSSCB43.5 | 68 (14) and 97 (12) | A | 2 | 300 | 1,075 | 1,640 | |
| DSSCB46 | | B | 3 | 300 | 1,475 | 2,800 | |
| | | C, D | 2 | 300 | 1,075 | 1,560 | |
| DSSCB48 | | E | 4 | 300 | 1,475 | 2,800 | |
| | | F, G | 3 | 300 | 1,475 | 2,725 | |

1. For additional important information, see General Information and Notes on p. 26.
2. DSSCB Allowable Slide-Clip Connector Loads are also limited by the Strut Channel Allowable Anchorage Loads to Steel table on p. 64, or Concrete Insert Allowable Anchorage Loads table on p. 65, or Strut Channel Allowable Anchorage Loads to CLT table on p. 69. Use the minimum tabulated values from the connector and anchorage load tables as applicable.
3. See illustrations on p. 60 for shouldered screw fastener pattern placement to stud framing.
4. Tabulated F₁ loads are based on assembly tests with the load through the centerline of the stud. F₁ loads require DSHS connector with (1) #10 screw to strut.

DSSCB Bypass Framing Drift Strut Connector

Drift Connectors



Typical DSSCB Installation
Fixed-Clip Application

DSSCB Screw Patterns (Fixed-Clip Applications)

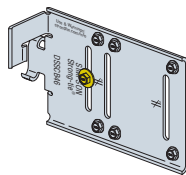
| Model | Pattern H | Pattern I | Pattern J |
|-----------|-----------|-----------|-----------|
| DSSCB43.5 | | | |
| Model | Pattern K | Pattern L | Pattern M |
| DSSCB46 | | | |
| Model | Pattern N | Pattern O | Pattern P |
| DSSCB48 | | | |

DSSCB Bypass Framing Drift Strut Connector

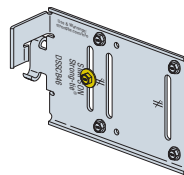
DSSCB Allowable Fixed-Clip Connector Loads (lb.)

| Model No. | Stud Thickness mil (ga.) | Screw Pattern | No. of #10 Screws | Allowable Load (lb.) | | | | Code Ref. |
|-----------|---------------------------|---------------|-------------------|----------------------|----------------|----------------|----------------|-----------|
| | | | | F ₁ | F ₂ | F ₃ | F ₄ | |
| DSSCB43.5 | 33 (20) | H | 4 | 220 | 705 | 705 | 345 | IBC, LA |
| DSSCB46 | | I, J | 2 | 185 | 355 | 355 | 175 | |
| | | K | 6 | 220 | 1,060 | 1,060 | 355 | |
| DSSCB48 | | L, M | 4 | 185 | 705 | 705 | 350 | |
| | | N | 8 | 220 | 1,060 | 1,060 | 545 | |
| DSSCB43.5 | | O, P | 4 | 185 | 705 | 705 | 505 | |
| | H | 4 | 265 | 1,050 | 1,050 | 450 | | |
| DSSCB46 | 43 (18) | I, J | 2 | 240 | 525 | 525 | 230 | |
| | | K | 6 | 285 | 1,125 | 1,580 | 460 | |
| DSSCB48 | | L, M | 4 | 240 | 1,050 | 1,050 | 455 | |
| | | N | 8 | 285 | 1,145 | 1,580 | 710 | |
| DSSCB43.5 | | O, P | 4 | 240 | 1,050 | 1,050 | 660 | |
| | | H | 4 | 330 | 1,410 | 2,070 | 1,025 | |
| DSSCB46 | 54 (16) | I, J | 2 | 300 | 1,070 | 1,035 | 515 | |
| | | K | 6 | 360 | 1,410 | 3,105 | 1,050 | |
| DSSCB48 | | L, M | 4 | 300 | 1,410 | 2,135 | 1,040 | |
| | | N | 8 | 360 | 1,440 | 3,105 | 1,145 | |
| DSSCB43.5 | | O, P | 4 | 300 | 1,420 | 2,135 | 1,070 | |
| | | H | 4 | 395 | 1,410 | 2,160 | 1,025 | |
| DSSCB46 | 68 (14) and 97 (12) | I, J | 2 | 300 | 1,080 | 1,080 | 515 | |
| | | K | 6 | 395 | 1,410 | 3,105 | 1,050 | |
| DSSCB48 | | L, M | 4 | 300 | 1,410 | 2,160 | 1,040 | |
| | | N | 8 | 395 | 1,440 | 3,240 | 1,145 | |
| DSSCB43.5 | | O, P | 4 | 300 | 1,420 | 2,160 | 1,070 | |

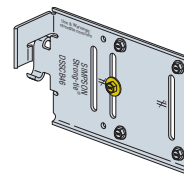
- For additional important information, see General Information and Notes on p. 26.
- DSSCB Allowable Fixed-Clip Connector Loads are also limited by the Strut Channel Allowable Anchorage Loads to Steel table on p. 64, or Concrete Insert Allowable Anchorage Loads table on p. 65, or Strut Channel Allowable Anchorage Loads to CLT table on p. 69. Use the minimum tabulated values from the connector and anchorage load tables as applicable.
- See illustrations on p. 62 for screw fastener pattern placement to stud framing.
- Tabulated F₁ loads are based on assembly tests with the load through the centerline of the stud. F₁ loads require DSHS connector with (1) #10 screw to strut.
- In-plane capacities (F₁) for DSSCB attached to 54 mil (16 ga.) stud can be increased to 455 lb. with the addition of a shoulder screw at first slot from bend line for screw pattern K and L and at middle slot for pattern M (reference patterns shown to the right). Failure mode for this condition is member, not fastener.



Screw pattern K
with added shoulder
screw per note 5



Screw pattern L
with added shoulder
screw per note 5



Screw pattern M
with added shoulder
screw per note 5

DSSCB Bypass Framing Drift Strut Connector

Strut Channel Allowable Anchorage Loads to Steel (lb.)

| Strut Size (in.) | Models | Welded Anchorage Each Flange | | | | | | #12–24 Screw Anchorage | | | | | Code Ref. | |
|------------------|--|---|----------------------------|----------------------|----------------------|----------------------|----------------------|------------------------|----------------------|----------------------|----------------------|----------------------|------------|---|
| | | Weld Spacing (in.) | Required Weld Length (in.) | F ₁ (lb.) | F ₂ (lb.) | F ₃ (lb.) | F ₄ (lb.) | Screw Spacing (in.) | F ₁ (lb.) | F ₂ (lb.) | F ₃ (lb.) | F ₄ (lb.) | | |
| ¾" | Unistrut® P3300 | 4 | 1 | 775 | 1,800 | 2,710 | 3,200 | 4 | 755 | 1,535 | 2,710 | 1,650 | IBC, LA | |
| | | 6 | 1 | 775 | 1,200 | 2,710 | 2,135 | 6 | 755 | 1,040 | 2,710 | 1,155 | | |
| | PHD 1201; 1202; 1211; 1212; 1221; 1222; 1241; 1242 | 8 | 1 | 775 | 900 | 2,710 | 1,600 | 8 | 755 | 800 | 2,710 | 865 | | |
| | | 10 | 1 | 775 | 720 | 2,710 | 1,280 | — | — | — | — | — | | |
| | | B-Line B52; B52H1½; B52SH; B52K06 | 12 | 1 | 775 | 600 | 2,710 | 1,065 | — | — | — | — | | — |
| | | | 16 | 1 | 775 | 450 | 2,710 | 800 | — | — | — | — | | — |
| 1½" | Unistrut® P1000; P1000HS; P1000T; P1000K0. | 4 | 1 | 775 | 4,310 | 3,925 | 1,745 | 4 | 755 | 1,535 | 3,925 | 1,315 | | |
| | | 6 | 1 | 775 | 2,875 | 3,925 | 1,715 | 6 | 755 | 1,040 | 3,925 | 1,155 | | |
| | PHD 1001; 1002; 1011; 1012; 1021; 1022; 1041; 1042 | 8 | 1 | 775 | 2,155 | 3,925 | 1,670 | 8 | 755 | 800 | 3,925 | 865 | | |
| | | 10 | 1 | 775 | 1,725 | 3,925 | 1,335 | — | — | — | — | — | | |
| | | B-Line B22; B22H1½; B22SH; B22K06 | 12 | 1 | 775 | 1,435 | 3,925 | 1,115 | — | — | — | — | | — |
| | | | 16 | 1 | 775 | 1,080 | 3,925 | 835 | — | — | — | — | | — |

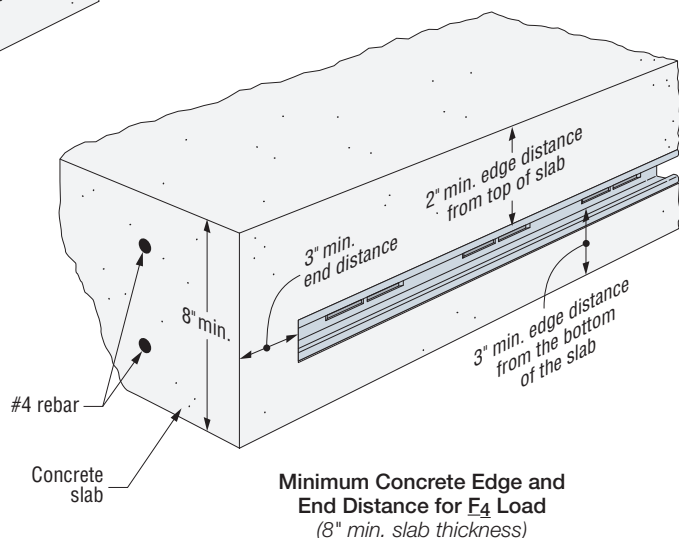
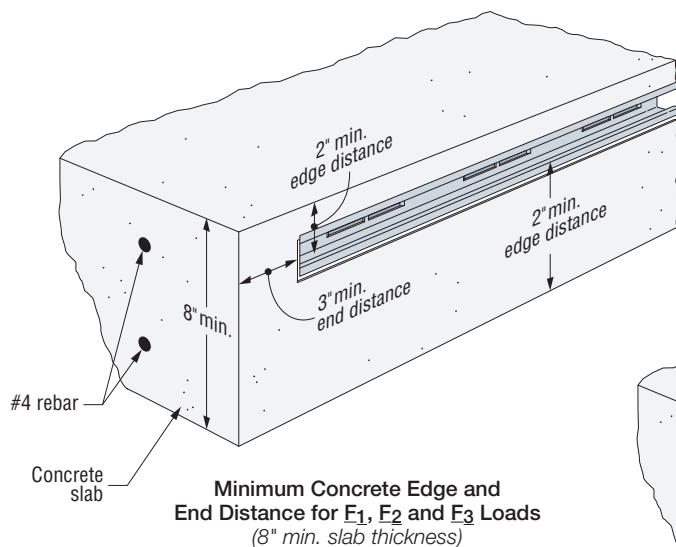
- For additional important information, see General Information and Notes on p. 26.
- Allowable anchorage loads are also limited by the DSSCB Connector Load tables on pp. 61 and 63. Use the minimum tabulated values from the connector and anchorage load tables as applicable.
- Allowable loads are based on 97 mil (12 ga.) thickness strut channel members with a minimum yield strength, F_y , of 33 ksi, tensile strength, F_u , of 45 ksi.
- Allowable loads for self-drilling screws are based on installation in minimum ¾"-thick structural steel with $F_y = 36$ ksi. Values listed above may be used where other thicknesses of steel are encountered provided that the fastener has equal or better tested values into thicker steel. It is the responsibility of the designer to select the proper length fasteners based on the steel thickness installation.
- For screw fastener installation into steel backed by concrete, predrilling of both the steel and the concrete is suggested. For predrilling, use a maximum ¾"-diameter drill bit. Screw to be installed through steel portion of channel strut (1.5 x screw diameter from punch-out) and centered vertically in web.
- For any connector occurring within 2" of channel strut splice, load not to exceed — $F_2 = 865$ lb. and $F_4 = 785$ lb.
- Maximum allowable load of strut can be increased at high concentrated loads by welding each flange 1" from the strut channel to support directly at clip location:
 - For ¾" strut size — $F_1 = 775$ lb., $F_2 = 1,800$ lb., $F_3 = 2,710$ lb., $F_4 = 3,200$ lb.
 - For 1½" strut size — $F_1 = 775$ lb., $F_2 = 4,310$ lb., $F_3 = 3,925$ lb., $F_4 = 1,745$ lb.
- Required weld length is on each flange at spacing indicated.
- Anchorage spacing cannot be greater than framing spacing.
- Connector load to be located a minimum of 2" from end of strut channel.
- Tabulated values for 1½" x ¾" strut may be used for 1½" x 1¼" strut except F_2 welded anchorage values are limited to a maximum load of 1,615 lb. If ¾" struts are pierced, a load modifier per note 12 is required. See p. 68 for all channel dimension requirements.
- F_1 , F_3 and F_4 have no load reductions for allowed piercings. F_2 has no load reductions for piercings, except for welded conditions as follows:
 - For ¾" hole at 1½" o.c., multiply by 0.9;
 - For ¾" hole at 6" o.c., multiply by 0.9;
 - For slotted hole (1½" x ¾") at 2" o.c., multiply by 0.85.
 No load reductions are required for F_1 , F_2 or F_3 load directions for allowed piercing. For images of allowed piercings reference p. 68.

DSSCB Bypass Framing Drift Strut Connector

Concrete Insert Allowable Anchorage Loads (lb.)

| Strut Size 1 5/8" Wide x Depth (in.) | Minimum Edge Distance | | Load Direction | Allowable Load (lb.) | | | |
|--|-----------------------|-------------------------|-------------------------------|----------------------|---------|------------------|---------|
| | Top of Slab (in.) | Bottom of Slab (in.) | | Uncracked Concrete | | Cracked Concrete | |
| | | | | SDC A&B | SDC C-F | SDC A&B | SDC C-F |
| 7/8 to 1 1/8 | 2 | 2 | In-plane (F ₁) | 2,955 | 2,590 | 2,070 | 1,815 |
| 7/8 | 2 | 2 | Tension (F ₂) | 1,715 | 1,250 | 1,200 | 1,050 |
| 1 1/8 | 2 | 2 | Tension (F ₂) | 2,100 | 1,570 | 1,470 | 1,290 |
| 7/8 to 1 1/8 | 2 | 2 | Compression (F ₃) | 2,710 | 2,710 | 2,710 | 2,710 |
| 7/8 to 1 1/8 | 2 | 6 | Shear (F ₄) | 1,640 | 1,440 | 1,150 | 1,005 |
| 7/8 to 1 1/8 | 2 | 3 | Shear (F ₄) | 485 | 425 | 340 | 300 |

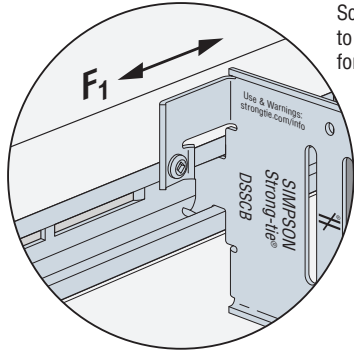
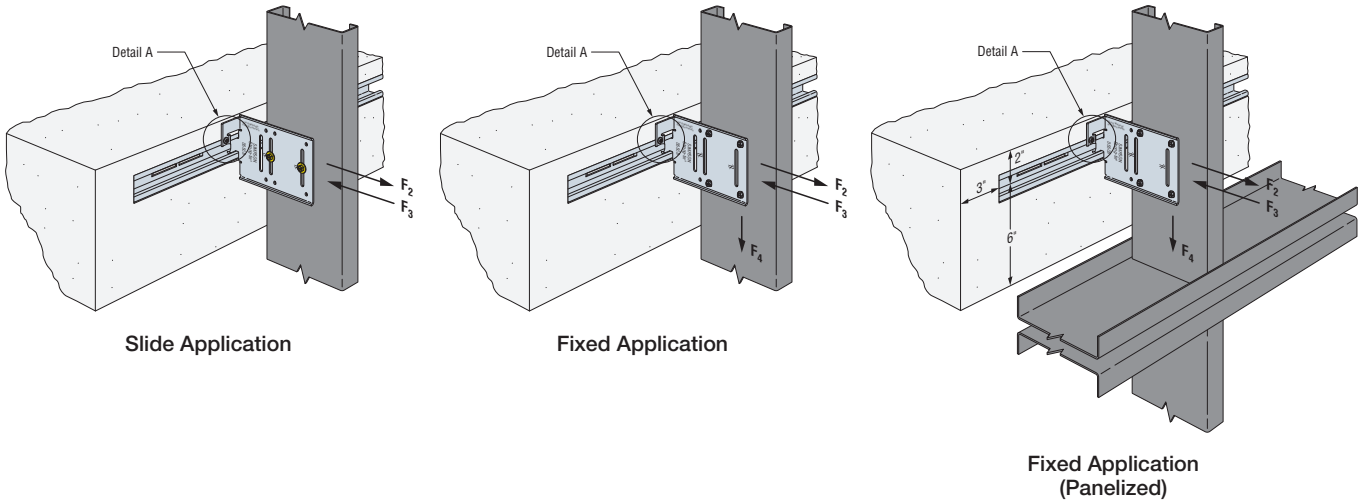
- For additional DSSCB connector requirements and important technical information, visit strongtie.com.
- The designer is responsible for concrete slab design. The minimum tested concrete slab thickness is 8". Minimum end distance and edge distances for concrete insert struts are shown in the illustrations.
- Tabulated values are for concrete compressive strength $f'_c = 4,000$ psi minimum. For 3,000 psi or 3,500 psi, apply a load adjustment factor of 0.87 or 0.94, respectively.
- Allowable anchorage loads with concrete insert are also limited by the DSSCB Connector Load tables on pp. 61 and 63. Use the minimum tabulated values from the connector and strut anchorage load table above as applicable.
- Allowable loads are based on 97 mil (12 ga.) thickness strut channel members with a minimum yield strength, F_y , of 33 ksi, tensile strength, F_u , of 45 ksi. Strut size and dimensions are illustrated on p. 68. Other strut manufacturers with equivalent performance and dimensions may be used as approved by the designer.
- Tabulated values are for connector load spacing at 16" minimum. Reduce load linearly for connector spacing less than 16". For example, shear connector load (F_4), with 2" edge distance from the top of slab at 12" spacing is 1,440 lb. * $(12"/16") = 1,080$ lb.
- Tabulated values are for clips installed 6" minimum from the end of strut. See minimum end distances from strut to concrete in illustration below.
- The load direction of shear (F_4) is toward the bottom of the slab for the tabulated capacities.
- Shear load (F_4) may be linearly interpolated for strut embedded between 2" from the top to 3" from the bottom of the concrete slab as follows:
 - For an 8" concrete slab, shear load (F_4) may be linearly interpolated for strut embedded between 2" from the top and 3" from the bottom of the slab.
 - For slabs thicker than 8", linearly interpolate based on bottom concrete edge distance.
- Allowable loads are based on testing in accordance with AC308 in the Simpson Strong-Tie's IAS-accredited test lab.



DSSCB Bypass Framing Drift Strut Connector

Drift Connectors

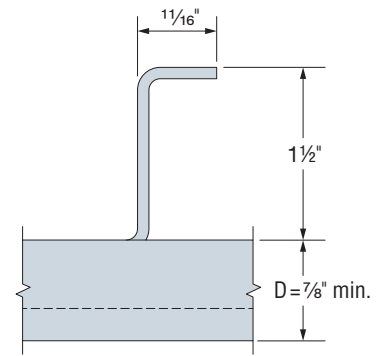
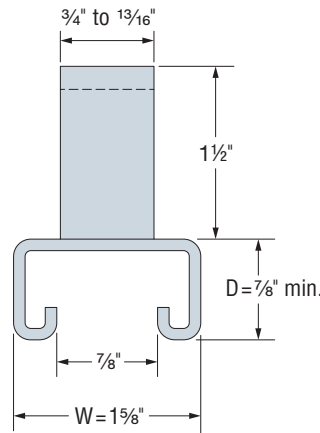
Concrete Insert Anchorages



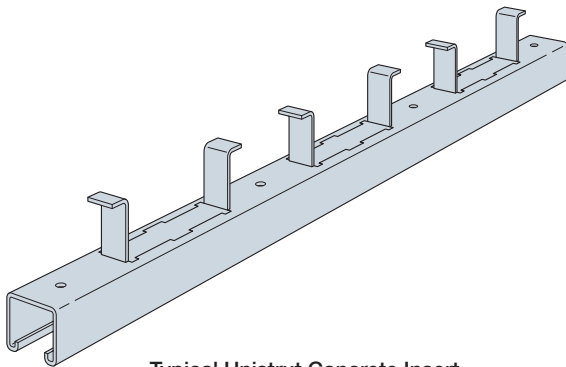
Screw (1) #10 screw to lip of channel for F₁ support

Detail A
(F₁ support required)
This detail meets or exceeds the published F₁ loads for this connector when installed with the DSHS drift stopper clip.

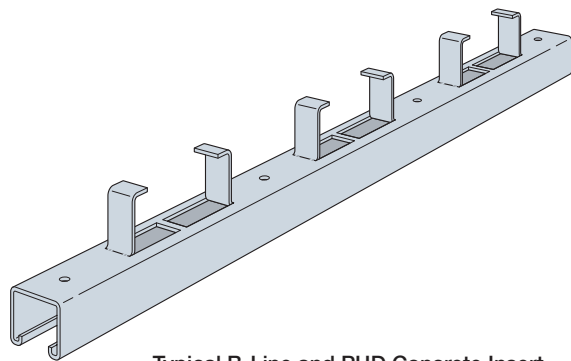
For horizontal drift connections where F₁ support is not required, do not fasten connector to strut.



12 ga. 33 ksi Concrete Insert
(by others)



Typical Unistrut Concrete Insert

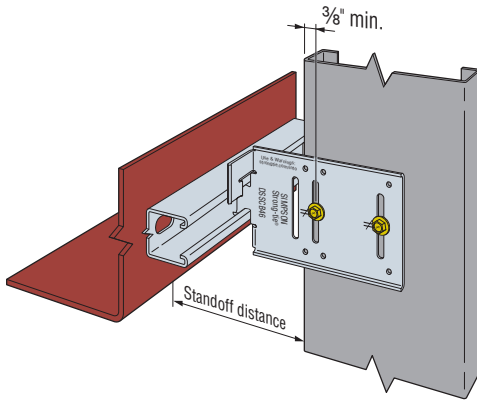


Typical B-Line and PHD Concrete Insert

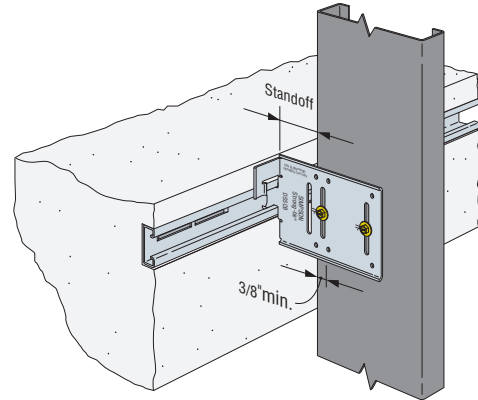
DSSCB Bypass Framing Drift Strut Connector

DSSCB Standoff Distances

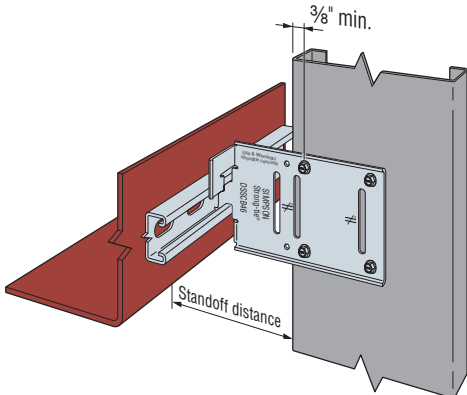
| Model No. | Application | Screw Pattern | No. of Screws | 7/8" Struts | | 1 1/8" Struts | | Concrete Inserts | | |
|-----------|-------------|---------------|---------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-------|
| | | | | Min. Standoff (in.) | Max. Standoff (in.) | Min. Standoff (in.) | Max. Standoff (in.) | Min. Standoff (in.) | Max. Standoff (in.) | |
| DSSCB43.5 | Slide Clip | A | 2 | 1 | 2 3/8 | 1 1/4 | 3 1/8 | 3/16 | 1 1/2 | |
| DSSCB46 | | B | 3 | | 2 3/8 | | | | 3 1/8 | 1 1/2 |
| | | C | 2 | | 2 3/8 | | | | 3 1/8 | 1 1/2 |
| | | D | 2 | | 3 1/8 | | | | 3 7/8 | 2 1/4 |
| DSSCB48 | | E | 4 | | 2 3/8 | | | | 3 1/8 | 1 1/2 |
| | | F | 3 | | 2 3/8 | | | | 3 1/8 | 1 1/2 |
| | | G | 3 | | 3 1/8 | | | | 3 7/8 | 2 1/4 |
| DSSCB43.5 | Fixed Clip | H | 4 | 1 | 2 3/4 | 1 1/4 | 3 1/2 | 3/16 | 1 7/8 | |
| | | I | 2 | | 2 3/4 | | | | 3 1/2 | 1 7/8 |
| | | J | 2 | | 3 1/2 | | | | 4 1/4 | 2 5/8 |
| DSSCB46 | | K | 6 | | 2 3/4 | | | | 3 1/2 | 1 7/8 |
| | | L | 4 | | 2 3/4 | | | | 3 1/2 | 1 7/8 |
| DSSCB48 | | M | 4 | | 3 1/2 | | | | 4 1/4 | 2 5/8 |
| | | N | 8 | | 2 3/4 | | | | 3 1/2 | 1 7/8 |
| | | O | 4 | | 2 3/4 | | | | 3 1/2 | 1 7/8 |
| | | P | 4 | | 3 1/2 | | | | 4 1/4 | 2 5/8 |



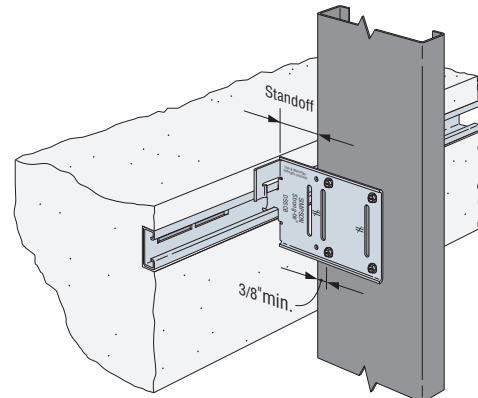
DSSCB Standoff Distance with 1 1/8" Strut (7/8" Strut Similar) and Minimum Fastener Edge Distance for Slide-Clip Application



DSSCB Standoff Distance with Concrete Insert and Minimum Fastener Edge Distance for Slide-Clip Application



DSSCB Standoff Distance with 7/8" Strut and Minimum Fastener Edge Distance for Fixed-Clip Application

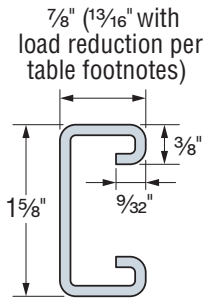


DSSCB Standoff Distance with Concrete Insert and Minimum Fastener Edge Distance for Fixed-Clip Application

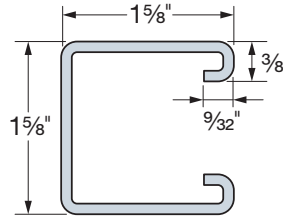
DSSCB Bypass Framing Drift Strut Connector

Strut Requirements

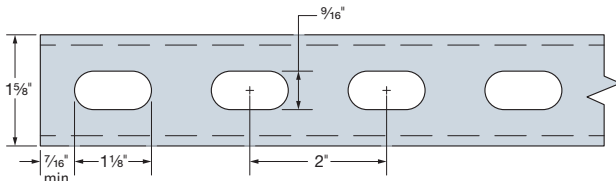
Struts must meet the strut channel dimensions, gauge, yield strength, and punch patterns shown in these requirements.



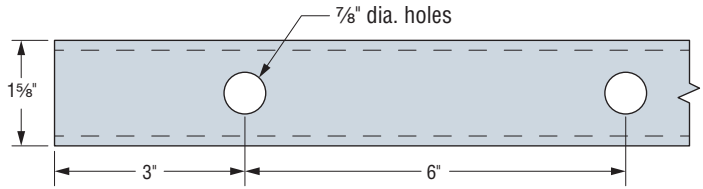
7/8" 12 ga. 33 ksi Strut Channel
(by others)



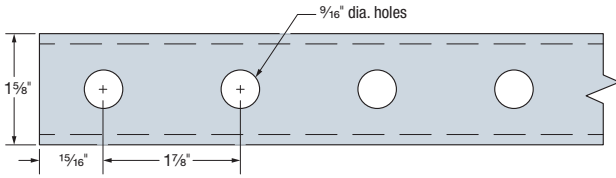
1 5/8" 12 ga. 33 ksi Strut Channel
(by others)



1 1/8" x 9/16" @ 2" o.c. Punchout Pattern



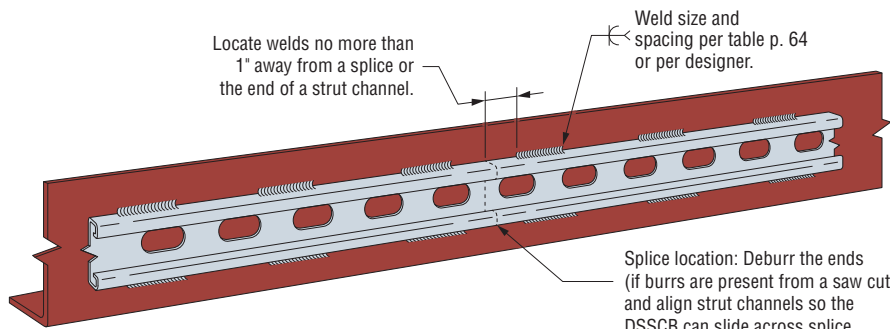
7/8" @ 6" o.c. Punchout Pattern



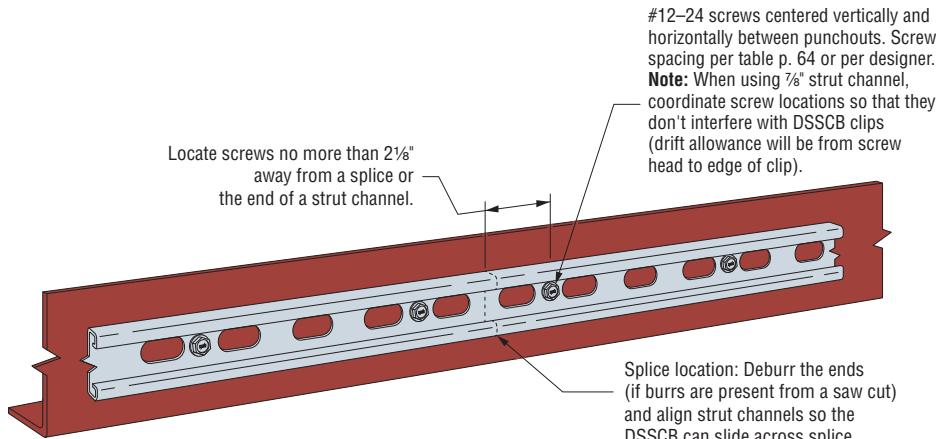
9/16" @ 1 7/8" o.c. Punchout Pattern



Unpunched Condition



Typical Strut Channel Anchorage with Welds



Typical Strut Channel Anchorage with Screws

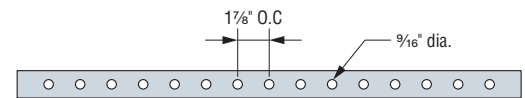
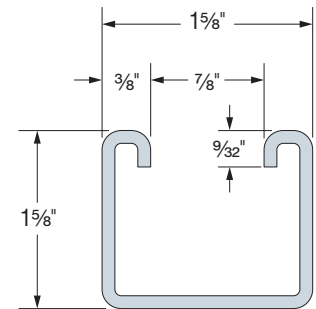
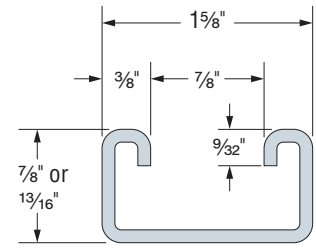
DSSCB Bypass Framing Drift Strut Connector

CLT Applications

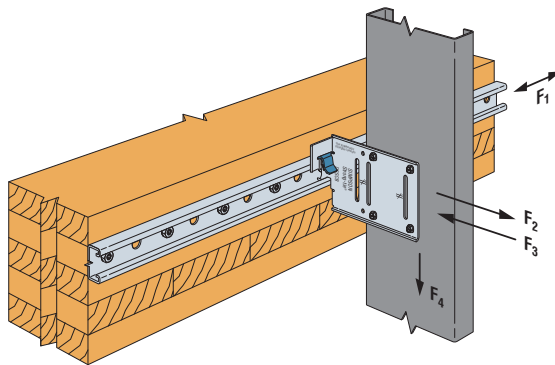
Strut Channel Allowable Anchorage Loads to CLT (lb.)

| Strut Size 1 5/8" Wide x Depth (in.) | SDHR31400 Screw Spacing (in.) | Allowable Load (lb.) | | | |
|--|--|-------------------------------------|------------------------------------|--|----------------------------------|
| | | In-Plane F ₁ (160) | Tension F ₂ (160) | Compression F ₃ (160) | Shear F ₄ (100) |
| 7/8" | 3 3/4" | 2,200 | 1,675 | 2,710 | 2,200 |
| 1 5/8" | | | | | 1,215 |
| 7/8" | 5 5/8" | 1,320 | 1,150 | 2,710 | 1,320 |
| 1 5/8" | | | | | 1,215 |

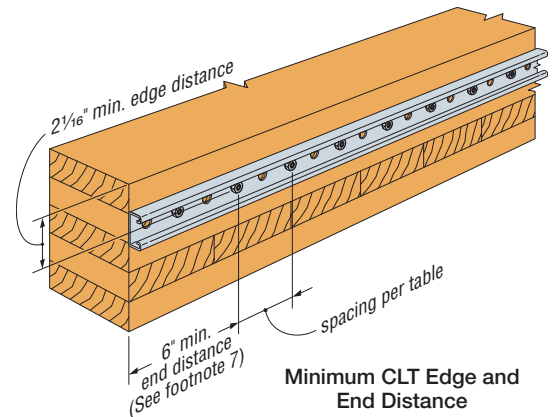
- For additional DSSCB connector requirements and important technical information, visit strongtie.com.
- The designer is responsible for CLT system design. Tabulated values are based on minimum 3-ply (4 1/8") SPF CLT into side or end grain.
- Tabulated values are based on Strong-Drive® SDHR31400 Combo-Head screw 0.472" diameter x 4" length. Minimum end distance, and edge distances for wood screws are shown in the illustrations.
- Allowable anchorage loads in CLT are also limited by the DSSCB Connector Load tables on pp. 61 and 63. Use the minimum tabulated values from the connector and strut anchorage load table above as applicable.
- Allowable loads are based on 97 mil (12 ga.) thickness strut channel members with a minimum yield strength, F_y, of 33 ksi, tensile strength, F_u, of 45 ksi. Strut size and dimensions are illustrated below. Other strut manufacturers with equivalent performance and dimensions may be used as approved by the designer.
- Tabulated values are for connector spacing at 16" minimum. Reduce load linearly for connector spacing less than 16". For example, shear connector load (F₄) for 7/8" depth strut, with 3 3/4" screw spacing, allowable load at 12" connector spacing is 2,200 lb. * (12"/16") = 1,650 lb.
- Tabulated values are for clips installed 6" minimum from the end of CLT.
- Strut size 1 5/8" width x 7/8" depth is limited to a horizontal fixed application due to DSSCB clip interference with SDHR screw head. Required coordination of screw head for installation.
- Loads (160) have been increased for wind or earthquake loading, with no further increase allowed. Reduce where other loads govern.
- Tabulated loads for 7/8" strut may be used for 1 3/16" strut, except F₂ load capacity reduced to 1,550 lb. and 1,035 lb. at 3 3/4" and 5 5/8" spacing, respectively.



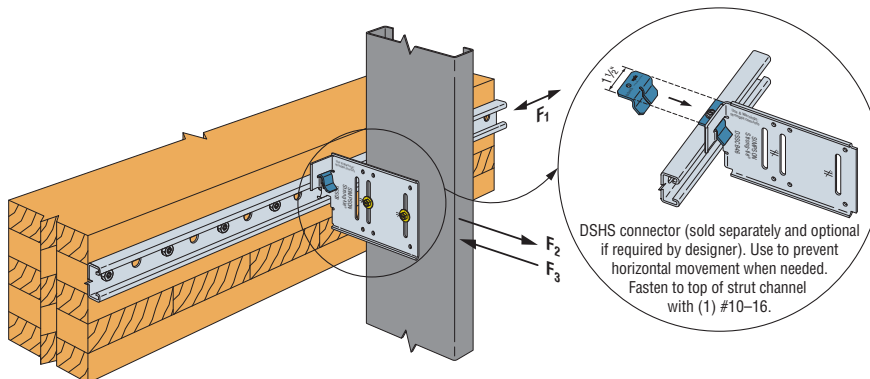
Unistrut: P3300HS, P1000HS
PHD: 1221-1222
Blind: B22H17/8
Other manufacturers that meet dimensions and thickness



Typical DSSCB Fixed Clip Installation



Minimum CLT Edge and End Distance



Typical DSSCB Slide Clip Installation

HWDC Head-of-Wall Drift-Clip Connector



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

The head-of-wall drift-clip connector (HWDC) is used to secure the head of a wall to the bottom of a slab or beam. The unique design allows anchor screws to be installed closer to the bend, providing a stronger and stiffer connection while also allowing horizontal and vertical movement during seismic and high-wind events. HWDC5.25 provides anchorage location options with a third slot providing a solution for clips overhanging beam flanges.

HWDC connectors are an optimal solution for adding strength to window or door jambs at head-of-wall connections. Tested load values are provided for anchorage to steel and concrete.

Features:

- Accommodates 1" of lateral drift in each direction, and 1" of upward and downward vertical deflection
- Unique design and placement of slot on anchorage leg allows for closer attachment of anchorage to the clip bend, providing increased load capacity
- The HWDC5.25 clip has three slots located at the anchorage leg allowing for attachment at the outer slots (anchorage pattern — centered) for maximum capacity or anchorage to the adjacent slots (anchorage pattern — off center) for walls that overhang the edge-angle or beam-edge
- Stiffening ribs are placed in between anchorage slots through the bend to provide additional strength and stiffness
- Simpson Strong-Tie® No-Equal® stamps mark the center of the slots to help ensure proper shouldered screw and anchor placement

Material: 97 mil (12 ga.), 50 ksi

Finish: Galvanized (G90)

Installation:

- Use the specified type and number of fasteners and anchors.
- In the vertical slots, use the specified number of #14 shoulder screws (included) for attachment to the stud. Install screws to align with No-Equal stamp.
- For attachment to steel support, use Simpson Strong-Tie Strong-Drive® XL Large-Head Metal Screws (XLQ114B1224). Use two screws centered in horizontal slot. Install screws to align with the No-Equal stamp and then back out one half-turn.
- For attachment to concrete support, use a Titen Turbo™ screw anchor.

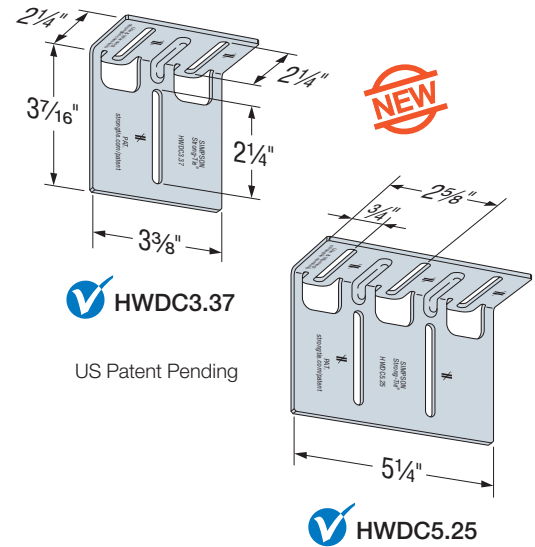
Codes: See p. 13 for Code Reference Key Chart

Ordering Information:

HWDC5.25-KT25, HWDC3.37-KT25

(55) XLSH78B1414 shoulder screws are provided with each order

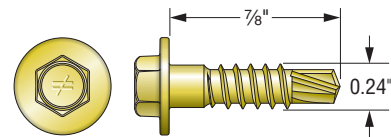
Replacement #14 shoulder screws for the HWDC are XLSH78B1414-RP83



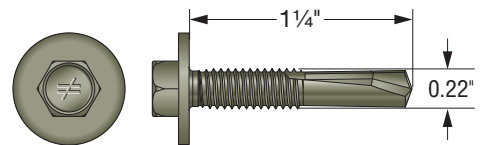
✓ HWDC3.37

US Patent Pending

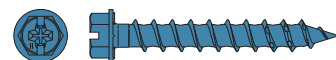
✓ HWDC5.25



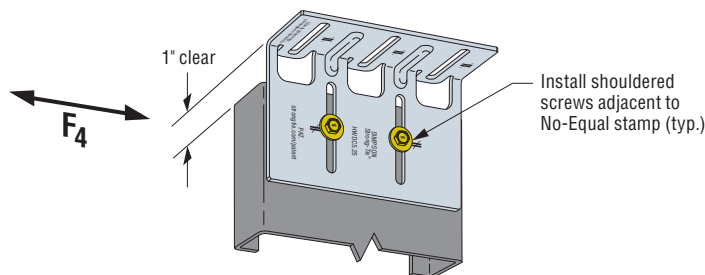
XLSH78B1414
#14 Shouldered Screw for Attachment to Stud Framing
(included)



XLQ114B1224 Screw for Anchorage to Steel Support
(sold separately)

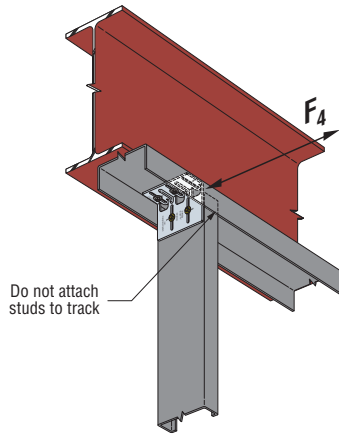


TNT25134H Screw Anchor for Anchorage to Concrete
(sold separately)

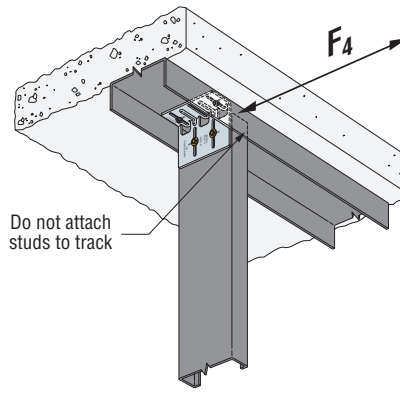


HWDC5.25 Installation with Two Shouldered Screws
(HWDC3.37 similar, only one shoulder screw required)

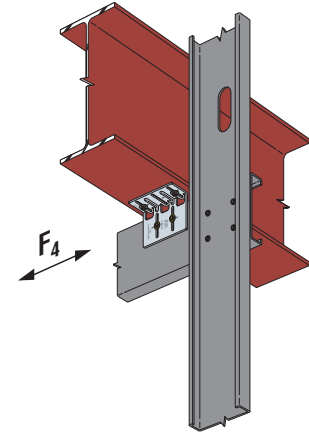
HWDC Head-of-Wall Drift-Clip Connector



Typical HWDC Installation at Stud to Steel Beam



Typical HWDC Installation at Stud to Concrete

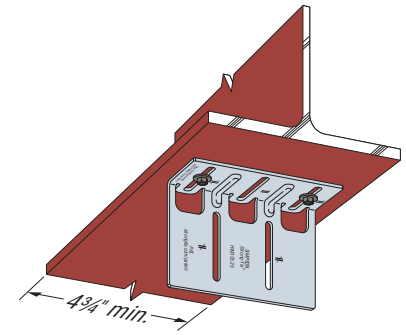


Typical HWDC Installation with Stud Strut

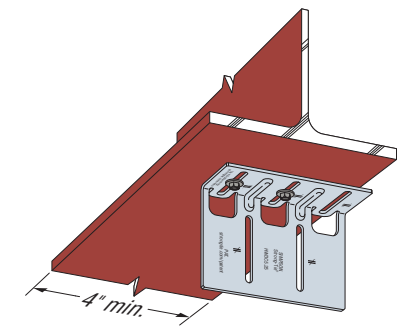
HWDC Allowable Connector Loads (lb.)

| Model No. | No. of #14 Shoulder Screws to Stud | Anchorage Pattern | Allowable Load, F_4 (lb.) | | |
|-----------|------------------------------------|-------------------|-----------------------------|-----------------|-----------------|
| | | | Stud Thickness | | |
| | | | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) |
| HWDC3.37 | 1 | — | 315 | 410 | 580 |
| HWDC5.25 | 2 | Center | 390 | 785 | 1,110 |
| | | Off center | 390 | 590 | 770 |

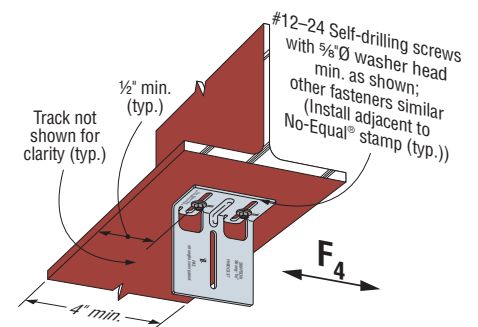
- For additional important information, see General Information and Notes on p. 26.
- HWDC allowable connector loads are also limited by the HWDC allowable anchorage loads below. Use the minimum tabulated values from the connector and anchorage load tables as applicable.
- See the illustration for shouldered screw fastener placement to stud framing.
- The published allowable load is the lower of the tested ultimate with a safety factor, load at $\frac{1}{8}$ " deflection or the fastener calculation limits.
- "Center" Anchorage Pattern refers to clip attached to structure at outer slots.
"Off center" Anchorage Pattern refers to clip attached to structure at end and center slots.



HWDC5.25 Anchor Layout
Two Anchors
(anchorage pattern — center)



HWDC5.25 Anchor Layout
Two Anchors
(anchorage pattern — off center)



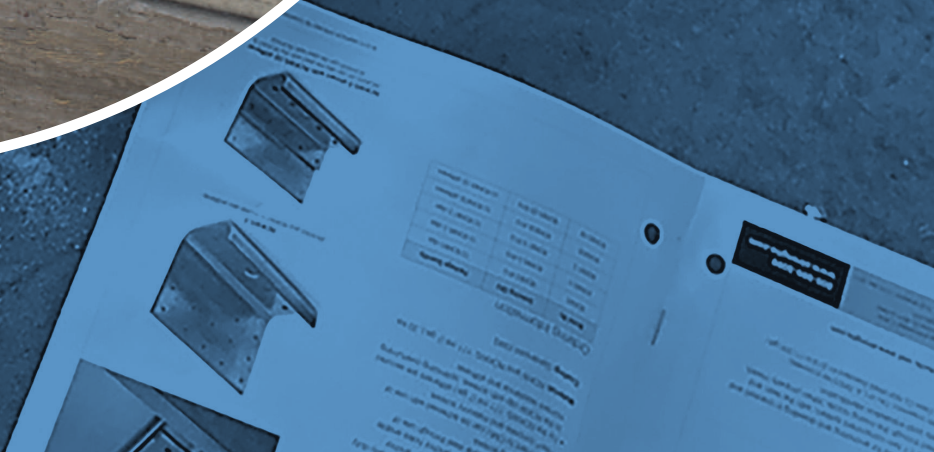
HWDC3.37 Anchor Layout

HWDC Allowable Anchorage Loads (lb.)

| Model No. | Anchorage Type | Minimum Base Material | Number of Anchors (Anchorage Pattern) | Allowable Load F_4 (lb.) |
|-----------|--|----------------------------------|---------------------------------------|----------------------------|
| HWDC3.37 | #12-24 self-drilling screws $\frac{5}{8}$ " washer diameter minimum (XLQ114B1224) | A36 steel $\frac{3}{16}$ " thick | 2 | 610 |
| | Simpson Strong-Tie® $\frac{1}{4}$ " x $1\frac{1}{4}$ " Titen Turbo™ screw anchor (TNT25134H) | Concrete $f'_c = 2,500$ psi | 2 | 320 |
| HWDC5.25 | #12-24 self-drilling screws $\frac{5}{8}$ " washer diameter minimum (XLQ114B1224) | A36 steel $\frac{3}{16}$ " thick | 2 (center) | 1,440 |
| | | | 2 (off center) | 1,150 |
| | Simpson Strong-Tie $\frac{1}{4}$ " x $1\frac{1}{4}$ " Titen Turbo™ screw anchor (TNT25134H) | Concrete $f'_c = 2,500$ psi | 2 (center) | 320 |
| | | | 2 (off center) | 500 |

- For additional important information, see General Information and Notes on p. 26.
- Allowable loads are for clip anchorage only. The capacity of the connection system will be the minimum of the tabulated value and the HWDC allowable connector load table above.
- Tabulated values require a minimum $\frac{1}{4}$ " and $2\frac{5}{8}$ " end distance for center and off-center anchorage pattern, respectively, for masonry screws in concrete.
- See the illustration for anchorage pattern to base material.

Rigid Connectors



FCB/MFCB Bypass Framing Fixed-Clip Connector



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

The FCB/MFCB clip is an economical, high-performance fixed-clip connector that can be used for a variety of framing applications. It is rated for tension, compression, shear and in-plane loads and offers the designer the flexibility of specifying different screw and anchorage patterns that conform to desired load levels.

Features:

- Rated for tension, compression, shear and in-plane loads
- Provides design flexibility with varying screw and anchorage patterns that achieve different load levels
- Strategically placed stiffeners, embossments and anchor holes maximize connector performance

Material: FCB — 54 mil (16 ga.); MFCB — 68 mil (14 ga.)

Finish: Galvanized (G90)

Installation:

- Use the specified type and number of anchors.
- Use the specified number of #12 self-drilling screws to CFS framing. Note that #10 self-drilling screws can be used per the load tables given on strongtie.com.
- For installations to wood framing, see Simpson Strong-Tie® engineering letter L-CF-FIXCLIPW at strongtie.com.

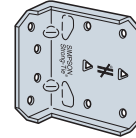
Codes: See p. 13 for Code Reference Key Chart

Ordering Information:

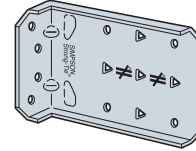
FCB43.5-R25, MFCB43.5-R25, FCB45.5-R25, MFCB45.5-R25, FCB47.5-R25, MFCB47.5-R25, FCB49.5-R25, FCB411.5-R25 contain:

- Box of 25 connectors (screws not included)

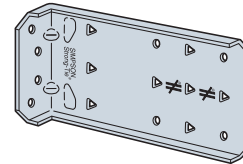
✓ FCB43.5
(MFCB43.5 similar)



✓ FCB45.5
(MFCB45.5 similar)

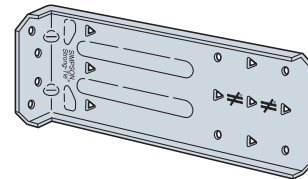


✓ FCB47.5
(MFCB47.5 similar)

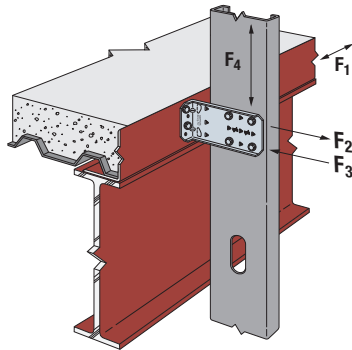
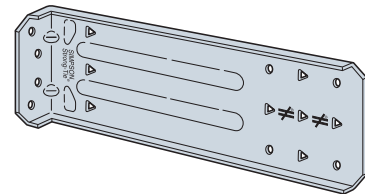


US Patent:
8,555,592

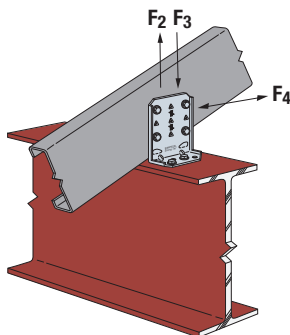
✓ FCB49.5



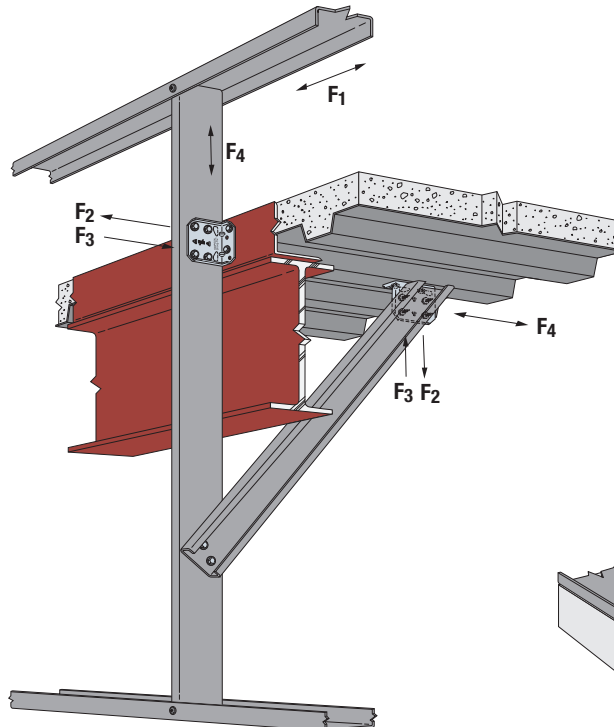
✓ FCB411.5



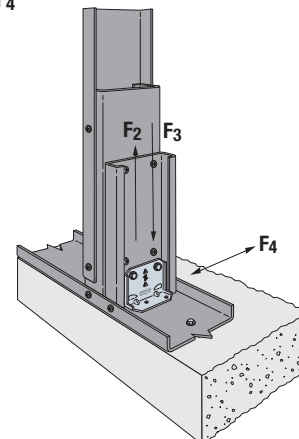
Typical FCB/MFCB Installation at Bypass Framing



Typical FCB/MFCB Installation for Roof Rafters



Typical FCB/MFCB Installation at Spandrel Studs and Kickers



Typical FCB/MFCB Installation at the Base of a 6" Jamb Stud

FCB/MFCB Bypass Framing Fixed-Clip Connector

Rigid Connectors

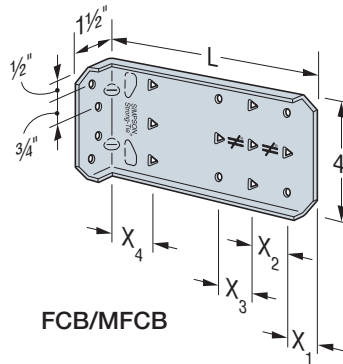
FCB/MFCB Allowable Connector Loads (lb.)

| Model No. | Connector Material Thickness mil (ga.) | L (in.) | Min./Max. | No. of #12-14 Self-Drilling Screws | Stud Thickness | | | | | | | | | | | | Code Ref. |
|-----------|--|---------|-----------|------------------------------------|-------------------------------|----------------|----------------|----------------|-------------------------------|----------------|----------------|----------------|-------------------------------|----------------|----------------|----------------|-------------|
| | | | | | 33 mil (20 ga.) | | | | 43 mil (18 ga.) | | | | 54 mil (16 ga.) | | | | |
| | | | | | F ₁ ^{3,4} | F ₂ | F ₃ | F ₄ | F ₁ ^{3,4} | F ₂ | F ₃ | F ₄ | F ₁ ^{3,4} | F ₂ | F ₃ | F ₄ | |
| FCB43.5 | 54 (16) | 3½ | Min. | 4 | 140 | 755 | 755 | 755 | 175 | 1,105 | 905 | 1,055 | 330 | 1,250 | 905 | 1,235 | IBC, FL, LA |
| | | | Max. | 6 | 205 | 1,100 | 1,130 | 1,075 | 260 | 1,105 | 1,105 | 1,350 | 330 | 1,250 | 2,245 | 1,770 | |
| MFCB43.5 | 68 (14) | 3½ | Min. | 4 | 140 | 755 | 755 | 755 | 220 | 1,105 | 1,105 | 1,055 | 410 | 1,530 | 2,280 | 1,595 | |
| | | | Max. | 6 | 205 | 1,130 | 1,130 | 1,075 | 260 | 1,265 | 1,105 | 1,545 | 410 | 1,530 | 2,630 | 1,770 | |
| FCB45.5 | 54 (16) | 5½ | Min. | 4 | 120 | 755 | 755 | 700 | 150 | 1,105 | 905 | 875 | 285 | 1,105 | 905 | 1,100 | |
| | | | Max. | 9 | 155 | 1,100 | 1,260 | 1,095 | 195 | 1,105 | 1,105 | 1,380 | 330 | 1,105 | 2,245 | 1,785 | |
| MFCB45.5 | 68 (14) | 5½ | Min. | 4 | 170 | 755 | 755 | 700 | 220 | 1,105 | 1,105 | 1,030 | 410 | 1,530 | 2,280 | 1,595 | |
| | | | Max. | 9 | 170 | 1,265 | 1,260 | 1,695 | 220 | 1,265 | 1,105 | 2,315 | 410 | 1,605 | 3,205 | 2,315 | |
| FCB47.5 | 54 (16) | 7½ | Min. | 4 | 90 | 755 | 755 | 220 | 110 | 1,105 | 875 | 330 | 215 | 1,105 | 875 | 815 | |
| | | | Max. | 12 | 110 | 1,100 | 1,260 | 705 | 135 | 1,105 | 1,260 | 1,050 | 260 | 1,105 | 2,245 | 1,345 | |
| MFCB47.5 | 68 (14) | 7½ | Min. | 4 | 165 | 755 | 755 | 415 | 215 | 1,105 | 1,105 | 540 | 410 | 1,580 | 2,280 | 1,025 | |
| | | | Max. | 12 | 165 | 1,265 | 1,260 | 1,345 | 215 | 1,265 | 1,405 | 1,530 | 410 | 1,605 | 3,350 | 2,700 | |
| FCB49.5 | 54 (16) | 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 | 54 (16) | 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 | |

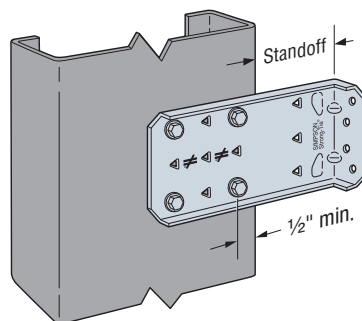
1. Min. fastener quantity and load values — fill all round holes; max. fastener quantity and load values — fill all round and triangular holes.
2. Allowable loads are based on clip capacity only and do not consider anchorage. The capacity of the connection system will be the minimum of the tabulated value and the allowable load from the FCB/MFCB Allowable Anchorage Loads table on p. 75.
3. Anchorage to the supporting structure using welds or a minimum of (2) #12-24 self-drilling screws is required.
4. Tabulated F₁ loads are based on assembly tests with the load through the centerline of stud. Tested failure modes were due to screw pullout; therefore compare F₁ against F_D calculated per ASCE 7-16 Chapter 13 with a_p = 1.25 and R_p = 1.0.
5. Tabulated values for 54 mil (16 ga.) CFS framing may be used for 68 mil (14 ga.) and greater steel thickness.

FCB/MFCB Standoff Distances

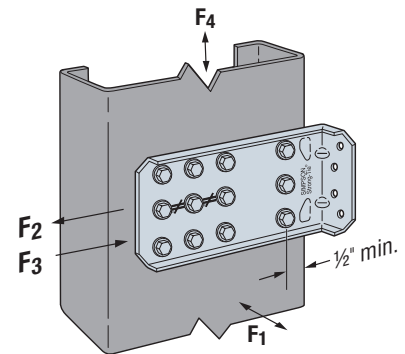
| Model No. | L (in.) | Min./Max. | No. of #12-14 Self-Drilling Screws | Maximum Standoff (in.) |
|-----------|---------|-----------|------------------------------------|------------------------|
| FCB43.5 | 3½ | Min. | 4 | 1 |
| | | Max. | 6 | 1 |
| MFCB43.5 | 3½ | Min. | 4 | 1 |
| | | Max. | 6 | 1 |
| FCB45.5 | 5½ | Min. | 4 | 1½ |
| | | Max. | 9 | 1 |
| MFCB45.5 | 5½ | Min. | 4 | 1½ |
| | | Max. | 9 | 1 |
| FCB47.5 | 7½ | Min. | 4 | 3½ |
| | | Max. | 12 | 1 |
| MFCB47.5 | 7½ | Min. | 4 | 3½ |
| | | Max. | 12 | 1 |
| FCB49.5 | 9½ | Min. | 4 | 5½ |
| | | Max. | 12 | 1 |
| FCB411.5 | 11½ | Min. | 4 | 7½ |
| | | Max. | 12 | 1 |



| Variable | Dimensions (in.) | | | | |
|----------------|------------------|------|------|------|-------|
| | FCB/MFCB | | | | |
| | 43.5 | 45.5 | 47.5 | 49.5 | 411.5 |
| X ₁ | ¾ | 1 | 1 | 1 | 1 |
| X ₂ | 1¼ | 1¼ | 1¼ | 1¼ | 1¼ |
| X ₃ | — | 1¼ | 1¼ | 1¼ | 1¼ |
| X ₄ | — | — | 1½ | 1½ | 1½ |
| L | 3½ | 5½ | 7½ | 9½ | 11½ |



FCB/MFCB Installation with Min. Fasteners



FCB/MFCB Installation with Max. Fasteners

FCB/MFCB Bypass Framing Fixed-Clip Connector

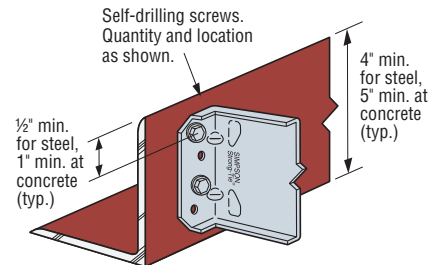
FCB Allowable Anchorage Loads (lb.)

| Anchorage Type | Minimum Base Material | No. of Anchors | Allowable Load (lb.) | | | | | | | | | |
|---|---|----------------|----------------------|-----------------------------------|-------------------|-------------------|-------------------|-------|-------------------|-------|--------------------|-----|
| | | | F ₁ | F ₂ and F ₃ | F ₄ | | | | | | | |
| | | | | | FCB43.5 Min./Max. | FCB45.5 Min./Max. | FCB47.5 Min. Max. | | FCB49.5 Min. Max. | | FCB411.5 Min. Max. | |
| #12-24 self-drilling screws Simpson Strong-Tie® X and XL Metal screws | A36 steel 3/16" thick | 2 | 165 | 795 | 645 | 895 | 555 | 1,075 | 535 | 535 | 370 | 535 |
| | | 3 | 250 | 1,120 | 970 | 1,340 | 830 | 1,610 | 545 | 560 | 370 | 560 |
| | | 4 | 330 | 1,590 | 1,290 | 1,785 | 1,105 | 2,145 | 545 | 560 | 370 | 560 |
| Simpson Strong-Tie 0.157" x 5/8" power-actuated fasteners PDPAT-62KP | A36, A572 or A992 steel 3/16" thick | 2 | — | 390 | 535 | | | | 535 | 535 | 370 | 535 |
| | | 3 | — | 715 | 560 | | | | 545 | 560 | 370 | 560 |
| | | 4 | — | 970 | 560 | | | | 545 | 560 | 370 | 560 |
| Simpson Strong-Tie 1/4" x 1 3/4" Titen Turbo™ TNT25134H | Concrete f' _c = 2,500 psi | 2 | — | 380 | 415 | 315 | 195 | 315 | 140 | 205 | 140 | 150 |
| | | 3 | — | 525 | 470 | 470 | 290 | 470 | 210 | 305 | 210 | 225 |
| | | 4 | — | 675 | 645 | 630 | 390 | 630 | 280 | 410 | 280 | 300 |
| Weld E70XX electrodes | A36 steel 3/16" thick | Hard side: 2" | 1,205 | 1,740 | 1,770 | 1,840 | 1,105 | 2,650 | 450 | 1,200 | 450 | 860 |
| | | Free side: 1" | | | | | | | | | | |

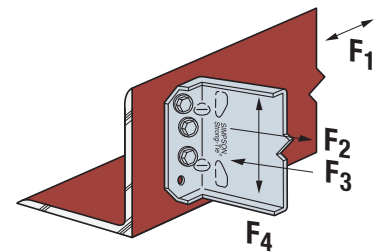
See footnotes below.

MFCB Allowable Anchorage Loads (lb.)

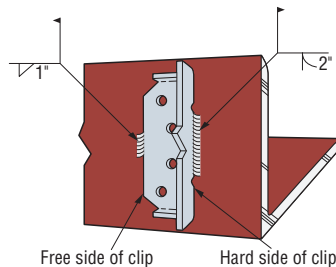
| Anchorage Type | Minimum Base Material | No. of Anchors | Allowable Load (lb.) | | | | | |
|---|---|----------------|----------------------|-----------------------------------|--------------------|--------------------|--------------------|-------|
| | | | F ₁ | F ₂ and F ₃ | F ₄ | | | |
| | | | | | MFCB43.5 Min./Max. | MFCB45.5 Min./Max. | MFCB47.5 Min. Max. | |
| #12-24 self-drilling screws Simpson Strong-Tie X and XL Metal screws | A36 steel 3/16" thick | 2 | 205 | 1,045 | 800 | 1,160 | 695 | 1,350 |
| | | 3 | 310 | 1,725 | 1,195 | 1,735 | 1,045 | 2,025 |
| | | 4 | 410 | 2,090 | 1,595 | 2,315 | 1,390 | 2,700 |
| Simpson Strong-Tie 0.157" x 5/8" power-actuated fasteners PDPAT-62KP | A36, A572 or A992 steel 3/16" thick | 2 | — | 390 | 535 | | | |
| | | 3 | — | 715 | 560 | | | |
| | | 4 | — | 970 | 560 | | | |
| Simpson Strong-Tie 1/4" x 1 3/4" Titen Turbo TNT25134H | Concrete f' _c = 2,500 psi | 2 | — | 380 | 415 | 315 | 195 | 315 |
| | | 3 | — | 525 | 470 | 470 | 290 | 470 |
| | | 4 | — | 675 | 645 | 630 | 390 | 630 |
| Weld E70XX electrodes | A36 steel 3/16" thick | Hard side: 2" | 1,485 | 4,570 | 1,770 | 2,315 | 1,390 | 3,335 |
| | | Free side: 1" | | | | | | |



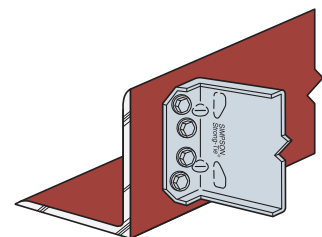
Two Anchors



Three Anchors



Weld



Four Anchors

FCB/MFCB Anchor Layout

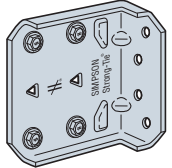
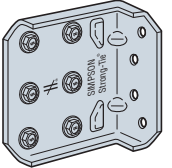
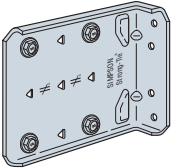
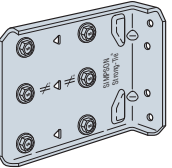
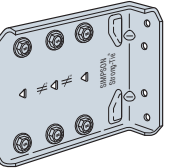
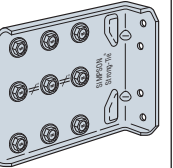
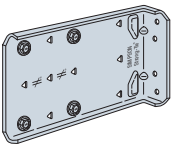
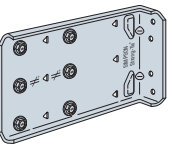
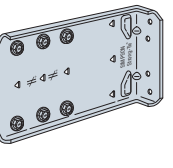
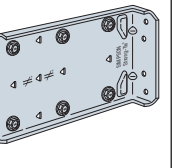
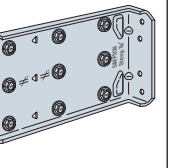
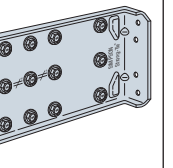
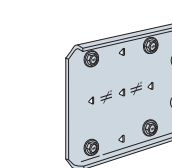
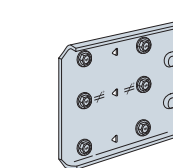
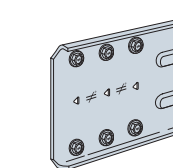
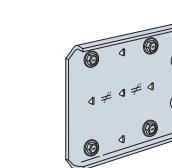
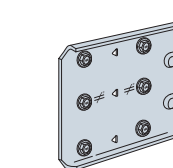
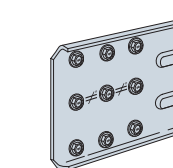
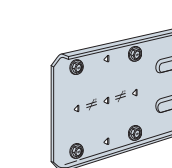
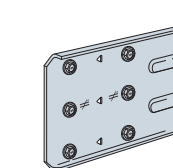
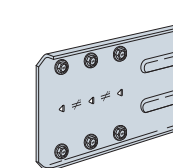
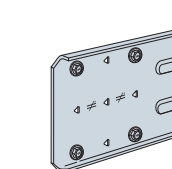
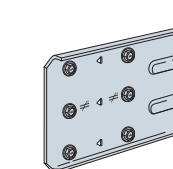
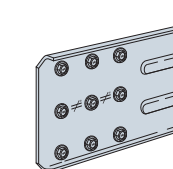
- For additional important information, see General Information and Notes on p. 26.
- Min. fastener quantity and load values — fill all round holes;
max. fastener quantity and load values — fill all round and triangular holes.
- Allowable loads are for clip anchorage only. The capacity of the connection system will be the minimum of the tabulated allowable anchorage loads the allowable load from the FCB/MFCB Allowable Connector Load table on p. 74.
- Allowable loads for #12-24 self-drilling screws and PDPAT powder-actuated fasteners are based on installation in minimum 3/16"-thick structural steel with F_y = 36 ksi. PDPAT values are also provided for A572 steel. Values listed above maybe used where other thicknesses of steel are encountered or other manufacturers are used, provided that the fastener has equal or better tested values (see p. 26). It is the responsibility of the designer to select the proper length fasteners based on the steel thickness installation.
- For attachment with 0.157" x 5/8" PDPAT-62KP to 3/16" thick, A572 or A992 steel, F₂ and F₃ allowable loads can increase to 585 lb., 800 lb. and 1,170 lb. for two, three and four fasteners, respectively.
- For screw fastener installation into steel backed by concrete, predrilling of both the steel and the concrete is suggested. For predrilling use a maximum 3/16"-diameter drill bit.

FCB/MFCB Bypass Framing Fixed-Clip Connector

The following FCB/MFCB supplemental information is given to help designers with value-engineered solutions for our FCB/MFCB connectors. Loads are given on our website for fastener patterns other than our standard “min.” (fill all round holes) and “max.” (fill all round and triangle holes). In addition, the tables on the website give LRFD loads and loads for #10 screws as well as #12 screws. Please visit strongtie.com/cfs and reference FCB/MFCB clip.

Rigid Connectors

Table 1: FCB/MFCB Screw Patterns

| | | | | | | |
|---|---|---|---|---|---|--|
| FCB43.5 MFCB43.5 | Pattern “Min.” | Pattern “Max.” | For load capacities for patterns 1 through 10, refer to FCB/MFCB clip on strongtie.com . | | | |
| |  |  | | | | |
| FCB45.5 MFCB45.5 | Pattern “Min.” | Pattern 1 | Pattern 2 | Pattern “Max.” | | |
| |  |  |  |  | | |
| | | | | | | |
| | | | | | | |
| FCB47.5 MFCB47.5 | Pattern “Min.” | Pattern 3 | Pattern 4 | Pattern 5 | Pattern 6 | Pattern “Max.” |
| |  |  |  |  |  |  |
| | | | | | | |
| | Pattern “Min.” | | Pattern 7 | | Pattern 8 | |
| |  | |  | |  | |
| | Pattern 9 | | Pattern 10 | | Pattern “Max.” | |
|  | |  | |  | | |
| FCB411.5 | Pattern “Min.” | | Pattern 11 | | Pattern 12 | |
| |  | |  | |  | |
| | Pattern 13 | | Pattern 14 | | Pattern “Max.” | |
| |  | |  | |  | |

FC Bypass Framing Fixed-Clip Connector

Ideal for high-seismic areas, Simpson Strong-Tie® FC connectors are the optimal solution for fixed-clip bypass framing. FC clips are often welded to the structure in high-seismic zones, but they also feature anchorage holes so that concrete screws or powder-actuated fasteners can be used to attach the clip to the structure. In addition to its anchorage versatility, the FC clip features prepunched screw holes for the framing attachment, eliminating the need for predrilling holes or worrying that fastener placement doesn't match the designer specifications. FC connectors are manufactured using heavy-duty 10- and 12-gauge steel to provide exceptional resistance to in-plane seismic load.

Features:

- The clips come in lengths of 3½", 6" and 8" and are intended to be used with 3½", 6" and 8" studs, respectively
- The maximum standoff distance is 1" for 3½" studs and 1½" for 6" and 8" studs
- Embossments in the bend line provide increased strength and stiffness in the F₁ and F₂ load directions, but are positioned towards the center of the clip so that 1½"-long welds can be applied at the top and bottom of the clip
- Prepunched large-diameter anchor holes accommodate ¼"-diameter concrete screws like the Simpson Strong-Tie Titen HD® screw anchor
- Prepunched small-diameter anchor holes accommodate powder-actuated fasteners like the 0.157"-diameter Simpson Strong-Tie PDPAT or #12 self-drilling Simpson Strong-Tie Strong-Drive® XL Large-Head Metal screw

Material: 50 ksi

Finish: Galvanized (G90)

Installation:

- Use the specified type and number of fasteners and anchors

Codes: See p. 13 for Code Reference Key Chart

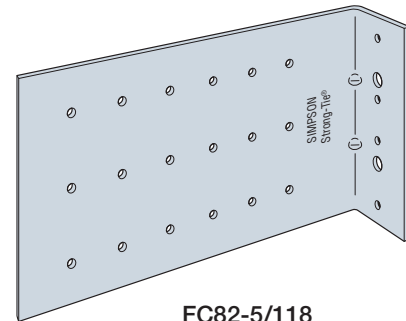
Ordering Information and Dimensions

| Model No. | Ordering SKU | Thickness mil (ga.) | L (in.) | A (in.) | B (in.) |
|------------|----------------|---------------------|---------|---------|---------|
| FC32-5/97 | FC32-5/97-R25 | 97 (12) | 3½ | ½ | ½ |
| FC62-5/97 | FC62-5/97-R25 | 97 (12) | 6 | 1 | 1 |
| FC62-5/118 | FC62-5/118-R25 | 118 (10) | 6 | 1 | 1 |
| FC82-5/118 | FC82-5/118-R25 | 118 (10) | 8 | 1 | 1 |

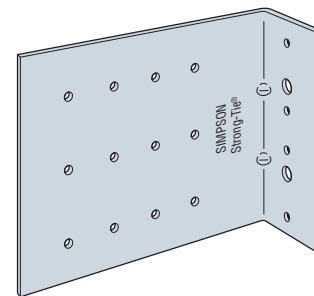
Note: Each box contains (25) connectors.

WANT MORE OPTIONS IN YOUR CLIP?

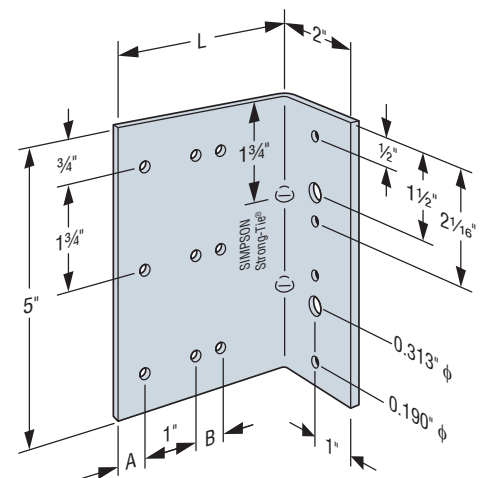
Try our SCS hybrid clip. Supports slip and fixed conditions in one clip. Also has the most versatile options in the industry for attaching to structure. Attach with weld, screws, powder-actuated fasteners to steel or attach to concrete with single ½"-diameter or (2) ¼"-diameter anchors. Reference p. 34 for SCS fixed-clip load chart.



FC82-5/118



FC62-5/97
(FC62-5/118 similar)



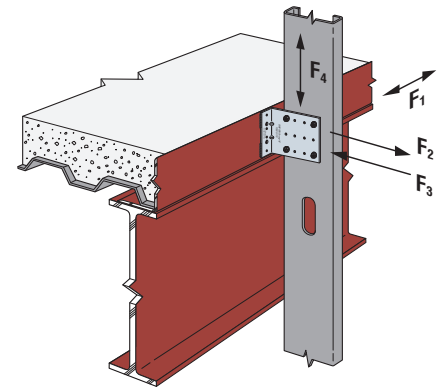
FC32-5/97

FC Bypass Framing Fixed-Clip Connector

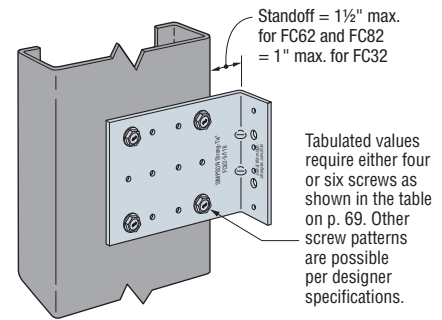
Rigid Connectors

FC Allowable Connector Loads (lb.)

| Model No. | Stud Thickness mil (ga.) | Fasteners to Stud | | Allowable Load (lb.) | | | | | Code Ref. | | |
|------------|--------------------------|--|---------------------------------|----------------------|--------------|----------------|----------------|----------------|-----------|-------|--|
| | | Allowable Pullout per Single #10 Screw | No. of #10 Self-Drilling Screws | F ₁ | | F ₂ | F ₃ | F ₄ | | | |
| | | | | 1" Standoff | 1½" Standoff | | | | | | |
| FC32-5/97 | 33 (20) | 85 | 4 | 165 | — | 705 | 1,130 | 705 | | | |
| | | | 6 | 225 | — | 1,060 | 1,355 | 1,060 | | | |
| FC62-5/97 | | | 4 | 115 | 130 | 705 | 1,130 | 705 | | | |
| | | | 6 | 140 | 160 | 1,060 | 1,355 | 1,060 | | | |
| FC62-5/118 | | | 4 | 115 | 130 | 705 | 1,130 | 705 | | | |
| | | | 6 | 140 | 160 | 1,060 | 1,355 | 1,060 | | | |
| FC82-5/118 | | 4 | 105 | 120 | 705 | 1,130 | 705 | | | | |
| | | 6 | 135 | 155 | 1,060 | 1,355 | 1,060 | | | | |
| FC32-5/97 | | 43 (18) | 110 | 4 | 215 | — | 1,050 | 1,470 | | 1,050 | |
| | | | | 6 | 290 | — | 1,580 | 1,765 | | 1,580 | |
| FC62-5/97 | | | | 4 | 150 | 175 | 1,050 | 1,470 | | 1,050 | |
| | | | | 6 | 185 | 215 | 1,580 | 1,765 | | 1,580 | |
| FC62-5/118 | 4 | | | 150 | 175 | 1,050 | 1,470 | 1,050 | | | |
| | 6 | | | 185 | 215 | 1,580 | 1,765 | 1,580 | | | |
| FC82-5/118 | 4 | | 140 | 160 | 1,050 | 1,470 | 1,050 | | | | |
| | 6 | | 175 | 200 | 1,580 | 1,765 | 1,580 | | | | |
| FC32-5/97 | 54 (16) | | 200 | 4 | 395 | — | 2,135 | 2,885 | 2,045 | | |
| | | | | 6 | 530 | — | 2,690 | 2,885 | 2,195 | | |
| FC62-5/97 | | | | 4 | 325 | 375 | 2,135 | 2,885 | 2,045 | | |
| | | | | 6 | 405 | 465 | 2,690 | 2,885 | 2,195 | | |
| FC62-5/118 | | 4 | | 345 | 395 | 2,135 | 2,885 | 2,045 | | | |
| | | 6 | | 370 | 425 | 3,205 | 2,885 | 2,195 | | | |
| FC82-5/118 | | 4 | 325 | 375 | 2,135 | 2,885 | 2,045 | | | | |
| | | 6 | 440 | 505 | 3,205 | 2,885 | 2,195 | | | | |
| FC32-5/97 | | 68 (14) | 250 | 4 | 495 | — | 2,160 | 2,885 | 2,045 | | |
| | | | | 6 | 670 | — | 2,690 | 2,885 | 2,195 | | |
| FC62-5/97 | | | | 4 | 435 | 500 | 2,160 | 2,885 | 2,045 | | |
| | | | | 6 | 465 | 535 | 2,690 | 2,885 | 2,195 | | |
| FC62-5/118 | 4 | | | 435 | 500 | 2,160 | 2,885 | 2,045 | | | |
| | 6 | | | 465 | 535 | 3,240 | 3,780 | 2,195 | | | |
| FC82-5/118 | 4 | | 410 | 470 | 2,160 | 2,885 | 2,045 | | | | |
| | 6 | | 555 | 640 | 3,240 | 3,780 | 2,195 | | | | |
| FC32-5/97 | 97 (12) | | 355 | 4 | 710 | — | 2,160 | 2,885 | 2,045 | | |
| | | | | 6 | 955 | — | 2,690 | 2,885 | 2,195 | | |
| FC62-5/97 | | | | 4 | 775 | 775 | 2,160 | 2,885 | 2,045 | | |
| | | | | 6 | 1,295 | 1,295 | 2,690 | 2,885 | 2,195 | | |
| FC62-5/118 | | 4 | | 775 | 775 | 2,160 | 2,885 | 2,045 | | | |
| | | 6 | | 1,150 | 1,150 | 3,240 | 3,780 | 2,195 | | | |
| FC82-5/118 | | 4 | 585 | 585 | 2,160 | 2,885 | 2,045 | | | | |
| | | 6 | 790 | 790 | 3,240 | 3,780 | 2,195 | | | | |



Typical FC Installation at Bypass Framing



FC62 with Four Screws

- For additional important information, see General Information and Notes on p. 26.
- FC Allowable Connector Loads are also limited by the FC Anchorage Load tables on pp. 79 and 80. Use the minimum tabulated values from the connector and anchorage load tables as applicable.
- See illustrations on p. 79 for screw fastener placement to stud framing.
- Tabulated F₁ loads are based on assembly tests with the load through the centerline of stud. Tested failure modes were due to screw pullout; therefore compare F₁ against F_p calculated per ASCE 7-16 Chapter 13 with a_p = 1.25 and R_p = 1.0.
- F₁ loads are based on maximum standoff distances of 1" or 1½" as shown. Other loads are applicable to a 1" standoff for FC32 and 1" or 1½" standoff for FC62 and FC82.
- The allowable plastic moment at the bend line in the F₁ load direction for 97 mil (12 ga.) and 118 mil (10 ga.) FC connectors are 395 in.-lb. and 675 in.-lb., respectively.

FC Bypass Framing Fixed-Clip Connector

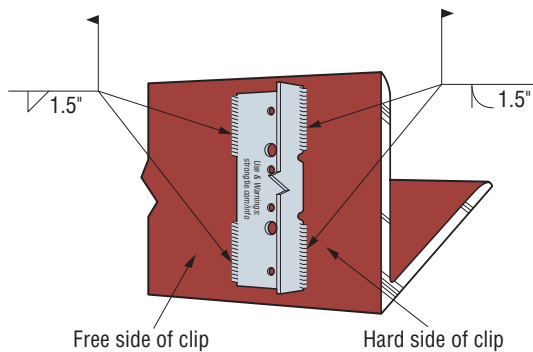
FC Screw Patterns

| Screw Pattern | Models | | |
|---------------|-----------|--------------------------|------------|
| | FC32-5/97 | FC62-5/97 and FC62-5/118 | FC82-5/118 |
| 4 screws | | | |
| 6 screws | | | |

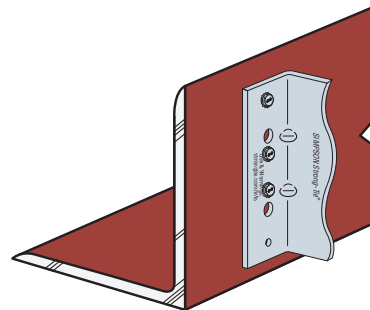
FC Allowable Anchorage Loads to Steel (lb.)

| Anchorage Type | Minimum Base Material | No. of Anchors | Allowable Load (lb.) | | |
|--|-----------------------------------|-----------------------|----------------------|-----------------------------------|----------------|
| | | | F ₁ | F ₂ and F ₃ | F ₄ |
| #12–24 self-drilling screws Simpson Strong-Tie® X and XL Metal screws | A36 steel 3/16" thick | 3 | 730 | 1,910 | 1,590 |
| | | 4 | 975 | 2,545 | 3,180 |
| Simpson Strong-Tie 0.157" x 5/8" powder-actuated fasteners PDPAT-62KP | A36 steel 3/16" thick | 3 | — | 780 | — |
| | | 4 | — | 1,040 | 1,040 |
| Simpson Strong-Tie 0.157" x 5/8" powder-actuated fasteners PDPAT-62KP | A572 or A992 steel 3/16" thick | 3 | — | 1,260 | — |
| | | 4 | — | 1,710 | 1,710 |
| Weld E70XX electrodes | A36 steel 3/16" thick | (2) Hard side: 1 1/2" | 2,040 | 4,720 | 3,865 |
| | | (2) Free side: 1 1/2" | | | |

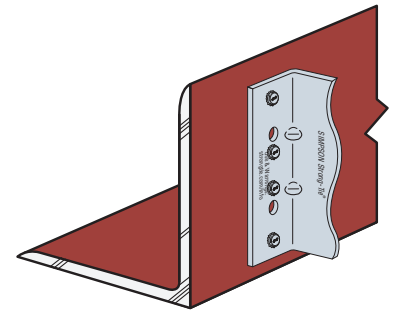
- For additional important information, see General Information and Notes on p. 26.
- Allowable anchorage loads are also limited by the FC Connector Load table on p. 78. Use the minimum tabulated values from the connector and anchorage load tables as applicable.
- Allowable loads for #12–24 self-drilling screws and PDPAT powder-actuated fasteners are based on installation in minimum 3/16" thick structural steel with F_y = 36 ksi. PDPAT values are also provided for A572 steel. Values listed above maybe used where other thicknesses of steel are encountered or other manufacturers are used, provided that the fastener has equal or better tested values (see p. 26). It is the responsibility of the designer to select the proper length fasteners based on the steel thickness installation.
- For screw fastener installation into steel backed by concrete, predrilling of both the steel and the concrete is suggested. For predrilling, use a maximum 3/16"-diameter drill bit.



Weld



3 PAF Anchor Placement
(3 screws similar)



4 PAF Anchor Placement
(4 screws similar)

FC Anchor Layout

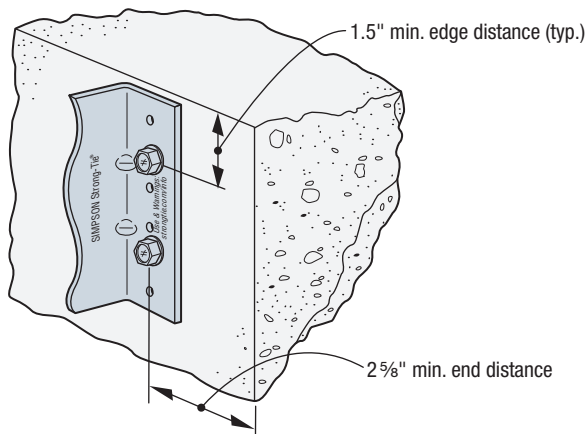
FC Bypass Framing Fixed-Clip Connector

Rigid Connectors

Allowable Titen HD® Anchorage Loads into Concrete with FC Clip (lb.)

| Anchorage Type | Nominal Embedment (in.) | Anchor Quantity and Size | f _c (psi) | Load Direction | Wind and Seismic in SDC A&B | | Seismic in SDC C through F |
|---|-------------------------|--------------------------|----------------------|-----------------------------------|-----------------------------|------------------|-------------------------------|
| | | | | | Uncracked Concrete | Cracked Concrete | Cracked Concrete ⁶ |
| Simpson Strong-Tie® Titen HD screw anchor THDB25178H | 1½" | (2) ¼" x 1 7/8" | 3,000 | F ₁ | 335 | 240 | 280 |
| | | | | F ₂ and F ₃ | 660 | 630 | 550 |
| | | | | F ₄ | 565 | 405 | 470 |
| | | | 4,000 | F ₁ | 390 | 280 | 325 |
| | | | | F ₂ and F ₃ | 760 | 725 | 635 |
| | | | | F ₄ | 655 | 465 | 545 |
| Simpson Strong-Tie Titen HD screw anchor THDB25234H | 2½" | (2) ¼" x 2¾" | 3,000 | F ₁ | 370 | 265 | 310 |
| | | | | F ₂ and F ₃ | 475 | 695 | 610 |
| | | | | F ₄ | 515 | 445 | 520 |
| | | | 4,000 | F ₁ | 430 | 305 | 360 |
| | | | | F ₂ and F ₃ | 550 | 805 | 705 |
| | | | | F ₄ | 590 | 515 | 600 |

- Allowable anchor capacities have been determined using ACI 318-14 Chapter 17 calculations with a minimum concrete compressive strength (f_c) of 3,000 and 4,000 psi in normal-weight concrete. Tabulated values shall be multiplied by a factor (λ_a) of 0.68 for sand light-weight concrete.
- Edge distance is assumed to be 1½", and end distance is 2½".
- Load values are for group anchors based on ACI 318, condition B, load factors from ACI 318-14 Section 5.3, no supplement edge reinforcement, Ψ_{c,v} = 1.0 for cracked concrete and periodic special inspection.
- Allowable Stress Design (ASD) values were determined by multiplying calculated LRFD capacities by a conversion factor, Alpha (α), of 0.70 for seismic load and 0.6 for wind loads. ASD values for other combinations may be determined using alternate conversion factors.
- Tabulated allowable ASD loads for Wind and Seismic in SDC A&B are based on using wind conversion factors and may be increased by 1.17 for SDC A and B only.
- Design loads shall include the over-strength factor per ASCE7 Section 12.4.3. For fasteners in exterior wall connection systems, Ω_o = 1.5 per Table 13.5-1.
- Allowable loads for F₄ are based on the governing loading direction which is toward the edge of slab.
- Allowable loads for F₁ are based on the governing loading direction which is toward the end of slab.
- For anchor subjected to both tension and shear loads, it shall be designed to satisfy the following:
 - For N_a / N_{all} ≤ 0.2, the full allowable load in shear is permitted.
 - For V_a / V_{all} ≤ 0.2, the full allowable load in tension is permitted.
 - For all other cases: N_a / N_{all} + V_a / V_{all} ≤ 1.2 where:
 - N_a = Applied ASD tension load
 - N_{all} = Allowable F₂ or F₃ load from the FC Allowable Anchorage Loads for Concrete table
 - V_a = Applied ASD shear load
 - V_{all} = Allowable F₄ or F₁ load from the FC Allowable Anchorage Loads for Concrete table
- Tabulated allowable loads are based on anchorage only. The capacity of the connection system shall be the minimum of the allowable anchorage load and the FC Allowable Connector Loads.



Titen HD Anchorage

For single-bolt fixed-clip connection to concrete, try the SCS hybrid clip; see p. 32.

FSB Bypass Framing Fixed-Clip Strut Connector

The FSB connector is the fixed-clip version of our popular SSB slide-clip strut connector. The FSB is commonly used at the bottom flange of a steel beam to accommodate large standoff distances for bypass curtain-wall studs.

Material: 54 mil (16 ga.)

Finish: Galvanized (G90)

Installation:

- Use the specified type and number of anchors.
- Use the specified type and number of screw fasteners to the stud.
- If the FSB intrudes on interior space, it can be trimmed. The trimmed part shall allow an edge distance of 1/2" or greater from the center of the nearest anchor to the end of the trimmed part.

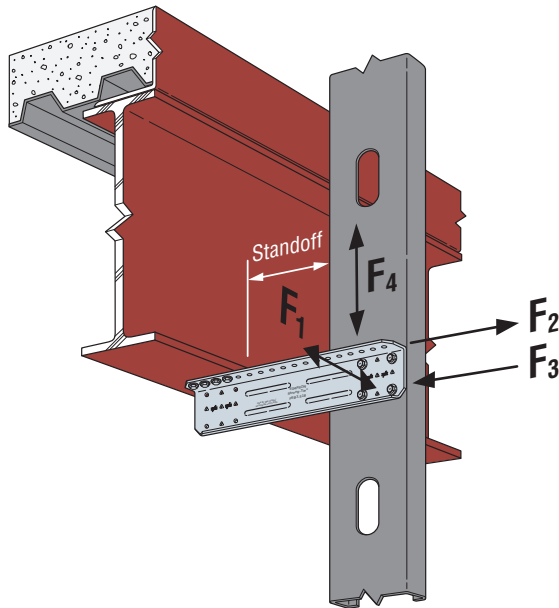
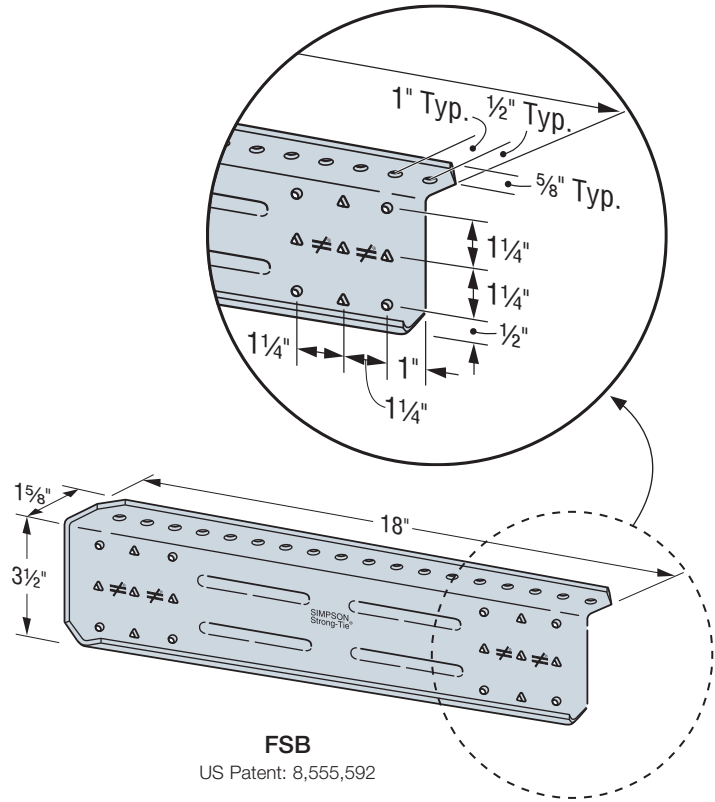
Codes: See p. 13 for Code Reference Key Chart

Ordering Information:

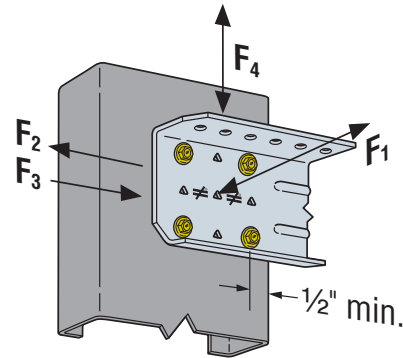
FSB3.518-R25 is a box of 25 connectors.

NEED SHORTER OR LONGER STRUT LENGTHS?

Try the HYS hybrid strut. HYS strut comes in 12", 15", 24" and 30" lengths. Reference p. 46 for HYS fixed-clip load chart.



Typical FSB3.518 Installation



FSB Installation with the Min. Number of Fasteners

FSB Bypass Framing Fixed-Clip Strut Connector

Rigid Connectors

FSB Allowable Connector Loads (lb.)

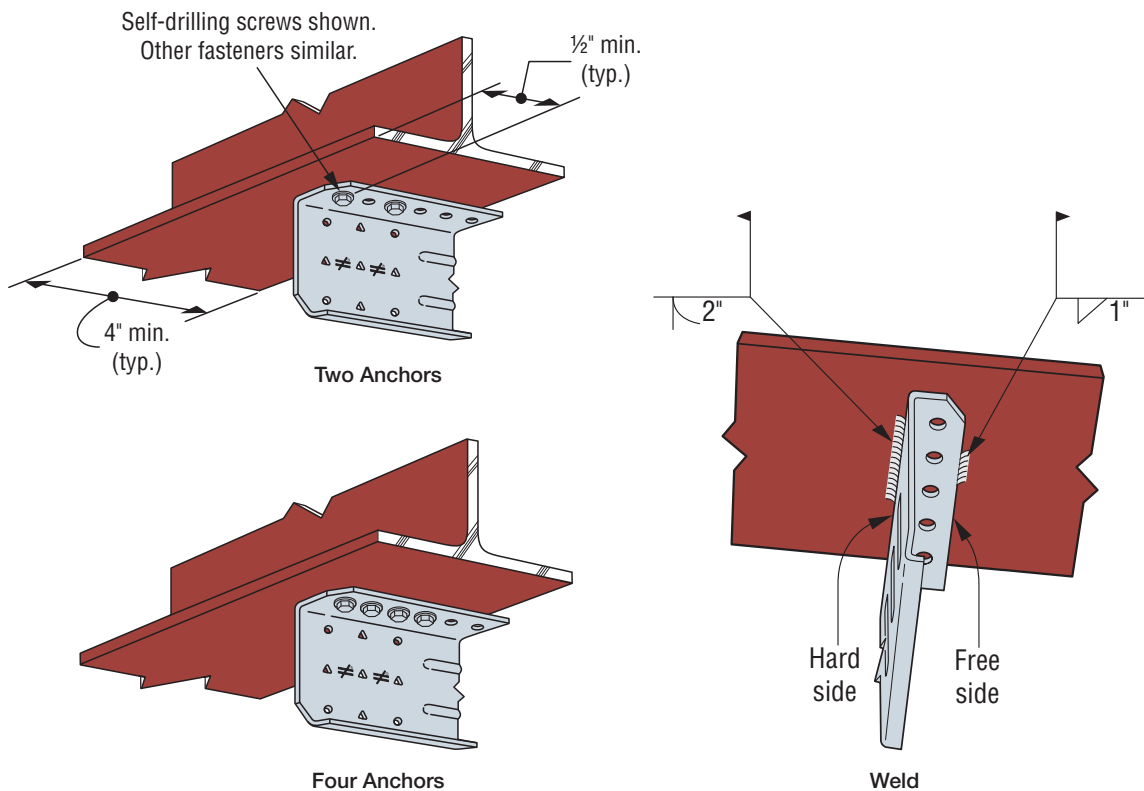
| Model No. | Connector Material Thickness mil (ga.) | Min./Max. | No. of #10–16 Screws | Stud Thickness | | | | | | | | | | | Code Ref. | |
|-----------|--|-----------|----------------------|-----------------------------|----------------|----------------|-----------------------------|-----------------------------|----------------|----------------|-----------------------------|-----------------------------|----------------|----------------|-----------|-----------------------------|
| | | | | 33 mil (20 ga.) | | | | 43 mil (18 ga.) | | | | 54 mil (16 ga.) | | | | |
| | | | | F ₁ ⁴ | F ₂ | F ₃ | F ₄ ⁵ | F ₁ ⁴ | F ₂ | F ₃ | F ₄ ⁵ | F ₁ ⁴ | F ₂ | F ₃ | | F ₄ ⁵ |
| FSB3.518 | 54 (16) | Min. | 4 | 120 | 705 | 705 | 160 | 150 | 1,050 | 1,050 | 210 | 145 | 1,670 | 1,615 | 210 | — |
| | | Max. | 9 | 155 | 1,590 | 1,340 | 160 | 200 | 2,365 | 2,180 | 210 | 215 | 2,670 | 2,180 | 260 | |

- For additional important information, see General Information and Notes on p. 26.
- FSB Allowable Connector Loads are also limited by the FSB Allowable Anchorage Loads table. Use the minimum value from the connector and anchorage load tables as applicable.
- Min. fasteners quantity and tabulated values — fill round holes; max. fasteners quantity and tabulated values — fill round and triangle holes.
- Tabulated F₁ loads are based on assembly tests with the load through the centerline of stud. Tested failure modes were due to screw pullout; therefore compare F₁ against F_p calculated per ASCE 7-16 Chapter 13 with a_p = 1.25 and R_p = 1.0.
- Tabulated F₄ values are controlled by 1/8" deformation limit. The connector strength load in the F₄ direction is 550 lb.
- Maximum standoff for FSB is 11" with two anchors to primary structure and 10" with four anchors to primary structure.

FSB Allowable Anchorage Loads (lb.)

| Anchorage Type | No. of Anchors | F ₁ | F ₂ and F ₃ | F ₄ |
|--|----------------|----------------|-----------------------------------|----------------|
| #12–24 self-drilling screws | 2 | 270 | 1,250 | 550 |
| | 4 | 270 | 2,500 | 550 |
| Simpson Strong-Tie® 0.157" x 5/8" powder-actuated fasteners PDPAT-62KP | 2 | — | 820 | — |
| | 4 | 270 | 1,640 | 550 |
| Weld | Hard side: 2" | 270 | 2,455 | 550 |
| | Free side: 1" | | | |

- Allowable loads for #12–24 self-drilling screws and PDPAT powder-actuated fasteners are based on installation in minimum 3/16" thick structural steel with F_y = 36 ksi. It is the responsibility of the designer to select the proper length fasteners.
- Allowable loads for welded connections require E70XX electrodes with a minimum throat size equal to the clip thickness. Welding shall comply with AWS D1.3. Welding galvanized steel may produce harmful fumes; follow proper welding procedures and precautions.
- Allowable loads are for anchorage only. It is the responsibility of the designer to verify the strength and stability of the structure for loads imposed by the cold-formed steel framing connections.



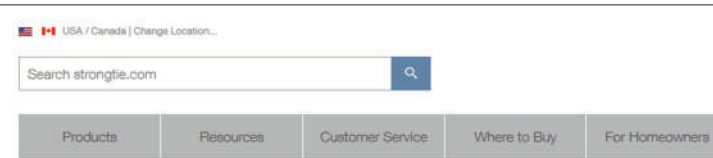
FSB Anchor Layout

DoD-Compliant Blast Design

Does your project require DoD-compliant blast design?

Although Allowable Strength Design (ASD) is widely used by designers of Cold-Formed Steel (CFS) construction, some projects require additional connector limit states beyond the typical ASD values that are normally tabulated in our load tables. For example, many Department of Defense (DoD) projects require blast design of exterior wall framing and connections. Such projects may require the LRFD strength or nominal strength for the blast calculations. **These limit states required for blast design are located on strongtie.com.** Search for the particular product required for blast design on our website to find these capacities.

Not finding what you need? Please contact Simpson Strong-Tie.



SCB/MSCB Bypass Framing Slide-Clip Connector — Service Load Limits, LRFD Design Strengths and Nominal Strengths

| Model No. | Dimensions (in.) | | No. of #14 Shldr. Screws | Load Dir. | Stud Thickness | | | | | | | | | | | |
|-----------|------------------|-------|--------------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------|----------------------------|------------------------|--------------------------|----------------------------|------------------------|-----------------|-------|--|
| | L | S | | | 33 mil (20 ga.) | | | 43 mil (18 ga.) | | | 54 mil (16 ga.) | | | 63 mil (14 ga.) | | |
| | | | | | Service Load Limit (lb.) | LRFD Design Strength (lb.) | Nominal Strength (lb.) | Service Load Limit (lb.) | LRFD Design Strength (lb.) | Nominal Strength (lb.) | Service Load Limit (lb.) | LRFD Design Strength (lb.) | Nominal Strength (lb.) | | | |
| SCB43.5 | 3 1/4 | 1 1/4 | 2 | F ₂ | 860 | 830 | 1,180 | 975 | 975 | 1,475 | 990 | 1,215 | 1,795 | 990 | | |
| | | | | | F ₃ | 1,260 | 830 | 1,180 | 1,260 | 1,105 | 1,570 | 1,260 | 1,565 | 2,180 | 1,260 | |
| SCB45.5 | 5 1/4 | 2 | 2 | F ₂ | 860 | 785 | 1,115 | 975 | 975 | 1,475 | 990 | 1,215 | 1,795 | 990 | | |
| | | | | F ₃ | 1,260 | 830 | 1,180 | 1,260 | 1,105 | 1,570 | 2,360 | 1,565 | 2,180 | 2,360 | | |
| | | | | F ₄ | 860 | 1,080 | 1,535 | 975 | 1,605 | 2,280 | 990 | 2,205 | 3,135 | 990 | | |
| MSCB45.5 | 5 1/4 | 2 | 3 | F ₂ | 860 | 785 | 1,115 | 990 | 1,245 | 1,770 | 1,055 | 1,855 | 2,640 | 1,195 | | |
| | | | | F ₃ | 1,260 | 830 | 1,180 | 1,260 | 1,105 | 1,570 | 2,210 | 1,925 | 2,685 | 2,195 | | |
| | | | | F ₄ | 860 | 1,080 | 1,535 | 1,105 | 1,715 | 2,435 | 1,220 | 2,570 | 3,655 | 1,365 | | |
| SCB47.5 | 7 1/4 | 4 | 2 | F ₂ | 860 | 785 | 1,115 | 975 | 975 | 1,475 | 990 | 1,215 | 1,795 | 990 | | |
| | | | | F ₃ | 1,260 | 830 | 1,180 | 1,260 | 1,105 | 1,570 | 2,260 | 1,515 | 2,115 | 2,260 | | |
| | | | | F ₄ | 860 | 1,080 | 1,535 | 975 | 1,605 | 2,280 | 990 | 2,205 | 3,135 | 990 | | |
| MSCB47.5 | 7 1/4 | 4 | 3 | F ₂ | 860 | 1,080 | 1,535 | 1,260 | 1,605 | 2,280 | 2,750 | 2,025 | 2,825 | 2,750 | | |
| | | | | F ₃ | 860 | 785 | 1,115 | 990 | 1,245 | 1,770 | 1,055 | 1,855 | 2,640 | 1,195 | | |
| | | | | F ₄ | 1,260 | 830 | 1,180 | 1,260 | 1,105 | 1,570 | 2,210 | 1,925 | 2,685 | 2,195 | | |
| SCB49.5 | 9 1/4 | 6 | 2 | F ₂ | 860 | 1,080 | 1,535 | 975 | 1,605 | 2,280 | 990 | 2,205 | 3,135 | 990 | | |
| | | | | F ₃ | 860 | 830 | 1,180 | 860 | 1,105 | 1,570 | 2,295 | 1,565 | 2,180 | 2,295 | | |
| | | | | F ₄ | 860 | 1,080 | 1,535 | 975 | 1,605 | 2,280 | 990 | 2,205 | 3,135 | 990 | | |
| SCB411.5 | 11 1/4 | 8 | 2 | F ₂ | 860 | 785 | 1,115 | 860 | 1,105 | 1,570 | 990 | 1,690 | 2,405 | 990 | | |
| | | | | F ₃ | 860 | 830 | 1,180 | 860 | 1,105 | 1,570 | 1,890 | 1,470 | 1,720 | 1,890 | | |
| | | | | F ₄ | 860 | 1,080 | 1,535 | 860 | 1,605 | 2,280 | 990 | 2,205 | 3,135 | 990 | | |
| | | | 3 | F ₂ | 860 | 1,080 | 1,535 | 1,260 | 1,605 | 2,280 | 2,620 | 2,025 | 2,710 | 2,620 | | |
| | | | | F ₃ | 860 | 1,080 | 1,535 | 1,260 | 1,605 | 2,280 | 2,910 | 3,090 | 3,610 | 2,910 | | |
| | | | | F ₄ | 860 | 785 | 1,115 | 975 | 1,105 | 1,570 | 990 | 1,215 | 1,795 | 990 | | |

SCW Head-of-Wall Side-Clip Connector — Service Load Limits, LRFD Design Strengths and Nominal Strengths

| Model No. | W (in.) | No. of #14 Shldr. Screws | Load Direction | Stud Thickness | | | | | | | |
|-----------|---------|--------------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------|----------------------------|------------------------|-----------------|-------|
| | | | | 33 mil (20 ga.) | | | 43 mil (18 ga.) | | | 54 mil (16 ga.) | |
| | | | | Service Load Limit (lb.) | LRFD Design Strength (lb.) | Nominal Strength (lb.) | Service Load Limit (lb.) | LRFD Design Strength (lb.) | Nominal Strength (lb.) | | |
| SCW3.25 | 3 1/4 | 2 | F ₄ | 935 | 730 | 865 | 1,030 | 1,010 | 1,175 | 1,095 | 1,260 |
| SCW5.5 | 5 1/4 | 2 | F ₄ | 1,125 | 730 | 1,020 | 1,655 | 1,010 | 1,580 | 1,950 | 1,105 |
| | | | 3 | F ₄ | 1,125 | 730 | 1,020 | 1,655 | 1,010 | 1,580 | 2,630 |

FCB Bypass Framing Fixed-Clip Connectors (FCB43.5, FCB45.5, FCB47.5 with #12-14 Screws) — Service Load Limits, LRFD Design Strengths and Nominal Strengths

| Model No. | No. of #12 Screws | Screw Pattern | Load Direction | Service Load Limit | Stud Thickness and Yield Strength | | | | | | | | |
|-----------|-------------------|---------------|----------------|--------------------|-----------------------------------|-------|---------|--------------------------|-------|---------|--------------------------|-------|---------|
| | | | | | 33 mil (20 ga.) — 33 ksi | | | 43 mil (18 ga.) — 33 ksi | | | 54 mil (16 ga.) — 33 ksi | | |
| | | | | | ASD | LRFD | Nominal | ASD | LRFD | Nominal | ASD | LRFD | Nominal |
| FCB43.5 | 4 | Min. | F ₂ | 1,100 | 755 | 1,130 | 2,255 | 1,105 | 1,680 | 3,360 | 1,250 | 1,105 | |
| | | | F ₃ | 1,185 | 755 | 1,130 | 2,180 | 975 | 1,565 | 2,180 | 975 | 1,105 | |
| | | | F ₄ | 2,170 | 755 | 1,130 | 1,990 | 1,120 | 1,680 | 2,590 | 1,490 | 1,105 | |
| | 6 | Max. | F ₂ | 1,100 | 1,100 | 1,690 | 3,245 | 1,105 | 2,425 | 3,720 | 1,250 | 1,105 | |
| | | | F ₃ | 1,260 | 1,130 | 1,690 | 3,245 | 1,260 | 2,425 | 3,720 | 1,735 | 1,105 | |
| | | | F ₄ | 2,415 | 1,130 | 1,690 | 2,635 | 1,455 | 2,330 | 3,315 | 1,910 | 1,105 | |
| FCB45.5 | 4 | Min. | F ₂ | 1,100 | 755 | 1,130 | 2,255 | 1,105 | 1,680 | 3,360 | 1,105 | 1,105 | |
| | | | F ₃ | 1,185 | 755 | 1,130 | 2,180 | 975 | 1,565 | 2,180 | 975 | 1,105 | |
| | | | F ₄ | 1,225 | 755 | 1,130 | 1,720 | 945 | 1,515 | 2,150 | 1,325 | 1,105 | |
| | 6 | 1 | F ₂ | 1,100 | 755 | 1,130 | 2,255 | 1,105 | 1,680 | 3,360 | 1,105 | 1,105 | |
| | | | F ₃ | 1,185 | 755 | 1,130 | 2,180 | 975 | 1,565 | 2,180 | 975 | 1,105 | |
| | | | F ₄ | 1,225 | 755 | 1,130 | 1,720 | 945 | 1,515 | 2,150 | 1,325 | 1,105 | |
| | 6 | 2 | F ₂ | 1,100 | 755 | 1,130 | 2,255 | 1,105 | 1,680 | 3,360 | 1,105 | 1,105 | |
| | | | F ₃ | 1,185 | 755 | 1,130 | 2,180 | 975 | 1,565 | 2,180 | 975 | 1,105 | |
| | | | F ₄ | 1,225 | 755 | 1,130 | 1,720 | 945 | 1,515 | 2,150 | 1,325 | 1,105 | |
| | 9 | Max. | F ₂ | 1,100 | 1,100 | 2,025 | 2,880 | 1,105 | 2,425 | 3,720 | 1,105 | 1,105 | |
| | | | F ₃ | 1,260 | 1,260 | 2,285 | 3,245 | 1,260 | 2,425 | 3,720 | 1,735 | 1,105 | |
| | | | F ₄ | 2,570 | 1,180 | 1,690 | 2,685 | 1,485 | 2,375 | 3,380 | 1,925 | 1,105 | |
| FCB47.5 | 4 | Min. | F ₂ | 1,100 | 755 | 1,130 | 2,255 | 1,105 | 1,680 | 3,360 | 1,105 | 1,105 | |
| | | | F ₃ | 1,185 | 755 | 1,130 | 2,115 | 945 | 1,515 | 2,115 | 945 | 1,105 | |
| | | | F ₄ | 380 | 200 | 330 | 660 | 330 | 495 | 830 | 365 | 1,105 | |
| | 6 | 3 | F ₂ | 1,100 | 755 | 1,130 | 2,255 | 1,105 | 1,680 | 3,360 | 1,105 | 1,105 | |
| | | | F ₃ | 1,185 | 755 | 1,130 | 2,115 | 945 | 1,515 | 2,115 | 945 | 1,105 | |
| | | | F ₄ | 380 | 260 | 390 | 775 | 380 | 575 | 1,060 | 380 | 1,105 | |
| | 6 | 4 | F ₂ | 1,100 | 755 | 1,130 | 2,255 | 1,105 | 1,680 | 3,360 | 1,105 | 1,105 | |
| | | | F ₃ | 1,185 | 755 | 1,130 | 2,115 | 945 | 1,515 | 2,115 | 945 | 1,105 | |
| | | | F ₄ | 380 | 275 | 410 | 820 | 380 | 585 | 1,060 | 380 | 1,105 | |
| | | | | | | | | | | | | | |

Raise Your Expectations, Lower Your Installed Costs!

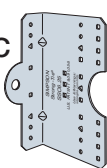


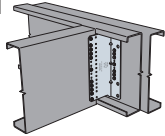
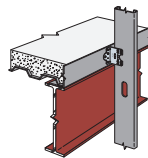
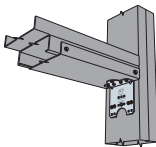
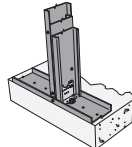
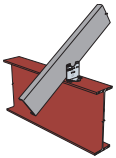
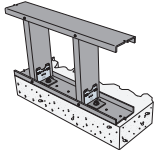
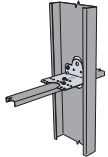
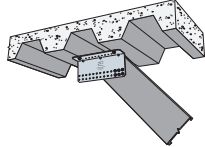
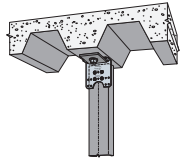
Rigid Connectors

Utility Clip Connectors

The SSC steel stud connector, the SJC steel joist connector and the SFC steel framing connector, are designed so that a minimum number of clips can be stocked to accommodate a wide array of applications. Prepunched holes and intuitive fastener hole patterns ensure that the structural needs of the designer and the efficient installation goals of the contractor are both satisfied.

Testing You Can Trust

Simpson Strong-Tie® utility clip connectors have undergone industry-first testing to provide maximum benefit to both the installer and the designer. By testing these connectors as part of a complete system in the applications for which they are intended, rather than only testing the physical capabilities of the connector, Simpson Strong-Tie is able to provide comprehensive allowable loads for real-world conditions. This system-based approach eliminates the need for designers to manually calculate connector performance and anchorage, and provides confidence that designs based on these values have been thoroughly evaluated by the industry leader in structural connector research and development.

| | | Product Category | | |
|---------------------------|---|--|---|---|
| | | SSC | SJC | SFC |
| Tested Application | |  |  |  |
| Steel-to-Steel |  | ✓ | ✓ | ✓ |
| Bypass Framing |  | ✓ | | |
| Headers |  | ✓ | | ✓ |
| Base of Jamb |  | ✓ | | |
| Rafter |  | ✓ | | |
| Kneewall |  | ✓ | | |
| U-Channel Bridging |  | ✓ | | ✓ |
| Kicker |  | | ✓ | |
| Soffit Hanger |  | ✓ | ✓ | |

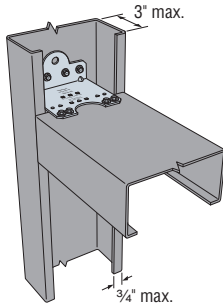
Innovative Design Lets You Work Smarter — Not Harder!

Simpson Strong-Tie® utility clip connectors have been designed with both the contractor and designer in mind. Connector dimensions and fastener/anchor locations have been developed to maximize design flexibility and installation efficiency.

Intelligent Connector Dimensions

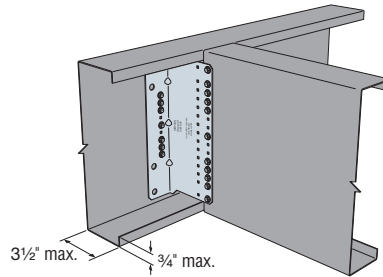
SSC Steel Stud Connectors

Designed to accommodate open-side connections with flanges up to 3" wide and stiffener lips up to 3/4"*



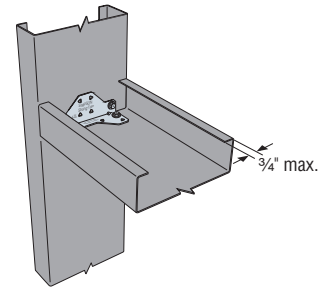
SJC Steel Joist Connectors

Designed to accommodate open-side connections with flanges up to 3 1/2" wide and stiffener lips up to 3/4"



SFC Steel Framing Connectors

Designed to accommodate open-side connections with stiffener lips up to 3/4" long**



*SSC2.25 clips will accommodate 2" wide flange and 5/8" stiffener lips.
**SFC2.25 clips will accommodate 5/8" long stiffener lips.

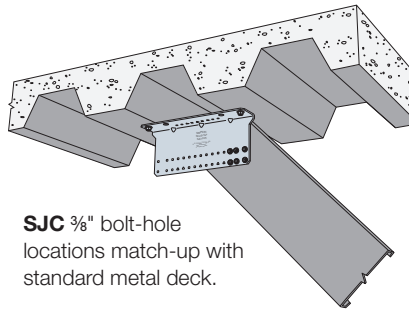
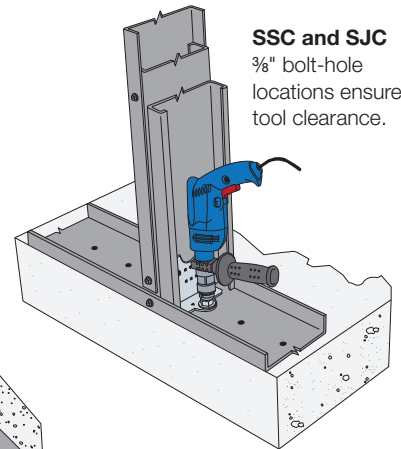
For detailed product dimensions, refer to p. 91 for SSC, p. 99 for SJC and p. 102 for SFC.

Rigid Connectors

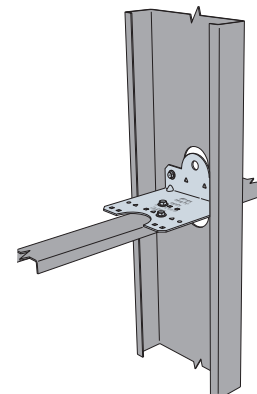
Intuitive Fastener Patterns

SSC and SJC connectors include prepunched holes for 3/8" diameter anchors that enable easy anchorage to concrete.

SSC and SJC anchorage leg also includes prepunched holes for #10 self-drilling screws.



SSC and SJC clips include round and triangle holes for minimum and maximum tabulated load values. Square holes are also provided, and can be combined with round and triangle holes for custom screw patterns per installation needs.



SSC Steel-Stud Connector

Rigid Connectors



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

SSC connectors are versatile utility clips ideal for a variety of stud-to-stud and stud-to-structure applications in cold-formed steel construction. The clips have been designed to enable easy installation on the open side of studs or joists with flanges up to 3" long and return lips up to 3/4". A wide pattern of strategic fastener locations allows the SSC to accommodate a variety of traditional and custom designs.

Features:

- Prepunched holes reduce installation cost by eliminating predrilling
- Intuitive fastener hole positions ensure accurate clip installation in accordance with design, support a wide range of design and application requirements and provide installation flexibility
- Angle lengths accommodate either hard-side or soft-side attachment for studs and joists with return lips up to 3/4"
- 4" leg length enables soft-side connections for studs and joists with flanges up to 3"
- Also suitable for u-channel bridging

Product Information:

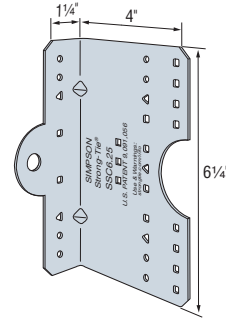
Material: LSSC — 54 mil (50 ksi); SSC — 68 mil (50 ksi); MSSC — 97 mil (50 ksi)

Finish: Galvanized (G90)

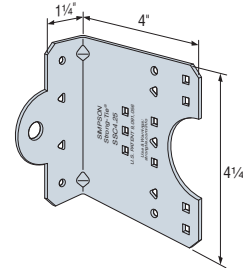
Installation: Use all specified fasteners/anchors

Codes: See p. 13 for Code Reference Key Chart

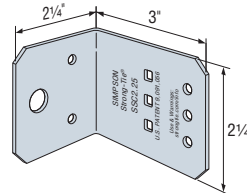
For detailed product dimensions, refer to p. 91.



SSC6.25
(LSSC6.25, MSSC6.25 similar)



SSC4.25
(LSSC4.25, MSSC4.25 similar)

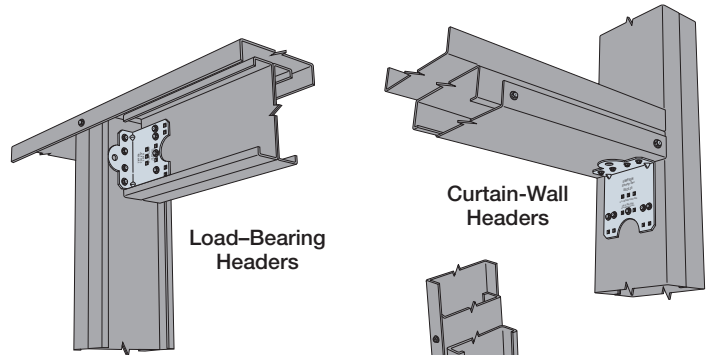


SSC2.25
(MSSC2.25 similar)

US Patent Pending

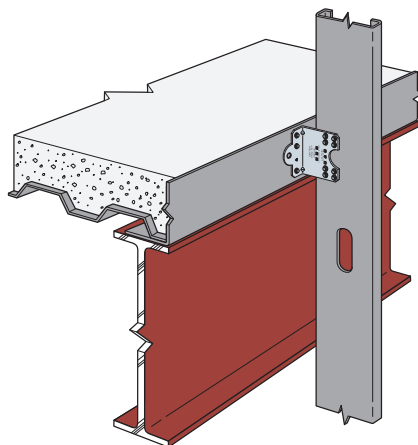
Ordering Information

| Model No. | Ordering SKU | Package Quantity |
|-----------|--------------|------------------|
| SSC2.25 | SSC2.25-R125 | Bucket of 125 |
| MSSC2.25 | MSSC2.25-R90 | Bucket of 90 |
| LSSC4.25 | LSSC4.25-R50 | Bucket of 50 |
| SSC4.25 | SSC4.25-R50 | |
| MSSC4.25 | MSSC4.25-R50 | Bucket of 30 |
| LSSC6.25 | LSSC6.25-R30 | |
| SSC6.25 | SSC6.25-R30 | |
| MSSC6.25 | MSSC6.25-R30 | |

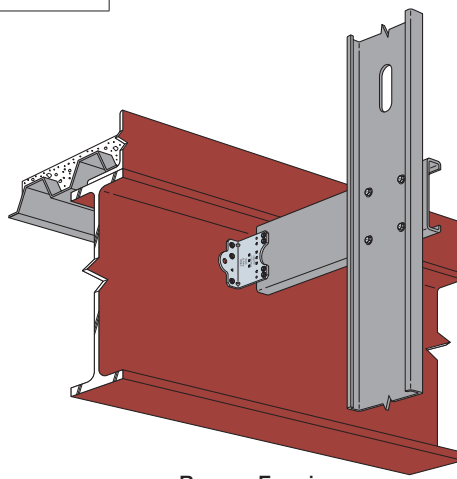


Load-Bearing Headers

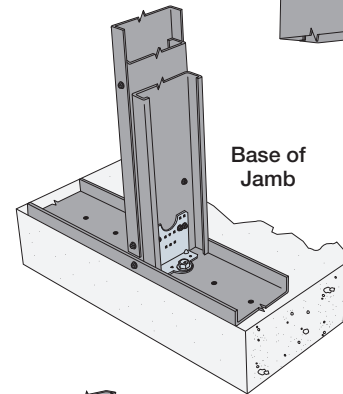
Curtain-Wall Headers



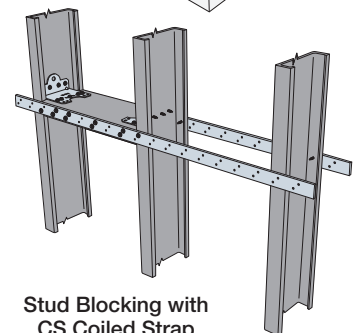
Bypass Framing



Bypass Framing with Stud Strut



Base of Jamb



Stud Blocking with CS Coiled Strap

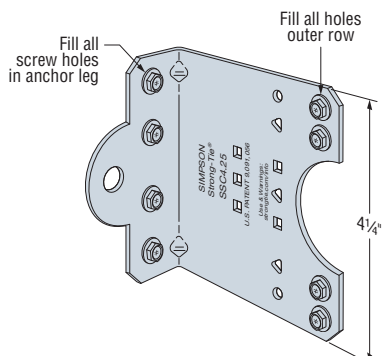
*SSC2.25 clips will accommodate attachment to the inside web of 3 3/8" studs.

SSC Steel-Stud Connector

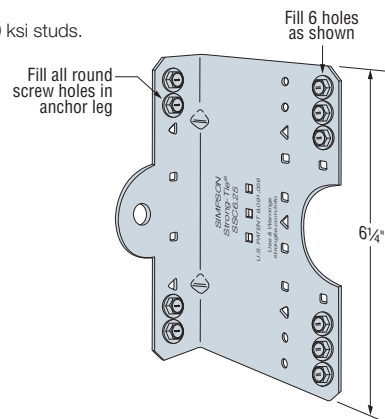
SSC Connectors — CFS to CFS Allowable Loads (lb.)

| Model No. | Connector Material Thickness mil (ga.) | Clip Length (in.) | Framing Member Depth (in.) | Fasteners | | | Allowable F ₄ Load (lb.) | | | | Code Ref. |
|-----------|--|-------------------|----------------------------|----------------------|----------------|-----------------|-------------------------------------|-----------------|-----------------|-------------------------------------|-----------|
| | | | | Pattern ¹ | Carried Member | Carrying Member | Minimum Member Thickness | | | Maximum Connector Load ² | |
| | | | | | | | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | | |
| SSC2.25 | 68 (14) | 2¼ | 3% | Min. | (3) #10 | (2) #10 | 165 | 225 | 345 | 690 | IBC |
| MSSC2.25 | 97 (12) | 2¼ | 3% | Min. | (3) #10 | (2) #10 | 165 | 225 | 345 | 690 | |
| LSSC4.25 | 54 (16) | 4¼ | 6 | Min. | (2) #10 | (2) #10 | 215 | 440 | 675 | 1,615 | |
| | | | | Max. | (5) #10 | (4) #10 | 215 | 440 | 725 | | |
| | | | | Outer | (4) #10 | (4) #10 | 200 | 310 | 520 | | |
| SSC4.25 | 68 (14) | 4¼ | 6 | Min. | (2) #10 | (2) #10 | 355 | 525 | 890 | 1,615 | |
| | | | | Max. | (5) #10 | (4) #10 | 365 | 600 | 1,005 | | |
| | | | | Outer | (4) #10 | (4) #10 | 235 | 330 | 625 | | |
| MSSC4.25 | 97 (12) | 4¼ | 6 | Min. | (2) #10 | (2) #10 | 355 | 525 | 890 | 1,615 | |
| | | | | Max. | (5) #10 | (4) #10 | 365 | 600 | 1,005 | | |
| | | | | Outer | (4) #10 | (4) #10 | 235 | 330 | 625 | | |
| LSSC6.25 | 54 (16) | 6¼ | 8 | Min. | (4) #10 | (4) #10 | 265 | 660 | 1,190 | 2,590 | |
| | | | | Max. | (7) #10 | (6) #10 | 265 | 660 | 1,190 | | |
| | | | | Outer | (6) #10 | (4) #10 | 270 | 375 | 695 | | |
| SSC6.25 | 68 (14) | 6¼ | 8 | Min. | (4) #10 | (4) #10 | 385 | 720 | 1,190 | 2,590 | |
| | | | | Max. | (7) #10 | (6) #10 | 385 | 720 | 1,190 | | |
| | | | | Outer | (6) #10 | (4) #10 | 270 | 460 | 725 | | |
| MSSC6.25 | 97 (12) | 6¼ | 8 | Min. | (4) #10 | (4) #10 | 385 | 720 | 1,190 | 2,590 | |
| | | | | Max. | (7) #10 | (6) #10 | 385 | 720 | 1,365 | | |
| | | | | Outer | (6) #10 | (4) #10 | 270 | 460 | 725 | | |

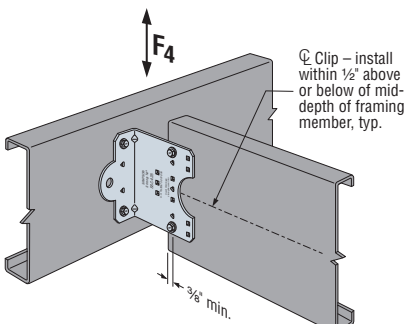
1. Min. fastener quantity and load values — fill all round holes; Max. fastener quantity and load values — fill all round and triangular holes; Outer fastener quantity and load values — see illustrations for fastener placement.
2. Allowable loads are based on bracing of the members located within 12" of the connection.
3. Maximum allowable load for connector that may not be exceeded when designing custom installations. designer is responsible for member and fastener design.
4. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.
5. Reference pp. 92–94 for supplemental information and alternate screw patterns.
6. For 50 ksi studs, 68 mil (14 ga.) and thicker, use tabulated values for 54 mil (16 ga.) — 50 ksi studs.



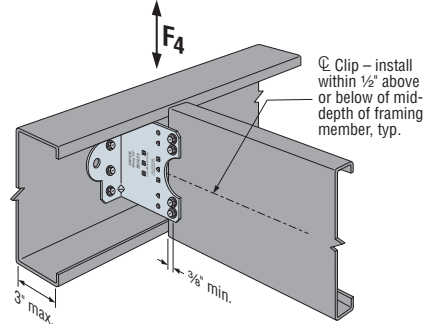
SSC4.25 — Outer Fastener Pattern
(LSSC4.25 and MSSC4.25 similar)



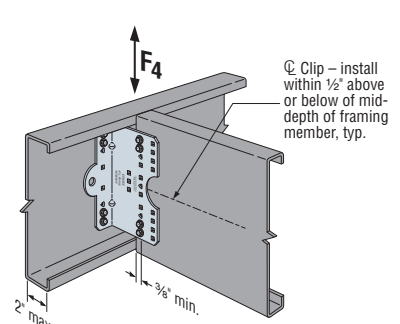
SSC6.25 — Outer Fastener Pattern
(LSSC6.25 and MSSC6.25 similar)



Typical SSC4.25 Installation with Min. Quantity



SSC Installation with Carried Member Fasteners in Outer Row



SSC6.25 Installation with Min. Quantity

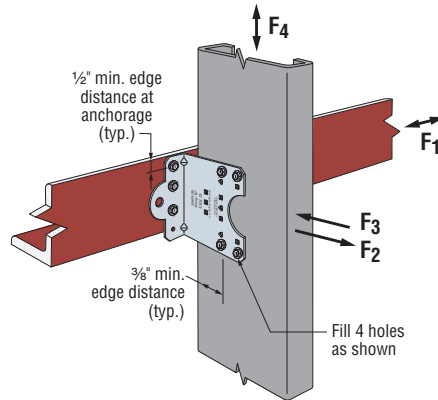
SSC Steel-Stud Connector

Rigid Connectors

SSC Connectors — Bypass Framing Allowable Loads (lb.)

| Model No. | Connector Material Thickness mil (ga.) | Clip Length (in.) | Fasteners ^{1,4} | | Stud Thickness | | | | | | | | | | | | Code Ref. |
|-----------|--|-------------------|--------------------------|---------|-----------------------------|----------------|----------------|----------------|-----------------------------|----------------|----------------|----------------|-----------------------------|----------------|----------------|----------------|-----------|
| | | | | | 33 mil (20 ga.) | | | | 43 mil (18 ga.) | | | | 54 mil (16 ga.) | | | | |
| | | | Anchorage ² | Stud | F ₁ ³ | F ₂ | F ₃ | F ₄ | F ₁ ³ | F ₂ | F ₃ | F ₄ | F ₁ ³ | F ₂ | F ₃ | F ₄ | |
| SSC4.25 | 68 (14) | 4¼ | (3) #10 | (4) #10 | 40 | 705 | 705 | 700 | 40 | 870 | 1,050 | 850 | 40 | 935 | 1,210 | 850 | IBC |
| | | | (3) PDPAT-62K | (4) #10 | 40 | 705 | 705 | 700 | 40 | 780 | 1,050 | 850 | 40 | 780 | 1,210 | 850 | — |
| MSSC4.25 | 97 (12) | 4¼ | (3) #10 | (4) #10 | 105 | 705 | 705 | 705 | 105 | 1,050 | 1,050 | 880 | 105 | 1,385 | 1,210 | 880 | IBC |
| | | | (3) PDPAT-62K | (4) #10 | 105 | 705 | 705 | 705 | 105 | 780 | 1,050 | 880 | 105 | 780 | 1,210 | 880 | — |

- See illustration for fastener placement.
- Allowable loads are based on anchors installed in minimum 3/8" thick structural steel with F_y = 36 ksi.
- Allowable loads based on in-plane loads applied at the centroid of the fasteners to the stud, with no rotational restraint of stud.
- See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

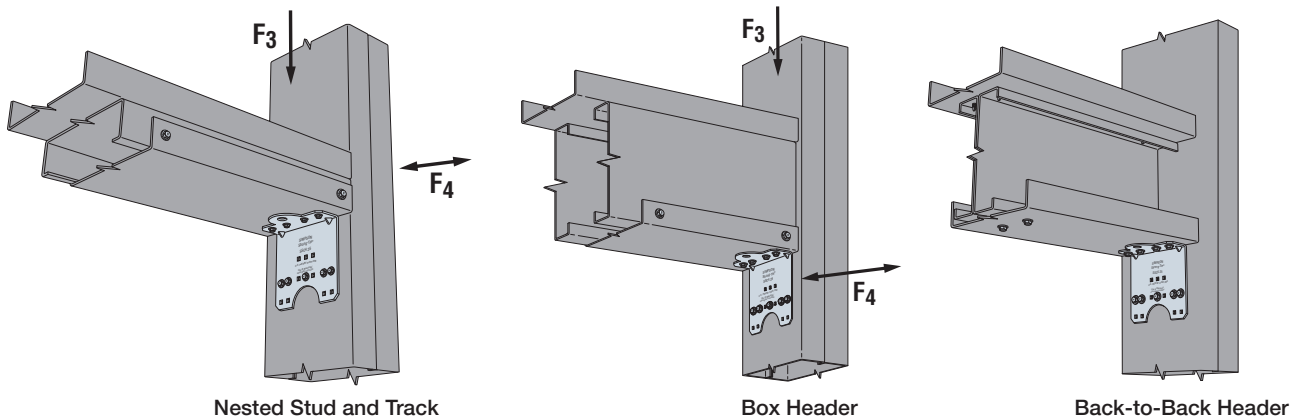


Typical SSC Installation

SSC Connectors — CFS Header to CFS Jamb Allowable Loads (lb.)

| Model No. | Connector Material Thickness mil (ga.) | Clip Length (in.) | Jamb Stud Depth (in.) | Fasteners ⁴ | | | Jamb and Header Thickness mil (ga.) | Allowable F ₃ Load (lb.) | | Allowable F ₄ Load (lb.) | Code Ref. |
|-----------|--|-------------------|-----------------------|------------------------|---------|---------|-------------------------------------|---|----------------------------------|-------------------------------------|-----------|
| | | | | Pattern | Jamb | Header | | Nested Stud and Track Header ³ | Back-to-Back Header ² | | |
| | | | | | | | | | | | |
| LSSC4.25 | 54 (16) | 4¼ | 6 | Max. | (5) #10 | (4) #10 | 33 (20) | 140 | 455 | 215 | IBC |
| | | | | | | | 43 (18) | 220 | 660 | 440 | |
| SSC4.25 | 68 (14) | 4¼ | 6 | Max. | (5) #10 | (4) #10 | 54 (16) | 375 | 1,055 | 1,005 | |
| | | | | | | | 68 (14) | 570 | 1,055 | 1,005 | |
| LSSC6.25 | 54 (16) | 6¼ | 8 | Max. | (7) #10 | (6) #10 | 33 (20) | 160 | 455 | 265 | |
| | | | | | | | 43 (18) | 250 | 730 | 660 | |
| SSC6.25 | 68 (14) | 6¼ | 8 | Max. | (7) #10 | (6) #10 | 54 (16) | 410 | 1,110 | 1,190 | |
| | | | | | | | 68 (14) | 640 | 1,110 | 1,190 | |

- Max. fastener quantity and load values — fill all round and triangular holes.
- Designer is responsible for checking web crippling of the header and reducing allowable loads accordingly.
- Also applies to box header per illustration below.
- See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



Nested Stud and Track

Box Header

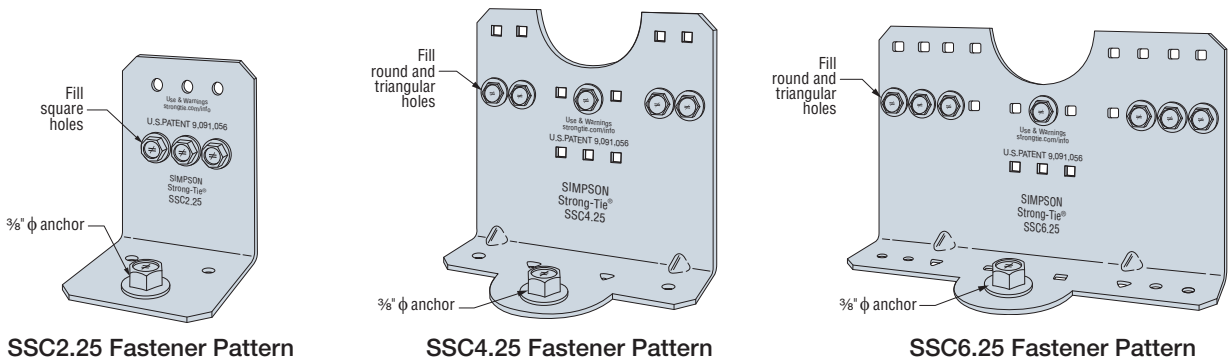
Back-to-Back Header

SSC Steel-Stud Connector

SSC Connectors — Base of CFS Jamb Allowable Loads

| Model No. | Connector Material Thickness mil (ga.) | Clip Length (in.) | Stud Member Depth (in.) | Fasteners | | Stud Thickness mil (ga.) | Allowable Load F ₄ (lb.) | Code Ref. |
|-----------|--|-------------------|-------------------------|-----------------|-----------------------------|--------------------------|-------------------------------------|-----------|
| | | | | Anchor Diameter | Stud Fasteners ³ | | | |
| SSC2.25 | 68 (14) | 2¼ | 3¾ | ¾ | (3) #10 | 33 (20) | 390 | IBC |
| | | | | | | 43 (18) | 605 | |
| | | | | | | 54 (16) | 940 | |
| SSC4.25 | 68 (14) | 4¼ | 6 | ¾ | (5) #10 | 33 (20) | 420 | |
| | | | | | | 43 (18) | 685 | |
| | | | | | | 54 (16) | 975 | |
| SSC6.25 | 68 (14) | 6¼ | 8 | ¾ | (7) #10 | 33 (20) | 470 | |
| | | | | | | 43 (18) | 715 | |
| | | | | | | 54 (16) | 1,020 | |

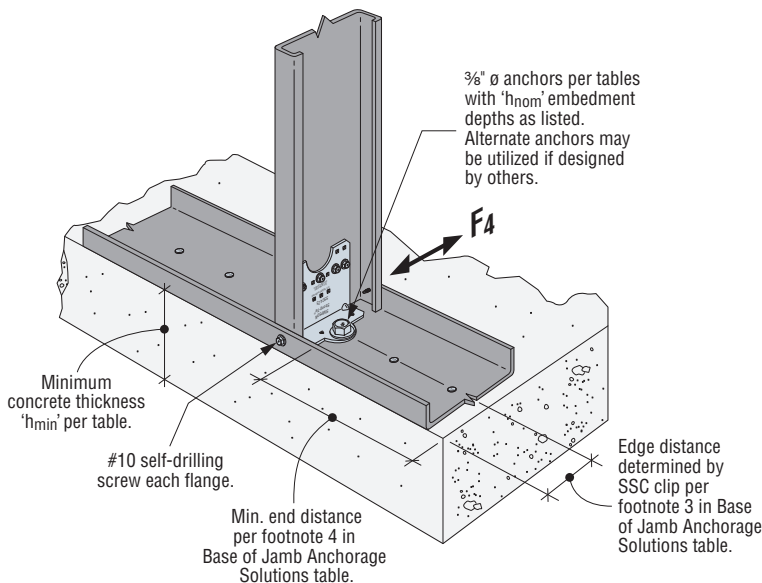
1. Allowable loads are based on minimum 33 mil (20 ga.) track for 33 mil (20 ga.) and 43 mil (18 ga.) studs, and minimum 43 mil (18 ga.) track for 54 mil (16 ga.) studs, with one #10 screw into each stud flange.
2. Allowable loads assume adequate torsional bracing is provided. Bracing design is the responsibility of the designer.
3. See illustrations for fastener placement.
4. Designer is responsible for anchorage design.
5. For anchorage capacity options, see p. 90.
6. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



SSC2.25 Fastener Pattern

SSC4.25 Fastener Pattern

SSC6.25 Fastener Pattern



Typical SSC Installation
(Note: This figure references the table on the following page.)



Titen HD® Screw Anchor Strong-Bolt® 2 Wedge Anchor AT-XP® Adhesive

For anchor capacities for SSC clip, reference p. 90. For more information on anchors, see *Anchoring, Fastening and Restoration Systems for Concrete and Masonry* catalog at strongtie.com.

SSC Steel-Stud Connector

Base of Jamb Anchorage Solutions

Rigid Connectors

| Uncracked Concrete, Wind and Seismic in SDC A & B ⁸ | | | | | | |
|--|--|--|---|------------------------------------|---------------|---------------|
| Model No. | Minimum Concrete Thickness (h_{min}) (in.) | $\frac{3}{8}$ " Diameter Simpson Strong-Tie [®] Anchor Type | Nominal Embedment Depth (h_{nom}) (in.) | Allowable Anchor Load, F_4 (lb.) | | |
| | | | | 3,000 psi SLWC | 3,000 psi NWC | 4,000 psi NWC |
| SSC2.25 | 4 | Titen HD [®] | 2½ | 275 | 455 | 530 |
| | | Titen HD | 3¼ | 290 | 485 | 560 |
| | 6 | SET-3G [™] | 4 | 345 | 510 | 590 |
| | | AT-XP [®] | 4 | 345 | 510 | 590 |
| SSC4.25 | 4 | Titen HD | 2½ | 550 | 920 | 975 |
| | | Titen HD | 3¼ | 620 | 975 | 975 |
| | 6 | SET-3G | 4 | 735 | 880 | 880 |
| | | AT-XP | 4 | 735 | 880 | 880 |
| SSC6.25 | 4 | Titen HD | 2½ | 735 | 1,020 | 1,020 |
| | | Titen HD | 3¼ | 960 | 1,020 | 1,020 |
| | 6 | SET-3G | 4 | 880 | 880 | 880 |
| | | AT-XP | 4 | 880 | 880 | 880 |
| Cracked Concrete, Wind and Seismic in SDC A & B ⁸ | | | | | | |
| Model No. | Minimum Concrete Thickness (h_{min}) (in.) | $\frac{3}{8}$ " Diameter Simpson Strong-Tie Anchor Type | Nominal Embedment Depth (h_{nom}) (in.) | Allowable Anchor Load, F_4 (lb.) | | |
| | | | | 3,000 psi SLWC | 3,000 psi NWC | 4,000 psi NWC |
| SSC2.25 | 4 | Titen HD | 2½ | 195 | 325 | 375 |
| | | Titen HD | 3¼ | 210 | 345 | 400 |
| | 6 | SET-3G | 4 | 245 | 360 | 420 |
| | | AT-XP | 4 | 245 | 360 | 420 |
| SSC4.25 | 4 | Titen HD | 2½ | 395 | 655 | 760 |
| | | Titen HD | 3¼ | 445 | 740 | 855 |
| | 6 | SET-3G | 4 | 525 | 775 | 880 |
| | | AT-XP | 4 | 525 | 775 | 880 |
| SSC6.25 | 4 | Titen HD | 2½ | 525 | 875 | 1,010 |
| | | Titen HD | 3¼ | 685 | 1,020 | 1,020 |
| | 6 | SET-3G | 4 | 810 | 880 | 880 |
| | | AT-XP | 4 | 810 | 880 | 880 |
| Cracked Concrete, Seismic in SDC C through F ⁹ | | | | | | |
| Model No. | Minimum Concrete Thickness (h_{min}) (in.) | $\frac{3}{8}$ " Diameter Simpson Strong-Tie Anchor Type | Nominal Embedment Depth (h_{nom}) (in.) | Allowable Anchor Load, F_4 (lb.) | | |
| | | | | 3,000 psi SLWC | 3,000 psi NWC | 4,000 psi NWC |
| SSC2.25 | 4 | Titen HD | 2½ | 90 | 150 | 175 |
| | | Titen HD | 3¼ | 95 | 160 | 185 |
| | 6 | SET-3G | 4 | 115 | 170 | 195 |
| | | AT-XP | 4 | 115 | 170 | 195 |
| SSC4.25 | 4 | Titen HD | 2½ | 185 | 305 | 355 |
| | | Titen HD | 3¼ | 205 | 345 | 400 |
| | 6 | SET-3G | 4 | 245 | 355 | 355 |
| | | AT-XP | 4 | 245 | 350 | 350 |
| SSC6.25 | 4 | Titen HD | 2½ | 245 | 410 | 470 |
| | | Titen HD | 3¼ | 320 | 480 | 480 |
| | 6 | SET-3G | 4 | 355 | 355 | 355 |
| | | AT-XP | 4 | 350 | 350 | 350 |

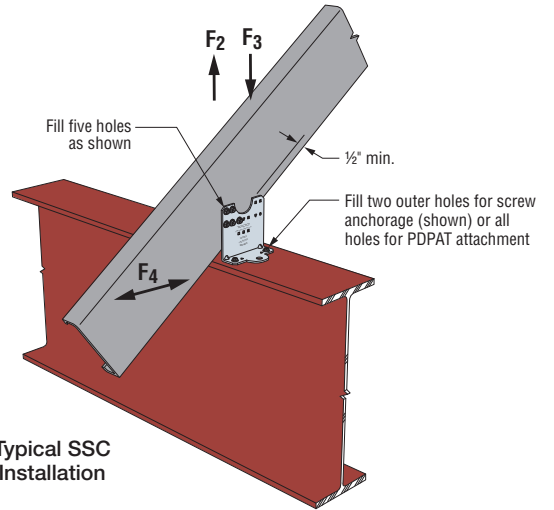
- Allowable anchor capacities have been determined using ACI 318-14 Chapter 17 calculations with the minimum concrete compressive strength, f'_c and slab thickness listed. Sand-lightweight concrete is abbreviated as "SLWC" while normal-weight concrete is abbreviated as "NWC".
- Nominal Embedment Depth/Effective Embedment Depth relationships:
 - $\frac{3}{8}$ " Titen HD in 4" Slab : $2.50" (h_{nom}) / 1.77" (h_{ef})$
 - $\frac{3}{8}$ " Titen HD in 6" Slab or thicker : $3.25" (h_{nom}) / 2.40" (h_{ef})$
 - SET-3G or AT-XP Adhesive with $\frac{3}{8}$ " F1554 Gr. 36 All-Thread Rod in 6" Slab or thicker : $4.0" (h_{nom}) = 4" (h_{ef})$
- Edge distances are assumed to be 1.81", 3.0" and 4.0" ($\frac{1}{2}$ of stud width) as determined for 3 $\frac{3}{8}$ ", 6" and 8" studs, respectively.
- End distances are assumed as 1.5 x min. edge distance in one direction and 'N/A' in the other direction. See figure on p. 89.
- Load values are for a single anchor based on ACI 318-14, condition B, load factors from ACI 318-14 Section 5.3, no supplemental edge reinforcement, $\Psi_{c,v} = 1.0$ for cracked concrete and periodic special inspection. Reference ICC-ES or IAPMO-UES evaluation reports for further information.
- Load values are based on a short-term temperature range of 160°F and 180°F for SET-3G and AT-XP. Long-term temperature range is assumed to be 110°F for both SET-3G and AT-XP. Dry hole conditions are assumed. Other conditions may be evaluated using Anchor Designer[™] Software for ACI 318, ETAG and CSA. See strongtie.com/software.
- Allowable Stress Design (ASD) values were determined by multiplying calculated LRFD capacities by a conversion factor, Alpha (α), of 0.7 for seismic loads and 0.6 for wind loads. ASD values for other load combinations may be determined using alternate conversion factors.
- Tabulated allowable ASD loads for Wind and Seismic in SDC A&B are based on using wind conversion factors and may be increased by 1.17 for SDC A&B only.
- Allowable loads have been divided by an Omega (Ω) seismic factor of 2.5 for brittle failure as required by ACI 318-14 Chapter 17.
- Allowable F_4 load based on loading direction towards the edge of slab.
- Tabulated capacities are based on maximum allowable anchorage loads only. The capacity of the connection system shall be the minimum of the tabulated value and the allowable load value from the SSC Connectors: Base of CFS Jamb Allowable Load Tables.

SSC Steel-Stud Connector

SSC Connectors — CFS Rafter Allowable Loads (lb.)

| Model No. | Connector Material Thickness mil (ga.) | Clip Length (in.) | Fasteners ^{1,4} | | Allowable Load (lb.) | | | Code Ref. |
|-----------|--|-------------------|---------------------------------|------------------|----------------------|----------------|----------------|-----------|
| | | | Anchorage to Steel ² | Supported Member | 43 mil (18 ga.) | | | |
| | | | | | F ₂ | F ₃ | F ₄ | |
| SSC4.25 | 68 (14) | 4¼ | (2) #12–24 | (5) #10 | 710 | 1,075 | 595 | IBC |
| | | | (4) 0.157" PDPAT | (5) #10 | 1,020 | 1,075 | 630 | |
| MSSC4.25 | 97 (12) | 4¼ | (2) #12–24 | (5) #10 | 710 | 1,335 | 595 | |
| | | | (4) 0.157" PDPAT | (5) #10 | 1,025 | 1,335 | 815 | |

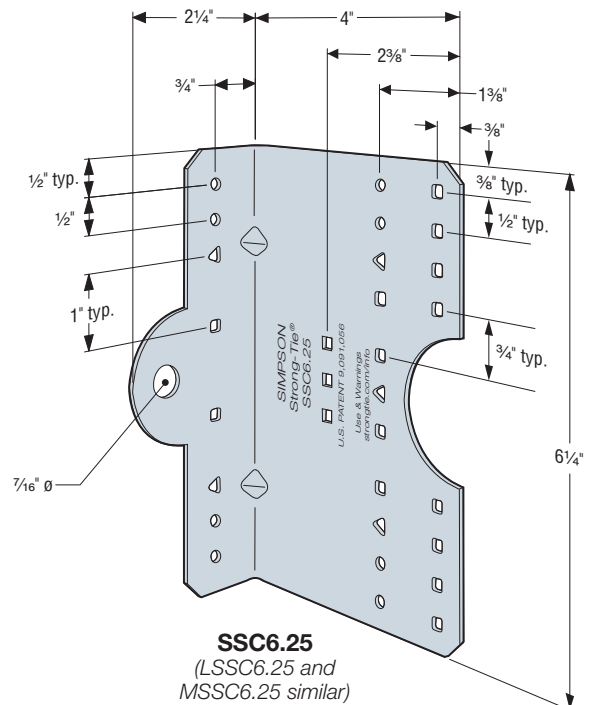
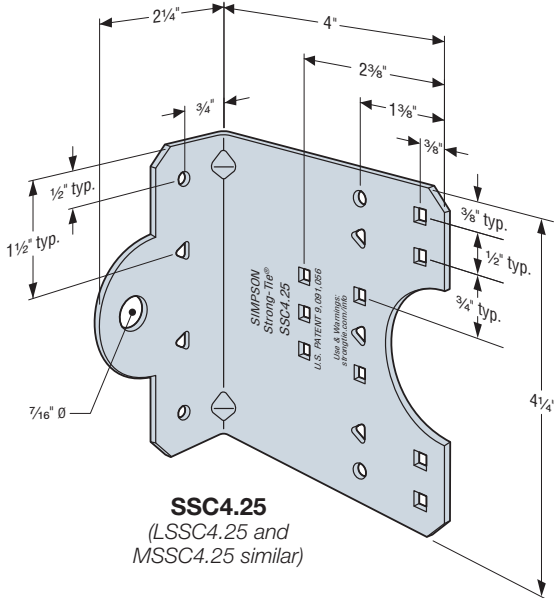
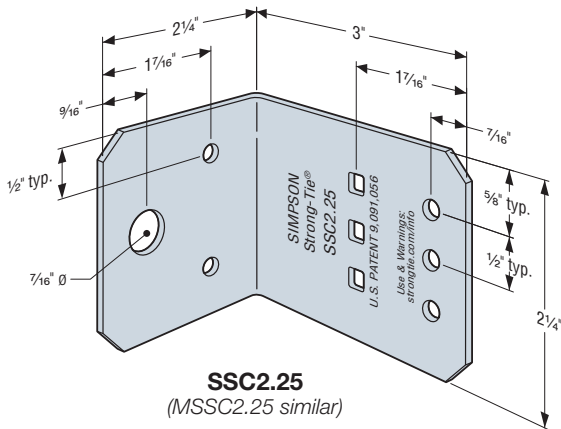
- See illustrations for fastener placement.
- Allowable loads are based on anchors installed in minimum 3/16"-thick structural steel with F_y = 36 ksi.
- Allowable loads are based on a 6"-deep member. For deeper members, designer must consider web crippling of the member and reduce loads accordingly.
- See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



Typical SSC Installation

Rigid Connectors

SSC Utility Clip Dimensions



SSC Supplemental Information

The following SSC supplemental information is given to help designers with value-engineered solutions for our SSC connectors. Loads are given for fastener patterns other than our standard “min.” (fill all round holes) and “max.” (fill all round holes) and “max.” (fill all round and triangle holes). The tables give ASD Loads. LRFD and nominal loads can be found at strongtie.com.

Rigid Connectors

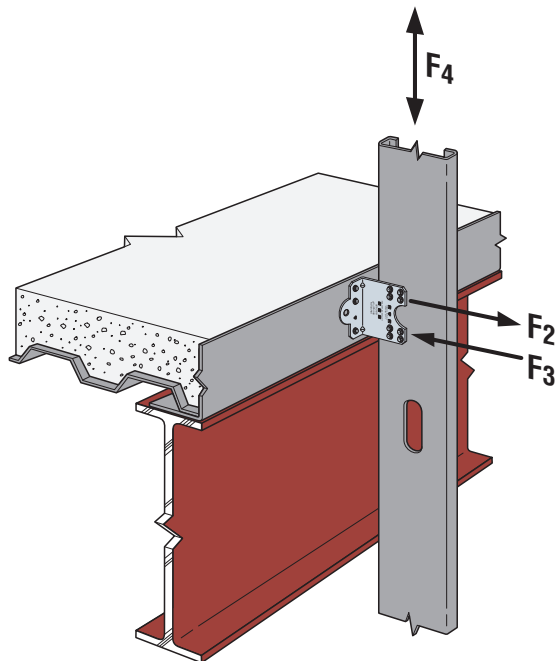
Table 1: SSC Screw Patterns

| | | | | |
|---------------------------------|----------------|----------------|-----------------|-----------|
| SSC2.25 MSSC2.25 | Pattern “Min.” | Pattern A | Pattern B | |
| | Pattern C | Pattern D | Pattern E | |
| | Pattern “Min.” | Pattern “Max.” | Pattern “Outer” | |
| | Pattern F | Pattern G | Pattern H | Pattern I |
| | Pattern “Min.” | Pattern “Max.” | Pattern “Outer” | |
| | Pattern J | Pattern K | Pattern L | |
| LSSC4.25 SSC4.25 MSSC4.25 | Pattern “Min.” | Pattern “Max.” | Pattern “Outer” | |
| | Pattern J | Pattern K | Pattern L | |
| | Pattern M | Pattern N | Pattern O | |
| | Pattern “Min.” | Pattern “Max.” | Pattern “Outer” | |
| LSSC6.25 SSC6.25 MSSC6.25 | Pattern “Min.” | Pattern “Max.” | Pattern “Outer” | |
| | Pattern J | Pattern K | Pattern L | |
| | Pattern M | Pattern N | Pattern O | |
| | Pattern “Min.” | Pattern “Max.” | Pattern “Outer” | |
| | Pattern J | Pattern K | Pattern L | |
| | Pattern M | Pattern N | Pattern O | |

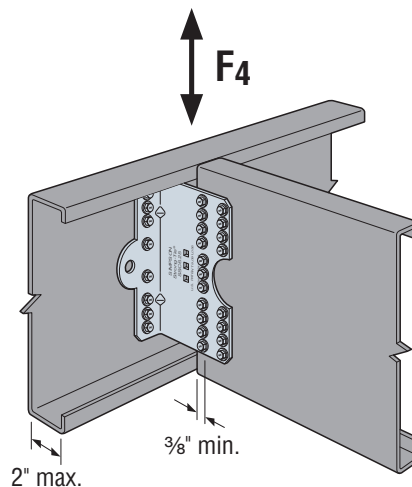
SSC Supplemental Information

Notes for Table 2 (see p. 94)

1. Calculated values are per AISI RP18-4, AISI S-100, or generally accepted industry standards. Shaded values for F_4 are derived from test data. Whenever possible, unshaded F_4 values are based on the maximum calculated value and applicable tested value.
2. The tabulated values do not account for anchorage to the support. Anchor strength must be calculated separately and may reduce the capacity of the connection when compared to the tabulated values.
3. Tabulated values do not include shear, web crippling, buckling, or other local effects in the member. The designer must check member limit states separately.
4. For load combinations that include F_4 and/or F_2 and/or F_3 , use an appropriate interaction equation.
5. #10–16 screws shall have $P_{SS} \geq 1,620$ lb. Calculated values are per AISI S-100. Screws must be installed with three (min.) exposed threads.
6. The number of screws is for one clip leg that is attached to the supported stud.
7. For the minimum screw pattern, fill all round holes. For the maximum screw pattern, fill all round and triangle holes. Reference p. 92.
8. In addition to calculations of net and gross section tension, and screw shear of the clip leg attached to the stud, F_2 values are also calculated for weak-axis bending of the anchored clip leg with the line of bending at the smaller anchor holes. The designer is responsible for calculating pullover, pullout, and tension strength of the anchors, and this may reduce F_2 strength compared to the tabulated values.
9. F_3 values are computed using the plate buckling provisions of AISI RP18-4.
10. For the F_4 calculated values, it's assumed that the connection eccentricity is taken by screws in the supported stud.
11. Service load limits for F_2 and F_3 are not given since there are no generally accepted industry methods available to compute these values. F_4 service load limits are based on AISI Research Report RP18-4 for $1/8$ " deflection or applicable test data.
12. For 50 ksi studs, 68 mil (14 ga.) and thicker, use tabulated values for 54 mil (16 ga.) — 50 ksi studs.



Installation Example #1 —
SSC4.25 Typical
Bypass Framing Installation



Installation Example #2 —
SSC6.25 Typical
Joist-to-Girder Installation

SSC Supplemental Information

Table 2: SSC Steel Stud Connectors — Allowable Loads (lb.)

Rigid Connectors

| Model No. | No. of #10 Screws | Screw Pattern | Stud Thickness and Yield Strength | | | | | | | | | | |
|-----------|-------------------|---------------|-----------------------------------|----------------|----------------|--------------------------|----------------|----------------|--------------------------|----------------|----------------|-------|-------|
| | | | 33 mil (20 ga.) – 33 ksi | | | 43 mil (18 ga.) – 33 ksi | | | 54 mil (16 ga.) – 50 ksi | | | | |
| | | | F ₂ | F ₃ | F ₄ | F ₂ | F ₃ | F ₄ | F ₂ | F ₃ | F ₄ | | |
| SSC2.25 | 3 | Min. | 235 | 525 | 165 | 235 | 610 | 225 | 235 | 610 | 345 | | |
| | 2 | A | | 350 | 65 | | 475 | 100 | | 475 | 205 | | |
| | 2 | B | | 350 | 105 | | 530 | 160 | | 635 | 325 | | |
| | 3 | C | | 525 | 165 | | 795 | 225 | | 820 | 345 | | |
| | 4 | D | | 635 | 190 | | 635 | 285 | | 635 | 580 | | |
| | 6 | E | | 820 | 245 | | 820 | 375 | | 820 | 750 | | |
| MSSC2.25 | 3 | Min. | 475 | 525 | 165 | 475 | 795 | 225 | 475 | 1,055 | 345 | | |
| | 2 | A | 350 | 350 | 65 | | 530 | 100 | | 820 | 205 | | |
| | 2 | B | | 350 | 105 | | 530 | 160 | | 1,070 | 325 | | |
| | 3 | C | 475 | 525 | 165 | | 795 | 225 | | 1,420 | 345 | | |
| | 4 | D | | 700 | 190 | | 1,060 | 285 | | 1,105 | 580 | | |
| | 6 | E | | 1,050 | 245 | | 1,420 | 375 | | 1,420 | 750 | | |
| 2 | Min. | 350 | | 350 | 215 | 435 | 350 | 440 | 435 | 350 | 675 | | |
| 5 | Max. | 435 | 845 | 215 | 845 | | 440 | 845 | | 725 | | | |
| 4 | Outer | | 575 | 200 | 575 | | 310 | 575 | | 520 | | | |
| 4 | F | | 350 | 320 | 350 | | 485 | 350 | | 980 | | | |
| 8 | G | | 695 | 530 | 695 | | 805 | 695 | | 1,495 | | | |
| 11 | H | | 845 | 590 | 845 | | 895 | 845 | | 1,495 | | | |
| 14 | I | | 845 | 730 | 845 | 1,105 | 845 | 1,495 | | | | | |
| SSC4.25 | 2 | Min. | 350 | 350 | 355 | 660 | 485 | 525 | 660 | 485 | 890 | | |
| | 5 | Max. | 660 | 875 | 365 | | 1,175 | 600 | | 1,175 | 1,005 | | |
| | 4 | Outer | | 700 | 235 | | 795 | 330 | | 795 | 625 | | |
| | 4 | F | | 485 | 320 | | 485 | 485 | | 485 | 980 | | |
| | 8 | G | | 970 | 530 | | 970 | 805 | | 970 | 1,625 | | |
| | 11 | H | | 1,175 | 590 | | 1,175 | 895 | | 1,175 | 1,805 | | |
| 14 | I | 1,175 | | 730 | 1,175 | 1,105 | 1,175 | 1,860 | | | | | |
| MSSC4.25 | 2 | Min. | 350 | 350 | 355 | 530 | 530 | 525 | 1,070 | 840 | 890 | | |
| | 5 | Max. | 875 | 875 | 365 | 1,325 | 1,325 | 600 | 1,340 | 2,040 | 1,005 | | |
| | 4 | Outer | 700 | 700 | 235 | 1,060 | 1,060 | 330 | | 1,380 | 625 | | |
| | 4 | F | | | 320 | 840 | 485 | 840 | | 980 | | | |
| | 8 | G | 1,400 | 530 | 1,680 | 805 | 1,680 | 1,625 | | | | | |
| | 11 | H | 1,340 | 1,925 | 590 | 1,340 | 2,040 | 895 | | 2,040 | 1,805 | | |
| 14 | I | 2,040 | | 730 | 1,105 | | | 2,235 | | | | | |
| LSSC6.25 | 4 | Min. | 640 | 700 | 265 | 640 | 705 | 660 | 640 | 705 | 1,190 | | |
| | 7 | Max. | | 1,225 | 265 | | 1,230 | 660 | | 1,230 | 1,190 | | |
| | 6 | Outer | | 870 | 270 | | 870 | 375 | | 870 | 695 | | |
| | 4 | J | | 350 | 435 | | 350 | 660 | | 350 | 1,330 | | |
| | 8 | K | | 705 | 785 | | 705 | 1,190 | | 705 | 2,210 | | |
| | 12 | L | | 1,055 | 1,050 | | 1,055 | 1,590 | | 1,055 | 2,205 | | |
| | 16 | M | | 1,255 | 1,230 | | 1,255 | 1,860 | | 1,255 | 1,975 | 1,255 | 2,250 |
| | 19 | N | | | 1,305 | | | 1,975 | | | | | |
| 22 | O | 1,455 | 2,200 | | | | | | | | | | |
| SSC6.25 | 4 | Min. | 700 | 700 | 385 | 975 | 980 | 720 | 975 | 980 | 1,190 | | |
| | 7 | Max. | 975 | 1,225 | 385 | | 1,710 | 720 | | 1,710 | 1,190 | | |
| | 6 | Outer | 975 | 1,050 | 270 | | 1,210 | 460 | | 1,210 | 725 | | |
| | 4 | J | 700 | 490 | 435 | | 490 | 660 | | 490 | 1,330 | | |
| | 8 | K | 975 | 980 | 785 | | 980 | 1,190 | | 980 | 2,405 | | |
| | 12 | L | | 1,465 | 1,050 | | 1,465 | 1,590 | | 1,465 | 2,750 | | |
| | 16 | M | | 1,230 | 1,745 | | 1,745 | 1,860 | | 1,745 | 2,845 | | |
| | 19 | N | | 1,305 | 1,745 | | 1,745 | 1,975 | | 1,745 | 2,845 | | |
| 22 | O | 1,455 | 1,745 | 1,455 | 2,200 | 1,745 | 2,200 | 1,745 | 2,845 | | | | |
| MSSC6.25 | 4 | Min. | 700 | 700 | 385 | 1,060 | 1,060 | 720 | 1,970 | 1,695 | 1,190 | | |
| | 7 | Max. | 1,225 | 1,225 | 385 | 1,855 | 1,855 | 720 | | 2,965 | 1,365 | | |
| | 6 | Outer | 1,050 | 1,050 | 270 | 1,590 | 460 | 2,100 | | 725 | | | |
| | 4 | J | 700 | 700 | 435 | 1,060 | 845 | 660 | | 845 | 1,330 | | |
| | 8 | K | 1,400 | 1,400 | 785 | 1,970 | 1,695 | 1,190 | | 1,695 | 2,405 | | |
| | 12 | L | 2,100 | 1,050 | 2,540 | | 1,590 | 2,540 | | 3,210 | | | |
| | 16 | M | 1,970 | 2,800 | 1,230 | | 3,025 | 1,860 | | 3,025 | 1,860 | 3,755 | |
| | 19 | N | | 1,305 | 1,975 | | | 1,975 | | | 3,985 | | |
| 22 | O | 1,455 | | 2,200 | 2,200 | 4,305 | | | | | | | |

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SJC Steel-Joist Connectors



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

SJC connectors have been specifically designed for various CFS joist, rafter and underside of metal deck applications. The unique clip dimensions enable easy installation on the open side of joists and rafters with up to 3 1/2" flanges and return lips up to 3/4". For metal deck applications, the prepunched 3/8" holes easily accommodate 6", 8", 10" and 12" on-center metal deck flutes.

Features:

- Prepunched holes reduce installation cost by eliminating predrilling
- Intuitive fastener hole positions ensure accurate clip installation in accordance with design, support a wide range of design and application requirements and provide installation flexibility
- Angle lengths accommodate either hard-side or soft-side attachment for joists with return lips up to 3/4"
- 4 1/2" leg length enables soft-side connections for joists with flanges up to 3 1/2"
- Also accommodates kicker-to-metal deck applications

Material: SJC — 68 mil (50 ksi); MSJC — 97 mil (50 ksi)

Finish: Galvanized (G90)

Installation:

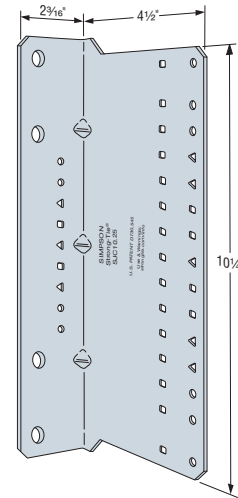
- Use all specified fasteners/anchors

Codes: See p. 13 for Code Reference Key Chart

For detailed product dimensions, refer to p. 99.

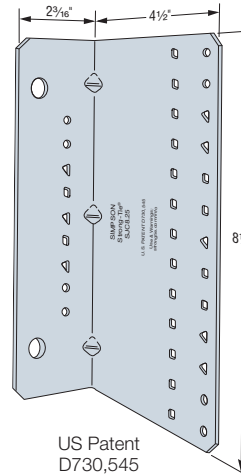
Ordering Information

| Model No. | Ordering SKU | Package Quantity |
|-----------|---------------|------------------|
| SJC8.25 | SJC8.25-R15 | Box of 15 |
| MSJC8.25 | MSJC8.25-R15 | |
| SJC10.25 | SJC10.25-R15 | Box of 15 |
| MSJC10.25 | MSJC10.25-R15 | |



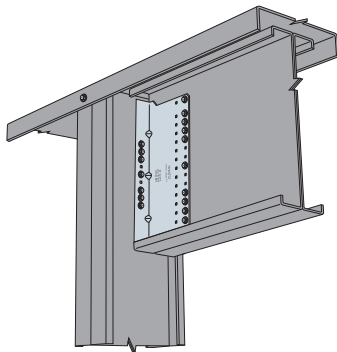
SJC10.25
(MSJC10.25 similar)

Full dimensions shown on p. 99.

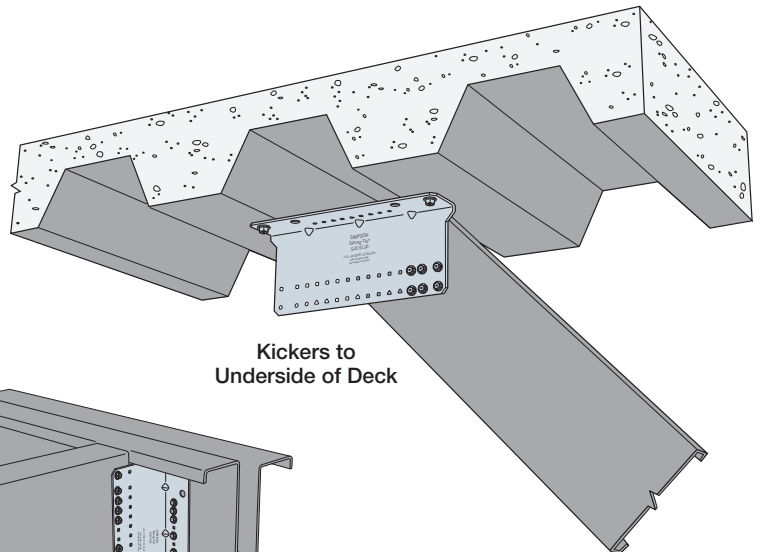


SJC8.25
(MSJC8.25 similar)

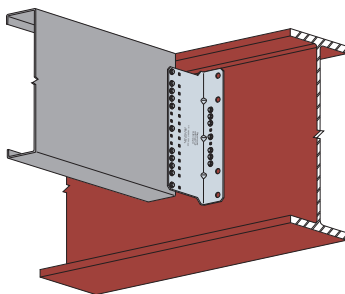
US Patent D730,545



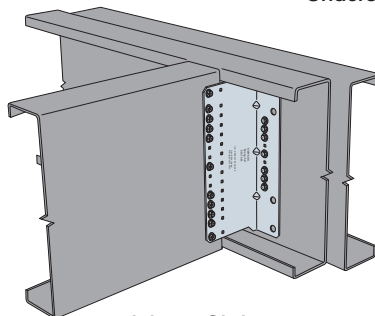
Header to Jamb



Kickers to Underside of Deck



Joists to I-Beam



Joist to Girder

Note: For 6" and 8" joists: SSC connectors are recommended.

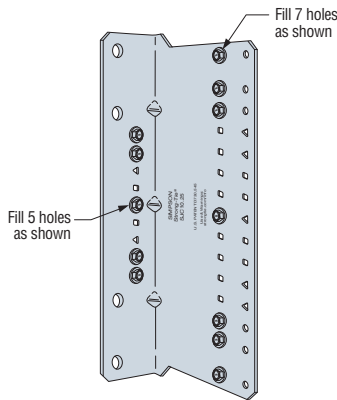
SJC Steel-Joist Connectors

Rigid Connectors

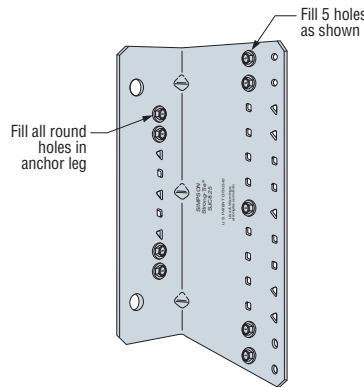
SJC Connectors — CFS to CFS Allowable Loads (lb.)

| Model No. | Connector Material Thickness mil (ga.) | Clip Length (in.) | Framing Member Depth ⁴ (in.) | Fasteners ⁵ | | | Allowable F ₄ Load (lb.) ² | | Code Ref. | | | | |
|-----------|--|-------------------|---|------------------------|----------------|-----------------|--|-----------------|-----------|-------------------------------------|-----|-----|-----|
| | | | | Pattern ¹ | Carried Member | Carrying Member | Minimum Member Thickness | | | Maximum Connector Load ³ | | | |
| | | | | | | | 54 mil (16 ga.) | 68 mil (14 ga.) | | | | | |
| SJC8.25 | 68 (14) | 8¼ | 10 | Min. | (4) #10 | (4) #10 | 980 | 980 | 2,930 | IBC | | | |
| | | | | Max. | (9) #10 | (7) #10 | 1,005 | 1,490 | | | | | |
| | | | | Inner | (5) #10 | (4) #10 | 1,345 | 2,005 | | | | | |
| MSJC8.25 | 97 (12) | 8¼ | 10 | Min. | (4) #10 | (4) #10 | 1,005 | 1,710 | 2,930 | | IBC | | |
| | | | | Max. | (9) #10 | (7) #10 | 1,135 | 1,765 | | | | | |
| | | | | Inner | (5) #10 | (4) #10 | 1,535 | 2,220 | | | | | |
| SJC10.25 | 68 (14) | 10¼ | 12 | Min. | (6) #10 | (4) #10 | 1,170 | 1,625 | 3,935 | | | IBC | |
| | | | | Max. | (11) #10 | (7) #10 | 1,265 | 1,625 | | | | | |
| | | | | Inner | (7) #10 | (5) #10 | 1,620 | 2,170 | | | | | |
| MSJC10.25 | 97 (12) | 10¼ | 12 | Min. | (6) #10 | (4) #10 | 1,200 | 2,045 | 3,935 | | | | IBC |
| | | | | Max. | (11) #10 | (7) #10 | 1,265 | 2,045 | | | | | |
| | | | | Inner | (7) #10 | (5) #10 | 1,730 | 2,635 | | | | | |

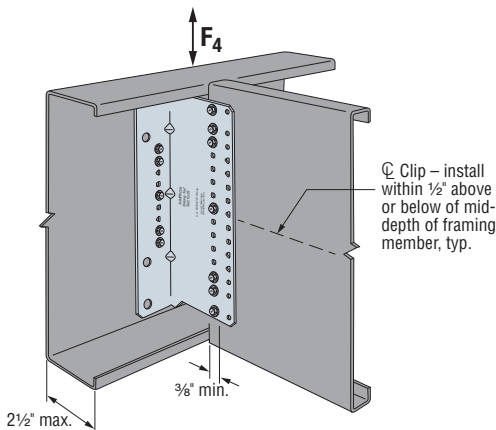
1. Min. fastener quantity and load values — fill all round holes; Max. fastener quantity and load values — fill all round and triangular holes; Inner fastener quantity and load values — see illustrations for fastener placement.
2. Allowable loads are based on bracing of the members located within 12" of the connection.
3. Maximum allowable load for connector that may not be exceeded when designing custom installations. Designer is responsible for member and fastener design.
4. For 6" and 8" joists, SSC connectors are recommended.
5. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



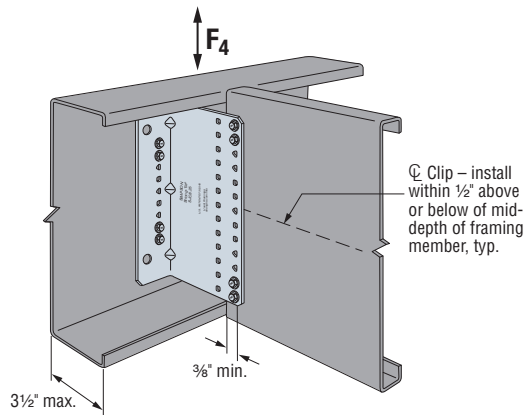
SJC10.25 — Inner Fastener Pattern
(MSJC10.25 similar)



SJC8.25 — Inner Fastener Pattern
(MSJC8.25 similar)



SJC Installation with Carried Member Fasteners in Inner Row



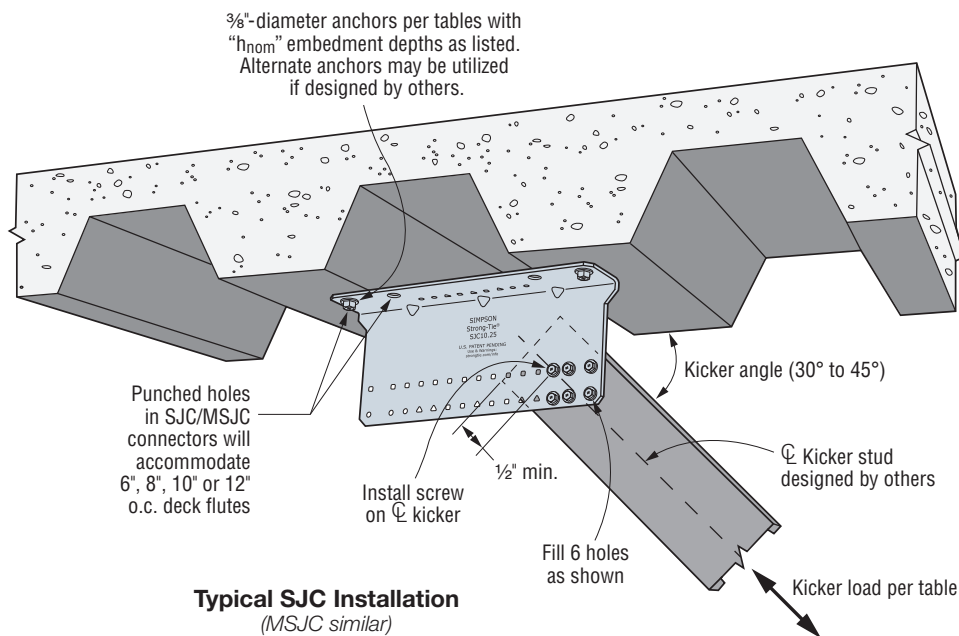
SJC Installation with Carried Member Fasteners in Min. Pattern
(fill circle holes min. quantity, circle and triangle holes max. quantity)

SJC Steel-Joist Connectors

SJC Connectors — Kicker Allowable Loads (lb.)

| Model No. | Connector Material Thickness mil (ga.) | Clip Length (in.) | Fasteners to Kicker | Kicker Angle ² | Max. Allowable Kicker Load for 33 mil (20 ga.) Min. Kicker (lb.) | Anchor Tension at Max. Allowable Kicker Load (lb.) | Code Ref. |
|-----------|--|-------------------|---------------------|---------------------------|--|--|-----------|
| SJC8.25 | 68 (14) | 8¼ | (6) #10 | 30° | 490 | 345 | IBC, FL |
| | | | | 45° | 535 | 570 | |
| SJC10.25 | 68 (14) | 10¼ | (6) #10 | 30° | 625 | 475 | |
| | | | | 45° | 530 | 440 | |
| MSJC10.25 | 97 (12) | 10¼ | (6) #10 | 30° | 950 | 675 | |
| | | | | 45° | 780 | 680 | |

1. Loads apply to connectors installed perpendicular or parallel to metal deck flutes, with minimum 33 mil (20 ga.) kicker. No increase allowed for kicker with heavier thickness.
2. Kicker angle is the acute angle measured relative to the horizontal plane of the metal deck.
3. The tabulated value for anchor tension is per anchor. Anchors must be designed for combined shear and tension. Simpson Strong-Tie anchorage solutions are tabulated on p. 98. Alternate anchors may be utilized if designed by others.
4. Maximum kicker load and anchorage tension at maximum load determined based on tests.
5. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



Example

Determine maximum allowable kicker load and tension load on anchor for MSJC10.25.

Given:

- Kicker load = 400 lb.
- Kicker angle = 35° from horizontal

Calculations:

- Interpolate max. allowed kicker load for MSCJ10.25 at 35°:

$$\text{Max. allowed kicker load for MSCJ10.25} = 950 - (950 - 780) * (\cos 35^\circ - \cos 30^\circ) / (\cos 45^\circ - \cos 30^\circ) = 899 \text{ lb.}$$
 Kicker Load = 400 lb. < 893 lb. **OK**
- Interpolate anchor tension at max. load for MSCJ10.25 at 35°:

$$\text{Anchor tension at maximum load} = 675 - (675 - 680) * (\cos 35^\circ - \cos 30^\circ) / (\cos 45^\circ - \cos 30^\circ) = 676 \text{ lb.}$$
- Determine tension load on anchor:

$$\text{Tension load on anchor} = 677 * 400 / 893 = 301 \text{ lb.}$$

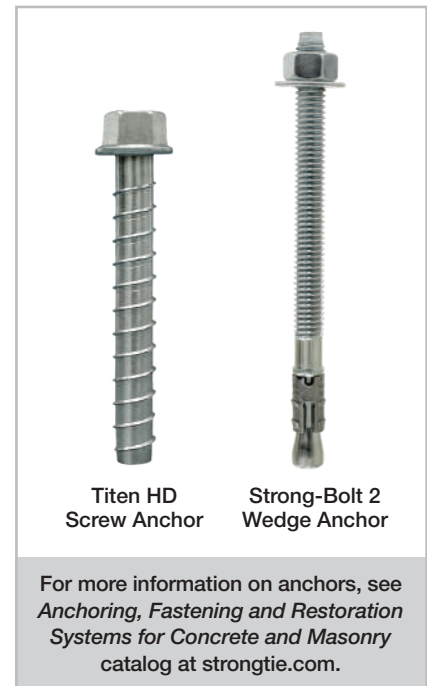
SJC Steel-Joist Connectors

SJC and MSJC Kicker Anchorage Solutions

| Uncracked Concrete, Wind and Seismic in SDC A&B | | | | |
|---|--------------|---|--|-------------------------------------|
| Minimum 2.5" Slab (3,000 psi concrete min.) Over Metal Deck | | | | |
| Model No. | Kicker Angle | 3/8"-Diameter Simpson Strong-Tie® Anchor Type | Nominal Embedment Depth, h_{nom} (in.) | Maximum Allowable Kicker Load (lb.) |
| SJC8.25 | 30° | Strong-Bolt® 2 | 2½ | 490 |
| | | Titen HD® | 2¼ | 490 |
| | 45° | Strong-Bolt 2 | 2½ | 535 |
| | | Titen HD | 2½ | 535 |
| SJC10.25 | 30° | Strong-Bolt 2 | 2½ | 625 |
| | | Titen HD | 2¼ | 625 |
| | 45° | Strong-Bolt 2 | 2½ | 530 |
| | | Titen HD | 2¼ | 530 |

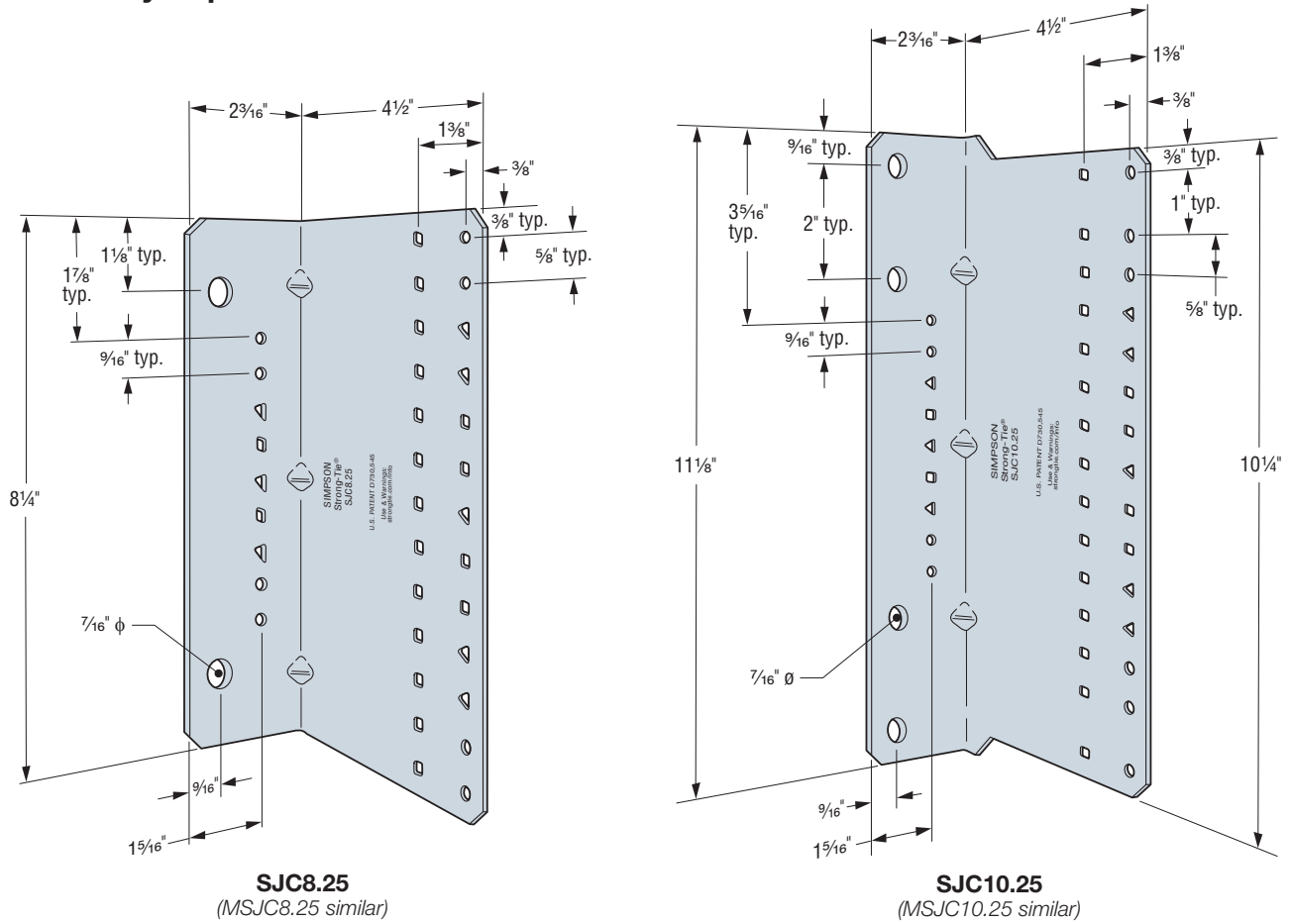
| Cracked Concrete, Wind and Seismic in SDC A&B | | | | |
|---|--------------|--|--|-------------------------------------|
| Minimum 2.5" Slab (3,000 psi concrete min.) Over Metal Deck | | | | |
| Model No. | Kicker Angle | 3/8"-Diameter Simpson Strong-Tie Anchor Type | Nominal Embedment Depth, h_{nom} (in.) | Maximum Allowable Kicker Load (lb.) |
| SJC8.25 | 30° | Strong-Bolt 2 | 2¾ | 490 |
| | | Titen HD | 2½ | 455 |
| | 45° | Strong-Bolt 2 | 2¾ | 535 |
| | | Titen HD | 2½ | 320 |
| SJC10.25 | 30° | Strong-Bolt 2 | 2¾ | 625 |
| | | Titen HD | 2½ | 435 |
| | 45° | Strong-Bolt 2 | 2¾ | 530 |
| | | Titen HD | 2½ | 410 |

| Cracked Concrete, Seismic in SDC C through F | | | | | |
|---|--------------|--|--|-------------------------------------|----------------|
| Minimum 2.5" Slab (3,000 psi concrete min.) Over Metal Deck | | | | | |
| Model No. | Kicker Angle | 3/8"-Diameter Simpson Strong-Tie Anchor Type | Nominal Embedment Depth, h_{nom} (in.) | Maximum Allowable Kicker Load (lb.) | |
| | | | | $\Omega = 1.5$ | $\Omega = 2.5$ |
| SJC8.25 | 30° | Strong-Bolt 2 | 3¾ | 490 | 435 |
| | | Titen HD | 2½ | 255 | 155 |
| | 45° | Strong-Bolt 2 | 3¾ | 535 | 330 |
| | | Titen HD | 2½ | 185 | 110 |
| SJC10.25 | 30° | Strong-Bolt 2 | 3¾ | 625 | 420 |
| | | Titen HD | 2½ | 245 | 145 |
| | 45° | Strong-Bolt 2 | 3¾ | 530 | 410 |
| | | Titen HD | 2½ | 235 | 140 |



- The allowable maximum kicker load is the minimum of anchor allowable loads or connector allowable loads per p. 97. The anchor allowable loads include checks for anchor shear and tension interaction including the effects of eccentric loading.
- Allowable loads have been determined using ACI 318-14 Chapter 17 anchorage calculations with the minimum concrete compressive strength, f'_c and slab thickness listed.
- Strong-Bolt 2 and Titen HD are 3/8"-diameter carbon steel anchor.
- Concrete over metal deck may be Normal Weight or Sand-Lightweight with f'_c of 3,000 psi minimum and 2.5" minimum slab height above upper flute.
- Minimum deck flute height is 1½" (distance from top flute to bottom flute). All other anchor installation requirements shall follow ICC-ES ESR-3037 and ICC-ES ESR-2713.
- Minimum Spacing and Edge distances for bottom of metal deck assemblies shall comply with those required in ICC-ES ESR-3037 for Strong-Bolt 2 anchors and ICC-ES ESR-2713 for Titen HD anchors.
- Load values are based on ACI 318-14, condition B, load factors from ACI 318-14 Section 5.3, no supplemental edge reinforcement for uncracked concrete, $\Psi_{c,v} = 1.0$ for cracked concrete, and periodic special inspection. Reference ICC-ES ESR-3037 and ICC-ES ESR-2713 for further information.
- Allowable Stress Design (ASD) values have been determined by multiplying Load Resistance Factor Design (LRFD) values by a conversion factor, Alpha (α), of 0.7 for seismic loads and 0.6 for wind loads. ASD values for other types or load combinations may be determined using alternate conversion factors.
- Minimum end distance to edge of panel is two times anchor embedment depth.

SJC Utility Clip Dimensions



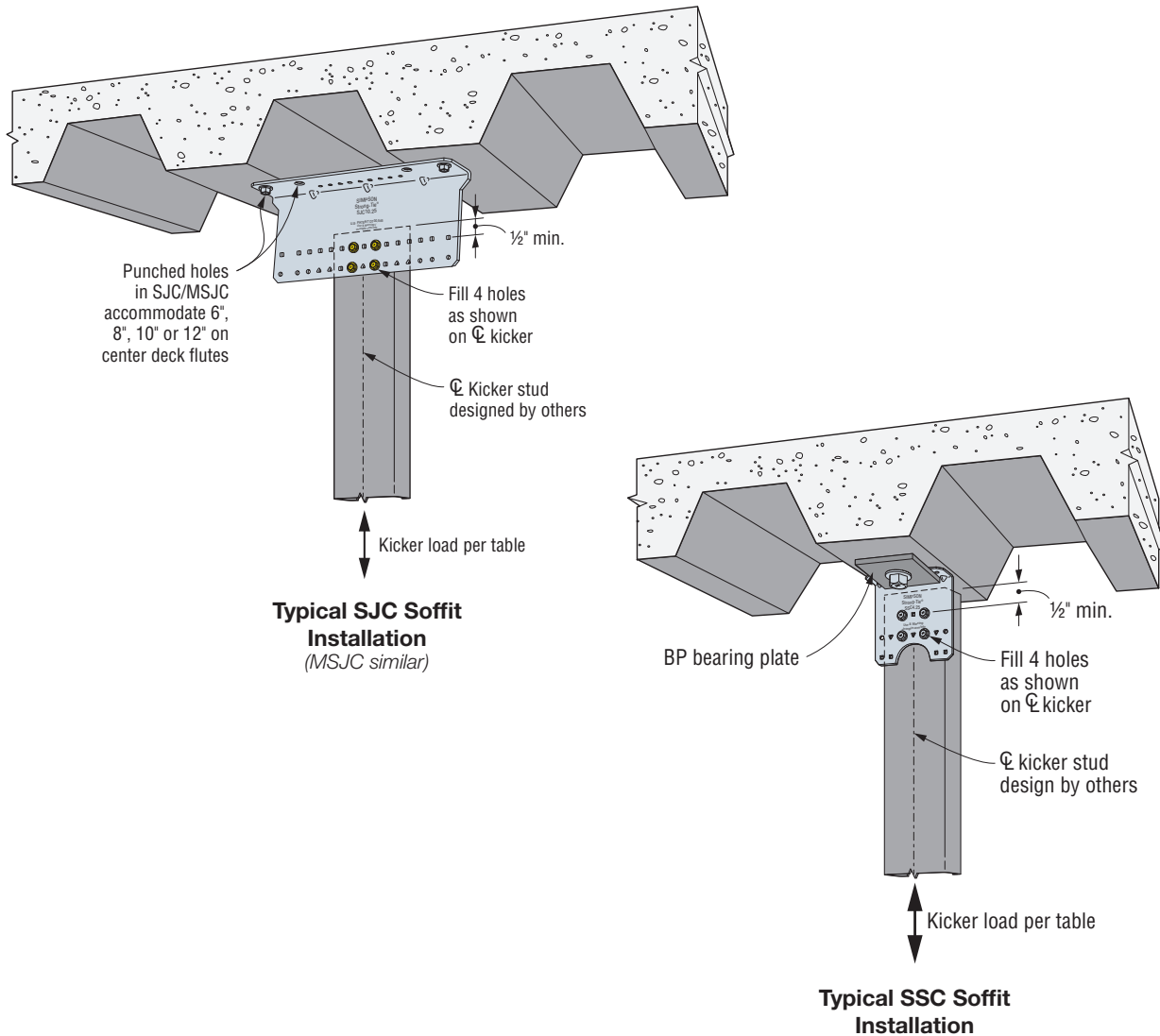
SJC Steel-Joist Connectors

Rigid Connectors

SJC and SSC Connectors — Soffit Stud Hanger Allowable Loads (lb.)

| Model No. | Connector Thickness mil (ga.) | Clip Length (in.) | Anchors | Fasteners to Stud 33 mil (20 ga.) Min. | Allowable Tension Load (lb.) | |
|-----------|-------------------------------|-------------------|---------|--|------------------------------|-----------------------------------|
| | | | | | No Bearing Plate | BP ^{1/2-3} Bearing Plate |
| SJC8.25 | 68 (14) | 8¼ | (2) ¾" | (4) #10 | 465 | 930 |
| SJC10.25 | 68 (14) | 10¼ | (2) ¾" | (4) #10 | 465 | 930 |
| SSC4.25 | 68 (14) | 4¼ | (1) ¾" | (4) #10 | 220 | 585 |

1. Loads apply to connectors installed perpendicular or parallel to metal deck flutes.
2. Stud member design per designer. Tabulated loads for stud fasteners are based on a minimum stud thickness of 33 mil (20 ga.) with a yield stress of 33 ksi. For 30 mil interior studs with a yield strength of 33 ksi, multiply the tabulated values by 0.9.
3. Anchor design per designer. Note that the SJC requires the symmetrical placement of one anchor on each side of the stud centerline.
4. For the bearing plate option, use Simpson Strong-Tie® BP^{1/2-3} bearing plates at each ¾"-diameter anchor. Bearing plates are sold separately.



SFC Steel Framing Connectors



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

SFC connectors are a low-cost, multi-use utility clips for light to moderate loading conditions in CFS stud-to-stud and stud-to-structure applications where long leg lengths are not required.

Features:

- Reduced number of screws reduces installation cost
- Prepunched holes reduce installation cost by eliminating predrilling
- Intuitive fastener hole positions ensure accurate clip installation in accordance with design, support a wide range of design and application requirements and provide installation flexibility
- In soft-side stud installations, SFC will not interfere with stud lips up to 3/4" long*
- Also suitable for u-channel bridging

Material: SFC — 54 mil (50 ksi)

Finish: Galvanized (G90)

Installation:

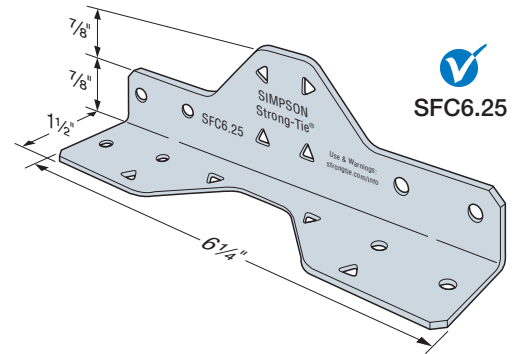
- Use all specified fasteners/anchors

Codes: See p. 13 for Code Reference Key Chart

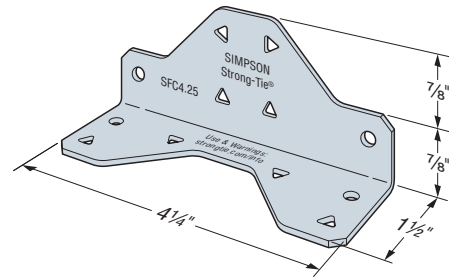
For detailed product dimensions, refer to p. 102.

Ordering Information

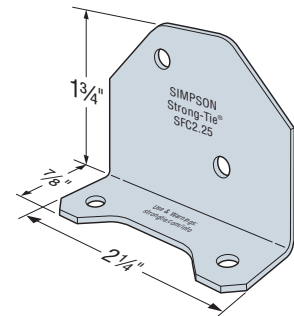
| Model No. | Ordering SKU | Package Quantity |
|-----------|--------------|------------------|
| SFC2.25 | SFC2.25-R300 | Bucket of 300 |
| SFC4.25 | SFC4.25-R175 | Bucket of 175 |
| SFC6.25 | SFC6.25-R100 | Bucket of 100 |



SFC6.25



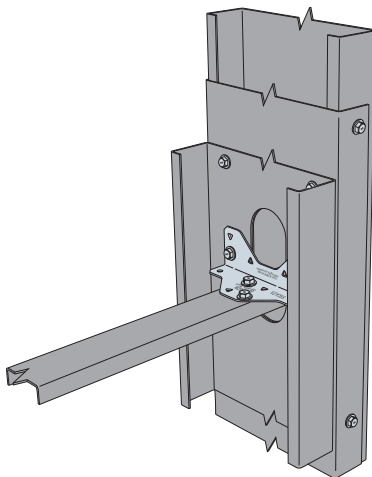
SFC4.25



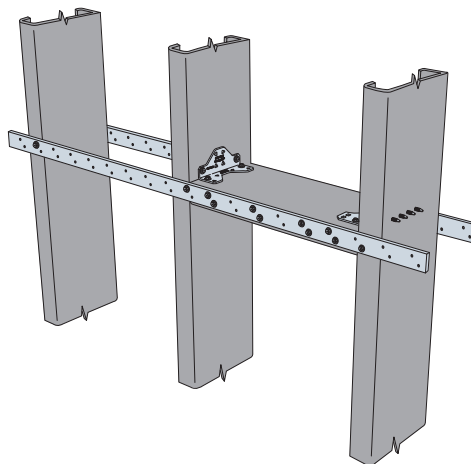
SFC2.25

US Patent: 9,016,024

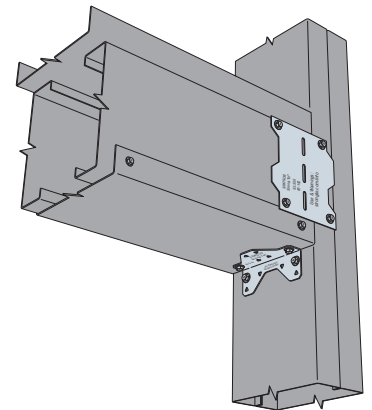
Rigid Connectors



U-Channel to Jamb



Stud Blocking with CS Coiled Strap



Box Headers to Jamb
(also shown S/LS angles)

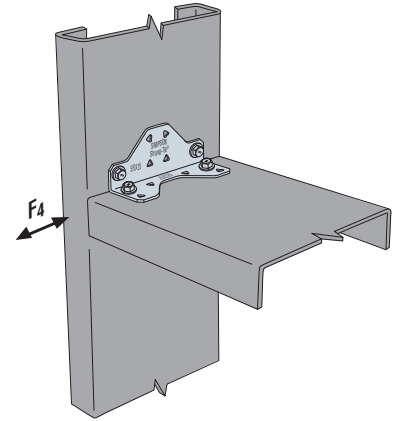
*SFC2.25 clips will accommodate 5/8" long stiffener clips.

SFC Steel Framing Connectors

Rigid Connectors

SFC Connectors — CFS to CFS Allowable Loads (lb.)

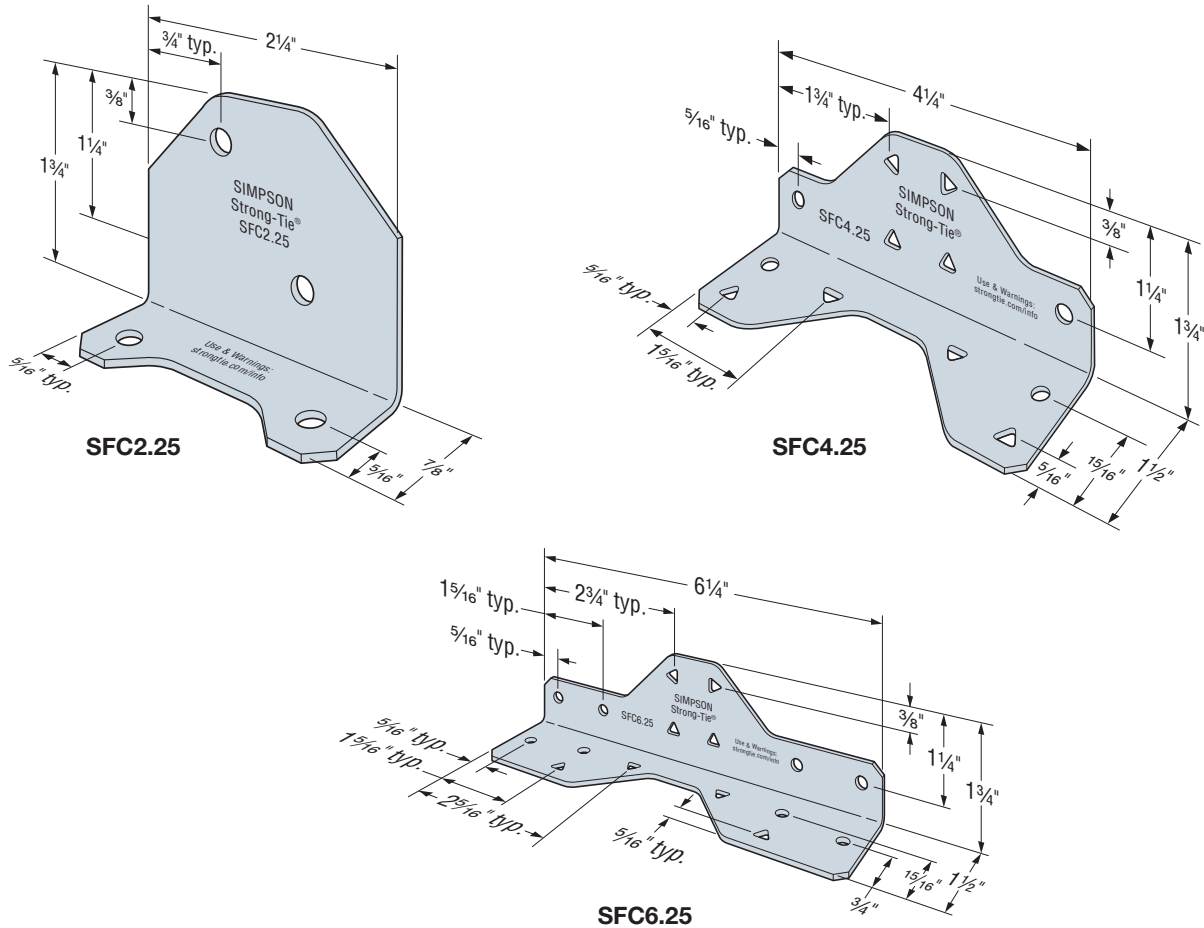
| Model No. | Connector Material Thickness mil (ga.) | L (in.) | Framing Member Depth (in.) | Fasteners | | | Allowable F ₄ Load (lb.) | | | | Code Ref. |
|-----------|--|---------|----------------------------|----------------------|----------------|-----------------|-------------------------------------|-----------------|-----------------|-------------------------------------|-----------|
| | | | | Pattern ¹ | Carried Member | Carrying Member | Minimum Member Thickness | | | Maximum Connector Load ³ | |
| | | | | | | | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | | |
| SFC2.25 | 54 (16) | 2¼ | 2½, 3¾ | Min. | (2) #10 | (2) #10 | 295 | 355 | 630 | 630 | IBC |
| SFC4.25 | 54 (16) | 4¼ | 6 | Min. | (2) #10 | (2) #10 | 355 | 525 | 745 | 1,750 | |
| | | | | Max. | (6) #10 | (6) #10 | 575 | 985 | 1,750 | | |
| SFC6.25 | 54 (16) | 6¼ | 8 | Min. | (4) #10 | (4) #10 | 590 | 1,035 | 1,840 | 2,640 | |
| | | | | Max. | (8) #10 | (8) #10 | 590 | 1,055 | 1,880 | | |



Typical SFC Installation

1. Min. fastener quantity and load values — fill all round holes; Max. fastener quantity and load values — fill all round and triangular holes.
2. Allowable loads are based on bracing of the members located within 12" of the connection.
3. Maximum allowable load for connector that may not be exceeded when designing custom installations. Designer is responsible for member and fastener design.
4. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

SFC Utility Clip Dimensions



RCA Rigid Connector Angles

The Simpson Strong-Tie® rigid connector angle is a general purpose clip angle designed for a wide range of cold-formed steel construction applications. With prepunched holes for fastener attachment, these L-shaped clips save time and labor on the job.

Features:

- Use with miscellaneous header/sill connections to jamb studs, jamb stud reinforcement at track, u-channel bridging, stud-blocking, bypass curtain-wall framing, joist connections and other versatile options
- Easy to install, with prepunched holes for quick and accurate fastener attachment

Material: RCAXXX/54 — 54 mil (16 ga.), 50 ksi
 RCAXXX/68 — 68 mil (14 ga.), 50 ksi
 RCAXXX/97 — 97 mil (12 ga.), 50 ksi
 (Note: “XXX” is model number shown below.)

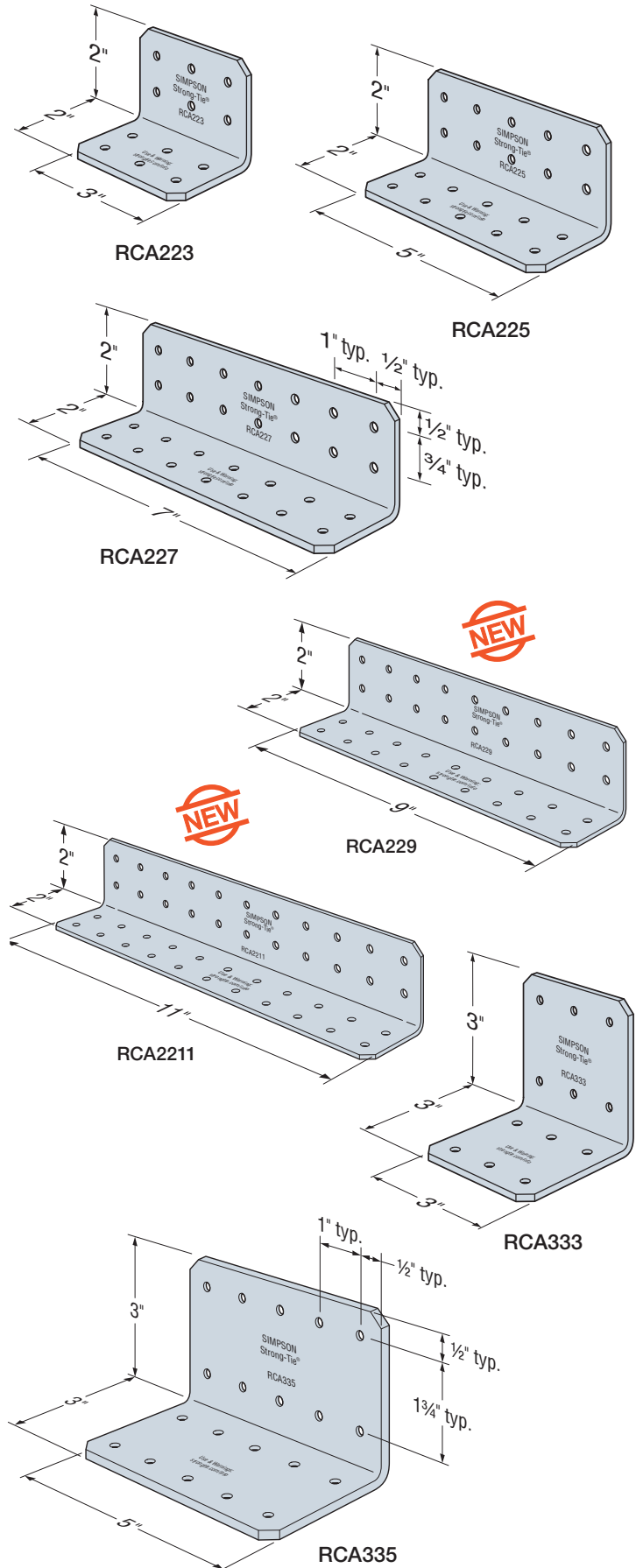
Finish: Galvanized (G90)

Installation:

- Use all specified anchors/fasteners

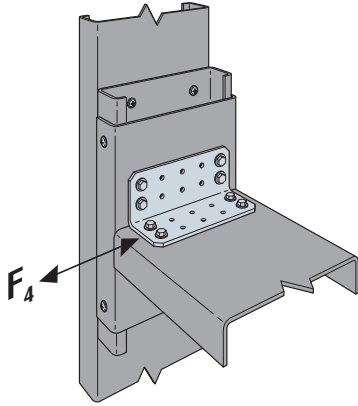
Ordering Information

| Model No. | Ordering SKU | Bucket Quantity |
|------------|----------------|-----------------|
| RCA223/54 | RCA223/54-R150 | 150 |
| RCA223/68 | RCA223/68-R125 | 125 |
| RCA223/97 | RCA223/97-R90 | 90 |
| RCA225/54 | RCA225/54-R90 | 90 |
| RCA225/68 | RCA225/68-R75 | 75 |
| RCA225/97 | RCA225/97-R55 | 55 |
| RCA227/54 | RCA227/54-R65 | 65 |
| RCA227/68 | RCA227/68-R55 | 55 |
| RCA227/97 | RCA227/97-R40 | 40 |
| RCA229/54 | RCA229/54-R50 | 50 |
| RCA229/68 | RCA229/68-R50 | 50 |
| RCA229/97 | RCA229/97-R35 | 35 |
| RCA2211/54 | RCA2211/54-R45 | 45 |
| RCA2211/68 | RCA2211/68-R40 | 40 |
| RCA2211/97 | RCA2211/97-R30 | 30 |
| RCA333/54 | RCA333/54-R100 | 100 |
| RCA333/68 | RCA333/68-R85 | 85 |
| RCA333/97 | RCA333/97-R60 | 60 |
| RCA335/54 | RCA335/54-R60 | 60 |
| RCA335/68 | RCA335/68-R50 | 50 |
| RCA335/97 | RCA335/97-R35 | 35 |

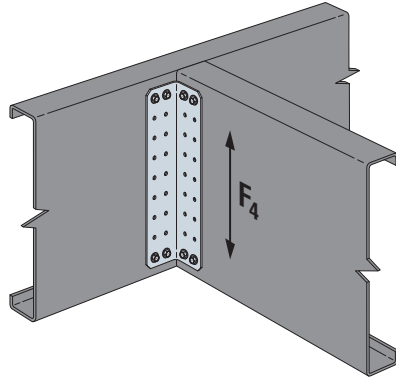


RCA Rigid Connector Angles

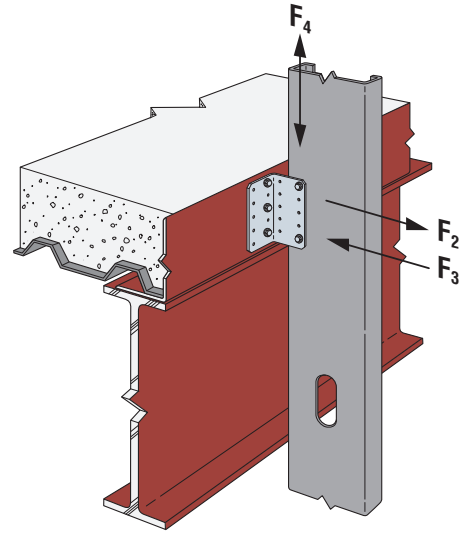
Rigid Connectors



Typical RCA225 Installation at Sill/Jamb



Typical RCA229 Installation at Joist Connection



Typical RCA335 Installation at Bypass Framing

Screw Patterns for Rigid Connector Angles

| Models | Pattern 3A | Pattern 3B | Pattern 3C | | |
|--|-------------|-------------|-------------|-------------|-------------|
| RCA223/54 RCA223/68 RCA223/97 RCA333/54 RCA333/68 RCA333/97 | | | | | |
| Models | Pattern 5A | Pattern 5B | Pattern 5C | Pattern 5D | Pattern 5E |
| RCA225/54 RCA225/68 RCA225/97 RCA335/54 RCA335/68 RCA335/97 | | | | | |
| Models | Pattern 7A | Pattern 7B | Pattern 7C | Pattern 7D | Pattern 7E |
| RCA227/54 RCA227/68 RCA227/97 | | | | | |
| Models | Pattern 9A | Pattern 9B | Pattern 9C | Pattern 9D | Pattern 9E |
| RCA229/54 RCA229/68 RCA229/97 | | | | | |
| Models | Pattern 11A | Pattern 11B | Pattern 11C | Pattern 11D | Pattern 11E |
| RCA2211/54 RCA2211/68 RCA2211/97 | | | | | |

RCA Rigid Connector Angles

RCA Rigid Connector Angles Allowable Loads (lb.)

| Model | No. of #10 Screws ^{5,6} | Screw Pattern | Stud Framing Thickness ¹ | | | | | | | | |
|-----------|----------------------------------|---------------|-------------------------------------|----------------|----------------|-----------------|----------------|----------------|-----------------|----------------|----------------|
| | | | 33 mil (20 ga.) | | | 43 mil (18 ga.) | | | 54 mil (16 ga.) | | |
| | | | F ₂ | F ₃ | F ₄ | F ₂ | F ₃ | F ₄ | F ₂ | F ₃ | F ₄ |
| RCA223/54 | 3 | 3A | 205 | 495 | 200 | 205 | 590 | 310 | 205 | 590 | 620 |
| | 4 | 3B | 205 | 580 | 390 | 205 | 580 | 605 | 205 | 580 | 1,095 |
| | 6 | 3C | 205 | 865 | 480 | 205 | 865 | 740 | 205 | 865 | 1,095 |
| RCA223/68 | 3 | 3A | 310 | 495 | 200 | 310 | 765 | 310 | 310 | 815 | 620 |
| | 4 | 3B | 310 | 660 | 390 | 310 | 805 | 605 | 310 | 805 | 1,210 |
| | 6 | 3C | 310 | 990 | 480 | 310 | 1,205 | 740 | 310 | 1,205 | 1,350 |
| RCA223/97 | 3 | 3A | 495 | 495 | 200 | 630 | 765 | 310 | 630 | 1,415 | 620 |
| | 4 | 3B | 630 | 660 | 390 | 630 | 1,020 | 605 | 630 | 1,265 | 1,210 |
| | 6 | 3C | 630 | 990 | 480 | 630 | 1,530 | 740 | 630 | 1,895 | 1,485 |
| RCA225/54 | 2 | 5A | 330 | 330 | 265 | 340 | 390 | 410 | 340 | 390 | 815 |
| | 4 | 5B | 340 | 580 | 535 | 340 | 580 | 830 | 340 | 580 | 1,660 |
| | 5 | 5C | 340 | 825 | 460 | 340 | 980 | 705 | 340 | 980 | 1,310 |
| | 8 | 5D | 340 | 1,155 | 915 | 340 | 1,155 | 1,420 | 340 | 1,155 | 1,825 |
| | 10 | 5E | 340 | 1,445 | 1,035 | 340 | 1,445 | 1,600 | 340 | 1,445 | 1,825 |
| RCA225/68 | 2 | 5A | 330 | 330 | 265 | 510 | 510 | 410 | 520 | 545 | 815 |
| | 4 | 5B | 520 | 660 | 535 | 520 | 805 | 830 | 520 | 805 | 1,660 |
| | 5 | 5C | 520 | 825 | 460 | 520 | 1,275 | 705 | 520 | 1,360 | 1,415 |
| | 8 | 5D | 520 | 1,320 | 915 | 520 | 1,605 | 1,420 | 520 | 1,605 | 2,255 |
| | 10 | 5E | 520 | 1,650 | 1,035 | 520 | 2,010 | 1,600 | 520 | 2,010 | 2,255 |
| RCA225/97 | 2 | 5A | 330 | 330 | 265 | 510 | 510 | 410 | 1,020 | 945 | 815 |
| | 4 | 5B | 660 | 660 | 535 | 1,020 | 1,020 | 830 | 1,050 | 1,265 | 1,660 |
| | 5 | 5C | 825 | 825 | 460 | 1,050 | 1,275 | 705 | 1,050 | 2,360 | 1,415 |
| | 8 | 5D | 1,050 | 1,320 | 915 | 1,050 | 2,040 | 1,420 | 1,050 | 2,525 | 2,835 |
| | 10 | 5E | 1,050 | 1,650 | 1,035 | 1,050 | 2,550 | 1,600 | 1,050 | 3,155 | 3,200 |
| RCA227/54 | 4 | 7A | 475 | 660 | 545 | 475 | 785 | 840 | 475 | 785 | 1,675 |
| | 4 | 7B | 475 | 580 | 595 | 475 | 580 | 920 | 475 | 580 | 1,840 |
| | 7 | 7C | 475 | 1,155 | 765 | 475 | 1,280 | 1,185 | 475 | 1,280 | 1,685 |
| | 8 | 7D | 475 | 1,155 | 1,120 | 475 | 1,155 | 1,730 | 475 | 1,155 | 2,555 |
| | 14 | 7E | 475 | 2,025 | 1,685 | 475 | 2,025 | 2,555 | 475 | 2,025 | 2,555 |
| RCA227/68 | 4 | 7A | 660 | 660 | 545 | 725 | 1,020 | 840 | 725 | 1,090 | 1,675 |
| | 4 | 7B | 660 | 660 | 595 | 725 | 805 | 920 | 725 | 805 | 1,840 |
| | 7 | 7C | 725 | 1,155 | 765 | 725 | 1,780 | 1,185 | 725 | 1,780 | 2,370 |
| | 8 | 7D | 725 | 1,320 | 1,120 | 725 | 1,605 | 1,730 | 725 | 1,605 | 3,155 |
| | 14 | 7E | 725 | 2,310 | 1,685 | 725 | 2,810 | 2,605 | 725 | 2,810 | 3,155 |
| RCA227/97 | 4 | 7A | 660 | 660 | 545 | 1,020 | 1,020 | 840 | 1,470 | 1,890 | 1,675 |
| | 4 | 7B | 660 | 660 | 595 | 1,020 | 1,020 | 920 | 1,470 | 1,265 | 1,840 |
| | 7 | 7C | 1,155 | 1,155 | 765 | 1,470 | 1,785 | 1,185 | 1,470 | 3,080 | 2,370 |
| | 8 | 7D | 1,320 | 1,320 | 1,120 | 1,470 | 2,040 | 1,730 | 1,470 | 2,525 | 3,460 |
| | 14 | 7E | 1,470 | 2,310 | 1,685 | 1,470 | 3,570 | 2,605 | 1,470 | 4,420 | 4,490 |
| RCA229/54 | 4 | 9A | 615 | 660 | 595 | 615 | 1,020 | 920 | 615 | 1,100 | 1,840 |
| | 4 | 9B | 615 | 660 | 620 | 615 | 815 | 960 | 615 | 815 | 1,920 |
| | 9 | 9C | 615 | 1,485 | 1,105 | 615 | 2,295 | 1,705 | 615 | 2,475 | 3,410 |
| | 8 | 9D | 615 | 1,320 | 1,210 | 615 | 1,630 | 1,865 | 615 | 1,630 | 3,735 |
| | 18 | 9E | 615 | 2,970 | 2,375 | 615 | 3,665 | 3,670 | 615 | 3,665 | 4,715 |
| RCA229/68 | 4 | 9A | 660 | 660 | 595 | 935 | 1,020 | 920 | 935 | 1,525 | 1,840 |
| | 4 | 9B | 660 | 660 | 620 | 935 | 1,020 | 960 | 935 | 1,130 | 1,920 |
| | 9 | 9C | 935 | 1,485 | 1,105 | 935 | 2,295 | 1,705 | 935 | 3,435 | 3,410 |
| | 8 | 9D | 935 | 1,320 | 1,210 | 935 | 2,040 | 1,865 | 935 | 2,260 | 3,735 |
| | 18 | 9E | 935 | 2,970 | 2,375 | 935 | 4,590 | 3,670 | 935 | 5,090 | 5,750 |
| RCA229/97 | 4 | 9A | 660 | 660 | 595 | 1,020 | 1,020 | 920 | 1,890 | 2,040 | 1,840 |
| | 4 | 9B | 660 | 660 | 620 | 1,020 | 1,020 | 960 | 1,890 | 1,610 | 1,920 |
| | 9 | 9C | 1,485 | 1,485 | 1,105 | 1,890 | 2,295 | 1,705 | 1,890 | 4,590 | 3,410 |
| | 8 | 9D | 1,320 | 1,320 | 1,210 | 1,890 | 2,040 | 1,865 | 1,890 | 3,220 | 3,735 |
| | 18 | 9E | 1,890 | 2,970 | 2,375 | 1,890 | 4,590 | 3,670 | 1,890 | 7,240 | 7,340 |

See footnotes on p. 106.

RCA Rigid Connector Angles

RCA Rigid Connector Angles Allowable Loads (lb.) (cont.)

Rigid Connectors

| Model | No. of #10 Screws ^{5,6} | Screw Pattern | Stud Framing Thickness ¹ | | | | | | | | |
|------------|----------------------------------|---------------|-------------------------------------|----------------|----------------|-----------------|----------------|----------------|-----------------|----------------|----------------|
| | | | 33 mil (20 ga.) | | | 43 mil (18 ga.) | | | 54 mil (16 ga.) | | |
| | | | F ₂ | F ₃ | F ₄ | F ₂ | F ₃ | F ₄ | F ₂ | F ₃ | F ₄ |
| RCA2211/54 | 4 | 11A | 660 | 660 | 620 | 700 | 1,020 | 960 | 700 | 1,100 | 1,915 |
| | 4 | 11B | 625 | 660 | 635 | 625 | 815 | 980 | 625 | 815 | 1,960 |
| | 11 | 11C | 750 | 1,815 | 1,450 | 750 | 2,805 | 2,245 | 750 | 3,030 | 4,490 |
| | 8 | 11D | 700 | 1,320 | 1,250 | 700 | 1,630 | 1,930 | 700 | 1,630 | 3,865 |
| | 22 | 11E | 750 | 3,630 | 3,075 | 750 | 4,480 | 4,755 | 750 | 4,480 | 5,765 |
| RCA2211/68 | 4 | 11A | 660 | 660 | 620 | 1,020 | 1,020 | 960 | 1,140 | 1,530 | 1,915 |
| | 4 | 11B | 660 | 660 | 635 | 1,020 | 1,020 | 980 | 1,140 | 1,130 | 1,960 |
| | 11 | 11C | 1,140 | 1,815 | 1,450 | 1,140 | 2,805 | 2,245 | 1,140 | 4,205 | 4,490 |
| | 8 | 11D | 1,140 | 1,320 | 1,250 | 1,140 | 2,040 | 1,930 | 1,140 | 2,260 | 3,865 |
| | 22 | 11E | 1,140 | 3,630 | 3,075 | 1,140 | 5,610 | 4,755 | 1,140 | 6,220 | 7,030 |
| RCA2211/97 | 4 | 11A | 660 | 660 | 620 | 1,020 | 1,020 | 960 | 2,040 | 2,040 | 1,915 |
| | 4 | 11B | 660 | 660 | 635 | 1,020 | 1,020 | 980 | 2,040 | 1,610 | 1,960 |
| | 11 | 11C | 1,815 | 1,815 | 1,450 | 2,310 | 2,805 | 2,245 | 2,310 | 5,610 | 4,490 |
| | 8 | 11D | 1,320 | 1,320 | 1,250 | 2,040 | 2,040 | 1,930 | 2,310 | 3,220 | 3,865 |
| | 22 | 11E | 2,310 | 3,630 | 3,075 | 2,310 | 5,610 | 4,755 | 2,310 | 8,850 | 9,510 |
| RCA333/54 | 3 | 3A | 205 | 440 | 130 | 205 | 440 | 195 | 205 | 440 | 395 |
| | 4 | 3B | 205 | 580 | 325 | 205 | 580 | 505 | 205 | 580 | 1,005 |
| | 6 | 3C | 205 | 865 | 430 | 205 | 865 | 665 | 205 | 865 | 1,095 |
| RCA333/68 | 3 | 3A | 310 | 495 | 130 | 310 | 615 | 195 | 310 | 615 | 395 |
| | 4 | 3B | 310 | 660 | 325 | 310 | 805 | 505 | 310 | 805 | 1,005 |
| | 6 | 3C | 310 | 990 | 430 | 310 | 1,205 | 665 | 310 | 1,205 | 1,335 |
| RCA333/97 | 3 | 3A | 495 | 495 | 130 | 630 | 765 | 195 | 630 | 1,065 | 395 |
| | 4 | 3B | 630 | 660 | 325 | 630 | 1,020 | 505 | 630 | 1,265 | 1,005 |
| | 6 | 3C | 630 | 990 | 430 | 630 | 1,530 | 665 | 630 | 1,895 | 1,335 |
| RCA335/54 | 2 | 5A | 330 | 295 | 205 | 340 | 295 | 320 | 340 | 295 | 635 |
| | 4 | 5B | 340 | 580 | 450 | 340 | 580 | 695 | 340 | 580 | 1,390 |
| | 5 | 5C | 340 | 735 | 305 | 340 | 735 | 475 | 340 | 735 | 835 |
| | 8 | 5D | 340 | 1,155 | 755 | 340 | 1,155 | 1,170 | 340 | 1,155 | 1,825 |
| | 10 | 5E | 340 | 1,445 | 860 | 340 | 1,445 | 1,330 | 340 | 1,445 | 1,825 |
| RCA335/68 | 2 | 5A | 330 | 330 | 205 | 510 | 410 | 320 | 520 | 410 | 635 |
| | 4 | 5B | 520 | 660 | 450 | 520 | 805 | 695 | 520 | 805 | 1,390 |
| | 5 | 5C | 520 | 825 | 305 | 520 | 1,025 | 475 | 520 | 1,025 | 945 |
| | 8 | 5D | 520 | 1,320 | 755 | 520 | 1,605 | 1,170 | 520 | 1,605 | 2,255 |
| | 10 | 5E | 520 | 1,650 | 860 | 520 | 2,010 | 1,330 | 520 | 2,010 | 2,255 |
| RCA335/97 | 2 | 5A | 330 | 330 | 205 | 510 | 510 | 320 | 1,020 | 710 | 635 |
| | 4 | 5B | 660 | 660 | 450 | 1,020 | 1,020 | 695 | 1,050 | 1,265 | 1,390 |
| | 5 | 5C | 825 | 825 | 305 | 1,050 | 1,275 | 475 | 1,050 | 1,775 | 945 |
| | 8 | 5D | 1,050 | 1,320 | 755 | 1,050 | 2,040 | 1,170 | 1,050 | 2,525 | 2,335 |
| | 10 | 5E | 1,050 | 1,650 | 860 | 1,050 | 2,550 | 1,330 | 1,050 | 3,155 | 2,660 |

- As applicable, the tabulated values are calculated based on AISI RP18-4, AISI S100 or generally accepted industry standards.
- The tabulated values do not account for anchorage to the support. Anchor strength must be calculated separately and may reduce the capacity of the connection when compared to the tabulated values.
- Tabulated values do not include shear, web crippling, buckling or other local effects in the member. The designer must check member limit states separately.
- For load combinations that include F₄ and/or F₂ and/or F₃, use an appropriate interaction equation.
- #10–16 screws shall have P_{SS} ≥ 1,620 lb. Calculated values are per AISI S100. Screws must be installed with three (minimum) exposed threads.
- The number of screws is for one clip leg that is attached to the supported stud.
- In addition to calculations of net and gross section tension, F₂ values are also calculated and normally controlled by weak-axis bending of the anchored clip leg with the line of bending at the holes nearest the bend radius of the angle. Moment arm of ¾" is used for F₂ loads. The designer is responsible for calculating pullover, pullout and tension strength of the anchors and this may reduce F₂ strength compared to the tabulated values.
- F₃ strength values are computed using the plate buckling provisions of AISI RP18-4.
- For the F₄ strength values it's assumed that all of the connection eccentricity is taken by the screws in the supported stud. F₄ values are also limited by plate shear buckling per AISI RP18-4. The designer is responsible for calculating the shear capacity of the anchorage, which may reduce F₄ strength compared to the tabulated values.
- In addition to the limit states given in notes 7, 8 and 9, F₂, F₃ and F₄ are also limited by screw shear according to the thinnest connected part of the connector and stud.
- For 50 ksi studs, 68 mil (14 ga.) and thicker, use the tabulated values for 54 mil (16 ga.) — 50 ksi studs.

LS and S/LS Skewable Angles

LS and S/LS angles are load rated and provide the correct thickness and number of fasteners the specifier is looking for compared with field fabricated clip angles. These angles also have well-defined fastener locations, and testing ensures that the tabulated load values account for connection eccentricities. The connectors are general utility reinforcing angles with multiple uses. LS and S/LS connectors are skewable and can be used to attach members intersecting at angles.

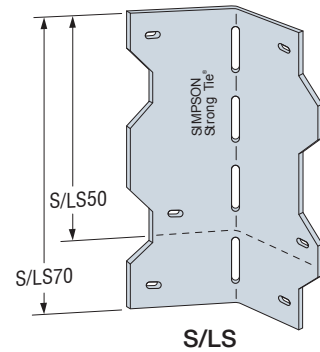
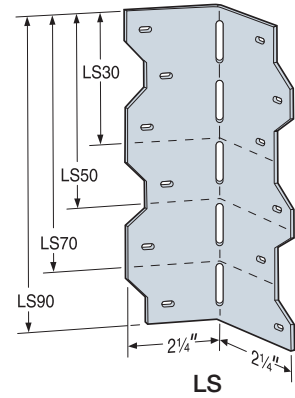
Material: LS — 43 mil (18 ga.); S/LS — 43 mil (18 ga.)

Finish: Galvanized (G90)

Installation:

- Use all specified fasteners
- Field-skewable; bend one time only
- CFS framing must be constrained against rotation when using a single connection

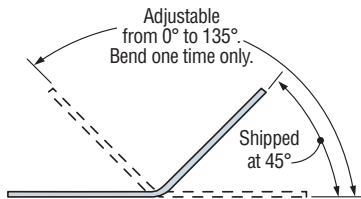
Codes: See p. 13 for Code Reference Key Chart



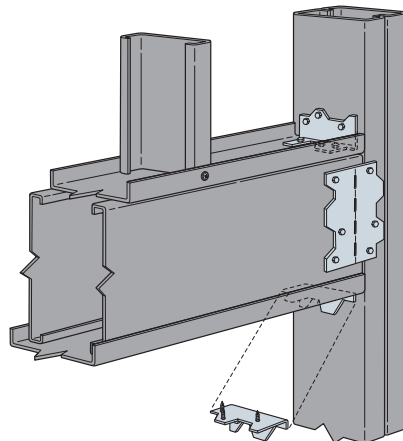
LS and S/LS Allowable Loads (lb.)

| Model No. | Length (in.) | Fasteners | Allowable Load (lb.) | | | | | | Code Ref. |
|-----------|--------------|-----------|----------------------|----|-----------------|----|-----------------|----|-----------|
| | | | 33 mil (20 ga.) | | 43 mil (18 ga.) | | 54 mil (16 ga.) | | |
| | | | F4 | F2 | F4 | F2 | F4 | F2 | |
| LS30 | 3% | (6) #10 | 200 | — | 370 | — | 500 | — | |
| S/LS50 | 4% | (4) #10 | 200 | — | 370 | — | 500 | — | |
| S/LS70 | 6% | (6) #10 | 465 | — | 575 | — | 715 | — | |
| LS90 | 7% | (12) #10 | 465 | — | 895 | — | 915 | — | |

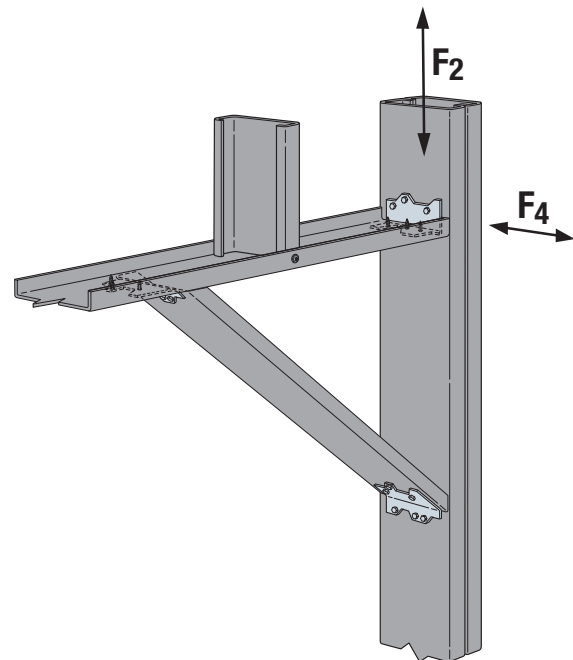
1. Loads are for one part only.
2. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



LS and S/LS Top View



Typical Installation for Gravity Headers



Typical Installation for Curtain-Wall Head

SHH Header Hanger



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

The SHH steel header hanger is used to support traditional CFS box headers that are fabricated with top and bottom tracks, as well as large-flange lay-in headers that are common in curtain-wall construction. The connector geometry minimizes drywall buildup, and the screw count has been minimized through extensive testing. A wide array of value-engineered hole patterns are available that will accommodate different load levels while minimizing installed cost.

Features:

- The bottom tabs transfer wind load from the horizontal window header to the jamb studs and help support the header assembly during installation.
- Tabulated loads are based on component assembly testing, which assists to mitigate design risk.
- The SHH6 is manufactured in steel thicknesses of 54 mil (16 ga.) and 68 mil (14 ga.) that are intended for use with 6"-deep (min.) box headers, and the SHH3 is manufactured from 68 mil (14 ga.) steel and is intended for 3 $\frac{5}{8}$ " or 4"-deep (max.) box headers and large-flange lay-in headers.
- To enable easier drywall installation, the gusset portion of the SHH is coped to avoid 1 $\frac{1}{2}$ " (max.) track legs.
- The screw-hole layout at the jamb studs accommodates flange sizes of 1 $\frac{5}{8}$ ", 2", 2 $\frac{1}{2}$ ", 3" and 3 $\frac{1}{2}$ ". This versatility allows two lines of fasteners to distribute the axial load.

Material: SHH3/68 – 68 mil (14 ga.), 40 ksi;
 SHH6/54 – 54 mil (16 ga.), 40 ksi;
 SHH6/68 – 68 mil (14 ga.), 40 ksi

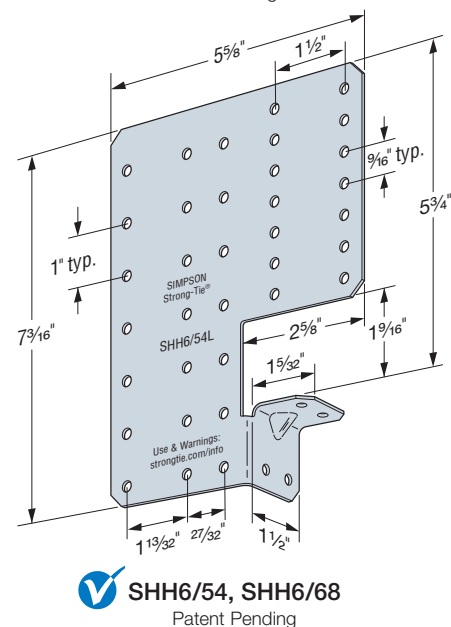
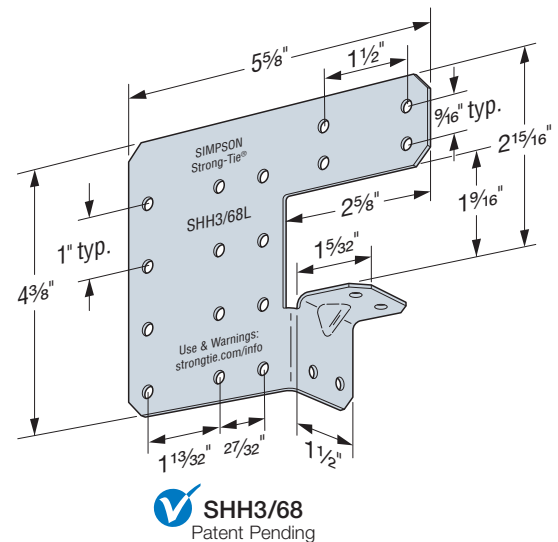
Finish: Galvanized (G90)

Installation:

- Use all specified anchors/fasteners.
- At each connection to a jamb stud, use one SHH connector on each side of the header. A $\frac{1}{8}$ " (max.) gap is allowed between the end of the header and the face of the jamb stud. Use all specified fasteners.

Codes: See p. 13 for Code Reference Key Chart.

Ordering Information: SHH3/68-KT24, SHH6/54-KT24 and SHH6/68-KT24 are each packaged as boxes of 12 right-handed connectors and 12 left-handed connectors.

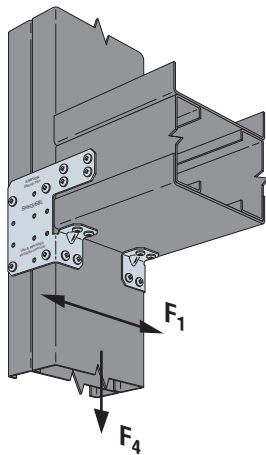


SHH Header Hanger

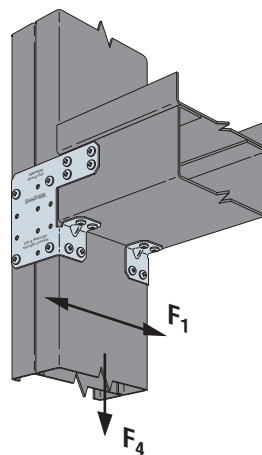
SHH Allowable Steel Header Hanger Connector Loads Total for Both Clips (lb.)

| Model No. | Screw Pattern | #10 Screws to Jamb (Total per Connection) | #10 Screws to Header (Total per Connection) | Load Direction | Jamb Stud Thickness mil (ga.) | Header Stud / Track Thickness mil (ga.) | | | | | Code Ref. |
|-----------|-------------------------------------|---|---|----------------|-------------------------------|---|---------|---------|---------|---------|-----------|
| | | | | | | 33 (20) | 43 (18) | 54 (16) | 68 (14) | 97 (12) | |
| SHH3/68 | A1 or A2 (with box header) | Flanges (8) Web (4) | Web (8) Track (4) | F ₁ | 33 (20) | 565 | 565 | | 565 | | |
| | | | | | 43 (18) | | 1,020 | | | | |
| | | | | | 54 (16) | | 1,845 | | | | |
| | | | | F ₄ | 33 (20) | 1,300 | 1,300 | | | | |
| | | | | | 43 (18) | | 1,740 | | | | |
| | | | | | 54 (16) | | 3,140 | | | | |
| SHH3/68 | B1 or B2 (with large-flange header) | Flanges (8) Web (4) | Flanges (8) Web (4) | F ₁ | 33 (20) | 335 | 335 | | 335 | | |
| | | | | | 43 (18) | | 635 | | | | |
| | | | | | 54 (16) | | 1,150 | | | | |
| | | | | F ₄ | 33 (20) | 1,285 | 1,285 | | | | |
| | | | | | 43 (18) | | 1,775 | | | | |
| | | | | | 54 (16) | | 2,275 | | | | |
| SHH6/54 | C1 or C2 | Flanges (8) Web (4) | Web (8) Track (4) | F ₁ | 33 (20) | 400 | 400 | | 400 | | |
| | | | | | 43 (18) | | 770 | | | | |
| | | | | | 54 (16) | | 770 | | | | |
| | | | | | 68 (14) | | 770 | | | | |
| | | | | F ₄ | 33 (20) | 1,705 | 1,705 | | | | |
| | | | | | 43 (18) | | 2,310 | | | | |
| | | | | | 54 (16) | | 3,525 | | | | |
| | | | | | 68 (14) | | 3,525 | 4,180 | 4,180 | | |
| SHH6/54 | D1 or D2 | Flanges (12) Web (4) | Web (12) Track (4) | F ₁ | 33 (20) | 400 | 400 | | 400 | | |
| | | | | | 43 (18) | | 775 | | | | |
| | | | | | 54 (16) | | 1,495 | | | | |
| | | | | F ₄ | 33 (20) | 1,705 | 1,705 | | | | |
| | | | | | 43 (18) | | 2,365 | | | | |
| | | | | | 54 (16) | | 5,335 | | | | |
| SHH6/54 | E1 or E2 | Flanges (16) Web (4) | Web (16) Track (4) | F ₁ | 33 (20) | 400 | 400 | | 400 | | |
| | | | | | 43 (18) | | 775 | | | | |
| | | | | | 54 (16) | | 1,495 | | | | |
| | | | | F ₄ | 33 (20) | 1,705 | 1,705 | | | | |
| | | | | | 43 (18) | | 2,365 | | | | |
| | | | | | 54 (16) | | 5,335 | | | | |

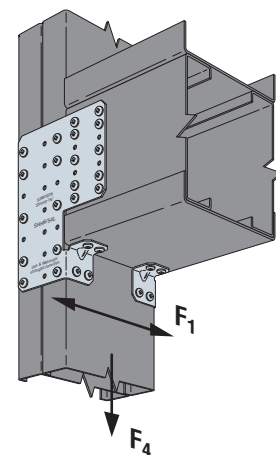
See footnotes on p. 110.



SHH3/68 with Box Header



SHH3/68 with Large-Flange Header



SHH6/54, SHH6/68

SHH Header Hanger

SHH Allowable Steel Header Hanger Connector Loads for Both Clips (lb.) (cont.)

Rigid Connectors

| Model No. | Screw Pattern | #10 Screws to Jamb (Total per Connection) | #10 Screws to Header (Total per Connection) | Load Direction | Jamb Stud Thickness mil (ga.) | Header Stud / Track Thickness mil (ga.) | | | | | Code Ref. |
|-----------|---------------|---|---|----------------|-------------------------------|---|---------|---------|---------|---------|-----------|
| | | | | | | 33 (20) | 43 (18) | 54 (16) | 68 (14) | 97 (12) | |
| SHH6/54 | F1 or F2 | Flanges (20) Web (4) | Web (20) Track (4) | F ₁ | 33 (20) | 400 | 400 | | 400 | | |
| | | | | | 43 (18) | | 775 | | 775 | | |
| | | | | | 54 (16) | | 775 | 1,565 | 1,565 | | |
| | | | | | 68 (14) | | | | 2,565 | | |
| | | | | F ₄ | 33 (20) | 1,705 | 1,705 | | 1,705 | | |
| | | | | | 43 (18) | | 2,365 | | 2,365 | | |
| | | | | | 54 (16) | | 2,365 | 5,650 | 5,650 | | |
| | | | | | 68 (14) | | | | 7,220 | | |
| SHH6/54 | G1 or G2 | Flanges (28) Web (4) | Web (28) Track (4) | F ₁ | 33 (20) | 400 | 400 | | 400 | | |
| | | | | | 43 (18) | | 775 | | 775 | | |
| | | | | | 54 (16) | | 775 | 1,565 | 1,565 | | |
| | | | | | 68 (14) | | | | 2,565 | | |
| | | | | | 97 (12) | | | | | | |
| | | | | F ₄ | 33 (20) | 1,705 | 1,705 | | 1,705 | | |
| | | | | | 43 (18) | | 2,365 | | 2,365 | | |
| | | | | | 54 (16) | | 2,365 | 5,650 | 5,650 | | |
| | | | | | 68 (14) | | | | 7,700 | | |
| | | | | | 97 (12) | | | | 7,700 | 9,710 | |
| SHH6/68 | E1 or E2 | Flanges (16) Web (4) | Web (16) Track (4) | F ₁ | 33 (20) | 400 | 400 | | 400 | | |
| | | | | | 43 (18) | | 870 | | 870 | | |
| | | | | | 54 (16) | | 870 | 1,610 | 1,610 | | |
| | | | | | 68 (14) | | | | 2,565 | | |
| | | | | F ₄ | 33 (20) | 1,705 | 1,705 | | 1,705 | | |
| | | | | | 43 (18) | | 2,365 | | 2,365 | | |
| | | | | | 54 (16) | | 2,365 | 5,665 | 5,665 | | |
| | | | | | 68 (14) | | | | 6,180 | | |
| SHH6/68 | F1 or F2 | Flanges (20) Web (4) | Web (20) Track (4) | F ₁ | 33 (20) | 400 | 400 | | 400 | | |
| | | | | | 43 (18) | | 775 | | 775 | | |
| | | | | | 54 (16) | | 775 | 1,565 | 1,565 | | |
| | | | | | 68 (14) | | | | 2,565 | | |
| | | | | F ₄ | 33 (20) | 1,705 | 1,705 | | 1,705 | | |
| | | | | | 43 (18) | | 2,365 | | 2,365 | | |
| | | | | | 54 (16) | | 2,365 | 5,665 | 5,655 | | |
| | | | | | 68 (14) | | | | 7,415 | | |
| SHH6/68 | G1 or G2 | Flanges (28) Web (4) | Web (28) Track (4) | F ₁ | 33 (20) | 400 | 400 | | 400 | | |
| | | | | | 43 (18) | | 870 | | 870 | | |
| | | | | | 54 (16) | | 870 | 1,610 | 1,610 | | |
| | | | | | 68 (14) | | | | 2,565 | | |
| | | | | | 97 (12) | | | | 2,565 | | |
| | | | | F ₄ | 33 (20) | 1,705 | 1,705 | | 1,705 | | |
| | | | | | 43 (18) | | 2,365 | | 2,365 | | |
| | | | | | 54 (16) | | 2,365 | 5,665 | 5,655 | | |
| | | | | | 68 (14) | | | | 7,700 | | |
| | | | | | 97 (12) | | | | 7,700 | 10,410 | |

1. Screws must be located in the patterns shown on p. 111 to achieve listed loads.

2. Connectors must be installed in pairs. Fasteners listed are number of fasteners for both clips in the connection at one end of header.

3. Allowable load is total load at one end of header assembly with both clips (left hand and right hand).

SHH Header Hanger

SHH Screw Patterns (Total Number of Screws Both Clips)

| SHH3/68 No. of Screws | Pattern A1 | Pattern A2 |
|--------------------------|------------|------------|
| Header Web (8) | | |
| Header Track (4) | | |
| Jamb Flanges (8) | | |
| Jamb Web (4) | | |

| SHH3/68 No. of Screws | Pattern B1 | Pattern B2 |
|--------------------------|------------|------------|
| Header Flange (8) | | |
| Header Web (4) | | |
| Jamb Flanges (8) | | |
| Jamb Web (4) | | |

| SHH6/54 No. of Screws | Pattern C1 | Pattern C2 |
|--------------------------|------------|------------|
| Header Web (8) | | |
| Header Track (4) | | |
| Jamb Flanges (8) | | |
| Jamb Web (4) | | |

| SHH6/54 No. of Screws | Pattern D1 | Pattern D2 |
|--------------------------|------------|------------|
| Header Web (12) | | |
| Header Track (4) | | |
| Jamb Flanges (12) | | |
| Jamb Web (4) | | |

| SHH6/54 or 68 No. of Screws | Pattern E1 | Pattern E2 |
|--------------------------------|------------|------------|
| Header Web (16) | | |
| Header Track (4) | | |
| Jamb Flanges (16) | | |
| Jamb Web (4) | | |

| SHH6/54 or 68 No. of Screws | Pattern F1 | Pattern F2 |
|--------------------------------|------------|------------|
| Header Web (20) | | |
| Header Track (4) | | |
| Jamb Flanges (20) | | |
| Jamb Web (4) | | |

| SHH6/54 or 68 No. of Screws | Pattern G1 | Pattern G2 |
|--------------------------------|------------|------------|
| Header Web (28) | | |
| Header Track (4) | | |
| Jamb Flanges (28) | | |
| Jamb Web (4) | | |

RCA-C Rigid Connector Angle for Concrete

Our lineup of rigid connector angles (RCA) has a new addition with the RCA-C. The RCA-C is an ideal solution for attaching stud framing to concrete supports. This connector provides the most anchor options for attaching to concrete in comparison to other similar connectors on the market. The connector's design includes holes for a 1/2"-diameter anchor, or two 1/4"-diameter concrete screws, accompanied by a wide array of fastening options — thus saving the installer the time and cost of drilling connector holes at the jobsite. In addition, the RCA connectors have been rigorously tested and load rated, giving you the confidence of quality and performance for your job.

Features:

- 2" x 2" legs provide plenty of room to make attachments to structure and stud framing.
- Multiple screw pattern options to stud framing for different load ratings.
- Can be used as either a heavy-duty shear and tension connector or light-duty moment connection.
- Prepunched holes for screws to stud framing and attachment to concrete. Prepunched holes on anchor leg provide options for (1) 1/2"-diameter anchor, (2) 1/4"-diameter anchors, or (2) 1/4"-diameter concrete screws.
- Attachment to concrete or masonry can be achieved with 1/2"-diameter Titen HD®, 1/2"-diameter Strong-Bolt® 2, 1/4"-diameter Titen HD, or 1/4"-diameter Titen Turbo™.

Material: RCA-C — 97 mil (12 ga.), 50 ksi

Finish: Galvanized (G90)

Installation:

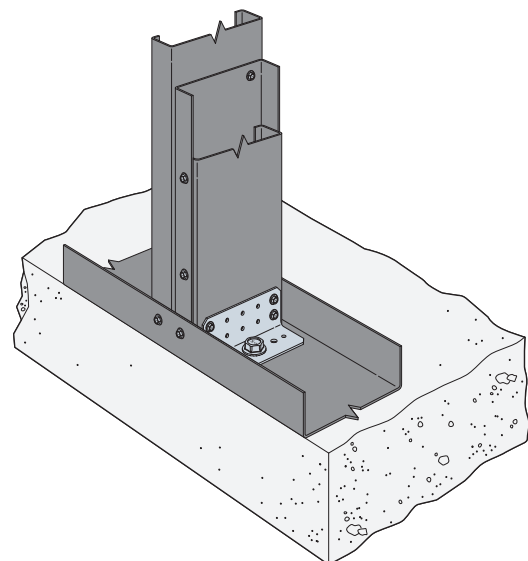
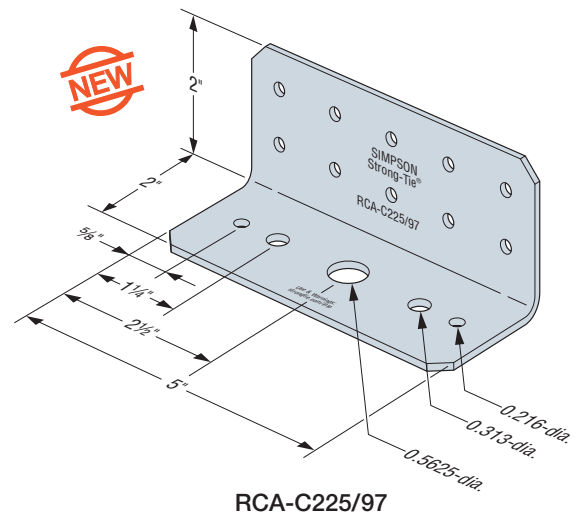
- Use all specified anchors/fasteners.

Codes: Tested per ICC-ES AC261 and calculations per AISI RP18-4, AISI S100 or generally accepted industry standards. Visit strongtie.com for the latest load values and testing information.

Ordering Information: RCA-C225/97-R55
(55 connectors per bucket)

Simpson Strong-Tie® Anchors for RCA-C Attachment to Concrete or Masonry

| Anchor Type | Anchor Diameter |
|---|-----------------|
| Titen HD Heavy-Duty Screw Anchor | 1/2" or 1/4" |
| Strong-Bolt 2 Wedge Anchor | 1/2" |
| Titen Turbo Concrete and Masonry Screw Anchor | 1/4" |



RCA-C Installation at Post

RCA-C Rigid Connector Angle for Concrete

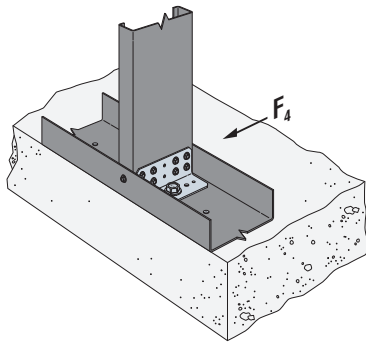


Figure A
F₄ Loading
(one anchor shown)

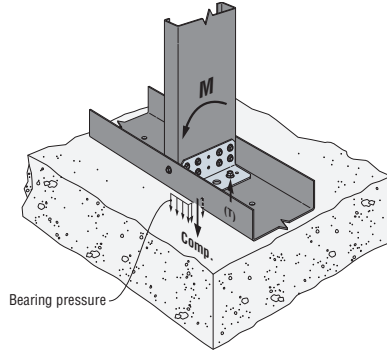


Figure B
Anchor Tension, T, Created from Moment
(two anchors shown)

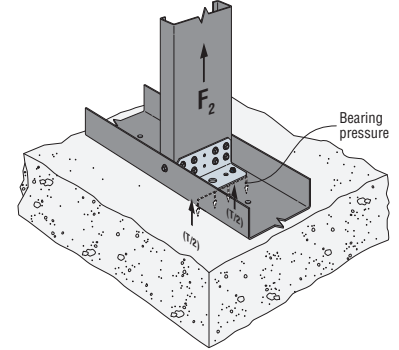


Figure C
Anchor Tension, T, Created from F₂
(two anchors shown)

Table 1: RCA-C Allowable Connector Loads (lb.)

| Model No. | Anchor Type | Fastener Pattern | No. of #10 Fasteners to Stud | Framing Member Thickness mil (ga.) | Connector Rotational Stiffness β (in.-kip/rad.) | Allowable Load | | | Anchor Tension, T | |
|-------------|---|------------------|------------------------------|------------------------------------|---|--------------------|------------------------------|----------------------------|------------------------------|---|
| | | | | | | Moment M (in.-lb.) | Tension F ₂ (lb.) | Shear F ₄ (lb.) | At Allowable Moment, M (lb.) | At Allowable Tension Load, F ₂ (lb.) |
| | | | | | | | | | f' _c = 4,000 psi | f' _c = 4,000 psi |
| RCA-C225/97 | (1) ½"-diameter Titen HD® or (1) ½"-diameter Strong-Bolt® 2 | 4A | 4 | 33 (20) | 130 | 845 | 660 | 425 | 345 | 705 |
| | | | | 43 (18) | 160 | 1,500 | 1,020 | 550 | 615 | 1,105 |
| | | | | 54 (16) | 165 | 1,900 | 1,050 | 1,050 | 785 | 1,140 |
| | | 8A | 8 | 33 (20) | 155 | 1,830 | 1,050 | 845 | 755 | 1,140 |
| | | | | 43 (18) | 160 | 3,215 | 1,050 | 1,105 | 1,355 | 1,140 |
| | | | | 54 (16) | 175 | 4,075 | 1,050 | 2,100 | 1,745 | 1,140 |
| | | 10A | 10 | 33 (20) | 155 | 3,430 | 1,050 | 845 | 1,455 | 1,140 |
| | | | | 43 (18) | 160 | 4,905 | 1,050 | 1,105 | 2,140 | 1,140 |
| | | | | 54 (16) | 175 | 7,640 | 1,050 | 2,100 | 3,540 | 1,140 |
| | (2) ¼"-diameter Titen HD | 4B | 4 | 33 (20) | 155 | 1,100 | 660 | 480 | 295 | 705 |
| | | | | 43 (18) | 200 | 1,770 | 1,020 | 625 | 480 | 1,105 |
| | | | | 54 (16) | 220 | 2,005 | 1,050 | 1,185 | 545 | 1,140 |
| | | 8B | 8 | 33 (20) | 170 | 2,375 | 1,050 | 960 | 645 | 1,140 |
| | | | | 43 (18) | 220 | 3,795 | 1,050 | 1,250 | 1,040 | 1,140 |
| | | | | 54 (16) | 240 | 4,300 | 1,050 | 2,375 | 1,180 | 1,140 |
| | | 10B | 10 | 33 (20) | 170 | 4,450 | 1,050 | 960 | 1,225 | 1,140 |
| | | | | 43 (18) | 220 | 5,790 | 1,050 | 1,250 | 1,610 | 1,140 |
| | | | | 54 (16) | 240 | 8,060 | 1,050 | 2,375 | 2,285 | 1,140 |
| | (2) ¼"-diameter Titen Turbo™ | 4C | 4 | 33 (20) | 190 | 1,100 | 660 | 480 | 250 | 705 |
| | | | | 43 (18) | 250 | 1,770 | 1,020 | 625 | 405 | 1,105 |
| | | | | 54 (16) | 310 | 2,005 | 1,050 | 1,185 | 460 | 1,140 |
| | | 8C | 8 | 33 (20) | 200 | 2,375 | 1,050 | 960 | 545 | 1,140 |
| | | | | 43 (18) | 260 | 3,795 | 1,050 | 1,250 | 880 | 1,140 |
| | | | | 54 (16) | 320 | 4,300 | 1,050 | 2,375 | 995 | 1,140 |
| 10C | | 10 | 33 (20) | 200 | 4,450 | 1,050 | 960 | 1,035 | 1,140 | |
| | | | 43 (18) | 260 | 5,790 | 1,050 | 1,250 | 1,355 | 1,140 | |
| | | | 54 (16) | 320 | 8,060 | 1,050 | 2,375 | 1,910 | 1,140 | |

- For additional important information, see General Information and Notes on p. 26.
- The designer is responsible for anchorage design. Reference Table 2 on p. 114 for anchorage solutions.
- See illustrations for fastener pattern placement.
- Tabulated values are based on framing members with track and stud of the same thickness and (1) #10 screw into each stud flange unless otherwise noted.
- Tabulated moment values correspond to maximum connector strength without consideration of serviceability. The designer must check out-of-plane deflections using tabulated rotational stiffness.
- Tabulated connector rotational stiffness may be used for any wall heights. The designer must consider member deflection due to bending in the stud member.
- Per IBC 2021, 2018, 2015, 2012 Table 1604.3 footnote f, wind load is permitted to be taken as 0.42 times "component and cladding loads" for deflection checks. For IBC 2009 and earlier, the factor is 0.7 instead of 0.42. Tabulated values have not been adjusted.
- Allowable loads are based on cold-formed steel members with a minimum F_y of 33 ksi and F_u of 45 ksi for 43 mil (18 ga.) and thinner and a minimum F_y of 50 ksi and F_u of 65 ksi for 54 mil (16 ga.) and thicker.
- Connectors subjected to tension, shear and moment loads: $F_2/F_{2all} + F_4/F_{4all} + M/M_{all} \leq 1.0$. F₄ interaction with Moment not required to be checked for walls 2'-0" or taller. Where: F₂, F₄ and M are the applied ASD tension, shear and moment, respectively. F_{2all}, F_{4all}, M_{all} are the allowable tension, shear and moment from Table 1, respectively.
- Anchor tension, T, is the force in the anchor, or both anchors for two-anchor solutions, at maximum allowable, M, or maximum allowable tension, F₂. See Table 2 on p. 114 for pre-engineered anchorage solutions that incorporate anchor T into the solution.
- Anchor tension is calculated using AISC Steel Design Guide 1. The Anchor Bolt Design illustration (Figure B) shows the anchor tension, T, based on an applied moment, M. An illustration for the anchor tension, T, based on a vertical tension load, F₂, shown in Figure C.
- Anchor tension, T, may be interpolated. Examples:
 - M_{req} = 3,312 in.-lb. (given), fastener pattern 10C, 54 mil studs. Anchor tension, T, at allowable moment = (3,312/8,060) x 1,910 = 785 lb.
 - T_{req} = 525 lb. (given), fastener pattern 4A, 33 mil studs. Anchor tension, T, at allowable tension load, F₂ = (525/660) x 755 = 601 lb.
- Tabulated anchor tension, T, is based on f'_c = 4,000 psi. For f'_c = 3,000 psi, use an increase factor of 1.05.

RCA-C Rigid Connector Angle for Concrete

Rigid Connectors

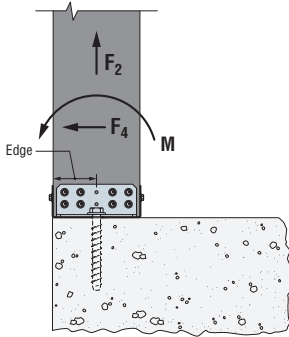


Figure A
One Anchor

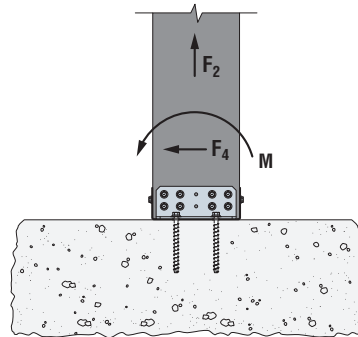


Figure B
Two Anchors

Table 2: RCA-C Allowable Anchorage Loads (lb.)

| Model No. | Type of Concrete | Anchor Type | Nominal Embedment Depth, l_{nom} (in.) | Min. Concrete Thickness, $l_{min.}$ (in.) | Min. Anchor Edge Distance (in.) | Uncracked 4,000 psi Concrete | | | Cracked 4,000 psi Concrete | | | | | |
|-------------------------------|--------------------------------|----------------------------------|--|---|---------------------------------|---------------------------------|---------------------|-------------------|---------------------------------|---------------------|-------------------|------------------------|---------------------|-------------------|
| | | | | | | Wind and Seismic in SDC A and B | | | Wind and Seismic in SDC A and B | | | Seismic in SDC C and D | | |
| | | | | | | Allowable | | | Allowable | | | Allowable | | |
| | | | | | | Moment M (in.-lb.) | Tension F_2 (lb.) | Shear F_4 (lb.) | Moment M (in.-lb.) | Tension F_2 (lb.) | Shear F_4 (lb.) | Moment M (in.-lb.) | Tension F_2 (lb.) | Shear F_4 (lb.) |
| RCA-C225/97 | SLWC | (1) 1/2"-diameter Titen HD® | 3 1/4 | 5 | 3 | 3,015 | 1,165 | 885 | 2,190 | 845 | 635 | 785 | 305 | 295 |
| | | | | | 12 | 3,425 | 1,320 | 1,560 | 2,465 | 950 | 1,105 | 885 | 340 | 515 |
| | | (1) 1/2"-diameter Strong-Bolt® 2 | 2 3/4 | 6 | 4 | 2,185 | 845 | 975 | 2,315 | 895 | 965 | 830 | 320 | 450 |
| | | | | | 12 | 2,890 | 1,115 | 1,465 | 2,315 | 895 | 1,035 | 830 | 320 | 485 |
| | | (2) 1/4"-diameter Titen HD | 1 5/8 | 3 1/4 | 1 1/2 | 1,265 | 565 | 445 | 1,205 | 540 | 315 | 425 | 190 | 150 |
| | | | | | 6 | 2,410 | 1,025 | 1,070 | 1,375 | 595 | 680 | 485 | 210 | 315 |
| | (2) 1/4"-diameter Titen Turbo™ | 1 3/4 | 3 1/4 | 1 3/4 | 1,360 | 590 | 495 | — | — | — | — | — | — | |
| | | | | 3 | 1,955 | 835 | 520 | — | — | — | — | — | — | |
| | NWC | (1) 1/2"-diameter Titen HD | 3 1/4 | 5 | 3 | 4,330 | 1,670 | 1,305 | 3,165 | 1,225 | 930 | 1,150 | 445 | 435 |
| | | | | | 12 | 4,895 | 1,890 | 2,295 | 3,555 | 1,375 | 1,625 | 1,295 | 500 | 760 |
| | | (1) 1/2"-diameter Strong-Bolt 2 | 2 3/4 | 6 | 4 | 3,160 | 1,220 | 1,435 | 3,345 | 1,290 | 1,420 | 1,215 | 470 | 665 |
| | | | | | 12 | 4,150 | 1,605 | 2,150 | 3,345 | 1,290 | 1,525 | 1,215 | 470 | 710 |
| (2) 1/4"-diameter Titen HD | | 1 5/8 | 3 1/4 | 1 1/2 | 1,855 | 825 | 655 | 1,765 | 785 | 465 | 625 | 280 | 220 | |
| | | | | 6 | 3,515 | 1,475 | 1,455 | 2,010 | 860 | 995 | 710 | 310 | 465 | |
| (2) 1/4"-diameter Titen Turbo | 1 3/4 | 3 1/4 | 1 3/4 | 1,990 | 855 | 520 | — | — | — | — | — | — | | |
| | | | 3 | 2,860 | 1,205 | 520 | — | — | — | — | — | — | | |

- Anchor allowable loads have been determined using ACI 318-14 Chapter 17 anchorage calculations with the minimum concrete compressive strength, f'_c , and slab thickness listed. Sand-Lightweight Concrete is abbreviated as SLWC, Normal Weight Concrete is abbreviated as NWC.
- Load values are for anchor based on ACI 318-14, condition B, load factors from ACI 318 Section 5.3, no supplemental edge reinforcement, $\Psi_{c,v} = 1.0$ for cracked concrete and periodic special inspection. Reference ICC-ES or IAPMO-UES evaluation reports for further information.
- Allowable Stress Design (ASD) values were determined by multiplying calculated strength design values by a conversion factor, Alpha (α), of 0.7 for seismic loads and 0.6 for wind loads. ASD values for other load combinations may be determined using alternate conversion factors.
- End distances are assumed as N/A perpendicular to load.
- Tabulated allowable ASD loads for Wind and Seismic in SDC A and B are based on using wind conversion factors and may be increased by 1.17 for seismic SDC A and B only.
- Allowable loads have been divided by an Omega (Ω) seismic factor of 2.5 for brittle failure as required by ACI 318-14 Chapter 17.
- Tabulated capacities are based on maximum allowable anchorage loads only. The capacity of the connection system shall be the minimum of the tabulated value and the RCA-C allowable load value listed on Table 1 on p. 113.
- Tabulated loads in Table 2 are based on $f'_c = 4,000$ psi. For $f'_c = 3,000$ psi, use an adjustment factor of 0.86.
- For anchor subjected to tension, shear and moment loads:

| | |
|--|--|
| When $(F_4/F_{4all}) \leq 0.2$ | $F_2/F_{2all} + M/M_{all} \leq 1.0$ |
| When $(F_2/F_{2all} + M/M_{all}) \leq 0.2$ | $F_4/F_{4all} \leq 1.0$ |
| When $(F_4/F_{4all}) > 0.2$ and $(F_2/F_{2all} + M/M_{all}) > 0.2$ | $(F_2/F_{2all} + M/M_{all}) + (F_4/F_{4all}) \leq 1.2$ |

 Where: F_2 , F_4 and M are the applied ASD tension, shear and moment, respectively.
 F_{2all} , F_{4all} , M_{all} are the allowable tension, shear and moment from Table 2, respectively.

RCA-C Fastener Patterns

| (1) 1/2"-Diameter Titen HD/Strong-Bolt 2 | | |
|--|------------|-------------|
| Pattern 4A | Pattern 8A | Pattern 10A |
| | | |
| (2) 1/4"-Diameter Titen HD | | |
| Pattern 4B | Pattern 8B | Pattern 10B |
| | | |
| (2) 1/4"-Diameter Titen Turbo | | |
| Pattern 4C | Pattern 8C | Pattern 10C |
| | | |

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RCA-C Rigid Connector Angle for Concrete

Example #1: Exterior Parapet Stud

- 2021 IBC (ASCE 7-16) and AISI S100-16
- 600S162-43 (33 ksi) stud @ 16" o.c. supported at base
- Parapet height, $L = 24"$
- Wind design pressure = 55.24 psf (LRFD)
- Deflection Limit, $\Delta_{allow} = L/240$ (Ref. IBC Table 1604.3)
- 4,000 psi NWC uncracked, SDC A&B, 3" edge

1. Determine ASD Wind Pressure:

$$p = (0.6)(55.24 \text{ psf}) = 33.14 \text{ psf}$$

$$w = (33.14 \text{ psf})(16 \text{ in.})(1 \text{ ft./12 in.}) = 44.19 \text{ plf}$$

2. Connector Moment Check:

$$M_{req} = \frac{wL^2}{2} = \frac{(44.19 \text{ plf})(24 \text{ in.})^2}{2 \left(12 \frac{\text{in.}}{\text{ft.}}\right)} = 1,061 \text{ in.-lb.}$$

From Table 1 for 600S162-43 (33ksi), 6" deep 43 mil stud:
 Select RCA-C225/97 (Fastener Pattern 4A) with $\frac{1}{2}" \phi$ anchor and (4) #10 screws, attaching to each stud @ 16" o.c.
 Allowable Moment 1,380 in.-lb. > 1,061 in.-lb. **OK**

3. Check Deflection at Required Moment:

$$\Delta_{req} = \Delta_{stud} + \Delta_{connection} = \frac{(0.7)wL^4}{8 E I_{xe}} + \left(\frac{(0.7)(M_{req})}{\beta}\right) L =$$

$$\Delta_{req} = \left(\frac{(0.7 \times 44.19 \text{ plf})(1 \text{ ft./12})(24 \text{ in.})^4}{8 (29,500,000 \text{ psi})(2.32 \text{ in.}^4)}\right) + \left(\frac{(0.7)(1,061 \text{ in.-lb.})}{165,000 \frac{\text{in.-lb.}}{\text{rad.}}}\right) 24 \text{ in.} = 0.002 \text{ in.} + 0.108 \text{ in.} = 0.110 \text{ in.}$$

$$\Delta_{allow} = \frac{2L}{240} = \frac{2(24 \text{ in.})}{240} = 0.200 \text{ in.} > 0.110 \text{ in.} \quad \mathbf{OK}$$

4. Select Anchorage:

Normal weight concrete with $f'_c = 4,000$ psi
 Table 2 — Uncracked concrete in SDC A&B
 (1) $\frac{1}{2}"$ -diameter Titen HD® with $3\frac{1}{4}"$ embedment and 3" edge

$$F_{4req} = \frac{(44.19 \text{ plf})(24 \text{ in.})}{\left(12 \frac{\text{in.}}{\text{ft.}}\right)} = 88.4 \text{ lb.} \quad F_{4all} = 1,305 \text{ lb.} \quad F_{4req}/F_{4all} = 0.07 < 1 \quad \mathbf{OK}$$

$$M_{req} = 1,061 \text{ in.-lb.} \quad M_{all} = 4,330 \text{ in.-lb.} \quad M_{req}/M_{all} = 0.25 < 1 \quad \mathbf{OK}$$

Notes:

1. 2021 IBC load combinations for ASD include a factor of 0.6 for wind loads.
2. Per IBC table 1604.3 footnote f, 0.42 factor can be used to calculate deflections for component and cladding wind loads for LRFD loads; ASD load conversion is 0.7.

Example #2: Load-Bearing Wall with Tension and Shear on Base Connector

- 2021 IBC (ASCE 7-16) and AISI S100-16
- 600S162-33 (33 ksi) stud @ 16" o.c. load bearing condition
- Base connection 4,000 psi NWC uncracked, SDC A&B, 3" edge (nearest fastener)
- Reactions $F_2 = 425 \text{ lb.}$, $F_4 = 147 \text{ lb.}$ (ASD Loads)

Select RCA-C225/97 (Fastener Pattern 4C) with (4) #10 screws and (2) $\frac{1}{4}"$ -diameter, $1\frac{3}{4}"$ embedded Titen Turbo™.

1. Determine Connector Allowables and Interactions (Reference Table 1 for Allowables):

$$F_{2req} = 425 \text{ lb.} \quad F_{2all} = 660 \text{ lb.} \quad F_{2req}/F_{2all} = 0.64 < 1 \quad \mathbf{OK}$$

$$F_{4req} = 147 \text{ lb.} \quad F_{4all} = 480 \text{ lb.} \quad F_{4req}/F_{4all} = 0.31 < 1 \quad \mathbf{OK}$$

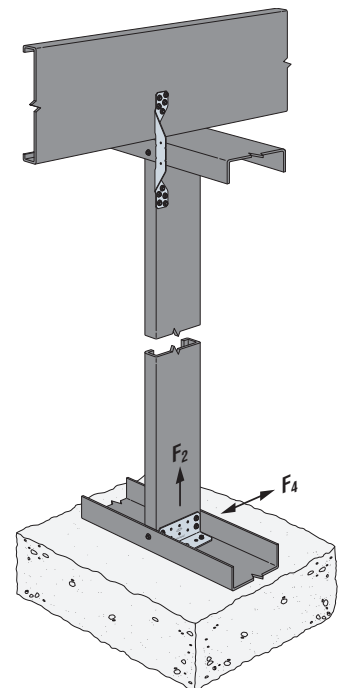
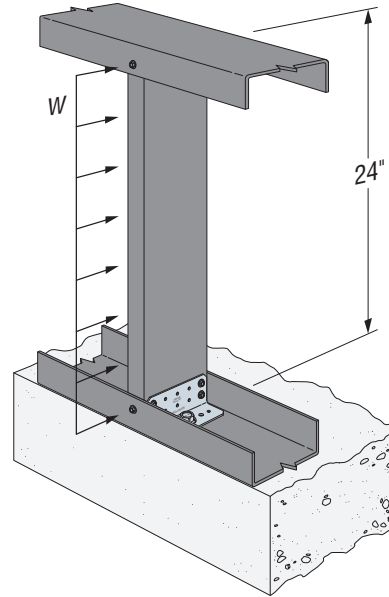
$$\text{Interaction} = 0.95 < 1 \quad \mathbf{OK}$$

2. Determine Anchorage Allowables and Interactions (Reference Table 2 for Allowables):

$$F_{2req} = 425 \text{ lb.} \quad F_{2all} = 1,205 \text{ lb.} \quad F_{2req}/F_{2all} = 0.35 < 1 \quad \mathbf{OK}$$

$$F_{4req} = 147 \text{ lb.} \quad F_{4all} = 520 \text{ lb.} \quad F_{4req}/F_{4all} = 0.28 < 1 \quad \mathbf{OK}$$

$$\text{Interaction} = 0.63 < 1.2 \quad \mathbf{OK}$$



RCKW Kneewall Connectors



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

The Simpson Strong-Tie® RCKW is a heavy 171 mil (7 ga.) rigid connector that has been developed to resist an overturning moment at the base of exterior kneewalls and parapets as well as interior partial-height walls or overhead ribbon window conditions. These connectors offer a unique small and large anchor-hole pattern that permits anchorage to both concrete and structural steel. The single-anchor RCKW has been redesigned to have all of the same features as the previous model but with an added two-anchor option that accommodates ½"- or ¾"-diameter concrete anchors. If load requires more capacity, a stiffener, the RCKWS can be added. The RCKWS is a heavy 171 mil (7 ga.) stiffener that nests onto the RCKW clip. The screw holes and anchor holes in the stiffener line up with those in the RCKW clip, making fastener and anchor installation a snap. The RCKW clip and RCKWS stiffener are sold separately.

Features:

- In addition to our RCKW3 and RCKW3S with a large single bolt hole for 3½" framing, we have the RCKW3D and RCKW3DS, which have two large holes for anchorage. This provides an option for more capacity in 3½"-framed kneewalls.
- Anchorage legs incorporate stiffened flanges, improving overturning moment resistance.
- Large-diameter anchor holes accommodate ½"-diameter concrete screw anchor and wedge anchors, such as the Simpson Strong-Tie Titen HD® heavy-duty screw anchor and the Strong-Bolt® 2 wedge anchor.
- The RCKW5.5 and RCKW7.5 have three large holes for added versatility. The center hole is for a one-anchor solution at the edge or center of slab. The outer holes are for a two-anchor solution that requires higher capacities at the center of slab. In addition, two ⅜" Titen HD screw anchors have been tested in the outer holes for shallow embedment conditions like fluted deck. The RCKW3 and RCKW3S have single large holes in the center, and the RCKW3D and RCKW3DS have two large holes on the outside for increased anchorage capacity.
- The smaller-diameter anchor holes enable attachment to structural steel with #12 self-drilling screws.
- Attachment to CMU can be achieved with Titen HD or Titen Turbo™ concrete and masonry screws.
- For the RCKWS: 171 mil (7 ga.) stiffeners are secured to the RCKW clip with screws, optimizing overturning moment resistance and stiffness.

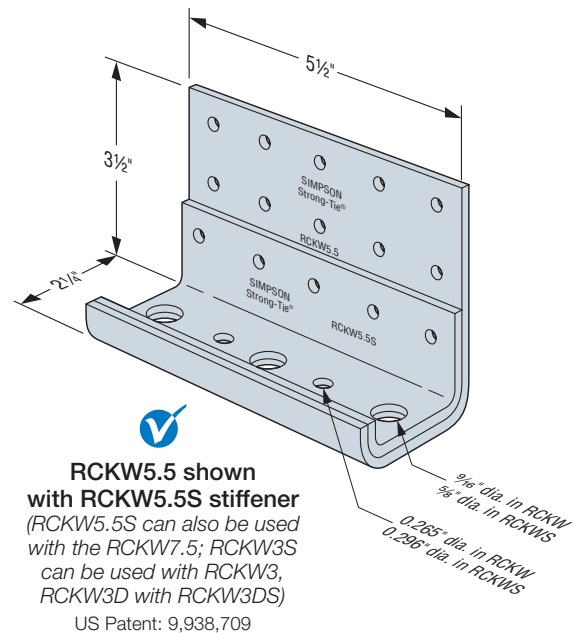
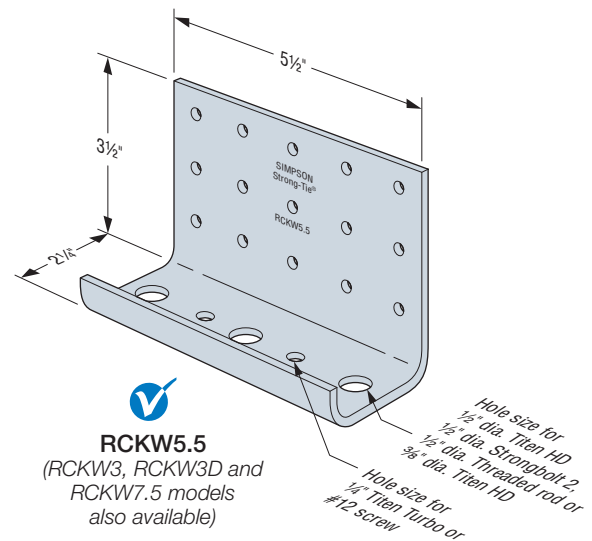
Material: RCKW and RCKWS — 171 mil (7 ga.), 33 ksi

Coating: Galvanized (G90)

Installation:

- Use all specified screw fasteners. To achieve tabulated load values, use #12–14 screws according to the fastener patterns on p. 121.
- When using the RCKWS, secure the stiffener to the clip with the specified screw fasteners. Screws must be at least 1" long and extend through the connection with a minimum of three exposed threads.
- Use all specified anchors. To achieve tabulated stiffness values, the installation torque for concrete anchors shall be at least 17 ft.-lb. or the torque requirements of the anchor, whichever is greater.
- When using the larger-diameter anchor holes, the bottom track must be predrilled or punched with a ¾"-diameter hole.

Codes: See p. 13 for Code Reference Key Chart



RCKW Kneewall Connectors

Ordering Information

| Model No. | Ordering SKU | Package Quantity |
|-----------|--------------|------------------------|
| RCKW3 | RCKW3-R10 | 10 RCKW3 clips |
| RCKW3D | RCKW3D-R10 | 10 RCKW3D clips |
| RCKW5.5 | RCKW5.5-R10 | 10 RCKW5.5 clips |
| RCKW7.5 | RCKW7.5-R10 | 10 RCKW7.5 clips |
| RCKW3S | RCKW3S-R10 | 10 RCKW3S stiffeners |
| RCKW3DS | RCKW3DS-R10 | 10 RCKW3DS stiffeners |
| RCKW5.5S | RCKW5.5S-R10 | 10 RCKW5.5S stiffeners |



RCKW assembly test with member failure.

Ease of Specification

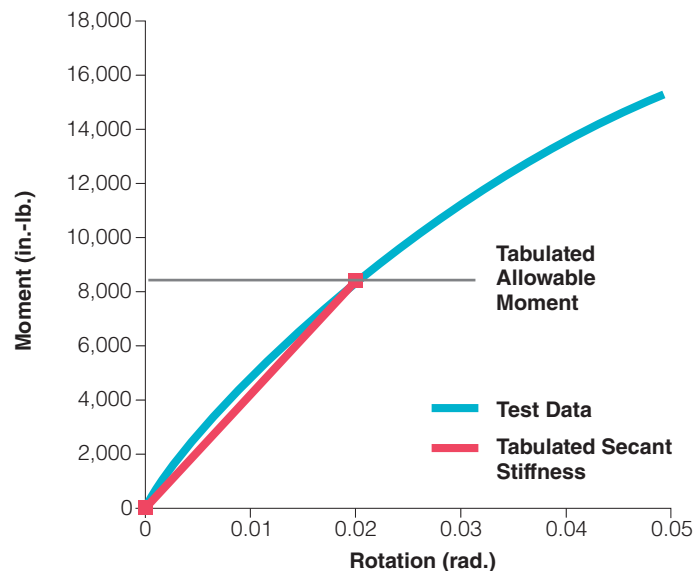
Many cold-formed steel connector manufacturers provide limited technical data for their products. As a result, designers often rely on detailed and time-consuming hand calculations for CFS connection design. This often involves assumptions regarding connection eccentricity, prying and connection stiffness.

Simpson Strong-Tie strives for ease of specification by providing comprehensive load tables based on tests that simulate real-world conditions. These load tables ensure that tabulated values reflect not only the strength of the connector, but also the strength of the fasteners, the anchorage, the member near the connection, and the overall stiffness. The photo to the right is an example of member failure near the connection. Such failures are reflected in our tabulated loads because of our assembly testing.

Simplified Stiffness Calculations

Some manufacturers tabulate stiffness values only for the connector. It's often unknown or unclear if their stiffness includes the screw fastener slip and how this varies with the thickness of the stud. Additionally, with some manufacturers, the deflection of the stud must be added to the deflection from the rotation of the connector in order to arrive at the final deflection for design.

Because we have tested the entire assembly, Simpson Strong-Tie tabulates stiffness that includes connector deflection, fastener slip and stud deflection for walls up to 38" in height. Our stiffness also takes into account the thickness of the stud, making it simple for the designer to calculate deflections: Simply divide the required moment by the tabulated stiffness, and then multiply the result by the stud length (Ref. Example #1 on p. 123). For walls over 38", a different approach is required (Ref. Example #2 on pp. 124–125).



RCKW Kneewall Connectors

Rigid Connectors

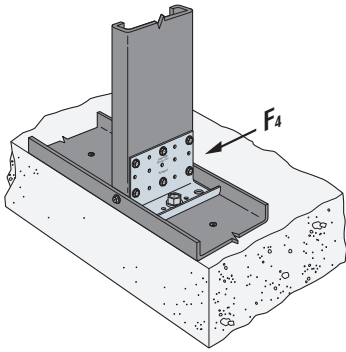


Figure A
F₄ Loading
(one anchor shown)

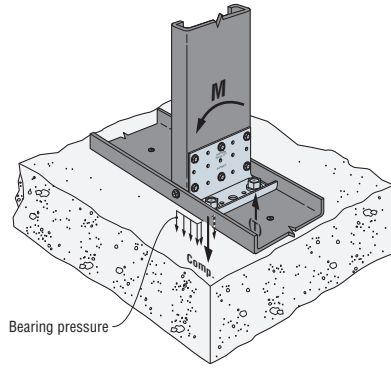


Figure B
Anchor Tension, T, Created from Moment
(two anchors shown)

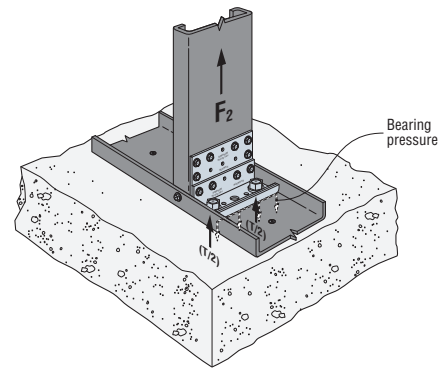


Figure C
Anchor Tension, T, Created from F₂
(two anchors shown)

Table 1: RCKW Allowable Loads (lb.) — Concrete Applications

| Model No. | Fastener Pattern No. | Anchor Bolt Diameter (in.) | Fasteners to Stud | Framing Members Thickness mil (ga.) | Assembly Rotational Stiffness β_c (in.-kip / rad.) | Connector Rotational Stiffness β_c (in.-kip / rad.) | Allowable Load | | | Anchor Tension, T | | | | Code Ref. |
|--------------------------------|----------------------|----------------------------|-------------------|-------------------------------------|--|---|--------------------|------------------------------|----------------------------|------------------------------|-----------------------------|---|-----------------------------|-----------|
| | | | | | | | Moment M (in.-lb.) | Tension F ₂ (lb.) | Shear F ₄ (lb.) | At Allowable Moment, M (lb.) | | At Allowable Tension Load, F ₂ (lb.) | | |
| | | | | | | | | | | f' _c = 3,000 psi | f' _c = 4,000 psi | f' _c = 3,000 psi | f' _c = 4,000 psi | |
| RCKW3 | 1 | (1) ½ | (4) #12 | 33 (20) | 87 | 93 | 2,425 | 860 | 620 | 1,870 | 1,790 | 1,080 | 1,055 | IBC, LA |
| | | | | 43 (18) | 113 | 115 | 3,080 | 1,340 | 755 | 2,510 | 2,355 | 1,780 | 1,705 | |
| | | | | 54 (16) | 128 | 137 | 4,330 | 1,850 | 1,120 | 4,120 | 3,590 | 2,645 | 2,470 | |
| | | | | 68 (14) | 141 | 153 | 5,150 | 1,850 | 1,120 | 6,530 ¹⁵ | 4,570 ¹⁵ | 2,645 | 2,470 | |
| RCKW3D | 1B | (2) ½ | (4) #12 | 33 (20) | 109 | 119 | 2,770 | 860 | 620 | 1,165 | 1,150 | 1,080 | 1,055 | — |
| | | | | 43 (18) | 126 | 136 | 3,860 | 1,340 | 755 | 1,665 | 1,630 | 1,780 | 1,705 | |
| | | | | 54 (16) | 165 | 180 | 5,530 | 1,850 | 1,120 | 2,480 | 2,400 | 2,645 | 2,470 | |
| | | | | 68 (14) | 302 | 343 | 6,280 | 1,850 | 1,120 | 2,870 | 2,760 | 2,645 | 2,470 | |
| RCKW3 and RCKW3S (Stiffener) | 2 | (1) ½ | (9) #12 | 33 (20) | 164 | 175 | 3,335 | 1,310 | 620 | 2,790 | 2,590 | 1,730 | 1,665 | IBC, LA |
| | | | | 43 (18) | 164 | 175 | 4,215 | 1,710 | 795 | 3,935 | 3,465 | 2,390 | 2,250 | |
| | | | | 54 (16) | 164 | 175 | 5,160 | 2,220 | 1,120 | 6,700 ¹⁵ | 4,585 ¹⁵ | 3,410 | 3,085 | |
| | | | | 68 (14) | 164 | 175 | 5,160 | 2,410 | 1,415 | 6,700 ¹⁵ | 4,585 ¹⁵ | 3,875 | 3,425 | |
| RCKW3D and RCKW3DS (Stiffener) | 2B | (2) ½ | (9) #12 | 33 (20) | 205 | 224 | 3,815 | 1,310 | 620 | 1,645 | 1,610 | 1,730 | 1,665 | — |
| | | | | 43 (18) | 303 | 371 | 5,215 | 1,710 | 795 | 2,320 | 2,250 | 2,390 | 2,250 | |
| | | | | 54 (16) | 341 | 410 | 7,930 | 2,220 | 1,120 | 3,800 | 3,595 | 3,410 | 3,085 | |
| | | | | 68 (14) | 341 | 410 | 7,930 | 2,410 | 1,415 | 3,800 | 3,595 | 3,875 | 3,425 | |

See footnotes on p. 120.

RCKW Kneewall Connectors

Table 1: RCKW Allowable Loads (lb.) — Concrete Applications (cont.)

| Model No. | Fastener Pattern No. | Anchor Bolt Diameter (in.) | Fasteners to Stud | Framing Members Thickness mil (ga.) | Assembly Rotational Stiffness β_c (in.-kip / rad.) | Connector Rotational Stiffness β_c (in.-kip / rad.) | Allowable Load | | | Anchor Tension, T | | | | Code Ref. |
|----------------------------------|----------------------|----------------------------|-------------------|-------------------------------------|--|---|--------------------|------------------------------|----------------------------|------------------------------|-----------------------------|---|-----------------------------|-----------|
| | | | | | | | Moment M (in.-lb.) | Tension F ₂ (lb.) | Shear F ₄ (lb.) | At Allowable Moment, M (lb.) | | At Allowable Tension Load, F ₂ (lb.) | | |
| | | | | | | | | | | f' _c = 3,000 psi | f' _c = 4,000 psi | f' _c = 3,000 psi | f' _c = 4,000 psi | |
| RCKW5.5 | 3 | (1) ½ | (6) #12 | 30 (20 DW) ^{5,6} | 258 | 280 | 3,775 | 1,030 | 600 | 1,455 | 1,435 | 1,250 | 1,235 | IBC, LA |
| | | | | 33 (20 STR) ⁶ | 260 | 281 | 4,670 | 1,140 | 665 | 1,830 | 1,795 | 1,395 | 1,375 | |
| | | | | 33 (20) | 304 | 328 | 4,670 | 1,140 | 665 | 1,830 | 1,795 | 1,395 | 1,375 | |
| | | | | 43 (18) | 320 | 338 | 6,245 | 1,440 | 1,035 | 2,525 | 2,450 | 1,790 | 1,755 | |
| | | | | 54 (16) | 320 | 338 | 8,225 | 2,455 | 1,390 | 3,465 | 3,320 | 3,255 | 3,125 | |
| | | | | 68 (14) | 417 | 438 | 9,375 | 2,455 | 1,390 | 4,065 | 3,850 | 3,255 | 3,125 | |
| | 3A | (2) ¾ | (6) #12 | 30 (20 DW) ^{5,6} | 258 | 280 | 3,775 | 1,030 | 600 | 770 | 765 | 1,250 | 1,235 | |
| | | | | 33 (20 STR) ⁶ | 260 | 281 | 4,670 | 1,140 | 665 | 955 | 950 | 1,395 | 1,375 | |
| | | | | 33 (20) | 304 | 328 | 4,670 | 1,140 | 665 | 955 | 950 | 1,395 | 1,375 | |
| | | | | 43 (18) | 333 | 355 | 6,245 | 1,440 | 1,035 | 1,285 | 1,275 | 1,790 | 1,755 | |
| | | | | 54 (16) | 412 | 439 | 8,865 | 2,455 | 1,390 | 1,845 | 1,830 | 3,255 | 3,125 | |
| | | | | 68 (14) | 489 | 519 | 11,620 | 2,455 | 1,390 | 2,455 ¹⁶ | 2,420 ¹⁶ | 3,255 | 3,125 | |
| | 3B | (2) ½ | (6) #12 | 30 (20 DW) ^{5,6} | 258 | 280 | 3,775 | 1,030 | 600 | 770 | 765 | 1,250 | 1,235 | |
| | | | | 33 (20 STR) ⁶ | 260 | 281 | 4,670 | 1,140 | 665 | 955 | 950 | 1,395 | 1,375 | |
| | | | | 33 (20) | 304 | 328 | 4,670 | 1,140 | 665 | 955 | 950 | 1,395 | 1,375 | |
| | | | | 43 (18) | 333 | 355 | 6,245 | 1,440 | 1,035 | 1,285 | 1,275 | 1,790 | 1,755 | |
| | | | | 54 (16) | 593 | 651 | 9,995 | 2,455 | 1,390 | 2,095 | 2,070 | 3,255 | 3,125 | |
| | | | | 68 (14) | 674 | 734 | 11,630 | 2,455 | 1,390 | 2,460 | 2,420 | 3,255 | 3,125 | |
| RCKW5.5 and RCKW5.5S (Stiffener) | 4 | (1) ½ | (10) #12 | 33 (20) | 256 | 272 | 4,855 | 1,660 | 665 | 1,910 | 1,870 | 2,090 | 2,040 | |
| | | | | 43 (18) | 450 | 490 | 8,445 | 2,165 | 1,035 | 3,580 | 3,420 | 2,815 | 2,720 | |
| | | | | 54 (16) | 467 | 502 | 11,575 | 2,980 | 1,390 | 5,340 ¹⁵ | 4,930 ¹⁵ | 4,115 | 3,895 | |
| | | | | 68 (14) | 511 | 513 | 14,040 | 2,980 | 1,830 | 7,105 ¹⁵ | 6,275 ¹⁵ | 4,115 | 3,895 | |
| | 4A | (2) ¾ | (10) #12 | 33 (20) | 256 | 272 | 4,855 | 1,660 | 665 | 990 | 985 | 2,090 | 2,040 | |
| | | | | 43 (18) | 450 | 490 | 8,445 | 2,165 | 1,035 | 1,755 | 1,740 | 2,815 | 2,720 | |
| | | | | 54 (16) | 530 | 576 | 12,920 | 2,980 | 1,390 | 2,705 ¹⁶ | 2,705 ¹⁶ | 4,115 | 3,895 | |
| | | | | 68 (14) | 626 | 678 | 14,300 | 2,980 | 1,830 | 3,065 ¹⁶ | 3,010 ¹⁶ | 4,115 | 3,895 | |
| | 4B | (2) ½ | (10) #12 | 33 (20) | 256 | 272 | 4,855 | 1,660 | 665 | 990 | 985 | 2,090 | 2,040 | |
| | | | | 43 (18) | 450 | 490 | 8,445 | 2,165 | 1,035 | 1,755 | 1,740 | 2,815 | 2,720 | |
| | | | | 54 (16) | 669 | 742 | 13,455 | 2,980 | 1,390 | 2,870 | 2,820 | 4,115 | 3,895 | |
| | | | | 68 (14) | 867 | 966 | 16,515 | 2,980 | 1,830 | 3,585 | 3,505 | 4,115 | 3,895 | |
| RCKW7.5 | 5 | (1) ½ | (6) #12 | 33 (20) | 389 | 402 | 6,445 | 1,095 | 795 | 1,815 | 1,790 | 1,315 | 1,300 | |
| | | | | 43 (18) | 510 | 536 | 8,200 | 1,280 | 1,200 | 2,345 | 2,300 | 1,550 | 1,530 | |
| | | | | 54 (16) | 554 | 571 | 11,400 | 2,165 | 1,695 | 3,370 | 3,275 | 2,715 | 2,655 | |
| | | | | 68 (14) | 605 | 628 | 13,895 | 2,165 | 1,695 | 4,225 | 4,065 | 2,715 | 2,655 | |
| | 5A | (2) ¾ | (6) #12 | 33 (20) | 389 | 402 | 6,445 | 1,095 | 795 | 1,095 | 1,090 | 1,315 | 1,300 | |
| | | | | 43 (18) | 510 | 536 | 8,200 | 1,280 | 1,200 | 1,400 | 1,395 | 1,550 | 1,530 | |
| | | | | 54 (16) | 820 | 868 | 12,840 | 2,165 | 1,695 | 2,230 ¹⁶ | 2,205 ¹⁶ | 2,715 | 2,655 | |
| | | | | 68 (14) | 912 | 965 | 14,920 | 2,165 | 1,695 | 2,610 ¹⁶ | 2,575 ¹⁶ | 2,715 | 2,655 | |
| | 5B | (2) ½ | (6) #12 | 33 (20) | 389 | 402 | 6,445 | 1,095 | 795 | 1,095 | 1,090 | 1,315 | 1,300 | |
| | | | | 43 (18) | 510 | 536 | 8,200 | 1,280 | 1,200 | 1,400 | 1,395 | 1,550 | 1,530 | |
| | | | | 54 (16) | 867 | 927 | 13,255 | 2,165 | 1,695 | 2,305 | 2,280 | 2,715 | 2,655 | |
| | | | | 68 (14) | 912 | 965 | 15,640 | 2,165 | 1,695 | 2,745 | 2,705 | 2,715 | 2,655 | |

See footnotes on p. 120.

RCKW Kneewall Connectors

Table 1: RCKW Allowable Loads (lb.) — Concrete Applications (cont.)

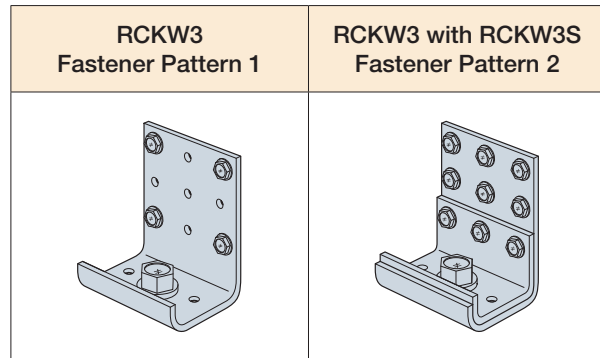
| Model No. | Fastener Pattern No. | Anchor Bolt Diameter (in.) | Fasteners to Stud | Framing Members Thickness mil (ga.) | Assembly Rotational Stiffness β_c (in.-kip / rad.) | Connector Rotational Stiffness β_c (in.-kip / rad.) | Allowable Load | | | Anchor Tension, T | | | | Code Ref. |
|----------------------------------|----------------------|----------------------------|-------------------|-------------------------------------|--|---|--------------------|------------------------------|----------------------------|------------------------------|-----------------------------|---|-----------------------------|-----------|
| | | | | | | | Moment M (in.-lb.) | Tension F ₂ (lb.) | Shear F ₄ (lb.) | At Allowable Moment, M (lb.) | | At Allowable Tension Load, F ₂ (lb.) | | |
| | | | | | | | | | | f' _c = 3,000 psi | f' _c = 4,000 psi | f' _c = 3,000 psi | f' _c = 4,000 psi | |
| RCKW7.5 and RCKW5.5S (Stiffener) | 6 | (1) ½ | (10) #12 | 33 (20) | 495 | 517 | 8,705 | 1,730 | 795 | 2,505 | 2,450 | 2,130 | 2,095 | IBC, LA |
| | | | | 43 (18) | 591 | 623 | 10,915 | 2,255 | 1,200 | 3,210 | 3,125 | 2,840 | 2,775 | |
| | | | | 54 (16) | 689 | 720 | 14,045 | 2,625 | 1,695 | 4,275 | 4,115 | 3,360 | 3,265 | |
| | | | | 68 (14) | 689 | 720 | 16,670 | 2,665 | 2,065 | 5,254 ¹⁵ | 4,985 ¹⁵ | 3,420 | 3,320 | |
| | 6A | (2) ¾ | (10) #12 | 33 (20) | 495 | 517 | 8,705 | 1,730 | 795 | 1,490 | 1,480 | 2,130 | 2,095 | |
| | | | | 43 (18) | 591 | 623 | 10,915 | 2,255 | 1,200 | 1,885 | 1,865 | 2,840 | 2,775 | |
| | | | | 54 (16) | 873 | 930 | 17,175 | 2,625 | 1,695 | 3,030 ¹⁶ | 2,985 ¹⁶ | 3,360 | 3,265 | |
| | | | | 68 (14) | 959 | 1,011 | 18,370 | 2,665 | 2,065 | 3,255 ¹⁶ | 3,200 ¹⁶ | 3,420 | 3,320 | |
| | 6B | (2) ½ | (10) #12 | 33 (20) | 495 | 517 | 8,705 | 1,730 | 795 | 1,490 | 1,480 | 2,130 | 2,095 | |
| | | | | 43 (18) | 591 | 623 | 10,915 | 2,255 | 1,200 | 1,885 | 1,865 | 2,840 | 2,775 | |
| | | | | 54 (16) | 923 | 991 | 19,940 | 2,625 | 1,695 | 3,550 | 3,490 | 3,360 | 3,265 | |
| | | | | 68 (14) | 1,040 | 1,107 | 22,555 | 2,665 | 2,065 | 4,060 | 3,975 | 3,420 | 3,320 | |

- For additional important information, see General Information and Notes on p. 26.
- The designer is responsible for anchorage design.
- See illustrations for fastener pattern placement.
- Tabulated values are based on framing members with track and stud of the same thickness and (1) #10 screw into each stud flange unless otherwise noted.
- Tabulated values may be used for framing members with track and stud of thickness 20 mil, F_y = 57 ksi (20 EQ).
- Tabulated values are applicable for framing members with CFS track of thickness 20 mil, F_y = 57 ksi (20 EQ).
- EQ — equivalent, DW — drywall, STR — structural.
- Tabulated moment values correspond to maximum connector strength without consideration of serviceability. Designer must check out-of-plane deflections using tabulated Rotational Stiffness.
- Tabulated Assembly Rotational Stiffness is applicable for walls at 38" tall with corresponding framing member depth and thickness. Reference Example #1 on p. 123.
- Tabulated Connector Rotational Stiffness may be used for any wall heights; the designer must consider member deflection due to bending in the stud member. Reference Example #2 on pp. 124–125.
- Per IBC 2012 and later Table 1604.3 footnote f, wind load is permitted to be taken as 0.42 times "component and cladding loads" for deflection checks. For IBC 2009 and earlier, the factor is 0.7 instead of 0.42. Tabulated values have not been adjusted.
- Anchor tension, T, is the force in the anchor, or both anchors for two-anchor solutions, at maximum allowable, M, or maximum allowable tension, F₂.
- Tabulated values for anchor tension, T, at allowable tension load, F₂, are provided for total anchor tension for (1) anchor and (2) anchors. See p. 126 for anchorage design tables and illustrations.
- Anchor tension is calculated using AISC Steel Design Guide 1. The 'Anchor Bolt Design' illustration (Figure B) shows the anchor tension, T, based on an applied moment, M. An illustration for the anchor tension, T, based on a vertical tension load, F₂, shown in Figure C.
- Tabulated allowable tension loads for the connectors with ½"-diameter anchor bolts require ASTM F3125, Grade A325 or ASTM A449 high-strength bolts. For A307 Grade A bolt, anchor tension load is limited to 4,410 lb.
- Tabulated allowable tension loads for the connectors with ¾"-diameter anchor bolts require ASTM F3125, Grade A325 or ASTM A449 high-strength bolts. For A307 Grade A bolt, anchor tension load is limited to 2,200 lb.
- Anchor tension, T, may be interpolated. See footnotes on p. 128.

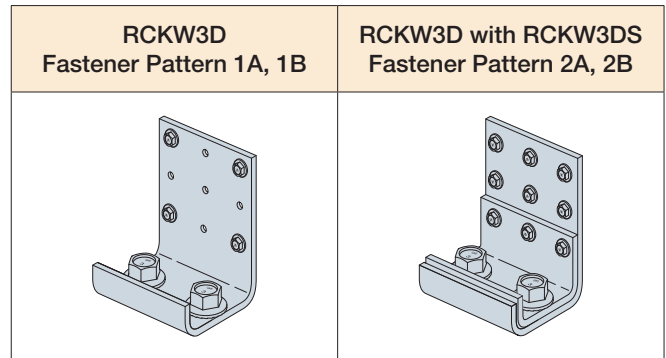
RCKW Kneewall Connectors

RCKW Fastener Patterns

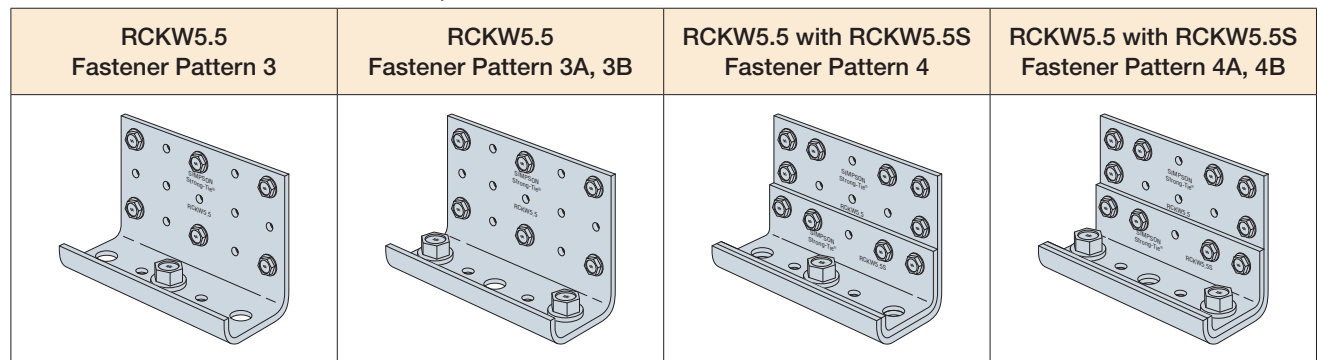
RCKW3 and RCKW3S Options



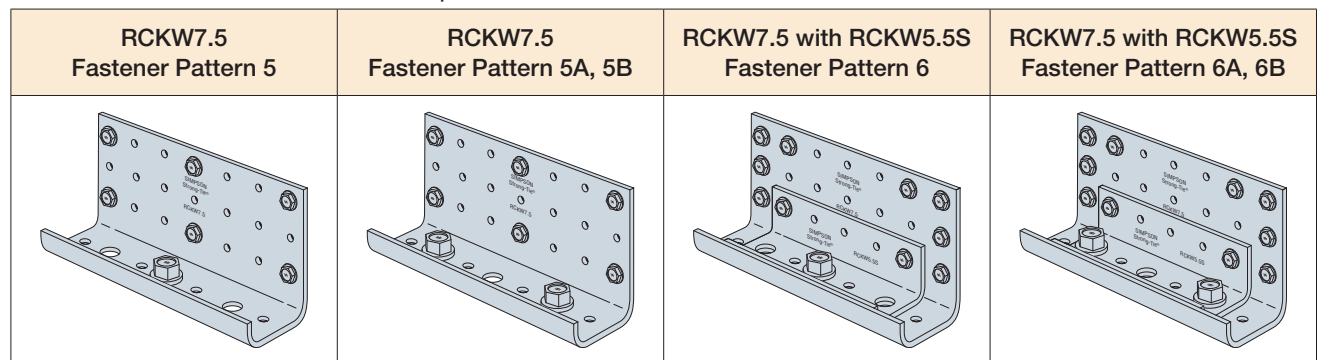
RCKW3D and RCKW3DS Options



RCKW5.5 and RCKW5.5S Options

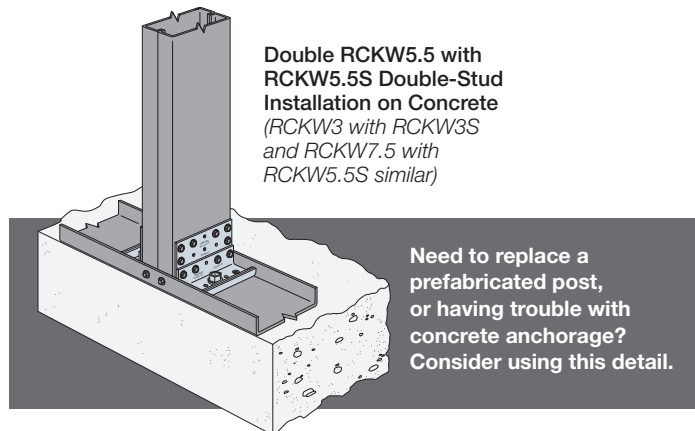
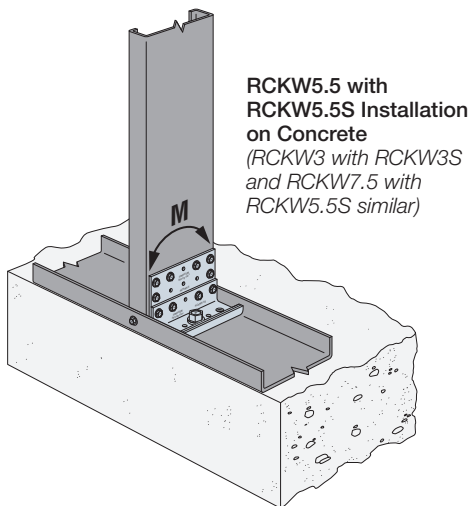
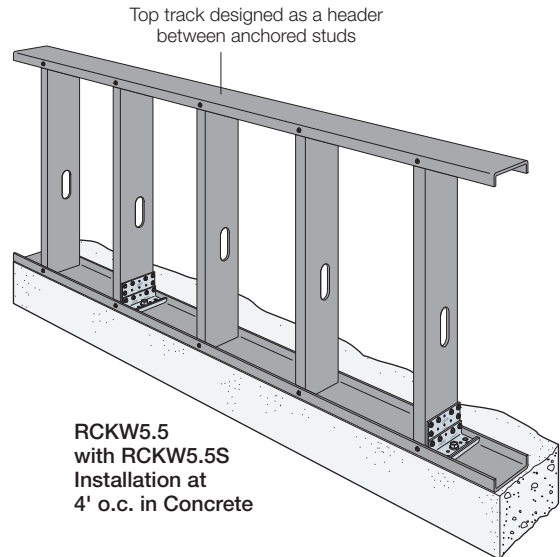
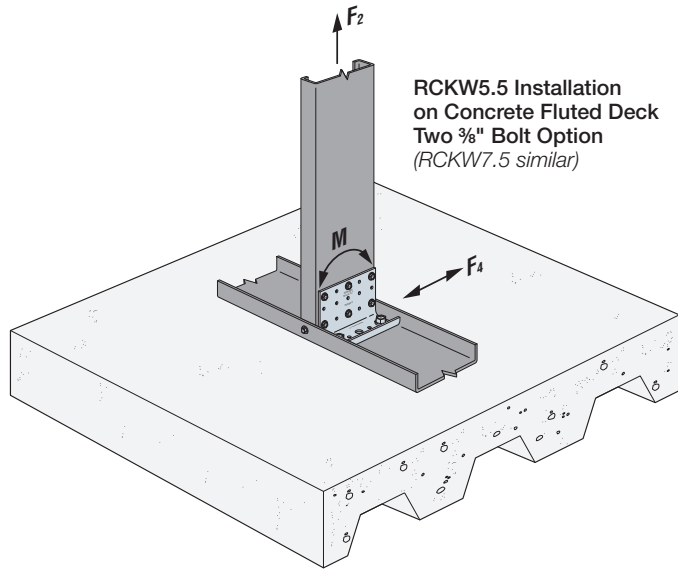
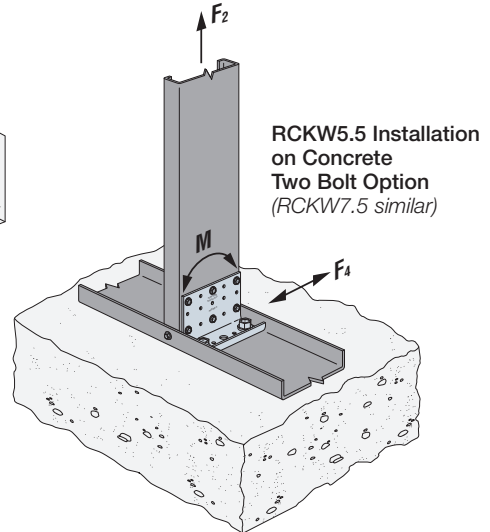
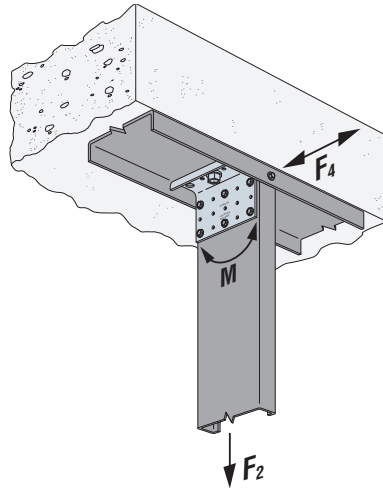
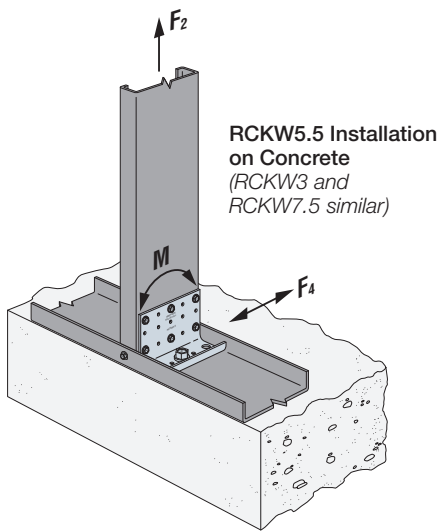


RCKW7.5 and RCKW5.5S Options



RCKW Kneewall Connectors

Rigid Connectors



RCKW Kneewall Connectors

Example #1: Exterior Parapet Stud

Given:

- 2021 IBC (ASCE 7-16 and AISI S100-16)
- 600S162-33 (33 ksi) studs @ 16" o.c. supported at the base
- Parapet height, $L = 38$ "-tall studs
- Wind design pressure = 49.67 psf (LRFD)
- Deflection Limits, $\Delta_{allow} = L/240$ (Ref. IBC Table 1604.3)
- 3,000 psi concrete, cracked, SDC A&B, 3" anchor edge

Calculations:

Determine ASD wind pressure:

$$p = (0.6)(49.67 \text{ psf}) = 29.8 \text{ psf}$$

Note: 2021 IBC load combinations for ASD include a factor of 0.6 for wind loads.

$$w = (29.8 \text{ psf}) \frac{16 \text{ in.}}{12 \text{ in.}} = 39.7 \text{ plf}$$

Determine Required Moment:

$$M_{req} = \frac{wL^2}{2} = \frac{(39.7 \text{ plf})(38 \text{ in.})^2}{2 \left(12 \frac{\text{in.}}{\text{ft.}}\right)} = 2,389 \text{ in.-lb.}$$

From Table 1 (p. 118–120) for 600S162-33, 6"-deep 33-mil stud:

- Select RCKW5.5 connector, fastener pattern 3, with $\frac{1}{2}$ " anchor diameter and (6) #12 self-drilling screws, attaching to each stud @ 16" o.c.
- Allowable Moment = 4,670 in.-lb. > 2,389 in.-lb. **OK**
- Assembly Rotational Stiffness, $\beta = 304,000 \text{ in.-lb. / rad.}$ for RCKW5.5 connector at 38" wall height

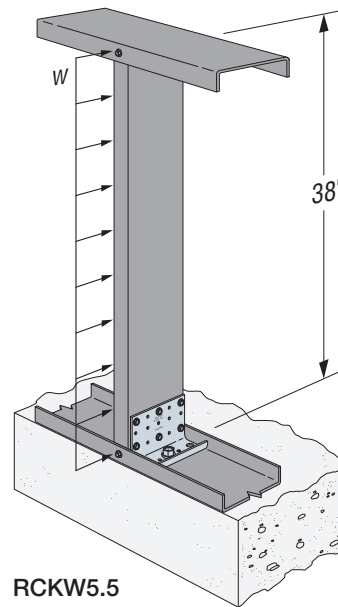
Check Deflection at Required Moment:

$$\Delta_{req} = \left(\frac{(0.7)(M_{req})}{\beta} \right) L = \left(\frac{(0.7)(2,389 \text{ in.-lb.})}{304,000 \frac{\text{in.-lb.}}{\text{rad.}}} \right) 38 \text{ in.} = 0.209 \text{ in.}$$

Note: Per IBC Table 1604.3 footnote f, 0.42 factor can be used to calculate deflections for components and cladding wind loads for LRFD loads. ASD load conversion is 0.7.

Allowable Deflection:

$$\Delta_{allow} = \frac{2L}{240} = \frac{2(38 \text{ in.})}{240} = 0.317 \text{ in.} > 0.209 \text{ in.} \text{ **OK**}$$



RCKW5.5

Select Anchorage:

Normal weight concrete with $f'_c = 3,000 \text{ psi}$
Table 2 (p. 126–127) — Cracked Concrete, Wind and Seismic in SDC A&B

(1) Titen HD® with $\frac{3}{4}$ " embedment and 3" edge

$$F_{4req} = 39.7 * 38 / 12 = 125.7 \text{ lb.}$$

$$M_{req} = 2,389 \text{ in.-lb.}$$

$$F_{4all} = 930 * 0.86 = 799.8 \text{ lb.}$$

$$M_{all} = 3,525 * 0.86 = 3,031 \text{ in.-lb.}$$

***Note:** 0.86 comes from note 11, Table 2 (p. 128) (3,000 psi concrete)

$$F_{4req} / F_{4all} = 125.7 / 799.8 = 0.16 < 1 \text{ **OK**}$$

$$M_{req} / M_{all} = 2,389 / 3,031 = 0.79 < 1 \text{ **OK**}$$

$$\text{Interaction} = 0.16 + 0.79 = 0.95 < 1.2 \text{ **OK**}$$



Computer-Assisted Design Note:

Please use kneewall module in Simpson Strong-Tie® CFS Designer™

RCKW Kneewall Connectors

Example #2: High Interior Half-Wall — Concrete Slab, No Edge, Two Anchor

Given:

- 2021 IBC (ASCE 7-16 and AISI S100-16)
- The top track 600T125-54 (50 ksi) spans between 600S162-54 (50 ksi) studs @ spacing, $S = 32"$ o.c. supported at the base
- 6" drywall studs at 16" o.c. as infill between the bottom and top track
- Wall height, $L = 48"$ -tall studs
- Design Load: $w = 50$ plf or $P = 200$ lb. concentrated load for guard or handrail applications in accordance with Section 4.5.1 of ASCE (Ref. IBC 1607.9.1 and 1607.9.1.1)
- Deflection Limit, $\Delta_{allow} = L/120$ (Ref. IBC Table 1604.3)
- 4,000 psi NWC, uncracked A&B, no edge, 5" concrete thickness

Calculations:

Design criteria #1 for linear load of 50 lb./ft.

Determine Required Concentrated Load, P_{req} :

$$P = (w)(S) = (50 \text{ plf})(32 \text{ in.}) \left(\frac{1 \text{ ft.}}{12 \text{ in.}} \right) = 133.3 \text{ lb.}$$

Determine Required Moment, M_{req} :

$$M_{req} = (P_{req})(L) = (133.3 \text{ lb.})(48 \text{ in.}) = 6,400 \text{ in.-lb.}$$

Design criteria #2 for concentrated load of 200 lb.

Note: From a 3D structural analysis with the 200 lb. concentrated load at the end stud, a continuous top track distributes some load to adjacent studs so that the worst-case moment is $M_{req(max)} = 7,513$ in.-lb. and maximum shear is $V_{req(max)} = 157$ lb. as indicated in the illustration.

From Table 1 (p. 118–120) for 600S162-54, 6"-deep, 54-mil stud:

- Select a RCKW5.5 connector, screw pattern 3B with (6) #12 self-drilling screws and (2) 1/2"-diameter anchors
- Allowable Moment = 9,995 in.-lb. > 6,400 in.-lb. (for linear load) **OK**
- Allowable Moment = 9,995 in.-lb. > 7,513 in.-lb. (for concentrated load) **OK**
- Connector Rotational Stiffness $\beta_c = 651,000$ in.-lb. / rad.

Check Deflection for Design Criteria #1 at Required Load:

Determine Stud Deflection, Δ_s , at $P_{req} = 133.3$ lb.

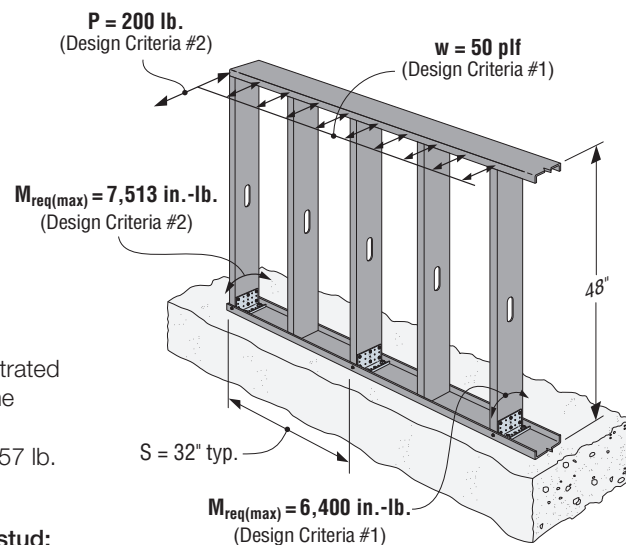
$$\Delta_s = \frac{P_{req} L^3}{3EI_{xe}} = \left(\frac{(133.3 \text{ lb.})(48 \text{ in.})^3}{3(29,500,000 \text{ psi})(2.86 \text{ in.}^4)} \right) = 0.058 \text{ in.}$$

Note: Effective moment of inertia for a 600S162-54 stud is $I_{xe} = 2.86$ in.⁴

Determine Connector Deflection, Δ_c , at $M_{req} = 6,400$ in.-lb. by utilizing the Connector Rotational Stiffness, $\beta_c = 651,000$ in.-lb. / rad. for RCKW5.5.

$$\Delta_c = \frac{M_{req} L}{\beta_c} = \frac{6,400 \text{ in.-lb.}}{651,000 \frac{\text{in.-lb.}}{\text{rad.}}} (48 \text{ in.}) = 0.472 \text{ in.}$$

Note: The Connector Rotational Stiffness may be used for any wall height; the designer must consider member deflection due to bending in the stud member. See footnote 10 of Table 1 (p. 120).



RCKW5.5 Installation on Concrete

RCKW Kneewall Connectors

Example #2: High Interior Half-Wall — Concrete Slab, No Edge, Two Anchor (cont.)

Total Deflection is the sum of the Stud Deflection and the Connector Deflection.

$$\Delta_{total} = \Delta_s + \Delta_c = 0.058 \text{ in.} + 0.472 \text{ in.} = 0.53 \text{ in.}$$

Allowable Deflection:

$$\Delta_{allow} = \frac{2L}{120} = \frac{(2)(48 \text{ in.})}{120} = 0.800 \text{ in.} > 0.53 \text{ in.} \text{ OK}$$

Check Deflection for Design Criteria #2 at Required Load:

Determine Stud Deflection, Δ_s , at $M_{req(max)} = 7,513 \text{ in.-lb.}$ from concentrated load.

$$\Delta_s = \frac{M_{req} L^2}{3EI_{xe}} = \left(\frac{(7,513 \text{ in.-lb.})(48 \text{ in.})^2}{3(29,500,000 \text{ psi})(2.86 \text{ in.}^4)} \right) = 0.068 \text{ in.}$$

Determine Connector Deflection, Δ_c , at $M_{req(max)} = 7,513 \text{ in.-lb.}$ by utilizing the Connector Rotational Stiffness, $\beta_c = 651,000 \text{ in.-lb. / rad.}$ for RCKW5.5.

$$\Delta_c = \frac{M_{req(max)}}{\beta_c} L = \frac{7,513 \text{ in.-lb.}}{651,000 \frac{\text{in.-lb.}}{\text{rad.}}} (48 \text{ in.}) = 0.554 \text{ in.}$$

Total Deflection is the sum of Stud Deflection and Connector Deflection.

$$\Delta_{total} = \Delta_s + \Delta_c = 0.068 \text{ in.} + 0.554 \text{ in.} = 0.622 \text{ in.}$$

Allowable Deflection:

$$\Delta_{allow} = \frac{2L}{120} = \frac{(2)(48 \text{ in.})}{120} = 0.800 \text{ in.} > 0.622 \text{ in.} \text{ OK}$$

Select Anchorage:

Normal-weight concrete with $f'_c = 4,000 \text{ psi}$

Table 2 (p. 126–127) — Uncracked Concrete Wind and Seismic in SDC A&B (2) ½"-diameter Titen HD® with 3¼" embedment

$F_{4req} = 157 \text{ lb.}$

$F_{4all} = 3,765 \text{ lb.}$ Table 2 (p. 126–127) two anchors assumed to act in shear with no edge condition

$F_{4req}/F_{4all} = 157 \text{ lb.}/3,765 \text{ lb.} = 0.04 < 1 \text{ OK}$

$M_{req(max)} = 7,513 \text{ in.-lb.}$

$M_{req} = 10,800 \text{ in.-lb.}$ Table 2 (p. 126–127)

$M_{req(max)}/M_{all} = 7,513 \text{ in.-lb.} / 10,280 \text{ in.-lb.} = 0.73 < 1 \text{ OK}$

Interaction = $0.04 + 0.73 = 0.77 < 1.2 \text{ OK}$

Note: Per ASCE Section 4.5.1, for handrail and guardrail systems, there is no need to apply the 50 plf linear load and the 200 lb. concentrated load concurrently. Example #2 demonstrates the design for both loading cases, and the outermost anchored stud governs when using the 200 lb. concentrated load.



Computer-Assisted Design Note:

Please use kneewall module in Simpson Strong-Tie® CFS Designer™

RCKW Kneewall Connectors

Rigid Connectors

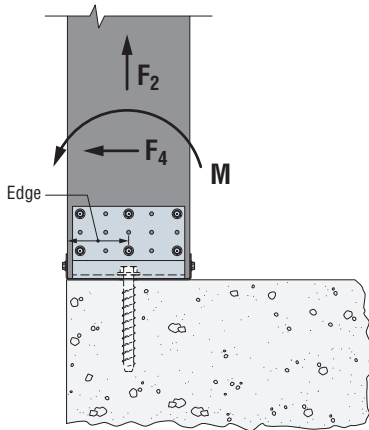


Figure 1
One Anchor

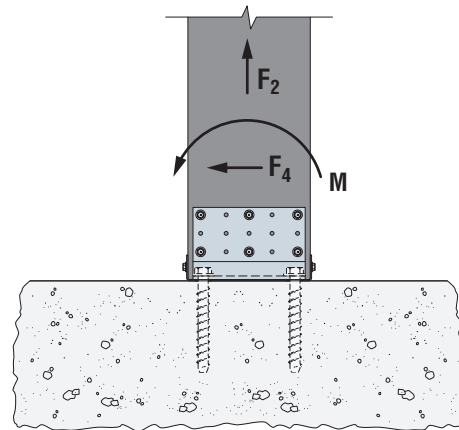


Figure 2
Two Anchors

Table 2: RCKW Allowable Anchorage Loads (lb.)

| Model No. | Min. Anchor Edge Distance (in.) | Type of Concrete | Anchor Type | Nominal Embedment Depth, h_{nom} (in.) | Minimum Concrete Thickness, h_{min} (in.) | Uncracked 4,000 psi Concrete | | | Cracked 4,000 psi Concrete | | | | | |
|-----------------------------|---------------------------------|------------------|------------------------------|--|---|---------------------------------|---------------------|-------------------|---------------------------------|---------------------|-------------------|------------------------|---------------------|-------------------|
| | | | | | | Wind and Seismic in SDC A and B | | | Wind and Seismic in SDC A and B | | | Seismic in SDC C and D | | |
| | | | | | | Allowable | | | Allowable | | | Allowable | | |
| | | | | | | Moment M (in.-lb.) | Tension F_2 (lb.) | Shear F_4 (lb.) | Moment M (in.-lb.) | Tension F_2 (lb.) | Shear F_4 (lb.) | Moment M (in.-lb.) | Tension F_2 (lb.) | Shear F_4 (lb.) |
| RCKW3 | 1 7/8 | SLWC | (1) 1/2"-dia. Titen HD® | 3 1/4 | 5 | 1,170 | 670 | 410 | 850 | 490 | 295 | 305 | 175 | 135 |
| | | | | 3 3/4 | 6 | 1,295 | 745 | 425 | 935 | 535 | 305 | 335 | 190 | 140 |
| | | NWC | (1) 1/2"-dia. Titen HD | 3 1/4 | 5 | 1,680 | 965 | 605 | 1,230 | 705 | 430 | 445 | 255 | 200 |
| | | | | 3 3/4 | 6 | 1,865 | 1,070 | 625 | 1,350 | 775 | 445 | 495 | 285 | 210 |
| | No edge | SLWC | (1) 1/2"-dia. Titen HD | 3 1/4 | 5 | 2,005 | 1,150 | 1,560 | 1,450 | 835 | 1,105 | 530 | 305 | 515 |
| | | | | 3 3/4 | 6 | 2,515 | 1,445 | 2,685 | 1,840 | 1,055 | 2,465 | 680 | 390 | 805 |
| | | | (1) 1/2"-dia. Strong-Bolt® 2 | 3 7/8 | 6 | 2,395 | 1,375 | 2,820 | 1,755 | 1,010 | 2,820 | 645 | 370 | 1,185 |
| | | | | 3 3/4 | 5 | 2,825 | 1,625 | 2,295 | 2,080 | 1,195 | 1,625 | 770 | 445 | 760 |
| | | NWC | (1) 1/2"-dia. Titen HD | 3 1/4 | 5 | 2,825 | 1,625 | 2,295 | 2,080 | 1,195 | 1,625 | 770 | 445 | 760 |
| | | | | 3 3/4 | 6 | 3,500 | 2,010 | 2,685 | 2,610 | 1,500 | 2,685 | 980 | 565 | 805 |
| (1) 1/2"-dia. Strong-Bolt 2 | 3 7/8 | 6 | 3,340 | 1,920 | 2,820 | 2,490 | 1,430 | 2,820 | 935 | 535 | 1,185 | | | |
| RCKW3D | 6 | NWC | (2) 1/2"-dia. Titen HD | 3 1/4 | 5 | 4,955 | 2,005 | 2,060 | 3,590 | 1,495 | 1,470 | 1,300 | 565 | 685 |
| | | | | 3 3/4 | 6 | 4,955 | 2,005 | 2,260 | 3,590 | 1,495 | 1,615 | 1,300 | 565 | 755 |
| | No edge | NWC | (2) 1/2"-dia. Titen HD | 3 1/4 | 5 | 4,955 | 2,440 | 3,765 | 3,590 | 1,845 | 2,665 | 1,300 | 710 | 1,245 |
| | | | | 3 3/4 | 6 | 6,245 | 2,805 | 5,370 | 4,555 | 2,155 | 5,370 | 1,660 | 850 | 1,610 |

Table continued on next page.

RCKW Kneewall Connectors

Table 2: RCKW Allowable Anchorage Loads (lb.) (cont.)

| Model No. | Min. Anchor Edge Distance (in.) | Type of Concrete | Anchor Type | Nominal Embedment Depth, h_{nom} (in.) | Minimum Concrete Thickness, h_{min} (in.) | Uncracked 4,000 psi Concrete | | | Cracked 4,000 psi Concrete | | | | | | | |
|-----------|---------------------------------|-----------------------------|-----------------------------|--|---|---------------------------------|------------------------------|----------------------------|---------------------------------|------------------------------|----------------------------|------------------------|------------------------------|----------------------------|-----|-----|
| | | | | | | Wind and Seismic in SDC A and B | | | Wind and Seismic in SDC A and B | | | Seismic in SDC C and D | | | | |
| | | | | | | Allowable | | | Allowable | | | Allowable | | | | |
| | | | | | | Moment M (in.-lb.) | Tension F ₂ (lb.) | Shear F ₄ (lb.) | Moment M (in.-lb.) | Tension F ₂ (lb.) | Shear F ₄ (lb.) | Moment M (in.-lb.) | Tension F ₂ (lb.) | Shear F ₄ (lb.) | | |
| RCKW5.5 | 3 | SLWC | (1) 1/2"-dia. Titen HD® | 3 1/4 | 5 | 3,360 | 1,055 | 815 | 2,435 | 765 | 635 | 870 | 275 | 295 | | |
| | | | | 3 3/4 | 6 | 3,855 | 1,210 | 915 | 2,770 | 870 | 655 | 995 | 310 | 305 | | |
| | | NWC | (1) 1/2"-dia. Titen HD | 3 1/4 | 5 | 4,845 | 1,520 | 1,305 | 3,525 | 1,105 | 930 | 1,275 | 400 | 435 | | |
| | | | | 3 3/4 | 6 | 5,535 | 1,735 | 1,350 | 4,015 | 1,260 | 965 | 1,450 | 455 | 450 | | |
| | No edge | SLWC | (1) 1/2"-dia. Titen HD | 3 1/4 | 5 | 3,815 | 1,195 | 1,560 | 2,735 | 855 | 1,105 | 980 | 305 | 515 | | |
| | | | | 3 3/4 | 6 | 4,845 | 1,520 | 2,685 | 3,490 | 1,095 | 2,465 | 1,260 | 395 | 805 | | |
| | | | (1) 1/2"-dia. Strong-Bolt 2 | 3 7/8 | 6 | 4,600 | 1,440 | 2,820 | 3,325 | 1,040 | 2,820 | 1,195 | 375 | 1,185 | | |
| | | | | 3 1/4 | 5 | 5,485 | 1,720 | 2,295 | 3,965 | 1,245 | 1,625 | 1,435 | 450 | 760 | | |
| | | NWC | (1) 1/2"-dia. Titen HD | 3 1/4 | 5 | 6,935 | 2,175 | 2,685 | 5,040 | 1,580 | 2,685 | 1,830 | 575 | 805 | | |
| | | | | 3 3/4 | 6 | 6,585 | 2,065 | 2,820 | 4,795 | 1,505 | 2,820 | 1,740 | 545 | 1,185 | | |
| | | | (1) 1/2"-dia. Strong-Bolt 2 | 2 1/2 | 4" slab and 3 1/4" top of metal deck | 2 1/2 | 4 | 4,460 | 1,430 | 1,020 | 2,060 | 700 | 725 | 725 | 250 | 335 |
| | | | | 2 1/4 | 4 | 4,360 | 1,440 | 700 | 3,070 | 1,035 | 700 | 1,095 | 370 | 330 | | |
| | | SLWC | (2) 3/8"-dia. Titen HD | 2 1/2 | 4" slab and 3 1/4" top of metal deck | 2 1/2 | 4 | 6,505 | 2,050 | 1,500 | 3,020 | 1,015 | 1,065 | 1,070 | 360 | 480 |
| | | | | 2 1/4 | 4 | 6,360 | 2,065 | 700 | 4,505 | 1,490 | 700 | 1,590 | 540 | 330 | | |
| | | | (2) 1/2"-dia. Titen HD | 3 1/4 | 5 | 7,080 | 1,900 | 2,560 | 5,040 | 1,380 | 1,815 | 1,790 | 500 | 845 | | |
| | | | | 3 3/4 | 6 | 9,040 | 2,265 | 5,370 | 6,460 | 1,650 | 4,380 | 2,305 | 600 | 1,610 | | |
| | NWC | (2) 1/2"-dia. Titen HD | 3 1/4 | 5 | 8,570 | 2,720 | 5,645 | 6,145 | 2,000 | 5,500 | 2,185 | 735 | 2,225 | | | |
| | | | 3 3/4 | 6 | 10,280 | 2,700 | 3,765 | 7,365 | 1,975 | 2,665 | 2,625 | 725 | 1,245 | | | |
| | | (2) 1/2"-dia. Strong-Bolt 2 | 3 1/4 | 5 | 13,110 | 3,185 | 5,370 | 9,415 | 2,350 | 5,370 | 3,360 | 875 | 1,610 | | | |
| | | | 3 3/4 | 6 | 12,425 | 3,780 | 5,645 | 8,945 | 2,830 | 5,645 | 3,190 | 1,070 | 2,370 | | | |
| RCKW7.5 | 4 | SLWC | (1) 1/2"-dia. Titen HD | 3 1/4 | 5 | 5,265 | 1,210 | 1,245 | 3,760 | 865 | 890 | 1,340 | 310 | 415 | | |
| | | | | 3 3/4 | 6 | 6,485 | 1,490 | 1,410 | 4,665 | 1,070 | 1,010 | 1,670 | 385 | 470 | | |
| | | | (1) 1/2"-dia. Strong-Bolt 2 | 3 7/8 | 6 | 5,145 | 1,180 | 1,465 | 4,580 | 1,050 | 1,050 | 1,635 | 375 | 490 | | |
| | | | | 3 1/4 | 5 | 7,615 | 1,750 | 1,830 | 5,475 | 1,260 | 1,310 | 1,965 | 450 | 610 | | |
| | | NWC | (1) 1/2"-dia. Titen HD | 3 1/4 | 5 | 9,345 | 2,150 | 2,075 | 6,760 | 1,555 | 1,485 | 2,440 | 560 | 690 | | |
| | | | | 3 3/4 | 6 | 7,445 | 1,710 | 2,160 | 6,640 | 1,525 | 1,540 | 2,385 | 550 | 720 | | |
| | | | (1) 1/2"-dia. Strong-Bolt 2 | 3 1/4 | 5 | 5,265 | 1,210 | 1,560 | 3,760 | 865 | 1,105 | 1,340 | 310 | 515 | | |
| | | | | 3 3/4 | 6 | 6,710 | 1,540 | 2,685 | 4,810 | 1,105 | 2,465 | 1,725 | 395 | 805 | | |
| | No edge | SLWC | (1) 1/2"-dia. Titen HD | 3 1/4 | 5 | 6,365 | 1,460 | 2,820 | 4,580 | 1,050 | 2,820 | 1,635 | 375 | 1,185 | | |
| | | | | 3 3/4 | 6 | 7,615 | 1,750 | 2,295 | 5,475 | 1,260 | 1,625 | 1,965 | 450 | 760 | | |
| | | | (1) 1/2"-dia. Strong-Bolt 2 | 3 1/4 | 5 | 9,680 | 2,225 | 2,685 | 6,985 | 1,605 | 2,685 | 2,510 | 575 | 805 | | |
| | | | | 3 3/4 | 6 | 9,180 | 2,110 | 2,820 | 6,640 | 1,525 | 2,820 | 2,385 | 550 | 1,185 | | |
| | | NWC | (2) 3/8"-dia. Titen HD | 2 1/2 | 4" slab and 3 1/4" top of metal deck | 2 1/2 | 4 | 5,365 | 1,450 | 1,020 | 2,475 | 700 | 725 | 870 | 250 | 335 |
| | | | | 2 1/4 | 4 | 5,245 | 1,460 | 700 | 3,690 | 1,045 | 700 | 1,315 | 370 | 330 | | |
| | | | (2) 3/8"-dia. Strong-Bolt 2 | 2 1/2 | 4" slab and 3 1/4" top of metal deck | 2 1/2 | 4 | 7,835 | 2,095 | 1,500 | 3,630 | 1,025 | 1,065 | 1,285 | 365 | 480 |
| | | | | 2 1/4 | 4 | 7,660 | 2,110 | 700 | 5,420 | 1,515 | 700 | 1,910 | 545 | 330 | | |
| | SLWC | (2) 1/2"-dia. Titen HD | 3 1/4 | 5 | 8,530 | 1,940 | 2,560 | 6,065 | 1,400 | 1,815 | 2,150 | 500 | 845 | | | |
| | | | 3 3/4 | 6 | 10,905 | 2,320 | 5,370 | 7,780 | 1,675 | 4,380 | 2,770 | 600 | 1,610 | | | |
| | | (2) 1/2"-dia. Strong-Bolt 2 | 3 1/4 | 5 | 10,335 | 2,805 | 5,645 | 7,400 | 2,040 | 5,500 | 2,625 | 740 | 2,225 | | | |
| | | | 3 3/4 | 6 | 12,410 | 2,780 | 3,765 | 8,875 | 2,020 | 2,665 | 3,155 | 730 | 1,245 | | | |
| NWC | (2) 1/2"-dia. Titen HD | 3 1/4 | 5 | 15,855 | 3,305 | 5,370 | 11,360 | 2,410 | 5,370 | 4,040 | 880 | 1,610 | | | | |
| | | 3 3/4 | 6 | 15,020 | 3,965 | 5,645 | 10,790 | 2,920 | 5,645 | 3,835 | 1,080 | 2,370 | | | | |

Rigid Connectors

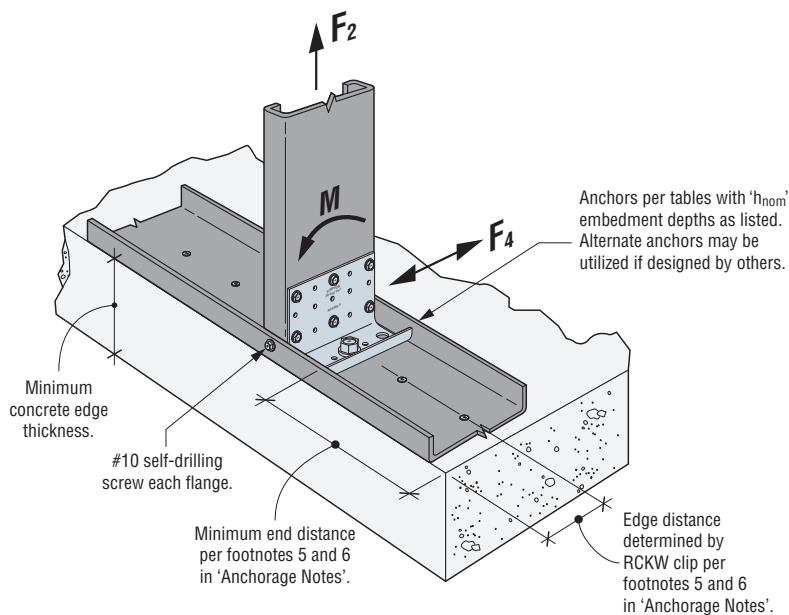
C-CF-2023 © 2023 SIMPSON STRONG-TIE COMPANY INC.

See footnotes on p. 128.

RCKW Kneewall Connectors

Table 2 Footnotes:

- Anchor Allowable Loads have been determined using ACI 318-14 Chapter 17 anchorage calculations with the minimum concrete compressive strength, f'_c , and slab thickness listed. Sand-Lightweight Concrete is abbreviated as 'SLWC', Normal Weight Concrete is abbreviated as 'NWC'.
- Load values are for anchor based on ACI 318-14, condition B, load factors from ACI 318 Section 5.3, no supplemental edge reinforcement, $\Psi_{c,v} = 1.0$ for cracked concrete and periodic special inspection. Reference ICC-ES or IAPMO-UES evaluation reports for further information.
- Load values are based on short-term temperature range of 160°F and 180°F for SET-3G™ and AT-XP® adhesives, respectively. Long-term temperature range is assumed to be 110°F for SET-3G and AT-XP adhesives.
- Allowable Stress Design (ASD) values were determined by multiplying calculated Strength Design values by a conversion factor, Alpha (α), of 0.7 for seismic loads and 0.6 for wind loads. ASD values for other load combinations may be determined using alternate conversion factors.
- End distances are assumed as 1.5 x Min. Edge Distance in one direction and 'N/A' in the other direction. See figure on this page.
- Edge and end distances are assumed as 'N/A' in all directions at locations for (No Edge).
- Tabulated anchorage capacities for RCKW models shown are applied to the same model size with stiffener. For example, a value for model RCKW3 is equivalent to model RCKW3 and RCKW3S.
- Tabulated allowable ASD loads for Wind and Seismic in SDC A and B are based on using wind conversion factors and may be increased by 1.17 for seismic SDC A and B only.
- Allowable loads have been divided by an Omega (Ω) seismic factor of 2.5 for brittle failure as required by ACI 318-14 Chapter 17, unless steel failure governs.
- Tabulated capacities are based on maximum allowable anchorage loads only. The capacity of the connection system shall be the minimum of the tabulated value and the RCKW allowable load value listed on p. 118–120.
- Tabulated loads in Table 2 are based on $f'_c = 4,000$ psi. For $f'_c = 3,000$ psi, use an adjustment factor of 0.86 for the blue shaded values and 1.0 for all other values.
- For anchor subjected to both tension and shear loads, it shall be designed to satisfy following:
 - For $N_a / N_{al} \leq 0.2$, the full allowable load in shear is permitted.
 - For $V_a / V_{al} \leq 0.2$, the full allowable load in tension is permitted.
 - For all other cases: $N_a / N_{al} + V_a / V_{al} \leq 1.2$.
 where:
 - N_a = Applied ASD tension load
 - N_{al} = Allowable tension load from Table 2
 - V_a = Applied ASD shear load
 - V_{al} = Allowable shear load from Table 2.

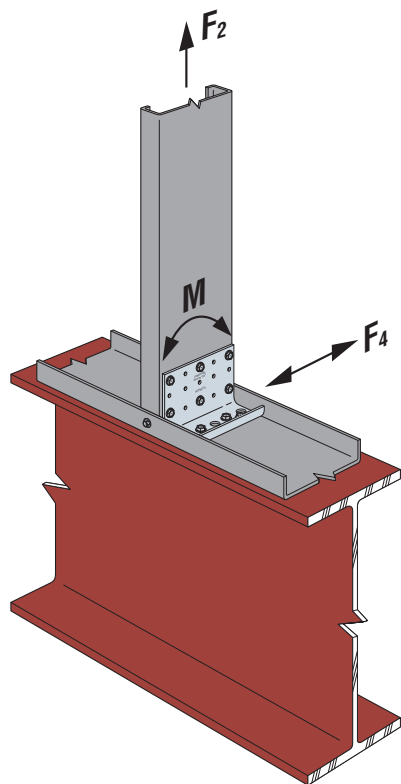


RCKW Kneewall Connectors

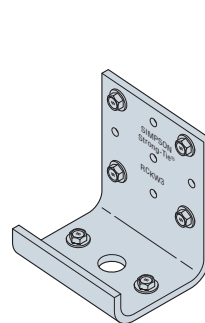
Table 3: RCKW Allowable Loads — Steel Applications with Anchorage

| Model No. | Framing Member Depth (in.) | Fastener to Structural Steel ² | Fastener to Stud ³ | Framing Member Thickness mil (ga.) | Assembly Rotational Stiffness ^{6,8} β (in.-lb./rad) | Connector Rotational Stiffness ^{7,8} β_c (in.-lb./rad) | Allowable Load | | | Code Ref. |
|-----------|----------------------------|---|-------------------------------|------------------------------------|--|---|---|------------------------------------|----------------------------------|-----------|
| | | | | | | | Moment ^{4,5} M (in.-lb.) | Tension F ₂ (lb.) | Shear F ₄ (lb.) | |
| RCKW3 | 3.625 | (2) #12 | (4) #12 | 33 (20) | 55,500 | 58,000 | 2,105 | 850 | 455 | — |
| | | | | 43 (18) | 73,300 | 76,700 | 2,570 | 1,225 | 745 | |
| | | | | 54 (16) | 87,260 | 91,200 | 2,690 | 1,115 | 1,115 | |
| RCKW5.5 | 6.00 | (4) #12 | (6) #12 | 33 (20) | 199,200 | 209,200 | 5,165 | 1,245 | 650 | |
| | | | | 43 (18) | 272,600 | 287,100 | 6,370 | 1,900 | 1,060 | |
| | | | | 54 (16) | 255,900 | 266,100 | 6,430 | 2,000 | 1,295 | |
| RCKW7.5 | 8.00 | (6) #12 | (6) #12 | 33 (20) | 456,700 | 483,200 | 7,030 | 965 | 655 | |
| | | | | 43 (18) | 571,600 | 603,600 | 9,595 | 1,950 | 1,135 | |
| | | | | 54 (16) | 693,600 | 731,600 | 11,320 | 2,185 | 1,710 | |

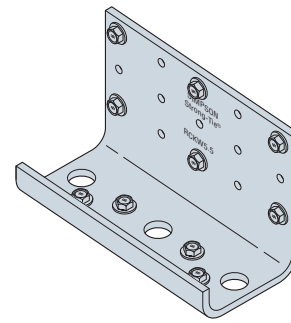
- For additional important information, see General Information and Notes on p. 26.
- Designer is responsible for structural steel design.
- See illustrations for fastener patterns.
- Tabulated values are based on framing members with track and stud of the same thickness and #10 screws into each stud flange.
- Tabulated moment values correspond to the maximum connector strength without consideration of serviceability. Designer must check out-of-plane deflections using tabulated Rotational Stiffness.
- Tabulated Assembly Rotational Stiffness is for walls at 38" tall.
- The tabulated Connector Rotational Stiffness is for any wall heights. The designer must consider member deflection due to bending in the stud.
- Per IBC 2015 Table 1604.3 footnote f, wind load is permitted to be taken as 0.42 times "component and cladding loads" for deflection checks. For IBC 2009 and earlier, the factor is 0.7 instead of 0.42.



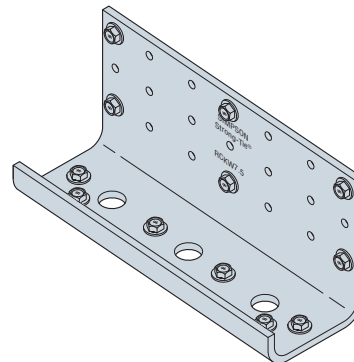
RCKW5.5 Installation on Structural Steel
(RCKW3 and RCKW7.5 similar)



RCKW3 Screw Pattern for Steel Anchorage



RCKW5.5 Screw Pattern for Steel Anchorage



RCKW7.5 Screw Pattern for Steel Anchorage

MSSC4.25KW and MSSC6.25KW Kneewall Connectors

Rigid Connectors

MSSC connectors are designed to work in tandem with Simpson Strong-Tie® BP $\frac{1}{2}$ -3 bearing plates to provide solutions for moment-resisting kneewall lighter-duty applications.

Features:

- One simple custom hole pattern for each stud size simplifies specification and installation
- $\frac{3}{8}$ " diameter anchor bolt location enables easy tool access

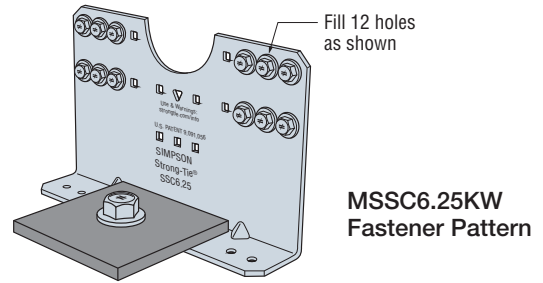
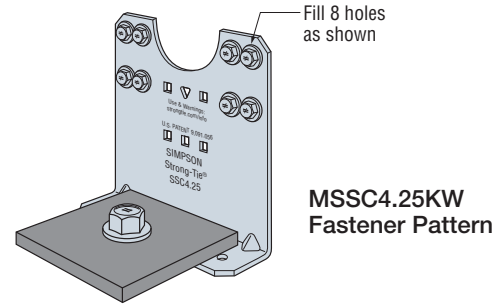
Material: MSSC — 97 mil (50 ksi); BP — 229 mil (33 ksi)

Finish: MSSC — Galvanized (G90); BP — None

Installation:

- Use all specified fasteners/anchors
- Install BP $\frac{1}{2}$ -3 bearing plate over anchor leg of MSSC connectors as shown in the illustrations

Codes: See p. 13 for Code Reference Key Chart



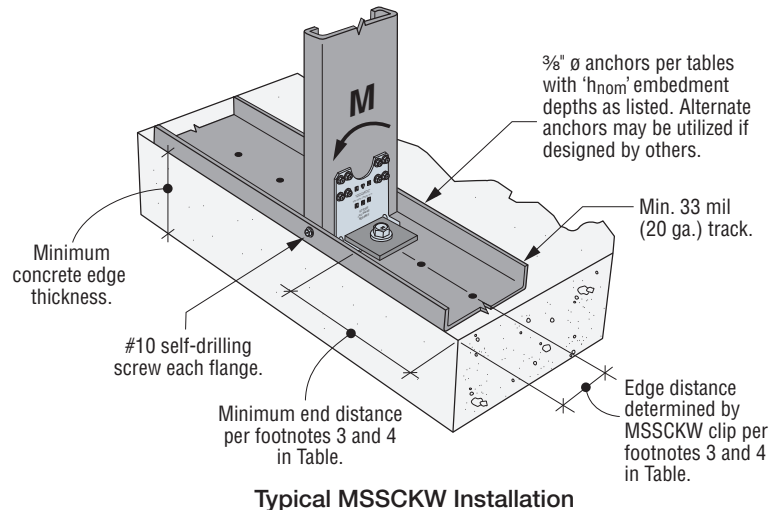
Ordering Information

| Model No. | Ordering SKU | Package Quantity |
|------------|-----------------|---|
| MSSC4.25KW | MSSC4.25KW-KT20 | Box of 20 connectors and 20 BP bearing plates |
| MSSC6.25KW | MSSC6.25KW-KT20 | |

Allowable Loads

| Model No. | Connector Material Thickness mil (ga.) | L (in.) | Framing Member Depth (in.) | Fasteners ⁵ | | Stud Thickness mil (ga.) | Allowable Moment, M (in.-lb.) ¹ | Anchor Tension at Allowable Moment (lb.) ² | Rotational Stiffness for Wind Deflection (in.-lb./rad.) ^{3,4} | Code Ref. |
|------------|--|-----------------|----------------------------|------------------------|----------|--------------------------|--|---|--|-----------|
| | | | | Anchor Diameter (in.) | Stud | | | | | |
| MSSC4.25KW | 97 (12) | 4 $\frac{1}{4}$ | 6 | $\frac{3}{8}$ | (8) #10 | 33 (20) | 3,135 | 1,610 | 64,800 | IBC, LA |
| | | | | | | 43 (18) | 4,320 | 2,305 ⁵ | | |
| | | | | | | 54 (16) | 5,830 | 3,300 ⁵ | | |
| MSSC6.25KW | 97 (12) | 6 $\frac{1}{4}$ | 8 | $\frac{3}{8}$ | (12) #10 | 33 (20) | 3,845 | 1,290 | 110,350 | IBC, LA |
| | | | | | | 43 (18) | 3,845 | 1,290 | | |
| | | | | | | 54 (16) | 8,350 | 2,980 ⁵ | | |

1. Tabulated values correspond to maximum connector strength without consideration of serviceability. Designer must check out-of-plane deflections using tabulated rotational stiffness.
2. Uplift may be linearly interpolated for design moment less than allowable. Designer is responsible for anchorage design.
3. Tabulated stiffness is applicable for walls up to 38" tall. For taller walls, the designer must consider additional deflection due to bending in the studs.
4. Per IBC 2015 Table 1604.3 footnote f, wind load is permitted to be taken as 0.42 times "component and cladding loads" for deflection checks. For IBC 2009 and earlier, the factor is 0.7 instead of 0.42.
5. Tabulated allowable tension loads for the connectors with $\frac{3}{8}$ "-diameter anchor bolts require ASTM F3125 Grade A325 or ASTM A449 high-strength bolts. For A307 Grade A bolt, anchor tension load is limited to 2,200 lb.
6. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



MSSC4.25KW and MSSC6.25KW Kneewall Connectors

Kneewall Connector Anchorage Solutions

| Uncracked Concrete, Wind and Seismic in SDC A & B ^{8,10} | | | | | | | | | |
|---|--|---|---|-------------------------------|---------------|---------------|-----------------------------|---------------|---------------|
| Model No. | Minimum Concrete Thickness (h _{min}) | ¾"-Diameter Simpson Strong-Tie® Anchor Type | Nominal Embedment Depth (h _{nom}) (in.) | Allowable Moment, M (in.-lb.) | | | | | |
| | | | | Edge of Slab ³ | | | Center of Slab ⁴ | | |
| | | | | 3,000 psi SLWC | 3,000 psi NWC | 4,000 psi NWC | 3,000 psi SLWC | 3,000 psi NWC | 4,000 psi NWC |
| MSSC4.25KW | 4" or thicker | Strong Bolt® 2 | 2¼ | — | — | — | 1,220 | 2,040 | 2,365 |
| | | Titen HD® | 2½ | 1,255 | 2,090 | 2,425 | 1,255 | 2,090 | 2,425 |
| | 6" or thicker | Strong Bolt 2 | 2⅞ | — | — | — | 1,555 | 2,590 | 2,995 |
| | | Titen HD | 3¼ | 1,795 | 2,995 | 3,450 | 2,075 | 3,465 | 3,995 |
| | | SET-3G™ | 4 | 725 | 1,425 | 1,425 | 1,930 | 3,705 | 3,705 |
| | Concrete thickness ≥ 9.5" | AT-XP® | 4 | 750 | 1,470 | 1,470 | 2,005 | 3,705 | 3,705 |
| | | SET-3G | 7½ | 670 | 1,320 | 1,320 | 3,610 | 3,705 | 3,705 |
| AT-XP | 7½ | 695 | 1,360 | 1,360 | 3,690 | 3,705 | 3,705 | | |
| MSSC6.25KW | 4" or thicker | Strong Bolt 2 | 2¼ | — | — | — | 1,515 | 2,530 | 2,930 |
| | | Titen HD | 2½ | 1,555 | 2,590 | 3,005 | 1,555 | 2,590 | 3,005 |
| | 6" or thicker | Strong Bolt 2 | 2⅞ | — | — | — | 1,930 | 3,215 | 3,715 |
| | | Titen HD | 3¼ | 2,570 | 4,295 | 4,950 | 2,570 | 4,295 | 4,950 |
| | | SET-3G | 4 | 1,110 | 2,170 | 2,170 | 2,395 | 4,595 | 4,595 |
| | | AT-XP | 4 | 1,135 | 2,235 | 2,235 | 2,480 | 4,595 | 4,595 |
| | Concrete thickness ≥ 9.5" | SET-3G | 7½ | 1,030 | 2,015 | 2,015 | 4,480 | 4,595 | 4,595 |
| | | AT-XP | 7½ | 1,055 | 2,065 | 2,065 | 4,575 | 4,595 | 4,595 |

See footnotes on p. 132.

| Cracked Concrete, Wind and Seismic in SDC A & B ^{8,10} | | | | | | | | | |
|---|--|---|---|-------------------------------|---------------|---------------|-----------------------------|---------------|---------------|
| Model No. | Minimum Concrete Thickness (h _{min}) | ¾"-Diameter Simpson Strong-Tie® Anchor Type | Nominal Embedment Depth (h _{nom}) (in.) | Allowable Moment, M (in.-lb.) | | | | | |
| | | | | Edge of Slab ³ | | | Center of Slab ⁴ | | |
| | | | | 3,000 psi SLWC | 3,000 psi NWC | 4,000 psi NWC | 3,000 psi SLWC | 3,000 psi NWC | 4,000 psi NWC |
| MSSC4.25KW | 4" or thicker | Strong Bolt 2 | 2¼ | — | — | — | 860 | 1,435 | 1,660 |
| | | Titen HD | 2½ | 575 | 955 | 1,100 | 575 | 955 | 1,100 |
| | 6" or thicker | Strong Bolt 2 | 2⅞ | — | — | — | 1,295 | 2,150 | 2,495 |
| | | Titen HD | 3¼ | 1,255 | 2,095 | 2,430 | 1,255 | 2,095 | 2,430 |
| | | SET-3G | 4 | 1,175 | 2,305 | 2,305 | 1,485 | 2,915 | 2,915 |
| | Concrete thickness ≥ 9.5" | AT-XP | 4 | 1,220 | 2,395 | 2,395 | 1,560 | 3,065 | 3,065 |
| | | SET-3G | 7½ | 2,200 | 3,705 | 3,705 | 2,790 | 3,705 | 3,705 |
| AT-XP | 7½ | 2,290 | 3,705 | 3,705 | 2,935 | 3,705 | 3,705 | | |
| MSSC6.25KW | 4" or thicker | Strong Bolt 2 | 2¼ | — | — | — | 1,070 | 1,780 | 2,055 |
| | | Titen HD | 2½ | 715 | 1,185 | 1,365 | 715 | 1,185 | 1,365 |
| | 6" or thicker | Strong Bolt 2 | 2⅞ | — | — | — | 1,605 | 2,665 | 3,090 |
| | | Titen HD | 3¼ | 1,555 | 2,600 | 3,010 | 1,555 | 2,600 | 3,010 |
| | | SET-3G | 4 | 1,795 | 3,505 | 3,505 | 1,840 | 3,615 | 3,615 |
| | | AT-XP | 4 | 1,860 | 3,645 | 3,645 | 1,935 | 3,800 | 3,800 |
| | Concrete thickness ≥ 9.5" | SET-3G | 7½ | 3,350 | 4,595 | 4,595 | 3,455 | 4,595 | 4,595 |
| AT-XP | | 7½ | 3,490 | 4,595 | 4,595 | 3,640 | 4,595 | 4,595 | |

See footnotes on p. 132.

MSSC4.25KW and MSSC6.25KW Kneewall Connectors

Kneewall Connector Anchorage Solutions (cont.)

| Cracked Concrete, Seismic in SDC C through F ^{9,10} | | | | | | | | | |
|--|--|---|---|-------------------------------|---------------|---------------|-----------------------------|---------------|---------------|
| Model No. | Minimum Concrete Thickness (h _{min}) | %"-Diameter Simpson Strong-Tie® Anchor Type | Nominal Embedment Depth (h _{nom}) (in.) | Allowable Moment, M (in.-lb.) | | | | | |
| | | | | Edge of Slab ³ | | | Center of Slab ⁴ | | |
| | | | | 3,000 psi SLWC | 3,000 psi NWC | 4,000 psi NWC | 3,000 psi SLWC | 3,000 psi NWC | 4,000 psi NWC |
| MSSC4.25KW | 4" or thicker | Strong Bolt® 2 | 2¼ | — | — | — | 300 | 500 | 580 |
| | | Titen HD® | 2½ | 200 | 335 | 385 | 200 | 335 | 385 |
| | 6" or thicker | Strong Bolt 2 | 2¾ | — | — | — | 450 | 755 | 870 |
| | | Titen HD | 3¼ | 440 | 735 | 850 | 440 | 735 | 850 |
| | | SET-3G™ | 4 | 410 | 805 | 805 | 520 | 1,020 | 1,020 |
| | | AT-XP® | 4 | 430 | 840 | 840 | 550 | 1,070 | 1,070 |
| | Concrete thickness ≥ 9.5" | SET-3G | 7½ | 770 | 1,495 | 1,495 | 975 | 4,325 | 4,325 |
| AT-XP | | 7½ | 800 | 1,575 | 1,575 | 1,025 | 4,325 | 4,325 | |
| MSSC6.25KW | 4" or thicker | Strong Bolt 2 | 2¼ | — | — | — | 375 | 620 | 720 |
| | | Titen HD | 2½ | 250 | 415 | 480 | 250 | 415 | 480 |
| | 6" or thicker | Strong Bolt 2 | 2¾ | — | — | — | 560 | 935 | 1,080 |
| | | Titen HD | 3¼ | 545 | 910 | 1,050 | 545 | 910 | 1,050 |
| | | SET-3G | 4 | 625 | 1,225 | 1,225 | 645 | 1,265 | 1,265 |
| | | AT-XP | 4 | 650 | 1,275 | 1,275 | 680 | 1,330 | 1,330 |
| | Concrete thickness ≥ 9.5" | SET-3G | 7½ | 1,180 | 5,360 | 5,360 | 1,210 | 5,360 | 5,360 |
| | | AT-XP | 7½ | 1,220 | 5,310 | 5,310 | 1,270 | 5,310 | 5,310 |

- Allowable Moments have been determined using ACI 318-14 Chapter 17 anchorage calculations with the minimum concrete compressive strength, f_c and slab thickness listed. Sand-Lightweight Concrete is abbreviated as 'SLWC', Normal Weight Concrete is abbreviated as 'NWC'.
- Nominal Embedment Depth/Effective Embedment Depth relationships:
 - ¾" Titen HD in 4" concrete: 2.50" (h_{nom}) / 1.77" (h_{ef})
 - ¾" Titen HD in 6" concrete: 3.25" (h_{nom}) / 2.40" (h_{ef})
 - ¾" carbon steel Strong-Bolt 2 into 4" concrete: 2.25" (h_{nom}) / 1.875" (h_{ef})
 - ¾" carbon steel Strong-Bolt 2 into 6" concrete: 2.875" (h_{nom}) / 2.5" (h_{ef})
 - SET-3G or AT-XP adhesive with ¾" F1554 Gr. 36 all-thread rod in 6" concrete: 4.0" (h_{nom}) = 4" (h_{ef})
 - SET-3G or AT-XP adhesive with ¾" F1554 Gr. 36 all-thread rod in 9.5" concrete: 7.5" (h_{nom}) = 7.5" (h_{ef})
- At edge of slab, edge distances are assumed to be 3.0" and 4.0" (½ of stud width) as determined for 6" and 8" studs, respectively. 'End distances' are assumed as 1.5 x Min. Edge Distance in one direction and 'N/A' in the other direction. See figure on p. 130.
- At center of slab, edge and end distances are assumed as 'N/A' in all directions at locations away from edge of slab. See figure on p. 130.
- Load values are for a single anchor based on ACI 318-14, condition B, load factors from ACI 318-14 Section 5.3, no supplemental edge reinforcement, $\Psi_{c,v} = 1.0$ for cracked concrete and periodic special inspection. Reference ICC-ES or IAPMO-UES evaluation reports for further information.
- Load values are based on a short-term temperature range of 160°F and 180°F for SET-3G and AT-XP. Long-term temperature range is assumed to be 110°F for both SET-3G and AT-XP. Dry hole conditions are assumed. Other conditions may be evaluated using Anchor Designer™ Software for ACI 318, ETAG and CSA. See strongtie.com/software.
- Allowable Stress Design (ASD) values were determined by multiplying calculated LRFD capacities by a conversion factor, Alpha (α), of 0.7 for seismic loads and 0.6 for wind loads. ASD values for other load combinations may be determined using alternate conversion factors.
- Tabulated allowable ASD loads for Wind and Seismic in SDC A&B are based on using wind conversion factors and may be increased by 1.17 for SDC A&B only.
- Allowable loads have been divided by an Omega (Ω) seismic factor of 2.5 for brittle failure as required by ACI 318-14 Chapter 17, unless steel failure governs.
- Tabulated allowable moments are for MSSC Kneewall Connectors attached to studs with 33 (20) or 43 (18) mil (ga.) thickness. Allowable moment may be increased for MSSC Kneewall Connectors attached to studs with 54 (16) mil (ga.) thickness by multiplying by a factor of 1.16 for MSSC4.25KW and 1.28 for MSSC6.25KW.
- Tabulated capacities assume lateral force applied at height of 38" above concrete. Tabulated capacities are based on maximum allowable anchorage loads only. The capacity of the connection system shall be the minimum of the tabulated value and the allowable load value from the MSSCKW Connectors: Allowable Load Tables.

PHC Panel Hoist Clip

The PHC panel hoist clip allows easier installation and lifting of wall panels on the job and at assembly sites. The PHC clip features a small profile design to fit inside holes as small as 1.5". Contractors can either drill holes in the track onsite or have the track manufactured with holes for easier installation of the clip through the top track. The rolled edges and rolled hoist-edge-hole provide greater strength and give the capacity needed for heavy panel projects. Maximum and minimum screw patterns give you options for heavier or lighter load needs. The PHC hoist clip has been assembly tested for tension and panel pick up, providing an increased level of safety for panelizers, installers and engineers.

Features:

- Small profile to allow for easy installation through the top track
- Greater top track strength with reduced opening size required for hoist clip to fit through top track
- Rolled stiffener for increased strength across the entire length of clip
- Rolled hoist-edge-hole for increased strength and smooth mounting edge
- Screw pattern options allow for varying load needs; fill round holes for minimum loads, or fill round holes and triangular holes for maximum loads
- Chamfered top corners and minimized distance of material above hoist hole allows for the lifting device to slide freely without getting stuck
- Assembly tested for tension and panel pick up at different angles for attachment to stud web
- Optional panel hoist clip cover (PHC-C) available to cover track hole and create a tight connector fit for the concrete pour when embedding the installed hoist in concrete or other hole cover needs

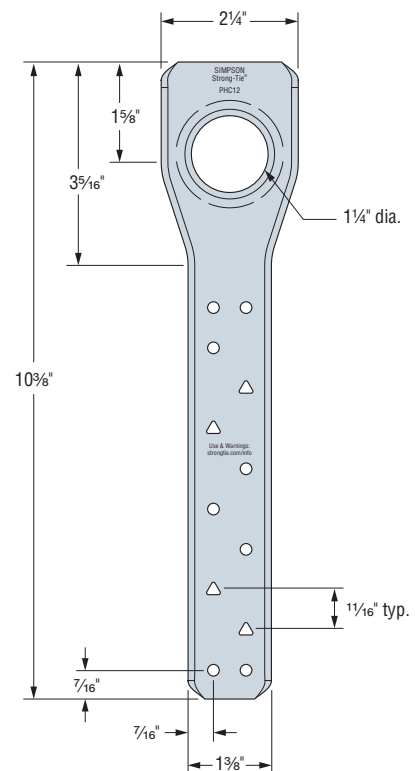
Material: PHC12 — 97 mil (12 ga.), 50 ksi; PHC-C — 33 mil

Finish: Galvanized (G90)

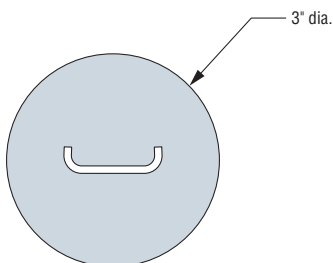
Installation: Use all specified fasteners/anchors

Codes: Testing performed in accordance with ICC-ES AC261. Visit strongtie.com for the latest load values and testing information.

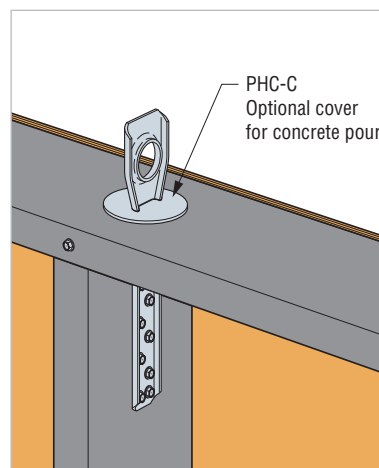
Ordering information: PHC12 is a box of 50 connectors
PHC-C is a box of 50 covers.



PHC12
Panel Hoist Clip

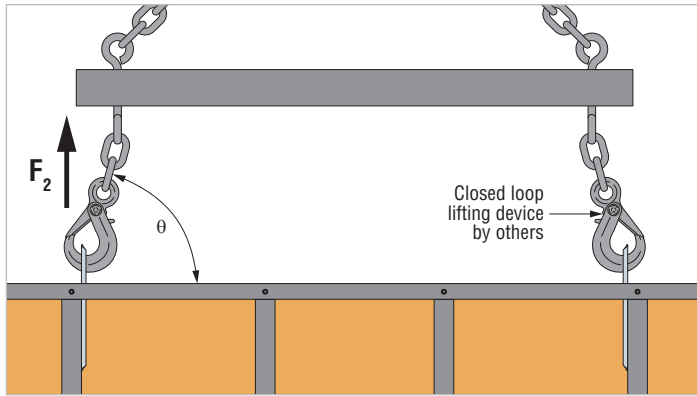


PHC-C
Panel Hoist Clip Cover
(for concrete pour or other hole cover needs, sold separately)

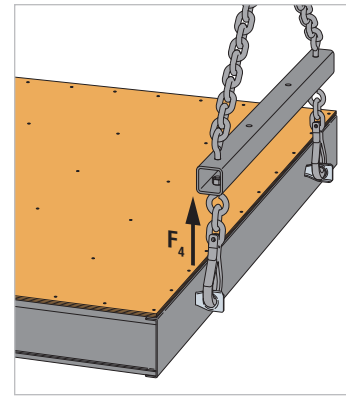


PHC Panel Hoist Clip

Rigid Connectors



F₂ Tension Load



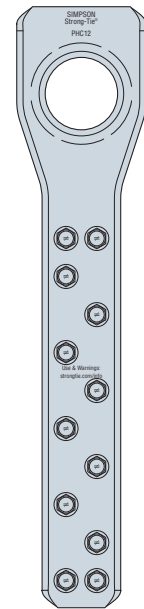
F₄ Flat Panel Pickup

PHC Allowable Loads per Clip (lb.)

| Model No. | No. of #10 Screws to Framing | Stud Thickness mil (ga.) | PHC12 Attach to Stud Web | | | |
|-----------|------------------------------|--------------------------|-----------------------------|----------------|----------------------------------|----------------|
| | | | Tension Load F ₂ | | Flat Panel Pickup F ₄ | |
| | | | θ = 45° | θ = 75° to 90° | θ = 45° | θ = 75° to 90° |
| PHC12 | 8 (min. pattern) | 33 (20) | 530 | 1,415 | 395 | 460 |
| | | 43 (18) | 695 | 2,105 | 515 | 600 |
| | | 54 (16) | 990 | 2,785 | 985 | 985 |
| | | 68 (14) | 1,250 | 3,220 | 1,240 | 1,240 |
| | | 97 (12) | 1,250 | 3,220 | 1,240 | 1,240 |
| | 12 (max. pattern) | 33 (20) | 795 | 2,120 | 590 | 690 |
| | | 43 (18) | 1,040 | 2,785 | 770 | 900 |
| | | 54 (16) | 1,485 | 2,785 | 1,475 | 1,475 |
| | | 68 (14) | 1,875 | 3,220 | 1,860 | 1,860 |
| | | 97 (12) | 1,875 | 3,220 | 1,860 | 1,860 |

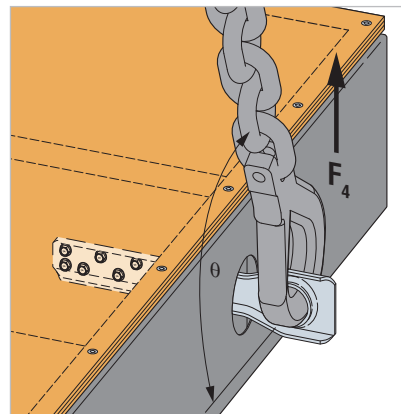
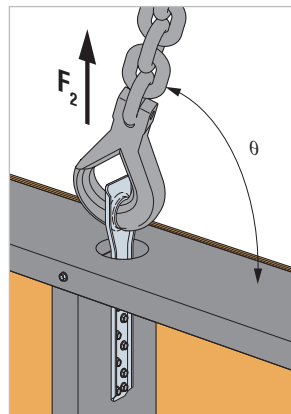


Eight-Screw Pattern



Twelve-Screw Pattern

1. For additional important information, see General Information and Notes on p. 26.
2. Allowable loads are for clip and anchorage to stud.
3. Minimum pattern is screws to all round holes; maximum pattern is screws to round and triangle holes.
4. Linear interpolation is allowed for angles between 45° and 75°.
5. Tabulated values are based on 3 3/8" to 8" framing members with track and stud of the same thickness and 2 1/2" maximum diameter hole centered in the top track for lifting devices.
6. Lifting devices should be connected to the PHC12 with a closed-loop attachment of sufficient strength to carry the allowable load.
7. The listed allowable tension load is the allowable vertical load of the hoist clip (not the allowable load in direction of force).



PHC Attached to Stud Web

Special Order Custom Clips and Connectors

Simpson Strong-Tie can make a variety of flat and bent steel clips and connectors for cold-formed steel framing. Most custom clips can be punched with different holes and slots.

Material: 229 mil (3 ga.) maximum, 33 mil (20 ga.) minimum mill-certified steel (carbon and Type 316L stainless steel)

Finish: Galvanized, Simpson Strong-Tie® gray paint. Contact Simpson Strong-Tie for availability.

To Obtain Quote:

- Supply a CAD drawing in .dwg or .dxf format complete with all dimensions, hole diameter and centerline locations, bend angles, steel strength (min. F_y and F_u), thickness (mil and/or ga.) and finish: (galvanized to G90, G185) or Simpson Strong-Tie gray paint (specify)
- Total shape and size up to a maximum of 48" x 48" (approx. $\frac{1}{16}$ " tolerance)
- Simpson Strong-Tie does not provide product engineering or load values for special-order custom clips and connectors
- Contact Simpson Strong-Tie for pricing information
- For additional information, please refer to Important Information and General Notes on pp. 14–17 and 26.

Specification Example:

Quantity: XX pieces

Dimensions: Per the attached CAD drawing (.dwg or .dxf format)

Drawing must be fully dimensioned, including:

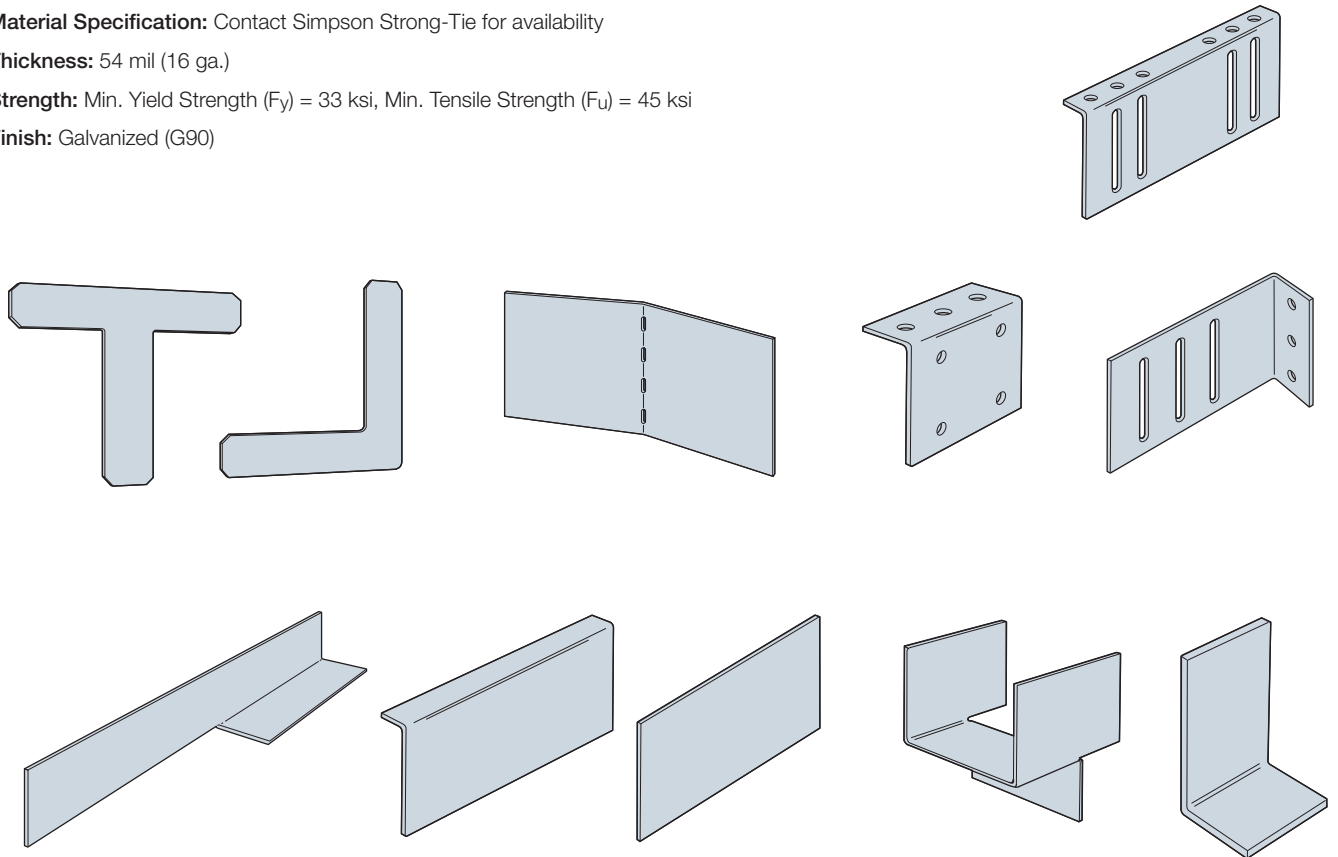
- Overall dimensions
- Leg dimensions
- Bend angles (if required)
- Hole/slot sizes and centerlines (if required)

Material Specification: Contact Simpson Strong-Tie for availability

Thickness: 54 mil (16 ga.)

Strength: Min. Yield Strength (F_y) = 33 ksi, Min. Tensile Strength (F_u) = 45 ksi

Finish: Galvanized (G90)



Bridging, Bracing and Backing



SUBH Bridging Connectors

Simplified Design and Installation Through Innovation

Simpson Strong-Tie® SUBH and MSUBH wall stud bridging connectors for cold-formed steel (CFS) framing offer a compact profile that allows standard 1½" studs to be sistered directly against adjacent studs. The LSUBH connector provides the same installation benefits of the SUBH/MSUBH connectors, and is suitable for many wind- and load-bearing situations where the load demand is light to moderate.

Many applications require only one screw, greatly reducing labor costs and increasing productivity.



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

Features:

- Tested to include stud-web strength and stiffness in the tabulated design values
- Design values ensure compliance with AISI S100 Sections C2.2.1 and C2.3 for axially and laterally-loaded studs
- Flexible design solutions for web thicknesses of 33 mil (20 ga.) through 97 mil (12 ga.) and stud sizes from 3½" to 8"
- SUBH and LSUBH accommodates single studs 33 mil (20 ga.) to 54 mil (16 ga.)
- MSUBH accommodates single studs 54 mil (16 ga.) to 97 mil (12 ga.) and back-to-back built-up members ranging from 33 mil (20 ga.) to 54 mil (16 ga.)

Material: LSUBH3.25 — 33 mil (20 ga.); SUBH3.25 — 43 mil (18 ga.); MSUBH3.25 — 68 mil (14 ga.)

Finish: Galvanized (G90)

Installation:

- See pp. 138 through 140

Codes: See p. 13 for Code Reference Key Chart

Ordering Information:

LSUBH3.25 and SUBH3.25-R150 (Bucket of 150),
MSUBH3.25-R100 (Bucket of 100)



Compact Geometry

Facilitates efficient installation in industry-standard 1.5" web knockouts

Web Slots

Offers strong rotational resistance without the use of screws

Embossments

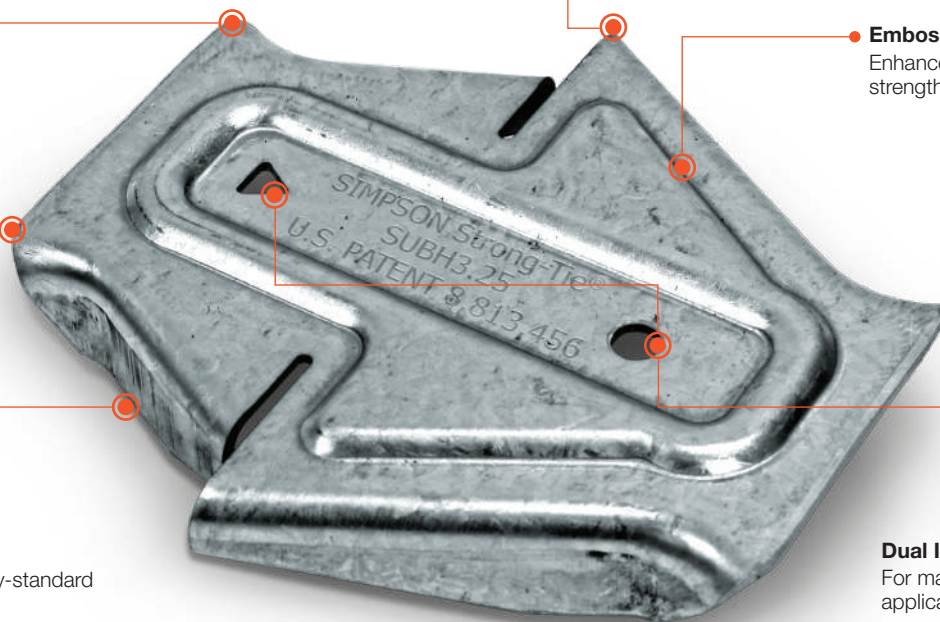
Enhance connector strength and stiffness

Contoured Flanges

Fits snug over industry-standard 1.5" wide u-channels

Dual Installation Options

For maximum design and application flexibility

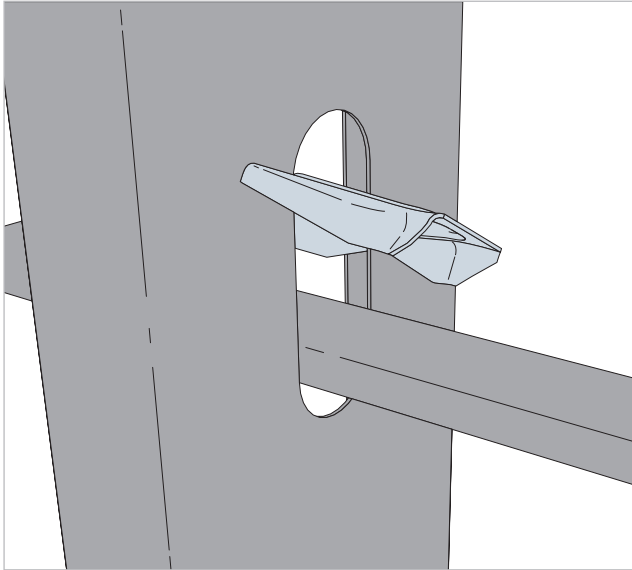


(LSUBH3.25 and MSUBH3.25 similar)

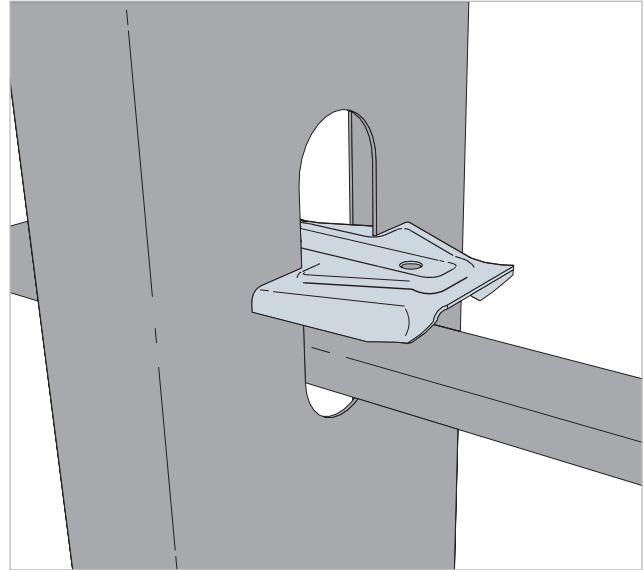
US Patent: 8,813,456

SUBH Bridging Connectors

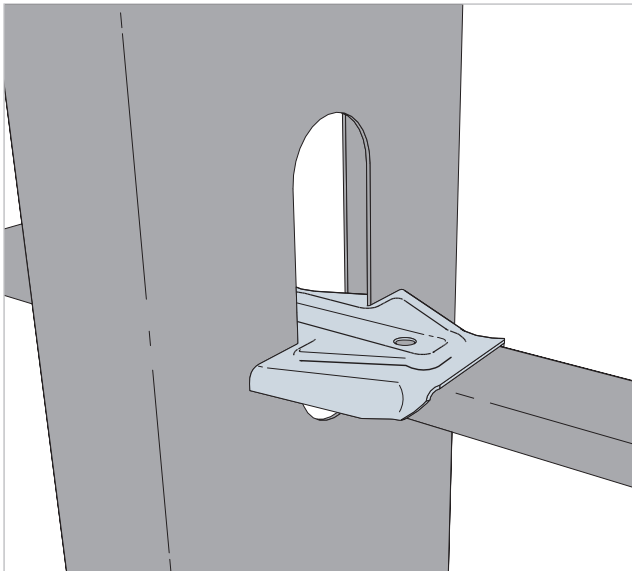
Installation Instructions



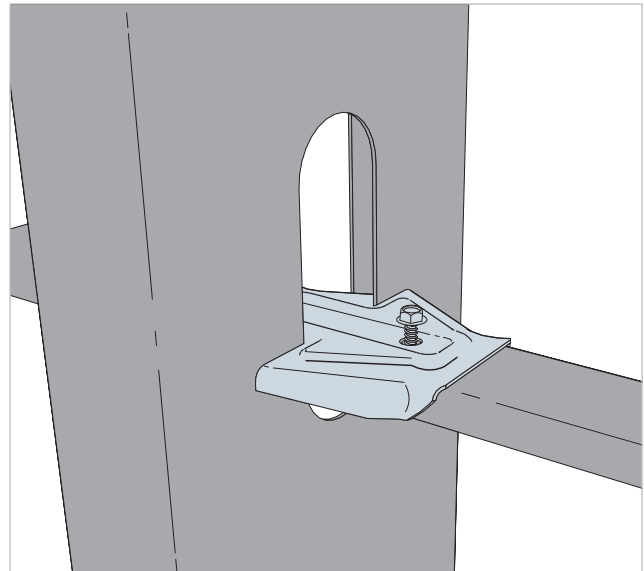
Step 1: With the u-channel in a stable, horizontal position, insert either end of the SUBH into the web knockout at approximately 45°.



Step 2: Rotate the SUBH into a horizontal position aligned with the u-channel so the slots engage the stud web.



Step 3: Slide the SUBH down over the u-channel flanges, ensuring that the connector and u-channel are fully seated.
(Note: For installations at slip track, the connector may be installed inverted — see p. 139.)

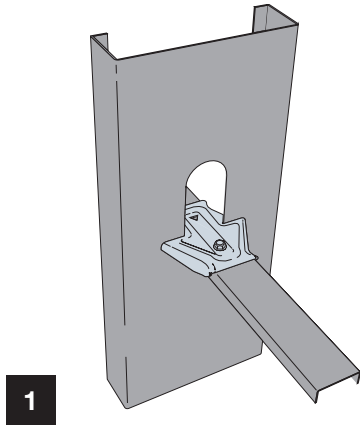


Step 4: Install the specified type and number of screws through the holes of the SUBH into the u-channel.

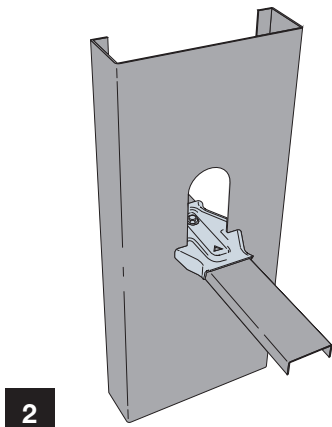
SUBH Bridging Connectors

Installation Details

Typical Orientations

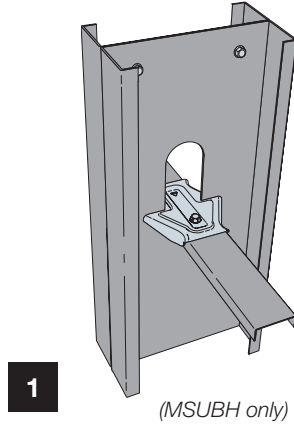


1 Round Hole Near Side



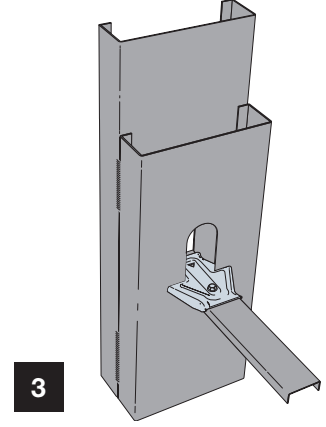
2 Round Hole Far Side

Recommended Details at Built-Up Studs

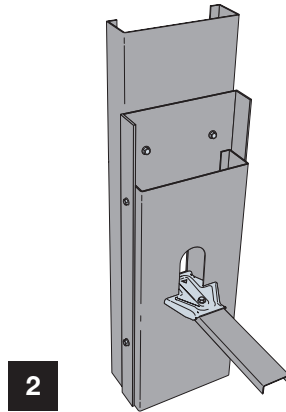


1

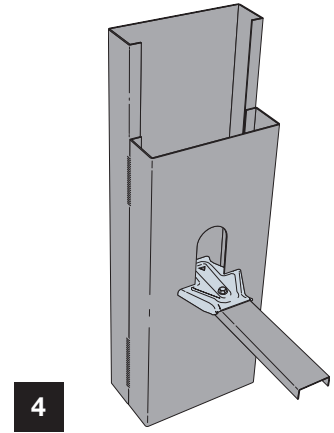
(MSUBH only)



3

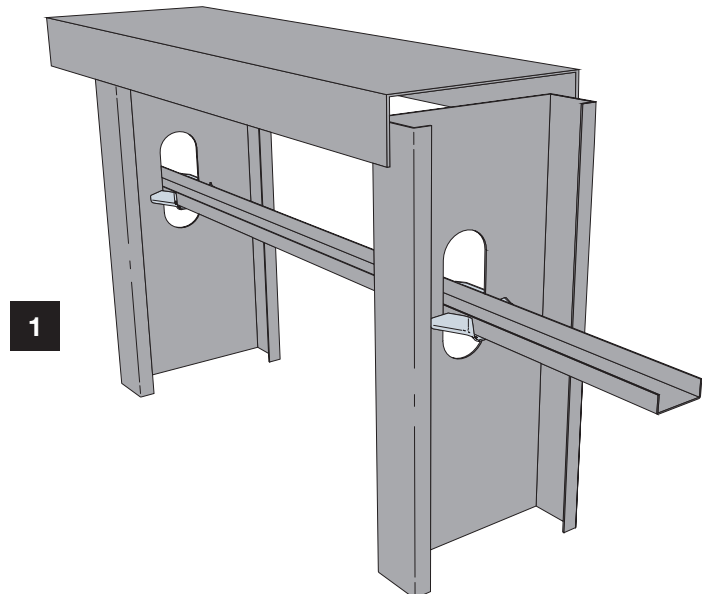


2



4

Recommended Detail at Slip Track

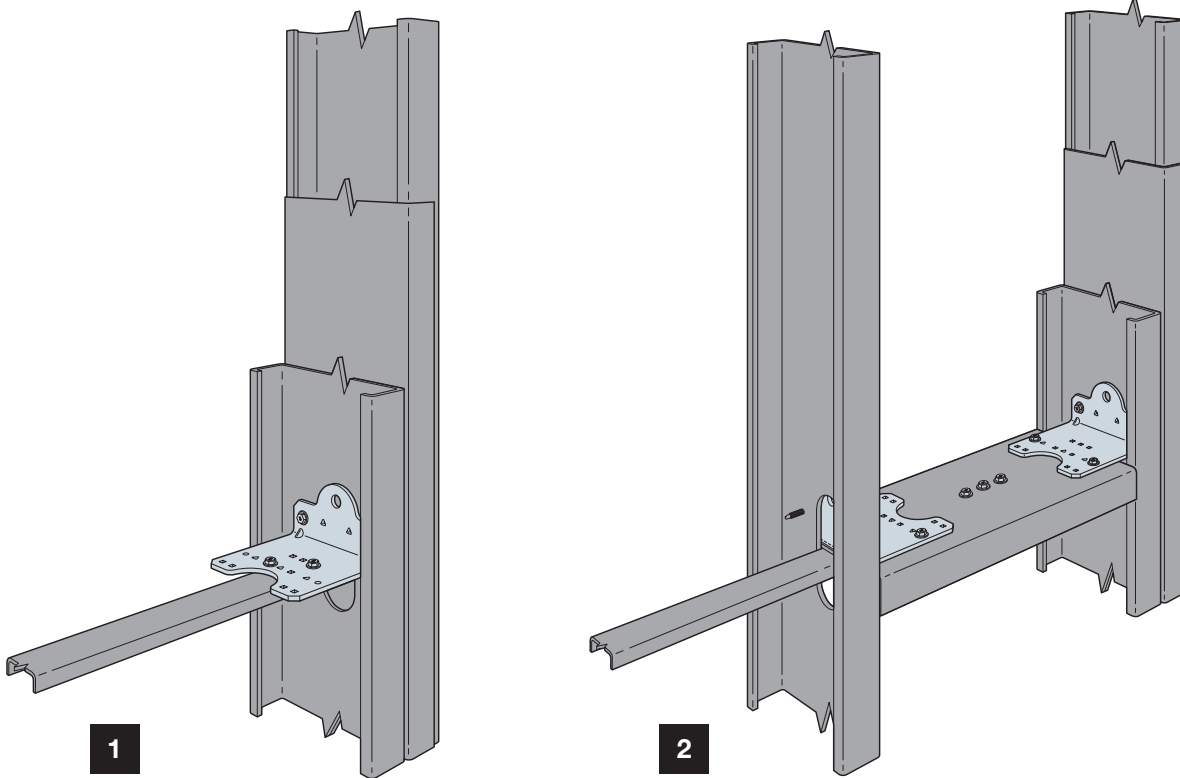


1

SUBH Bridging Connectors

Alternate and Optional U-Channel Bridging Installation Details

Recommended details where knockout access is restricted, or where additional u-channel restraint is needed for load path considerations.



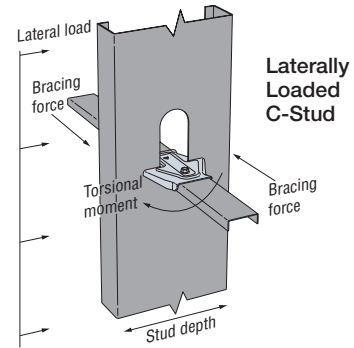
SUBH Bridging Connectors

How to Use Bridging Connector Allowable Load Table

The tabulated strength and stiffness values are for use with Sections C2.2.1 and C2.3 of the 2016 edition of AISI North American Specification for the Design of Cold-Formed Steel Structural Members (AISI S100-2016) as follows:

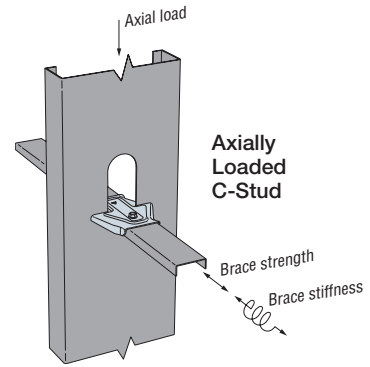
Bracing Design for Laterally Loaded C-Studs

- Step 1: Calculate required bracing force for each flange using equation C2.2.1-3
- Step 2: Multiply result by stud depth to obtain torsional moment
- Step 3: Select connector with tabulated allowable torsional moment that exceeds torsional moment from Step 2 for the stud depth and gauge required



Bracing Design for Axially Loaded C-Studs

- Step 1: Calculate required brace strength using equation C2.3-1
- Step 2: Calculate required brace stiffness using equation C2.3-2a
- Step 3: Select connector with tabulated allowable brace strength that exceeds strength from Step 1 and tabulated brace stiffness that exceeds stiffness from Step 2 for the stud depth and gauge required



SUBH Bridge Clip Connector – Strength and Stiffness

| Model No. | Stud Depth (in.) | Stud Thickness mils (ga.) | Laterally Loaded C-Stud | | Axially Loaded C-Stud | | | Code Ref. | |
|-----------|------------------|---------------------------|---|---------|---|------|--|-----------|-------------|
| | | | Allowable Torsional Moment ¹ (in.-lb.) | | Allowable Brace Strength ^{1,2} (lb.) | | Brace Stiffness ³ (lb./in.) | | |
| | | | Min. | Max. | Min. | Max. | Min. | | Max. |
| LSUBH3.25 | 3.50 or 3.625 | 33 (20) | 215 | 330 | 155 | 275 | 2,300 | 2,685 | IBC, FL, LA |
| | | 43 (18) | 230 | 370 | 175 | 310 | 5,075 | 7,585 | |
| | | 54 (16) | 225 | 370 | 195 | 345 | 5,075 | 8,100 | |
| SUBH3.25 | | 33 (20) | 320 | 345 | 230 | 370 | 1,450 | 1,985 | |
| | | 43 (18) | 355 | 430 | 255 | 420 | 2,780 | 4,035 | |
| | | 54 (16) | 420 | 455 | 290 | 475 | 2,925 | 3,975 | |
| MSUBH3.25 | | 54 (16) | 550 | 800 | 435 | 630 | 3,440 | 4,015 | |
| | | 68 (14) | 640 | 860 | 485 | 695 | 4,040 | 6,145 | |
| | | 97 (12) | 670 | 860 | 515 | 770 | 6,860 | 14,265 | |
| LSUBH3.25 | 6.00 | 33 (20) | 225 | 330 | 120 | 140 | 670 | 730 | |
| | | 43 (18) | 250 | 395 | 155 | 285 | 1,010 | 2,075 | |
| | | 54 (16) | 265 | 395 | 180 | 330 | 1,025 | 2,565 | |
| SUBH3.25 | | 33 (20) | 275 | 385 | 110 | 110 | 605 | 605 | |
| | | 43 (18) | 295 | 525 | 230 | 250 | 1,050 | 1,205 | |
| | | 54 (16) | 350 | 550 | 275 | 415 | 1,130 | 1,700 | |
| MSUBH3.25 | | 54 (16) | 565 | 895 | 385 | 430 | 1,630 | 1,695 | |
| | | 68 (14) | 655 | 925 | 455 | 620 | 1,860 | 2,655 | |
| | | 97 (12) | 690 | 960 | 505 | 765 | 4,070 | 4,090 | |
| LSUBH3.25 | 8.00 | 43 (18) | 235 | 375 | 135 | 135 | 815 | 815 | |
| | | 54 (16) | 250 | 375 | 180 | 260 | 1,130 | 1,130 | |
| | | 43 (18) | 255 | 570 | 190 | 190 | 505 | 535 | |
| SUBH3.25 | | 54 (16) | 325 | 605 | 250 | 300 | 895 | 1,025 | |
| | | 54 (16) | 545 | 890 | 270 | 270 | 1,025 | 1,045 | |
| | | 68 (14) | 635 | 925 | 435 | 455 | 1,400 | 1,400 | |
| MSUBH3.25 | | 97 (12) | 665 | 955 | 545 | 545 | 2,465 | 2,465 | |
| | | MSUBH3.25 | 10, 12 | 54 (16) | — | 820 | — | 200 | — |

1. Allowable loads are for use when utilizing Allowable Stress Design methodology. For LRFD loads multiply the ASD tabulated values by 1.6.
2. Allowable brace strengths are based on ultimate test load divided by a safety factor. Serviceability limit is not considered, as brace stiffness requirements are given in section C2.3 of AISI S100-2016. Contact Simpson Strong-Tie if nominal brace strength is required.
3. Tabulated stiffness values apply to both ASD and LRFD designs.
4. Allowable loads consider bridging connection only. It is responsibility of the designer to verify the strength and serviceability of the framing members.
5. Min. fastener quantity and tabulated values – fill round hole (one screw total); Max. fastener quantity and tabulated values – fill round and triangle holes (two screws total).
6. For 4" and 5.5" stud depth, reference SUBH connector page at strongtie.com.

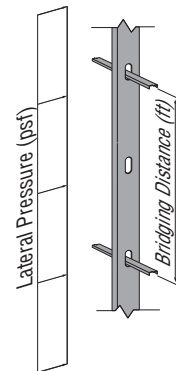
SUBH Design Tables

Bridging, Bracing and Backing

LSUBH — Maximum Vertical Spacing for Rows of U-Channel Bridging (ft.)

| Stud Spacing (in.) | Stud Section | Stud Thickness mil (ga.) | Lateral Stud Pressure (psf) | | | | | | | | | | | | | | | | | | | | | | |
|--------------------|--------------|--------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---|---|---|
| | | | 5 | | 10 | | 15 | | 20 | | 25 | | 30 | | 35 | | 40 | | 45 | | 50 | | | | |
| | | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | | | |
| 16 | 362S162 | 33 (20) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 4 | 6 | — | 5 | — | 5 | — | 4 | — | 4 | | |
| | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 7 | 4 | 6 | — | 5 | — | 5 | — | 5 | — | 4 | |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 7 | 4 | 6 | — | 5 | — | 5 | — | 5 | — | 4 | |
| | 362S200 | 33 (20) | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 4 | 6 | — | 5 | — | 4 | — | 4 | — | — | — | — | — | — | |
| | | 43 (18) | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 7 | — | 6 | — | 5 | — | 4 | — | 4 | — | 4 | — | — | |
| | | 54 (16) | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 7 | — | 6 | — | 5 | — | 4 | — | 4 | — | 4 | — | — | |
| | 362S250 | 43 (18) | 8 | 8 | 8 | 8 | 6 | 8 | 4 | 7 | — | 5 | — | 4 | — | 4 | — | — | — | — | — | — | — | — | |
| | | 54 (16) | 8 | 8 | 8 | 8 | 5 | 8 | 4 | 7 | — | 5 | — | 4 | — | 4 | — | — | — | — | — | — | — | — | |
| | 600S162 | 33 (20) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 4 | 6 | 4 | 6 | 4 | 6 | — | 5 | — | 4 | |
| | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 4 | 7 | 4 | 7 | 4 | 6 | — | 5 | |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 4 | 7 | 4 | 7 | 4 | 6 | — | 5 | |
| | 600S200 | 33 (20) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 4 | 7 | 4 | 6 | — | 5 | — | 4 | — | 4 | — | 4 | — | — | |
| | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 4 | 7 | — | 6 | — | 5 | — | 4 | — | 4 | — | 4 | |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 7 | 4 | 6 | — | 5 | — | 4 | — | 4 | — | 4 | |
| | 600S250 | 43 (18) | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 6 | — | 5 | — | 4 | — | 4 | — | — | — | — | — | — | |
| | | 54 (16) | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 6 | — | 5 | — | 4 | — | 4 | — | — | — | — | — | — | |
| | 800S162 | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 4 | 7 | 4 | 6 | — | 6 | — | 6 | |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 4 | 7 | 4 | 7 | 4 | 6 | — | 6 |
| | 800S200 | 43 (18) | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 7 | 4 | 6 | — | 5 | — | 5 | — | 5 | — | 4 | — | 4 |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 7 | 4 | 6 | — | 5 | — | 5 | — | 5 | — | 4 | — | 4 |
| | 800S250 | 43 (18) | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 7 | — | 5 | — | 5 | — | 4 | — | — | — | — | — | — | |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 4 | 7 | 4 | 6 | — | 5 | — | 4 | — | 4 | — | 4 | — | — | — | |
| | 24 | 362S162 | 33 (20) | 8 | 8 | 8 | 8 | 6 | 8 | 4 | 6 | — | 5 | — | 4 | — | — | — | — | — | — | — | — | — | |
| | | | 43 (18) | 8 | 8 | 8 | 8 | 6 | 8 | 4 | 7 | — | 6 | — | 5 | — | 4 | — | — | — | — | — | — | — | |
| 54 (16) | | | 8 | 8 | 8 | 8 | 6 | 8 | 4 | 7 | — | 6 | — | 5 | — | 4 | — | — | — | — | — | — | — | — | |
| 362S200 | | 33 (20) | 8 | 8 | 6 | 8 | 4 | 7 | — | 5 | — | 4 | — | — | — | — | — | — | — | — | — | — | — | | |
| | | 43 (18) | 8 | 8 | 7 | 8 | 4 | 8 | — | 6 | — | 4 | — | 4 | — | — | — | — | — | — | — | — | — | | |
| | | 54 (16) | 8 | 8 | 7 | 8 | 4 | 8 | — | 6 | — | 4 | — | 4 | — | — | — | — | — | — | — | — | — | | |
| 362S250 | | 43 (18) | 8 | 8 | 6 | 8 | 4 | 6 | — | 4 | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| | | 54 (16) | 8 | 8 | 5 | 8 | — | 6 | — | 4 | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 600S162 | | 33 (20) | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 6 | — | 5 | — | 4 | — | 4 | — | — | — | — | — | | |
| | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 4 | 7 | 4 | 6 | — | 5 | — | 4 | — | 4 | — | — | — | | |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 7 | 4 | 6 | — | 5 | — | 4 | — | 4 | — | — | — | | |
| 600S200 | | 33 (20) | 8 | 8 | 8 | 8 | 5 | 8 | 4 | 6 | — | 4 | — | 4 | — | — | — | — | — | — | — | — | — | | |
| | | 43 (18) | 8 | 8 | 8 | 8 | 6 | 8 | 4 | 7 | — | 5 | — | 4 | — | 4 | — | — | — | — | — | — | — | | |
| | | 54 (16) | 8 | 8 | 8 | 8 | 6 | 8 | 4 | 7 | — | 5 | — | 4 | — | 4 | — | — | — | — | — | — | — | | |
| 600S250 | | 43 (18) | 8 | 8 | 7 | 8 | 4 | 7 | — | 5 | — | 4 | — | — | — | — | — | — | — | — | — | — | — | | |
| | | 54 (16) | 8 | 8 | 7 | 8 | 5 | 7 | — | 5 | — | 4 | — | — | — | — | — | — | — | — | — | — | — | | |
| 800S162 | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 4 | 6 | — | 5 | — | 5 | — | 4 | — | 4 | — | 4 | |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 7 | 4 | 6 | — | 5 | — | 4 | — | 4 | — | 4 | |
| 800S200 | | 43 (18) | 8 | 8 | 8 | 8 | 6 | 8 | 4 | 7 | — | 6 | — | 5 | — | 4 | — | — | — | — | — | — | — | — | |
| | | 54 (16) | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 7 | 4 | 6 | — | 5 | — | 4 | — | — | — | — | — | — | — | — | |
| 800S250 | | 43 (18) | 8 | 8 | 7 | 8 | 5 | 7 | — | 5 | — | 4 | — | — | — | — | — | — | — | — | — | — | — | | |
| | | 54 (16) | 8 | 8 | 8 | 8 | 5 | 8 | 4 | 6 | — | 4 | — | 4 | — | — | — | — | — | — | — | — | — | | |

1. See General Information and Notes on pp. 15–17 and 26.
2. Tabulated solutions are for ASD lateral pressure. Contact Simpson Strong-Tie for LRFD solutions.
3. Lateral pressure shall be determined based on load combinations of the applicable code. For designs in accordance with the 2009 IBC and earlier, wind pressures are at working stress level and may be used directly. For designs in accordance with the 2012 IBC and later, wind pressures are at strength level and must be multiplied by 0.6 for ASD load combinations.
4. “Min.” designates a solution with the minimum number of fasteners ((1) #10 screw installed in round hole). “Max.” designates a solution requiring the maximum number of fasteners ((2) #10 screws; fill both round and triangle holes). Blank areas designate conditions where the LSUBH does not offer a solution.



SUBH Design Tables

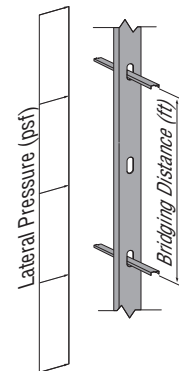
SUBH — Maximum Vertical Spacing for Rows of U-Channel Bridging (ft.)

| Stud Spacing (in.) | Stud Section | Stud Thickness mil (ga.) | Lateral Stud Pressure (psf) | | | | | | | | | | | | | | | | | | | | |
|--------------------|--------------|--------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---|
| | | | 5 | | 10 | | 15 | | 20 | | 25 | | 30 | | 35 | | 40 | | 45 | | 50 | | |
| | | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | |
| 16 | 362S162 | 33 (20) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | |
| | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | 362S200 | 33 (20) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 6 | 5 | 5 | 4 | 4 | — | 4 | — | — | — | — |
| | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 6 | 4 | 5 | 4 | 5 | — | 4 | — | 4 |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 7 | 5 | 6 | 5 | 5 | 4 | 4 | 4 | 4 |
| | 362S250 | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 6 | 4 | 5 | — | 4 | — | 4 | — | — | — | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 7 | 5 | 5 | 4 | 5 | 4 | 4 | — | — | — | — |
| | 600S162 | 33 (20) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 5 | 7 | 4 | 6 | 4 | 5 |
| | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 4 | 8 | 4 | 7 |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 5 | 8 |
| | 600S200 | 33 (20) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 7 | 4 | 6 | — | 5 | — | 4 | — | 4 | — |
| | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 4 | 8 | 4 | 7 | — | 6 | — | 5 | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 4 | 7 | 4 | 6 | — | 6 | — |
| | 600S250 | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 4 | 7 | — | 6 | — | 5 | — | 5 | — | 4 | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 4 | 6 | — | 6 | — | 5 | — | 4 | — |
| | 800S162 | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 4 | 8 | 4 | 8 |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 6 | 8 | 5 | 8 |
| | 800S200 | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 4 | 8 | — | 8 | — | 7 | — | 7 | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 5 | 8 | 4 | 8 | 4 | 7 |
| | 800S250 | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 4 | 8 | 4 | 8 | — | 7 | — | 6 | — | 6 | — | 5 | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 4 | 8 | 4 | 8 | — | 7 | — | 6 | — |
| | 24 | 362S162 | 33 (20) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 7 | 5 | 5 | 4 | 4 | — | — | — | — | — | — | — | — |
| | | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 7 | 5 | 6 | 4 | 5 | — | 4 | — | 4 | — | 4 |
| 54 (16) | | | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 6 | 6 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | — | — |
| 362S200 | | 33 (20) | 8 | 8 | 8 | 8 | 6 | 7 | 5 | 5 | 4 | 4 | — | — | — | — | — | — | — | — | — | — | — |
| | | 43 (18) | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 6 | 4 | 5 | — | 4 | — | — | — | — | — | — | — | — | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 7 | 5 | 5 | 4 | 4 | — | 4 | — | — | — | — | — | — | — |
| 362S250 | | 43 (18) | 8 | 8 | 8 | 8 | 6 | 7 | 4 | 5 | — | 4 | — | — | — | — | — | — | — | — | — | — | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 7 | 7 | 5 | 5 | 4 | 4 | — | — | — | — | — | — | — | — | — | — | — |
| 600S162 | | 33 (20) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 7 | 4 | 6 | — | 5 | — | 4 | — | 4 | — | — | — |
| | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 8 | 4 | 7 | — | 6 | — | 5 | — | 5 | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 5 | 7 | 4 | 6 | — | 6 | — | 5 | — |
| 600S200 | | 33 (20) | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 7 | 4 | 5 | — | 4 | — | 4 | — | — | — | — | — | — | — |
| | | 43 (18) | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 7 | — | 6 | — | 5 | — | 4 | — | 4 | — | 4 | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 4 | 6 | — | 5 | — | 5 | — | 4 | — | 4 | — |
| 600S250 | | 43 (18) | 8 | 8 | 8 | 8 | 5 | 8 | 4 | 7 | — | 6 | — | 5 | — | 4 | — | — | — | — | — | — | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 4 | 6 | — | 5 | — | 4 | — | 4 | — | — | — | — | — |
| 800S162 | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 8 | 4 | 8 | — | 7 | — | 7 | — | 6 | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 4 | 8 | 4 | 8 | 4 | 7 | — |
| 800S200 | | 43 (18) | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 4 | 8 | — | 7 | — | 6 | — | 5 | — | 5 | — | 4 | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 4 | 8 | — | 7 | — | 6 | — | 5 | — | 5 | — |
| 800S250 | | 43 (18) | 8 | 8 | 8 | 8 | 5 | 8 | 4 | 8 | — | 7 | — | 6 | — | 5 | — | 4 | — | 4 | — | — | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 4 | 7 | — | 6 | — | 5 | — | 4 | — | 4 | — | — | — |

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Bridging, Bracing and Backing

- See General Information and Notes on pp. 15–17 and 26.
- Tabulated solutions are for ASD lateral pressure. Contact Simpson Strong-Tie for LRFD solutions.
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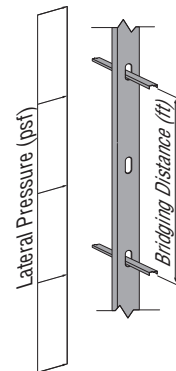
SUBH Design Tables

MSUBH — Maximum Vertical Spacing for Rows of U-Channel Bridging (ft.)

Bridging, Bracing and Backing

| Stud Spacing (in.) | Stud Section | Stud Thickness mil (ga.) | Lateral Stud Pressure (psf) | | | | | | | | | | | | | | | | | | | | |
|--------------------|--------------|--------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---|
| | | | 5 | | 10 | | 15 | | 20 | | 25 | | 30 | | 35 | | 40 | | 45 | | 50 | | |
| | | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | |
| 16 | 362S162 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 7 | 8 | |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | 362S200 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 6 | 8 | 5 | 7 | 8 |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 7 | 8 | 6 | 8 | 8 |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 8 |
| | 362S250 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 7 | 4 | 7 | 4 | 6 |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 7 | 5 | 7 | 5 | 6 |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 6 | 7 | 5 | 6 | 5 | 6 |
| | 600S162 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | 600S200 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 7 | 8 | 7 | 8 | 6 | 8 |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | 600S250 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 5 | 7 | 8 |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 6 | 8 | 5 | 8 | 8 |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 6 | 8 | 6 | 8 | 8 |
| | 800S162 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | 800S200 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 8 |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| 800S250 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 5 | 8 | 8 | |
| | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 6 | 8 | 6 | 8 | 8 | |
| | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 6 | 8 | 8 | |
| 1000S162 | 54 (16) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| | 68 (14) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| | 97 (12) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| 1000S200 | 54 (16) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| | 68 (14) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| | 97 (12) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| 1000S250 | 54 (16) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| | 68 (14) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| | 97 (12) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| 1200S162 | 54 (16) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| | 68 (14) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| | 97 (12) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| 1200S200 | 54 (16) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| | 68 (14) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| | 97 (12) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| 1200S250 | 54 (16) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| | 68 (14) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |
| | 97 (12) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | |

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SUBH Design Tables

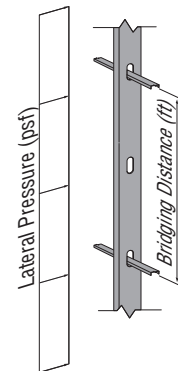
MSUBH — Maximum Vertical Spacing for Rows of U-Channel Bridging (ft.) (cont.)

| Stud Spacing (in.) | Stud Section | Stud Thickness mil (ga.) | Lateral Stud Pressure (psf) | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------|--------------|--------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---|---|---|---|
| | | | 5 | | 10 | | 15 | | 20 | | 25 | | 30 | | 35 | | 40 | | 45 | | 50 | | | | | |
| | | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | | | | |
| 24 | 362S162 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | |
| | 362S200 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 7 | 4 | 6 | 4 | 5 | — | 5 | | | |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 7 | 4 | 6 | 4 | 5 | | | |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 7 | 5 | 7 | 5 | 6 | 4 | 5 | |
| | 362S250 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 4 | 7 | 4 | 6 | — | 5 | — | 4 | — | — | 4 | | |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 7 | 4 | 6 | 4 | 6 | — | 5 | — | 5 | — | — | 4 | |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 7 | 5 | 6 | 4 | 5 | 4 | 5 | 4 | 5 | — | — | 4 | |
| | 600S162 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | 600S200 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 4 | 7 | 4 | 7 | 4 | 6 | | |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 7 | 4 | 7 | | |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 5 | 7 | | |
| | 600S250 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 4 | 7 | 4 | 6 | — | 5 | — | — | 5 | | | |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 7 | 4 | 6 | 4 | 6 | 4 | 6 | — | — | 5 | |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 5 | 7 | 4 | 6 | 4 | 6 | — | — | 5 | |
| | 800S162 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | 800S200 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 5 | 8 | 5 | 8 | 4 | 7 | | |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 5 | 8 | 5 | 7 | |
| | | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 8 | 5 | 8 | |
| 800S250 | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 5 | 8 | 5 | 8 | 4 | 7 | — | 6 | — | — | 5 | | | | |
| | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 5 | 8 | 5 | 7 | 4 | 6 | 4 | 6 | 4 | 6 | | | |
| | 97 (12) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 6 | 8 | 5 | 7 | 4 | 7 | 4 | 7 | 4 | 6 | | | |
| 1000S162 | 54 (16) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | | | |
| | 68 (14) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | | | |
| | 97 (12) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | | | |
| 1000S200 | 54 (16) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | 7 | | |
| | 68 (14) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | 7 | | |
| | 97 (12) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | 7 | | |
| 1000S250 | 54 (16) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 7 | — | 6 | — | 5 | | | |
| | 68 (14) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 7 | — | 6 | — | 5 | | | |
| | 97 (12) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 7 | — | 6 | — | 5 | | | |
| 1200S162 | 54 (16) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | | | |
| | 68 (14) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | | | |
| | 97 (12) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | | | |
| 1200S200 | 54 (16) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | | | |
| | 68 (14) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | | | |
| | 97 (12) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | | | |
| 1200S250 | 54 (16) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 7 | — | 6 | — | 6 | | | |
| | 68 (14) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 7 | — | 6 | — | 6 | | | |
| | 97 (12) | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 8 | — | 7 | — | 7 | — | 6 | | | |

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Bridging, Bracing and Backing

1. See General Information and Notes on pp. 15–17 and 26.
2. Tabulated solutions are for ASD lateral pressure. Contact Simpson Strong-Tie for LRFD solutions.
3. Lateral pressure shall be determined based on load combinations of the applicable code. For designs in accordance with the 2009 IBC and earlier, wind pressures are at working stress level and may be used directly. For designs in accordance with the 2012 IBC and later, wind pressures are at strength level and must be multiplied by 0.6 for ASD load combinations.
4. "Min." designates a solution with the minimum number of fasteners ((1) #10 screw installed in round hole). "Max." designates a solution requiring the maximum number of fasteners ((2) #10 screws; fill both round and triangle holes). Blank areas designate conditions where the MSUBH does not offer a solution.



SUBH Bridging Connectors

Example #1: Curtain-Wall Stud

Given

- 2021 IBC (ASCE 7-16 and AISI S100-16)
- 600S162-43 (33 ksi) studs at 24" o.c.
- 10'-tall studs with mid-point bracing (5' o.c.)
- Wind design pressure = 41 psf

Select Connector Using Design Table (p. 143)

ASD wind pressure:

$$p = (0.6)(41 \text{ psf}) = 24.6 \text{ psf}$$

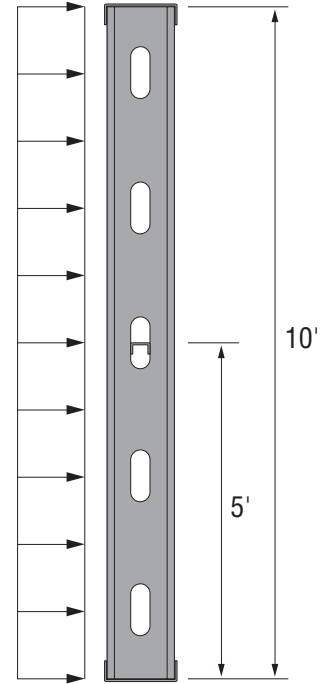
Note: 2021 IBC load combinations for ASD include a factor of 0.6 for wind loads.

For 600S162-43 stud with SUBH3.25 connector, and 25 psf wind pressure with 5' bracing distance:

➔ SUBH3.25 with Min. fasteners **OK**

Notes

1. Only lateral load has been included for clarity. Design of curtain-wall studs should consider load combinations with vertical load in accordance with the applicable building code (see Example #2).
2. Bridging connector may also be designed using Allowable Loads table on p. 141 (see Example #2).



Example #2: Exterior Bearing-Wall Stud

Given

- 2021 IBC (ASCE 7-16 and AISI S100-16)
- 600S162-54 (50 ksi) studs at 24" o.c., 10' tall
Mid-point bracing (5' o.c.)
Required axial stud strength, $P_{ra} = 2,200 \text{ lb.}$
Distance from shear center to mid-plane of web, $m = 0.663''$ (AISI Manual, Table I-2)
- Wind design pressure = 34 psf

Axially-Loaded Stud Design

Required brace strength (AISI S100 Eq. C2.3-1):

$$P_{br,1} = 0.01P_{ra} = (0.01)(2,200 \text{ lb.}) = 22 \text{ lb.}$$

Required brace stiffness (AISI S100 Eq. C2.3-2a):

$$\beta_{rb} = \{2[4 - (2/n)]/L_b\} \Omega P_{ra} = \{2[4 - (2/1)]/60 \text{ in.}\} (2)(2,200) = 294 \text{ lb./in.}$$

From Allowable Loads table (p. 141) for 6"-deep 54-mil stud:

- ➔ Select SUBH3.25 with Min. fasteners
Allowable brace strength = 275 lb. > 22 lb. **OK**
Brace stiffness = 1,130 lb./in. > 294 lb./in. **OK**

Laterally-Loaded Stud Design

Design load tributary to a single connector:

$$W = (0.6)(34 \text{ psf})(2 \text{ ft.})(5 \text{ ft.}) = 204 \text{ lb.}$$

Note: 2021 IBC load combinations for ASD include a factor of 0.6 for wind loads.

Required flange force (AISI S100 Eq. C2.2.1-3):

$$P_{L1} = -P_{L2} = 1.5(m/d)W = (1.5)(0.663 \text{ in.}/6 \text{ in.})(204 \text{ lb.}) = 33.8 \text{ lb.}$$

Torsional moment:

$$M_z = P_{L1}d = -P_{L2}d = (33.8 \text{ lb.})(6 \text{ in.}) = 203 \text{ in.-lb.}$$

From Allowable Loads table (p. 141) for 6"-deep 54-mil stud:

- ➔ Select SUBH3.25 with Min. fasteners
Allowable torsional moment = 350 in.-lb. > 203 in.-lb. **OK**

Combined-Loading Check

$$(P_{br,1}/\text{Allowable brace strength}) + (M_z/\text{Allowable torsional moment}) = (22 \text{ lb.}/275 \text{ lb.}) + (203 \text{ in.-lb.}/350 \text{ in.-lb.}) = 0.66 < 1.0 \text{ **OK**}$$

SBR/DBR Spacer Bracers



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

Simpson Strong-Tie introduces the SBR and DBR spacer bracers for cold-formed steel construction. These spacer bracers reduce the installed cost of cold-formed steel stud walls by enabling faster stud layout while minimizing the need for bridging clips.

The DBR is used for interior walls to eliminate stud bow and allow for quicker drywall attachment, while the SBR is designed for structural exterior walls. Both products provide bracing along the length of the stud, and for head-of-wall slip conditions. The SBR and DBR also come with prepunched slots that eliminate the need to use bridging clips with on-module studs.

The SBR and DBR spacer bracers come with bracing load data based on assembly testing, thus mitigating risk for designers and maximizing confidence in design specs. In fact, the SBR and DBR are the only spacer bracers on the market with tabulated design values based on assembly tests.

Features:

- SBR and DBR have patent-pending precision-engineered prepunched slots strategically located to enable 12", 16" and 24" on-center stud spacing and can be used to space the studs without having to mark the top track for layout
- The SBR will accommodate 3/8" up to 8" studs in thicknesses of 33 mil (20 ga.) through 68 mil (14 ga.)
- The DBR will accommodate 2 1/2", 3 3/8" and 6" studs in thicknesses of 15 mil (25 ga. EQ) through 33 mil (20 ga.)
- Prepunched holes in the SBR provide rapid screw installation when spacer-bracer splices are needed for axial load-bearing studs
- In off-layout or end-of run conditions, the hat-section profiles enable clip attachments to the stud with Simpson Strong-Tie® LSSC or RCA connectors

Installation:

- Spacer bracers are fed through the stud knockout at a 90° angle until studs align with spacer-bracer slots. With the slots engaging the stud web, the spacer-bracer is then rotated back to the flat position so that the slotted flanges are on the bottom.
- For off-layout or end-of-run studs where a spacer-bracer slot does not engage a stud, manually snip the spacer-bracer flanges with a 1/2"-deep slot and secure the spacer bracer to the stud with Simpson Strong-Tie LSSC or RCA connectors. Use all specified fasteners.
- Wear gloves while handling and installing spacer bracers.

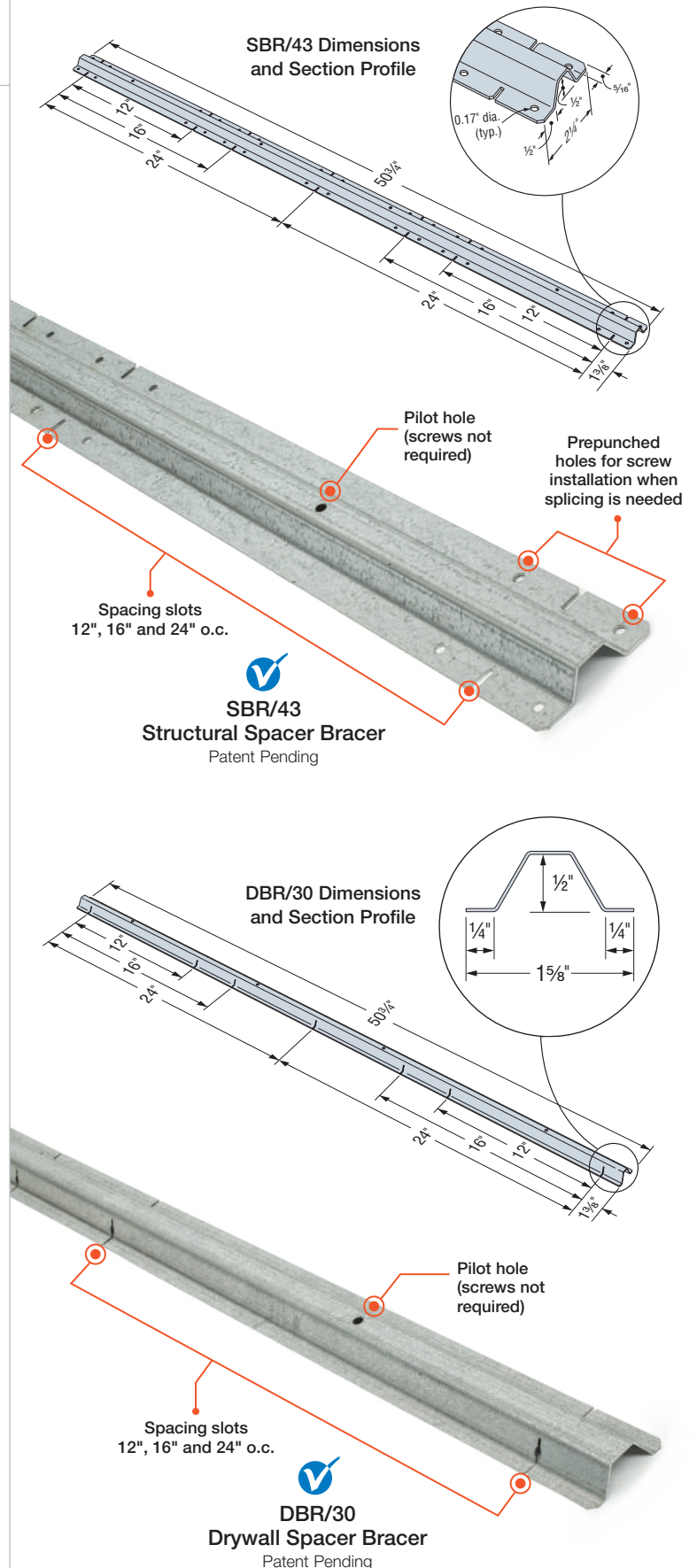
Material: SBR/43 — 43 mil (40 ksi);
DBR/30 — 27 mil (33 ksi)

Finish: Galvanized (G90)

Codes: See p. 13 for Code Reference Key Chart

Ordering Information:

SBR/43-R680 (Pallet 680) SBR/43-R20 (Box of 20)
DBR/30-R680 (Pallet 680) DBR/30-R20 (Box of 20)

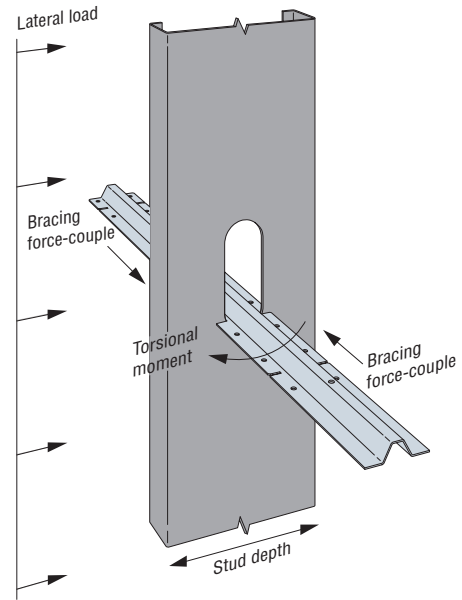


SBR/DBR Spacer Bracers

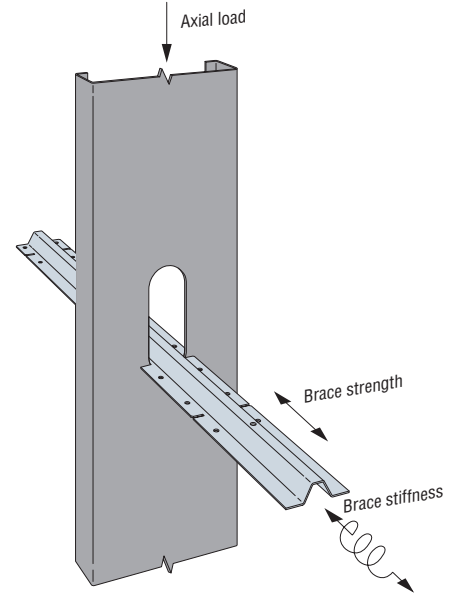
SBR and DBR Spacer Bracer — Connection Strength and Stiffness

| Model No. | Stud Depth (in.) | Stud Thickness mil (ga.) | Allowable Torsional Moment (in./lb.) | Allowable Brace Strength (lb.) | Brace Stiffness (lb./in.) | Code Ref. |
|-----------|------------------|--------------------------|--------------------------------------|--------------------------------|---------------------------|-----------|
| SBR/43 | 3% | 33 (20) | 235 | 390 | 845 | — |
| | | 43 (18) | 310 | 435 | 1,390 | |
| | | 54 (16) | 400 | 435 | 1,390 | |
| | | 68 (14) | 400 | 435 | 1,390 | |
| | 6 | 33 (20) | 215 | 160 | 495 | |
| | | 43 (18) | 310 | 330 | 765 | |
| | | 54 (16) | 365 | 450 | 840 | |
| | | 68 (14) | 365 | 450 | 840 | |
| | 8 | 33 (20) | 200 | — | — | |
| | | 43 (18) | 310 | — | — | |
| | | 54 (16) | 335 | — | — | |
| | | 68 (14) | 335 | — | — | |
| DBR/30 | 2½ | 15 (25 EQ) | 55 | — | — | |
| | | 18 (25) | 55 | — | — | |
| | | 19 (20 EQ) | 60 | — | — | |
| | | 30 (20 DW) | 85 | — | — | |
| | | 33 (20 STR) | 90 | — | — | |
| | 6 | 15 (25 EQ) | 55 | — | — | |
| | | 18 (25) | 55 | — | — | |
| | | 19 (20 EQ) | 60 | — | — | |
| | | 30 (20 DW) | 85 | — | — | |
| | | 33 (20 STR) | 90 | — | — | |

1. Allowable loads are for use when utilizing the traditional Allowable Stress Design methodology. For LRFD loads multiply the ASD tabulated values by 1.6.
2. Tabulated Allowable Brace Strengths are based on ultimate test load divided by a safety factor. Serviceability limit is not considered, as brace stiffness requirements are given in section C2.3 of AISI S100-16.
3. Tabulated Brace Stiffness values apply to both ASD and LRFD designs.
4. Allowable loads consider bridging connection only. It is the responsibility of the designer to verify the strength and serviceability of the framing members.
5. EQ — equivalent, DW — drywall, STR — structural.



Laterally Loaded C-Stud with SBR Spacer Bracer
(DBR spacer bracer similar)



Axially Loaded C-Stud with SBR Spacer Bracer

SBR/DBR Spacer Bracers

SBR and DBR Gross Properties

| Model No. | Design Thickness (in.) | F _y (ksi) | Area ² (in.) | I _x ⁴ (in.) | S _x ³ (in.) | R _x (in.) | I _y ⁴ (in.) | S _y ³ (in.) | R _y (in.) | Torsional Properties | | | | | |
|-----------|------------------------|----------------------|-------------------------|-----------------------------------|-----------------------------------|----------------------|-----------------------------------|-----------------------------------|----------------------|----------------------------|-----------------------------------|----------------------|---------|----------------------|-------|
| | | | | | | | | | | Jx1,000 ⁴ (in.) | C _w ⁶ (in.) | Y ₀ (in.) | m (in.) | R ₀ (in.) | β |
| SBR/43 | 0.0468 | 40 | 0.126 | 0.0047 | 0.1458 | 0.1936 | 0.0436 | 0.0400 | 0.5891 | 0.0916 | 5.56E-04 | 0.283 | 0.017 | 0.681 | 0.828 |
| DBR/30 | 0.0289 | 33 | 0.060 | 0.0023 | 0.0082 | 0.1936 | 0.0109 | 0.0141 | 0.4259 | 0.0167 | 7.05E-05 | 0.346 | 0.087 | 0.582 | 0.647 |

SBR and DBR Net Properties

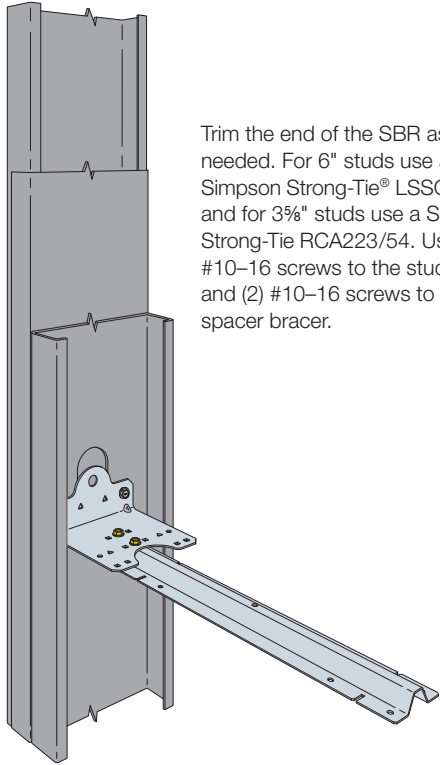
| Model No. | Area ² (in.) | I _x ⁴ (in.) | S _x ³ (in.) | R _x (in.) | I _y ⁴ (in.) | S _y ³ (in.) | R _y (in.) | Torsional Properties | | | | | |
|-----------|-------------------------|-----------------------------------|-----------------------------------|----------------------|-----------------------------------|-----------------------------------|----------------------|----------------------------|-----------------------------------|----------------------|---------|----------------------|-------|
| | | | | | | | | Jx1,000 ⁴ (in.) | C _w ⁶ (in.) | Y ₀ (in.) | m (in.) | R ₀ (in.) | β |
| SBR/43 | 0.085 | 0.0028 | 0.0097 | 0.1816 | 0.0120 | 0.0184 | 0.3765 | 0.0617 | 3.43E-05 | 0.355 | 0.141 | 0.548 | 0.581 |
| DBR/30 | 0.022 | 0.0001 | 0.0004 | 0.0479 | 0.0008 | 0.0027 | 0.1944 | 0.0061 | 1.09E-06 | 0.086 | 0.051 | 0.218 | 0.844 |

SBR and DBR Allowable Member Strengths

| Model No. | M _a (F _y) (in.-lb.) | M _a (12" o.c.) (in.-lb.) | M _a (16" o.c.) (in.-lb.) | M _a (24" o.c.) (in.-lb.) | P _a (12" o.c.) (lb.) | P _a (16" o.c.) (lb.) | P _a (24" o.c.) (lb.) |
|-----------|--|-------------------------------------|-------------------------------------|-------------------------------------|---------------------------------|---------------------------------|---------------------------------|
| SBR/43 | 369 | 369 | 369 | 360 | 945 | 904 | 618 |
| DBR/30 | 44 | 40 | 38 | 32 | — | — | — |

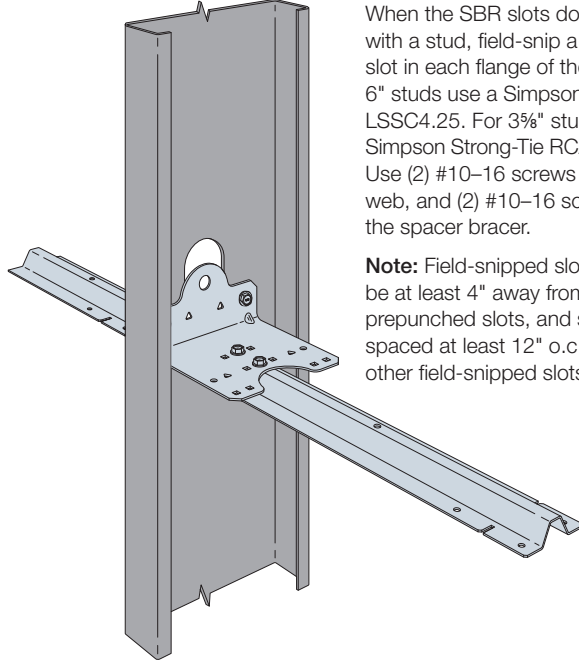
1. Net section properties are based a section that excludes all material that is interrupted by the slots.
2. Member strengths are based on DSM Analysis (non-prequalified section, $\Omega = 2.0$).
3. C_b = 1.67 has been applied to M_a to account for a triangular moment diagram with zero end moment.

SBR/DBR Spacer Bracers



Trim the end of the SBR as needed. For 6" studs use a Simpson Strong-Tie® LSSC4.25 and for 3½" studs use a Simpson Strong-Tie RCA223/54. Use (2) #10-16 screws to the stud web, and (2) #10-16 screws to the spacer bracer.

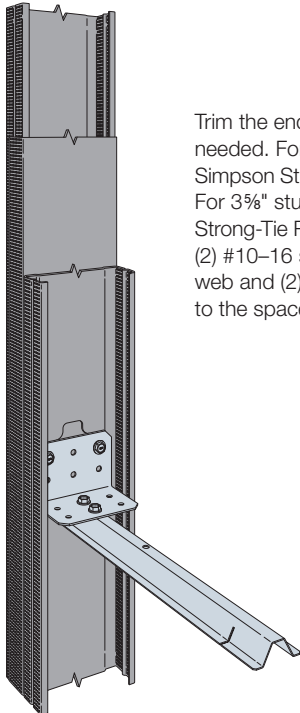
SBR End-of-Run for 6" Studs with LSSC4.25
(3½" studs with RCA 223/54 similar)



When the SBR slots do not line up with a stud, field-snip a ½"-deep slot in each flange of the SBR. For 6" studs use a Simpson Strong-Tie LSSC4.25. For 3½" studs use a Simpson Strong-Tie RCA223/54. Use (2) #10-16 screws to the stud web, and (2) #10-16 screws to the spacer bracer.

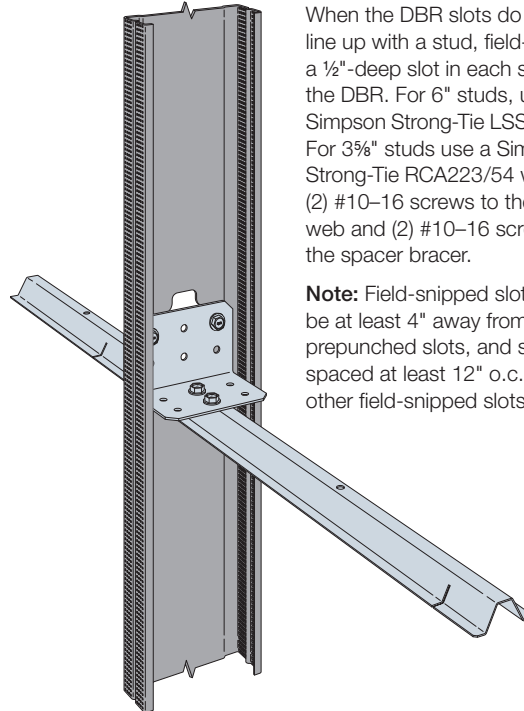
Note: Field-snipped slots shall be at least 4" away from other prepunched slots, and shall be spaced at least 12" o.c. from other field-snipped slots.

SBR Off-Module for 6" Studs with LSSC4.25
(3½" studs with RCA 223/54 similar)



Trim the end of the DBR as needed. For 6" studs use a Simpson Strong-Tie LSSC4.25. For 3½" studs use a Simpson Strong-Tie RCA223/54. Use (2) #10-16 screws to the stud web and (2) #10-16 screws to the spacer bracer.

DBR End-of-Run for 3½" Studs with RCA223/54
(6" studs with LSSC4.25 similar)

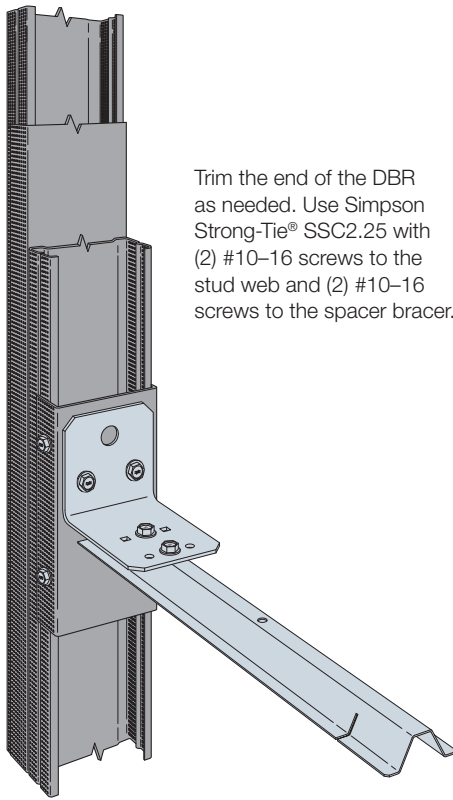


When the DBR slots do not line up with a stud, field-snip a ½"-deep slot in each side of the DBR. For 6" studs, use a Simpson Strong-Tie LSSC4.25. For 3½" studs use a Simpson Strong-Tie RCA223/54 with (2) #10-16 screws to the stud web and (2) #10-16 screws to the spacer bracer.

Note: Field-snipped slots shall be at least 4" away from other prepunched slots, and shall be spaced at least 12" o.c. from other field-snipped slots.

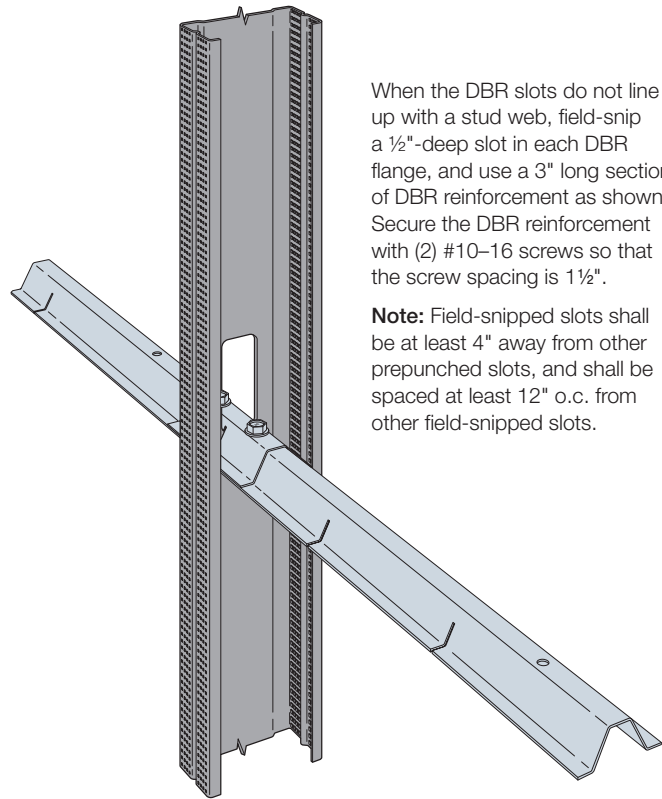
DBR Off-Module for 3½" Studs with RCA223/54
(6" studs with LSSC4.25 similar)

SBR/DBR Spacer Bracers



Trim the end of the DBR as needed. Use Simpson Strong-Tie® SSC2.25 with (2) #10-16 screws to the stud web and (2) #10-16 screws to the spacer bracer.

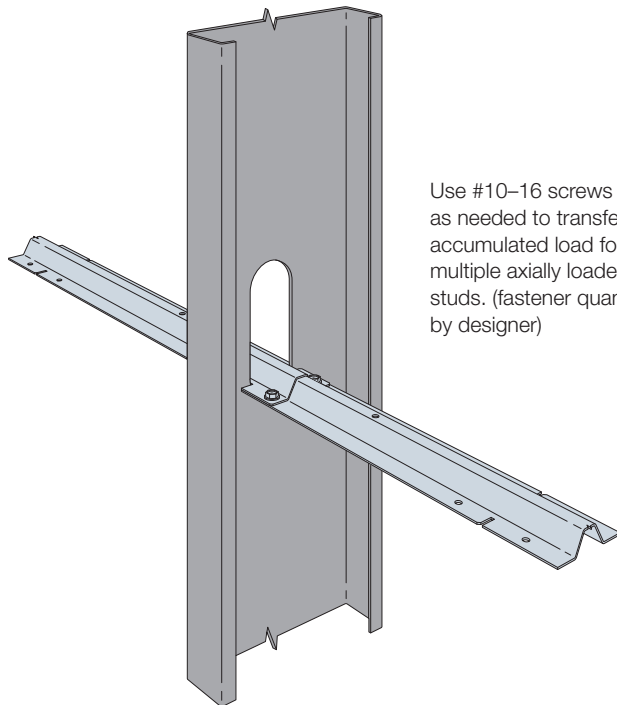
DBR End-of-Run for 2.5" Studs with SSC2.25



When the DBR slots do not line up with a stud web, field-snip a 1/2"-deep slot in each DBR flange, and use a 3" long section of DBR reinforcement as shown. Secure the DBR reinforcement with (2) #10-16 screws so that the screw spacing is 1 1/2".

Note: Field-snipped slots shall be at least 4" away from other prepunched slots, and shall be spaced at least 12" o.c. from other field-snipped slots.

DBR Off-Module for 2 1/2" Studs with DBR Reinforcement
(DBR and SBR with 3 5/8" studs and 6" studs similar)



Use #10-16 screws as needed to transfer accumulated load for multiple axially loaded studs. (fastener quantity by designer)

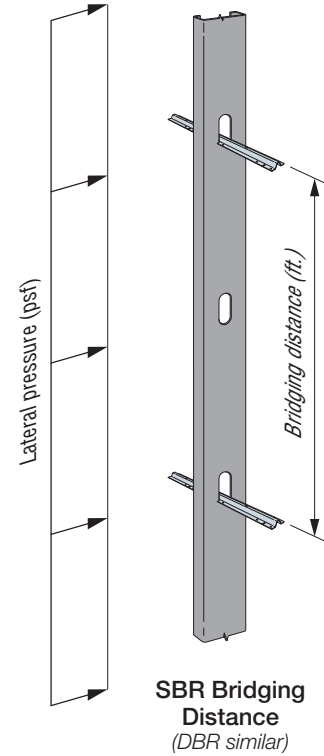
Typical SBR Splice for Axially Loaded Studs

SBR/DBR Spacer Bracers

Bridging, Bracing and Backing

SBR/43 Maximum Bridging Distance (ft.)

| Stud Spacing (in.) | Stud Section | Stud Thickness mil (ga.) | Lateral Stud Pressure (psf) | | | | | | | | | |
|--------------------|--------------|--------------------------|-----------------------------|----|----|----|----|----|----|----|----|----|
| | | | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 12 | 362S162 | 33 (20) | 8 | 8 | 8 | 8 | 7 | 6 | 5 | 4 | 4 | — |
| | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 6 | 5 | 5 |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 6 |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 6 |
| | 362S200 | 33 (20) | 8 | 8 | 8 | 7 | 6 | 5 | 4 | — | — | — |
| | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 6 | 5 | 5 | 4 | 4 |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 6 | 5 | 4 |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 6 | 5 | 4 |
| | 600S162 | 33 (20) | 8 | 8 | 8 | 8 | 8 | 7 | 6 | 5 | 4 | 4 |
| | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 6 | 6 |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 |
| 600S200 | 33 (20) | 8 | 8 | 8 | 7 | 6 | 5 | 4 | — | — | — | |
| | 43 (18) | 8 | 8 | 8 | 8 | 8 | 7 | 6 | 5 | 5 | 4 | |
| | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 6 | 6 | 5 | |
| | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 6 | 6 | 5 | |
| 16 | 362S162 | 33 (20) | 8 | 8 | 8 | 7 | 5 | 4 | 4 | — | — | — |
| | | 43 (18) | 8 | 8 | 8 | 8 | 7 | 6 | 5 | 4 | 4 | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 7 | 6 | 5 | 5 | 4 |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 6 | 5 | 4 |
| | 362S200 | 33 (20) | 8 | 8 | 7 | 5 | 4 | — | — | — | — | — |
| | | 43 (18) | 8 | 8 | 8 | 7 | 6 | 5 | 4 | — | — | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 7 | 6 | 5 | 4 | 4 | — |
| | | 68 (14) | 8 | 8 | 8 | 8 | 7 | 6 | 5 | 4 | 4 | — |
| | 600S162 | 33 (20) | 8 | 8 | 8 | 7 | 6 | 5 | 4 | — | — | — |
| | | 43 (18) | 8 | 8 | 8 | 8 | 8 | 7 | 6 | 5 | 5 | 4 |
| | | 54 (16) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 6 | 6 | 5 |
| | | 68 (14) | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 6 | 6 | 5 |
| 600S200 | 33 (20) | 8 | 8 | 7 | 5 | 4 | — | — | — | — | — | |
| | 43 (18) | 8 | 8 | 8 | 8 | 6 | 5 | 4 | 4 | — | — | |
| | 54 (16) | 8 | 8 | 8 | 8 | 8 | 6 | 5 | 5 | 4 | 4 | |
| | 68 (14) | 8 | 8 | 8 | 8 | 8 | 6 | 5 | 5 | 4 | 4 | |
| 24 | 362S162 | 33 (20) | 8 | 8 | 6 | 4 | — | — | — | — | — | — |
| | | 43 (18) | 8 | 8 | 8 | 6 | 5 | 4 | — | — | — | — |
| | | 54 (16) | 8 | 8 | 8 | 7 | 6 | 5 | 4 | — | — | — |
| | | 68 (14) | 8 | 8 | 8 | 7 | 6 | 5 | 4 | — | — | — |
| | 362S200 | 33 (20) | 8 | 7 | 5 | — | — | — | — | — | — | — |
| | | 43 (18) | 8 | 8 | 6 | 5 | 4 | — | — | — | — | — |
| | | 54 (16) | 8 | 8 | 7 | 5 | 4 | — | — | — | — | — |
| | | 68 (14) | 8 | 8 | 7 | 5 | 4 | — | — | — | — | — |
| | 600S162 | 33 (20) | 8 | 8 | 7 | 5 | 4 | — | — | — | — | — |
| | | 43 (18) | 8 | 8 | 8 | 7 | 6 | 5 | 4 | — | — | — |
| | | 54 (16) | 8 | 8 | 8 | 8 | 7 | 6 | 5 | 4 | 4 | — |
| | | 68 (14) | 8 | 8 | 8 | 8 | 7 | 6 | 5 | 4 | 4 | — |
| 600S200 | 33 (20) | 8 | 7 | 5 | — | — | — | — | — | — | — | |
| | 43 (18) | 8 | 8 | 7 | 5 | 4 | — | — | — | — | — | |
| | 54 (16) | 8 | 8 | 8 | 6 | 5 | 4 | — | — | — | — | |
| | 68 (14) | 8 | 8 | 8 | 6 | 5 | 4 | — | — | — | — | |

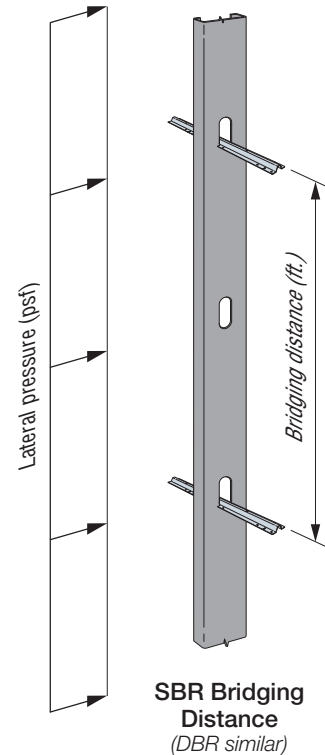


1. Tabulated solutions are for ASD lateral pressure. Contact Simpson Strong-Tie for LRFD solutions.
2. Lateral pressures shall be determined based on the load combinations of the applicable building code. For designs in accordance with the 2009 IBC and earlier, wind pressures are at the working stress level and may be used directly. For designs in accordance with the 2012, 2015, 2018 and 2021 IBC, wind pressures are at the strength level and must be multiplied by 0.6 for ASD load combinations.
3. Tabulated values are based on the minimum of the tested connection strength and the calculated SBR/DBR member strength. Studs must be checked separately for unbraced length.
4. For 8"-studs tabulated values, reference strongtie.com.

SBR/DBR Spacer Bracers

DBR/30 Maximum Bridging Distance (ft.)

| Stud Spacing (in.) | Stud Section | Stud Thickness mil (ga.) | Lateral Stud Pressure (psf) | |
|--------------------|--------------|--------------------------|-----------------------------|----|
| | | | 5 | 10 |
| 12 | 362S125 | 15 (25 EQ) | 8 | 5 |
| | | 18 (25) | 8 | 5 |
| | | 19 (20 EQ) | 8 | 5 |
| | | 30 (20 DW) | 8 | 5 |
| | | 33 (20 STR) | 8 | 5 |
| | 600S125 | 15 (25 EQ) | 8 | 6 |
| | | 18 (25) | 8 | 6 |
| | | 19 (20 EQ) | 8 | 6 |
| | | 30 (20 DW) | 8 | 6 |
| | | 33 (20 STR) | 8 | 6 |
| 16 | 362S125 | 15 (25 EQ) | 7 | — |
| | | 18 (25) | 7 | — |
| | | 19 (20 EQ) | 7 | — |
| | | 30 (20 DW) | 7 | — |
| | | 33 (20 STR) | 7 | — |
| | 600S125 | 15 (25 EQ) | 8 | 4 |
| | | 18 (25) | 8 | 4 |
| | | 19 (20 EQ) | 8 | 4 |
| | | 30 (20 DW) | 8 | 4 |
| | | 33 (20 STR) | 8 | 4 |
| 24 | 362S125 | 15 (25 EQ) | 4 | — |
| | | 18 (25) | 4 | — |
| | | 19 (20 EQ) | 4 | — |
| | | 30 (20 DW) | 4 | — |
| | 600S125 | 33 (20 STR) | 4 | — |
| | | 15 (25 EQ) | 4 | — |
| | | 18 (25) | 4 | — |
| | | 19 (20 EQ) | 4 | — |
| | | 30 (20 DW) | 5 | — |
| | | 33 (20 STR) | 5 | — |



1. Tabulated solutions are for ASD lateral pressure. Contact Simpson Strong-Tie for LRFD solutions.
2. Lateral pressures shall be determined based on the load combinations of the applicable building code. For designs in accordance with the 2009 IBC and earlier, wind pressures are at the working stress level and may be used directly. For designs in accordance with the 2012 and later IBC, wind pressures are at the strength level and must be multiplied by 0.6 for ASD load combinations.
3. Tabulated values are based on the minimum of the tested connection strength and the calculated SBR/DBR member strength. Studs must be checked separately for unbraced length.

SBR Spacer Bracer

Given

- 2021 IBC (ASCE 7-16 and AISI S100-16)
- 600S162-54 (50 ksi) studs at 24" o.c., 10'-stud height
 - Mid-point bracing (5' o.c.)
 - Distance from shear center to mid-plane of web, $m = 0.663$ ". (AISI Manual, Table I-2)
- Wind design pressure = 34 psf
- P_{ra} = Required ASD axial load = 3,000 lb.

Axially Loaded Stud

Required brace strength (AISI S100, Eq. C2.3-1)
 $P_{rb} = 0.01P_{ra} = (0.01)(3,000 \text{ lb.}) = 30 \text{ lb.}$

Required brace stiffness (AISI S100, Eq. C2.3-2a)
 $\beta_{rb} = (2[4-(2/n)]/L_b)(\Omega P_{ra}) = (2[4-(2/4)]/60)(2)(3,000) = 400 \text{ lb./in.}$

Check connection strength and stiffness from Strength and Stiffness table (p. 148) for the SBR/43 for 6"-deep, 54-mil studs

- ➔ Allowable brace strength = 450 lb. > 30 lb. **OK**
- ➔ Allowable brace stiffness = 840 lb./in. > 400 lb./in. **OK**

Check member strength from Allowable Strengths table (p. 148) for the SBR/43 for 24" o.c.

- ➔ P_a (24" o.c.) = Allowable member strength = 618 lb. > 30 lb. **OK**

Note: Member stiffness and the effects of accumulated load for multiple axially loaded studs have not been accounted for in the above calculations. Reference CFSEI Tech Note W400-16 for additional guidance on these topics.

Laterally Loaded Stud

ASD Design load tributary to brace:

$$W = (0.6)(34 \text{ psf})(2 \text{ ft.})(5 \text{ ft.}) = 204 \text{ lb.}$$

Note: 2021 IBC load combinations for ASD include a factor of 0.6

Required flange force (AISI S100 Eq. C2.2.1-3)

$$P_{L1} = -P_{L2} = 1.5(m/d)W = (1.5)(0.663 \text{ in.}/6 \text{ in.})(204 \text{ lb.}) = 33.8 \text{ lb.}$$

Torsional moment

$$M_z = P_{L1}d = -P_{L2}d = (33.8)(6) = 202.8 \text{ in.-lb.}$$

Moment applied to bridging member

$$M_m = 0.64M_z = (0.64)(202.8) = 129.8 \text{ in.-lb.}$$

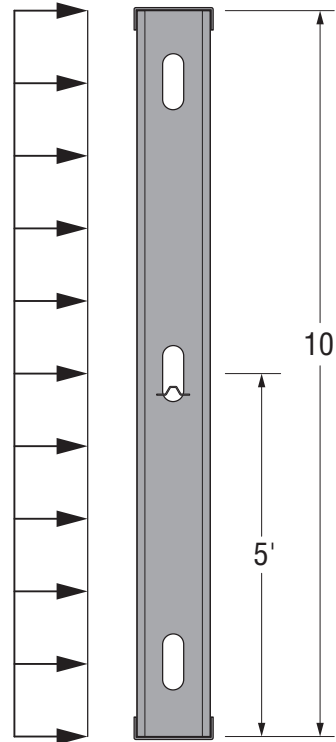
Note: The 0.64 factor is from an analysis of a five-span continuous beam that is loaded with equal support moments (Reference AISI Design Guide D110-07, pp. 2-9, Figure 2-6)

Check connection strength from Strength and Stiffness table (p. 148) for the SBR/43 for 6"-deep, 54-mil studs

- ➔ Allowable torsional moment = 365 in.-lb. > 202.8 in.-lb. **OK**

Check member strength from Allowable Strengths table (p. 148) for the SBR/43 for 24" o.c.

- ➔ M_a (24" o.c.) = Allowable moment = 360 in.-lb. > 129.8 in.-lb. **OK**



Combined-Loading Check of Connection

$(P_{br}/\text{Allowable brace strength}) + (M_z/\text{Allowable torsional moment}) \leq 1.0$
 $(30 \text{ lb.}/450 \text{ lb.}) + (202.8 \text{ in.-lb.}/365 \text{ in.-lb.}) = 0.62 < 1.0$ **OK**

Combined-Loading Check of Bridging Member

Reference AISI Eq. H1.2-1.

Reference Chapter E for Ω_c and Chapter F for Ω_b .

$$\frac{\Omega_c P}{P_n} + \frac{\Omega_b M}{M_n} \leq 1.0$$

$$P_n = 2P_a \quad M_n = 2M_a$$

$$\frac{1.8 (30)}{2 (618)} + \frac{1.67 (129.8)}{2 (360)} = 0.34 < 1.0$$
 OK

Note: The allowable strengths given in the Allowable Strengths table (p. 148) have been converted to nominal strengths by multiplying by $\Omega = 2.0$.

SFC Steel Framing Connectors / SSC Steel-Stud Connectors

SFC/SSC Connectors – U-Channel Bridging Allowable Loads

| Model No. | Connector Material Thickness mil (ga.) | Clip Length (in.) | Stud Depth (in.) | Stud Thickness mil (ga.) | Fasteners ^{1,5} | | Laterally Loaded C-Stud | Axially Loaded C-Stud | | Code Ref. |
|-----------|--|-------------------|------------------|--------------------------|--------------------------|----------|---|---|--|-----------|
| | | | | | Stud | Bridging | Allowable Torsional Moment ² (in.-lb.) | Allowable Brace Strength ^{2,3} (lb.) | Brace Stiffness ⁴ (lb./in.) | |
| SFC4.25 | 54 (16) | 4¼ | 6 | 33 (20) | (2) #10 | (2) #10 | 275 | 125 | 860 | IBC |
| | | | | 43 (18) | (2) #10 | (2) #10 | 510 | 190 | 1,220 | |
| | | | | 54 (16) | (2) #10 | (2) #10 | 645 | 280 | 2,045 | |
| LSSC4.25 | 54 (16) | 4¼ | 6 | 54 (16) | (2) #10 | (2) #10 | 1,085 | 180 | 165 | |
| SSC4.25 | 68 (14) | 4¼ | 6 | 54 (16) | (2) #10 | (2) #10 | 655 | 280 | 2,045 | |
| | | | | 68 (14) | (2) #10 | (2) #10 | 805 | 335 | 2,305 | |
| | | | | 97 (12) | (2) #10 | (2) #10 | 920 | 660 | 4,230 | |
| LSSC6.25 | 54 (16) | 6¼ | 8, 10, 12 | 54 (16) | (2) #10 | (2) #10 | 1,085 | 180 | 685 | |

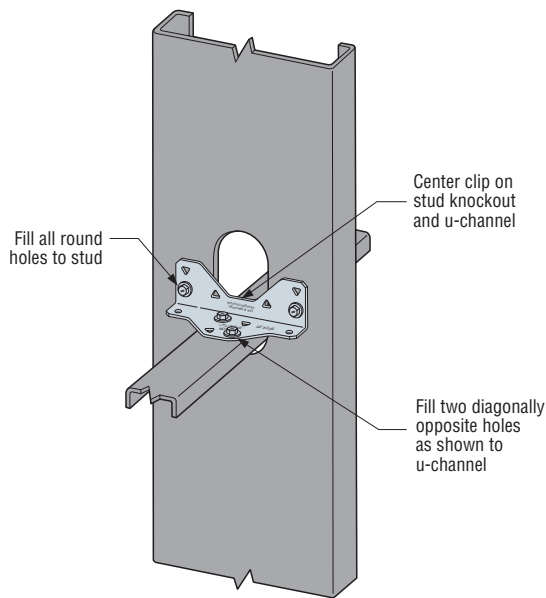
1. See illustrations for fastener placement.

2. Allowable loads are for use when utilizing Allowable Stress Design methodology. For LRFD loads, multiply the tabulated ASD values by 1.6.

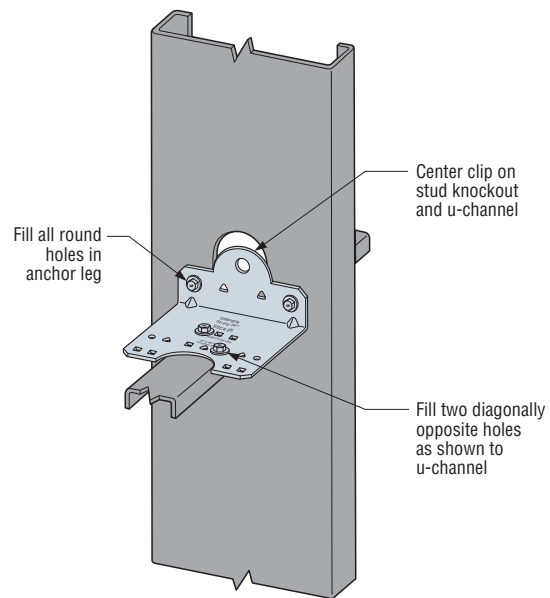
3. Allowable brace strengths are based on ultimate test load divided by a safety factor. Serviceability limit is not considered, as brace stiffness requirements are given in Section C2.3 of AISI S100. Contact Simpson Strong-Tie if nominal brace strength is required.

4. Tabulated stiffness values apply to both ASD and LRFD designs.

5. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



Typical SFC4.25 Installation



Typical SSC4.25 Installation

DBC Drywall Bridging Connector

Work smarter, not harder

Patented design allows for one- or two-screw installation of the DBC, significantly reducing labor and material cost. The first and only connector load rated for $\frac{3}{4}$ " u-channel, the DBC joins the SUBH line of bridging connectors tested as a system, ensuring that published design capacities capture the influence of stud web depth and thickness.

Features:

- Most applications require only a single screw
- Designed for $\frac{3}{4}$ " u-channel to fit smaller web knockouts common to drywall studs
- Compatible with drywall stud depths of $3\frac{5}{8}$ " and 6" with $1\frac{1}{2}$ " wide knockouts

Material: 33 mil (20 ga.) carbon steel

Finish: Galvanized (G90)

Installation:

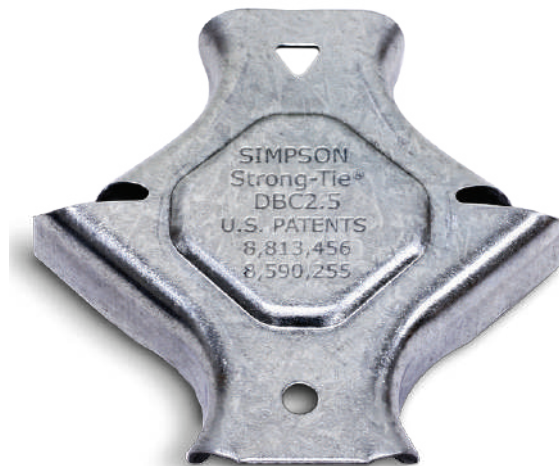
- With $\frac{3}{4}$ " x 54 mil (16 ga.) u-channel installed through the stud web knockouts, insert the DBC2.5 through the knockout so that the DBC slots engage the stud web and the DBC flanges engage the u-channel as shown in the illustration
- Use the specified number of #8 screws to fasten the DBC to the u-channel

Codes: See p. 13 for Code Reference Key Chart

Ordering Information: DBC2.5-R200 (Bucket of 200)



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.




DBC2.5
 US Patents:
 8,813,456 and 8,590,255

DBC Drywall Bridging Connector

DBC — Bridging Connector Strength Allowable Loads

| Model No. | Stud Depth | Stud Thickness and Yield Strength | | | Fasteners | | Laterally Loaded C-Stud Allowable Torsional Moment (in.-lb.) | Code Ref. | |
|-----------|------------|-----------------------------------|--------------------|----------------------|-----------|--------|--|-----------|-----|
| | | Mil | Gauge ³ | F _y (ksi) | | | | | |
| DBC2.5 | 3% | 15 | 25 EQ. | 50 | Min. | (1) #8 | 65 | — | |
| | | 18 | 25 | 33 | | | | | |
| | | 19 | 20 EQ. | 65 | | | | | |
| | | 20 | 20 EQ. | 57 | | | | | |
| | | 30 | 20 DW | 33 | Min. | (1) #8 | | | 85 |
| | | | | | Max. | (2) #8 | | | 125 |
| | 33 | 20 STR | 33 | Min. | (1) #8 | 85 | | | |
| | | | | Max. | (2) #8 | 125 | | | |
| | 6 | 15 | 25 EQ. | 50 | Min. | (1) #8 | 65 | | |
| | | | 18 | 25 | | | | | 33 |
| | | | 19 | 20 EQ. | | | | | 65 |
| | | | 21 | 20 EQ. | | | | | 57 |
| | | 30 | 20 DW | 33 | Min. | (1) #8 | | | 85 |
| | | | | | Max. | (2) #8 | | | 125 |
| 33 | | | 20 STR | 33 | Min. | (1) #8 | | 85 | |
| | | | | | Max. | (2) #8 | | 125 | |

- Allowable loads are for use when utilizing Allowable Stress Design methodology.
For LRFD loads, multiply the ASD tabulated values by 1.6.
- Min. fastener quantity and tabulated values — fill round hole (one screw total);
Max. fastener quantity and tabulated values — fill round and triangle holes (two screws total).
- EQ — equivalent, DW — drywall, STR — structural.

Design Example

Given

- 600S125-18 (33 ksi) studs at 24" o.c., 10' tall
Mid-point bracing (5' o.c.)
Distance from shear center to mid-plane of web, $m = 0.408$ in.
(SFIA Technical Guide Version 2022)
- Lateral load = 5 psf

Laterally-Loaded Stud Design

ASD Design load tributary to brace:

$$W = (5 \text{ psf})(2 \text{ ft.})(5 \text{ ft.}) = 50 \text{ lb.}$$

Required bracing force (AISI S100 Eq. C2.2.1-3):

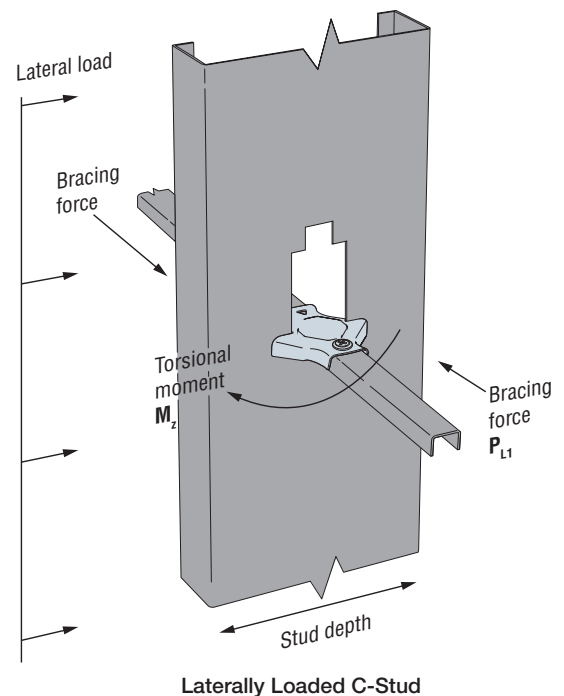
$$P_{L1} = -P_{L2} = 1.5(m/d)W = (1.5)(0.408 \text{ in.}/6 \text{ in.})(50 \text{ lb.}) = 5.1 \text{ lb.}$$

Torsional moment:

$$M_z = P_{L1}d = -P_{L2}d = (5.1 \text{ lb.})(6 \text{ in.}) = 30.6 \text{ in.-lb.}$$

From Allowable Loads table above, for 6"-18 mil stud:

- ➔ Select DBC2.5 with Min. fasteners ((1) #8)
Allowable torsional moment = 65 in.-lb. > 30.6 in.-lb. **OK**



CS Coiled Strap

CS coiled utility straps are an ideal solution when it is desired to brace wall studs via the flanges with strap. These products are packaged in lightweight (about 40 pounds) cartons and can be cut to length on the jobsite.

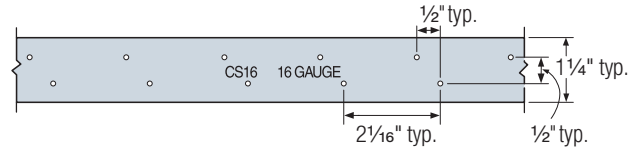
Materials: See table.

Finish: Galvanized (G90); ZMAX®

Installation:

- Use all specified fasteners; see General Notes.
- Refer to the applicable code for minimum edge and end distance.
- The table shows the maximum allowable loads and the screws required to obtain them. See footnote #1. Fewer screws may be used as given by footnote #3.

Codes: See p. 13 for Code Reference Key Chart



CS16 Hole Pattern
(all other CS straps similar)

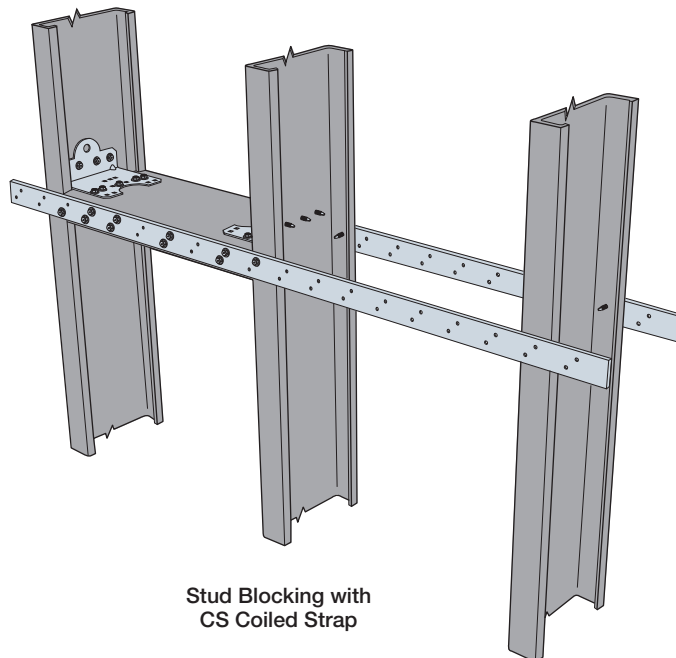
These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

| Model No. | Total Length (ft.) | Connector Material Thickness mil (ga.) | Width (in.) | Fasteners (At Blocking) ⁴ | | | Allowable Tension Load (lb.) | Code Ref. |
|-----------|--------------------|--|-------------|--------------------------------------|---------|---------|------------------------------|-------------|
| | | | | Framing Thickness mil (ga.) | | | | |
| | | | | 33 (20) | 43 (18) | 54 (16) | | |
| CS16 | 150 | 54 (16) | 1 1/4 | (9) #10 | (6) #10 | (4) #10 | 1,550 | IBC, FL, LA |
| CS20 | 250 | 33 (20) | 1 1/4 | (6) #10 | (4) #10 | (3) #10 | 945 | |

1. In order to achieve the tabulated loads in the strap, attach each strap to the blocking with the tabulated number of screws.
2. Strap length at blocking to achieve tabulated load = number of tabulated screws + 1".
3. Calculate the strap value for a reduced number of screws to the blocking as follows:

$$\text{Allowable Load} = \frac{\text{No. of Screws Used}}{\text{No. of Screws in Table}} \times \text{Table Load.}$$

4. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



Stud Blocking with CS Coiled Strap

LTB Bridging

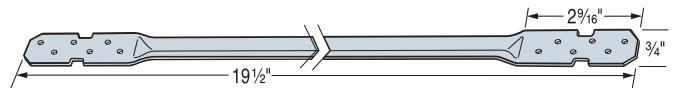
LTB bridging connectors are a cost-effective solution for bracing between non-load-bearing wall studs when compared with field fabricated blocking and clip angles.

Material: 27 mil (22 ga.)

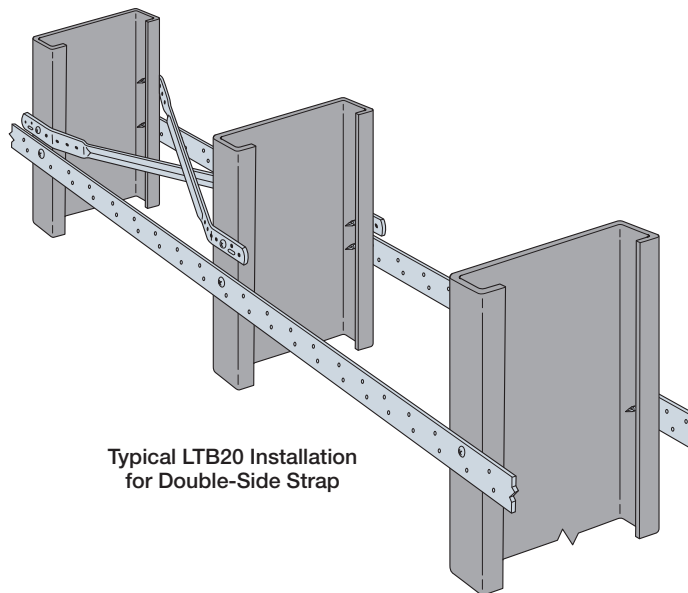
Finish: Galvanized (G90)

Installation:

- Use (2) #10 screws at each end
- The LTB can be utilized with 3½", 6", 8", and 10" studs at 16" o.c.
- LTB works only in tension, so must be used in cross pairs
- Install bridging tightly; loose installation may allow stud movement



LTB20



Typical LTB20 Installation
for Double-Side Strap

WBAC Wood Backing Steel Connector

The WBAC wood backing steel connector is the ideal solution for connecting wood backing to cold-formed steel studs. Perfect for cabinets, shelves, handrails, heavy wall hangings and more, this versatile connector installs easily and provides tested strength. The WBAC is designed to eliminate alignment issues and reduce installation time. Since stiffness and strength are critical for these applications, the fastening pattern into both steel and wood has been engineered to optimize performance.

Features:

- Simple installation using prepunched holes allowing the same screw to be used for both wood backing and stud attachment
- Not limited to just a 1½" flange, the WBAC has been tested to accommodate 1¼" flanges, 1⅝" flanges and 2" flanges
- Works for any stud spacing, predetermined or typical stud spacing not required
- Sight lines to guide installation alignment
- Unique rolled support bottom tabs provide extra strength and stiffness

Materials: WBAC162 33 mil (20 ga.), 33 ksi;
WBAC200 33 mil (20 ga.), 33 ksi

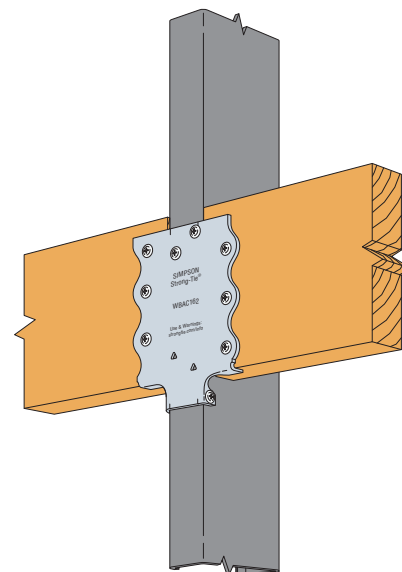
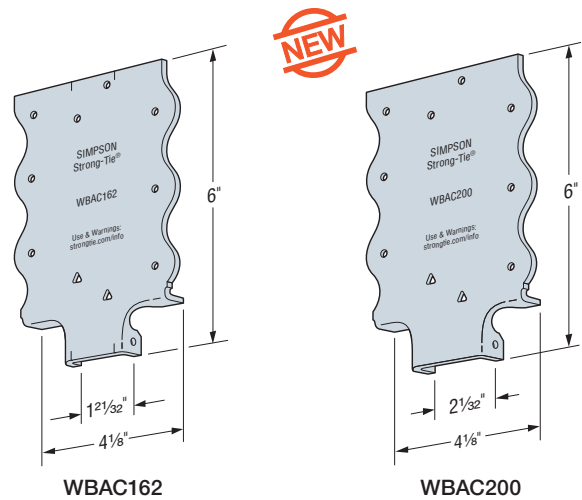
Finish: Galvanized (G90)

Installation:

- Attach to grade lumber or ⅝" fire-rated board
- Use WBAC162 for 1¼" and 1⅝" flanges, and WBAC200 for 2" flanges
- Drywall stud (1¼" flange) — Align top of connector with markings and attach using (4) #8–18 modified truss-head self-drilling screws to stud flange and (3) #8–18 modified truss-head screws to each wood block
- Structural studs (1⅝" and 2" flange) — Attach using (4) #8–18 modified truss-head SDS screws [(2) to stud flange, (1) to lip, and (1) to web] and (3) #8–18 modified truss-head screws to each wood block

Codes: Testing performed in accordance with ICC-ES AC261

Ordering Information: WBAC162-R50, WBAC200-R50

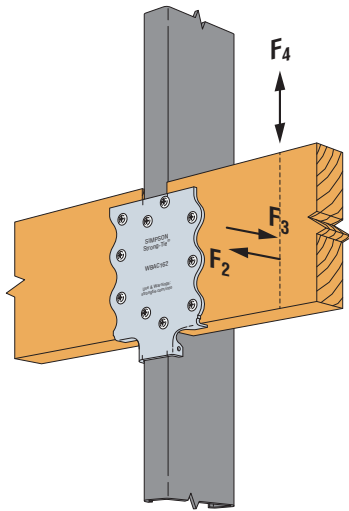


Typical WBAC162 Installation
(WBAC200 similar)

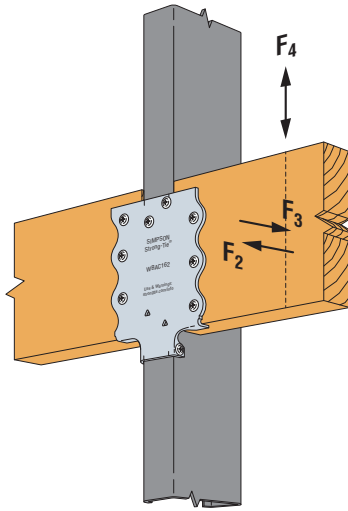
Fastener Patterns

| WBAC162 Installation to 1¼" Flange | WBAC162 Installation to 1⅝" Flange | WBAC200 Installation to 2" Flange |
|------------------------------------|------------------------------------|-----------------------------------|
| | | |

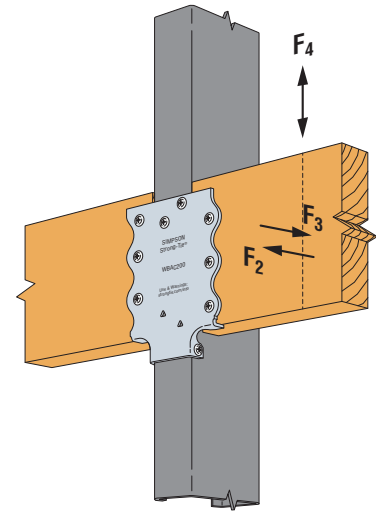
WBAC Wood Backing Steel Connector



WBAC162 Installation to 1 1/4" Flange



WBAC162 Installation to 1 5/8" Flange

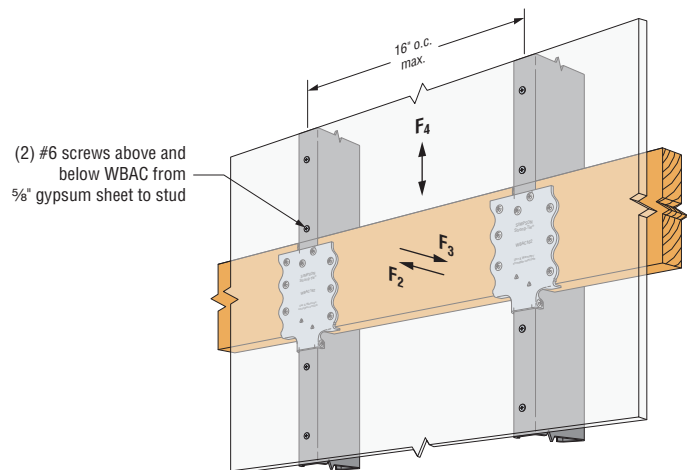


WBAC200 Installation to 2" Flange

Allowable Loads on Blocking Supported by WBAC (lb.)

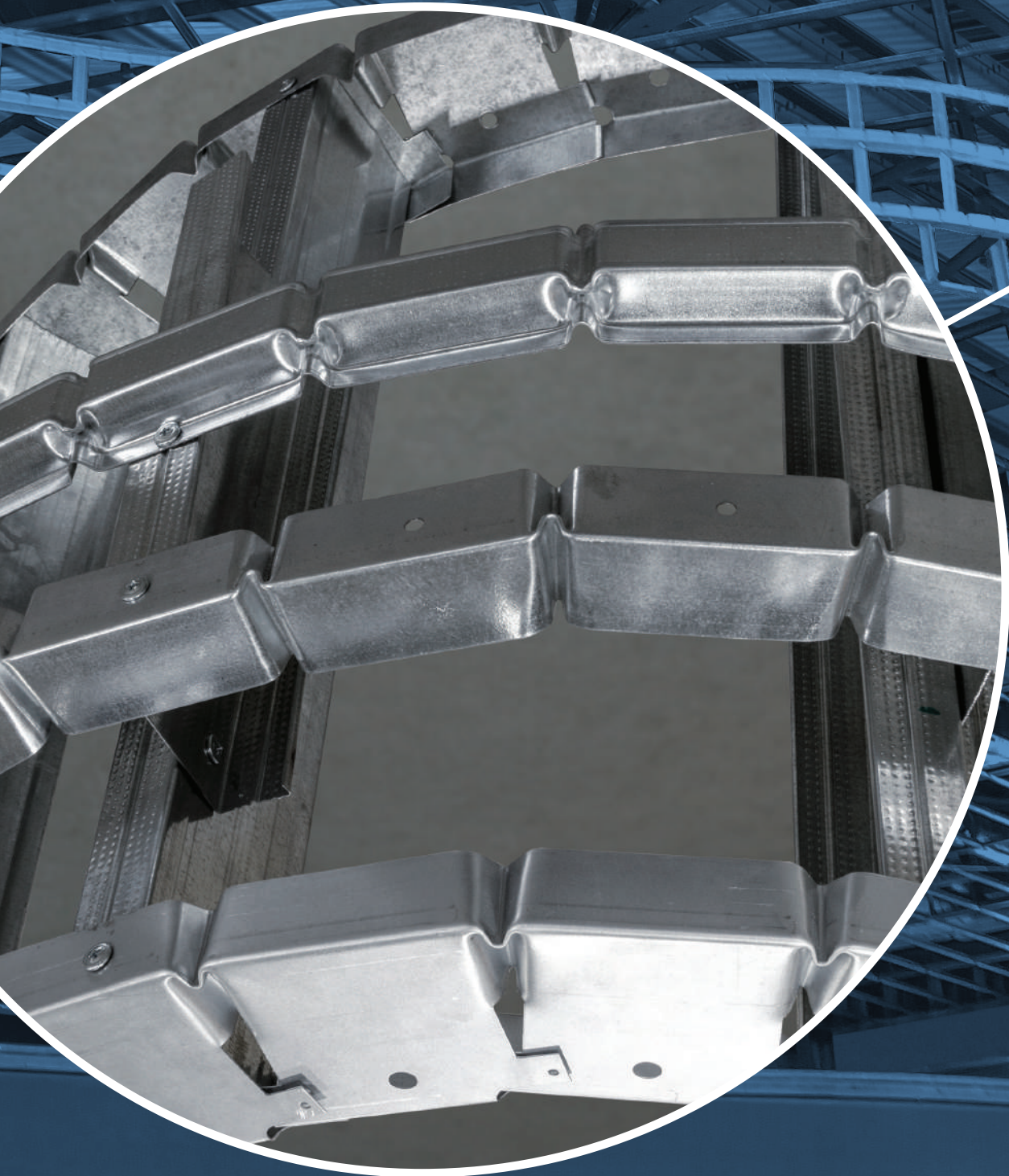
| Model No. | Stud Thickness mil. (ga.) | Stud Steel Strength, F_y (ksi) | Fasteners | | Allowable Load (lb.) | | | |
|-----------------------------|---------------------------|----------------------------------|-----------|---------------|-------------------------|------------------|-------------------|-------------------|
| | | | Stud | Wood Blocking | F_2 @ 1/8" Deflection | F_2 @ Strength | F_4 @ 0" Offset | F_4 @ 3" Offset |
| Stud Flange = 1 1/4" | | | | | | | | |
| WBAC162 | 15 (25 EQ) | 50 | (4) #8 | (3) #8 | 95 | 135 | 275 | 60 |
| | 18 (25) | 33 | | | 90 | 160 | 175 | 40 |
| | 19 (20 EQ) | 57 | | | 95 | 135 | 275 | 60 |
| | 30 (20 DW) | 33 | | | 150 | 265 | 285 | 65 |
| | 33 (20 Struct) | 33 | | | 220 | 295 | 320 | 75 |
| Stud Flange = 1 5/8" | | | | | | | | |
| WBAC162 | 33 (20 Struct) | 33 | (4) #8 | (3) #8 | 220 | 295 | 320 | 75 |
| | 43 (18) | 33 | | | 260 | 355 | 355 | 85 |
| | 54 (16) | 50 | | | 275 | 405 | 395 | 95 |
| Stud Flange = 2" | | | | | | | | |
| WBAC200 | 33 (20 Struct) | 33 | (4) #8 | (3) #8 | 220 | 295 | 320 | 75 |
| | 43 (18) | 33 | | | 260 | 355 | 355 | 85 |
| | 54 (16) | 50 | | | 275 | 405 | 395 | 95 |

1. Allowable loads may not be increased for wind or seismic load.
2. Allowable loads are the lower of tested ultimate load with a safety factor, load at 1/8" deflection (u.o.n.), or fastener calculation limits in accordance with ICC-ES AC261.
3. Fasteners to stud and wood blocking are #8–18 (3/4" min. long) modified truss-head screws.
4. Wood blocking may be any species of solid sawn or engineered lumber with a minimum specific gravity of 0.42.
5. Listed capacities do not consider the resistance of the gypsum board. The WBAC connector installed with 5/8" gypsum may be increased by a factor of 1.15, 1.15, and 1.35 for F_2 @ 1/8" deflection, F_4 @ 0" offset, and F_4 @ 3" offset, respectively.
6. F_3 is limited to an allowable capacity of 175 lb. with (3) #8–18 (3/4" long) modified truss screws to each wood block or 260 lb. with (3) #8–18 (1" long). F_3 tests do not consider resistance of gypsum board.
7. F_4 may be interpolated between offset 0" and 3".
8. F_2 , F_3 and F_4 loads assumed to act at 1/4 point of wood blocking.
9. For combined loading, use (F_2 @ Strength) and a linear interaction.



WBAC162 Installation to 1 5/8" Stud Flange with Gypsum
(see table footnote 5 for addition of gypsum board)

Curved Hand-Bendable Framing



Ready-Track® Framing

Ready-Track framing is the fast and dependable way to frame curved walls on the jobsite. Simple to bend into smooth curves, it holds its shape without fasteners for easy positioning and installation.

- Ideal for curved walls, stairwells, soffits, clouds and complicated compound radiuses
- Handles almost any application when you need material curved along the flange
- Screw holes in the bottom web allow the top-track radius to be locked down for easy replication, once fitted over the bottom track
- Optional screw holes in the leg allow the radius to be easily locked down from the side

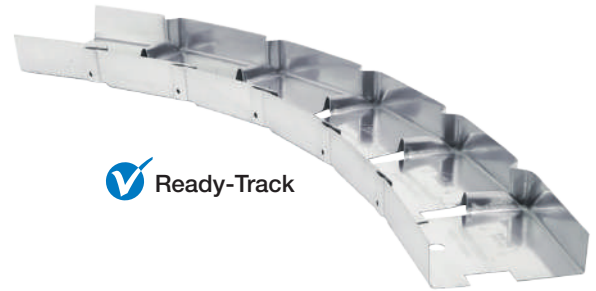
Product Information

| Model No. | Track Width (in.) | Length (ft.) | Quantity per Bundle* |
|--------------------------|-------------------|--------------|----------------------|
| 20 Gauge (30 mil) | | | |
| RT250-8 | 2½ | 8 | 12 |
| RT250-10 | 2½ | 10 | 10 |
| RT350-8 | 3½ | 8 | 12 |
| RT362-8 | 3¾ | 8 | 12 |
| RT362-10 | 3¾ | 10 | 10 |
| RT400-8 | 4 | 8 | 6 |
| RT400-10 | 4 | 10 | 10 |
| RT550-8 | 5½ | 8 | 6 |
| RT600-8 | 6 | 8 | 6 |
| RT600-10 | 6 | 10 | 10 |
| 18 Gauge (43 mil) | | | |
| RT362-8-18 | 3¾ | 8 | 12 |
| RT362-10-18 | 3¾ | 10 | 10 |
| RT600-8-18 | 6 | 8 | 6 |
| RT600-10-18 | 6 | 10 | 10 |

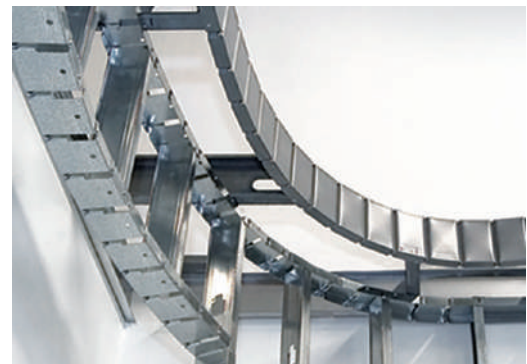
*Product is shipped in bundled, straight sections.



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.



Ready-Track



Typical Ready-Track Installation

Curved Hand-Bendable Framing

Ready-Arch® Framing



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

Creating arched openings and designs is simpler than ever with Ready-Arch framing members. Round, elliptical or s-shapes are all easy to form on the jobsite without any cutting or additional reinforcement. Ready-Arch members are also ideal for more challenging applications where material needs to curve along the web.

- Ideal for soffits, arches, light coves and elliptical or eyebrow curves for windows and doorways
- 20-gauge (30 mil) steel holds its shape without any fasteners
- Installs to cold-formed steel or wood framing

Product Information

| Model No. | Width (in.) | Length (ft.) | Quantity per Bundle* |
|-----------|-------------|--------------|----------------------|
| RA362-8 | 3¾ | 8 | 10 |
| RA600-8 | 6 | 8 | 6 |

*Product is shipped in bundled, straight sections.



Ready-Arch



Typical Ready-Arch Installation

Ready-Hat® Framing



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

Whether the plans call for framing over a CMU wall or concrete column or just a curved transition from wall to ceiling, the Ready-Hat furring and framing channel is right for the job. This versatile product is easy to form by hand into the exact shape needed and is secured to concrete or CMU walls with powder-driven fasteners or concrete screws.

- Ideal for furring on curved walls or to create coves, barrel vaults, groin vaults, soffits and serpentine ceilings
- Great for wrapping columns or as cross-framing to eliminate drywall butt joints
- 20-gauge (33 mil) steel holds its shape once formed and positioned for easy fastening

Product Information

| Model No. | Channel Height (in.) | Overall Width (in.) | Length (ft.) | Quantity per Bundle* |
|-----------|----------------------|---------------------|--------------|----------------------|
| RH087-10 | 7/8 | 2½ | 10 | 10 |

*Product is shipped in bundled, straight sections.



Ready-Hat



Typical Ready-Hat Installation

Ready-Angle® Framing



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

Ready-Angle framing angle adapts to almost any shape, and curves in multiple directions, so it's easy to form challenging compound curves and s-bends. Use two pieces to replicate curved track for steel and wood studs, to form arches of any depth quickly, or to produce finished corners that are ready for drywall.

- Ideal for s-shapes, spirals, sweeps or virtually any free-form shape
- 20-gauge (30 mil) steel holds its shape without any fasteners
- A versatile product for problem-solving on the jobsite

Product Information

| Model No. | Angle Leg (in.) | Length (ft.) | Quantity per Bundle* |
|-----------|-----------------|--------------|----------------------|
| RL150-8 | 1½ | 8 | 12 |
| RL150-10 | 1½ | 10 | 10 |

*Product is shipped in bundled, straight sections.



Ready-Angle



Typical Ready-Angle Installation

Ready Track Bender™ Custom Framing Tool

The Ready Track Bender is a portable, on-the-jobsite tool that bends studs and track easily, accurately and conveniently by creating compound indentations at consistent intervals along the length of the material.

- Spaces indentations as close as 2" apart for a tight radius, and up to 12" or more apart for a larger radius
- Forms all standard stud and track profiles up to 20-gauge thick and 6" wide
- No flange or web cutting to form radius and no plywood or strap repair needed for strength
- Reliable and precise — turn the dial to the desired radius and create uniform bends in piece after piece, all day long
- Tough heavy-gauge steel construction throughout for smooth, trouble-free operation job after job
- Rugged plastic case for easy transportation

Minimum Bend Radius

| Track/Stud Width (in.) | Approx. Min. Radius (in.) | Bend Spacing (in.) |
|------------------------|---------------------------|--------------------|
| 2½ | 13 | 2 |
| 3½ – 4 | 19 | 2 |
| 5½ – 6 | 27 | 2 |



Models and Capabilities

S150 Standard Tool

- Bends 20-gauge and 25-gauge steel
- Forms track or studs 2½" to 6" wide
- Can accommodate leg length up to 1½" high

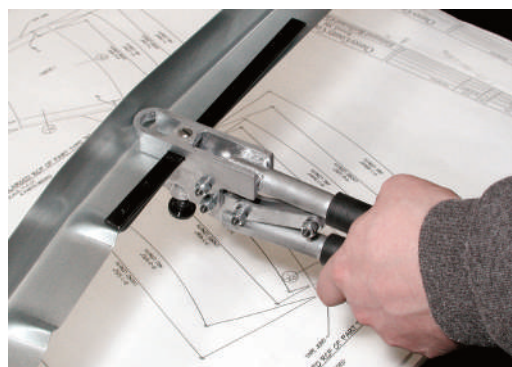
D150 Deluxe Tool

- Bends 20-gauge and 25-gauge steel
- Forms track or studs 2½" to 6" wide
- Can accommodate leg length up to 3" high

Ready Trim Bender™ Custom Framing Tool

The Ready Trim Bender allows the user to bend angles quickly, accurately and conveniently right on the jobsite by creating compound indentations at consistent intervals along the length of the angle. It eliminates the need for old-fashioned tin snips and the trial-and-error method of approximating the right radius.

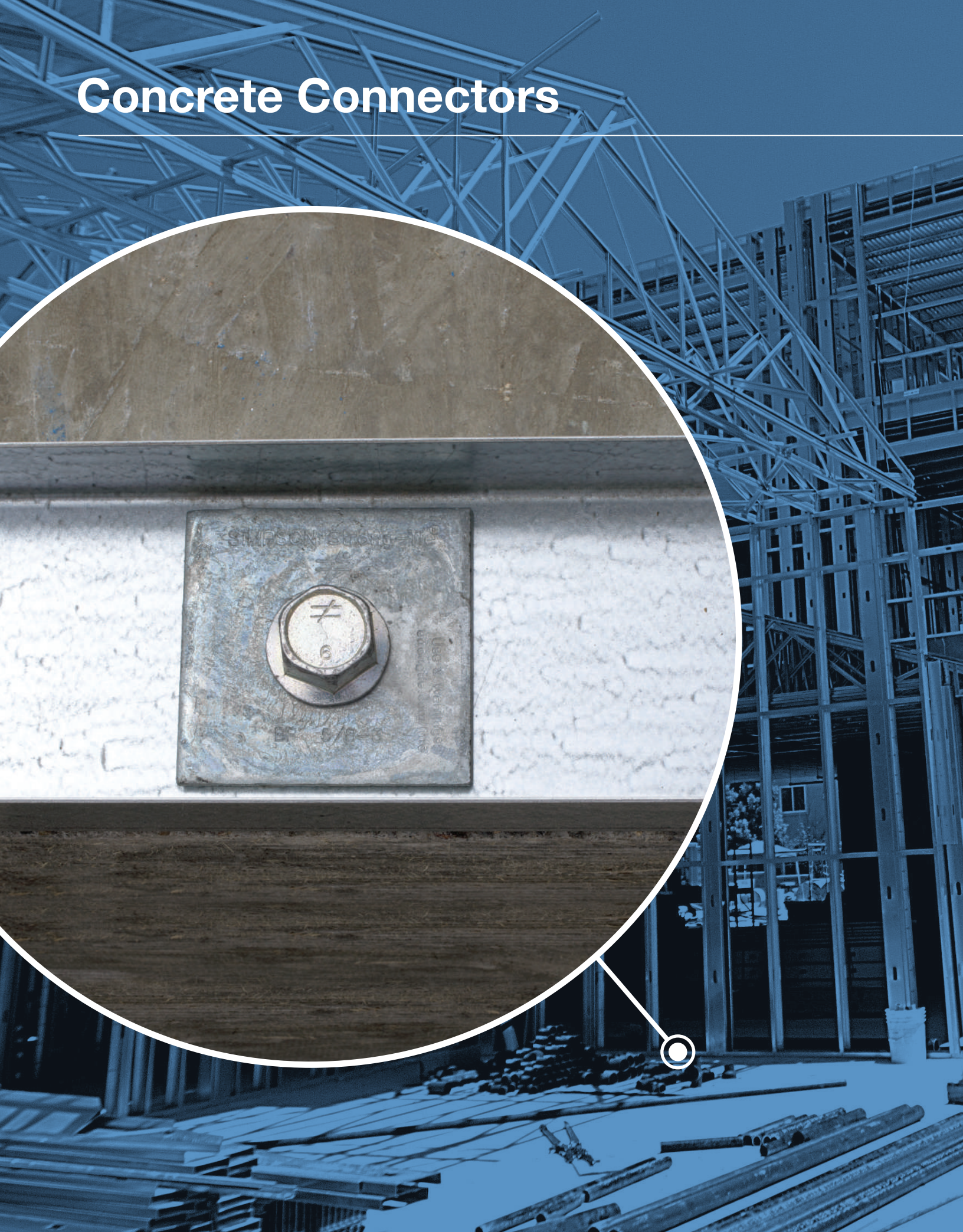
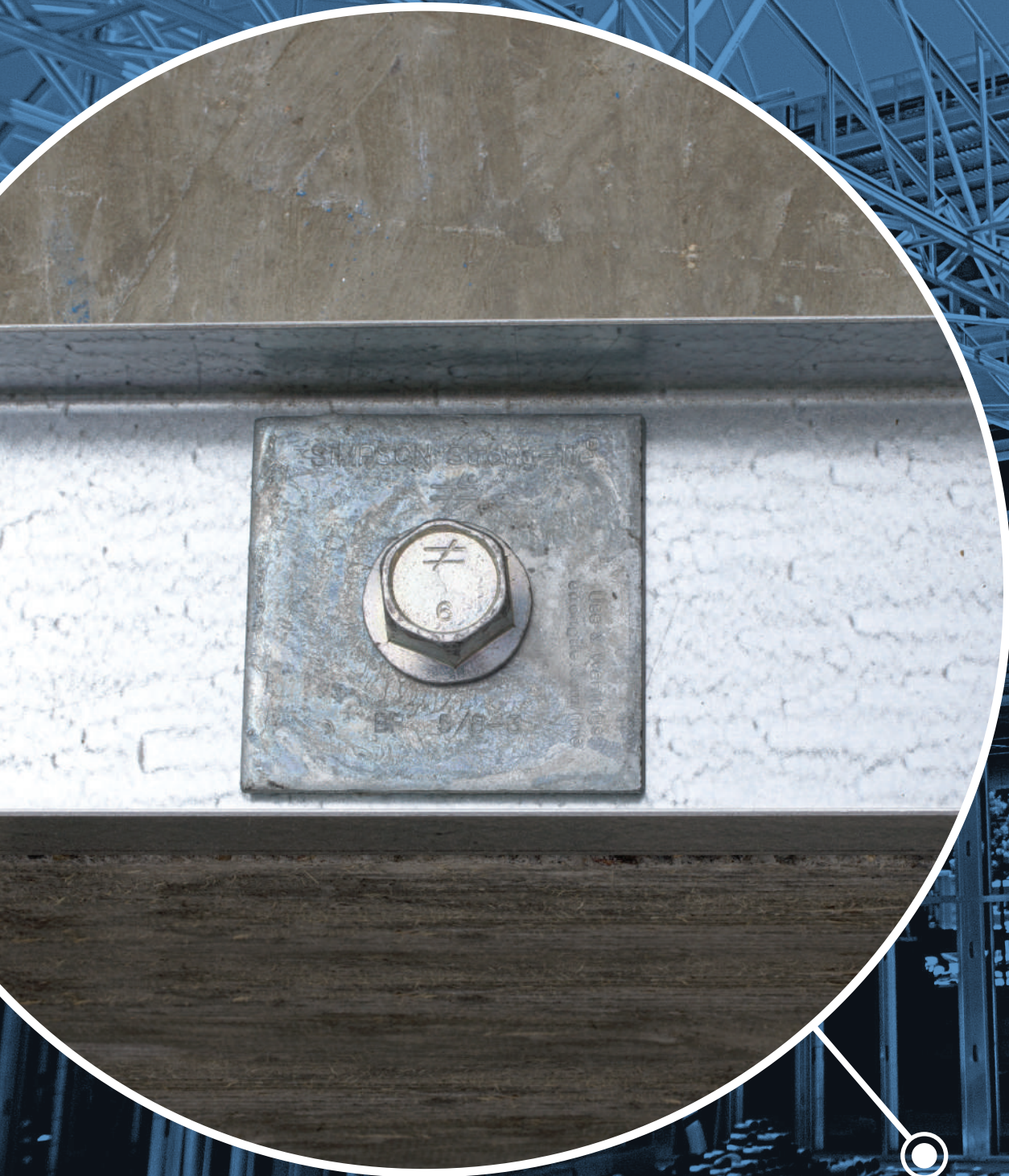
- Consistently forms the exact radius you need
- Tough heavy-gauge steel construction assures a smooth, trouble-free operation job after job
- Great for 20-gauge to 25-gauge angles with 1½" x 1½", 2" x 2" or 3" x 3" legs
- Minimum radius is 30"–44"



Ready Trim Bender — Model No. AB200

To learn more about how Simpson Strong-Tie can make your curved CFS wall and ceiling framing jobs faster and easier, visit strongtie.com/cfs.

Concrete Connectors



AnchorMate® Anchor Bolt Holders

The reusable AnchorMate anchor bolt holder is designed to hold the anchor in place before the concrete pour, as required in some jurisdictions. The gripping section secures the bolt in place without a nut for quicker setup and teardown. It also protects the threads from wet concrete and simplifies trowel finishing.

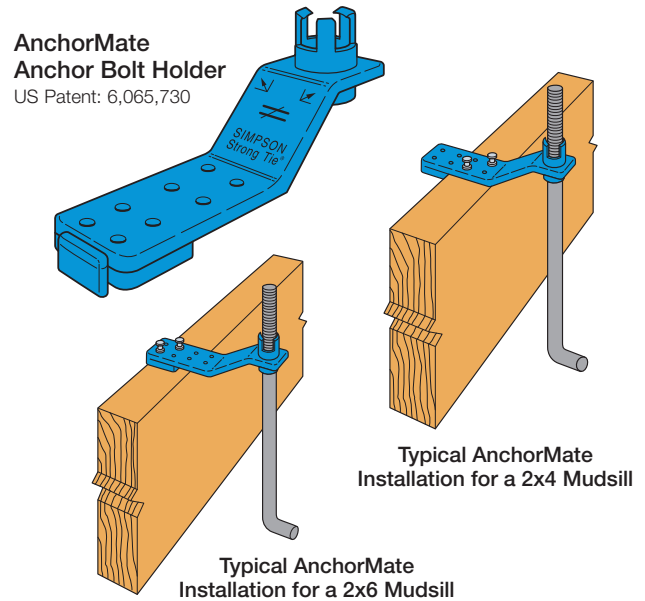
Features:

- Built-in 2x4 and 2x6 stops eliminate measuring.
- Color coded for easy size identification.
- Use the $\frac{5}{8}$ " and $\frac{7}{8}$ " AnchorMate to secure the SSTB to the formboard before the concrete pour. Alignment arrows (left or right) match the SSTB bolt head arrow.

Material: Nylon

Codes: See p. 13 for Code Reference Key Chart

| Model No. | Diameter (in.) | Color | Code Ref. |
|------------------|----------------|--------|-----------|
| AM $\frac{1}{2}$ | $\frac{1}{2}$ | Yellow | — |
| AM $\frac{5}{8}$ | $\frac{5}{8}$ | Blue | |
| AM $\frac{3}{4}$ | $\frac{3}{4}$ | Red | |
| AM $\frac{7}{8}$ | $\frac{7}{8}$ | Green | |
| AM1 | 1 | Black | |



ABS Anchor Bolt Stabilizer

The ABS stabilizes the anchor bolt to prevent it from being pushed against the form during the concrete pour.

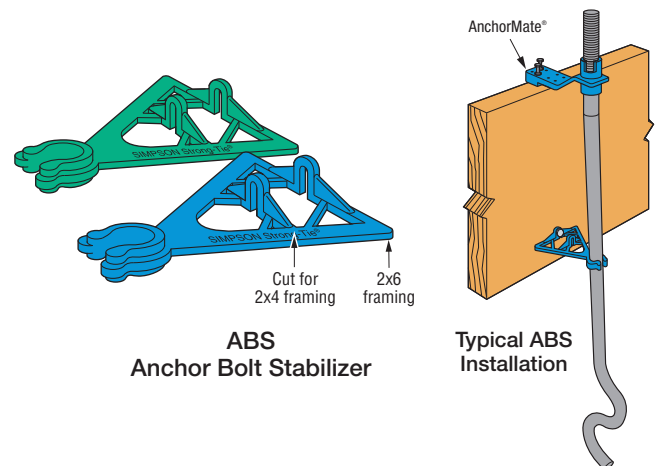
Features:

- Supports the bolt approximately 8" below the top of the concrete
- Model ABS $\frac{5}{8}$ is for the $\frac{5}{8}$ " SSTB and ABS $\frac{7}{8}$ is for the $\frac{7}{8}$ " SSTB
- Thin section limits the effect of a cold joint
- Sized for 2x4 and 2x6 mudsills

Material: Engineered Composite Plastic

Codes: See p. 13 for Code Reference Key Chart

| Model No. | Diameter (in.) | Color | Code Ref. |
|-------------------|----------------|-------|-----------|
| ABS $\frac{5}{8}$ | $\frac{5}{8}$ | Blue | — |
| ABS $\frac{7}{8}$ | $\frac{7}{8}$ | Green | |



StrapMate® Strap Holder

The StrapMate is designed to keep the STHD and LSTHD straps vertically aligned during the concrete pour to minimize possibility of spalling. The friction fit allows for quick and easy installation.

Features:

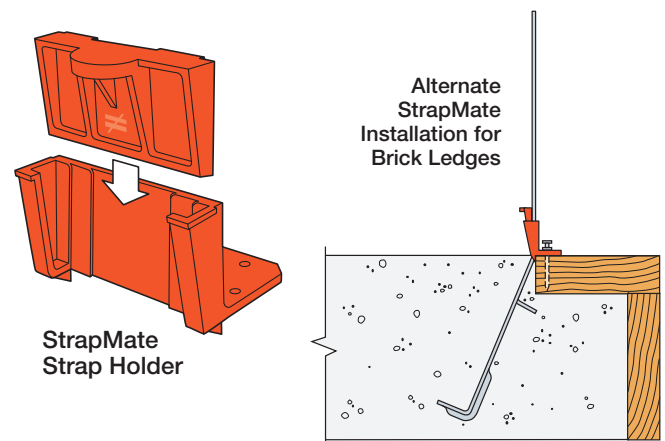
- The StrapMate is reusable
- Works with STHD, LSTHD

Material: Engineered Composite Plastic

- Designed to fit $\frac{3}{4}$ " plywood forms up to 1 $\frac{3}{4}$ " LVL forms and larger
- The strap is positioned off the front edge of the form board

Codes: See p. 13 for Code Reference Key Chart

| Model No. | Nails | Code Ref. |
|-----------|---------------|-----------|
| SM1 | (2) 8d duplex | — |



BP/LBP Bearing Plates

Bearing plates give greater bearing surface than standard cut washers, and help distribute the load at these critical connections.

The BP $\frac{1}{2}$ -3 and BP $\frac{5}{8}$ -3 are 3" x 3" bearing plates that meet the latest requirements of the IRC and IBC. These plate washers are available uncoated or with a hot-dip galvanized (HDG) coating.

The BPS and LBPS are bearing plates that offer increased flexibility. The slotted hole allows for adjustability to account for bolts that are not in the middle of the track-bottom plate.

Material: See table

Finish: LBP, LBPS and BP5/8S — Galvanized;
BP7/8-2 and BP5/8S — Zinc Plated; BPS, BP — None.
BPs and BPSs may be ordered HDG;
LBP and LBPS products may be ordered ZMAX®; contact Simpson Strong-Tie. Refer to pp. 19–23 for Corrosion Information.

Installation:

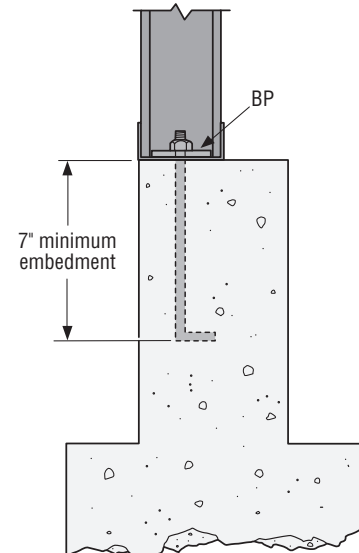
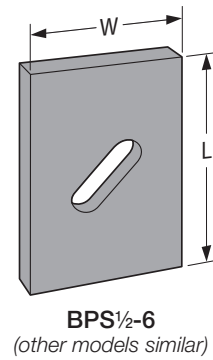
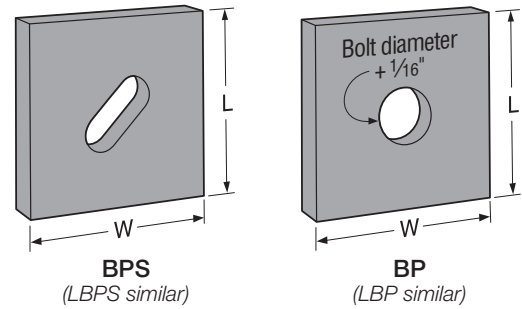
- See General Notes on pp. 14–17.
- BP/BPS — For shearwall applications, position edge of plate washer within ½" of sheathed edge of track bottom plate.

Codes: See p. 13 for Code Reference Key Chart

These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

| Bolt Dia. (in.) | Model No. | Thickness | Dimensions (in.) | | Code Ref. |
|-----------------|-----------|------------------|------------------|----|-----------|
| | | | W | L | |
| $\frac{3}{8}$ | BP3/8-2 | $\frac{3}{16}$ " | 2 | 2 | IBC, FL |
| $\frac{1}{2}$ | LBP1/2 | $\frac{3}{64}$ " | 2 | 2 | — |
| | LBPS1/2 | $\frac{3}{64}$ " | 3 | 3 | |
| | BPS1/2-3 | 3 ga. | 3 | 3 | |
| | BPS1/2-6 | 3 ga. | 3 | 4½ | |
| | BP1/2 | $\frac{3}{16}$ " | 2 | 2 | |
| | BP1/2-3 | 3 ga. | 3 | 3 | |
| $\frac{5}{8}$ | LBP5/8 | $\frac{3}{64}$ " | 2 | 2 | — |
| | LBPS5/8 | $\frac{3}{64}$ " | 3 | 3 | |
| | BPS5/8-3 | 3 ga. | 3 | 3 | |
| | BPS5/8-6 | 3 ga. | 3 | 4½ | |
| | BP5/8-2 | $\frac{3}{16}$ " | 2 | 2 | IBC, FL |
| | BP5/8 | $\frac{1}{4}$ " | 2½ | 2½ | — |
| | BP5/8-3 | 3 ga. | 3 | 3 | IBC, FL |
| $\frac{3}{4}$ | BP3/4 | $\frac{5}{16}$ " | 2¾ | 2¾ | |
| | BP3/4-3 | 3 ga. | 3 | 3 | |
| | BPS3/4-3 | 3 ga. | 3 | 3 | |
| | BPS3/4-6 | 3 ga. | 3 | 4½ | |
| $\frac{7}{8}$ | BP7/8-2 | $\frac{3}{8}$ " | 1¼ | 2¼ | — |
| | BP7/8 | $\frac{5}{16}$ " | 3 | 3 | |
| 1 | BP1 | $\frac{3}{8}$ " | 3½ | 3½ | — |

1. Standard cut washer required with BPS1/2-3, BPS5/8-3, BPS3/4-3, BPS1/2-6, BPS5/8-6 and BPS3/4-6 (not provided) per the 2015 IRC and 2015 SPDWS.



Typical BP Installed with a Bottom Track Anchor Bolt

CNW Coupler Nuts

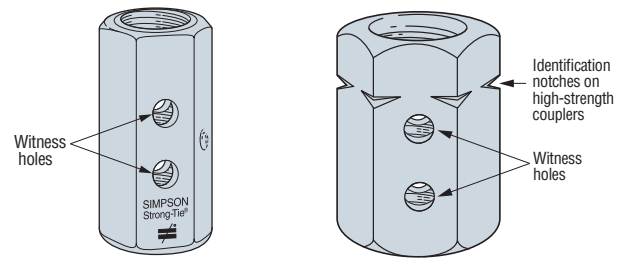
Simpson Strong-Tie coupler nuts are a tested and load-rated method to join threaded rod and anchor bolts. The Witness® holes in each nut provides a means to verify when rods are properly installed. The positive stop feature helps ensure even threading into each end of the nut. The CNW exceeds the specified minimum tensile capacity of corresponding standard-strength bolts and threaded rod. The HSCNW exceeds the specified minimum tensile capacity of corresponding high-strength bolts and threaded rod. Contact Simpson Strong-Tie for other coupler nut sizes.

Finish: Zinc Plated

Installation:

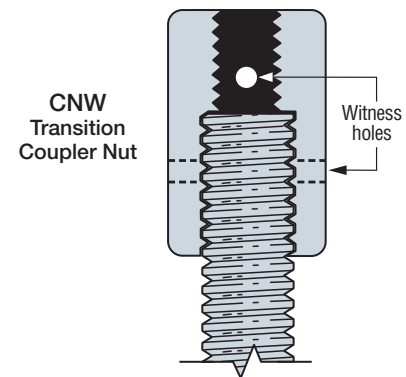
- Tighten the two rods until each all-thread rod is visible in the Witness hole. Any portion of thread visible in the Witness hole is a correct installation.
- Standard CNW for use with non-hot-dip galvanized all-thread rod only.
- Couplers available with oversized threads for installation to hot-dip galvanized bolts (order CNW5/8-5/8-OST and CNW7/8-7/8-OST).
- OST couplers are typically oversized on one end of the coupler nut only and will be marked with an "O" on oversized side. Contact Simpson Strong-Tie to order.

Codes: See p. 13 for Code Reference Key Chart



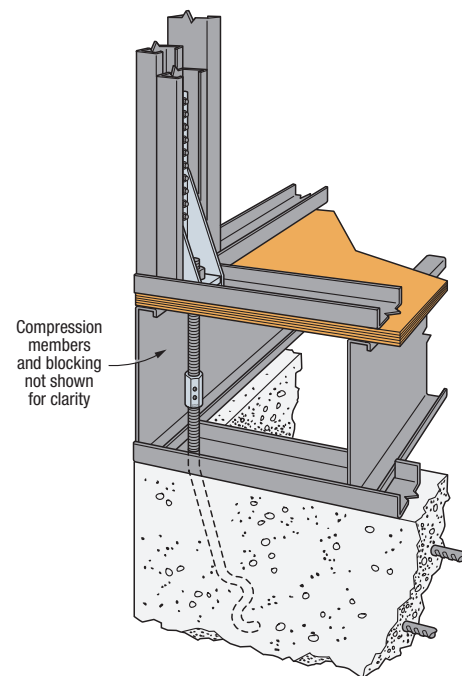
CNW
Allows Fast Visual Check
for Correct All Thread
Rod Installation

HSCNW
High-Strength
Coupler Nut



| Model No. | Rod Diameter (in.) | Allowable Tension Load | Code Ref. |
|---------------------|--------------------|------------------------|-----------|
| | | (100) | |
| CNW1/2 | 1/2 | 4,265 | IBC, FL |
| CNW5/8 | 5/8 | 6,675 | |
| CNW3/4 | 3/4 | 9,610 | |
| CNW7/8 | 7/8 | 13,080 | — |
| CNW1 | 1 | 17,080 | |
| CNW1-1/4 | 1 1/4 | 26,690 | |
| HSCNW3/4 | 3/4 | 19,880 | |
| HSCNW1 | 1 | 35,345 | |
| Transition Couplers | | | |
| CNW5/8-1/2 | 5/8 to 1/2 | 4,265 | IBC, FL |
| CNW3/4-5/8 | 3/4 to 5/8 | 6,675 | |
| CNW7/8-5/8 | 7/8 to 5/8 | 6,675 | — |
| CNW1-7/8 | 1 to 7/8 | 13,080 | |

1. Allowable loads shown are based on AISC 360 for A36 and A449 (HS) threaded rods.



**Typical CNW Rim Joist
Installation**

ABL Anchor Bolt Locator

The ABL enables the accurate and secure placement of anchor bolts on concrete-deck forms prior to concrete placement. The structural heavy-hex nut is attached to a pre-formed steel "chair," which eliminates the need for an additional nut on the bottom of the anchor bolt. Electrogalvanized versions available for HDG anchor bolts. Order ABL-OST when using HDG anchor bolts.

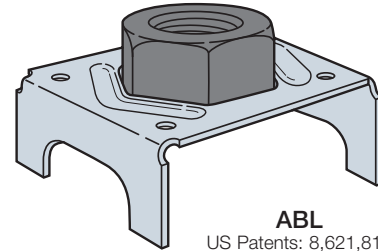
Features:

- Designed for optimum concrete flow
- Installed with two nails or two screws
- Meets code requirement for 1" standoff
- The ABL is designed for use with SAR anchors

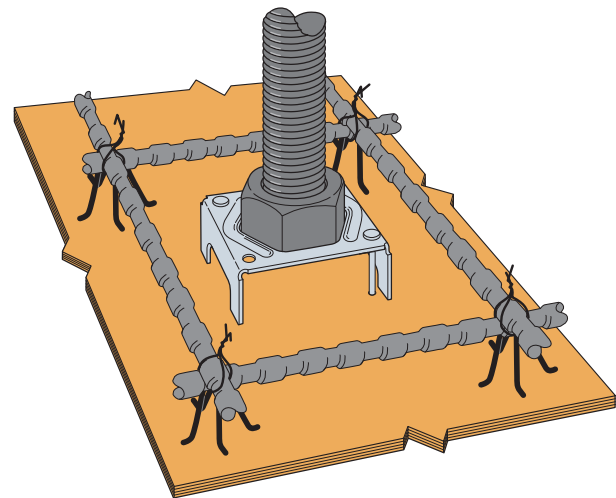
Material: Nut — Heavy hex; Chair — 14 gauge

Finish: Nut — None or Electro-galvanized;
Chair — G90

Codes: See p. 13 for Code Reference Key Chart



ABL
US Patents: 8,621,816
and 8,381,482



Typical ABL Installation

Please visit strongtie.com
for ABL load ratings.

| Model No. | Anchor Bolt Diameter (in.) | Code Ref. |
|-----------|----------------------------|-----------|
| ABL4-1 | 1/2 | — |
| ABL5-1 | 5/8 | |
| ABL6-1 | 3/4 | |
| ABL7-1 | 7/8 | |
| ABL8-1 | 1 | |
| ABL9-1 | 1 1/8 | |
| ABL10-1 | 1 1/4 | |

MASA/MASAP Mud sill Anchors

Mud sill anchors have always been a time-saving alternative to anchor bolts, and the MASA anchors provide an even greater load-carrying capacity alternative. For $\frac{3}{8}$ " and $\frac{1}{2}$ " mud sill anchor bolts on bottom tracks, the MASA has load capacities that meet or exceed the parallel and perpendicular to plate shear capacity of other cast-in-place anchors. Two versions of the MASA are available — the standard MASA for installation on standard forms, and the MASAP for panelized forms.

The MASA and MASAP are code listed by ICC-ES under the 2006, 2009, 2012 and 2015 IBC® and IRC® and have been tested to meet the requirements of ICC-ES acceptance criteria AC-398 for cracked and uncracked concrete.

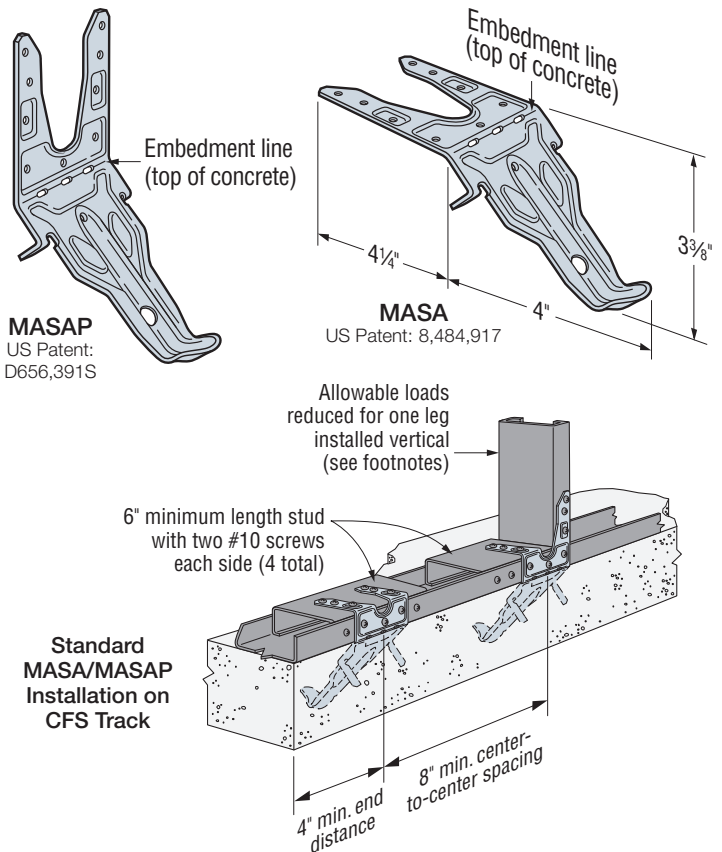
Material: 16 gauge

Finish: Galvanized, all available in ZMAX® coating.
See Corrosion Information, pp. 19–23.

Installation:

- Use all specified fasteners; see General Notes
- **MASA/MASAP**
 - Concrete shall have a minimum $f'_c = 2,500$ psi.
 - Spalling — Full loads apply for spalls up to a maximum height of $1\frac{1}{4}$ " and a maximum depth of $\frac{7}{8}$ ". Any exposed portion of the mud sill anchor must be protected against possible corrosion.
 - Minimum MASA end distance is 4" and minimum center-to-center spacing is 8" for a full load.
 - For continuous load path, MASA should be installed on the same side of the wall as uplift connectors.

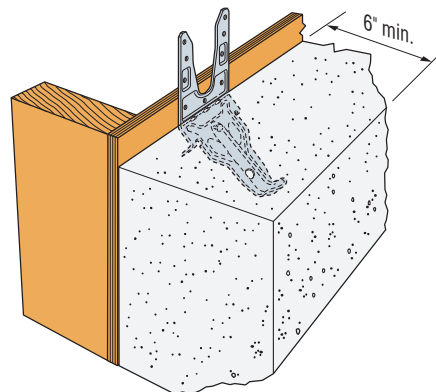
Codes: See p. 13 for Code Reference Key Chart



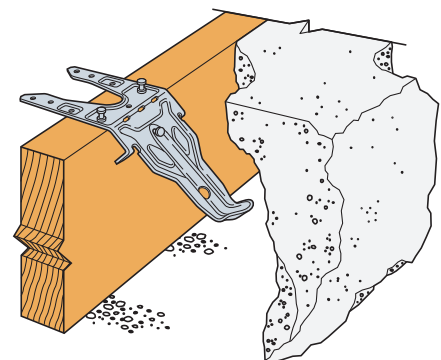
Allowable Loads for MASA/MASAP Cast-in-Place Mud sill Anchor on CFS Track

| Model No. | Fasteners ^a | | Allowable Load (lb.) ^{1,2,3,4,5} 43 mil (18 ga.) CFS | | | | | | Code Ref. |
|---------------|------------------------|--------------|---|--------------------------------|------------------------|---------|--------------------------------|------------------------|-------------|
| | Sides | Top of Track | Standard Installation | | | SDC C-F | | | |
| | | | Uplift | Parallel to Track ⁷ | Perpendicular to Track | Uplift | Parallel to Track ⁷ | Perpendicular to Track | |
| MASA or MASAP | (3) #10 | (6) #10 | Non-Cracked | | | | | | IBC, FL, LA |
| | | | 645 | 1,155 | 855 | 565 | 1,010 | 750 | |
| | | | Cracked | | | | | | |
| | | | 490 | 1,155 | 630 | 425 | 1,010 | 550 | |

1. Allowable loads are governed by tests and may not be increased ($C_D = 1.0$).
2. The tabulated allowable (ASD) loads may be multiplied by 1.67 for designs for wind and in SDC A&B, and by 1.4 for designs in SDC C through F to obtain the LRFD loads.
3. Minimum concrete compression strength, f'_c is 2,500 psi.
4. Allowable loads are based on a minimum stem wall width of 6".
5. For simultaneous loads in more than one direction, the connector must be evaluated using the Unity Equation.
6. Per Section 1613 of the 2012, 2015 and 2018 IBC, detached one- and two-family dwellings in SDC C may use the "Wind and SDC A&B" allowable loads.
7. Parallel-to-Track loads for One-Leg-Up Installation: SDC A-C = 985 lb., SDC C-F = 860 lb.
8. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

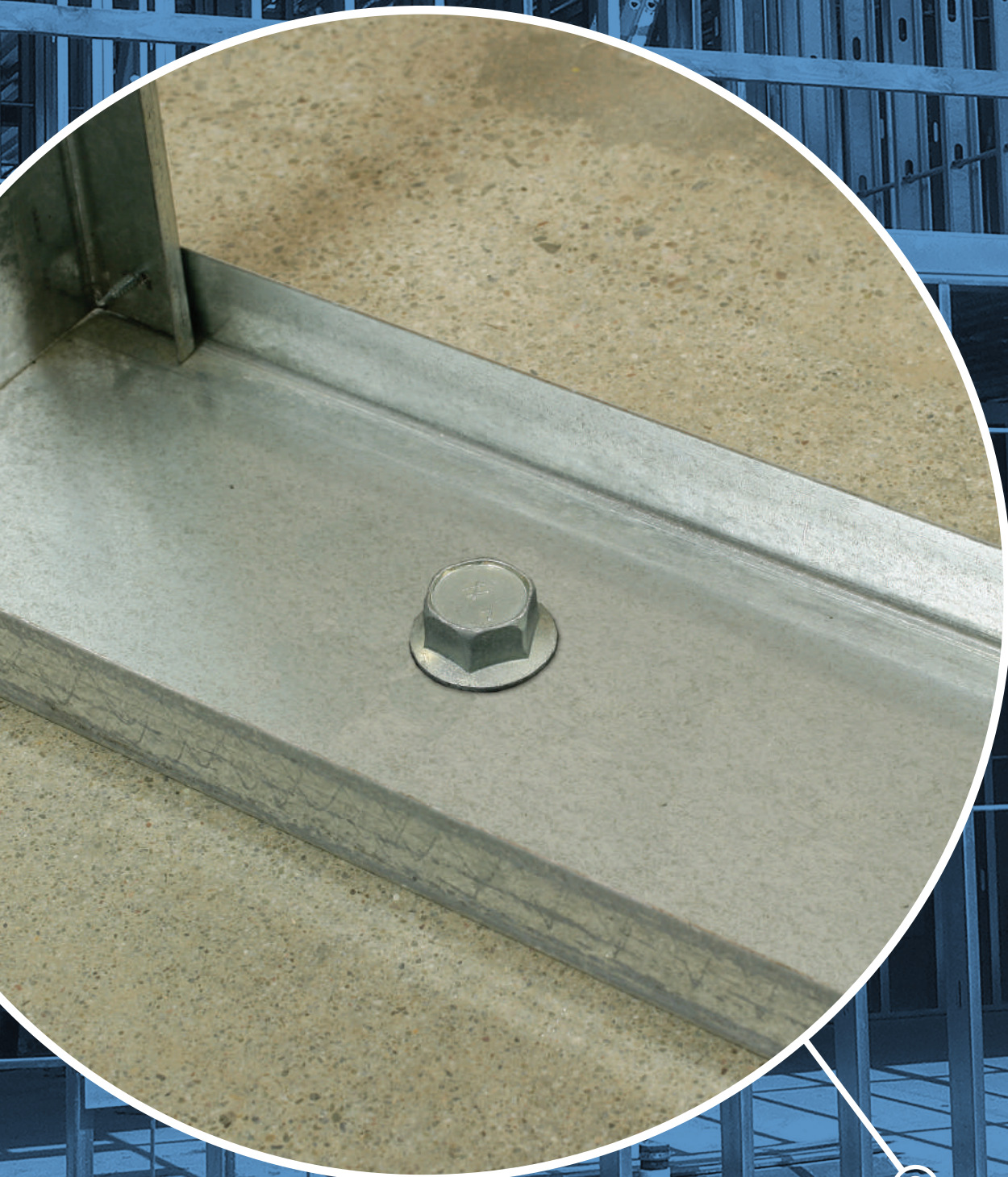


Standard MASAP Installation in Concrete



Standard MASA Installation in Concrete







Anchors



Simpson Strong-Tie® Anchor Solutions for CFS Construction

The most frequently applicable and suitable Simpson Strong-Tie Anchors used with CFS installations. For further information and more anchorage solutions, please visit strongtie.com.

✓ = Code listed ✓ = Tested — = Not tested

| Product | | | Base Materials | | | | | |
|--------------------|---|---|----------------|-----------|------------------------|--------------|--------|-------|
| | | | Concrete | | Concrete on Metal Deck | CMU | | Other |
| | | | Cracked | Uncracked | | Grout-Filled | Hollow | |
| Adhesive Anchors | SET-3G™ |  | ✓ | ✓ | — | — | — | — |
| | AT-XP® |  | ✓ | ✓ | — | ✓ | ✓ | — |
| Mechanical Anchors | Titen HD® (THD) (reference pp. 175–179) |  | ✓ | ✓ | ✓ | ✓ | — | — |
| | Titen HD® Countersunk Screw Anchor |  | ✓ | ✓ | ✓ | ✓ | — | — |
| | Strong-Bolt® 2 (STB2) |  | ✓ | ✓ | ✓ | ✓ | — | — |
| | Tie-Wire (TW) |  | — | ✓ | ✓ | — | — | — |

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Anchors

Simpson Strong-Tie® Anchor Solutions for CFS Construction

✓ = Code listed

✓ = Tested

— = Not tested

| Product | | | Base Materials | | | | | Other |
|--------------------|---|---|----------------|-----------|------------------------|--------------|--------|-----------------------------|
| | | | Concrete | | Concrete on Metal Deck | CMU | | |
| | | | Cracked | Uncracked | | Grout-Filled | Hollow | |
| Mechanical Anchors | Titen Turbo™ (TNT) |  | — | ✓ | — | ✓ | ✓ | — |
| | Drop-in Anchors (DIAB and DIA-S) |  | — | ✓ | ✓ | — | — | Hollow Core ✓ |
| | Hollow Drop-In (HDIA) |  | — | ✓ | — | — | ✓ | — |
| | Zinc Nailon™ (ZN) |  | — | ✓ | — | — | — | — |
| | Crimp Drive® (CD) |  | — | ✓ | ✓ | — | — | — |
| Direct Fastening | Powder-Actuated Fasteners (PDPAT, PDPA) (reference pp. 180–182) |  | — | ✓ | ✓ | ✓ | ✓ | Steel ✓ |
| | Gas-Actuated Fasteners (GDP, GDPS) |  | — | ✓ | ✓ | ✓ | ✓ | Steel ✓ |
| | Gas-Actuated Fasteners (GDPSK) |  | — | — | — | — | — | Plywood/ OSB to CFS ✓ |

Titen HD® Heavy-Duty Screw Anchor

A high-strength screw anchor for use in cracked and uncracked concrete, as well as uncracked masonry. The Titen HD offers low installation torque and outstanding performance. Designed for use in dry, interior, non-corrosive environments or temporary outdoor applications.

Features

- Tested in accordance with ACI 355.2, AC193 and AC106
- Qualified for static and seismic loading conditions
- Thread design undercuts to efficiently transfer the load to the base material
- Standard fractional sizes
- Specialized heat-treating process creates tip hardness for better cutting without compromising the ductility
- No special drill bit required — designed to install using standard-sized ANSI tolerance drill bits
- Hex-washer head requires no separate washer, unless required by code, and provides a clean installed appearance
- Removable — ideal for temporary anchoring (e.g. formwork, bracing) or applications where fixtures may need to be moved
- Reuse of the anchor will not achieve listed loads and is not recommended

Codes: ICC-ES ESR-2713 (concrete);

ICC-ES ESR-1056 (masonry);

City of LA Supplement within ESR-2713 (concrete);

City of LA Supplement within ESR-1056 (masonry);

Florida FL15730 (concrete and masonry);

FM 3017082, 3035761 and 3043442;

Multiple DOT listings

Material: Carbon steel

Coating: Zinc plated or mechanically galvanized.

Not recommended for permanent exterior use or highly corrosive environments.

Installation

! Holes in steel fixtures to be mounted should match the diameter specified in the table below.

Use a Titen HD screw anchor one time only — installing the anchor multiple

! times may result in excessive thread wear and reduce load capacity.

Do not use impact wrenches to install into hollow CMU.

! **Caution:** Oversized holes in base material will reduce or eliminate the mechanical interlock of the threads with the base material and reduce the anchor's load capacity.

1. Drill a hole in the base material using a carbide drill bit the same diameter as the nominal diameter of the anchor to be installed. Drill the hole to the specified embedment depth plus minimum hole depth overdrill (see table below) to allow the thread tapping dust to settle, and blow it clean using compressed air. (Overhead installations need not be blown clean.) Alternatively, drill the hole deep enough to accommodate embedment depth and the dust from drilling and tapping.
2. Insert the anchor through the fixture and into the hole.
3. Tighten the anchor into the base material until the hex-washer head contacts the fixture.

Additional Installation Information

| Titen HD Diameter (in.) | Wrench Size (in.) | Recommended Steel Fixture Hole Size (in.) | Minimum Hole Depth Overdrill (in.) |
|-------------------------|-------------------|---|------------------------------------|
| 1/4 | 3/8 | 3/8 to 7/16 | 1/8 |
| 3/8 | 9/16 | 1/2 to 9/16 | 1/4 |
| 1/2 | 3/4 | 5/8 to 11/16 | 1/2 |
| 5/8 | 15/16 | 3/4 to 13/16 | 1/2 |
| 3/4 | 1 1/8 | 7/8 to 15/16 | 1/2 |

Suggested fixture hole sizes are for structural steel thicker than 12 gauge only. Larger holes are not required for wood or thinner cold-formed steel members.

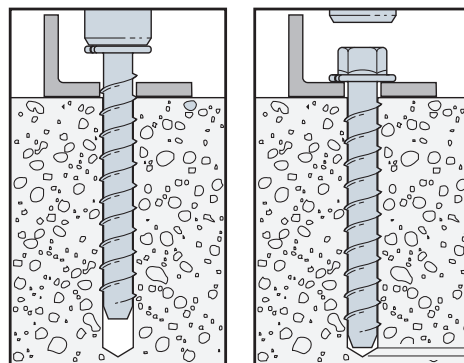
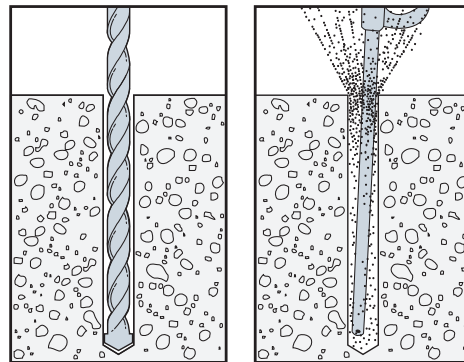


Titen HD
Screw Anchor



Serrated teeth on the tip of the Titen HD screw anchor facilitate cutting and reduce installation torque.

Installation Sequence



Minimum overdrill. See table.

Titen HD® Heavy-Duty Screw Anchor

Titen HD Anchor Product Data — Zinc Plated¹

| Size (in.) | Model No. | Drill Bit Dia. (in.) | Wrench Size (in.) | Quantity | |
|------------|---------------------------|----------------------|-------------------|----------|--------|
| | | | | Box | Carton |
| ¼ x 1⅞ | THDB25178H | ¼ | ⅜ | 100 | 500 |
| ¼ x 2¾ | THDB25234H | ¼ | ⅜ | 50 | 250 |
| ¼ x 3 | THDB25300H | ¼ | ⅜ | 50 | 250 |
| ¼ x 3½ | THDB25312H | ¼ | ⅜ | 50 | 250 |
| ¼ x 4 | THDB25400H | ¼ | ⅜ | 50 | 250 |
| ⅜ x 1¾ | THD37134H ^{2,3} | ⅜ | ⅝ | 50 | 250 |
| ⅜ x 2½ | THD37212H ^{2,3} | ⅜ | ⅝ | 50 | 200 |
| ⅜ x 3 | THD37300H | ⅜ | ⅝ | 50 | 200 |
| ⅜ x 4 | THD37400H | ⅜ | ⅝ | 50 | 200 |
| ⅜ x 5 | THD37500H | ⅜ | ⅝ | 50 | 100 |
| ⅜ x 6 | THD37600H | ⅜ | ⅝ | 50 | 100 |
| ½ x 3 | THD50300H ^{2,4} | ½ | ¾ | 25 | 100 |
| ½ x 4 | THD50400H | ½ | ¾ | 20 | 80 |
| ½ x 5 | THD50500H | ½ | ¾ | 20 | 80 |
| ½ x 6 | THD50600H | ½ | ¾ | 20 | 80 |
| ½ x 6½ | THD50612H | ½ | ¾ | 20 | 40 |
| ½ x 8 | THD50800H | ½ | ¾ | 20 | 40 |
| ½ x 12 | THD501200H | ½ | ¾ | 5 | 25 |
| ½ x 13 | THD501300H | ½ | ¾ | 5 | 25 |
| ½ x 14 | THD501400H | ½ | ¾ | 5 | 25 |
| ½ x 15 | THD501500H | ½ | ¾ | 5 | 25 |
| ⅝ x 4 | THDB62400H ^{2,4} | ⅝ | 1⅝ | 10 | 40 |
| ⅝ x 5 | THDB62500H | ⅝ | 1⅝ | 10 | 40 |
| ⅝ x 6 | THDB62600H | ⅝ | 1⅝ | 10 | 40 |
| ⅝ x 6½ | THDB62612H | ⅝ | 1⅝ | 10 | 40 |
| ⅝ x 8 | THDB62800H | ⅝ | 1⅝ | 10 | 20 |
| ⅝ x 10 | THDB62100H | ⅝ | 1⅝ | 10 | 20 |
| ¾ x 4 | THD75400H ^{2,5} | ¾ | 1⅞ | 10 | 40 |
| ¾ x 5 | THD75500H | ¾ | 1⅞ | 5 | 20 |
| ¾ x 6 | THDT75600H | ¾ | 1⅞ | 5 | 20 |
| ¾ x 7 | THD75700H | ¾ | 1⅞ | 5 | 10 |
| ¾ x 8½ | THD75812H | ¾ | 1⅞ | 5 | 10 |
| ¾ x 10 | THD75100H | ¾ | 1⅞ | 5 | 10 |

- Length of anchor is measured from underside of the head to end of anchor.
- These models do not meet minimum embedment depth requirements for strength design.
- Installation torque shall not exceed 25 ft.-lb. using a manual torque wrench or maximum torque rating of 100 ft.-lb. when installed with impact wrench.
- Installation torque shall not exceed 50 ft.-lb. using a manual torque wrench or maximum torque rating of 100 ft.-lb. when installed with impact wrench.
- Installation torque shall not exceed 50 ft.-lb. using a manual torque wrench or maximum torque rating of 135 ft.-lb. when installed with impact wrench.

Titen HD Anchor Product Data — Mechanically Galvanized

| Size (in.) | Model No. | Drill Bit Dia. (in.) | Wrench Size (in.) | Quantity | |
|------------|--------------|----------------------|-------------------|----------|--------|
| | | | | Box | Carton |
| ⅜ x 3 | THD37300HMG | ⅜ | ⅝ | 50 | 200 |
| ⅜ x 4 | THD37400HMG | | | 50 | 200 |
| ⅜ x 5 | THD37500HMG | | | 50 | 100 |
| ⅜ x 6 | THD37600HMG | | | 50 | 100 |
| ½ x 4 | THD50400HMG | ½ | ¾ | 20 | 80 |
| ½ x 5 | THD50500HMG | | | 20 | 80 |
| ½ x 6 | THD50600HMG | | | 20 | 80 |
| ½ x 6½ | THD50612HMG | | | 20 | 40 |
| ½ x 8 | THD50800HMG | | | 20 | 40 |
| ⅝ x 5 | THDB62500HMG | ⅝ | 1⅝ | 10 | 40 |
| ⅝ x 6 | THDB62600HMG | | | 10 | 40 |
| ⅝ x 6½ | THDB62612HMG | | | 10 | 40 |
| ⅝ x 8 | THDB62800HMG | | | 10 | 20 |
| ¾ x 6 | THDT75600HMG | ¾ | 1⅞ | 5 | 20 |
| ¾ x 8½ | THD75812HMG | | | 5 | 10 |
| ¾ x 10 | THD75100HMG | | | 5 | 10 |

Mechanical galvanizing meets ASTM B695, Class 65, Type 1. Intended for some pressure-treated wood sill plate applications. Not for use in other corrosive or outdoor environments. Visit strongtie.com/info for more corrosion information.

Titen HD® Heavy-Duty Screw Anchor

Table 1: Titen HD — Tension Loads Attaching Cold-Formed Steel to Normal-Weight Concrete (lb.)⁶

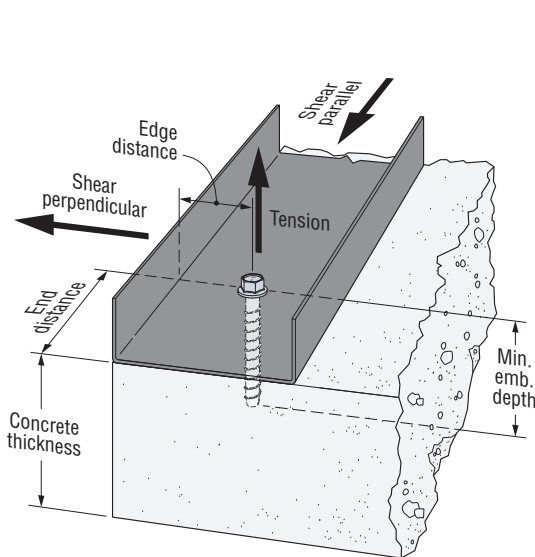
| Anchor Size (in.) | Drill Bit (in.) | Edge Distance (in.) | End Distance (in.) | Min. Emb. Depth (in.) | Concrete Thickness (in.) | Spacing (in.) | Concrete ≥ 2,500 psi ^{3,4} | | | | Cold-Formed Steel (ASD) ⁵ | | | |
|-------------------|-----------------|---------------------|--------------------|-----------------------|--------------------------|---------------|-------------------------------------|-------------------------------|---------------------------------|------------------------------|--------------------------------------|-----------------|-----------------|-----------------|
| | | | | | | | LRFD ^{1,9,10} (Seismic) | LRFD ^{1,8,10} (Wind) | ASD ^{2,9,10} (Seismic) | ASD ^{2,8,10} (Wind) | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | 68 mil (14 ga.) |
| ¼ x 1 7/8 | ¼ | 1 ½ | 3 | 1 5/8 | 3 ¼ | 6 | 470 | 630 | 330 | 375 | 390 | 505 | 920 | 1,160 |
| | | 1 ¾ | 3 | 1 5/8 | 3 ¼ | 6 | 530 | 705 | 370 | 425 | | | | |
| | | 3 | 3 | 1 5/8 | 3 ¼ | 6 | 540 | 715 | 375 | 430 | | | | |
| ¼ x 2 ¼ | | 1 ½ | 3 | 2 ½ | 3 ½ | 6 | 725 | 965 | 510 | 580 | | | | |
| | | 1 ¾ | 3 | 2 ½ | 3 ½ | 6 | 790 | 1,050 | 555 | 630 | | | | |
| | | 3 | 3 | 2 ½ | 3 ½ | 6 | 930 | 1,240 | 650 | 745 | | | | |
| ¾ x 3 | ¾ | 1 ¾ | 3 | 2 ½ | 4 | 6 | 600 | 800 | 420 | 480 | 585 | 760 | 1,380 | 1,740 |
| ½ x 4 | ½ | 1 ¾ | 4 | 3 ¼ | 5 | 8 | 940 | 1,255 | 660 | 755 | 585 | 760 | 1,380 | 1,740 |
| | | 3 | 4 | 3 ¼ | 5 | 8 | 1,320 | 1,760 | 925 | 1,055 | | | | |
| | | 4 | 4 | 3 ¼ | 5 | 8 | 1,490 | 1,985 | 1,045 | 1,190 | | | | |

See footnotes on p. 179.

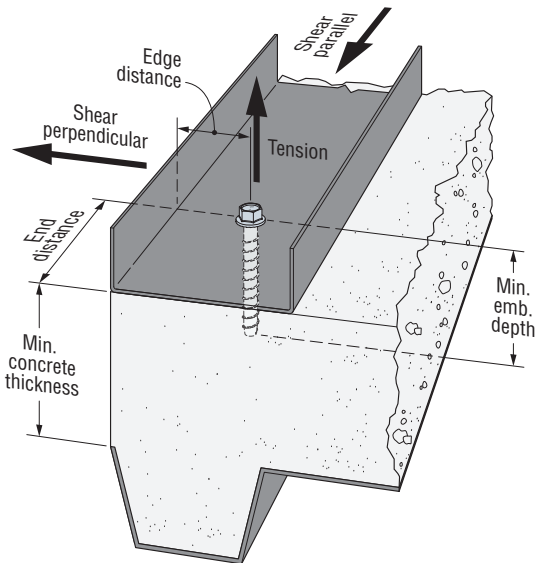
Table 2: Titen HD — Shear Loads Perpendicular to Edge in Normal-Weight Concrete (lb.)⁶

| Anchor Size (in.) | Drill Bit (in.) | Edge Distance (in.) | End Distance (in.) | Min. Emb. Depth (in.) | Concrete Thickness (in.) | Spacing (in.) | Concrete ≥ 2,500 psi ^{3,4} | | | | Cold-Formed Steel (ASD) ⁵ | | | |
|-------------------|-----------------|---------------------|--------------------|-----------------------|--------------------------|---------------|-------------------------------------|-------------------------------|---------------------------------|------------------------------|--------------------------------------|-----------------|-----------------|-----------------|
| | | | | | | | LRFD ^{1,9,10} (Seismic) | LRFD ^{1,8,10} (Wind) | ASD ^{2,9,10} (Seismic) | ASD ^{2,8,10} (Wind) | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | 68 mil (14 ga.) |
| ¼ x 1 7/8 | ¼ | 1 ½ | 3 | 1 5/8 | 3 ¼ | 6 | 305 | 305 | 215 | 185 | 350 | 455 | 830 | 1,045 |
| | | 1 ¾ | 3 | 1 5/8 | 3 ¼ | 6 | 385 | 385 | 270 | 230 | | | | |
| | | 3 | 3 | 1 5/8 | 3 ¼ | 9 | 555 | 555 | 390 | 335 | | | | |
| ¼ x 2 ¼ | | 1 ½ | 3 | 2 ½ | 3 ½ | 6 | 340 | 340 | 235 | 205 | | | | |
| | | 1 ¾ | 3 | 2 ½ | 3 ½ | 6 | 425 | 425 | 300 | 255 | | | | |
| | | 3 | 3 | 2 ½ | 3 ½ | 9 | 635 | 635 | 445 | 380 | | | | |
| ¾ x 3 | ¾ | 1 ¾ | 7 | 2 ½ | 4 | 5 ¼ | 475 | 475 | 335 | 285 | 510 | 685 | 1,240 | 1,565 |
| | | 3 | 7 | 2 ½ | 4 | 9 | 1,000 | 1,000 | 700 | 600 | | | | |
| ½ x 4 | ½ | 1 ¾ | 8 | 3 ¼ | 5 | 5 ¼ | 545 | 545 | 380 | 325 | 595 | 880 | 1,655 | 2,085 |
| | | 3 | 8 | 3 ¼ | 5 | 9 | 1,225 | 1,225 | 860 | 735 | | | | |

See footnotes on p. 179.



Edge and end distances for Titen HD in concrete slab corner condition. (reference table 1, 2 and 3)



Edge and end distances for Titen HD in concrete over metal deck. (reference table 4, 5 and 6)

Titen HD® Heavy-Duty Screw Anchor

Table 3: Titen HD — Shear Loads Parallel to Edge in Normal-Weight Concrete (lb./ft.)⁶

| Anchor Size (in.) | Drill Bit (in.) | Edge Distance (in.) | End Distance (in.) | Min. Emb. Depth (in.) | Concrete Thickness (in.) | Spacing | Concrete ≥ 2,500 psi ^{3,4} | | | | Cold-Formed Steel (ASD) ⁵ | | | |
|-------------------|-----------------|---------------------|--------------------|-----------------------|--------------------------|---------|-------------------------------------|-------------------------------|---------------------------------|------------------------------|--------------------------------------|-----------------|-----------------|-----------------|
| | | | | | | | LRFD ^{1,9,10} (Seismic) | LRFD ^{1,9,10} (Wind) | ASD ^{2,9,10} (Seismic) | ASD ^{2,9,10} (Wind) | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | 68 mil (14 ga.) |
| ¼ x 1 7/8 | ¼ | 1 ½ | 3 | 1 5/8 | 3 ¼ | 0' – 6" | 790 | 790 | 550 | 470 | 700 | 910 | 1,660 | 2,090 |
| | | | | | | 0' – 8" | 595 | 595 | 415 | 355 | 525 | 685 | 1,245 | 1,570 |
| | | | | | | 1' – 0" | 395 | 395 | 275 | 235 | 350 | 455 | 830 | 1,045 |
| | | | | | | 1' – 4" | 295 | 295 | 205 | 175 | 265 | 340 | 625 | 785 |
| | | | | | | 2' – 0" | 200 | 200 | 140 | 120 | 175 | 230 | 415 | 525 |
| | | | | | | 2' – 8" | 150 | 150 | 105 | 90 | 130 | 170 | 310 | 390 |
| | | | | | | 4' – 0" | 100 | 100 | 70 | 60 | 90 | 115 | 210 | 260 |
| ¼ x 1 7/8 | ¼ | 3 | 3 | 1 5/8 | 3 ¼ | 0' – 9" | 740 | 740 | 520 | 445 | 465 | 605 | 1,105 | 1,395 |
| | | | | | | 1' – 0" | 555 | 555 | 390 | 335 | 350 | 455 | 830 | 1,045 |
| | | | | | | 1' – 4" | 415 | 415 | 295 | 250 | 265 | 340 | 625 | 785 |
| | | | | | | 2' – 0" | 280 | 280 | 195 | 170 | 175 | 230 | 415 | 525 |
| | | | | | | 2' – 8" | 210 | 210 | 145 | 125 | 130 | 170 | 310 | 390 |
| | | | | | | 4' – 0" | 140 | 140 | 100 | 85 | 90 | 115 | 210 | 260 |
| | | | | | | 6' – 0" | 95 | 95 | 65 | 55 | 60 | 75 | 140 | 175 |
| ¼ x 2 ¾ | ¼ | 3 | 3 | 2 ½ | 3 ½ | 0' – 9" | 845 | 845 | 595 | 505 | 465 | 605 | 1,105 | 1,395 |
| | | | | | | 1' – 0" | 635 | 635 | 445 | 380 | 350 | 455 | 830 | 1,045 |
| | | | | | | 1' – 4" | 475 | 475 | 335 | 285 | 265 | 340 | 625 | 785 |
| | | | | | | 2' – 0" | 320 | 320 | 225 | 190 | 175 | 230 | 415 | 525 |
| | | | | | | 2' – 8" | 240 | 240 | 165 | 145 | 130 | 170 | 310 | 390 |
| | | | | | | 4' – 0" | 160 | 160 | 110 | 95 | 90 | 115 | 210 | 260 |
| | | | | | | 6' – 0" | 105 | 105 | 75 | 65 | 60 | 75 | 140 | 175 |
| ¾ x 3 | ¾ | 3 | 7 | 2 ½ | 4 | 0' – 8" | 1,770 | 1,770 | 1,240 | 1,060 | 765 | 1,030 | 1,860 | 2,350 |
| | | | | | | 1' – 0" | 1,180 | 1,180 | 825 | 710 | 510 | 685 | 1,240 | 1,565 |
| | | | | | | 1' – 4" | 885 | 885 | 620 | 530 | 385 | 515 | 930 | 1,175 |
| | | | | | | 2' – 0" | 590 | 590 | 415 | 355 | 255 | 340 | 620 | 780 |
| | | | | | | 2' – 8" | 445 | 445 | 310 | 265 | 190 | 255 | 465 | 585 |
| | | | | | | 4' – 0" | 295 | 295 | 205 | 175 | 130 | 170 | 310 | 390 |
| | | | | | | 6' – 0" | 195 | 195 | 135 | 115 | 85 | 115 | 205 | 260 |
| ½ x 4 | ½ | 3 | 8 | 3 ¼ | 5 | 0' – 8" | 2,505 | 2,505 | 1,755 | 1,505 | 895 | 1,320 | 2,485 | 3,130 |
| | | | | | | 1' – 0" | 1,670 | 1,670 | 1,170 | 1,000 | 595 | 880 | 1,655 | 2,085 |
| | | | | | | 1' – 4" | 1,255 | 1,255 | 880 | 755 | 445 | 660 | 1,240 | 1,565 |
| | | | | | | 2' – 0" | 835 | 835 | 585 | 500 | 300 | 440 | 830 | 1,045 |
| | | | | | | 2' – 8" | 625 | 625 | 440 | 375 | 220 | 330 | 620 | 780 |
| | | | | | | 4' – 0" | 420 | 420 | 295 | 250 | 150 | 220 | 415 | 520 |
| | | | | | | 6' – 0" | 280 | 280 | 195 | 170 | 100 | 145 | 275 | 350 |

See footnotes on p. 179.

Titen HD® Heavy-Duty Screw Anchor

Table 4: Titen HD — Tension Loads Attaching Cold-Formed Steel to Top of Normal-Weight Concrete over Metal Deck (lb.)^{6,11}

| Anchor Size (in.) | Drill Bit (in.) | Min. Edge Distance (in.) | Min. End Distance (in.) | Emb. Depth (in.) | Min. Concrete Thickness (in.) | Spacing (in.) | Concrete ≥ 3,000 psi ^{3,4} | | | | Cold-Formed Steel (ASD) ⁵ | | | |
|-------------------|-----------------|--------------------------|-------------------------|------------------|-------------------------------|---------------|-------------------------------------|-------------------------------|---------------------------------|------------------------------|--------------------------------------|-----------------|-----------------|-----------------|
| | | | | | | | LRFD ^{1,9,10} (Seismic) | LRFD ^{1,8,10} (Wind) | ASD ^{2,9,10} (Seismic) | ASD ^{2,8,10} (Wind) | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | 68 mil (14 ga.) |
| ¼ x 1½ | ¼ | 3½ | 3¾ | 1½ | 2½ | 3½ | 580 | 775 | 405 | 545 | 390 | 505 | 920 | 1,160 |
| ⅝ x 3 | ⅝ | 3 | 7¼ | 2½ | 3¼ | 3 | 660 | 880 | 460 | 615 | 585 | 760 | 1,380 | 1,740 |

See footnotes below.

Table 5: Titen HD — Shear Loads Perpendicular to Edge in Top of Normal-Weight Concrete over Metal Deck (lb.)^{6,11}

| Anchor Size (in.) | Drill Bit (in.) | Min. Edge Distance (in.) | Min. End Distance (in.) | Emb. Depth (in.) | Min. Concrete Thickness (in.) | Spacing (in.) | Concrete ≥ 3,000 psi ^{3,4} | | | | Cold-Formed Steel (ASD) ⁵ | | | |
|-------------------|-----------------|--------------------------|-------------------------|------------------|-------------------------------|---------------|-------------------------------------|-------------------------------|---------------------------------|------------------------------|--------------------------------------|-----------------|-----------------|-----------------|
| | | | | | | | LRFD ^{1,9,10} (Seismic) | LRFD ^{1,8,10} (Wind) | ASD ^{2,9,10} (Seismic) | ASD ^{2,8,10} (Wind) | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | 68 mil (14 ga.) |
| ¼ x 1½ | ¼ | 3½ | 3¾ | 1½ | 2½ | 3½ | 450 | 450 | 315 | 315 | 350 | 455 | 830 | 1,045 |
| ⅝ x 3 | ⅝ | 3 | 7¼ | 2½ | 3¼ | 3 | 660 | 660 | 460 | 460 | 510 | 685 | 1,240 | 1,565 |

See footnotes below.

Table 6: Titen HD — Shear Loads Parallel to Edge in Top of Normal-Weight Concrete over Metal Deck (lb./ft.)^{6,11}

| Anchor Size (in.) | Drill Bit (in.) | Min. Edge Distance (in.) | Min. End Distance (in.) | Emb. Depth (in.) | Min. Concrete Thickness (in.) | Spacing | Concrete ≥ 3,000 psi ^{3,4} | | | | Cold-Formed Steel (ASD) ⁵ | | | |
|-------------------|-----------------|--------------------------|-------------------------|------------------|-------------------------------|---------|-------------------------------------|-------------------------------|---------------------------------|------------------------------|--------------------------------------|-----------------|-----------------|-----------------|
| | | | | | | | LRFD ^{1,9,10} (Seismic) | LRFD ^{1,8,10} (Wind) | ASD ^{2,9,10} (Seismic) | ASD ^{2,8,10} (Wind) | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | 68 mil (14 ga.) |
| ¼ x 1½ | ¼ | 3½ | 3¾ | 1½ | 2½ | 1'–0" | 635 | 635 | 445 | 445 | 350 | 455 | 830 | 1,045 |
| | | | | | | 1'–4" | 475 | 475 | 335 | 335 | 265 | 340 | 625 | 785 |
| ⅝ x 3 | ⅝ | 3 | 7¼ | 2½ | 3¼ | 0'–9" | 1,590 | 1,590 | 1,115 | 1,115 | 680 | 915 | 1,655 | 2,085 |
| | | | | | | 1'–0" | 1,195 | 1,195 | 835 | 835 | 510 | 685 | 1,240 | 1,565 |
| | | | | | | 1'–4" | 895 | 895 | 625 | 625 | 385 | 515 | 930 | 1,175 |

See footnotes below.

Footnotes

1. Anchorage designs conform to ACI 318-14 Chapter 17 and assume cracked concrete with no supplementary reinforcement.
2. Allowable Stress Design (ASD) values are obtained by multiplying Load Resistance Factor Design (LRFD) capacities by 0.7 for seismic and 0.6 for wind.
3. Anchor is considered as an individual anchor without influence from other anchors. For tables 2 and 3, shear load is applied perpendicular and parallel to the edge of concrete respectively.
4. Concrete shall have a minimum f'_c of 2,500 psi, 3,000 psi for metal deck. Reference ICC-ES ESR-2713 for further information.
5. Cold-Formed Steel (CFS) tension pullover values are based on AISI S-100, Eq. J4.4.2-1, $d_w = 0.50"$ (¼" THD), $d_w = 0.75"$ (⅝" and ½" THD) and $\Omega = 3.0$. Reference General Notes for CFS properties. To convert from ASD to LRFD multiply value by 1.5. Tension values where applicable do not account for weak axis bending in the sill member.
6. Governing load is the lesser of concrete and CFS.
7. For conditions not covered by this table, use the Simpson Strong-Tie® Anchor Designer™ software available at strongtie.com.
8. Wind design includes SDC A&B.
9. The listed load values are governed by a brittle failure mode, the Designer shall consider ductility requirements of ACI 318-14 Section 17.2.3.4.3 for designing anchorage in Seismic Design Category C–F.
10. For installation in sand-lightweight concrete, concrete values shall be multiplied by 0.68.
11. For tables 4, 5 and 6, metal deck configuration to comply with Figure 5 of ICC-ES ESR-2713.

Powder-Actuated Fasteners

PDPA — 0.300"-Diameter Head with
0.157"-Diameter Shank Powder Drive Pins

| Model No. | Pin | | Quantity | | Compatible Powder-Actuated Tools | |
|------------|--------------|------------------|----------|--------|---------------------------------------|--------------------|
| | Length (in.) | Shank Dia. (in.) | Pack | Carton | Simpson Strong-Tie | Others |
| PDPA-50 | ½ | 0.157 | 100 | 1,000 | PTP-27L PT-27 PT-22A PT-22HA | Other major brands |
| PDPA-50K | ½ knurled | | | | | |
| PDPA-62K | ⅝ knurled | | | | | |
| PDPA-75 | ¾ | | | | | |
| PDPA-100 | 1 | | | | | |
| PDPA-106 | 1 ¼ | | | | | |
| PDPA-125 | 1 ½ | | | | | |
| PDPA-131 | 1 ⅝ | | | | | |
| PDPA-150 | 1 ¾ | | | | | |
| PDPA-187 | 2 | | | | | |
| PDPA-200 | 2 ¼ | | | | | |
| PDPA-250 | 2 ½ | | | | | |
| PDPA-250MG | 2 ½ | | | | | |
| PDPA-287 | 2 ¾ | | | | | |
| PDPA-287MG | 2 ¾ | | | | | |



PDPA

Note: The PDPA-250MG and PDPD-287MG models have mechanically galvanized (Class 65) finish.

PDPAT — 0.300"-Diameter Head with
0.157"-Diameter Shank Powder Drive Pins with Top Hat

| Model No. | Pin | | Quantity | | Compatible Powder-Actuated Tools | |
|------------|--------------|------------------|----------|--------|---------------------------------------|--------------------|
| | Length (in.) | Shank Dia. (in.) | Pack | Carton | Simpson Strong-Tie | Others |
| PDPAT-50K | ½ knurled | 0.157 | 100 | 1,000 | PTP-27L PT-27 PT-22A PT-22HA | Other major brands |
| PDPAT-62KP | ⅝ knurled | | | | | |
| PDPAT-75 | ¾ | | | | | |
| PDPAT-100 | 1 | | | | | |



PDPAT-62KP

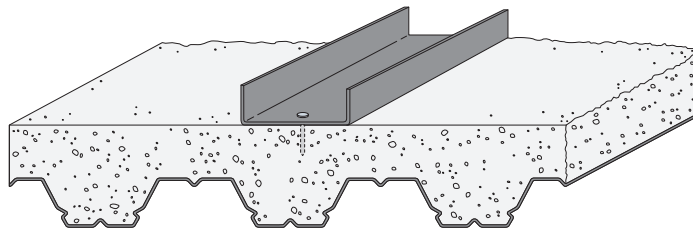
Note: PDPAT-62KP is a point protrusion pin. The point of the pin is designed to slightly protrude from the tool to aid in hole location.

Powder-Actuated Fasteners

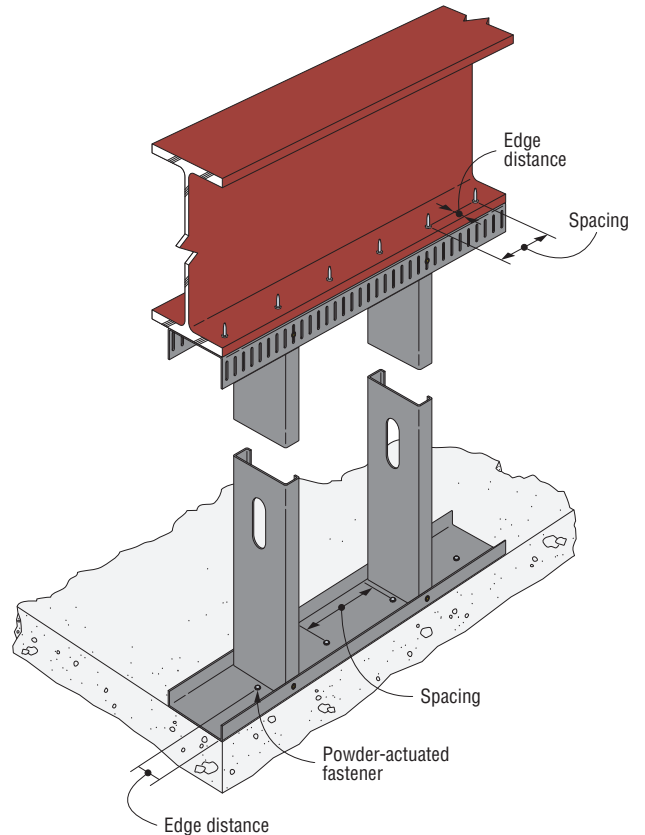
PDPA and PDPAT Pins — Allowable Shear and Tension Loads

| Model Type | Dia. (in.) | Pin Spacing | Base Material | | | | | | | | | Attached Material | | | | | | |
|--|------------|---|-------------------------------------|-----------|-----------|--|-----------------------------|-----------------------------------|------------------------|------|-------------------|--------------------------------|-------------------|-------------------|-------------------|---------------------|-------------------|--|
| | | | Normal Weight Concrete ¹ | | | Sand-Lightweight Concrete Filled Steel Deck ^{6,7} | | | A36 Steel ² | | | Cold-Formed Steel ³ | | | | | | |
| | | | Emb. Depth (in.) | 2,500 psi | 4,000 psi | Emb. Depth (in.) | Concrete ¹ (Top) | Lower Flute ⁸ (Bottom) | 3/16" | 1/4" | 3/8" | 1/2" | 3/4" | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | | |
| Allowable Shear Load^{4,5,13} (lb./ft.) | | | | | | | | | | | | | | | | | | |
| PDPA PDPAT | 0.157 | 0'-6" | 1 | 570 | 620 | 1 | 450 | 560 | 820 | 730 | 770 ¹⁰ | 770 ¹⁰ | 650 ⁹ | 760 ¹² | 990 ¹² | 1,800 ¹² | | |
| | | | 1 1/4 | 720 | 840 | 1 1/4 | 840 | 640 | | | | | | | | | | |
| | | 0'-8" | 1 | 430 | 465 | 1 | 340 | 420 | 615 | 550 | 580 ¹⁰ | 580 ¹⁰ | 490 ⁹ | 570 ¹² | 745 ¹² | 1,350 ¹² | | |
| | | | 1 1/4 | 540 | 630 | 1 1/4 | 630 | 480 | | | | | | | | | | |
| | | 1'-0" or - | 1 | 285 | 310 | 1 | 225 | 280 | 410 | 365 | 385 ¹⁰ | 385 ¹⁰ | 325 ⁹ | 380 ¹² | 495 ¹² | 900 ¹² | | |
| | | | 1 1/4 | 360 | 420 | 1 1/4 | 420 | 320 | | | | | | | | | | |
| | | 2'-0" | 1 | 145 | 155 | 1 | 115 | 140 | 205 | 185 | 195 ¹⁰ | 195 ¹⁰ | 165 ⁹ | 190 ¹² | 250 ¹² | 450 ¹² | | |
| | | | 1 1/4 | 180 | 210 | 1 1/4 | 210 | 160 | | | | | | | | | | |
| | | 3'-0" | 1 | 95 | 105 | 1 | 75 | 95 | 135 | 120 | 130 ¹⁰ | 130 ¹⁰ | 110 ⁹ | 125 ¹² | 165 ¹² | 300 ¹² | | |
| | | | 1 1/4 | 120 | 140 | 1 1/4 | 140 | 105 | | | | | | | | | | |
| | | Allowable Tension Load^{4,5} (lb.) | | | | | | | | | | | | | | | | |
| | | 0.157 | — | 1 | 210 | 310 | 1 | 150 | 145 | 260 | 370 | 380 ¹⁰ | 530 ¹⁰ | 195 ⁹ | 225 ¹¹ | 295 ¹¹ | 535 ¹¹ | |
| 1 1/4 | 320 | | | 380 | 1 1/4 | 320 | 170 | | | | | | | | | | | |

- For concrete the minimum edge distance and spacing is 3 1/2" and 5", respectively.
- For A36 steel, the minimum edge distance and spacing is 0.5" and 1", respectively. Entire pointed portion of the fastener must fully penetrate steel base material unless noted otherwise.
- Cold-formed steel (CFS) values are based on AISI-S100. Reference General Notes for CFS properties.
- Governing load is the lesser of the base material and CFS.
- Allowable loads are based on ICC-ES ESR-2138.
- Concrete shall have a minimum compressive strength of $f'_c = 3,000$ psi.
- For steel deck, the minimum depth and thickness is 3" and 33 mil (20 ga.), respectively. Steel deck must have a minimum yield strength of 38,000 psi.
- For installation through steel deck, the minimum edge and end distance is 1 1/2" and 4", respectively with 4" minimum spacing.
- Based upon a minimum penetration depth of 0.46" (11.7 mm).
- For applications to structural steel, the fastener must be driven to where at least some of the point of the fastener penetrates through the steel substrate.
- The following CFS allowable tension loads may be used for PDPAT: 390 lb. (33 mil), 505 lb. (43 mil), 915 lb. (54 mil).
- CFS allowable shear load may be multiplied by 1.15 for PDPAT fastener.
- Shear loads listed do not account for indirect tension due to eccentricity of load at the deflection track. Designer to evaluate combined loading as needed.
- A "-" in the pin spacing means no spacing or load directly at fastener.



PDPA In Lightweight Concrete Over Steel Deck



Typical Powder-Actuated Fastener Installation

Powder-Actuated Fasteners

PDPA in 4,000 psi Normal-Weight Concrete

| Fastener | Shank Diameter (in.) | Fastener Length (in.) | Edge Distance (in.) | Spacing in Load Dir. (in.) | Track Width (in.) | Number of Fasteners | Allowable Shear Load (lb.) | |
|----------|----------------------|-----------------------|---------------------|----------------------------|-------------------|---------------------|----------------------------|-----|
| PDPA-100 | 0.157 | 1 | 2¼ | — | 3½ | 1 | 240 | |
| | | | | ¾ | | 2 | 310 | |
| | | | | — | 6 | 1 | 240 | |
| | | | | 2¼ | | 2 | 510 | |
| PDPA-125 | | 1.25 | 2¼ | 2¼ | — | 3½ | 1 | 325 |
| | | | | | ¾ | | 2 | 490 |
| | | | | | — | 6 | 1 | 325 |
| | | | | | 2¼ | | 2 | 590 |

1. Allowable loads are based on fasteners installed through 16 ga. cold-formed steel ($F_y > 33$ ksi).
2. Minimum concrete thickness must be three times the fastener length.
3. Edge distance and spacing are shown in figures below.

PDPA in 3,000 psi Sand-Lightweight Concrete

| Fastener | Shank Diameter (in.) | Fastener Length (in.) | Edge Distance (in.) | Spacing in Load Dir. (in.) | Track Width (in.) | Number of Fasteners | Allowable Shear Load (lb.) | |
|----------|----------------------|-----------------------|---------------------|----------------------------|-------------------|---------------------|----------------------------|-----|
| PDPA-100 | 0.157 | 1 | 2¼ | — | 3½ | 1 | 235 | |
| | | | | ¾ | | 2 | 310 | |
| | | | | — | 6 | 1 | 235 | |
| | | | | 2¼ | | 2 | 445 | |
| PDPA-125 | | 1.25 | 2¼ | 2¼ | — | 3½ | 1 | 245 |
| | | | | | ¾ | | 2 | 455 |
| | | | | | — | 6 | 1 | 245 |
| | | | | | 2¼ | | 2 | 530 |
| PDPA-150 | 1.5 | 2¼ | 2¼ | — | 3½ | 1 | 245 | |
| | | | | ¾ | | 2 | 470 | |
| | | | | — | 6 | 1 | 245 | |
| | | | | 2¼ | | 2 | 530 | |

1. Allowable loads are based on fasteners installed through 16 ga. cold-formed steel ($F_y > 33$ ksi).
2. Minimum concrete thickness must be three times the fastener length.
3. Edge distance and spacing are shown in figures below.

Anchors

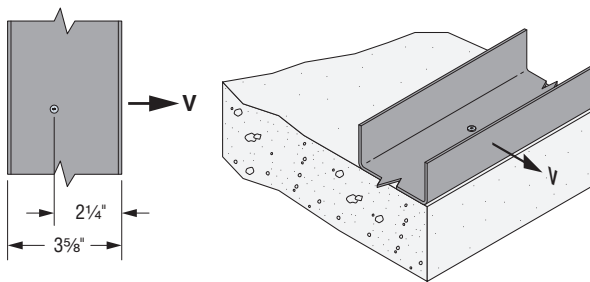


Figure 1: 3½" Track – One Fastener

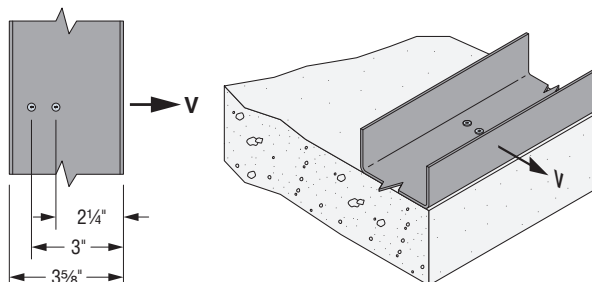


Figure 2: 3½" Track – Two Fasteners

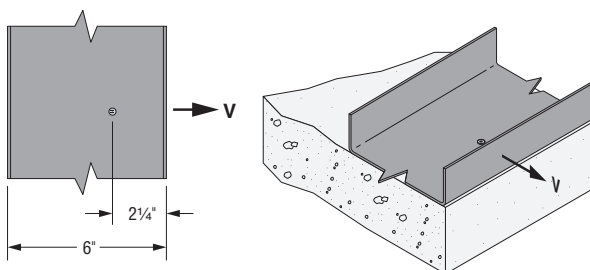


Figure 3: 6" Track – One Fastener

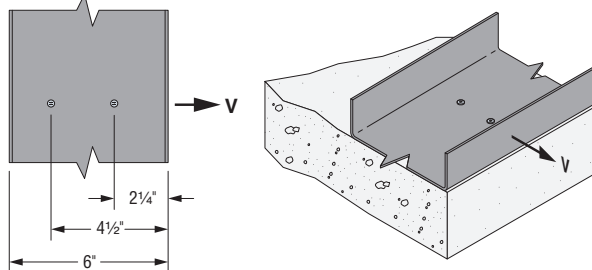


Figure 4: 6" Track – Two Fasteners

SB Anchor Bolt



This product is preferable to similar connectors because of (a) easier installation, (b) higher loads, (c) lower installed cost, or a combination of these features.

The SB anchor bolt offers an anchorage solution for our holdowns that call for a 5/8" diameter, a 7/8" diameter and a 1"-diameter anchor.

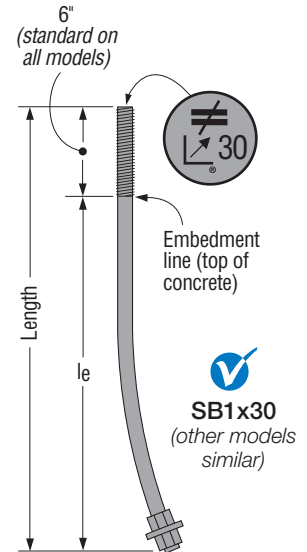
SB anchor bolts are code listed by ICC-ES under the 2012/2015/2018/2021 IBC and IRC.

Features:

- Identification on the bolt head showing embedment angle and model
- Sweep geometry to optimize position in form
- Rolled thread for higher tensile capacity
- Hex nuts and plate washer fixed in position
- Available in HDG for additional corrosion resistance

Material: ASTM F1554, Grade 36

Finish: None. May be ordered HDG; contact Simpson Strong-Tie.



SSTB® Anchor Bolt



This product is preferable to similar connectors because of (a) easier installation, (b) higher loads, (c) lower installed cost, or a combination of these features.

The SSTB anchor bolt is designed for maximum performance as an anchor bolt for holdowns and Simpson Strong-Tie® Strong-Wall® shearwalls. Extensive testing has been done to determine the design load capacity of the SSTB when installed in many common applications.

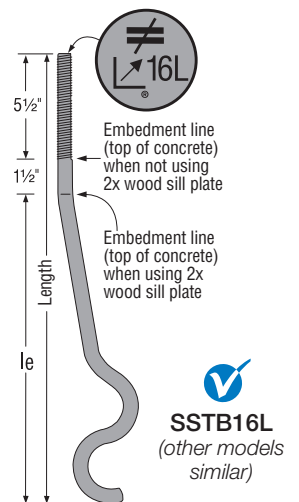
The Simpson Strong-Tie SSTB anchor bolts are code listed by ICC-ES under the 2012, 2015, 2018 and 2021 IBC® and IRC®.

Features:

- Identification on the bolt head showing embedment angle and model
- Offset angle reduces side bursting, and provides more concrete cover
- Rolled thread for higher tensile capacity
- Stamped embedment line aids installation
- Available in HDG for additional corrosion resistance

Material: ASTM F-1554, Grade 36

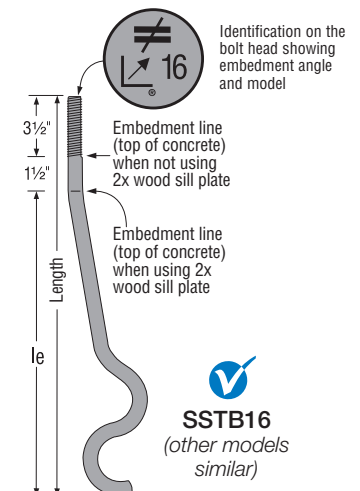
Finish: None. May be ordered HDG; contact Simpson Strong-Tie.



These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

| Model No. | Dimensions (in.) | | | |
|-----------|------------------|----------|-----------------------|------------------|
| | Stemwall Width | Diameter | Length | Min. Embed. (le) |
| SB5/8X24 | 6 | 5/8 | 24 | 18 |
| SB7/8X24 | 8 | 7/8 | 24 | 18 |
| SB1X30 | 8 | 1 | 30 | 24 |
| SSTB16 | 6 | 5/8 | 17 5/8 (16L = 19 5/8) | 12 5/8 |
| SSTB20 | 6 | 5/8 | 21 5/8 (20L = 24 5/8) | 16 5/8 |
| SSTB24 | 6 | 5/8 | 25 5/8 (24L = 28 5/8) | 20 5/8 |
| SSTB28 | 8 | 7/8 | 29 7/8 (28L = 32 7/8) | 24 7/8 |
| SSTB34 | 8 | 7/8 | 34 7/8 | 28 7/8 |
| SSTB36 | 8 | 7/8 | 36 7/8 | 28 7/8 |

1. For SB and SSTB allowable tension loads, details and installation procedure, please reference strongtie.com.

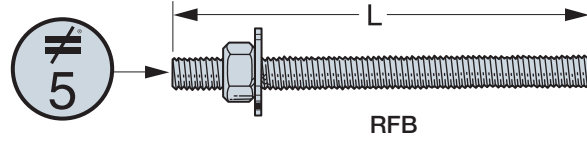


RFB Retrofit Bolts

RFBs are clean, oil-free, pre-cut threaded rod, supplied with nut and washer. Offers a complete engineered anchoring system when used with Simpson Strong-Tie adhesive. Inspection is easy; the head is stamped with rod length and No-Equal® symbol for identification after installation.

Material: ASTM F1554 Grade 36

Finish: Zinc Plated (unless otherwise noted), available in HDG (per ASTM A153); stainless steel (RFB#5x8SS only)



These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

| Model No. | Length, L (in.) | Bolt Diameter (in.) |
|---------------|-----------------|---------------------|
| RFB#4X4 | 4 | 1/2 |
| RFB#4X5 | 5 | 1/2 |
| RFB#4X6 | 6 | 1/2 |
| RFB#4X7 | 7 | 1/2 |
| RFB#4X10 | 10 | 1/2 |
| RFB#4x8HDGP2 | 8 | 1/2 |
| RFB#5X5 | 5 | 5/8 |
| RFB#5X8 | 8 | 5/8 |
| RFB#5X10 | 10 | 5/8 |
| RFB#5x12HDGP2 | 12 | 5/8 |
| RFB#5X16 | 16 | 5/8 |
| RFB#6X10.5 | 10 1/2 | 3/4 |

1. RFB#4X8HDG-R and RFB#5X12HDG-R are only available with a hot-dip galvanized coating. They are retail packaged and are sold 10 per carton.

2. Washer provided on all RFB (except RFB#5x8SS).

PAB Pre-Assembled Anchor Bolt

The PAB anchor bolt is a versatile cast-in-place anchor bolt ideal for high-tension-load applications, such as rod systems and shearwalls. It features a plate washer, at the embedded end, sandwiched between two fixed hex nuts and a head stamp for easy identification after the pour.

- Available in diameters from 1/2" to 1 1/4" in lengths from 12" to 36" (in 6" increments)
- Available in standard and high-strength steel
- Head stamp contains the No Equal sign, diameter designation and an "H" on high-strength rods

Material:

Standard Steel — ASTM F1554 Grade 36, A36 or A307; $F_u = 58$ ksi

High-Strength Steel (up to 1" dia.) — ASTM A449; $F_u = 120$ ksi

High-Strength Steel (1 1/8" and 1 1/4" dia.) — ASTM A193 B7 or F1554 Grade 105; $F_u = 125$ ksi

Finish: None. May be ordered in HDG; contact Simpson Strong-Tie.

Installation:

- On HDG PABs, chase the threads to use standard nuts or couplers or use overtapped products in accordance with ASTM A563; for example, Simpson Strong-Tie® NUT 5/8-OST, NUT 7/8-OST, CNW 5/8-OST, CNW 7/8-OST. OST couplers are typically oversized on one end of the coupler nut only and will be marked with an "O" on oversized side. Couplers may be special ordered with both ends oversized. Contact Simpson Strong-Tie.

Related Software

The Simpson Strong-Tie Anchor Designer™ Software analyzes and suggests anchor solutions using the ACI 318 strength-design methodology (or CAN/CSA A23.3 Annex D Limit States Design methodology). It provides cracked and uncracked-concrete anchorage solutions for numerous Simpson Strong-Tie mechanical and adhesive anchors as well as the PAB anchor bolt. With its easy-to-use graphical user interface, the software makes it easy for the designer to identify anchorage solutions without having to perform time-consuming calculations by hand. See strongtie.com/software.

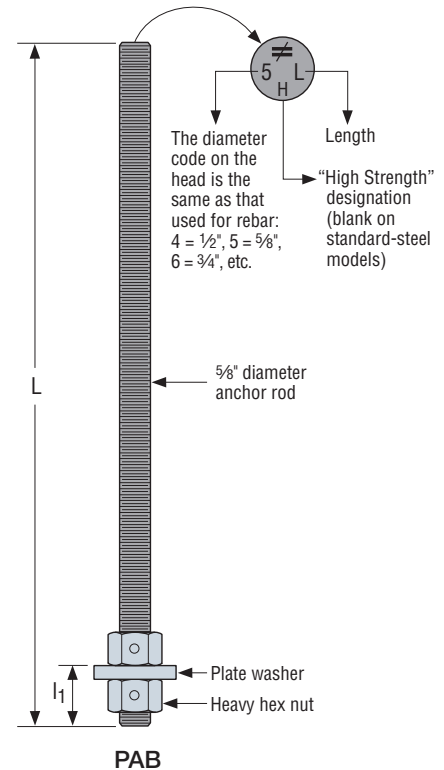
How to Specify and Order:

- When calling out PAB anchor bolts, substitute the desired length after the "-" in the Root Model Number
- For a 5/8" x 18" anchor bolt, the model number would be PAB5-18 (or PAB5H-18 for high strength)

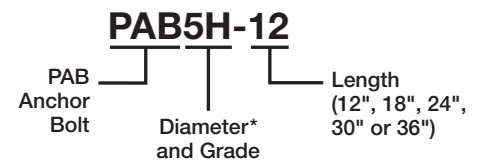
PAB Anchor Bolt

| Diameter (in.) | Plate Washer Size (in.) | l ₁ (in.) | Root Model No. | | Lengths (in.) |
|----------------|-------------------------|----------------------|-------------------|---------------|----------------------------------|
| | | | Standard Strength | High Strength | |
| 1/2 | 3/8 x 1 1/2 x 1 1/2 | 1 1/8 | PAB4-XX | PAB4H-XX | 12" to 36" (in 6" increments) |
| 5/8 | 1/2 x 1 3/4 x 1 3/4 | 1 3/8 | PAB5-XX | PAB5H-XX | |
| 3/4 | 1/2 x 2 1/4 x 2 1/4 | 1 1/2 | PAB6-XX | PAB6H-XX | |
| 7/8 | 1/2 x 2 1/2 x 2 1/2 | 1 5/8 | PAB7-XX | PAB7H-XX | |
| 1 | 5/8 x 3 x 2 3/4 | 1 7/8 | PAB8-XX | PAB8H-XX | |
| 1 1/8 | 5/8 x 3 1/2 x 3 1/4 | 2 | PAB9-XX | PAB9H-XX | |
| 1 1/4 | 3/4 x 3 1/2 x 3 1/2 | 2 1/4 | PAB10-XX | PAB10H-XX | |

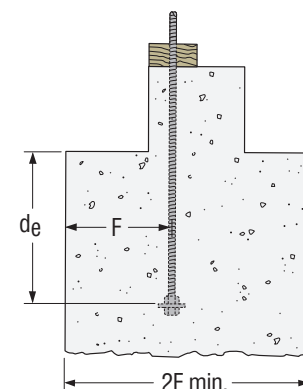
1. Lengths greater than 36" are available as a special order.
2. Plate washers are designed to develop the capacity of the bolt.



Naming Legend



*Units in 1/8" Increments
(Ex: 9 = 9/8" or 1 1/8")



Design loads are calculated using a full shear cone. Coverage on each side of the bolt shall be a minimum of F or reductions must be taken.

PAB Pre-Assembled Anchor Bolt

PAB Anchor Bolt – Anchorage Solutions

| Design Criteria | Diameter (in.) | Anchor Bolt | 2,500 psi Concrete | | | | 3,000 psi Concrete | | | |
|-----------------|----------------|-------------|--------------------|--------|--------------|--------|--------------------|--------|--------------|--------|
| | | | Dimensions (in.) | | Tension Load | | Dimensions (in.) | | Tension Load | |
| | | | de | F | ASD | LRFD | de | F | ASD | LRFD |
| Wind | ½ | PAB4 | 4½ | 7 | 4,270 | 6,405 | 4 | 6 | 4,270 | 6,405 |
| | ⅝ | PAB5 | 4 | 6 | 4,030 | 6,720 | 4 | 6 | 4,415 | 7,360 |
| | | | 6 | 9 | 6,675 | 10,010 | 5½ | 8½ | 6,675 | 10,010 |
| | ¾ | PAB6 | 5½ | 8½ | 6,500 | 10,835 | 5 | 7½ | 6,175 | 10,290 |
| | | | 7½ | 11½ | 9,610 | 14,415 | 7 | 10½ | 9,610 | 14,415 |
| | ⅞ | PAB7 | 6 | 9 | 7,405 | 12,345 | 5½ | 8½ | 7,120 | 11,870 |
| | | | 9 | 13½ | 13,080 | 19,620 | 8½ | 13 | 13,080 | 19,620 |
| | | PAB7H | 9 | 13½ | 13,610 | 22,680 | 8½ | 13 | 13,680 | 22,805 |
| | | | 14 | 21 | 27,060 | 40,590 | 13½ | 20½ | 27,060 | 40,590 |
| | 1 | PAB8 | 8 | 12 | 11,405 | 19,005 | 7½ | 11½ | 11,340 | 18,900 |
| | | | 10½ | 16 | 17,080 | 25,565 | 10 | 15 | 17,080 | 25,560 |
| | | PAB8H | 10½ | 16 | 17,150 | 28,580 | 10 | 15 | 17,460 | 29,100 |
| | 16½ | | 25 | 35,345 | 53,015 | 15½ | 23½ | 35,345 | 53,015 | |
| | 1½ | PAB9 | 9 | 13½ | 13,610 | 22,680 | 8 | 12 | 12,495 | 20,820 |
| 12½ | | | 19 | 21,620 | 32,430 | 12 | 18 | 21,620 | 32,430 | |
| 1¼ | PAB10 | 14 | 21 | 26,690 | 40,035 | 13½ | 20½ | 26,690 | 40,035 | |
| Seismic | ½ | PAB4 | 5 | 7½ | 4,270 | 6,405 | 4½ | 7 | 4,270 | 6,405 |
| | ⅝ | PAB5 | 6½ | 10 | 6,675 | 10,010 | 6 | 9 | 6,675 | 10,010 |
| | ¾ | PAB6 | 7½ | 11½ | 9,060 | 12,940 | 7 | 10½ | 8,945 | 12,780 |
| | | | 8 | 12 | 9,610 | 14,415 | 7½ | 11½ | 9,610 | 14,415 |
| | ⅞ | PAB7 | 9 | 13½ | 11,905 | 17,010 | 8½ | 13 | 11,970 | 17,100 |
| | | | 10 | 15 | 13,080 | 19,620 | 9½ | 14½ | 13,080 | 19,620 |
| | | PAB7H | 14½ | 22 | 25,350 | 36,215 | 13½ | 20½ | 24,650 | 35,215 |
| | 15½ | | 23½ | 27,060 | 40,590 | 14½ | 22 | 27,060 | 40,590 | |
| | 1 | PAB8 | 11 | 16½ | 15,996 | 22,850 | 10½ | 16 | 16,435 | 23,480 |
| | | | 11½ | 17½ | 17,080 | 25,625 | 11 | 16½ | 17,080 | 25,625 |
| | | PAB8H | 17 | 25½ | 33,045 | 47,205 | 16 | 24 | 32,720 | 46,740 |
| | | | 18 | 27 | 35,345 | 53,015 | 17 | 25½ | 35,345 | 53,015 |
| | 1½ | PAB9 | 12½ | 19 | 19,795 | 28,275 | 12 | 18 | 20,255 | 28,940 |
| | | | 13½ | 20½ | 21,620 | 32,430 | 12½ | 19 | 21,620 | 32,430 |
| 1¼ | PAB10 | 14½ | 22 | 25,350 | 36,215 | 14 | 21 | 26,190 | 37,415 | |
| | | 15 | 22½ | 26,690 | 40,035 | 14½ | 22 | 26,690 | 40,035 | |

- Anchorage designs conform to ACI 318-14 and assume cracked concrete with no supplementary reinforcement.
- Seismic indicates Seismic Design Category C-F and designs comply with ACI318-19, Section 17.10.5.3. Per Section 1613 of the 2012/2015/2018/2021 IBC, detached one- and two-family dwellings in SDC C may use wind values.
- Wind includes Seismic Design Category A and B.
- Foundation dimensions are for anchorage only. Foundation design (size and reinforcement) by designer. The registered design professional may specify alternative embedment, footing size, and anchor bolt.
- Where tension loads are governed by anchor steel, the design provisions from AISC 360 are used to determine the tensile steel limit. LRFD values are calculated by multiplying the nominal AISC steel capacity by a 0.75 phi factor, and allowable values are calculated by dividing the AISC nominal capacity by a 2.0 omega factor.
- Where tension loads are governed by ACI 318 concrete limit, the Allowable Stress Design (ASD) values are obtained by multiplying Load Resistance Factor Design (LRFD) capacities by 0.7 for Seismic and by 0.6 for Wind.

Anchor Software

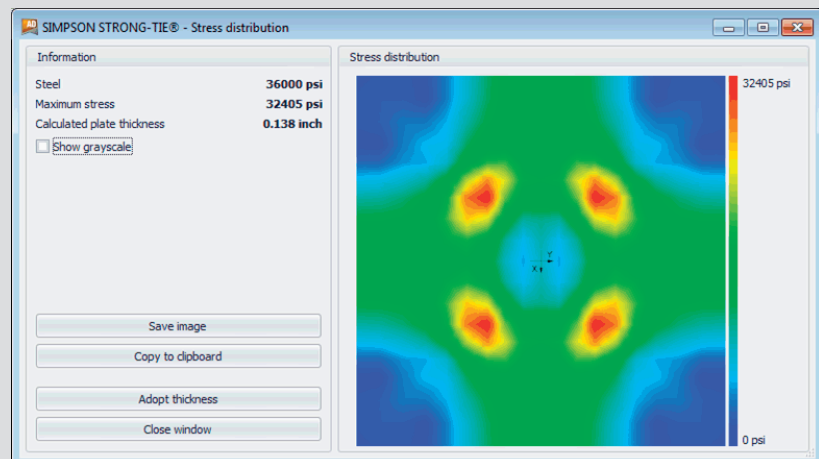
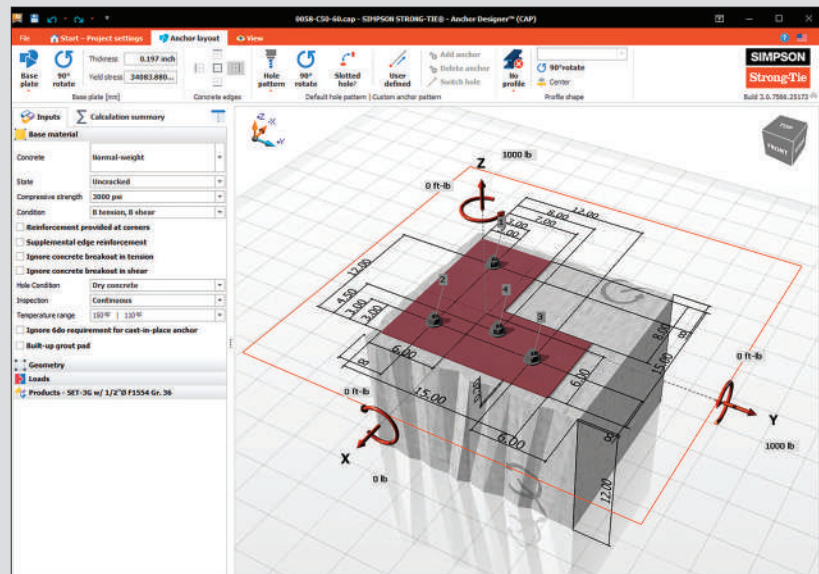
Anchor Designer™ Software for ACI 318, ETAG and CSA

Simpson Strong-Tie® Anchor Designer Software is the latest anchorage design tool for structural engineers to satisfy the strength design provisions and methodologies. Anchor Designer will quickly and accurately analyze an existing design or suggest anchorage solutions based upon user-defined design elements in cracked and uncracked concrete conditions.

The real-time design is visually represented in a fully interactive 3D graphic user interface, supports Imperial and Metric-sized Simpson Strong-Tie mechanical and adhesive anchors, and offers cast-in-place anchor solutions. Anchor Designer can calculate single anchor solutions or with multiple anchors in a single plate. Anchor locations are fully customizable to assist engineers in complex design conditions.

Features include:

- Design standards: ACI 318-14 Chapter 17 / ACI 318-11 Appendix D, CAN / CSA A23.3 Annex D, ETAG 001 Annex C or EOTA TR029.
- Customizable anchor pattern.
- Easy-to-use menus.
- Ability to calculate multiple anchor solutions at once.
- Multi-lingual options include English, German, French, Spanish, Polish and Danish languages.
- Rectangular, circular, L-shape and T-shape base plate geometries with the option to include slotted holes.
- And much more!



Visit: strongtie.com/softwareandwebapplications/category

Fasteners

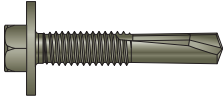
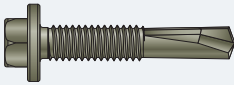

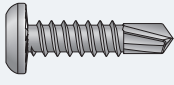



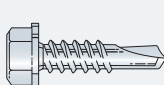



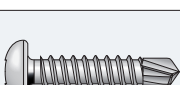


Space 4x4

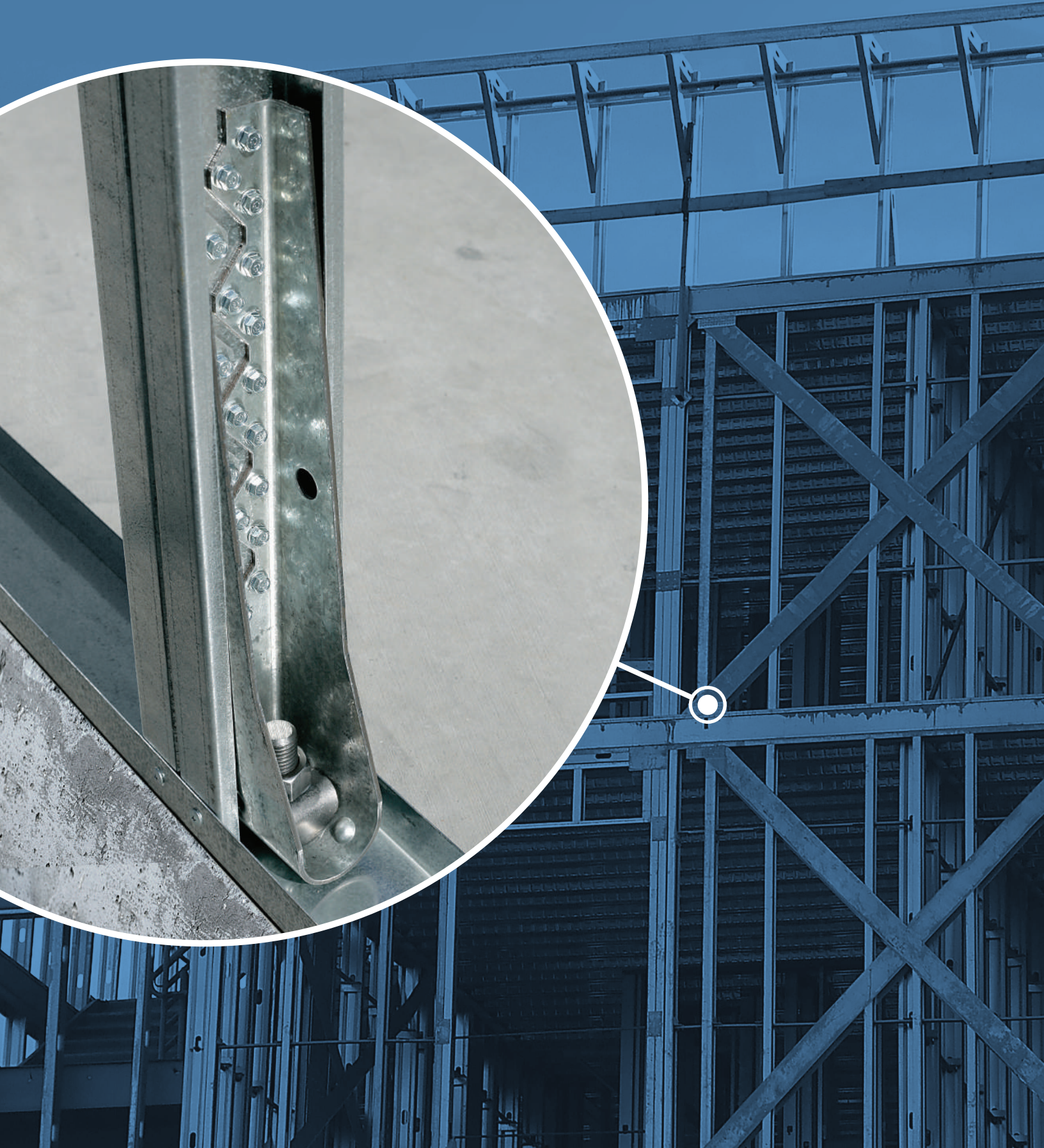
Simpson Strong-Tie® Fasteners for CFS Construction

Below is a list of Simpson Strong-Tie fasteners and tested base materials. This list does not represent the complete line of Simpson Strong-Tie offerings, but the most suitable fasteners for CFS construction.

✓ = Code listed ✓ = Tested — = Not tested

| | Product | Single/ Collated | Fastened Materials | | | | | | | |
|-----------|--|---|---|-------------------------|------------------|-------------------|----------------|-------------|---|---|
| | | | CFS to CFS | CFS to Structural Steel | Sheathing to CFS | Dens Glass to CFS | Drywall to CFS | Wood to CFS | | |
| Fasteners | Strong-Drive® XL LARGE-HEAD METAL Screw |  | #12 hex head L = 1 1/4" | Single/ collated | ✓ | ✓ | — | — | — | — |
| | Strong-Drive XM MEDIUM-HEAD METAL Screw |  | #12 hex head L = 1 1/4" | Single/ collated | ✓ | ✓ | — | — | — | — |
| | Strong-Drive XE EXTERIOR STRUCTURAL METAL Screw |  | #10 hex head L = 3/4" | Single/ collated | ✓ | — | — | — | — | — |
| | Strong-Drive FPHSD FRAMING-TO-CFS Screw |  | #10, #12 flat pan head L = 3/4" | Single/ collated | ✓ | — | — | — | — | — |
| | Strong-Drive PPHD SHEATHING-TO-CFS Screw |  | #8, #10, #12 flat head L = 1 3/4" to 3" | Single/ collated | — | — | ✓ | ✓ | — | — |
| | Strong-Drive SELF-DRILLING X METAL Screw |  | #10, #12 hex head L = 3/4" to 1 1/2" | Single/ collated | ✓ | ✓ | — | — | — | — |
| | Strong-Drive TB WOOD-TO-STEEL Screw |  | #12, #14 flat head L = 1 3/4" to 3" | Single/ collated | — | — | — | — | — | ✓ |
| | Self-Drilling E Metal Screw |  | #14 hex head L = 1" | Single | ✓ | ✓ | — | — | — | — |
| | DWFSD Drywall-to-CFS Screw |  | #6, #8 bugle head L = 1 1/4" to 2" | Collated | — | — | — | ✓ | ✓ | — |
| | CBSDQ Sheathing-to-CFS Screw |  | #8, #10 ribbed flat head L = 1 5/8" to 2 1/4" | Collated | — | — | ✓ | — | — | — |
| | DWF Drywall-to-CFS Screw |  | #6 bugle head L = 1 1/4" to 1 5/8" | Collated | — | — | — | — | ✓ | — |
| | PHSD Framing-to-CFS Screw |  | #8 pan head L = 3/4" | Collated | ✓ | — | — | — | — | — |

Holdowns and Tension Ties



S/HDU Holdowns

The S/HDU series of holdowns combines performance with ease of installation. The pre-deflected geometry virtually eliminates material stretch, resulting in low deflection under load. Installation using self-drilling screws into the studs reduces installation time and saves labor cost.

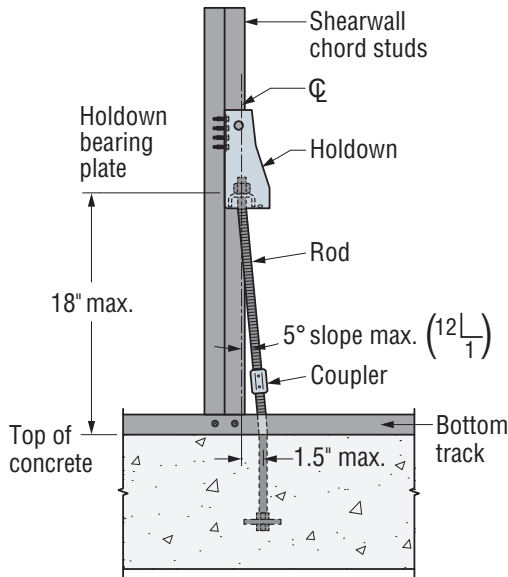
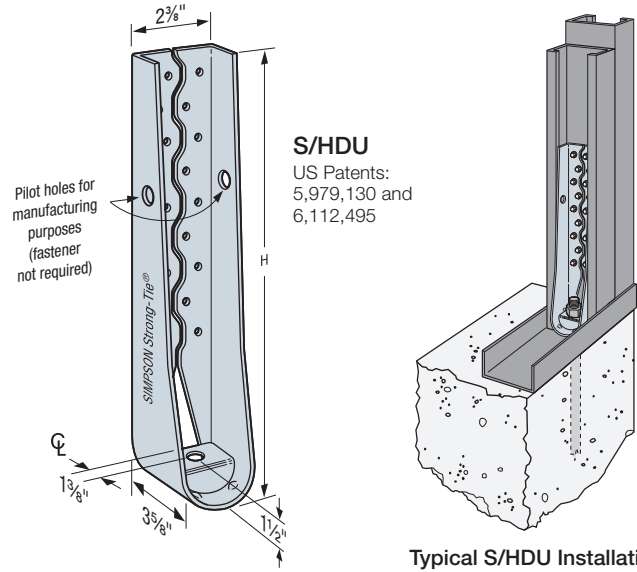
Material: 118 mil (10 ga.)

Finish: Galvanized (G90)

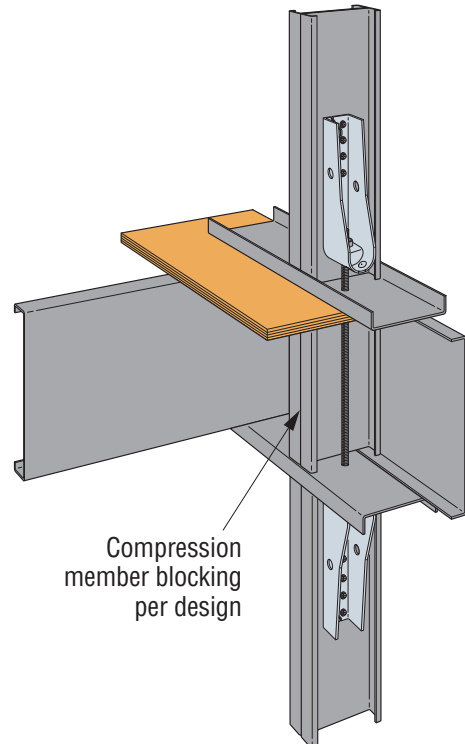
Installation:

- Use all specified fasteners; see General Notes
- Use standard #14 self-drilling screws to fasten to studs
- Anchor bolt washer is not required
- See SB, SSTB and PAB anchor bolts on pp. 183 and 185 for cast-in-place anchorage options
- See SET-3G™ and AT-XP® adhesive products at strongtie.com for anchor bolt retrofit options

Codes: See p. 13 for Code Reference Key Chart



General Holddown and Tension Ties Raised Off CFS Bottom Track



Typical S/HDU Floor-to-Floor Installation

C-CF-2023 © 2023 SIMPSON STRONG-TIE COMPANY INC.

Holdowns and Tension Ties

S/HDU Holdowns

These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

| Model | H (in.) | Fasteners | | Stud Member Thickness ² mil (ga.) | ASD | | LRFD | | Nominal Tension Load ⁵ (lb.) | Code Ref. | | | | |
|------------------------------|---------|---|----------------|--|--------------------|---|--------------------|--|---|-------------|--------|-------|--------|-------------|
| | | Anchor Bolt Diameter ¹ (in.) | Stud Fasteners | | Tension Load (lb.) | Deflection at ASD Load ⁴ (in.) | Tension Load (lb.) | Deflection at LRFD Load ⁴ (in.) | | | | | | |
| S/HDU4 | 7 7/8 | 5/8 | (6) #14 | 33 (20) | 1,195 | 0.069 | 1,795 | 0.116 | 3,575 | — | | | | |
| | | | | 43 (18) | 1,780 | 0.068 | 2,670 | 0.106 | 5,095 | | | | | |
| | | | | 54 (16) | 2,550 | 0.031 | 4,080 | 0.053 | 6,900 | | | | | |
| | | | | S/HDU6 | 10 3/8 | 5/8 | (12) #14 | 2-33 (2-20) | 2,320 | 0.093 | 3,705 | 0.149 | 5,685 | IBC, FL, LA |
| | | | | | | | | 2-43 (2-18) | 3,825 | 0.115 | 6,105 | 0.190 | 9,365 | |
| | | | | | | | | 2-54 (2-16) | 3,970 | 0.093 | 6,345 | 0.156 | 9,730 | |
| 3/16" A36 Steel | 4,470 | 0.063 | 7,165 | | | | | 0.103 | 12,120 | | | | | |
| S/HDU9 | 12 7/8 | 7/8 | (18) #14 | 33 (20) | 2,390 | 0.064 | 3,590 | 0.119 | 6,590 | — | | | | |
| | | | | 43 (18) | 3,295 | 0.054 | 5,270 | 0.108 | 8,915 | | | | | |
| | | | | 54 (16) | 5,100 | 0.073 | 8,160 | 0.167 | 13,805 | | | | | |
| | | | | 68 (14) | 5,570 | 0.052 | 8,915 | 0.095 | 15,075 | | | | | |
| | | | | S/HDU11 | 16 3/8 | 7/8 | (27) #14 | 2-33 (2-20) | 4,895 | 0.125 | 8,495 | 0.250 | 10,470 | IBC, FL, LA |
| | | | | | | | | 2-43 (2-18) | 6,125 | 0.119 | 9,690 | 0.250 | 15,460 | |
| | | | | | | | | 2-54 (2-16) | 6,125 | 0.108 | 9,785 | 0.234 | 15,005 | |
| | | | | | | | | 3/16" A36 Steel | 7,000 | 0.069 | 10,000 | 0.185 | 14,695 | |
| S/HDU11 | 16 3/8 | 7/8 | (27) #14 | 33 (20) | 2,855 | 0.029 | 4,570 | 0.045 | 7,730 | — | | | | |
| | | | | 43 (18) | 3,725 | 0.037 | 5,960 | 0.061 | 10,080 | | | | | |
| | | | | 54 (16) | 6,750 | 0.071 | 10,805 | 0.131 | 18,270 | | | | | |
| | | | | 68 (14) | 8,355 | 0.087 | 13,370 | 0.159 | 22,610 | | | | | |
| | | | | S/HDU11 | 16 3/8 | 7/8 | (27) #14 | 97 (12) | 8,355 | 0.087 | 13,370 | 0.159 | 22,610 | IBC, FL, LA |
| | | | | | | | | 2-33 (2-20) | 6,965 | 0.103 | 11,125 | 0.189 | 13,165 | |
| | | | | | | | | 2-43 (2-18) | 9,255 | 0.125 | 15,485 | 0.250 | 21,810 | |
| | | | | | | | | 2-54 (2-16) | 9,990 | 0.106 | 15,960 | 0.225 | 24,480 | |
| | | | | | | | | 3/16" A36 Steel | 14,625 | 0.136 | 20,890 | 0.185 | 31,455 | |
| | | | | | | | | 43 (18) | 4,225 | 0.039 | 6,765 | 0.062 | 11,440 | |
| S/HDU11 | 16 3/8 | 7/8 | (27) #14 | 54 (16) | 7,665 | 0.070 | 12,265 | 0.109 | 20,740 | IBC, FL, LA | | | | |
| | | | | 68 (14) | 9,655 | 0.087 | 15,450 | 0.143 | 26,130 | | | | | |
| | | | | 97 (12) ³ | 14,925 | 0.129 | 23,880 | 0.235 | 40,385 | | | | | |
| | | | | 2-33 (2-20) | 6,965 | 0.103 | 11,125 | 0.189 | 13,165 | | | | | |
| | | | | 2-43 (2-18) | 9,595 | 0.096 | 15,330 | 0.162 | 23,515 | | | | | |
| | | | | 2-54 (2-16) | 9,675 | 0.110 | 15,460 | 0.158 | 23,710 | | | | | |
| | | | | 2-43 (2-18) ³ | 11,100 | 0.125 | 17,500 | 0.250 | 24,955 | | | | | |
| | | | | 2-54 (2-16) ³ | 12,175 | 0.125 | 19,445 | 0.243 | 29,825 | | | | | |
| 3/16" A36 Steel ³ | 16,010 | 0.127 | 22,875 | 0.185 | 31,715 | | | | | | | | | |

- The designer shall specify the foundation anchor material type, embedment, and configuration. Some of the tabulated holdown tension loads exceed the tensile strength of typical ASTM A36 or A307 anchor bolts.
- It is acceptable to use the capacity listed for the thickest single member or back-to-back members for thicker stud members in the same configuration. Stud design by specifier.
- A heavy hex nut for the anchor bolt is required to achieve the table loads for S/HDU11.
- Deflection at ASD or LRFD is the deflection of the fastener slip, holdown deformation, and anchor rod elongation for holdowns installed up to 4" above the top of concrete when loaded to the ASD and LRFD load, respectively. Holdowns may be installed raised to 18" above the top of concrete, with no load reduction provided that additional elongation of the anchor rod is accounted for. This movement is strictly due to the holdown deformation under a static load test attached to members listed in the table above.
- The Nominal Tension Load is based on the tested average ultimate (peak) load and is provided for design under section E1 of AISI S400 that categorized the holdowns as capacity-protected components. Based on AISI S400, the nominal load shall be greater than or equal to the required strength. Per AISI S400, holdowns are Capacity Protected Components and they are not part of the designated energy-dissipating mechanism. Nominal strength to resist amplified seismic load is not required.
- See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

S/LTT, S/DTT and HTT Tension Ties

The HTT is a single-piece formed tension tie — no rivets, and a four-ply formed seat. No washers are required.

S/DTT2Z tension tie is suitable for lighter-duty holdown applications on single or back-to-back studs, and installed easily with #14 self-drilling screws.

The HTT, S/DTT and S/LTT tension ties are ideal for retrofit or new construction projects. They provide high-strength, post-pour, concrete-to-steel connections.

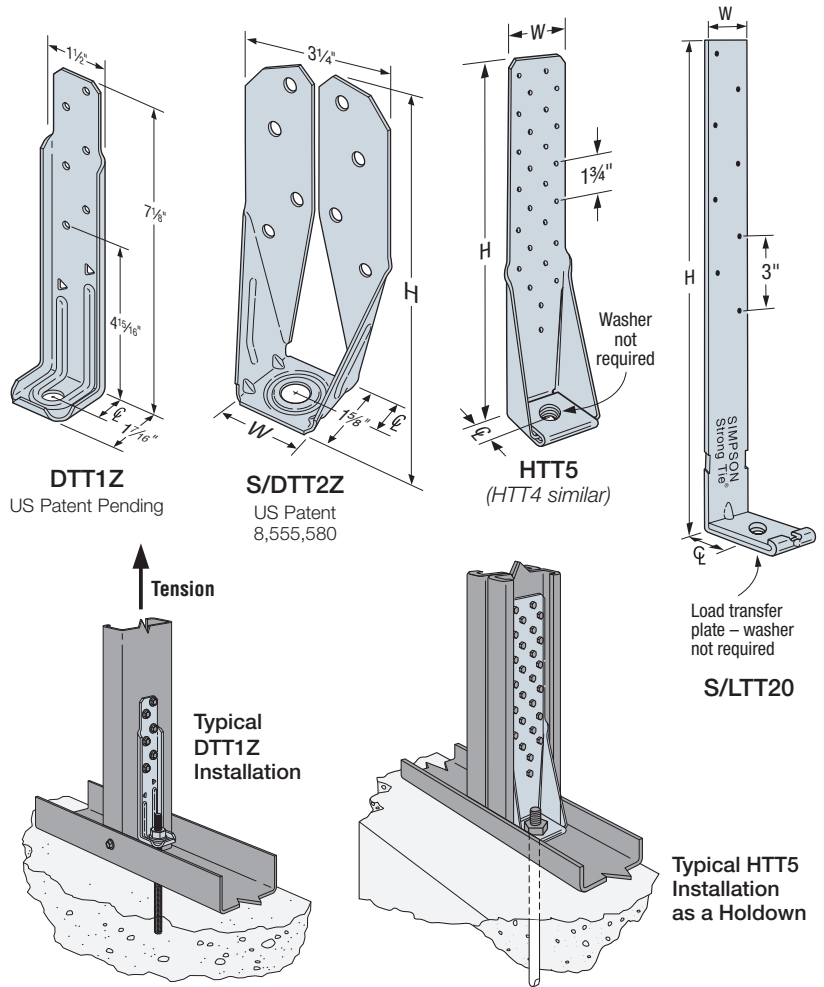
Material: HTT — 111 mil (11 ga.)
DTT1Z, S/DTT2Z — 68 mil (14 ga.)
S/LTT20 — Strap: 97 mil (12 ga.);
Plate: 229 mil (3 ga.)

Finish: HTT, S/LTT — Galvanized (G90);
DTT1Z, S/DTT2Z — ZMAX® coating

Installation:

- Use all specified fasteners.
- Use the specified number of type of screws to attach the strap portion to the steel stud. Bolt the base to the wall or foundation with a suitable anchor; see table for the required bolt diameter.
- S/DTT2Z requires a standard cut washer (included) be installed between the nut and the seat.
- Do not install S/LTT20 raised off of the bottom track.
- See SB and SSTB Anchor Bolts on p. 183 for anchorage options.
- See SET-3G™ and AT-XP® adhesive products at strongtie.com for anchor bolt retrofit options.

Codes: See p. 13 for Code Reference Key Chart



These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

| Model | Dimensions (in.) | | | Fasteners | | Stud Member Thickness mil (ga.) | ASD | | LRFD | | Nominal Tension Load ⁴ (lb.) | Code Ref. |
|---------|------------------|---------|--------|---|-----------------------------|---------------------------------|--------------------|---|--------------------|--|---|-------------|
| | W | H | ϕ | Anchor Bolt Diameter ¹ (in.) | Stud Fasteners ⁵ | | Tension Load (lb.) | Deflection at ASD Load ³ (in.) | Tension Load (lb.) | Deflection at LRFD Load ³ (in.) | | |
| DTT1Z | 1 1/2 | 7 1/8 | 3/4 | 3/8 | (6) #10 | 33 (20) | 905 | 0.156 | 1,270 | 0.250 | 3,485 | — |
| S/LTT20 | 2 | 20 | 1 1/2 | 1/2 | (8) #10 | 33 (20) | 1,200 | 0.125 | 1,890 | 0.250 | 4,625 | IBC, FL, LA |
| S/DTT2Z | 1 5/8 | 6 15/16 | 1 3/16 | 1/2 | (8) #14 | 33 (20) | 1,570 | 0.138 | 2,200 | 0.250 | 4,265 | |
| | | | | | | 43 (18) | 1,685 | 0.151 | 2,355 | 0.250 | 5,570 | |
| | | | | | | 2-33 (2-20) | 1,735 | 0.153 | 2,430 | 0.250 | 5,735 | |
| HTT4 | 2 1/2 | 12 3/8 | 1 3/8 | 5/8 | (18) #10 | 33 (20) | 3,180 | 0.104 | 4,770 | 0.187 | 8,215 | |
| | | | | | | 2-33 (2-20) | 4,395 | 0.125 | 6,675 | 0.250 | 11,835 | |
| HTT5 | 2 1/2 | 16 | 1 3/8 | 5/8 | (26) #10 | 43 (18) | 4,150 | 0.125 | 6,425 | 0.250 | 11,585 | |
| | | | | | | 2-43 (2-18) | 4,670 | 0.125 | 6,970 | 0.250 | 12,195 | |
| | | | | | | 1-54 (1-16) | 4,150 | 0.125 | 6,425 | 0.250 | 12,365 | |

1. The designer shall specify the foundation anchor material type, embedment and configuration.
2. Stud design by specifier. Tabulated loads are based on a minimum stud thickness for fastener connection.
3. Deflection at ASD or LRFD includes fastener slip, holdown deformation and anchor rod elongation for holdowns installed up to 4" above top of concrete. Holdowns may be installed raised, up to 18" above top of concrete, with no load reduction provided that additional elongation of the anchor rod is accounted for. See bottom of p. 191 for installation detail.
4. The Nominal Tension Load is based on the tested average ultimate (peak) load and is provided for design in accordance with section C5 of AISI S213 that requires a tension tie to have a nominal strength to resist the lesser of the amplified seismic load or the maximum force the system can deliver.
5. It is acceptable to use the capacity listed for the thickest single member or back-to-back members for thicker stud members in the same configuration. Stud design by specifier.
6. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

S/HDS and S/HDB Holdowns

The S/HD series of holdowns is designed for installation with either screws or bolts into the studs or column. The S/HDS series installs with #14 screws and has been designed to utilize fewer fasteners to reduce installation time. The S/HDB series is ideal for bolt-on applications where the cold-formed stud manufacturer can pre-punch the bolt holes.

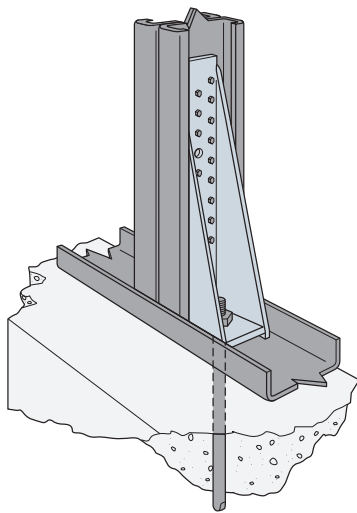
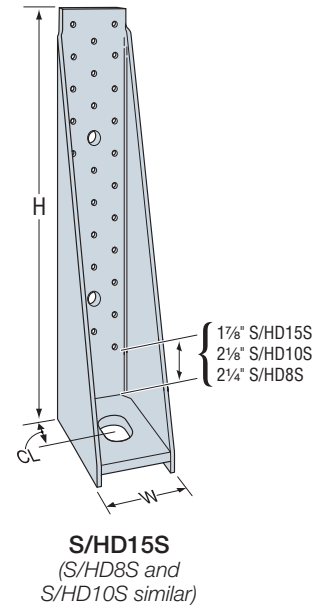
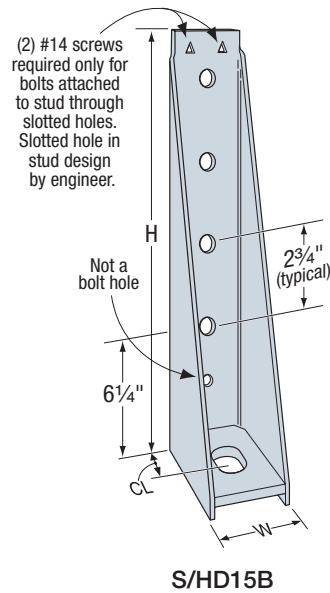
Material: See table

Finish: Simpson Strong-Tie® gray paint. Hot-dip galvanized is available; see Corrosion Information, pp. 19–23.

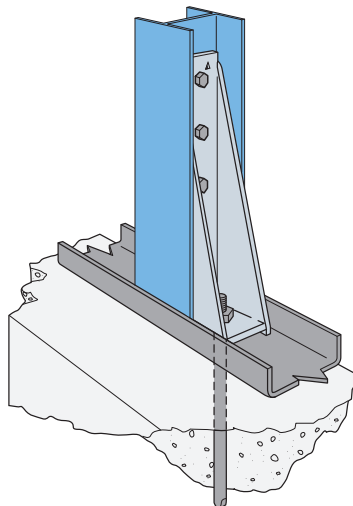
Installation:

- Use all specified fasteners; some models have extra fastener holes. See General Notes.
- Anchor bolt washer is not required.
- Standard washers are required on stud bolt nuts for model S/HDB.
- Thin wall socket (OD = 2" maximum) is required for S/HD15 to tighten the 1" anchor bolt.
- Stud bolts — use A307.
- Boundary members (back-to-back studs) design shall be by designer.
- S/HDS and S/HDB holdowns can be welded per designer's recommendation and specification. To tie back-to-back stud members together, the designer must determine the fasteners required to bind members to act as one unit. Welders and welding procedures shall be qualified as specified in AWS D1.3. Welded connections used for cold-formed steel structural members in which the thickness of the thinnest connected part is 0.18 inch or less shall comply to AISI S100 Specification Section E2.
- See SB, SSTB and PAB Anchor Bolts on pp. 183 and 185 for anchorage options.
- See SET-3G™ and AT-XP® adhesive products at strongtie.com for anchor bolt retrofit options.

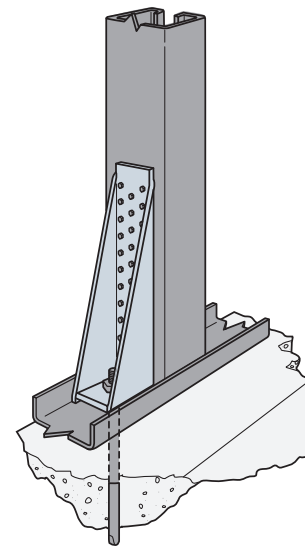
Codes: See p. 13 for Code Reference Key Chart



Typical S/HD10S
Back-to-Back Stud
Installation



Typical S/HD10B
PACO Column Installation
See Code Report



Typical S/HD10S Heavy-Duty
(Large Flange) Stud Application
See Code Report

S/HDS and S/HDB Holdowns

These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

| Model No. | Mil (ga.) | H (in.) | W (in.) | C (in.) | Fasteners | | Stud Member Thickness mil (ga.) | ASD | | LRFD | | Nominal Tension Load (lb.) | Code Ref. |
|-----------|-----------|--------------------------------|--------------------------------|--------------------------------|-------------------------------------|--|---|--------------------|---|--------------------|--|----------------------------|-------------|
| | | | | | Anchor Bolt Dia. ¹ (in.) | Stud Fasteners ⁷ | | Tension Load (lb.) | Deflection at ASD Load ⁴ (in.) | Tension Load (lb.) | Deflection at LRFD Load ⁴ (in.) | | |
| S/HD8S | 118 (10) | 11 | 2 ⁵ / ₁₆ | 1 ¹ / ₂ | 7 ⁸ / ₁₆ | (17) #14 ⁷ | 2-33 (2-20) | 7,335 | 0.12 | 11,715 | 0.204 | 13,720 | IBC, FL, LA |
| | | | | | | | 2-43 (2-18) | 8,750 | 0.086 | 13,975 | 0.146 | 21,435 | |
| | | | | | | | 2-54 (2-16) | 8,855 | 0.106 | 14,145 | 0.162 | 21,700 | |
| | | | | | | | 3 ¹⁶ / ₁₆ " A36 steel | 10,840 | 0.053 | 17,335 | 0.072 | 32,525 | |
| S/HD10S | 118 (10) | 13 ¹ / ₂ | 2 ⁵ / ₁₆ | 1 ¹ / ₂ | 7 ⁸ / ₁₆ | (22) #14 ⁷ | 2-33 (2-20) | 7,400 | 0.122 | 11,815 | 0.192 | 13,835 | |
| | | | | | | | 2-43 (2-18) | 11,120 | 0.112 | 17,755 | 0.124 | 20,795 | |
| | | | | | | | 2-54 (2-16) | 12,220 | 0.096 | 19,520 | 0.145 | 29,940 | |
| | | | | | | | 3 ¹⁶ / ₁₆ " A36 steel | 12,375 | 0.043 | 19,820 | 0.061 | 33,535 | |
| S/HD15S | 171 (7) | 17 | 2 ⁵ / ₁₆ | 1 ⁹ / ₁₆ | 1 | (30) #14 ⁷ | 2-43 (2-18) | 12,110 | 0.096 | 19,340 | 0.164 | 22,645 | |
| | | | | | | | 2-54 (2-16) | 13,500 | 0.11 | 21,565 | 0.13 | 33,075 | |
| | | | | | | | 3 ¹⁶ / ₁₆ " A36 steel | 15,810 | 0.043 | 25,320 | 0.065 | 42,845 | |
| S/HD8B | 171 (7) | 11 | 2 ⁵ / ₁₆ | 1 ¹ / ₂ | 7 ⁸ / ₁₆ | (2) 3 ⁴ / ₄ " dia. | 2-33 (2-20) | 3,895 | 0.081 | 5,620 | 0.144 | 8,645 | |
| | | | | | | | 2-43 (2-18) | 5,345 | 0.098 | 7,710 | 0.146 | 11,865 | |
| | | | | | | | 2-54 (2-16) | 8,950 | 0.082 | 14,280 | 0.141 | 20,310 | |
| | | | | | | | 3 ¹⁶ / ₁₆ " A36 steel | 9,080 | 0.069 | 14,545 | 0.104 | 22,975 | |
| S/HD10B | 118 (10) | 13 ¹ / ₂ | 2 ⁵ / ₁₆ | 1 ¹ / ₂ | 7 ⁸ / ₁₆ | (3) 3 ⁴ / ₄ " dia. | 2-33 (2-20) | 5,840 | 0.070 | 8,430 | 0.124 | 12,970 | |
| | | | | | | | 2-43 (2-18) | 8,015 | 0.087 | 11,565 | 0.12 | 17,795 | |
| | | | | | | | 2-54 (2-16) | 12,090 | 0.125 | 19,720 | 0.23 | 28,050 | |
| | | | | | | | 3 ¹⁶ / ₁₆ " A36 steel | 15,635 | 0.102 | 24,955 | 0.123 | 35,495 | |
| S/HD15B | 171 (7) | 17 | 2 ⁵ / ₁₆ | 1 ⁹ / ₁₆ | 1 | (4) 3 ⁴ / ₄ " dia. | 2-43 (2-18) | 10,690 | 0.118 | 15,425 | 0.179 | 22,165 | |
| | | | | | | | 2-54 (2-16) | 16,020 | 0.090 | 25,565 | 0.121 | 36,360 | |
| | | | | | | | 3 ¹⁶ / ₁₆ " A36 steel | 18,690 | 0.104 | 29,825 | 0.139 | 42,425 | |

- The designer shall specify the foundation anchor material type, embedment and configuration.
Some of the tabulated holdown tension loads exceed the tension strength of typical ASTM A36 or A307 anchor bolts.
- Stud design by specifier. Tabulated loads are based on a minimum stud thickness for fastener connection.
- 1/4" self-drilling screws may be substituted for #14 self-tapping screws.
- Deflection at ASD or LRFD includes fastener slip, holdown deformation and anchor rod elongation for holdowns installed up to 4" above top of concrete. Holdowns may be installed raised, up to 18" above top of concrete, with no load reduction provided that additional elongation of the anchor rod is accounted for. See bottom of p. 191 for installation detail.
- The Nominal Tension Load is based on the tested average ultimate (peak) load and is provided for design in accordance with section C5 of AISI S213 that requires a holddown to have a nominal strength to resist the lesser of the amplified seismic load or the maximum force the system can deliver.
- Not all fastener holes for S/HDS holdowns need to be filled, as additional fastener holes provided.
Install fasteners symmetrically.
- It is acceptable to use the capacity listed for 2-54 (2-16) member for thicker stud members in the same configuration.
- See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

PA/HPA Purlin Anchors

PA/HPA purlin anchors offer solutions for CFS to concrete and concrete block connections which satisfy code requirements. The HPA offers the highest capacity in concrete. The PAs dual embedment line allows installation in concrete or concrete block.

Material: PA — 12 gauge; HPA — 10 gauge

Finish: Galvanized. PAs available in HDG or ZMAX® coating.

Installation:

- Use all specified fasteners; some models have extra fastener holes. See General Notes.
- Purlin anchor must hook around rebar.
- Allowable loads are for a horizontal installation into the side of a concrete or masonry wall.
- Strap may be bent one full cycle. (Bent vertical 90° then bent horizontal.)

Edge Distance — Minimum concrete edge distance is 5". Minimum concrete block left-to-right edge distance is 20".

Concrete Block Wall — The minimum wall specifications are:

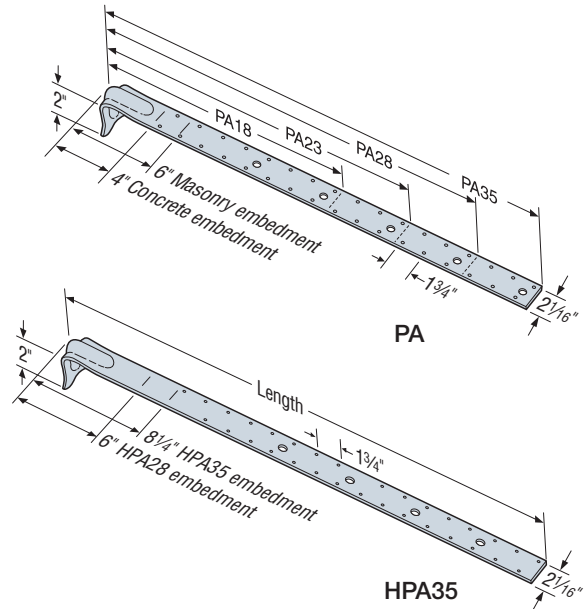
- A One #4 vertical rebar, 32" long, 16" each side of anchor.
- B Two courses of grout filled block above and below the anchor (no cold joints allowed).
- C A horizontal bond beam with two #4 rebars, 40" long, a maximum of two courses above or below the anchor.
- D Minimum masonry compressive strength, $f'_m = 1,500$ psi.

Options: See S/LTT and HTT Tension Ties for alternate retrofit solutions

Codes: See p. 13 for Code Reference Key Chart

ASCE 12.11.2.2.5 states:

... Diaphragm to structural wall anchorage using embedded straps shall have the straps attached to, or hooked around the reinforcing steel or otherwise terminated to effectively transfer forces to the reinforcing steel.

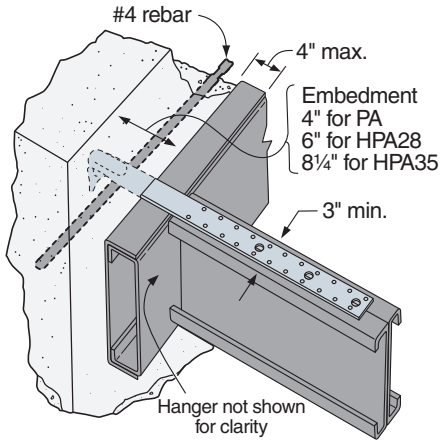


These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

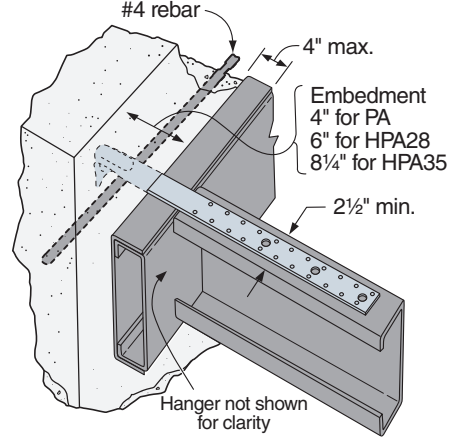
| Wind and SDC A&B — Allowable Load (lb.) | | | | | | | | | | |
|---|----------------------|---------------|------------------------------|-----------------|-----------------|--------------|---------|------------------------------|-----------------------------------|-----------|
| Model No. | Strap Length L (in.) | l_e^a (in.) | Fasteners ^b | | | Tension Load | | Max. Allowable Strap Tension | Masonry Installation Tension Load | Code Ref. |
| | | | Rafter/Stud /Joist Thickness | | | UnCracked | Cracked | | | |
| | | | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | | | | | |
| PA18 | 18½ | 4 | (16) #10 | (16) #10 | (8) #10 | 2,430 | 2,260 | NA | 1,895 | IBC |
| PA23 | 23¾ | 4 | (22) #10 | (16) #10 | (8) #10 | 3,220 | 2,260 | NA | 2,815 | |
| PA28 | 29 | 4 | (22) #10 | (16) #10 | (8) #10 | 3,230 | 2,260 | NA | 2,815 | |
| PA35 | 35 | 4 | (22) #10 | (16) #10 | (8) #10 | 3,230 | 2,260 | NA | 2,815 | |
| HPA28 | 32½ | 6 | (28) #10 | (20) #10 | (10) #10 | 5,145 | 4,675 | NA | — | |
| HPA35 | 38½ | 8¼ | (32) #10 | (22) #10 | (12) #10 | 5,145 | 5,145 | NA | — | |
| SDC C-F — Allowable Load (lb.) | | | | | | | | | | |
| PA18 | 18½ | 4 | (16) #10 | (16) #10 | (8) #10 | 2,340 | 1,980 | 3,220 | 1,895 | |
| PA23 | 23¾ | 4 | (22) #10 | (16) #10 | (8) #10 | 2,830 | 1,980 | 3,220 | 2,815 | |
| PA28 | 29 | 4 | (22) #10 | (16) #10 | (8) #10 | 2,830 | 1,980 | 3,935 | 2,815 | |
| PA35 | 35 | 4 | (22) #10 | (16) #10 | (8) #10 | 2,830 | 1,980 | 3,935 | 2,815 | |
| HPA28 | 32½ | 6 | (28) #10 | (20) #10 | (10) #10 | 5,145 | 4,090 | 5,145 | — | |
| HPA35 | 38½ | 8¼ | (32) #10 | (22) #10 | (12) #10 | 5,145 | 5,145 | 5,145 | — | |

1. Loads may not be increased for short-term loading.
2. For concrete installs, the minimum compressive strength, $f'_c = 3,000$ psi.
3. Multiply Seismic and Wind ASD load values by 1.4 or 1.67, respectively, to obtain LRFD capacities.
4. In accordance with 2012, 2015 and 2018 IBC Section 1613.1, detached one- and two-family dwellings in Seismic Design Category (SDC) C may use "Wind and SDC A&B" allowable loads.
5. Minimum center-to-center spacing is 3 times the required embedment ($S_{min} = 3 \times l_e$) for PA/HPAs acting in tension simultaneously, where l_e = embedment depth. Standard installation is based on minimum 5" end distance.
6. Install fasteners symmetrically and with a minimum of 4 of the required fasteners between the embedment line and the first tooling hole. In some cases, not all of the fastener holes will need to be filled.
7. For wall anchorage systems in SDC C-F, the maximum strap allowable load shall not be less than 1.4 times the ASD anchor design load.
8. For PA straps, concrete embedment shown; embedment in masonry shall be 6".
9. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

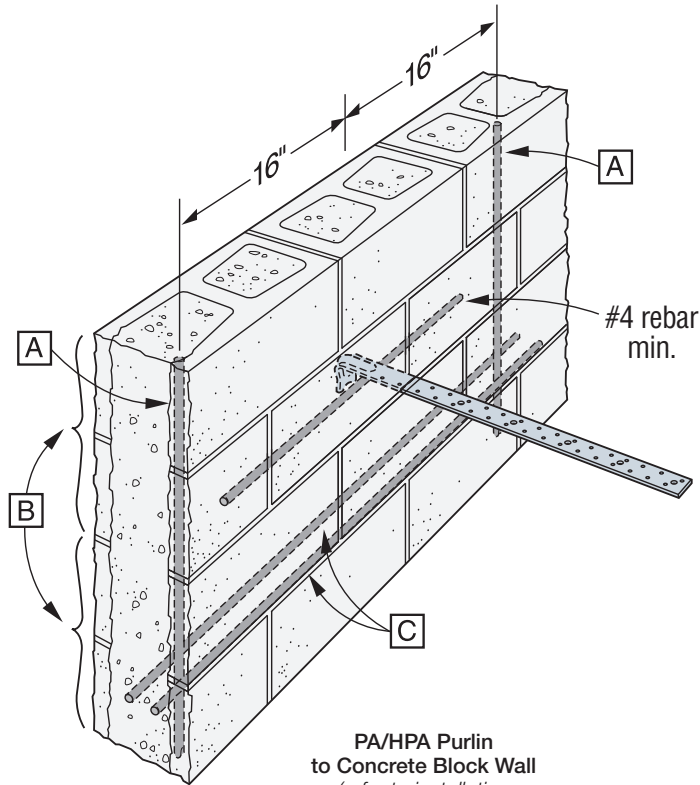
PA/HPA Purlin Anchors



PA/HPA Purlin to Concrete Wall
Back-to-Back Joist Installation



PA/HPA Purlin to Concrete Wall
Single C-Shape Joist Installation



PA/HPA Purlin
to Concrete Block Wall
(refer to installation
notes above)

STHD/LSTHD Strap Tie Holdowns



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

The STHD is an embedded strap-tie holddown offering high-load capacity. The STHD incorporates many features that aid correct installation and improve performance. When installed on the forms with the StrapMate® strap holder, the unique design of the STHD delivers enhanced stability before and during the pour to help prevent both parallel and perpendicular movement (relative to the form). This results in accurate positioning of the strap and reduced possibility of spalling.

Features

- The fastener pattern allows for fastening to the edges of back-to-back studs
- The slots below the embedment line enable increased front-to-back concrete bond and help to reduce spalling
- Rim joist models accommodate up to a 17" clear span without any loss of strap fastening

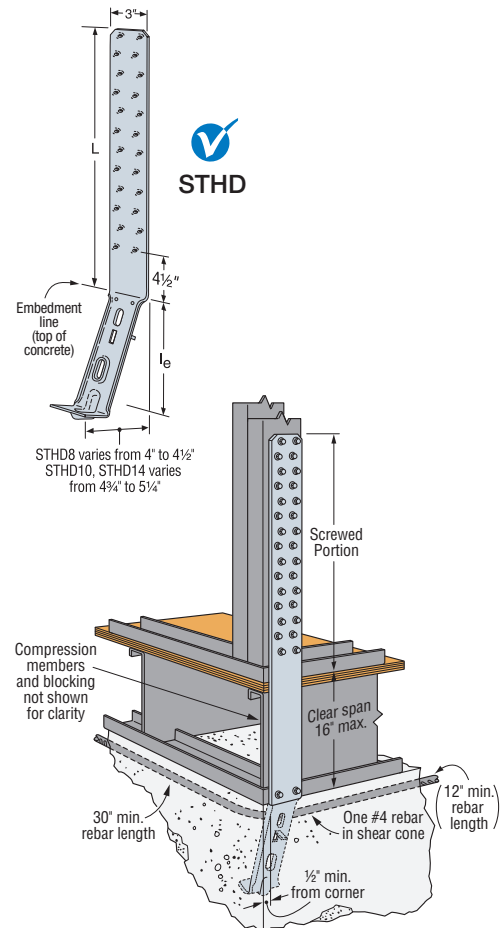
Material: LSTHD8, LSTHD8RJ — 14 gauge, all others — 12 gauge

Finish: Galvanized

Installation: • Use all specified fasteners; see General Notes.

- Use table below for both standard concrete and post-tension slab installations.
- Install before concrete pour with a StrapMate or other holding device.
- Fasten strap from the bottom up. Install strap plumb.
- Strap may be bent one full cycle (bent horizontal 90° then bent vertical) to aid wall placement, but may cause spalling behind the strap. If the spall is 1" or less, measured from the embedment line to the bottom of the spall, full loads apply. 1" to 4" spalls for LSTHD8 achieve 0.9 times table loads. STHD10 and STHD14 achieve full load for spalls less than 4". Any portion of the strap left exposed should be protected against corrosion.
- Other than where noted in the two-pour detail, do not install where: (a) a horizontal cold joint exists within the embedment depth between the slab and foundation wall or footing beneath, unless provisions are made to transfer the load, or the slab is designed to resist the load imposed by the anchor; or (b) slabs are poured over concrete block foundation walls.
- Additional studs attached to the shearwall studs or post may be required by the designer for wall sheathing fastening.
- For installation in severe corrosion environments, refer to strongtie.com/cipcorrosion for additional considerations.

Codes: See p. 13 for Code Reference Key Chart



Typical STHD14RJ Rim Joist Application

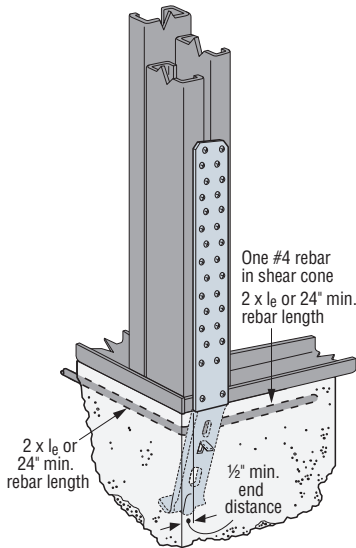
Holdowns and Tension Ties

Allowable Stress Design (ASD) Loads for STHD Strap Style Holdowns on CFS — 2,500 psi Concrete

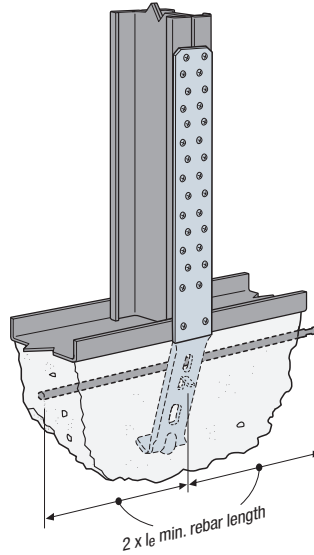
| Wind and SDC A & B — Allowable Tension Loads (lb.) — 33 mil (20 ga.) Studs | | | | | | | | | | | | | | Code Ref. |
|--|-----------|-----------|------------------|-----------------|----------|--------------|---------|--------|---------|--------------|---------|--------|---------|-------------|
| Min. Stem Wall (in.) | Model No. | | Strap Length (L) | | le (in.) | Uncracked | | | | Cracked | | | | |
| | Standard | Rim Joist | Standard (in.) | Rim Joist (in.) | | Req'd Screws | Midwall | Corner | Endwall | Req'd Screws | Midwall | Corner | Endwall | |
| 6 | LSTHD8 | LSTHD8RJ | 18% | 32 1/2 | 8 | (20) #10 | 2,985 | 2,590 | 1,620 | (16) #10 | 2,565 | 2,225 | 1,395 | IBC, LA, FL |
| | STHD10 | STHD10RJ | 24% | 38 1/2 | 10 | (24) #10 | 3,535 | 3,535 | 1,960 | (22) #10 | 2,910 | 2,910 | 1,635 | |
| | STHD14 | STHD14RJ | 26% | 39% | 14 | (30) #10 | 4,935 | 4,935 | 3,065 | (30) #10 | 4,935 | 4,935 | 3,065 | |
| 8 | LSTHD8 | LSTHD8RJ | 18% | 32 1/2 | 8 | (20) #10 | 2,985 | 2,590 | 2,135 | (16) #10 | 2,565 | 2,225 | 1,835 | |
| | STHD10 | STHD10RJ | 24% | 38 1/2 | 10 | (28) #10 | 4,755 | 4,075 | 3,015 | (22) #10 | 4,020 | 3,350 | 2,480 | |
| | STHD14 | STHD14RJ | 26% | 39% | 14 | (30) #10 | 5,285 | 5,285 | 4,410 | (30) #10 | 5,285 | 5,285 | 4,410 | |
| SDC C-F — Allowable Tension Loads (lb.) — 33 mil (20 ga.) Studs | | | | | | | | | | | | | | |
| Min. Stem Wall (in.) | Model No. | | Strap Length (L) | | le (in.) | Uncracked | | | | Cracked | | | | |
| | Standard | Rim Joist | Standard (in.) | Rim Joist (in.) | | Req'd Screws | Midwall | Corner | Endwall | Req'd Screws | Midwall | Corner | Endwall | |
| 6 | LSTHD8 | LSTHD8RJ | 18% | 32 1/2 | 8 | (16) #10 | 2,270 | 2,090 | 1,220 | (14) #10 | 2,250 | 1,950 | 1,220 | |
| | STHD10 | STHD10RJ | 24% | 38 1/2 | 10 | (18) #10 | 2,750 | 2,750 | 1,615 | (18) #10 | 2,550 | 2,550 | 1,435 | |
| | STHD14 | STHD14RJ | 26% | 39% | 14 | (22) #10 | 3,695 | 3,695 | 2,685 | (22) #10 | 3,695 | 3,695 | 2,685 | |
| 8 | LSTHD8 | LSTHD8RJ | 18% | 32 1/2 | 8 | (16) #10 | 2,615 | 2,125 | 1,635 | (14) #10 | 2,250 | 1,950 | 1,610 | |
| | STHD10 | STHD10RJ | 24% | 38 1/2 | 10 | (20) #10 | 3,400 | 2,940 | 2,295 | (20) #10 | 3,400 | 2,940 | 2,175 | |
| | STHD14 | STHD14RJ | 26% | 39% | 14 | (24) #10 | 3,815 | 3,815 | 3,500 | (24) #10 | 3,815 | 3,815 | 3,500 | |

1. Deflection at highest allowable loads for install over CFS double studs are as follows: LSTHD8 = 0.065", STHD10 = 0.096" and STHD14 = 0.115".
2. Multiply Seismic and Wind ASD load values by 1.4 or 1.67, respectively, to obtain LRFD capacities.
3. Per 2012, 2015, 2018 and 2021 IBC Section 1613, detached one- and two-family dwellings assigned to Seismic Design Category (SDC) A, B or C are exempt from the seismic design provisions of IBC Section 1613. For this case, the allowable wind loads apply.
4. Minimum center-to-center spacing is 3 times the required embedment ($S_{min} = 3 \times l_e$) for STHD's acting in tension simultaneously. Midwall install is based on $1.5 \times l_e$ end distance.
5. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

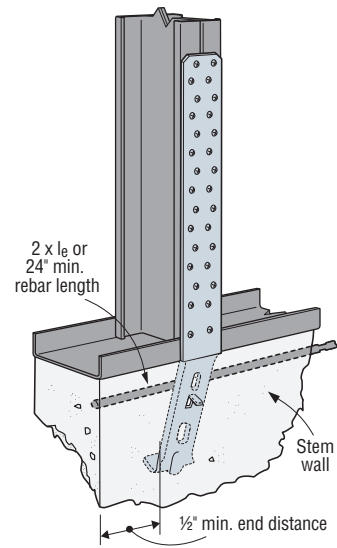
STHD/LSTHD Strap Tie Holdowns



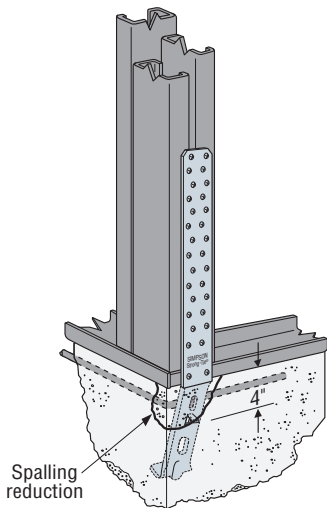
Typical STHD14 Corner Installation on Three Studs
(end of wall similar)



Typical STHD14 Mid-Wall Installation

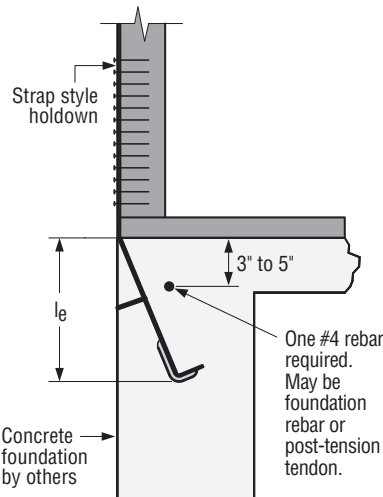


Typical STHD End Installation



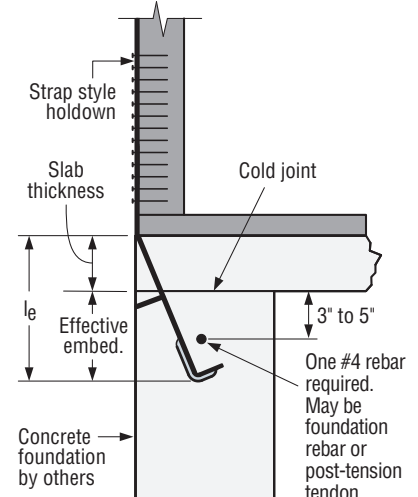
Spalling Load Reduction

If strap is bent horizontal 90° during installation and then bent vertical for fastening to the stud, concrete spalling could result. Load reductions may apply, see installation note.



Single-Pour Rebar Installation

Maintain minimum rebar cover, per ACI-318 concrete code requirements.



Two-Pour Installation for Downturn Footings

Spall Reduction System for STHD Holddown

Features

- Built-in tab
- StrapMate® locator line
- Additional diamond hole in RJ versions

Benefits

Built-in Tab:

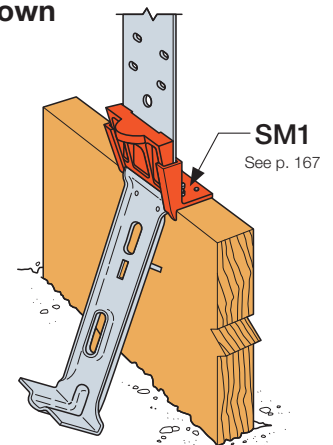
- Reduces spalling and costly retrofits.
- No additional labor to install.
- Holds STHD away from form board.

StrapMate Locator Line:

- Easy inspection to ensure proper location.
- Allows adjustment without removing STHD.

Additional Diamond Hole:

- One more fastener to help prevent the STHD RJ models from bowing out at the rim joist section.



Joist Framing Connectors



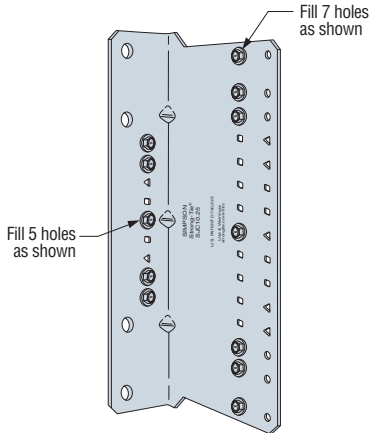
SJC Steel-Joist Connectors

SJC Connectors — CFS to CFS Allowable Loads (lb.)

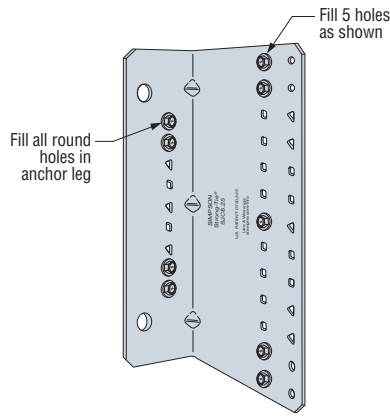
| Model No. | Connector Material Thickness mil (ga.) | L (in.) | Framing Member Depth ⁵ (in.) | Fasteners ⁵ | | | Allowable Load F ₄ (lb.) ³ | | | Code Ref. |
|-----------|--|---------|---|------------------------|----------------|-----------------|--|-----------------|-------------------------------------|-----------|
| | | | | Pattern ² | Carried Member | Carrying Member | Minimum Member Thickness | | Maximum Connector Load ⁴ | |
| | | | | | | | 54 mil (16 ga.) | 68 mil (14 ga.) | | |
| SJC8.25 | 68 (14) | 8¼ | 10 | Min. | (4) #10 | (4) #10 | 980 | 980 | 2,930 | IBC |
| | | | | Max. | (9) #10 | (7) #10 | 1,005 | 1,490 | | |
| | | | | Inner | (5) #10 | (4) #10 | 1,345 | 2,005 | | |
| MSJC8.25 | 97 (12) | 8¼ | 10 | Min. | (4) #10 | (4) #10 | 1,005 | 1,710 | 2,930 | |
| | | | | Max. | (9) #10 | (7) #10 | 1,135 | 1,765 | | |
| | | | | Inner | (5) #10 | (4) #10 | 1,535 | 2,220 | | |
| SJC10.25 | 68 (14) | 10¼ | 12 | Min. | (6) #10 | (4) #10 | 1,170 | 1,625 | 3,935 | |
| | | | | Max. | (11) #10 | (7) #10 | 1,265 | 1,625 | | |
| | | | | Inner | (7) #10 | (5) #10 | 1,620 | 2,170 | | |
| MSJC10.25 | 97 (12) | 10¼ | 12 | Min. | (6) #10 | (4) #10 | 1,200 | 2,045 | 3,935 | |
| | | | | Max. | (11) #10 | (7) #10 | 1,265 | 2,045 | | |
| | | | | Inner | (7) #10 | (5) #10 | 1,730 | 2,635 | | |

- See p. 95 for product information.
- Min. fastener quantity and load values — fill all round holes; Max. fastener quantity and load values — fill all round and triangular holes; Inner fastener quantity and load values — see illustrations for fastener placement.
- Allowable loads are based on bracing of the members located within 12" of the connection.
- Maximum allowable load for connector that may not be exceeded when designing custom installations. Designer is responsible for member and fastener design.
- For 6" and 8" joists, SSC connectors are recommended.
- See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

For smaller framing depth members (3½" to 8"), see SSC Connector on pp. 86–94.

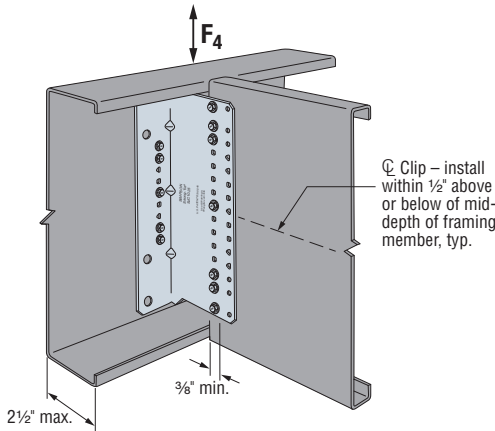


SJC10.25 — Inner Fastener Pattern (MSJC10.25 similar)

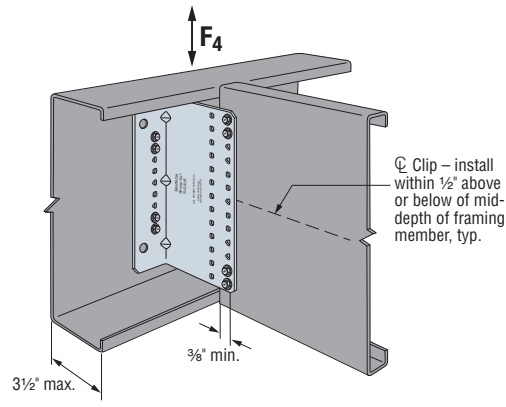


SJC8.25 — Inner Fastener Pattern (MSJC8.25 similar)

For full dimensioned SJC clips, see p. 99.



SJC Installation with Carried Member Fasteners in Inner Row



SJC8.25 Installation with Min. Screw Pattern (screw in round holes)
For max. screw pattern, fill all round and triangle holes.
Min./Max. patterns have screws only in outer row.

S/JCT and S/HJCT Steel-Joist Connectors



This product is preferable to similar connectors because of a) easier installation, b) higher loads, c) lower installed cost, or a combination of these features.

The S/JCT and S/HJCT are unique, skewable steel-joist framing connectors that combine strength, versatility and low installed cost. The connectors can be used with CFS headers, wood headers, steel I-beams (with welds or PAF fasteners) and masonry walls. Installed cost is minimized since these products are shear rather than bearing connectors, eliminating the need for web stiffeners. The connectors also feature horizontal tabs that facilitate top flange alignment and joist support during screw installation.

Material: S/JCT — 68 mil (14 ga.); S/HJCT — 97 mil (12 ga.)

Finish: Galvanized

Features:

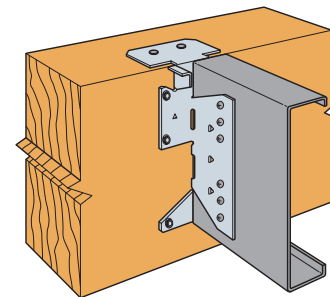
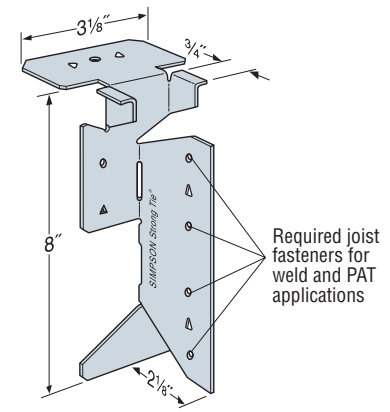
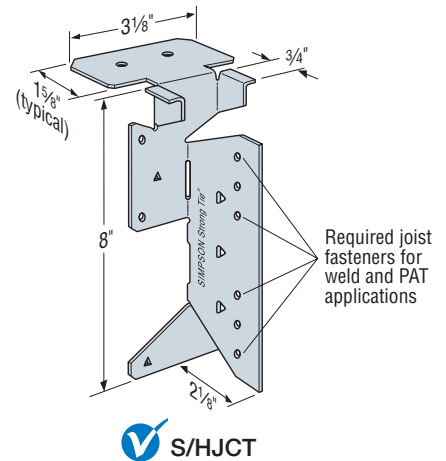
- Uni-directional: Joist can be attached from left or right
- One size fits joists 8" through 14" deep
- Optional holes for additional load capacity
- Simplicity of design
- Quick and easy installation
- Field skewable up to 45° left or right

Installation:

- Attach hanger with specified fasteners. Use round holes for minimum load, use round and triangle holes for maximum load.
- May be used for weld-on applications. The minimum required weld to the top flange is 1/8" x 2 1/2" fillet weld to each side of top flange. Consult the code for special considerations when welding galvanized steel.
- May be installed using PDPAT-62KP (0.157" x 5/8") powder-actuated fasteners. Steel headers with thicknesses between 1/4" and 3/4" having a minimum F_y = 36 ksi. A Red (level 5) or Purple (level 6) powder load may be required to achieve specified penetration (p). See illustration on p. 203.

Codes: See p. 13 for Code Reference Key Chart

Ordering Information: The S/JCT is sold in cartons of 50. The S/HJCT is sold in kits as the S/HJCT-KT and contains five (5) connectors and (95) #14 screws.



S/HJCT Installation with a 4x10 Wood Header

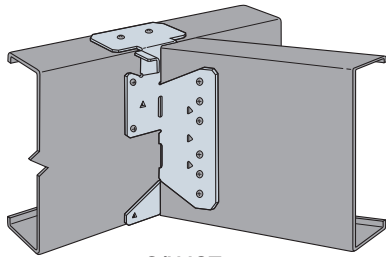
1. Allowable loads are based on a minimum of single 54 mil (16 ga.) CFS joist member. CFS joist shall be laterally braced per designer specification.
2. Allowable loads for wood header are based on 4x DF/SP minimum, for SPF/HF wood species use an adjustment factor of 0.72.
3. CFS header must be braced to prevent web buckling per designer specification and header must have full bearing of 1 1/2" flange-depth.
4. Backing in the steel beam cavity is not required behind the hanger for load listed.
5. Screws shall be installed using joist hanger holes screwing through the hanger into the joist.
6. CFS joists with up to a 0.50" gap (short cut), use an adjustment factor of 0.87 and joists with a 0.50" to 0.90" gap (short cut), use an adjustment factor of 0.75.
7. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.
8. See p. 203 for more information.

Joist Framing Connectors

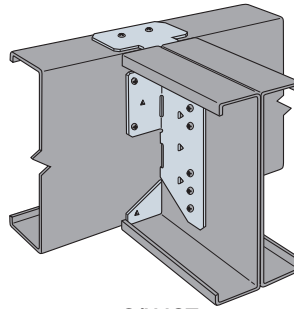
| Model No. | Fasteners ⁷ | | | Allowable Load ¹ (lb.) | | Code Ref. |
|--|---|-------------------------------|---------|-----------------------------------|-------|-------------|
| | Top | Face | Joist | Uplift | Down | |
| Attached to CFS Header: 54 mil (16 ga.)³ — Straight Hanger | | | | | | |
| S/JCT (min.) | (1) #10 | (2) #10 | (4) #10 | 940 | 1,195 | IBC, FL, LA |
| S/JCT (max.) | (1) #10 | (4) #10 | (6) #10 | 1,435 | 2,105 | |
| S/HJCT (min.) | (2) #10 | (4) #14 | (6) #14 | 1,510 | 2,920 | |
| S/HJCT (max.) | (2) #10 | (8) #14 | (9) #14 | 1,670 | 3,855 | |
| Attached to CFS Header: 54 mil (16 ga.)³ — Skewed Hanger | | | | | | |
| S/JCT (min.) | (1) #10 | (2) #10 | (4) #10 | 940 | 1,135 | IBC, FL, LA |
| S/JCT (max.) | (1) #10 | (4) #10 | (6) #10 | 940 | 1,185 | |
| S/HJCT (min.) | (2) #10 | (4) #14 | (6) #14 | 1,510 | 2,305 | |
| Attached to Steel Header⁴ — Straight and Skewed Hanger | | | | | | |
| S/JCT (min.) | 1/8" x 2 1/2" fillet weld to each side of top flange | | (4) #10 | 145 | 940 | |
| S/HJCT (min.) | | | (4) #14 | 195 | 1,450 | |
| S/HJCT (min.) Skew | (2) 0.157" x 5/8" powder-actuated fastener ⁸ | | (4) #14 | 195 | 1,235 | |
| S/JCT (min.) | | | (4) #10 | 145 | 750 | |
| S/HJCT (min.) | | | (4) #14 | 195 | 1,185 | |
| Attached to Masonry — Straight and Skewed Hanger | | | | | | |
| S/HJCT (min.) | (2) 1/4" x 2 1/4" Titen Turbo™ | (4) 1/4" x 2 1/4" Titen Turbo | (6) #14 | 710 | 1,785 | — |
| S/HJCT (min.) Skew | | | | 710 | 1,410 | |

| Model No. | Fasteners ⁷ | | | Allowable Load ^{1,2} (lb.) | | Code Ref. |
|---|------------------------|-------------------|---------|-------------------------------------|------------|-------------|
| | Top | Face | Joist | Uplift (160) | Down (100) | |
| Attached to 4x DF/SP Wood Header — Straight Hanger | | | | | | |
| S/JCT (min.) | (1) 10d | (2) 10d | (4) #10 | 555 | 945 | IBC, FL, LA |
| S/JCT (max.) | (1) 10d | (4) 10d | (6) #10 | 945 | 1,465 | |
| S/HJCT (min.) | (2) 10d | (4) 1/4"x3" SDS | (6) #14 | 1,210 | 2,625 | |
| S/HJCT (max.) | (2) 10d | (8) 1/4"x3" SDS | (9) #14 | 1,475 | 2,980 | |
| Attached to 4x DF/SP Wood Header — Skewed Hanger | | | | | | |
| S/JCT (min.) | (1) 10d | (2) 10d | (4) #10 | 390 | 845 | IBC, FL, LA |
| S/JCT (max.) | (1) 10d | (4) 10d | (6) #10 | 775 | 1,300 | |
| S/HJCT (min.) | (2) 10d | (4) 1/4" x 3" SDS | (6) #14 | 1,210 | 1,935 | |

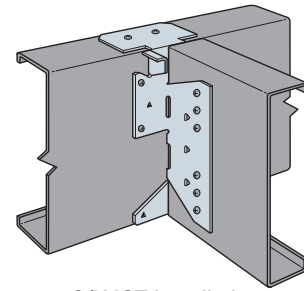
S/JCT and S/HJCT Steel-Joist Connectors



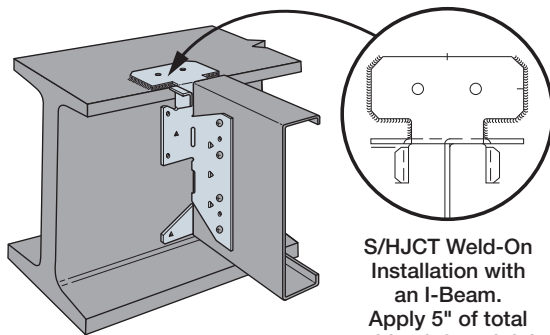
S/HJCT
Skewed 45° Installation



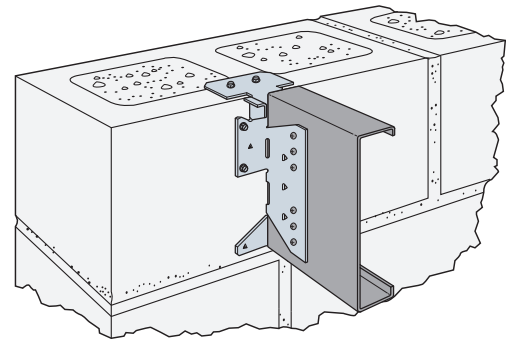
S/HJCT
Double-Joist Installation



S/HJCT Installation
with a CFS Steel Header

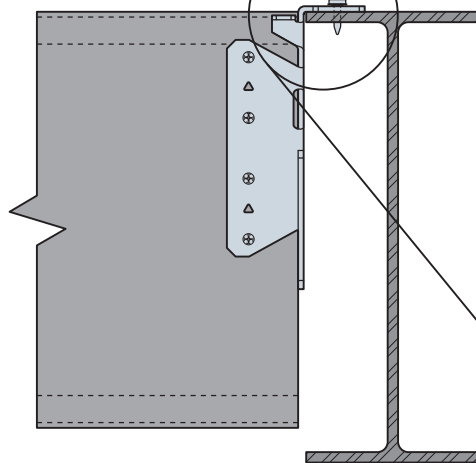


S/HJCT Weld-On
Installation with
an I-Beam.
Apply 5" of total
weld at left and right
edges, as shown.

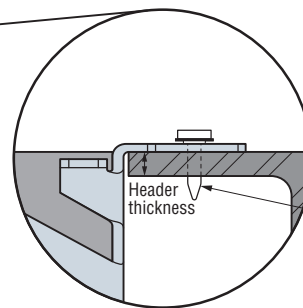


S/HJCT Installation
on Masonry Header

PDPAT-62KP fasteners
installed into existing
top-flange nail holes

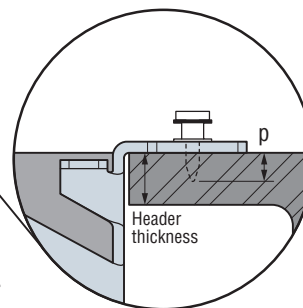


S/JCT Installed on a Steel Header
with Powder-Actuated Fasteners



Steel header
thickness:
1/4" to 1/2"

Point of PDPAT-62KP
must penetrate through
the steel header



Steel header
thickness:
>1/2" to 3/4"

$p = 0.46"$ min.
for A36 steel
 $p = 0.36"$ min.
for A572 or
A992 steel

S/LBV and S/B Hangers

S/LBV and S/B top-flange hangers are manufactured with precision forming and quality control, providing dimensional accuracy and helping to ensure proper bearing area and connection. These hangers are designed for attaching to cold-formed steel members with screws or to structural steel with powder-actuated fasteners or welds.

Material: S/LBV — 68 mil (14 ga.); S/B — 97 mil (12 ga.)

Finish: Galvanized (G90)

Installation:

Cold-Formed Steel:

- S/LBV and S/B may be attached to cold-formed steel supporting members with screws to the face and top flanges and provide capacities for downward and uplift.

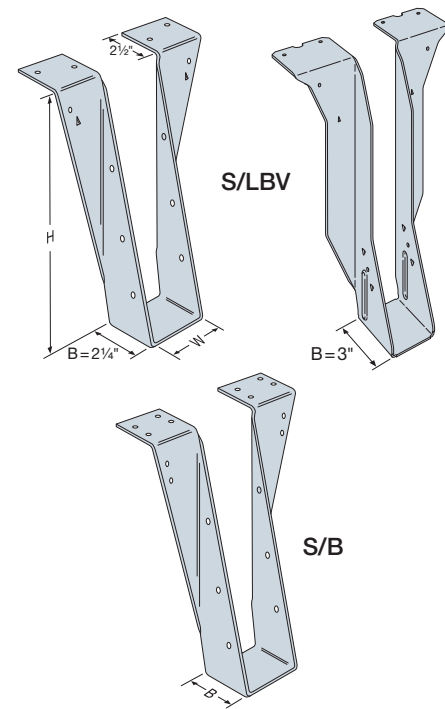
Structural Steel:

- S/LBV and S/B may be attached to structural steel support members with powder-actuated fasteners or welds. For powder-actuated fasteners use PDPAT-62KP (0.157" x 5/8") and provide full penetration as required. For welds use a minimum of 1/8" x 2" fillet weld on each top flange as required. Distribute the weld equally on both flanges. Capacities are provided for downward loads.

Skew Options:

- S/LBV and S/B may be skewed up to a maximum of 45°. Widths for skewable sections are limited to a maximum of 5.25" (specify right or left skew).

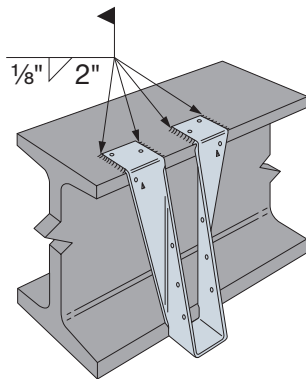
Codes: See p. 13 for Code Reference Key Chart



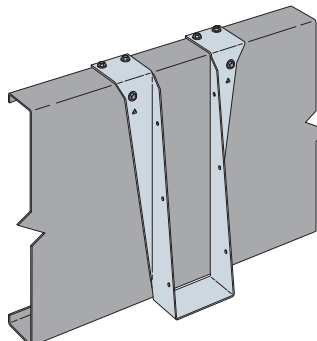
S/LBV and S/B Hanger Allowable Loads (lb.)

| Model | Base Header Material | Hanger Type | Fasteners | | | Allowable ASD Loads (lb.) | | Code Ref. |
|-------|-------------------------|-------------|-----------------------|---------|---------|---------------------------|-------|-------------|
| | | | Top | Face | Joist | Uplift | Down | |
| S/LBV | CFS | Straight | (4) #10 | (2) #10 | (3) #10 | 1,010 | 3,150 | IBC, LA, FL |
| | | Skewed | (4) #10 | (2) #10 | (3) #10 | 1,010 | 2,220 | |
| | A36 steel 3/16" min. | Straight | (4) 1/8" x 2" weld | — | (3) #10 | — | 2,920 | |
| | | | (8) 0.157" x 5/8" PAF | — | (3) #10 | — | 2,685 | |
| S/B | CFS | Straight | (8) #10 | (4) #14 | (3) #14 | 1,855 | 5,970 | |
| | | Skewed | (8) #10 | (4) #14 | (3) #14 | 1,855 | 4,195 | |
| | A36 steel 3/16" min. | Straight | (4) 1/8" x 2" weld | — | (3) #14 | — | 5,755 | |
| | | | (8) 0.157" x 5/8" PAF | — | (3) #14 | — | 3,695 | |

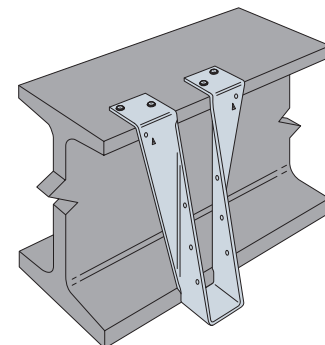
- Designer shall ensure that the joist member adequately transfers load to hanger. Header must be braced to prevent buckling per designer specification.
- Load is based on the Simpson Strong-Tie® PDPAT-62KP (0.157" x 5/8") powder-actuated fasteners. Steel headers with thicknesses between 1/4" and 3/4" having minimum $F_y = 36$ ksi. A Red (level 5) or Purple (level 6) powder load may be required to achieve specified penetration.
- Tabulated loads are based on testing with full bearing of 2 1/2" flange-depth minimum with 68 mil (14 ga.) CFS for S/LBV and 97 mil (12 ga.) CFS for S/B hanger.
- S/LBV2.12 and S/LBV4.18 bearing depth dimension, B, is 3", other S/LBV hanger sizes are 2 1/4".
- See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



S/LBV
Weld-On Applications
(S/B similar)



S/LBV Installed to a
CFS Header with Screws
(S/B similar)



S/LBV Installed to a
Steel Beam with PAF(s)
(S/B similar except 8 PAF(s))

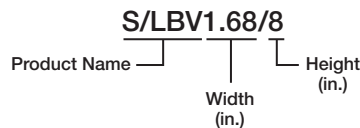
S/LBV and S/B Hangers

The Standard Hanger Sizes table below are hangers with common widths and heights.

Standard Hanger Sizes

| Joist width (in.) | S/LBV | S/B | W (in.) | H (in.) |
|-------------------|--------------|------------|---------|---------|
| 1 1/8 | S/LBV1.68/6 | S/B1.68/6 | 1 1/8 | 6 |
| | S/LBV1.68/8 | S/B1.68/8 | | 8 |
| | S/LBV1.68/10 | S/B1.68/10 | | 10 |
| | S/LBV1.68/12 | S/B1.68/12 | | 12 |
| | S/LBV1.68/14 | S/B1.68/14 | | 14 |
| 2 | S/LBV2.12/6 | S/B2.12/6 | 2 1/8 | 6 |
| | S/LBV2.12/8 | S/B2.12/8 | | 8 |
| | S/LBV2.12/10 | S/B2.12/10 | | 10 |
| | S/LBV2.12/12 | S/B2.12/12 | | 12 |
| | S/LBV2.12/14 | S/B2.12/14 | | 14 |
| 2 1/2 | S/LBV2.56/8 | S/B2.56/8 | 2 9/16 | 8 |
| | S/LBV2.56/10 | S/B2.56/10 | | 10 |
| | S/LBV2.56/12 | S/B2.56/12 | | 12 |
| 3 | S/LBV3.12/8 | S/B3.12/8 | 3 1/8 | 8 |
| | S/LBV3.12/10 | S/B3.12/10 | | 10 |
| | S/LBV3.12/12 | S/B3.12/12 | | 12 |
| (2) 1 1/8 | S/LBV3.38/6 | S/B3.38/6 | 3 3/8 | 6 |
| | S/LBV3.38/8 | S/B3.38/8 | | 8 |
| | S/LBV3.38/10 | S/B3.38/10 | | 10 |
| | S/LBV3.38/12 | S/B3.38/12 | | 12 |
| | S/LBV3.38/14 | S/B3.38/14 | | 14 |
| (2) 2 | S/LBV4.18/6 | S/B4.18/6 | 4 3/8 | 6 |
| | S/LBV4.18/8 | S/B4.18/8 | | 8 |
| | S/LBV4.18/10 | S/B4.18/10 | | 10 |
| | S/LBV4.18/12 | S/B4.18/12 | | 12 |
| | S/LBV4.18/14 | S/B4.18/14 | | 14 |

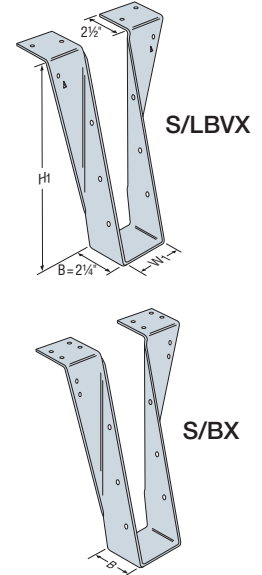
Standard size ordering:
Joist 800S162-54 using an S/LBV hanger.



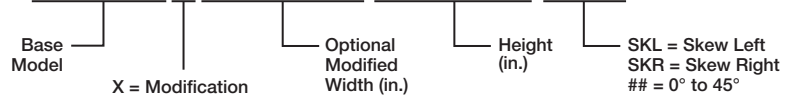
The S/ hangers can be ordered special to fit different width, height or skew from the standard hangers. Below is a table with base model and the modified options.

Hanger Modification Options: Custom Width, Height and Skew

| S/LBV | S/B | W (in.) | Modified W range, W ₁ (in.) | H ₁ (in.) | Skew |
|------------|----------|---------|--|------------------------------------|----------------------------|
| S/LBV1.56X | — | 1 1/8 | 1.56 | S/LBV 6 to 20 S/B 6 to 30 | Left or right 0° to 45° |
| S/LBV1.68X | S/B1.68X | 1 1/8 | 1.57 to 1.68 | | |
| S/LBV2.12X | S/B2.12X | 2 1/8 | 1.69 to 2.12 | | |
| S/LBV2.56X | S/B2.56X | 2 9/16 | 2.13 to 2.56 | | |
| S/LBV3.12X | S/B3.12X | 3 1/8 | 2.57 to 3.12 | | |
| S/LBV3.38X | S/B3.38X | 3 3/8 | 3.13 to 3.38 | | |
| S/LBV4.18X | S/B4.18X | 4 1/8 | 3.38 to 4.18 | | |
| S/LBV5.25X | S/B5.25X | 5 1/4 | 4.19 to 5.25 | | |
| — | S/B7.5X | 7 1/4 | 5.26 to 7.25 | | |



S/LBV2.12 X W₁ = Specify H₁ = Specify SKL##



Customizable Options for Hangers

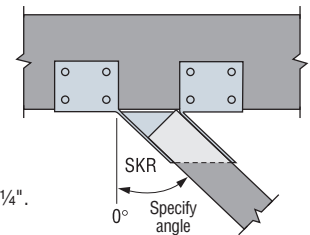
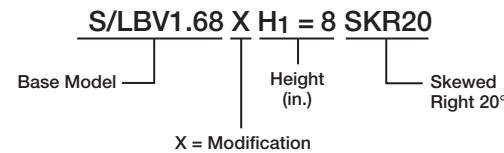
Optional Modified Width (W₁) is defined in the W₁ range from the table and measured in 1/16" increments less than the base model width. For example, if a 2.50" wide S/LBV hanger is needed, start with the wider S/LBV2.56X base model and add "W₁ = 2.25" after X. If W₁ is left blank, then the width of the base model will be used.

Height 1 (H₁) is the modified hanger height defined in the H₁ range from the table and measured in 1/16" increments. For example, if a 9.25" long hanger height is needed, add "H₁ = 9.25" after X or the W₁ value if also modifying the width.

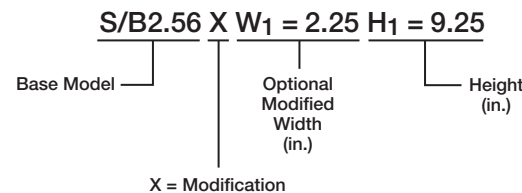
Skew is the modified skew slope where SKL is for left skew or SKR for right skew followed by a value for the skew angle ranging from 0 to 45°. For example, add "SKL20" after the H₁ value for a 20° left skewed hanger.

For more examples of modified hangers, see EX1 and EX2 below:

EX1: Joist 800S162-54 using S/LBV hanger skewed right 20°.



EX2: Need a 12 ga. hanger with a W₁ = 2 1/4" and a H₁ = 9 1/4".



Top View S/B Hanger Skewed Right (S/LBV similar)

S/DHUTF Drywall Hangers

The S/DHUTF top-mount hanger is designed to carry joist loads to a CFS stud wall through two layers of $\frac{5}{8}$ " gypsum board (drywall). This hanger installs after the drywall is in place and comes in sizes that accommodate most typical joists used in multi-family and commercial construction.

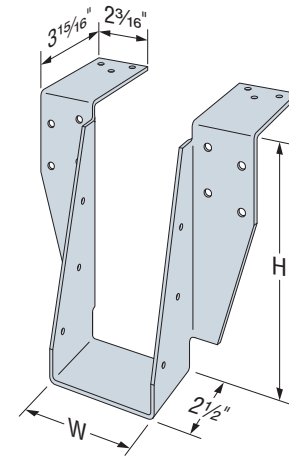
Material: 97 mil (12 ga.)

Finish: Galvanized (G90)

Installation:

- Use all specified fasteners; see General Notes
- Hanger to be framed in-line with vertical wall stud
- Drywall is installed first
- Wall top track must be restrained to counteract load eccentricity from hanger

Codes: See p. 13 for Code Reference Key Chart



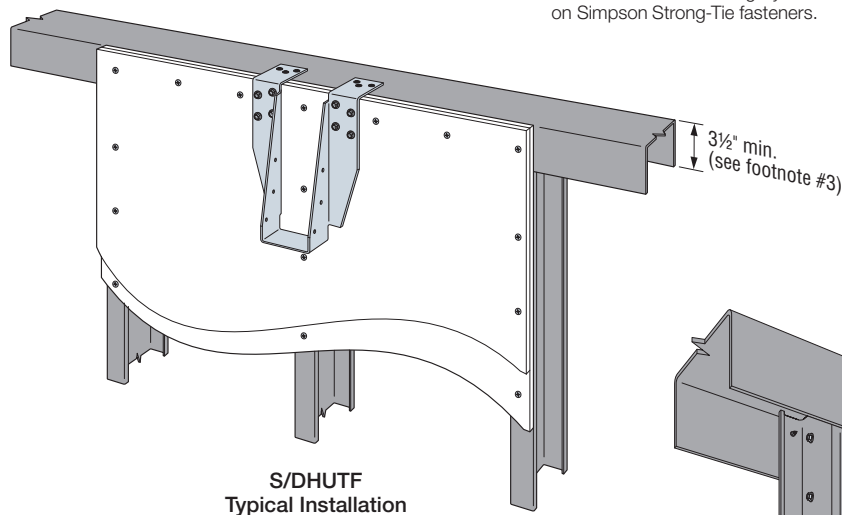
S/DHUTF
US Patent: 9,394,680

| Model No. | Dimensions (in.) | |
|----------------|------------------|----|
| | W | H |
| S/DHU1.68/8TF | 1 $\frac{1}{16}$ | 8 |
| S/DHU1.68/10TF | | 10 |
| S/DHU1.68/12TF | | 12 |
| S/DHU2.1/8TF | 2 $\frac{1}{16}$ | 8 |
| S/DHU2.1/10TF | | 10 |
| S/DHU2.1/12TF | | 12 |
| S/DHU2.56/8TF | 2 $\frac{5}{16}$ | 8 |
| S/DHU2.56/10TF | | 10 |
| S/DHU2.56/12TF | | 12 |

S/DHUTF Allowable Loads (lb.)

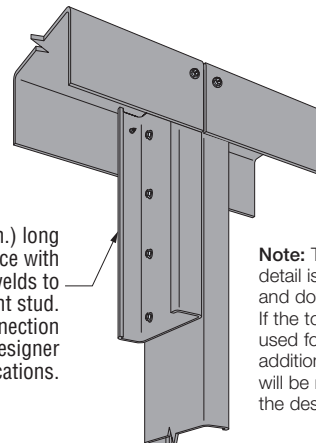
| Model | Fasteners ⁶ | | | Allowable Load (lb.) | | Code Ref. |
|---------|------------------------|--------------|---------|----------------------|-------|-----------|
| | Top | Face | Joist | Uplift | Down | |
| S/DHUTF | (6) #10 | (8) #14 x 2" | (3) #10 | 1,230 | 1,700 | — |

1. Designer shall ensure that the joist member adequately transfers load to the hanger.
2. Tabulated loads assume (2x) $\frac{5}{8}$ " Type X drywall attached per IBC.
3. Wall studs designed per designer specifications. At a minimum, the assembly must consist of 600T350-68, Gr. 50 ksi top track and 600S162-43, Gr. 33 ksi wall studs spaced at a maximum of 24" o.c.
4. Tabulated loads are based on testing with full bearing of 3 $\frac{15}{16}$ " hanger top flange. The minimum joist gauge is 54 mil (16 ga.).
5. S/DHUTF hanger can be installed $\frac{3}{4}$ " max. from the center of the vertical stud per the in-line framing specifications of the AISI General Provisions without load adjustment.
6. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

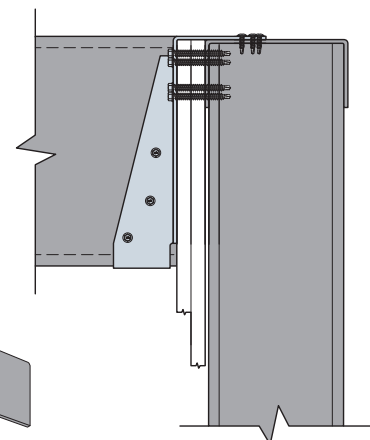


S/DHUTF
Typical Installation

12" (min.) long stud piece with screws or welds to full height stud. Stud and connection per designer specifications.



Typical Top Track Splice



Typical Installation
Over (2) Layers
of $\frac{5}{8}$ " Drywall

Note: This splice detail is for uplift and download only. If the top track is used for drag, additional detailing will be required by the designer.

WP Hanger

This series of purlin hangers offer the greatest design flexibility and versatility.

Material: Stirrup — 97 mil (12 ga.)

Finish: Simpson Strong-Tie® gray paint. Some models available hot-dip galvanized; specify HDG; see Corrosion Information on pp. 19–23.

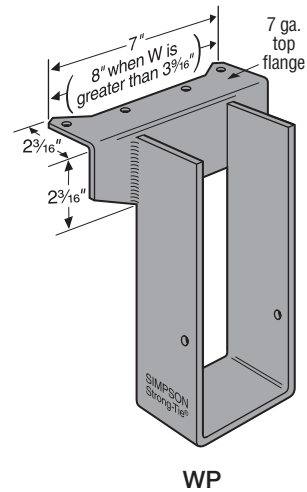
Installation: WP hanger may be welded to steel header with $\frac{3}{16}$ " x $1\frac{1}{2}$ "-fillet welds located at each end of top flange

Options: W and H dimensions are modifiable

Sloped and/or Skewed Seat:

- WP series may be skewed to a maximum of 84° and/or sloped to a maximum of 45° .
- For slope only, skew only, or slope and skew combinations, the allowable load is 100% of the table load.
- Specify the slope up or down in degrees from the horizontal plane and/or the skew right or left in degrees from the perpendicular vertical plane. Specify whether low side, high side or center of joist will be flush with the top of the header.

Codes: See p. 13 for Code Reference Key Chart



Some model configurations may differ from those shown. Call Simpson Strong-Tie for details.

| Model No. | Dimensions (in.) | | | Fasteners ⁴ | | Allowable Down Load (lb.) | Code Ref. |
|-----------|----------------------------------|--------|--------------------|------------------------|---------|---------------------------|-----------|
| | W | H | B | Header | Joist | | |
| WP | $1\frac{9}{16}$ – $7\frac{1}{2}$ | 4 – 30 | $2\frac{1}{2}$ – 5 | Weld | (1) #10 | 3,650 | — |

1. For hanger heights exceeding the joist height, the allowable load is 0.50 of the table value.
2. The designer shall ensure that the joist member adequately transfers load to the hanger.
3. Not all combinations of W, H, and B dimensions are available. Contact Simpson Strong-Tie.
4. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

HU/HUC Hangers

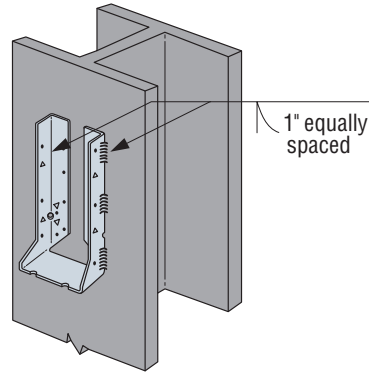
Material: 68 mil (14 ga.)

Finish: Galvanized (G90)

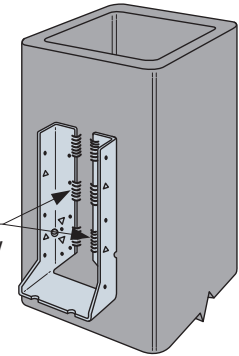
Installation:

- Single Joist — Fill all round holes on one leg of HU/HUC with #10 screws to web of joist.
- Boxed Joist — Fill all round holes on both legs of HU/HUC with #10 screws to web of both joists.
- Screw attach to Steel — Fill all round holes on both flanges to structural steel support.
- Weld attach to Steel — Use 1" weld segments equally spaced top and bottom with half the segments on each side of hanger. Welds may be either lap joint (on outside edge of flanges) or flare-bevel groove (on flange bend line).

Codes: See p. 13 for Code Reference Key Chart



Flare-Bevel Groove Weld
(see detail)

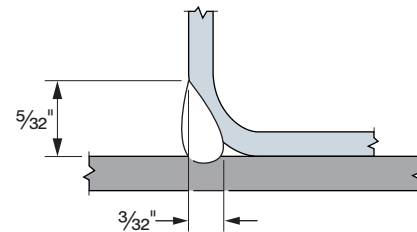


Lap-Joint Fillet Weld

HU/HUC Allowable Loads (lb.)

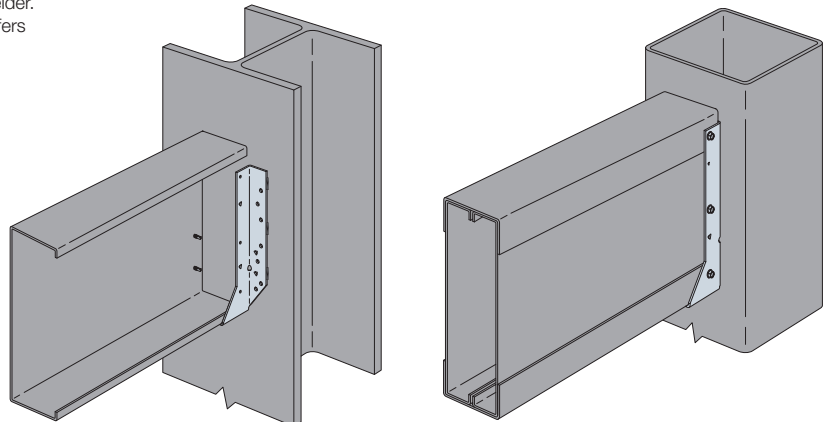
| Model No. | Fasteners | | Joist Depth (in.) | Joist Thickness mil (ga.) | ASD | | Code Ref. |
|------------------|-----------|---------|-------------------|---------------------------|----------------|--------------|-----------|
| | Face | Joist | | | Download (lb.) | Uplift (lb.) | |
| HU36/ HUC36 | (8) #12 | (2) #10 | 6 | 33 (20) | 990 | 355 | — |
| | | | | 43 (18) | 1,480 | 525 | |
| | | | | 54 (16) | 1,480 | 915 | |
| | | | | 68 (14) | 1,400 | 1,080 | |
| | | | | 97 (12) | 1,400 | 1,080 | |
| HU38/ HUC38 | (10) #12 | (2) #10 | 8 | 33 (20) | 825 | 355 | — |
| | | | | 43 (18) | 1,220 | 525 | |
| | | | | 54 (16) | 1,220 | 915 | |
| | | | | 68 (14) | 1,500 | 1,080 | |
| | | | | 97 (12) | 1,500 | 1,080 | |
| HU310/ HUC310 | (14) #12 | (3) #10 | 10 | 43 (18) | 1,435 | 790 | — |
| | | | | 54 (16) | 1,585 | 1,495 | |
| | | | | 68 (14) | 1,995 | 1,620 | |
| | | | | 97 (12) | 1,995 | 1,620 | |
| HU312/ HUC312 | (16) #12 | (3) #10 | 12 | 54 (16) | 1,355 | 1,495 | — |
| | | | | 68 (14) | 1,985 | 1,620 | |
| | | | | 97 (12) | 1,985 | 1,620 | |

1/16" 1" equally spaced



Flare-Bevel Groove Weld Detail

Installation for CFS Built-Up Beam
The designer is responsible for design of beam member.



1. Loads assume E-70S-6 (60 ksi) filler rod.
2. Welds must conform to the current AWS D1.3 structural welding code for sheet steel and must be performed by a certified welder.
3. Designer shall ensure that the joist member adequately transfers load to hanger.
4. Design loads must not exceed the weld capacities onto steel members of 3,280 lb. for four 1" segment weld, and 4,855 lb. for six 1" segment weld.
5. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

L, LS and S/LS Utility Clips and Skewable Angles

L, LS, and S/LS angles are load rated, providing the correct thickness and number of fasteners for the specifier compared with field fabricated clip angles. These angles also have well-defined fastener locations, and testing ensures that the tabulated load values account for connection eccentricities. The connectors are general utility reinforcing angles with multiple uses. S/LS and LS connectors are skewable and can be used to attach members intersecting at angles.

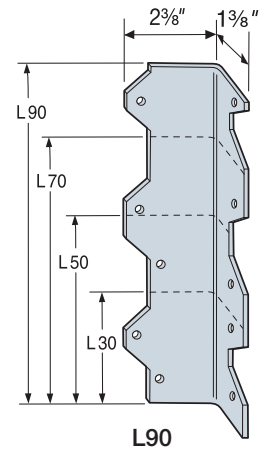
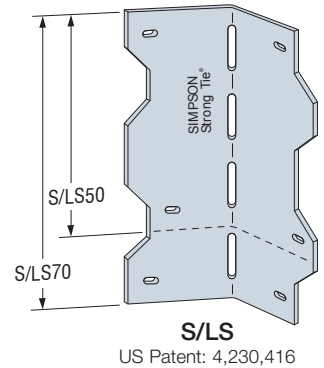
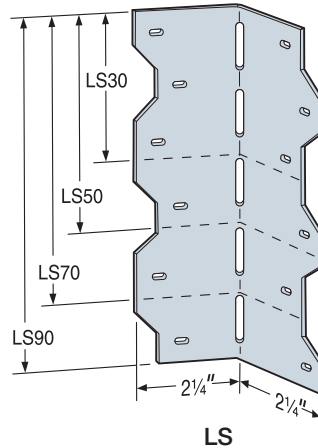
Material: L — 54 mil (16 ga.); S/LS and LS — 43 mil (18 ga.)

Finish: Galvanized (G90)

Installation:

- Use all specified fasteners
- S/LS and LS — Field-skewable; bend one time only
- CFS framing must be constrained against rotation when using a single S/LS or LS per connection

Codes: See p. 13 for Code Reference Key Chart

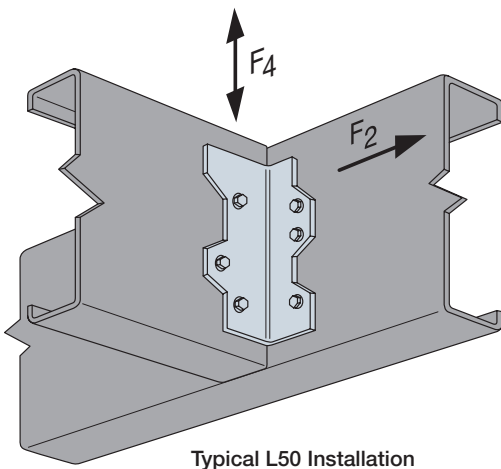


These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

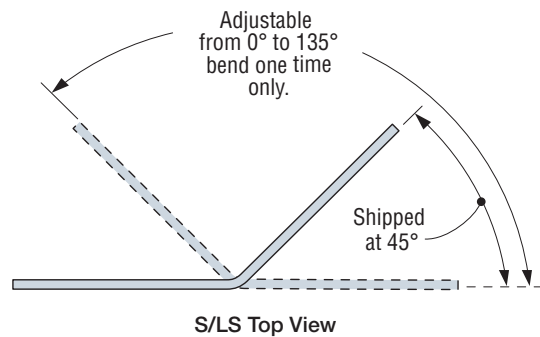
| Model No. | Length (in.) | Fasteners ² | Allowable Load (lb.) | | | | | | Code Ref. |
|-----------|--------------|------------------------|----------------------|----------------|-----------------|----------------|-----------------|----------------|-----------|
| | | | 33 mil (20 ga.) | | 43 mil (18 ga.) | | 54 mil (16 ga.) | | |
| | | | F ₄ | F ₂ | F ₄ | F ₂ | F ₄ | F ₂ | |
| L30 | 3 | (4) #10 | 200 | 60 | 315 | 85 | 610 | — | — |
| L50 | 5 | (6) #10 | 475 | — | 675 | 90 | 750 | 110 | |
| L70 | 7 | (8) #10 | 705 | — | 760 | 110 | 1,100 | 110 | |
| L90 | 9 | (10) #10 | 795 | — | 945 | 110 | 1,740 | 110 | |
| LS30 | 3 3/8 | (6) #10 | 200 | — | 370 | — | 500 | — | |
| S/LS50 | 4 7/8 | (4) #10 | 200 | — | 370 | — | 500 | — | |
| S/LS70 | 6 3/8 | (6) #10 | 465 | — | 575 | — | 715 | — | |
| LS90 | 7 7/8 | (12) #10 | 465 | — | 895 | — | 915 | — | |

1. Loads are for one part only.
2. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

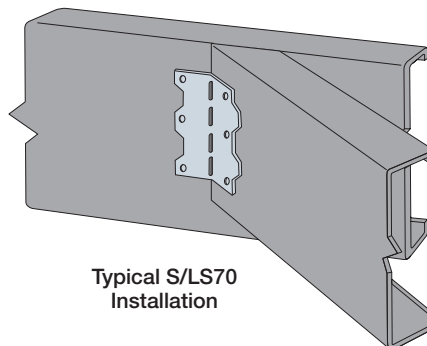
See pp. 103–106 for more utility clips options with the RCA (Rigid Connector Angle).



Typical L50 Installation



S/LS Top View



Typical S/LS70 Installation

ICFVL Ledger Connector System

The ICFVL ledger connector system is engineered to solve the challenges of mounting CFS ledgers to insulated concrete form (ICF) walls. The ICFVL is designed to provide both vertical and lateral, in-plane performance. There are many benefits over traditional anchor bolting, including better on-center spacing in most cases, faster installation and no protrusions. The embedded legs of the ICFVL are embossed for additional stiffness and the hole allows for concrete to flow through and around the connector. The exposed flange on the face of the ICF provides a structural surface for mounting a CFS ledger.

Material: ICFVL — 68 mil (14 ga.)

Finish: Galvanized (G90)

Installation:

ICFVL in ICF

- Snap a chalk line for the bottom of the ledger
- Mark required on-center spacing
- Use ICFVL to mark kerfs locations
- Cut kerfs as marked
- Insert ICFVL flush to the face of the ICF
- Pour concrete

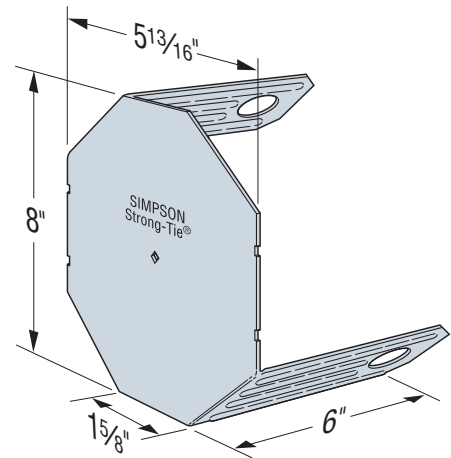
CFS Ledger Attachment

- Position the ledger level to the chalk line and against the ICFVL
- Attach with four #14 x 3/4", #3 drill point screws (not provided)
- All screws should be located at least 1/2" from the edge of the ICFVL
- Space screws evenly

Codes: See p. 13 for Code Reference Key Chart

Warning:
Industry studies show that hardened fasteners can experience performance problems in wet environments. Accordingly, use this product in dry environments only.

New ICFVL models are coming Spring 2023. See strongtie.com for more information.



ICFVL
Patent pending

| Model No. | Fasteners | Allowable ASD Load (lb.) | | Code Ref. |
|-----------|----------------------|--------------------------|------------------------|-----------|
| | | Download | Lateral F ₁ | |
| ICFVL | (4) #14 ³ | 54 mil (16 ga.) | | — |
| | | 68 mil (14 ga.) | | |
| ICFVL | (4) #14 ³ | 1,660 | 1,525 | — |

1. Fasteners for CFS ledger are not provided.
2. Loads apply to ICF foam thicknesses of 2 3/4" or less. Contact Simpson Strong-Tie for allowable loads on thicker walls.
3. Alternatively, 1/4" fastener may be used. Recommended maximum fastener length is 1" to avoid interfering with the concrete.
4. Concrete f_c = 2,500 psi minimum.
5. When combining download and lateral loads, the designer shall use the following interaction equation: Design Download/Allowable Download + Design Lateral Load/Allowable Lateral Load ≤ 1.

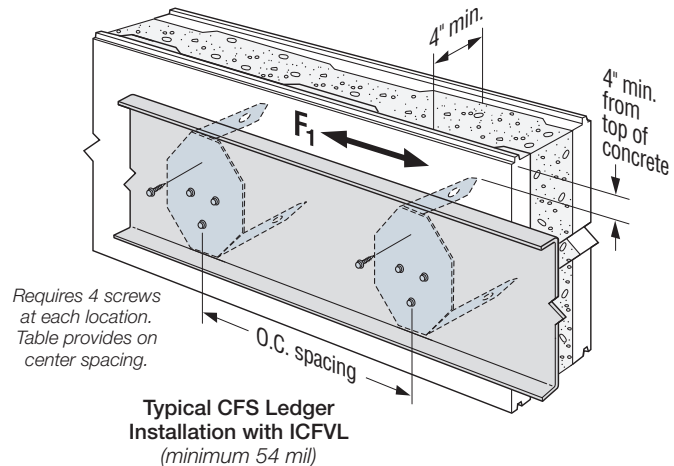
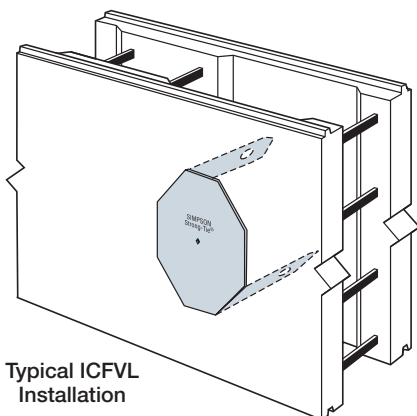
Reduce the chance of misinstallations using the wrong size screws; specify Simpson Strong-Tie® #14 Self-Drilling E Metal screw (Model No. E1B1414) with the ICFVL Ledger Connector System. Visit strongtie.com for details.

Available in 100 ct. and 2,500 ct. cartons.

These tables address vertical load applications only

| Ledger Material Thickness mil (ga.) | Connector Type | ICFVL Spacing to Replace Anchor Bolts on a CFS Ledger (in.) ^{1,2} | | | | | | | |
|-------------------------------------|----------------|--|----------|----------|----------|--------------------------|----------|----------|----------|
| | | 1/2"-Diameter Anchors at | | | | 5/8"-Diameter Anchors at | | | |
| | | 12" o.c. | 24" o.c. | 36" o.c. | 48" o.c. | 12" o.c. | 24" o.c. | 36" o.c. | 48" o.c. |
| 68 (14) | ICFVL | 11 | 22 | 33 | 44 | 9 | 18 | 27 | 36 |
| 54 (16) | ICFVL | 15 | 30 | 45 | 48 | 12 | 24 | 36 | 48 |

1. The designer may specify different spacing based on the load requirements.
2. See flier F-ICFVL at strongtie.com for additional connection details.



TB and LTB Bridging

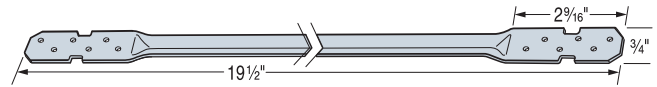
TB and LTB bridging connectors are a cost-effective solution for bracing between floor joists when compared with field fabricated blocking and clip angles.

Material: LTB — 27 mil (22 ga.); TB — 33 mil (20 ga.)

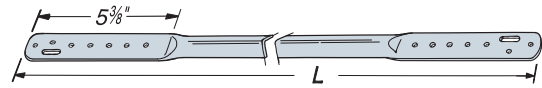
Finish: Galvanized (G90)

Installation: Use (2) #10 screws at each end

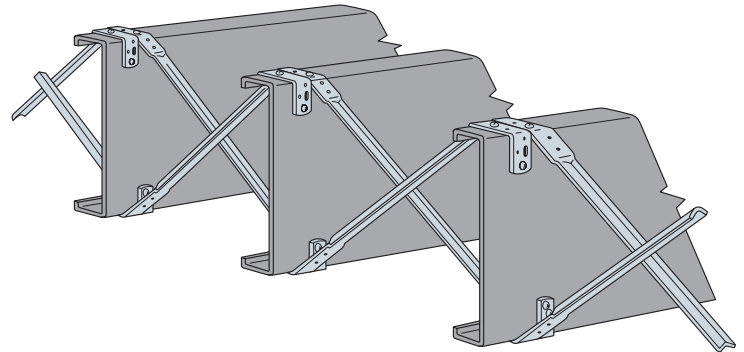
Codes: See p. 13 for Code Reference Key Chart



LTB20



TB



Typical TB Installation

| Web Height (in.) | Spacing (in.) | TB | | LTB | Code Ref. |
|------------------|---------------|-----------|---------|-----------|-----------|
| | | Model No. | L (in.) | Model No. | |
| 6 | 12 | TB20 | 20 | LTB20 | — |
| 8 | | TB20 | 20 | LTB20 | |
| 10 | | TB20 | 20 | — | |
| 12 | | TB27 | 27 | — | |
| 14 | | TB27 | 27 | — | |
| 6 | 16 | TB27 | 27 | — | |
| 8 | | TB27 | 27 | — | |
| 10 | | TB27 | 27 | — | |
| 12 | | TB27 | 27 | — | |
| 14 | | TB27 | 27 | — | |
| 10 | 24 | TB36 | 36 | — | |
| 12 | | TB36 | 36 | — | |
| 14 | | TB36 | 36 | — | |

CS Coiled Strap

CS coiled utility straps are an ideal solution when it is desired to brace floor joist flanges with flat strap. These products are packaged in lightweight cartons (about 40 lb.) and can be cut to length on the jobsite.

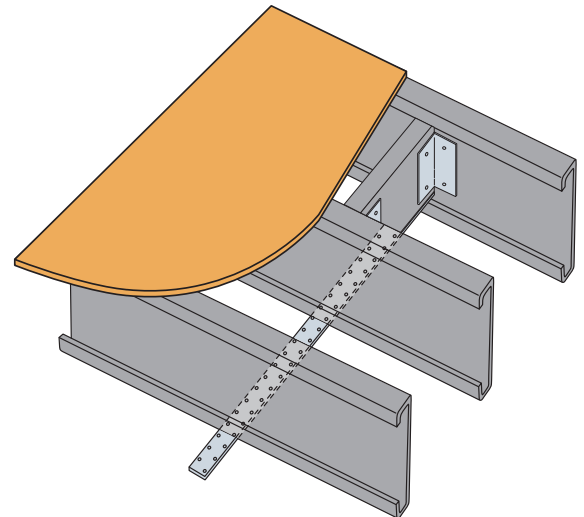
Material: See table

Finish: Galvanized (G90)

Installation:

- Use all specified fasteners
- Refer to the applicable code for minimum edge and end distance

Codes: See p. 13 for Code Reference Key Chart



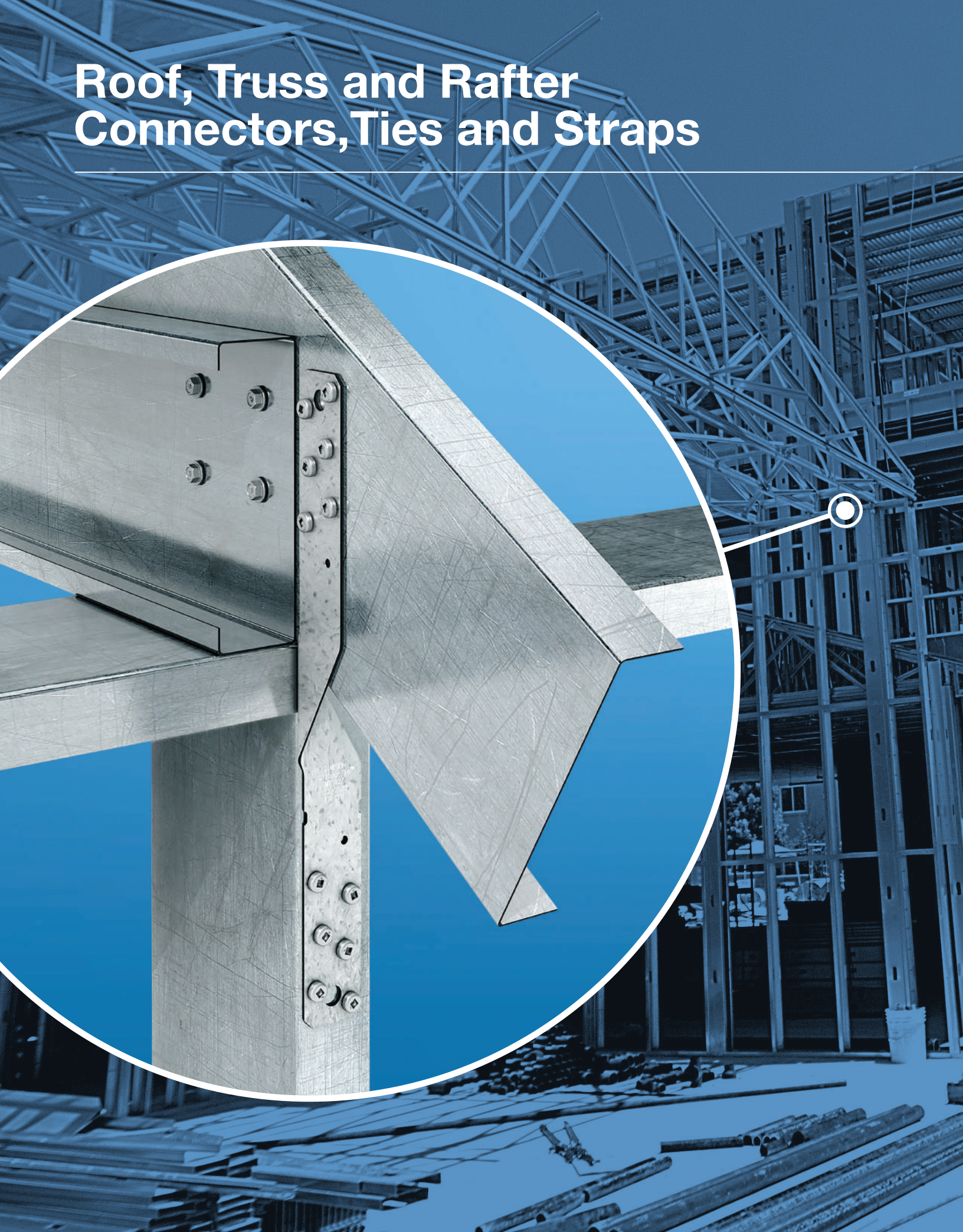
Typical CS Installation for Block and Strap Joist Bridging

| Model No. | Total Length (ft.) | Connector Material Thickness mil (ga.) | Width (in.) | Fasteners ⁴ (At Blocking) | | | Allowable Tension Load (lb.) | Code Ref. |
|-----------|--------------------|--|-------------|--------------------------------------|-------------|-------------|------------------------------|-------------|
| | | | | Framing Thickness mil (ga.) | | | | |
| | | | | 33 (20 ga.) | 43 (18 ga.) | 54 (16 ga.) | | |
| CS20 | 250 | 33 (20) | 1 1/4 | (6) #10 | (4) #10 | (3) #10 | 945 | IBC, FL, LA |
| CS16 | 150 | 54 (16) | 1 1/4 | (9) #10 | (6) #10 | (4) #10 | 1,550 | |
| CS14 | 100 | 68 (14) | 1 1/4 | (28) #10 | (18) #10 | (12) #10 | 2,305 | |

1. In order to achieve the tabulated loads in the strap, attach each strap to the blocking with the tabulated number of screws.
2. Strap length at blocking to achieve tabulated load = number of tabulated screws + 1".
3. Calculate the strap value for a reduced number of screws to the blocking as follows:

$$\text{Allowable Load} = \frac{\text{No. of Screws Used}}{\text{No. of Screws in Table}} \times \text{Table Load}$$
4. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

Roof, Truss and Rafter Connectors, Ties and Straps



SSP/DSP/TSP Stud Plate Ties

The SSP, DSP and TSP are pre-bent strap designed to connect double studs in either top or bottom track applications. These versatile single- and double-stud-plate connector helps to create a continuous load path in uplift resistance.

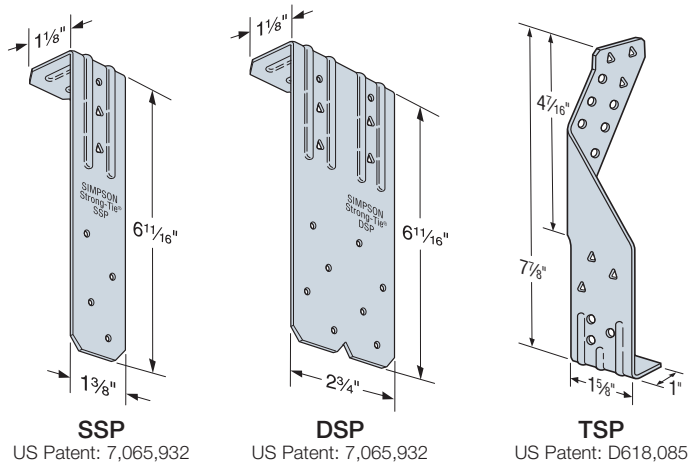
Material: SSP/DSP — 43 mil (18 ga.);
TSP — 54 mil (16 ga.)

Finish: Galvanized (G90). Some products available in ZMAX®; see Corrosion Information, pp. 19–23.

Installation:

- Use all specified fasteners; see General Notes
- DSP/SSP — top track installation; fill all round and triangle holes

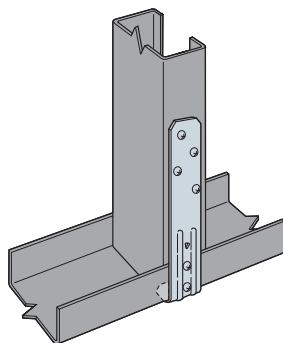
Codes: See p. 13 for Code Reference Key Chart



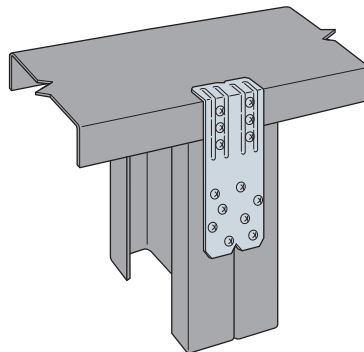
These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

| Model No. | Fasteners ⁴ | | | | Allowable Uplift Load (lb.) | | Code Ref. |
|-----------|------------------------|----------------------|---------|--------------|-----------------------------|--------------------|-------------|
| | Studs | Top Track | | Bottom Track | 33 mil (20 ga.) | 43 mil (18 ga.) | |
| | | CFS | Wood | CFS | | | |
| SSP | (4) #10 | — | — | (2) #10 | 355 | 625 | IBC, FL, LA |
| | | — | (2) #10 | — | 340 | 600 | |
| | | (2) #10 ³ | (1) #10 | — | 405 ¹ | 715 ¹ | |
| | | (2) 10d | (1) #10 | — | 480 ¹ | 840 ¹ | |
| DSP | (8) #10 | — | — | (4) #10 | 430 | 695 | |
| | | — | (4) #10 | — | 475 | 775 | |
| | | (4) #10 ³ | (2) #10 | — | 585 ¹ | 955 ¹ | |
| | | (4) 10d | (2) #10 | — | 730 ¹ | 1,200 ¹ | |
| TSP | (6) #10 | — | — | (3) #10 | 345 | 645 | |
| | | — | (3) #10 | — | 370 | 700 | |
| | (9) #10 | (3) #10 ³ | (3) #10 | — | 360 ¹ | 685 ¹ | |
| | | (3) 10d | (3) #10 | — | 480 ¹ | 905 ¹ | |

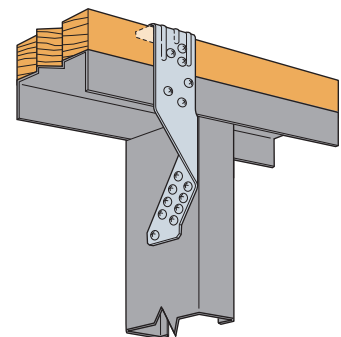
1. For wood plates, noted values only apply to DF/SP members where wood top plates are used. For SPF values, multiply by 0.86.
2. For wood plates, when cross-grain tension cannot be avoided, mechanical reinforcement to resist such forces should be considered.
3. Screws installed into wood plates with a minimum #10 x 3/4" self-drilling screw.
4. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



Typical SSP Installed to Bottom Track
(DSP similar for double stud)



Typical DSP Installed to Top Track
(SSP similar for single stud)



Typical TSP Installed to Top Track with Top Plate

SP Stud Plate Ties

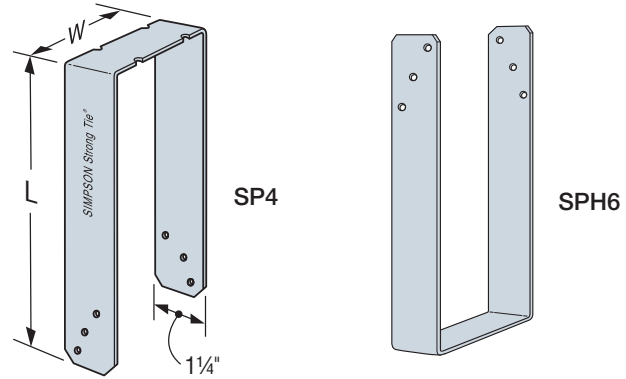
The SP stud plate tie is a plate-to-stud connection providing uplift resistance.

Material: See table.

Finish: Galvanized. Available with ZMAX® coating; see Corrosion Information, pp. 19–23.

Installation: Use all specified fasteners

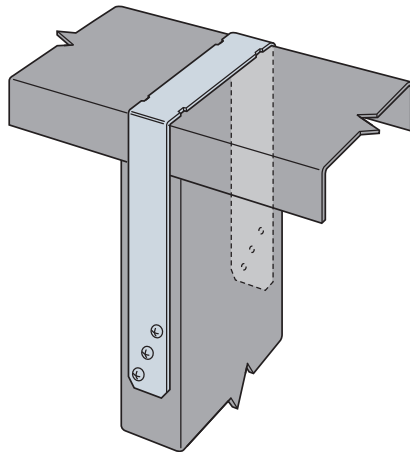
Codes: See p. 13 for Code Reference Key Chart



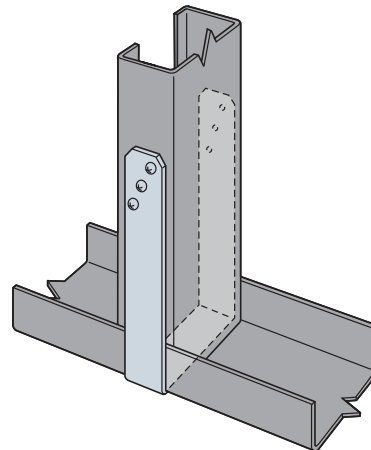
These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

| Model No. | Connector Material Thickness mil (ga.) | Dimensions (in.) | | Stud Fasteners ¹ | Allowable Uplift Load 33 mil (20 ga.) (lb.) | Code Ref. |
|-----------|--|--------------------------------|--------------------------------|-----------------------------|---|-------------|
| | | W | L | | | |
| SP4 | 33 (20) | 3 ⁵ / ₁₆ | 7 ¹ / ₄ | (6) #10 | 825 | IBC, FL, LA |
| SP6 | 33 (20) | 5 ⁵ / ₁₆ | 7 ³ / ₄ | (6) #10 | 825 | |
| SP8 | 43 (18) | 7 ⁵ / ₁₆ | 8 ⁵ / ₁₆ | (6) #10 | 930 | — |
| SPH4 | 43 (18) | 3 ⁵ / ₁₆ | 8 ³ / ₄ | (12) #10 | 1,490 | |
| SPH4R | 43 (18) | 4 ¹ / ₁₆ | 8 ¹ / ₄ | (12) #10 | 1,490 | |
| SPH6 | 43 (18) | 5 ⁵ / ₁₆ | 9 ¹ / ₄ | (12) #10 | 1,490 | |
| SPH6R | 43 (18) | 6 ¹ / ₁₆ | 8 ³ / ₄ | (12) #10 | 1,490 | |
| SPH8 | 43 (18) | 7 ⁵ / ₁₆ | 8 ³ / ₈ | (12) #10 | 1,490 | |

1. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



Typical SP Installation
(Wall-to-Top Track)



Typical SP Installation
(Wall-to-Bottom Track)
(SPH similar)

S/H and H Seismic and Hurricane Ties

Designed to provide seismic and wind ties for trusses or joists, this versatile line may be used for general tie purposes, strongback attachments, and as all-purpose ties where one member crosses another.

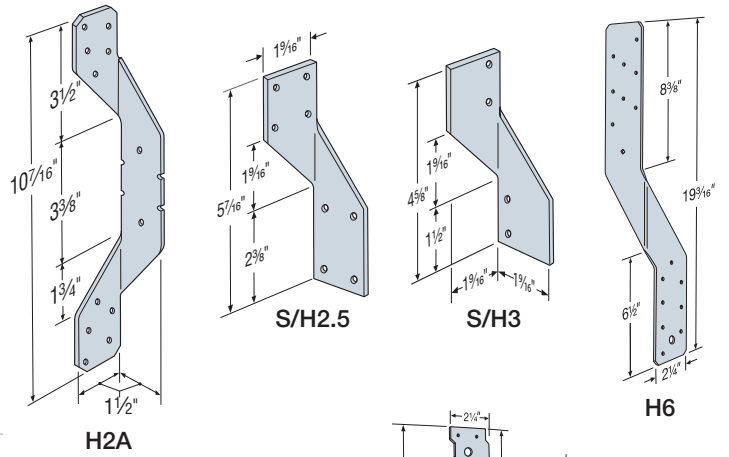
Material: See table

Finish: Galvanized (G90). Available with ZMAX® coating; see Corrosion Information, pp. 19–23.

Installation:

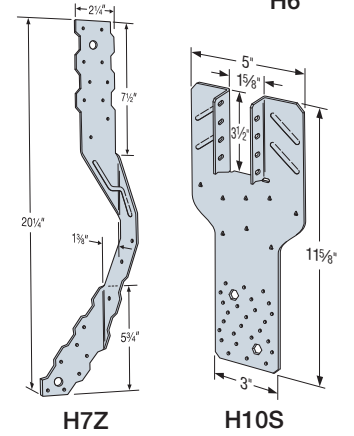
- Use all specified fasteners
- Hurricane ties do not replace solid blocking
- S/H2.5, S/H3 and H6 ties are only shipped in equal quantities of rights and lefts

Codes: See p. 13 for Code Reference Key Chart

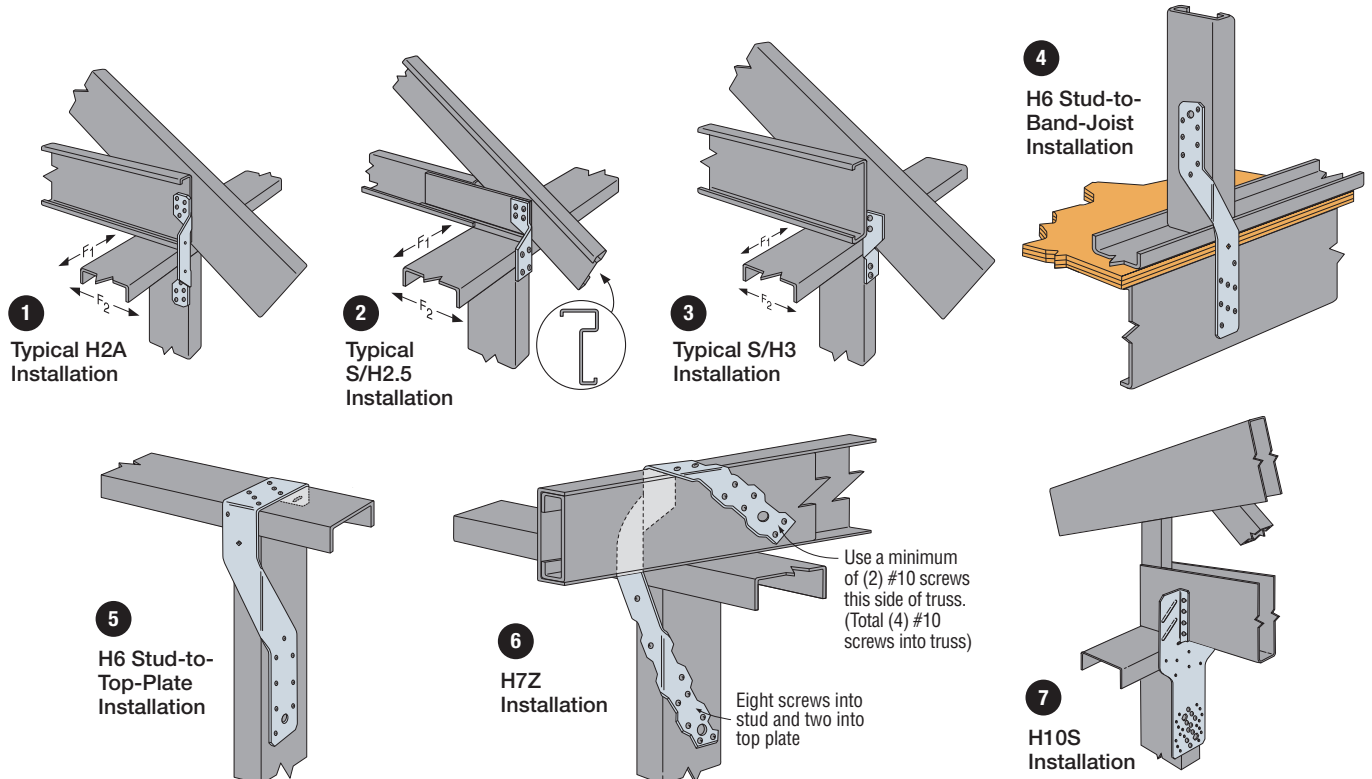


These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

| Model No. | Connector Material Thickness mil (ga.) | Fasteners ⁵ | | | Allowable Load (lb.) 33 mil (20 ga.) | | | Code Ref. |
|-------------------|--|------------------------|--------------|---------|--------------------------------------|----------------|----------------|-----------|
| | | To Rafters/Truss | To Top Track | To Stud | Uplift | Lateral | | |
| | | | | | | F ₁ | F ₂ | |
| H2A | 43 (18) | (5) #10 | (1) #10 | (5) #10 | 450 | 90 | 100 | — |
| S/H2.5 | 43 (18) | (4) #10 | — | (4) #10 | 390 | 90 | 125 | |
| S/H3 | 43 (18) | (2) #10 | (2) #10 | — | 375 | 90 | 125 | |
| H6 | 54 (16) | — | (8) #10 | (8) #10 | 950 | — | — | |
| H7Z | 54 (16) | (4) #10 | (2) #10 | (8) #10 | 985 | — | — | |
| H10S ⁴ | 43 (18) | (8) #10 | — | (8) #10 | 930 ³ | — | — | |



1. Loads are based on attachment of cold-formed steel members having a minimum thickness of 33 mil (20 ga.).
2. Hurricane ties are shown installed on the outside of wall for clarity. Installation inside of wall is acceptable. For Continuous Load Path, connections in the same area must be on same side of wall.
3. For H10S connectors with CFS members having a minimum thickness of 43 mil (18 ga.), the allowable load is 1,260 lb.
4. H10S connectors can be installed 3/4" (max.) from the center of the vertical stud per the in-line framing specifications of the AISI General Provisions for reduced uplift of 890 lb., provided that the screw edges are met.
5. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



H Hybrid Connectors

 Seismic and Hurricane Ties for Wood Truss or Joist-to-CFS Wall

Designed to provide seismic and wind ties for wood trusses or joists-to-CFS walls, this versatile line may be used for general purposes, strongback attachments, and as all-purpose ties where one member crosses another.

HS24 attaches the bottom chord of a truss or rafter at pitches from 0:12 to 4:12 to steel top plates.

Material: See table

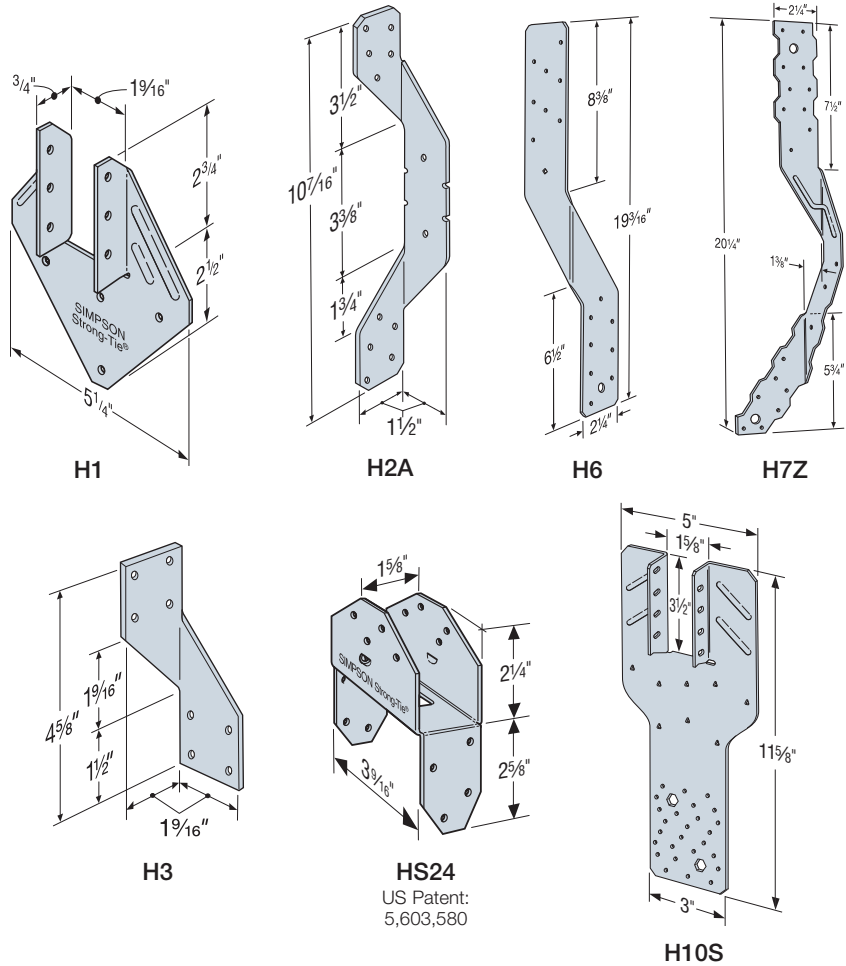
Finish: Galvanized (G90).

Selected products available in stainless steel or ZMAX® coating. See Corrosion Information, pp. 19–23.

Installation:

- Use all specified fasteners; see General Notes
- H1 can be installed with flanges facing inward (reverse of illustration 1)
- Hurricane ties do not replace solid blocking
- H3 and H6 ties are only shipped in equal quantities of rights and lefts

Codes: See p. 13 for Code Reference Key Chart

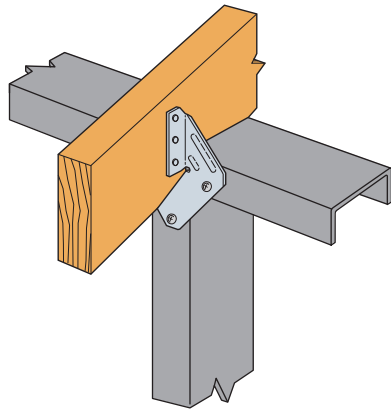


These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

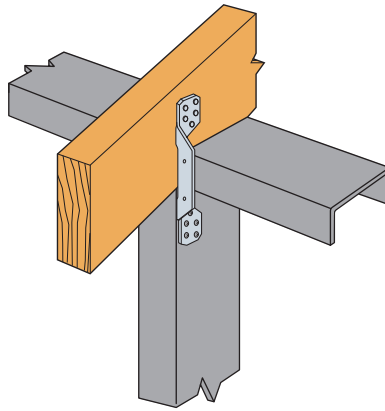
| Model No. | Connector Material Thickness mil (ga.) | Fasteners ⁵ | | | Allowable Uplift Load 33 mil (20 ga.) (160) (lb.) | | Code Ref. |
|-------------------|--|------------------------|--------------|---------|---|--------|-----------|
| | | To Rafters/ Truss | To Top Track | To Stud | DF/SP | SPF/HF | |
| | | | | | | | |
| H1 | 43 (18) | (6) 8d x 1 1/2" | (3) #10 | (1) #10 | 600 | 500 | — |
| H2A | 43 (18) | (5) 8d x 1 1/2" | (1) #10 | (5) #10 | 550 | 460 | |
| H3 | 43 (18) | (4) 8d x 1 1/2" | (4) #10 | — | 365 | 305 | |
| H6 | 54 (16) | — | (8) 8d | (8) #10 | 950 | 820 | |
| H7Z | 54 (16) | (4) 8d x 1 1/2" | (2) #10 | (8) #10 | 985 | 845 | |
| HS24 | 43 (18) | (8) 8d x 1 1/2" | (4) #10 | (4) #10 | 625 | 520 | |
| H10S ⁵ | 43 (18) | (8) 8d x 1 1/2" | — | (8) #10 | 930 | 780 | |

1. Allowable loads on wood have been increased 60% for wind or earthquake loading with no further increase allowed; reduce where other load duration factors govern.
2. Hurricane Ties are shown installed on the outside of wall for clarity. Installation inside of wall is acceptable. For Continuous Load Path, connections must be on same side of wall.
3. When cross-grain bending or cross-grain tension cannot be avoided, mechanical reinforcement to resist such force should be considered.
4. H10S connectors can be installed 3/4" (max.) from the center of the vertical stud per the in-line framing specifications of the AISI General Provisions for reduced uplift of 890 lb., provided that the screw edges are met.
5. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

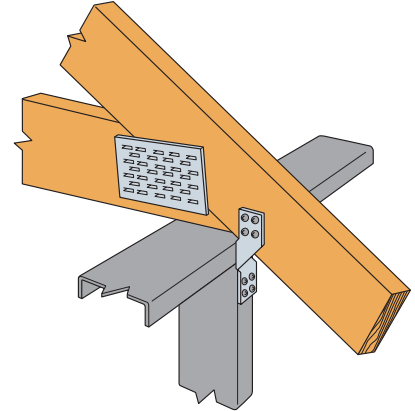
H Hybrid Connectors Seismic and Hurricane Ties for Wood Truss or Joist-to-CFS Wall



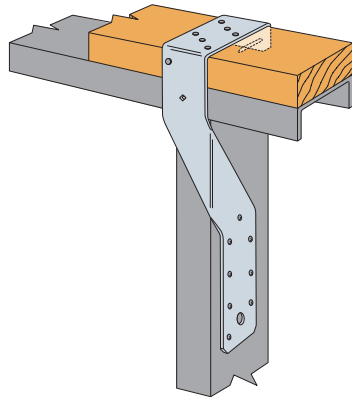
1 H1 Installation



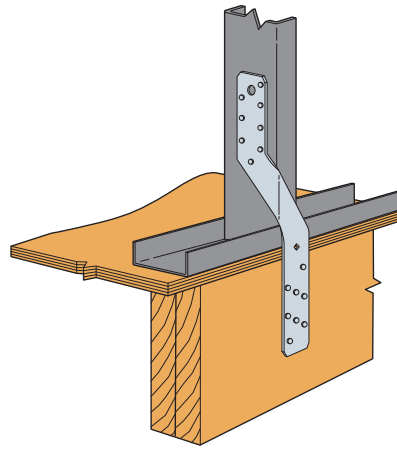
2 H2A Installation



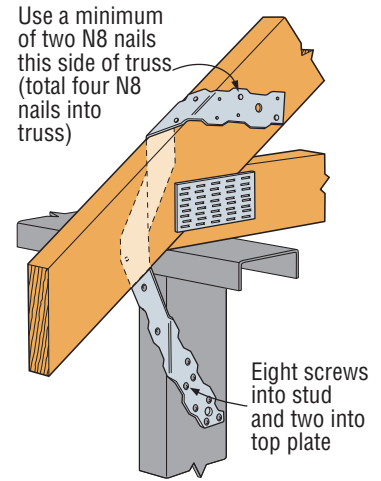
3 H3 Installation



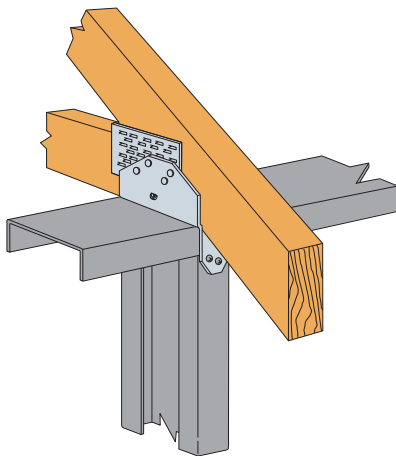
4 H6 Stud-to-Top-Plate Installation



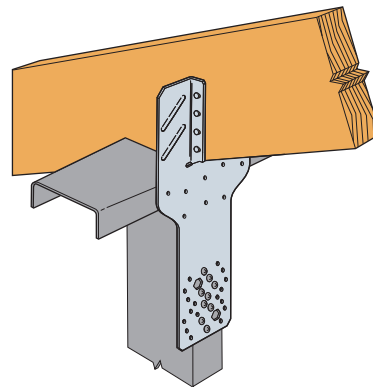
5 H6 Stud-to-Band-Joist Installation



6 H7Z Installation



7 HS24 Installation



8 H10S Installation

S/H1A Seismic and Hurricane Ties

S/H1A is designed to fit within several proprietary truss chords to provide uplift resistance.

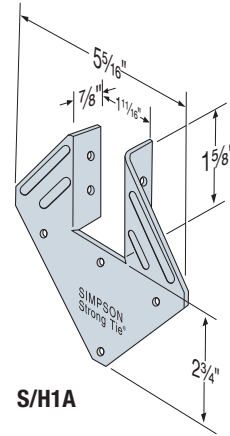
Material: 43 mil (18 ga.)

Finish: Galvanized (G90)

Installation:

- Use all specified fasteners.
- S/H1A can be installed with flanges facing outwards, reverse of illustration, when installed inside a wall for truss applications.
- S/H1A does not replace solid blocking.
- S/H1A may be used with proprietary truss sections. Contact material supplier for specific installation details.

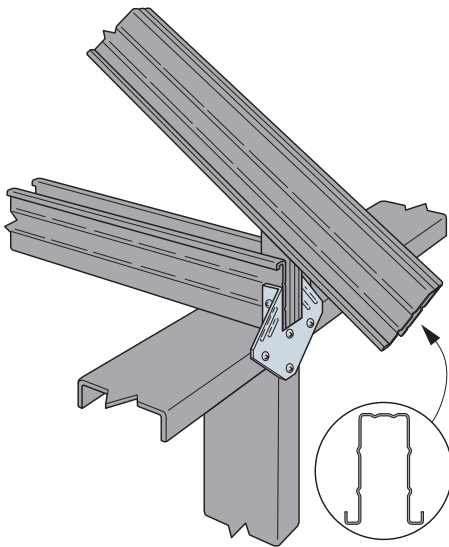
Codes: See p. 13 for Code Reference Key Chart



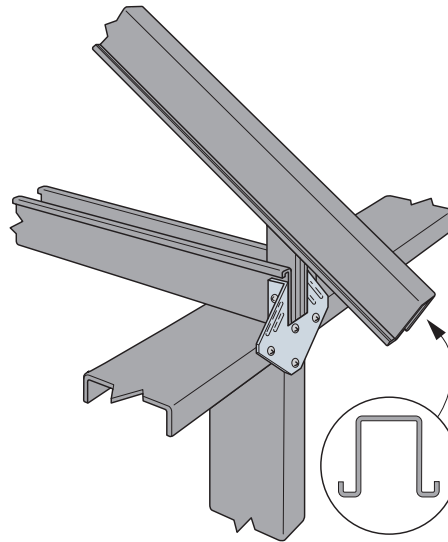
| Model No. | Fasteners ² | | | Truss Thickness mil (ga.) | Allowable Uplift Load (lb.) | | | Code Ref. |
|-----------|------------------------|-----------|---------|---------------------------|-------------------------------------|-----------------|-----------------|-------------|
| | Truss | Top Track | Stud | | Plate/Wall Stud Thickness mil (ga.) | | | |
| | | | | | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | |
| S/H1A | (4) #10 | (3) #10 | (1) #10 | 27 (22) | 470 | 470 | 470 | IBC, FL, LA |
| | (4) #10 | (3) #10 | (1) #10 | 33 (20) | 510 | 550 | 690 | |
| | (4) #10 | (3) #10 | (1) #10 | 43 (18) | 510 | 550 | 690 | |
| | (4) #10 | (3) #10 | (1) #10 | 54 (16) | 520 | 675 | 850 | |

1. Tabulated loads based on truss members with yield strength, F_y , of 50 ksi and tensile strength, F_u , of 65 ksi. Reduce tabulated load proportionally for lower truss member steel strength. For example: 43 mil (18 ga.) truss member with a yield strength, F_y , of 33 ksi and a tensile strength, F_u , of 45 ksi is connected to 43 mil top track and wall stud. The adjusted allowable load is then 550 lb. x minimum $[33/50 \text{ or } 45/60] = 363 \text{ lb.}$

2. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



Typical S/H1A Installation



Typical S/H1A Installation

MTSM/HTSM Twist Straps

The MTSM and HTSM offer high-strength truss-to-masonry connections.

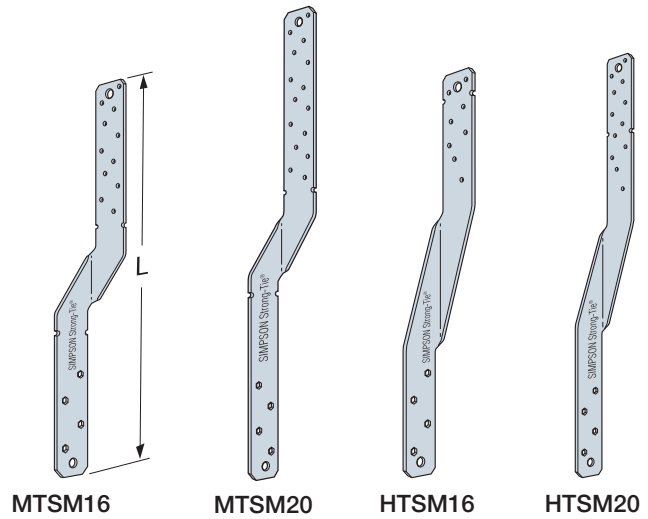
Material: See table.

Finish: Galvanized (G90). Some products available in stainless steel and ZMAX®; see Corrosion Information, pp. 19–23.

Installation:

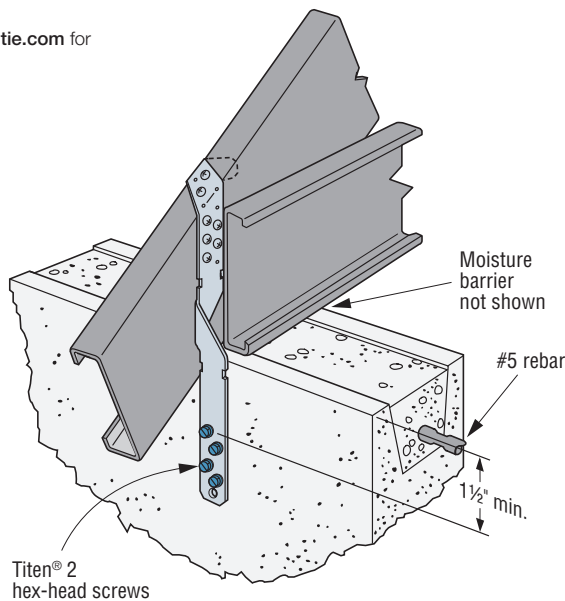
- Use all specified fasteners; see General Notes.
- May be attached to either side of a grouted block wall. A minimum of one #5 horizontal rebar shall be installed in the top course of this wall.

Codes: See p. 13 for Code Reference Key Chart



| Model No. | Connector Material Thickness mil (ga.) | L (in.) | Fasteners ⁶ | | | | Allowable Load 33 mil (20 ga.) (lb.) | Code Ref. | |
|-----------|--|---------|-----------------------------|-----------------|-----------------|---------------------------|--------------------------------------|-----------|-------------------------|
| | | | Rafter/Stud/Joist Thickness | | | CMU ⁵ | | | Concrete ^{3,5} |
| | | | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | | | | |
| MTSM16 | 54 (16) | 16 | (5) #10 | (4) #10 | (3) #10 | (4) ¼" x 2¼" Titen Turbo™ | (4) ¼" x 1¾" Titen Turbo | 830 | — |
| MTSM20 | | 20 | (5) #10 | (4) #10 | (3) #10 | (4) ¼" x 2¼" Titen Turbo | (4) ¼" x 1¾" Titen Turbo | 830 | |
| HTSM16 | 68 (14) | 16 | (7) #10 | (5) #10 | (3) #10 | (4) ¼" x 2¼" Titen Turbo | (4) ¼" x 1¾" Titen Turbo | 1,110 | |
| HTSM20 | | 20 | (7) #10 | (5) #10 | (3) #10 | (4) ¼" x 2¼" Titen Turbo | (4) ¼" x 1¾" Titen Turbo | 1,110 | |

1. All straps have additional fastener holes.
2. Twist straps do not have to be wrapped over the truss to achieve the load.
3. Minimum edge distance in concrete block for Titen Turbo screws is 1½".
4. Straps can be installed on the inside face of the wall.
5. Min. $f'_m = 1,500$ psi and $f'_c = 2,500$ psi.
6. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



Typical MTSM20 Installation

META/HETA/HHETA Embedded Truss Anchors

The embedded truss anchor series provides an engineered method to properly attach roof trusses to concrete and masonry walls. Information regarding the use of two anchors on single- and multi-ply trusses is included below.

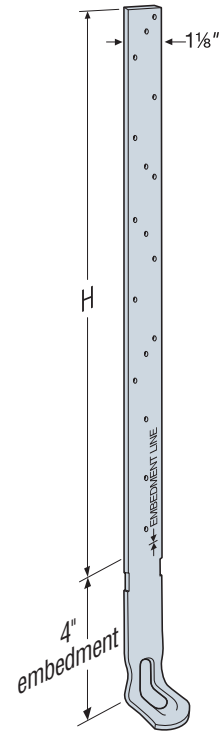
Material: HHETA — 14 gauge; HETA — 16 gauge; META — 18 gauge

Finish: Galvanized (G90). Some products available in ZMAX® coating; see Corrosion Information on pp. 19–23.

Installation:

- Use all specified fasteners; see General Notes.
- The META, HETA and HHETA are embedded 4" into a 6" minimum concrete beam or 8" nominal grouted block wall.
- For mislocated truss anchors which are greater than 1/8" but less than 1 1/2" from the face of the truss, a shim must be provided. Shim design by truss engineer. When gap is greater than 1 1/2", install retrofit anchors.
- In double embedded anchor installations, do not install fasteners where the straps overlap when wrapped over the truss heel.

Codes: See p. 13 for Code Reference Key Chart



HETA20
(META/HHETA similar)

These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

Single Embedded Anchor Installation

| Model No. | H (in.) | Fastener ⁹ Rafter/Stud/Truss Thickness | Allowable Uplift Load (lb.) | | | Lateral Load ⁸ | | Code Ref. |
|-----------|---------|--|---|-----------------|-----------------|---------------------------|-----------------|-----------|
| | | | Rafter/Stud/Truss Thickness | | | F ₁ | F ₂ | |
| | | | 33 mil, 43 mil and 54 mil (20 ga., 18 ga. and 16 ga.) | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | 54 mil (16 ga.) | |
| META12 | 8 | (7) #10 | 1,240 | 1,450 | 1,450 | 340 | 725 | — |
| META16 | 12 | (9) #10 | 1,450 | 1,450 | 1,450 | | | |
| META18 | 14 | (9) #10 | 1,450 | 1,450 | 1,450 | | | |
| META20 | 16 | (9) #10 | 1,450 | 1,450 | 1,450 | | | |
| META22 | 18 | (9) #10 | 1,450 | 1,450 | 1,450 | | | |
| META24 | 20 | (9) #10 | 1,450 | 1,450 | 1,450 | | | |
| META40 | 36 | (9) #10 | 1,450 | 1,450 | 1,450 | 340 | 725 | |
| HETA12 | 8 | (7) #10 | 1,240 | 1,780 | 1,780 | | | |
| HETA16 | 12 | (9) #10 | 1,595 | 1,810 | 1,810 | | | |
| HETA20 | 16 | (9) #10 | 1,595 | 1,810 | 1,810 | | | |
| HETA24 | 20 | (9) #10 | 1,595 | 1,810 | 1,810 | | | |
| HETA40 | 36 | (9) #10 | 1,595 | 1,810 | 1,810 | 340 ⁵ | 815 | |
| HHETA12 | 8 | (7) #10 | 1,240 | 1,820 | 1,820 | | | |
| HHETA16 | 12 | (10) #10 | 1,770 | 2,235 | 2,235 | | | |
| HHETA20 | 16 | (10) #10 | 1,770 | 2,235 | 2,235 | | | |
| HHETA24 | 20 | (10) #10 | 1,770 | 2,235 | 2,235 | | | |
| HHETA40 | 36 | (10) #10 | 1,770 | 2,235 | 2,235 | | | |

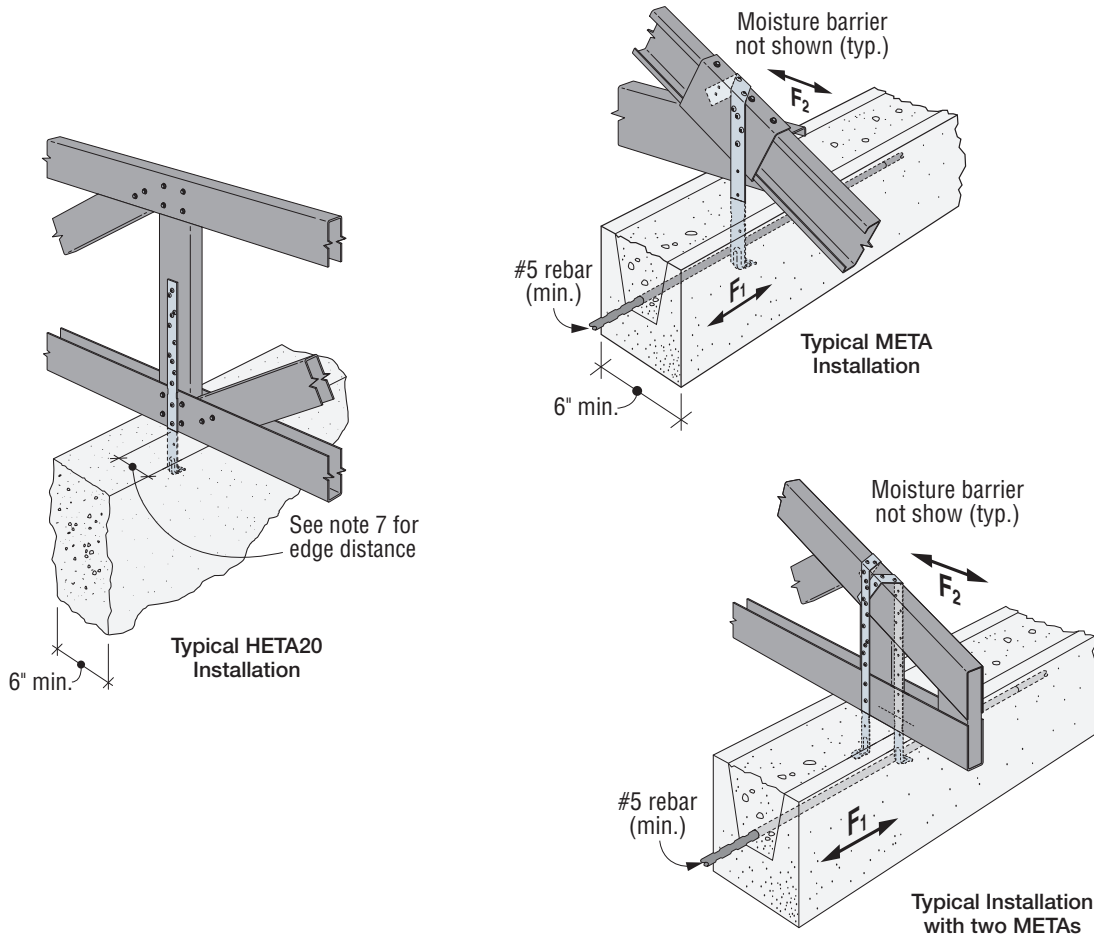
1. Allowable loads may not be increased for wind or seismic load.
2. Minimum $f'_c = 2,500$ psi. Minimum $f'_m = 1,500$ psi.
3. For simultaneous loads in more than one direction, the connector must be evaluated as described in Note d, p. 16 under General Instructions to the Designer.
4. It is acceptable to use a reduced number of fasteners provided that there is a reduction in uplift load capacity. Lateral loads do not apply when fewer fasteners are used.
5. The HHETA allowable F_1 load can be increased to 435 lb. if the strap is wrapped over the truss and a minimum of 12 fasteners are installed.
6. Minimum spacing for multiple anchor installation is two times the embedment depth for full load. See Double Embedded Anchor Installation table on p. 221 for loads on closer spaced anchors.
7. Minimum edge distance is 1 1/2" for concrete and 2" masonry.
8. Lateral loads are limited to 54 mil (16 ga.) CFS members.
9. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

META/HETA/HHETA Embedded Truss Anchors

Double Embedded Anchor Installation

| Model No. | Qty. | Application | Fasteners ⁸ | Allowable Uplift Load (lb.) | | | Lateral Load ⁷ | |
|--|------|-------------|---|-----------------------------|-----------------|-----------------|---------------------------|----------------|
| | | | Rafter/Stud/Truss Thickness | | | | F ₁ | F ₂ |
| | | | 33 mil, 43 mil and 54 mil (20 ga., 18 ga. and 16 ga.) | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | 54 mil (16 ga.) | |
| 1 1/2" Width Minimum of Rafter/Stud/Truss | | | | | | | | |
| META | 2 | CMU | (10) #10 | 1,770 | 1,985 | 1,985 | 340 | 725 |
| | | Concrete | (10) #10 | 1,770 | 1,985 | 1,985 | | |
| HETA | 2 | CMU | (10) #10 | 1,770 | 2,035 | 2,035 | 340 | 725 |
| | | Concrete | (10) #10 | 1,770 | 2,035 | 2,035 | | |
| HHETA | 2 | CMU | (10) #10 | 1,770 | 2,035 | 2,035 | 340 | 815 |
| | | Concrete | (10) #10 | 1,770 | 2,235 | 2,235 | | |
| 3" Width Minimum of Rafter/Stud/Truss | | | | | | | | |
| META | 2 | CMU | (14) #10 | 1,900 | 1,900 | 1,900 | 1,210 | 1,160 |
| | | Concrete | (14) #10 | 2,480 | 2,565 | 2,565 | | |
| HETA | 2 | CMU | (12) #10 | 2,480 | 2,500 | 2,500 | 1,225 | 1,520 |
| | | Concrete | (12) #10 | 2,480 | 2,700 | 2,700 | | |
| HHETA | 2 | CMU | (12) #10 | 2,480 | 2,500 | 2,500 | 1,225 | 1,520 |
| | | Concrete | (12) #10 | 2,480 | 3,050 | 3,050 | | |
| | | Concrete | (14) #10 | 2,480 | 3,350 | 3,350 | | |

- Allowable loads may not be increased for wind or seismic load.
- Minimum $f'_c = 2,500$ psi. Minimum $f_m = 1,500$ psi.
- For simultaneous loads in more than one direction, the connector must be evaluated as described in Note d, p. 16 under General Instructions to the Designer.
- Minimum spacing for multiple anchor installation is two times the embedment depth for full load. See Double Embedded Anchor Installation table for loads on closer spaced anchors.
- Install with spoons facing outward and straps spaced no more than 1/8" wider than the truss width.
- F₁ lateral loads listed may cause an additional 1/16" deflection beyond the standard 1/8" limit there the straps are installed not wrapped over the heel as shown.
- Lateral loads are limited to 54 mil (16 ga.) CFS members.
- See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



LTS/MTS/HTS Twist Straps

Twist straps provide a tension connection between two members. They resist uplift at the heel of a truss economically. LTS/ MTS have a 2"-bend section and HTS has a 3¾"-bend section that eliminates interference at the transition points between the two members.

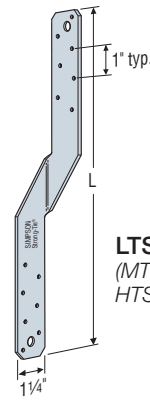
Material: See table

Finish: Galvanized (G90). Some products available in stainless steel and ZMAX®; see Corrosion Information, pp. 19–23.

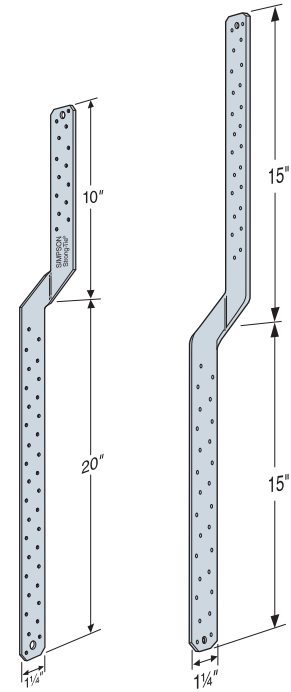
Installation:

- Use all specified fasteners; see General Notes.
- LTS, MTS and HTS are available with the bend reversed. Specify “-REV” after the model number, such as MTS16-REV.

Codes: See p. 13 for Code Reference Key Chart



LTS12
(MTS and HTS similar)

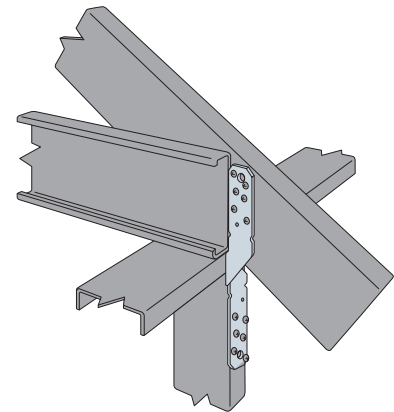


MTS30
(HTS30 similar)

MTS30C
(HTS30C similar)

These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

| Model No. | Connector Material Thickness mil (ga.) | L (in.) | Fasteners ⁶ (Total) | | | Allowable Tension Load (lb.) | Code Ref. |
|-----------|--|---------|--------------------------------|-----------------|-----------------|------------------------------|-------------|
| | | | Rafter/Stud/Joist Thickness | | | | |
| | | | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | 33 mil (20 ga.) | |
| LTS12 | 43 (18) | 12 | (10) #10 | (6) #10 | (6) #10 | 775 | IBC, FL, LA |
| LTS16 | | 16 | (10) #10 | (6) #10 | (6) #10 | 775 | |
| LTS18 | | 18 | (10) #10 | (6) #10 | (6) #10 | 775 | |
| LTS20 | | 20 | (10) #10 | (6) #10 | (6) #10 | 775 | |
| MTS12 | 54 (16) | 12 | (12) #10 | (8) #10 | (6) #10 | 995 | |
| MTS16 | | 16 | (12) #10 | (8) #10 | (6) #10 | 995 | |
| MTS18 | | 18 | (12) #10 | (8) #10 | (6) #10 | 995 | |
| MTS20 | | 20 | (12) #10 | (8) #10 | (6) #10 | 995 | |
| MTS30 | 68 (14) | 30 | (12) #10 | (8) #10 | (6) #10 | 995 | |
| MTS24C | | 24 | (12) #10 | (8) #10 | (6) #10 | 995 | |
| MTS30C | | 30 | (12) #10 | (8) #10 | (6) #10 | 995 | |
| HTS16 | | 68 (14) | 16 | (16) #10 | (12) #10 | (6) #10 | |
| HTS20 | 20 | | (18) #10 | (12) #10 | (6) #10 | 1,450 | |
| HTS24 | 24 | | (18) #10 | (12) #10 | (6) #10 | 1,450 | |
| HTS30 | 30 | | (18) #10 | (12) #10 | (6) #10 | 1,450 | |
| HTS30C | 30 | | (18) #10 | (12) #10 | (6) #10 | 1,450 | |



Typical MTS Installation
Truss-to-Steel Studs

1. Not all fastener holes need to be filled, as additional fastener holes are provided. Install fasteners symmetrically.
2. Install half of the fasteners on each end of strap to achieve full loads.
3. All straps except the MTS30 and HTS30 have the twist in the center of the strap.
4. Twist straps do not have to be wrapped over the truss to achieve the load.
5. May be installed on the inside face of the stud.
6. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

VGT and S/VGT2.5 Variable-Pitch Girder Tiedown

The variable-pitch girder tiedown, S/VGT2.5, is a high-capacity tiedown for single- or multi-ply CFS girder trusses. It attaches with self-drilling screws from the side of the truss. The VGT uses Simpson Strong-Tie® Strong-Drive® SDS Heavy-Duty Connector screws for wood truss applications. They both feature a predeflected crescent washer that allows them to accommodate top-chord pitches up to 8/12.

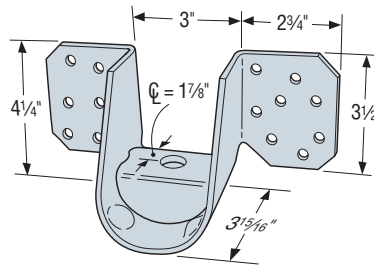
Material: 171 mil (7 ga.)

Finish: Galvanized (G90)

Installation:

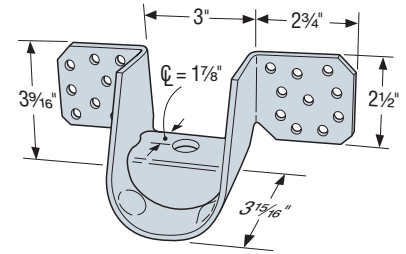
- Use all specified fasteners
- Screw holes are configured to allow for double installation on multi-member girders
- Install washer component (provided) so that top of washer is horizontal and parallel with top of wall

Codes: See p. 13 for Code Reference Key Chart



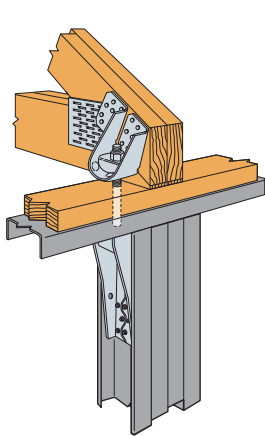
VGT

US Patent: 7,707,785

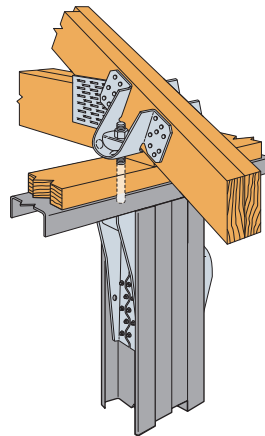


S/VGT2.5

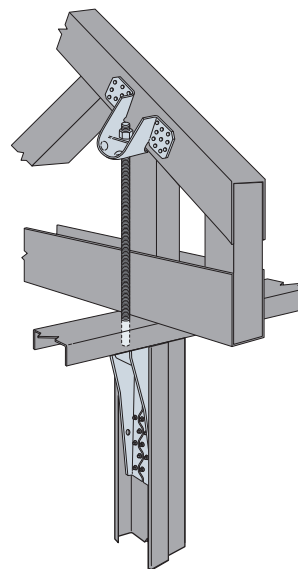
US Patent: 7,707,785



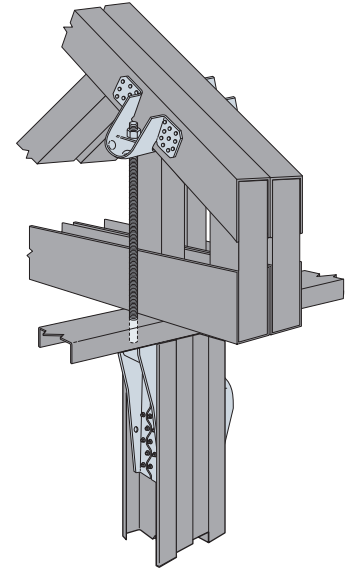
**Typical Hybrid VGTR
Single Installation
with S/HDU4**



**Typical Hybrid VGT
Double Installation
with S/HDU6**

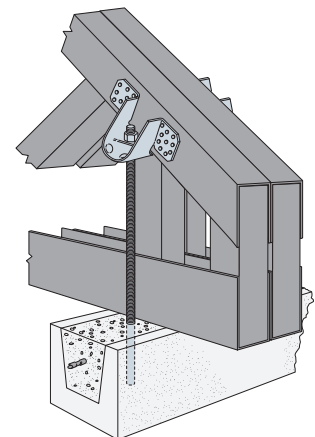


**Typical S/VGT2.5
Single Installation
with HDU6**



**Typical S/VGT2.5
Double Installation
with S/HDU6**

| Model No. | Quantity | No. of Truss Plies | Fasteners ⁵ | | Allowable Uplift Load ² (lb.) | | Code Ref. |
|-------------------------------------|----------|--------------------|------------------------|--------------------|---|---------------------|-----------|
| | | | Anchor Dia. | Girder Truss | 3/12 | 8/12 | |
| Cold-Formed Steel Connection | | | | | 54 mil (16 ga.) | | |
| S/VGT2.5 (min.) ⁴ | 1 | 1 | (1) % | (16) #14 | 3,050 | 2,620 | — |
| | 2 | 2 | (2) % | (32) #14 | 6,100 | 5,240 | |
| S/VGT2.5 (max.) | 1 | 1 | (1) % | (20) #14 | 3,860 | 3,130 | — |
| | 2 | 2 | (2) % | (40) #14 | 7,720 | 6,260 | |
| Hybrid Connection | | | | | Allowable Uplift Load³ up to 8/12 (lb.) | | Code Ref. |
| | | | | | DF/SP (160) | SPF/HF (160) | |
| VGT | 1 | 2 | (1) % | (16) 1/4" x 3" SDS | 4,940 | 3,555 | FL |
| | 2 | 2 | (2) % | (32) 1/4" x 3" SDS | 7,185 | 5,175 | |
| | 2 | 3 | (2) % | (32) 1/4" x 3" SDS | 8,890 | 6,400 | |
| VGTR/L | 1 | 2 | (1) % | (16) 1/4" x 3" SDS | 2,230 | 1,605 | FL |
| | 2 | 2 | (2) % | (32) 1/4" x 3" SDS | 5,545 | 3,990 | |



**Typical S/VGT2.5
Installation in CMU**

1. Designer shall insure attached members are adequately designed to resist applied loads.
2. Straight-line interpolation can be used to determine allowable loads for pitches between 3/12 and 8/12.
3. Allowable loads on wood have been increased 60% for wind or earthquake loading with no further increase allowed; reduce where other load duration factors govern.
4. For (min.) tabulated values, not all screw holes need to be filled. Install screws symmetrically.
5. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

LTA2, S/HGAM10 and H10S Seismic and Hurricane Ties

The LTA2 develops high uplift at a minimum heel height. Great in areas where a strap over the heel is not required. The side tab acts as a locator in the masonry block and the four embedded hooks provide for a positive bond in the concrete grout.

The H10S and the S/HGAM10 attaches to truss joist and provides good uplift resistance.

Material: See table

Finish: Galvanized (G90)

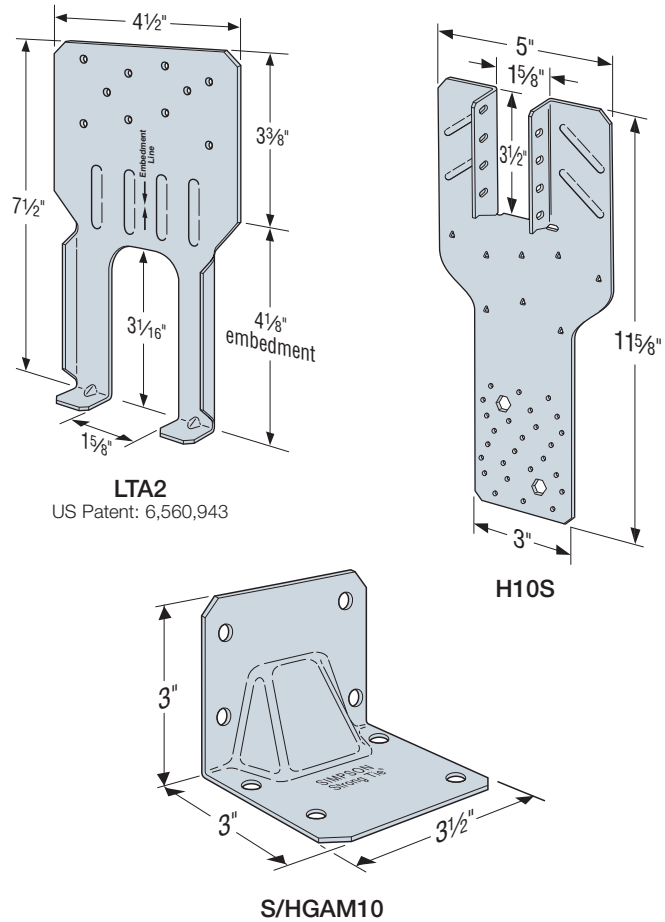
Installation:

- Use all specified fasteners; see General Notes.
- S/HGAM10 can be installed into grouted concrete block.
- Titen Turbo™ screws are provided.
- Hurricane ties do not replace solid blocking.
- Attach to grouted concrete block with a minimum one #5 rebar horizontal in the top lintel block.

Codes: See p. 13 for Code Reference Key Chart

Ordering Information:

- The HGAM10KT is a kit of (10) connectors with (40) ¼" x 2¾" Titen Turbo screws.



| Model No. | Connector Material Thickness mil (ga.) | Fasteners ⁵ | | | Allowable Uplift Load (lb.) | | Code Ref. |
|---|--|-------------------------------|-----------------------------------|--------------------------|-----------------------------|-----------------|-------------|
| | | To Rafter/ Truss ⁵ | To CMU | To Concrete | 33 mil (20 ga.) | 43 mil (18 ga.) | |
| LTA2 perpendicular-to-wall installation | 43 (18) | (10) #10 | Embed | Embed | 1,295 | 1,425 | — |
| LTA2 parallel-to-wall installation | 43 (18) | (10) #10 | Embed | Embed | 1,295 | 1,390 | |
| S/HGAM10KT | 68 (14) | (4) #14 | (4) ¼" x 2¾" Titen Turbo | (4) ¼" x 1¾" Titen Turbo | 810 | 850 | IBC, FL, LA |
| H10S | 43 (18) | (8) #10 | (2) ¾" x 4" Titen HD [®] | (2) ¾" x 4" Titen HD | 915 | 1,245 | |

1. Min. $f_m = 1,500$ psi and $f_c = 2,500$ psi.

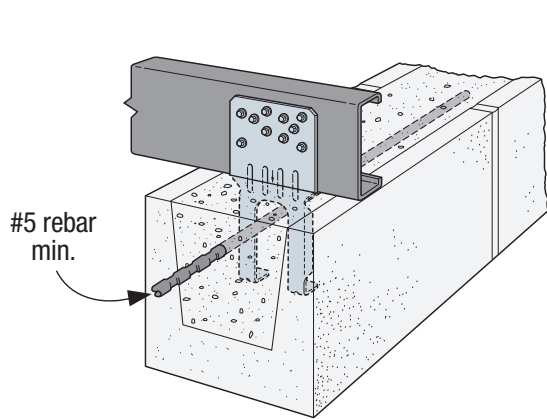
2. Minimum edge distance is 1½" for Titen Turbo screws.

3. The products shall be installed such that the Titen Turbo screws and Titen HD anchors are not exposed to the weather.

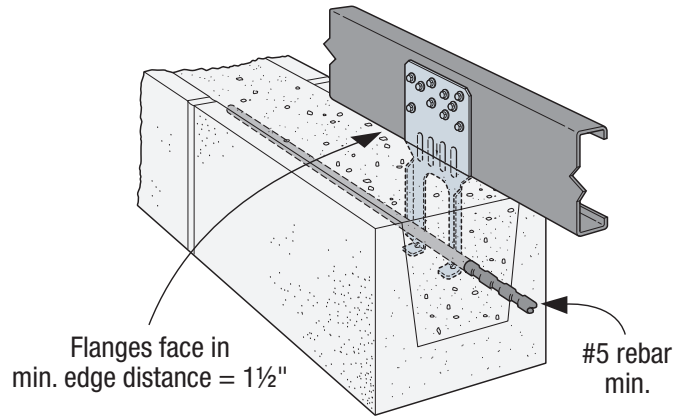
4. Visit strongtie.com for Titen Turbo screw and Titen HD information.

5. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

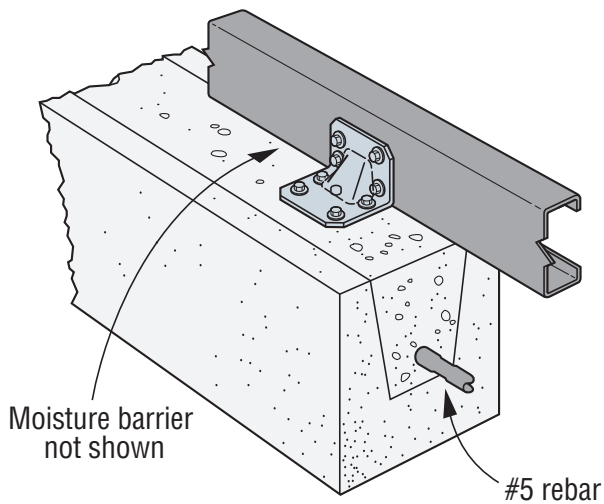
LTA2, S/HGAM10 and H10S Seismic and Hurricane Ties



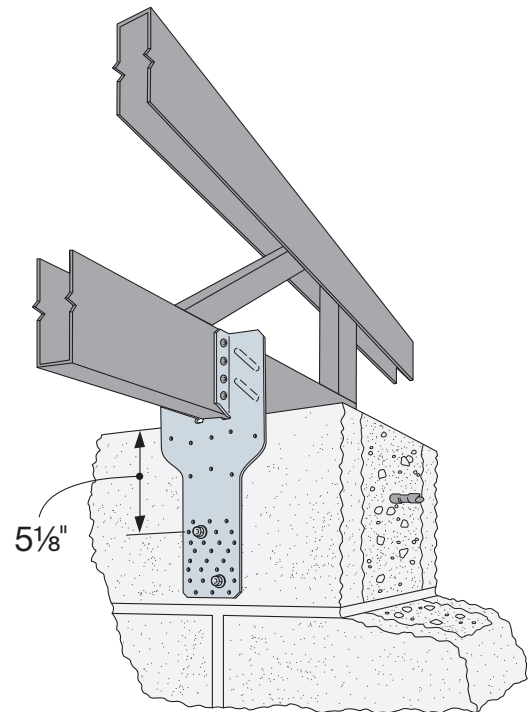
Typical LTA2 Installation
(perpendicular to wall)



Typical LTA2 Installation
(parallel to wall)



Typical S/HGAM10
Installation



H10S Installation

TJC Jack Truss and Rafter Connector

TJC is a versatile connector for skewed members. Adjustable from 0° to 67.5° (shipped with 67.5° bend). Screw hole locations allow for easy installation.

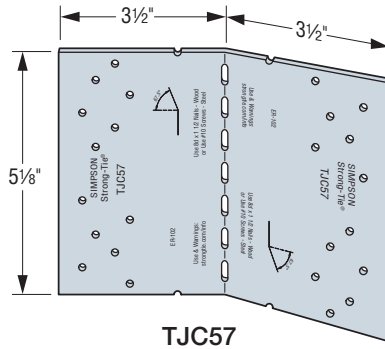
Material: 54 mil (16 ga.)

Finish: Galvanized (G90)

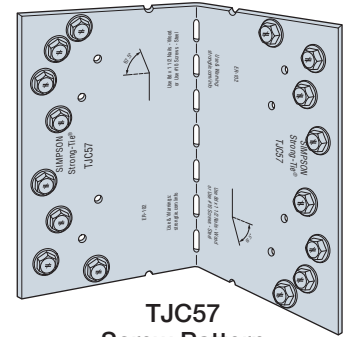
Installation:

- Use all specified fasteners; see General Notes
- Position the skewed member on the inside of the bend line with the end of the member flush with the bend line
- Bend the TJC to the desired position (one bend cycle only)

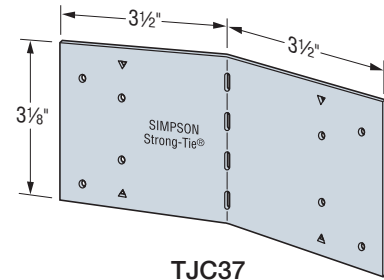
Codes: See p. 13 for Code Reference Key Chart



TJC57



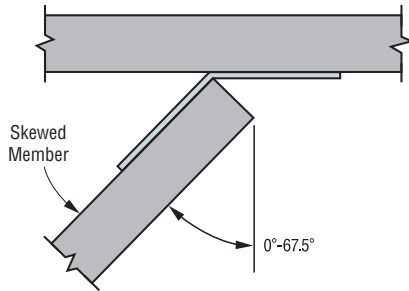
TJC57
Screw Pattern



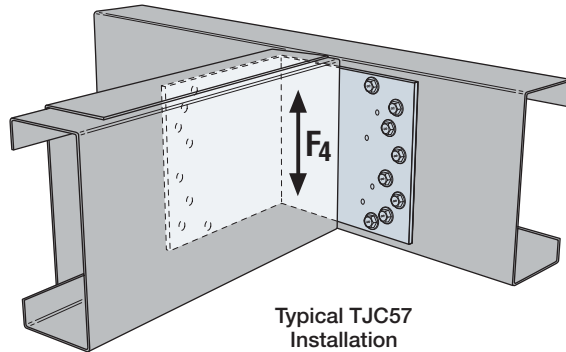
TJC37

| Model No. | Fasteners ² | | Member Thickness mil (ga.) | Allowable Load F ₄ (lb.) | | | Code Ref. |
|--------------|------------------------|----------------|----------------------------|-------------------------------------|--------|-----------|-------------|
| | Carrying Member | Carried Member | | 0° | 1°–60° | 61°–67.5° | |
| TJC37 (min.) | (4) #10 | (4) #10 | 43 (18) | 660 | 565 | 475 | IBC, FL, LA |
| TJC37 (max.) | (6) #10 | (6) #10 | 43 (18) | 680 | 630 | 530 | |
| TJC57 (min.) | (8) #10 | (8) #10 | 43 (18) | 1,295 | 1,215 | 1,235 | — |
| TJC57 (max.) | (8) #10 | (8) #10 | 54 (16) | 1,790 | 1,790 | 1,790 | |

1. Reference the illustration for the required screw pattern of the TJC57.
2. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



Top View Installation



Typical TJC57 Installation

LS and S/LS Skewable Angles

LS and S/LS skewable angles are a cost-effective method for connecting roof rafters to hip rafters.

Material: 43 mil (18 ga.)

Finish: Galvanized (G90)

Installation:

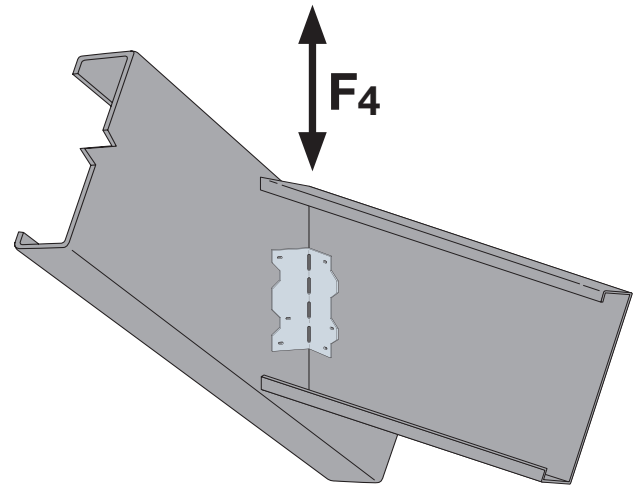
- Use all specified fasteners
- Field-skewable; bend one time only

Codes: See p. 13 for Code Reference Key Chart

| Model No. | Length (in.) | Fasteners ² | Allowable Load (lb.) | | | Code Ref. |
|-----------|-----------------|------------------------|----------------------|-----------------|-----------------|-----------|
| | | | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | |
| | | | F ₄ | F ₄ | F ₄ | |
| LS30 | 3 $\frac{7}{8}$ | (6) #10 | 200 | 370 | 500 | — |
| S/LS50 | 4 $\frac{7}{8}$ | (4) #10 | 200 | 370 | 500 | |
| S/LS70 | 6 $\frac{3}{8}$ | (6) #10 | 465 | 575 | 715 | |
| LS90 | 7 $\frac{7}{8}$ | (12) #10 | 465 | 895 | 915 | |

1. Loads are for one part only.

2. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



Typical Installation Between Roof Rafter and Hip Rafter

AHEP Adjustable Hip-End Purlin

The Simpson Strong-Tie AHEP is a structural purlin that also serves as an installation aid during the truss-erection process. The AHEP attaches to the step-down hip trusses at the leading edge, eliminating the need for drop top chords and C-stud fillers. The AHEP installs linearly, aligned with the end jacks, to maintain sheathing spacing from eave to hip or peak. Roof sheathing/decking attaches directly to the purlin. Adjustable in length, the AHEP is designed to accommodate a pitch range of 3/12 to 9/12.

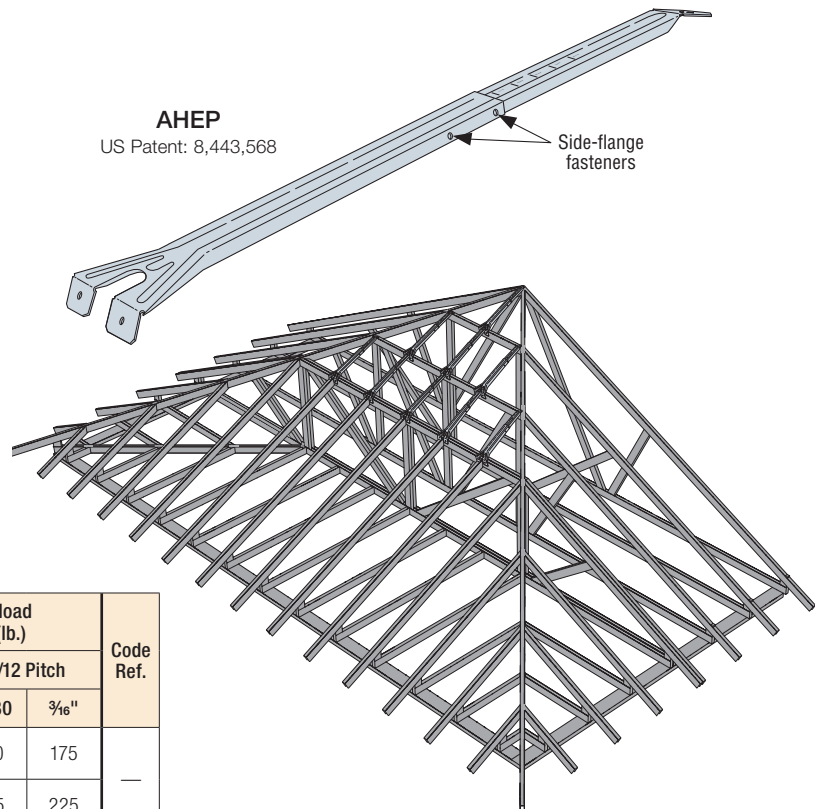
Material: 33 mil (20 ga.)

Finish: Galvanized

Installation:

- Use all specified fasteners; see General Notes

Codes: See p. 13 for Code Reference Key Chart



| Model No. | Fasteners ³ | | Sheathing Option | Allowable Download 33 mil (20 ga.) (lb.) | | | | Code Ref. |
|-----------|------------------------|------------|--------------------------------|--|------------------|------------|------------------|-----------|
| | Side Flanges | Truss Ends | | 3/12 Pitch | | 9/12 Pitch | | |
| | | | | L/180 | $\frac{3}{16}$ " | L/180 | $\frac{3}{16}$ " | |
| AHEP | (4) #10 | (4) #10 | None | 285 | 360 | 160 | 175 | — |
| | | | $\frac{1}{2}$ " wood sheathing | 285 | 360 | 205 | 225 | |

1. Designer shall ensure attached members are adequately designed to resist applied loads.
2. Straight-line interpolation can be used to determine allowable loads for pitches between 3/12 and 9/12.
3. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

STC/STCT/DTC Roof Truss Clips

For alignment control between a roof truss and nonbearing walls; the 1½" slot permits vertical truss chord movement when loads are applied.

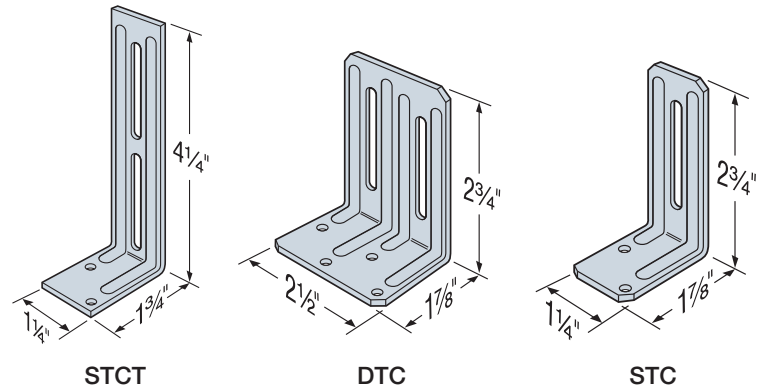
Material: 43 mil (18 ga.)

Finish: Galvanized (G90)

Installation:

- Use all specified fasteners; see General Notes
- Use STC or DTC depending on required loads
- STC/STCT/DTC may be used with proprietary material sections. Contact material supplier for specific installation details
- Use STCT where truss or rafter is separated from the top plate of the nonbearing wall
- Install slot screws in the middle of the slot

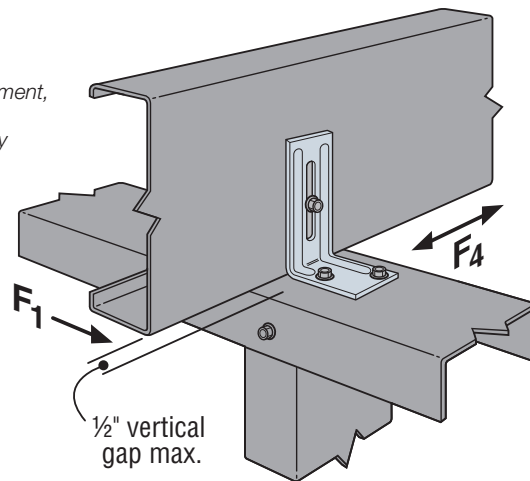
Codes: See p. 13 for Code Reference Key Chart



| Model No. | Fasteners ³ | | Allowable Load 33 mil (20 ga.) (lb.) | | | | | | Code Ref. |
|-----------|------------------------|--------|--|----------------|----------------|----------------|----------------|----------------|-------------|
| | Base | Slot | Without Gap | | ¼" Max. Gap | | ¼" < Gap ≤ ½" | | |
| | | | F ₁ | F ₄ | F ₁ | F ₄ | F ₁ | F ₄ | |
| STC | (2) #8 | (1) #8 | 185 | 35 | 135 | 35 | 75 | 35 | IBC, FL, LA |
| STCT | (2) #8 | (1) #8 | — | — | — | — | — | — | — |
| DTC | (4) #8 | (2) #8 | 200 | 160 | 200 | 160 | 145 | 160 | IBC, FL, LA |

1. Truss or rafter must be bearing on top plate to achieve the allowable loads under "Without Gap."
2. Clips are required on both sides of the truss to achieve F₁ loads in both directions (stagger parts to avoid screw interferences).
3. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.

To allow for vertical truss movement, screws into the truss or rafter should not be driven completely flush against the connector.



Typical STC Installation

S/HTC Heavy Truss Clips

S/HTC provides a slotted connection from the truss or joist to the top track when isolation of two members is required.

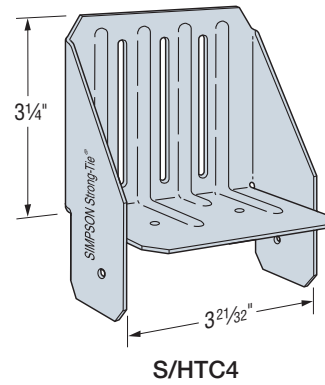
Material: 43 mil (18 ga.)

Finish: Galvanized (G90)

Installation:

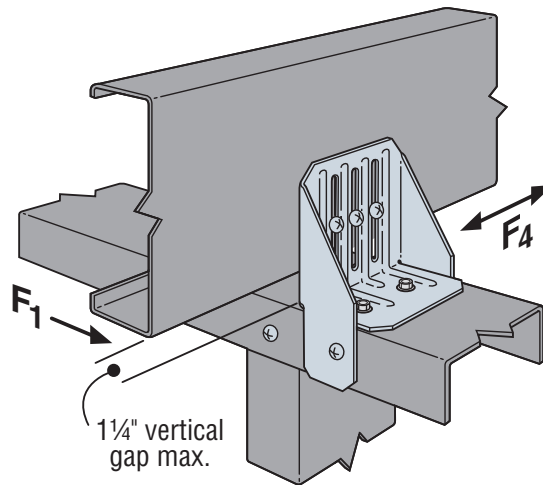
- Use all specified fasteners
- Screws in vertical slots shall not be driven completely flush against the connector when vertical movement is desired

Codes: See p. 13 for Code Reference Key Chart



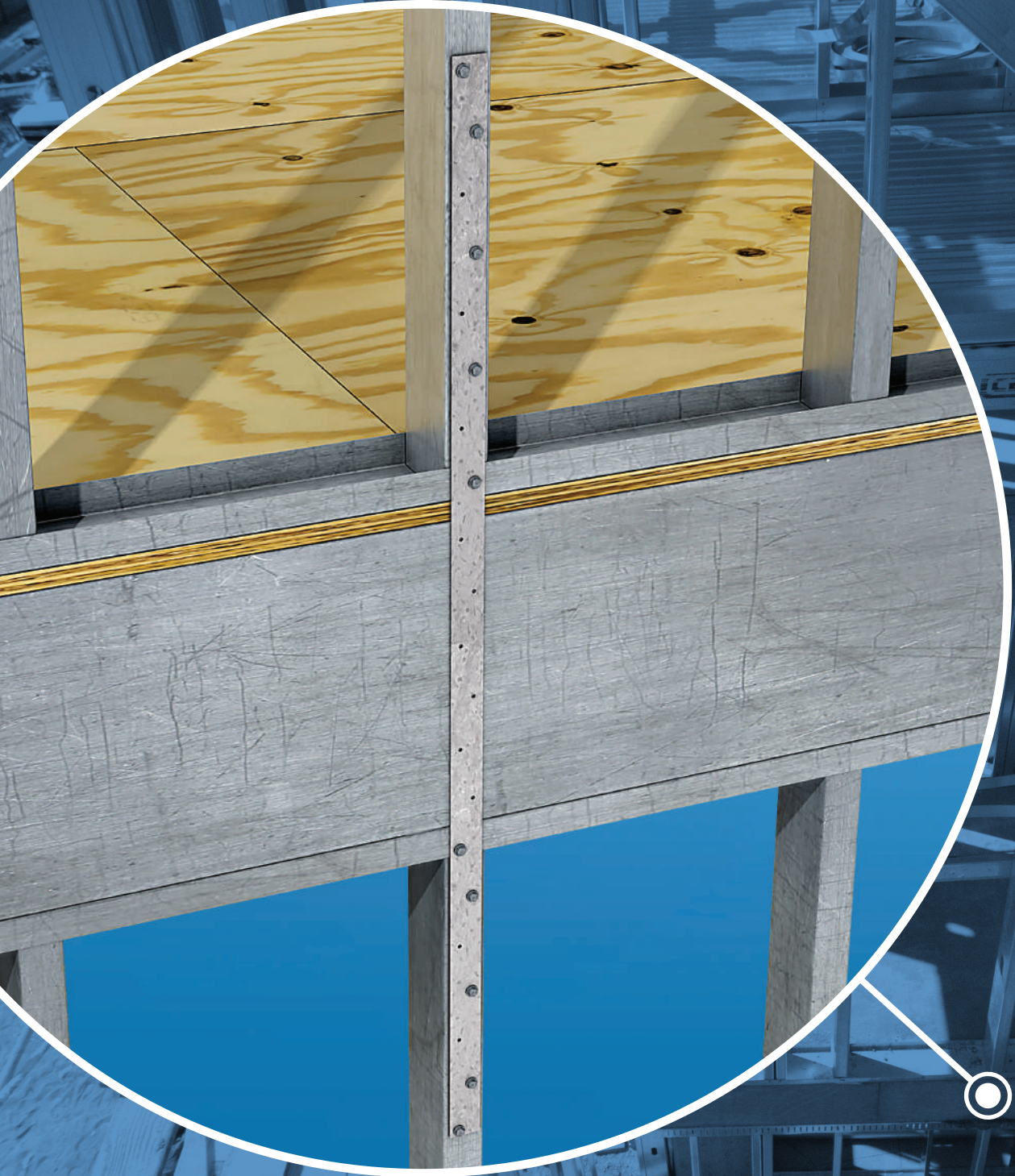
| Model No. | Fasteners ³ | | Allowable Load 43 mil (18 ga.) (lb.) | | | | Code Ref. |
|-----------|------------------------|--------|--|----------------|------------------------------|----------------|-----------|
| | Top Track | Truss | Without Gap ¹ | | With 1 1/4" Gap ² | | |
| | | | F ₁ | F ₄ | F ₁ | F ₄ | |
| S/HTC4 | (4) #8 | (3) #8 | 320 | 460 | 85 | 175 | — |

1. Truss or rafter must be bearing on top plate to achieve the allowable loads under "Without Gap."
2. Installed with maximum 1 1/4" space between rafter or truss and top plate under "With 1 1/4" Gap."
Where loads are not required, space is not limited to 1 1/4".
3. See the current *Fastening Systems* catalog at strongtie.com for more information on Simpson Strong-Tie fasteners.



Typical S/HTC4 Installation

Lateral Connectors, Ties and Straps



HRS/ST/FHA/PS/LSTA/LSTI/MST/MSTA/MSTC/MSTI Strap Ties

Straps are load rated and provide the correct thickness and number of fasteners the specifier is looking for compared with field fabricated straps.

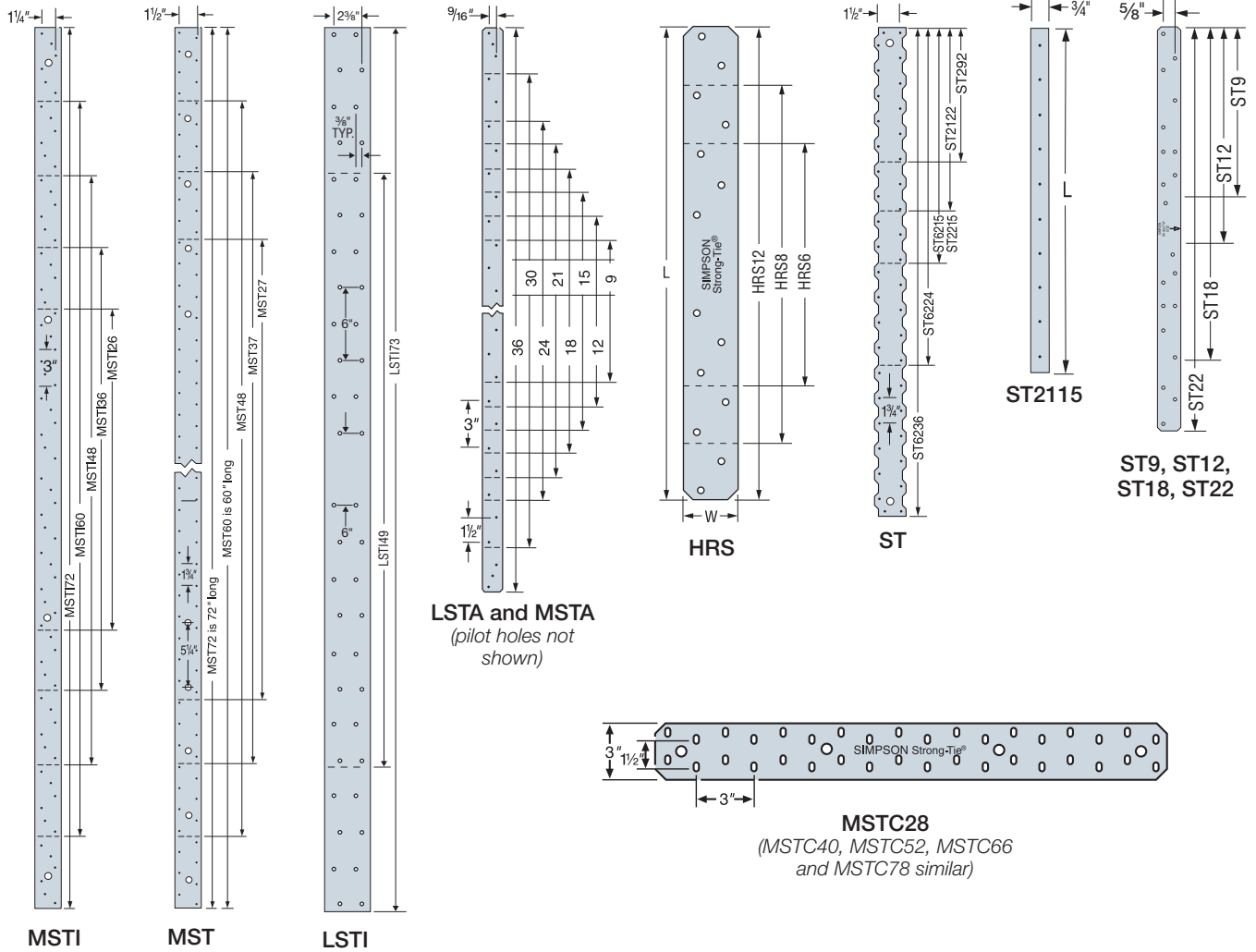
Install strap ties where top or bottom plates are cut, at wall intersections, and as ridge ties. Reduce the allowable load based on the size and quantity of fasteners used.

Refer to applicable code for minimum edge and end distances.

Finish: PS — hot-dip galvanized (HDG); all others — galvanized. Some products are available in stainless steel or ZMAX®; see Corrosion Information, pp. 19–23.

Installation: Use all specified fasteners; see General Notes

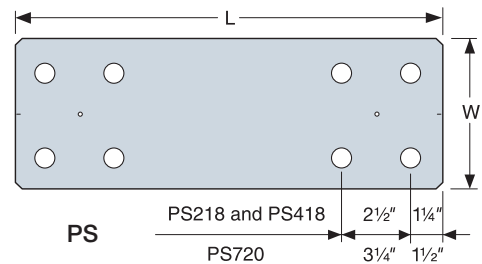
Codes: See p. 13 for Code Reference Key Chart



C-CF-2023 © 2023 SIMPSON STRONG-TIE COMPANY INC.

Lateral Connectors, Ties and Straps

| Model No. | Connector Material Thickness mil (ga.) | Dimensions (in.) | | Bolts | | Code Ref. |
|-----------|--|------------------|----|----------|----------------|-----------|
| | | W | L | Quantity | Diameter (in.) | |
| PS218 | 171 (7) | 2 | 18 | 4 | 3/4 | — |
| PS418 | | 4 | 18 | 4 | 3/4 | |
| PS720 | | 6 3/4 | 20 | 8 | 1/2 | |



1. PS strap design loads must be determined by the designer for each illustration. Hole diameter in the part may be oversized to accommodate the HDG. Designer must determine if the oversize creates an unacceptable installation.

HRS/ST/FHA/PS/LSTA/LSTI/MST/MSTA/MSTC/MSTI Strap Ties

Codes: See p. 13 for Code Reference Key Chart

These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

| Model No. | Connector Material Thick. mil (ga.) | Dimensions (in.) | | Fasteners ⁴ (Total) | | | Allowable ASD Tension Load (lb.) | | | Code Ref. |
|-----------|-------------------------------------|------------------|------|--------------------------------|-----------------|-----------------|----------------------------------|-----------------|-----------------|-------------|
| | | | | Rafter/Stud/Joist Thickness | | | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | |
| | | W | L | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | | | | |
| LSTA9 | 33 (20) | 1 ¼ | 9 | (8) #10 | (8) #10 | (8) #10 | 705 | 1,120 | 1,190 | IBC, FL, LA |
| LSTA12 | | 1 ¼ | 12 | (10) #10 | (10) #10 | (8) #10 | 885 | 1,190 | 1,190 | |
| LSTA15 | | 1 ¼ | 15 | (12) #10 | (12) #10 | (10) #10 | 1,060 | 1,190 | 1,190 | |
| LSTA18 | | 1 ¼ | 18 | (14) #10 | (12) #10 | (10) #10 | 1,190 | 1,190 | 1,190 | |
| LSTA21 | | 1 ¼ | 21 | (14) #10 | (12) #10 | (10) #10 | 1,190 | 1,190 | 1,190 | |
| LSTA24 | | 1 ¼ | 24 | (14) #10 | (12) #10 | (10) #10 | 1,190 | 1,190 | 1,190 | |
| ST292 | | 2 ⅙ | 9 ⅝ | (12) #10 | (10) #10 | (10) #10 | 1,060 | 1,240 | 1,240 | |
| ST2122 | | 2 ⅙ | 12 ⅜ | (16) #10 | (12) #10 | (10) #10 | 1,415 | 1,502 | 1,502 | |
| ST2115 | | ¾ | 16 ⅝ | (8) #10 | (6) #10 | (4) #10 | 630 | 630 | 630 | |
| ST2215 | | 2 ⅙ | 16 ⅝ | (20) #10 | (14) #10 | (10) #10 | 1,765 | 1,825 | 1,825 | |
| LSTA30 | 43 (18) | 1 ¼ | 30 | (18) #10 | (12) #10 | (10) #10 | 1,555 | 1,555 | 1,555 | |
| LSTA36 | | 1 ¼ | 36 | (18) #10 | (16) #10 | (14) #10 | 1,555 | 1,555 | 1,555 | |
| LSTI49 | | 3 ¾ | 49 | (32) #10 | (32) #10 | (20) #10 | 2,830 | 4,050 | 4,050 | |
| LSTI73 | | 3 ¾ | 73 | (46) #10 | (32) #10 | (20) #10 | 4,050 | 4,050 | 4,050 | |
| MSTA9 | | 1 ¼ | 9 | (8) #10 | (8) #10 | (8) #10 | 705 | 1,050 | 1,555 | |
| MSTA12 | | 1 ¼ | 12 | (10) #10 | (10) #10 | (8) #10 | 885 | 1,315 | 1,555 | |
| MSTA15 | | 1 ¼ | 15 | (12) #10 | (12) #10 | (10) #10 | 1,060 | 1,555 | 1,555 | |
| MSTA18 | | 1 ¼ | 18 | (14) #10 | (12) #10 | (10) #10 | 1,235 | 1,555 | 1,555 | |
| MSTA21 | | 1 ¼ | 21 | (16) #10 | (12) #10 | (10) #10 | 1,415 | 1,555 | 1,555 | |
| MSTA24 | | 1 ¼ | 24 | (18) #10 | (12) #10 | (10) #10 | 1,555 | 1,555 | 1,555 | |

Table continued on the next page.

HRS/ST/FHA/PS/LSTA/LSTI/MST/MSTA/MSTC/MSTI Strap Ties

Codes: See p. 13 for Code Reference Key Chart

These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

| Model No. | Connector Material Thick. mil (ga.) | Dimensions (in.) | | Fasteners ⁴ (Total) | | | Allowable ASD Tension Load (lb.) | | | Code Ref. |
|-----------|-------------------------------------|------------------|------|--------------------------------|-----------------|-----------------|----------------------------------|-----------------|-----------------|-------------|
| | | | | Rafter/Stud/Joist Thickness | | | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | |
| | | W | L | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | | | | |
| MSTA30 | 54 (16) | 1 ¼ | 30 | (22) #10 | (16) #10 | (12) #10 | 1,945 | 1,950 | 1,950 | IBC, FL, LA |
| MSTA36 | | 1 ¼ | 36 | (24) #10 | (18) #10 | (16) #10 | 1,950 | 1,950 | 1,950 | |
| ST6215 | | 2 ½ | 16 ½ | (20) #10 | (16) #10 | (10) #10 | 1,765 | 2,025 | 2,025 | |
| ST6224 | | 2 ½ | 23 ½ | (28) #10 | (20) #10 | (12) #10 | 2,455 | 2,455 | 2,455 | |
| ST9 | | 1 ¼ | 9 | (8) #10 | (8) #10 | (8) #10 | 705 | 1,050 | 1,350 | |
| ST12 | | 1 ¼ | 11 ½ | (10) #10 | (10) #10 | (8) #10 | 885 | 1,315 | 1,350 | |
| ST18 | | 1 ¼ | 17 ¾ | (14) #10 | (12) #10 | (12) #10 | 1,235 | 1,350 | 1,350 | |
| ST22 | | 1 ¼ | 21 ½ | (20) #10 | (20) #10 | (20) #10 | 1,350 | 1,350 | 1,350 | |
| MSTC28 | | 3 | 28 ¼ | (36) #10 | (36) #10 | (30) #10 | 3,180 | 4,600 | 4,600 | |
| MSTC40 | | 3 | 40 ¼ | (52) #10 | (46) #10 | (46) #10 | 4,595 | 4,600 | 4,600 | |
| MSTC52 | | 3 | 52 ¼ | (54) #10 | (42) #10 | (42) #10 | 4,600 | 4,600 | 4,600 | |
| MSTC66 | | 68 (14) | 3 | 65 ¾ | (66) #10 | (46) #10 | (30) #10 | 5,795 | 5,795 | |
| MSTC78 | 3 | | 77 ¾ | (66) #10 | (46) #10 | (30) #10 | 5,795 | 5,795 | 5,795 | |
| ST6236 | 2 ½ | | 33 ¾ | (40) #10 | (30) #10 | (18) #10 | 3,535 | 3,760 | 3,760 | |
| HRS6 | 97 (12) | 1 ¾ | 6 | (6) #10 | (6) #10 | (6) #10 | 530 | 790 | 1,600 | — |
| HRS8 | | 1 ¾ | 8 | (10) #10 | (10) #10 | (10) #10 | 885 | 1,315 | 2,670 | |
| HRS12 | | 1 ¾ | 12 | (14) #10 | (14) #10 | (12) #10 | 1,235 | 1,840 | 2,710 | |
| MSTI26 | | 2 ½ | 26 | (26) #10 | (26) #10 | (22) #10 | 2,300 | 3,420 | 5,025 | |
| MSTI36 | | 2 ½ | 36 | (36) #10 | (36) #10 | (22) #10 | 3,180 | 4,735 | 5,025 | |
| MSTI48 | | 2 ½ | 48 | (48) #10 | (40) #10 | (22) #10 | 4,240 | 5,025 | 5,025 | |
| MSTI60 | | 2 ½ | 60 | (58) #10 | (40) #10 | (22) #10 | 5,025 | 5,025 | 5,025 | |
| MST27 | | 2 ½ | 27 | (30) #10 | (30) #10 | (22) #10 | 2,650 | 3,945 | 5,025 | |
| MST37 | | 2 ½ | 37 | (42) #10 | (40) #10 | (34) #10 | 3,710 | 5,025 | 5,025 | |
| MST48 | | 2 ½ | 48 | (54) #10 | (54) #10 | (46) #10 | 4,770 | 5,155 | 5,155 | |
| MST60 | 118 (10) | 2 ½ | 60 | (68) #10 | (68) #10 | (62) #10 | 5,820 | 6,420 | 6,650 | |
| MST72 | | 2 ½ | 72 | (80) #10 | (72) #10 | (64) #10 | 6,650 | 6,650 | 6,650 | |

1. Use half of the fasteners in each member being connected to achieve the listed loads.

2. Loads are based on lesser of steel capacity or fastener calculation.

3. Not all fastener holes need to be filled, as additional fastener holes are provided. Install fasteners symmetrically.

4. See the current *Fastening Systems* catalog on strongtie.com for more information on Simpson Strong-Tie fasteners.

CS/CMST Coiled Straps

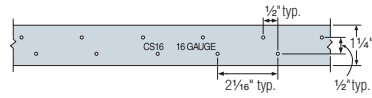
CMSTC provides countersunk fastener slots that provide a lower screw head profile. CS, CMST and CMSTC are continuous utility straps which can be cut to length on the jobsite. Packaged in lightweight cartons (about 40 lb.).

Finish: Galvanized. Some products available in ZMAX® coating; see Corrosion Information, pp. 19–23.

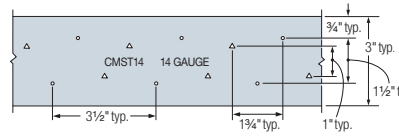
Installation:

- Use all specified fasteners; see General Notes.
- Refer to the applicable code for minimum edge and end distances.
- The table shows the maximum allowable loads and the screws required to obtain them. See footnote #1. Fewer screws may be used; reduce the allowable load by the code lateral load for each fastener subtracted from each end.

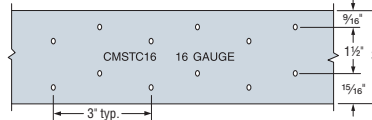
Codes: See p. 13 for Code Reference Key Chart



CS16 Hole Pattern
(all other CS straps similar)

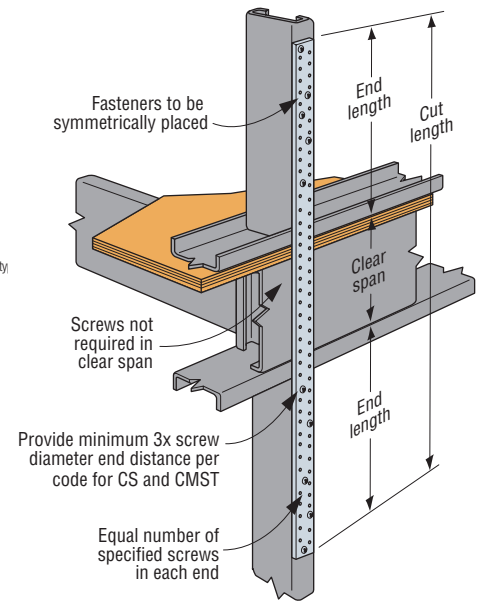


CMST14 Hole Pattern
(CMST12 similar)



CMSTC16 Hole Pattern

Gauge stamped on part for easy identification.



Typical CS Installation as a Floor-to-Floor Tie

These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

| Model No. | Total Length | Connector Material Thickness mil (ga.) | Width (in.) | Fasteners ⁸ (Total) | | | Allowable Tension Load (lb.) | Code Ref. |
|----------------------|--------------|--|-------------|--------------------------------|-----------------|-----------------|---|-------------|
| | | | | Rafter/Stud Thickness | | | | |
| | | | | 33 mil (20 ga.) | 43 mil (18 ga.) | 54 mil (16 ga.) | 33 mil (20 ga.) 43 mil (18 ga.) 54 mil (16 ga.) | |
| CMST12 ² | 40'–3" | 97 (12) | 3 | (104) #10 | (70) #10 | (40) #10 | 9,080 | IBC, FL, LA |
| CMST14 ² | 52'–6" | 68 (14) | 3 | (72) #10 | (50) #10 | (28) #10 | 6,365 | |
| CMSTC16 ³ | 54' | 54 (16) | 3 | (54) #10 | (36) #10 | (30) #10 | 4,600 | |
| CS14 | 100' | 68 (14) | 1 1/4 | (28) #10 | (18) #10 | (12) #10 | 2,305 | |
| CS16 | 150' | 54 (16) | 1 1/4 | (18) #10 | (12) #10 | (8) #10 | 1,550 | |
| CS20 | 250' | 33 (20) | 1 1/4 | (12) #10 | (8) #10 | (6) #10 | 945 | |

1. Use half of the fasteners in each member being connected to achieve the listed loads.
2. For CMST straps: End Length (inches) = 1/2 total fasteners x 7/8" + 1" when all holes filled. Double length if only round holes filled.
3. For CMSTC16 straps: End Length (inches) = 1/2 total fasteners x 3/4" + 1" when all holes filled. Double length if only round holes filled.
4. For CS straps: End Length (inches) = 1/2 total fasteners + 1".
5. Total Cut Length = End Length + Clear Span + End Length.
6. Calculate the connector value for a reduced number of screws as follows: Allowable Load = $\frac{\text{No. of Screws Used}}{\text{No. of Screws in Table}} \times \text{Table Load}$

Example: CMSTC16 on 54 mil with 24 screws: $\frac{24 \text{ Screws (Used)}}{30 \text{ Screws (Table)}} \times 4,600 \text{ lb.} = 3,680 \text{ lb.}$

7. Loads are based on lesser of steel strap capacity and AISI S100 fastener calculation.
8. See the current *Fastening Systems* catalog on strongtie.com for more information on Simpson Strong-Tie fasteners.

LTP5 Framing Anchor

The LTP5 framing anchor spans subfloor at the top of the blocking or rim joist. The embossments enhance performance and allow for design flexibility.

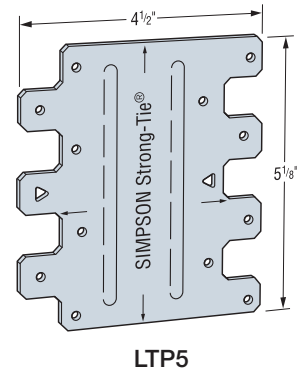
Material: 33 mil (20 ga.)

Finish: Galvanized

Installation:

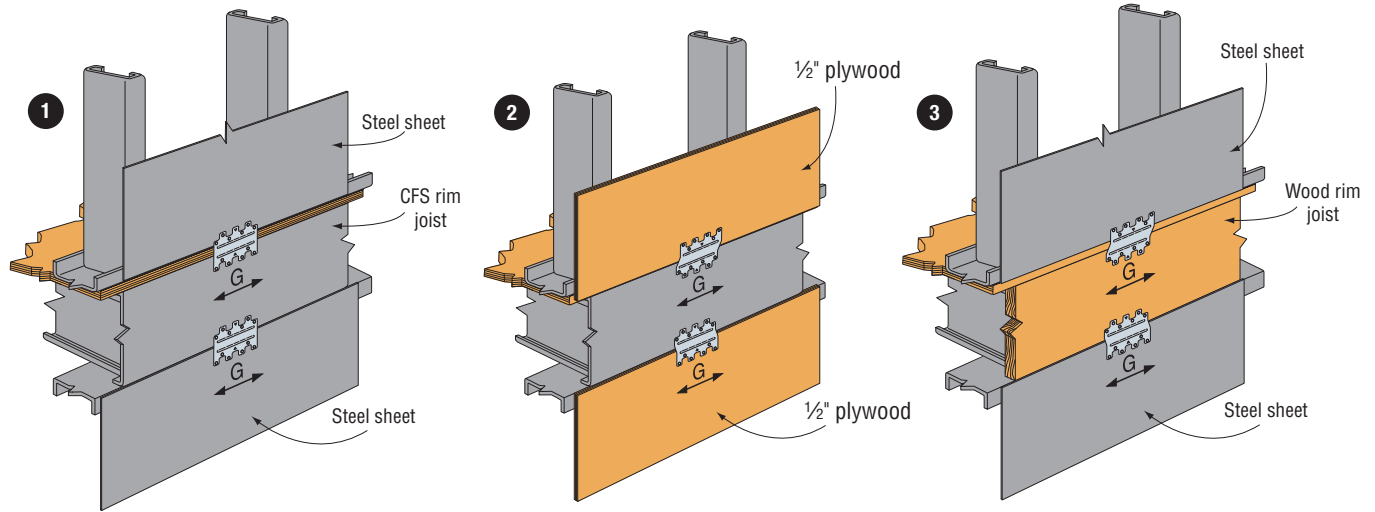
- Use all specified fasteners; see General Notes

Codes: See p. 13 for Code Reference Key Chart



| Model No. | Type of Connection | Direction of Load | Fasteners ⁴ | | Allowable Load 43 mil (18 ga.) (lb.) | Code Ref. |
|-----------|--------------------|-------------------|------------------------|------------------------|--|----------------|
| | | | To Rim Joist | To Sheathing and Track | | |
| LTP5 | 1 | G | (7) #10 | (7) #10 | 1,045 | IBC, FL, LA |
| | 2 | | (7) #10 | (7) #10 | 1,110 | |
| | 3 | | (7) 8d x 1 1/2" | (7) #10 | 730 | |

1. Allowable loads are for one anchor.
2. Allowable loads are based on steel (stud and sheet) of 43 mil (18 ga.) minimum.
3. Allowable load for Type 3 connection assumes $C_D = 1.60$.
4. See the current *Fastening Systems* catalog on strongtie.com for more information on Simpson Strong-Tie fasteners.



Note: When attaching an LTP5 framing anchor over sheathing, the screws must penetrate and engage the steel framing. A minimum of three threads shall penetrate past the steel.

Lateral Systems



Steel Strong-Wall® Shearwalls

Features and Benefits:

Code Listed

New ICC-ES ESR-1679 code report evaluated to the 2021 IRC/IBC

Less Labor = Increased Production

Fewer anchor bolts and fasteners coupled with easy access to the top and bottom of the wall result in more efficient installation

Easier for All Trades

An easy-to-use anchor-bolt template for concrete contractors; available pre-attached CFS studs and predrilled holes where electricians need them for wiring

Support and Service

Simpson Strong-Tie provides the best engineering technical support and experienced field representation available

Codes: ICC-ES ESR-1679; City of L.A. RR25625; State of Florida FL5113

Please visit strongtie.com/products/lateral-systems for load tables, structural details and anchorage information.

Also refer to the General Notes on pp. 7–9 in the *Strong-Wall® Shearwalls* catalog (C-L-SW21) at strongtie.com for Important Information and General Notes.



Strong-Wall Shearwall Selector Application

This application helps design professionals select an appropriate Simpson Strong-Tie Steel Strong-Wall, Strong-Wall wood shearwall or original wood Strong-Wall system.

Optimized Solution

Provides the most cost-effective Strong-Wall solution based on the input shear load.

Manual Solution

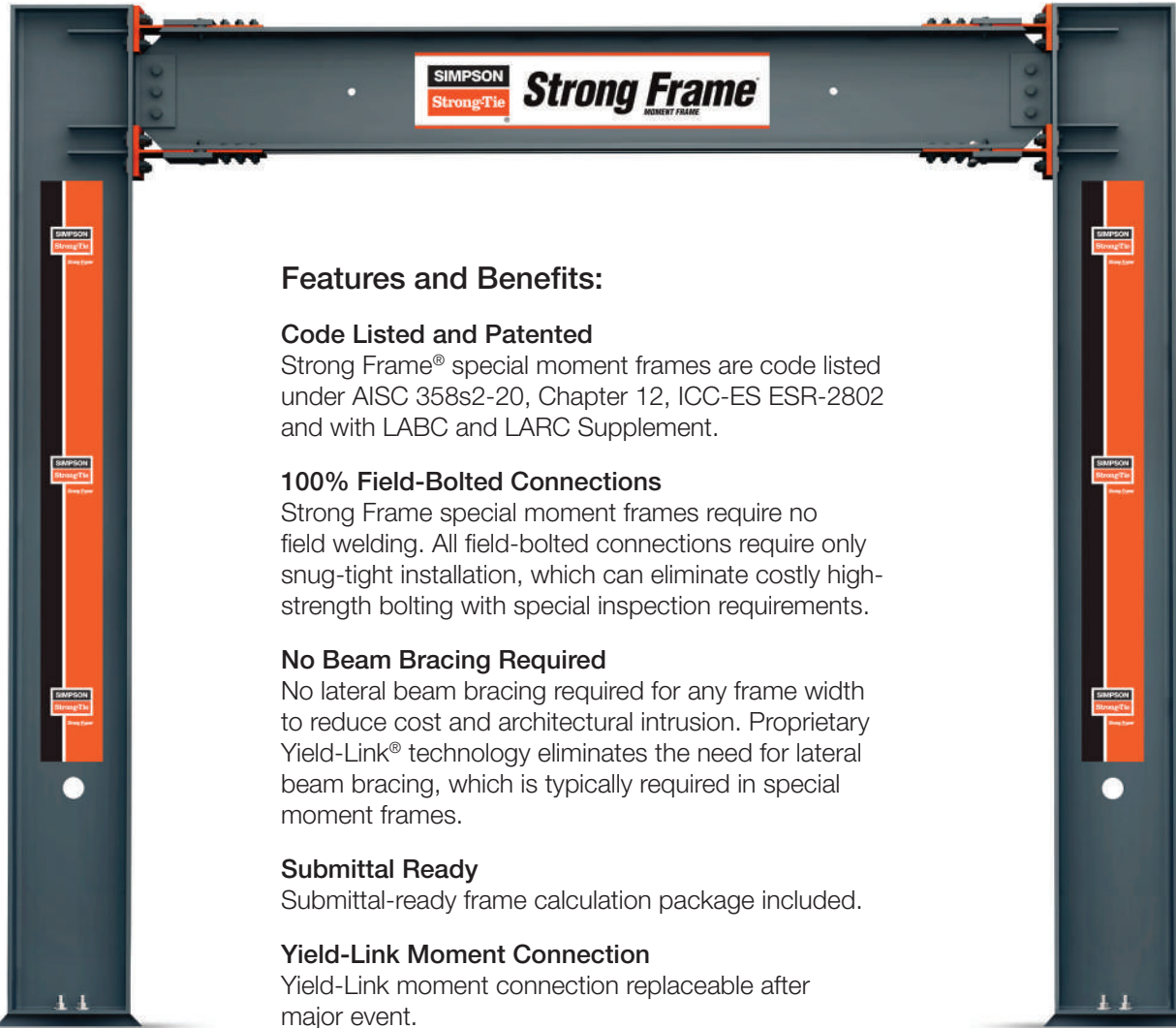
Allows designers to choose which type and number of walls meet their requirements.

- Finds lowest cost solution
- Provides actual drift and uplift values
- Provides solutions for different model Codes
- Includes new anchorage solutions
- Saves, exports and prints solutions

You can find the Strong-Wall Shearwall Selector application at strongtie.com/webapps/strongwallshearwallselector.



Strong-Frame® Special Moment Frames



Features and Benefits:

Code Listed and Patented

Strong Frame® special moment frames are code listed under AISC 358s2-20, Chapter 12, ICC-ES ESR-2802 and with LABC and LARC Supplement.

100% Field-Bolted Connections

Strong Frame special moment frames require no field welding. All field-bolted connections require only snug-tight installation, which can eliminate costly high-strength bolting with special inspection requirements.

No Beam Bracing Required

No lateral beam bracing required for any frame width to reduce cost and architectural intrusion. Proprietary Yield-Link® technology eliminates the need for lateral beam bracing, which is typically required in special moment frames.

Submittal Ready

Submittal-ready frame calculation package included.

Yield-Link Moment Connection

Yield-Link moment connection replaceable after major event.

Preinstalled CFS Nailer

Preinstalled CFS nailer attached for frames supplied by Simpson Strong-Tie.

Support and Service

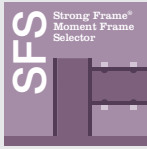
Frame design service included. Field support for Strong Frame installations and questions.

Codes: ICC-ES ESR-2802, AISC 358s2-20 Chapter 12

Please visit strongtie.com/products/lateral-systems for structural details and anchorage information.

Refer to flier F-L-SF at strongtie.com for additional information.

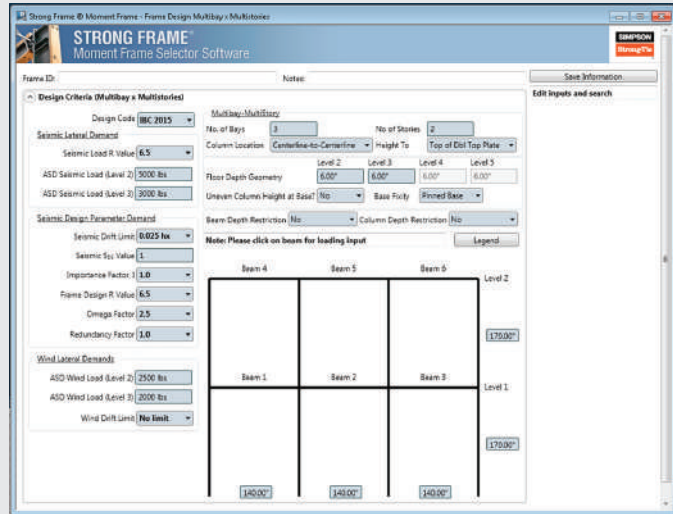
Strong-Frame® Special Moment Frames



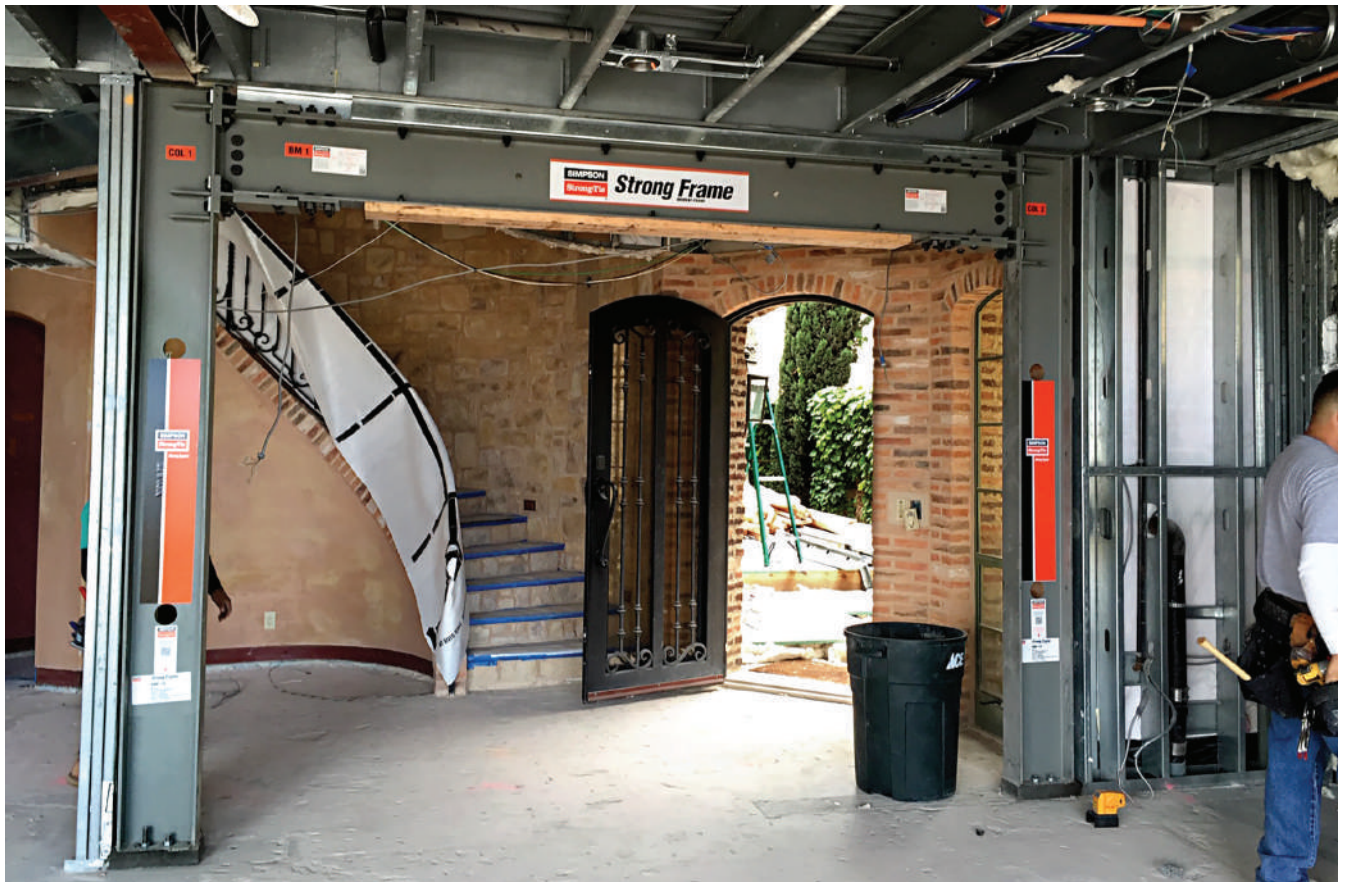
Strong Frame Moment Frame Selector Software

The Simpson Strong-Tie® Strong Frame moment frame selector software is designed to help designers select a moment frame for their project's given geometry and loading. Only minimal geometry inputs are required for the software to select an appropriate frame for the available space. Based on input geometry, the selector software will design and narrow down the available standard frames to a handful of possible solutions. If opening dimensions are outside our range of standard frame sizes, designers can enter the specific opening dimensions, and the software will provide a list of customized solutions.

Designers can also input load and geometries for multi-bay and multi-story frames and email to Simpson Strong-Tie for design assistance.



Visit strongtie.com/software for more information.



Miscellaneous



3"
Off

PSPNZ Protecting Shield Plate

PSPN58Z and PSPN516Z protecting shield plate fastener stoppers meet IRC, IBC and the International Plumbing Code. PSPN516Z meets the code plumbing protection requirements as well as having additional fasteners if the designer chooses to use it as a track splice strap.

Material: 54 mil (16 ga.)

Finish: ZMAX® coating

Installation:

- Flatten prongs with hammer as needed
- Use #10 screws

Codes: See p. 13 for Code Reference Key Chart

PSPN516Z at top plates

- International Residential Code® — 2015/2018 P2603.2.1
- International Plumbing Code — 2015/2018 305.6

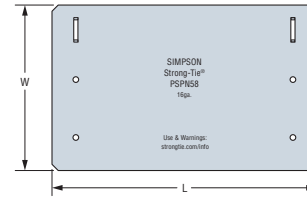
PSPN516Z at bottom plate.

- International Plumbing Code — 2015/2018 305.6

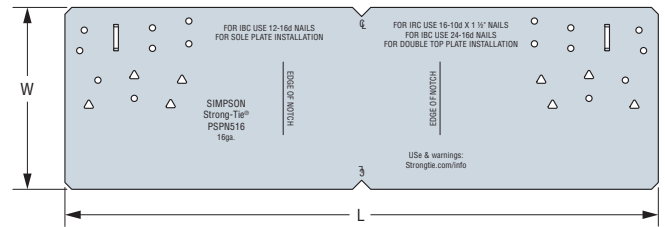
PSPN58Z at top plates and bottom plate.

- International Plumbing Code — 2015/2018 305.6

Note that the IBC section 2308.5.8 (2018 IBC) and 2308.5.7 (2015 IBC) and the IRC section R602.6.1 require a 54 mil (16 ga.) strap with (6) 16d nails and (8) 16d nails respectively each side at a hole or notch in a wood top, sill or sole plate. The designer or local building jurisdiction may permit an equivalent fastener strength (e.g., screws in lieu of nails) to be used for the same condition in a CFS top or bottom track.



PSPN58Z

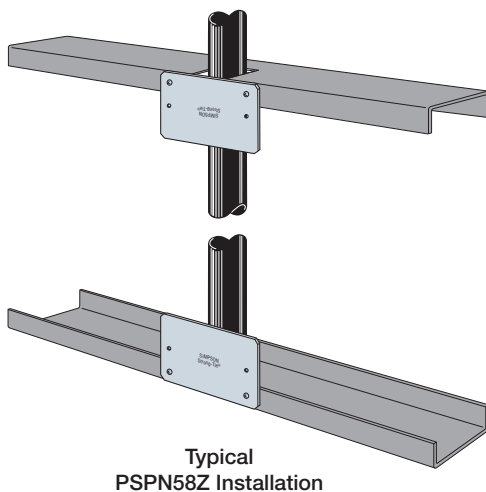


PSPN516Z

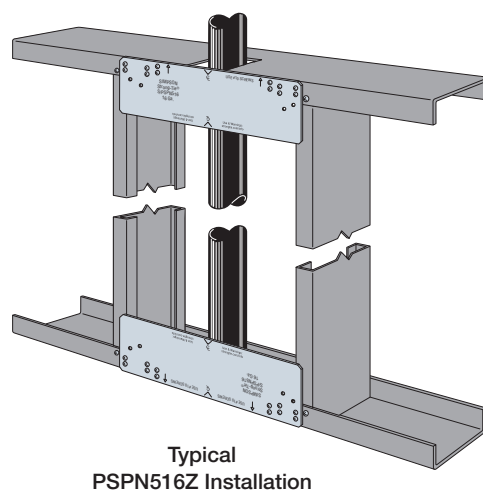
For more information, see pp. 19–23.

| Model No. | W (in.) | L (in.) | Code Ref. |
|-----------|---------|---------------------------------|-----------|
| PSPN58Z | 5 | 8 | — |
| PSPN516Z | 5 | 16 ⁵ / ₁₆ | |

1. #10 self-tapping screws may be used to attach PSPNZ to CFS framing with quantity determined by designer.
2. PSPN516Z with (6) #10 self-tapping screws each side achieves an allowable shear capacity of 1,060 lb. and 1,580 lb. to 33 mil (20 ga.) track and to 43 mil (18 ga.) track, respectively.



Typical PSPN58Z Installation



Typical PSPN516Z Installation

Simpson Strong-Tie Limited Warranty

Effective Date: March 18, 2021

This Limited Warranty applies to all Simpson Strong-Tie products ("Products") purchased after the Effective Date while this Limited Warranty remains in effect, other than those Simpson Strong-Tie products that have a separate Limited Warranty applicable to such products. For purchases after the Effective Date, please consult strongtie.com/limited-warranties, as this Limited Warranty may be updated by Simpson from time to time. All future purchases of Products are subject to the terms of the Limited Warranty in effect as of the purchase date.

This Limited Warranty must be read in conjunction with all applicable General Notes, General Instructions for the Installer, General Instructions for the Designer, Building Codes, Corrosion Information, and Terms & Conditions of Sale, along with any other information or specifications published by Simpson Strong-Tie Company Inc. ("Simpson") or available on the strongtie.com website ("Website") or on the product package, label or product manual. All of this information is referred to collectively as the "Simpson Strong-Tie Documentation." All applicable Simpson Documentation must be carefully reviewed each time any Product is used.

Simpson Strong-Tie warrants, to the original purchaser only, that each Product will be free from substantial defects in materials, manufacturing and design if properly specified, installed, and maintained, and when used in accordance with the design limits and the structural, technical, and environmental specifications in the Simpson Strong-Tie Documentation. This Limited Warranty is void and does not apply to any (a) Product purchased from an unauthorized dealer, retailer or distributor, (b) Product deterioration or damage due to environmental conditions or inadequate or improper handling, transportation, storage or maintenance, (c) cosmetic defects, including discoloration, (d) failure or damage caused by improper installation, application, mixing or preparation, (e) use of a Product in temperatures or environmental conditions outside the ranges specified for such Product in the Simpson Strong-Tie Documentation, (f) use of a Product outside of its shelf-life specifications, (g) normal wear and tear, (h) failure or damage caused by the use of a Product with any fasteners, pins, screwstrips, products or accessories other than authentic Simpson Strong-Tie products, (i) Product that was subjected to negligence or excessive or improper use, including any use not in accordance with the Simpson Strong-Tie Documentation, (j) failure or damage caused by the building site, foundation, or any third-party products, building materials or components, (k) failure or damage caused by use of a Product in a structure that has a design or other defect or that does not comply with all applicable building codes, laws, rules and regulations, (l) modified Product, or any nonstandard use or application of a Product, (m) failure or damage caused by corrosion, termites or other wood destroying organisms, animal or insect activity, wood fungal decay, rot, mold, mildew, exposure to chemicals or other hazardous substances, a corrosive environment or materials, inadequate moisture protection, or premature deterioration of building materials, (n) failure or damage caused by an act of God, including any hurricane, earthquake, tornado, lightning, ice, snow, high wind, flood or other severe weather or natural phenomena, (o) installation services or workmanship, including any failure or damage caused by installation of any Product, whether or not in accordance with the Simpson Strong-Tie Documentation, or (p) failure or damage caused by the gross negligence, willful misconduct, or other acts or omissions of the builder, general contractor, installer or any third party, including the building owner. Notwithstanding the foregoing, Simpson Strong-Tie disclaims and does not provide any warranty related to the design of any custom-order or non-catalog Product.

Although Products are designed for a wide variety of uses, Simpson Strong-Tie assumes no liability for confirming that any Product is appropriate for an intended use, and each intended use of a Product must be reviewed and approved by qualified professionals. Each Product is designed for the load capacities and uses listed in the Simpson Strong-Tie Documentation, subject to the limitations and other information set forth in the Simpson Strong-Tie Documentation.

Due to the particular characteristics of potential impact events such as earthquakes and high velocity winds, the specific design and location of the structure, the building materials used, the quality of construction, or the condition of the soils or substrates involved, damage may nonetheless result to a structure and its contents even if the loads resulting from the impact event do not exceed Simpson Strong-Tie's specifications and the Products are properly installed in accordance with applicable building codes, laws, rules and regulations.

Product demonstrations, training, operator examinations, technical and customer support and other services provided by Simpson Strong-Tie are based on Simpson Strong-Tie's present knowledge and experience, are

conducted for illustrative or instructive purposes only, do not constitute a warranty of Product capabilities, specifications or installation and do not modify the applicable Limited Warranty for Products set forth herein. Any services provided by Simpson Strong-Tie are provided without any representation or warranty of any kind, and Simpson Strong-Tie assumes no liability for any representations or statements made as part of such Product demonstrations, training, operator examinations or other services. In the event of any inconsistency between any information provided during any such demonstration or service, and the information in any applicable Simpson Strong-Tie Documentation, the information in the Simpson Strong-Tie Documentation shall govern. In the event of any inconsistency between any information provided on the Website, and the information in any other Simpson Strong-Tie Documentation, the information on the Website shall govern.

ALL WARRANTY OBLIGATIONS OF SIMPSON STRONG-TIE SHALL BE LIMITED, AT SIMPSON STRONG-TIE'S ABSOLUTE DISCRETION, TO EITHER REPAIRING THE DEFECTIVE PRODUCT OR PROVIDING A REPLACEMENT FOR THE DEFECTIVE PRODUCT. THIS REMEDY CONSTITUTES SIMPSON STRONG-TIE'S SOLE OBLIGATION AND LIABILITY AND THE SOLE AND EXCLUSIVE REMEDY OF PURCHASER AND, WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, EXCLUDES ANY LABOR OR OTHER COSTS INCURRED IN CONNECTION WITH A WARRANTY CLAIM. PURCHASER ASSUMES ALL RISK AND LIABILITY ASSOCIATED WITH ANY USE OF THE PRODUCT, INCLUDING BUT NOT LIMITED TO SUITABILITY FOR ITS INTENDED USE.

THE LIMITED WARRANTY HEREIN IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, AND, WHERE LAWFUL, SIMPSON STRONG-TIE DISCLAIMS ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND WARRANTIES ARISING FROM COURSE OF PERFORMANCE, COURSE OF DEALING OR TRADE USAGE. IN NO EVENT WILL SIMPSON STRONG-TIE BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR SPECIAL DAMAGES OR DIRECT OR INDIRECT LOSS OF ANY KIND, INCLUDING BUT NOT LIMITED TO PROPERTY DAMAGE, DEATH AND PERSONAL INJURY. SIMPSON STRONG-TIE'S ENTIRE LIABILITY IS LIMITED TO THE PURCHASE PRICE OF THE DEFECTIVE PRODUCT. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

To obtain warranty service, you must contact Simpson Strong-Tie promptly at (800) 999-5099 or at Simpson Strong-Tie Company Inc., 5956 West Las Positas Boulevard, Pleasanton, CA 94588, regarding any potential claim, no later than sixty (60) days after you discover the potential claim. Upon request by Simpson Strong-Tie, you must provide Simpson Strong-Tie with: (a) proof of purchase and written records evidencing, in reasonable detail, the date and manner of installation, application, mixing and preparation of the Products, as applicable, (b) a reasonable opportunity to inspect the site where the Product was installed, and (c) samples of the Products from the actual installation in sufficient quantities in order for Simpson Strong-Tie to perform testing to determine whether or not the Product failed as set forth herein. Simpson Strong-Tie may, in its absolute discretion, request that you return the allegedly defective Products to Simpson Strong-Tie, in which case Simpson Strong-Tie will issue a Return Materials Authorization (RMA), which must be completed and returned to Simpson Strong-Tie with the Product. Simpson Strong-Tie is not responsible for any costs or expenses incurred in connection with any inspection (other than by Simpson Strong-Tie employees) or in connection with the return of Products to Simpson Strong-Tie, but Simpson Strong-Tie shall bear all costs and expenses incurred in connection with the shipment of replacement Products in the event that Simpson Strong-Tie determines that the Product should be replaced in accordance with this Limited Warranty. If Simpson Strong-Tie elects to repair or replace the Product, Simpson Strong-Tie shall have a reasonable time to do so.

No one is authorized to change or add to this Limited Warranty. If at any time Simpson Strong-Tie does not enforce any of the terms, conditions or limitations stated in this Limited Warranty, Simpson Strong-Tie shall not have waived the benefit of said term, condition or limitation and can enforce it at any time. This Limited Warranty is extended only to the original purchaser and is not transferrable. It is not intended nor shall it be construed to create rights in any third party.

A wood-backing CFS connector with proven strength and stiffness.



Introducing the WBAC wood-backing steel connector from Simpson Strong-Tie

— a stronger, easier solution for connecting wood backing to cold-formed steel studs. Ideal for heavy wall hangings like cabinets and shelves in commercial or midrise structures, the WBAC has unique rolled tabs that are assembly tested and proven to provide extra strength and stiffness. And with our nationwide distribution network and reliable product availability, you can be confident builders can always get the connector you specify.

For more information, visit go.strongtie.com/wbac or call us at (800) 999-5099.

SIMPSON
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For more information on the WBAC connector, see p. 160.

A complete line of CFS solutions designed to optimize any CFS design.

We offer a comprehensive line of products and systems that are load rated for superior strength and performance. And they're proven with extensive assembly testing both in the lab and in the field. Not to mention value engineered for easy, efficient installation. Along with our unsurpassed product range, we also offer state-of-the-art software to streamline accurate member-connector analysis and design according to precise AISI specifications. Whether you need products or design, solving your structural problems is our passion.

