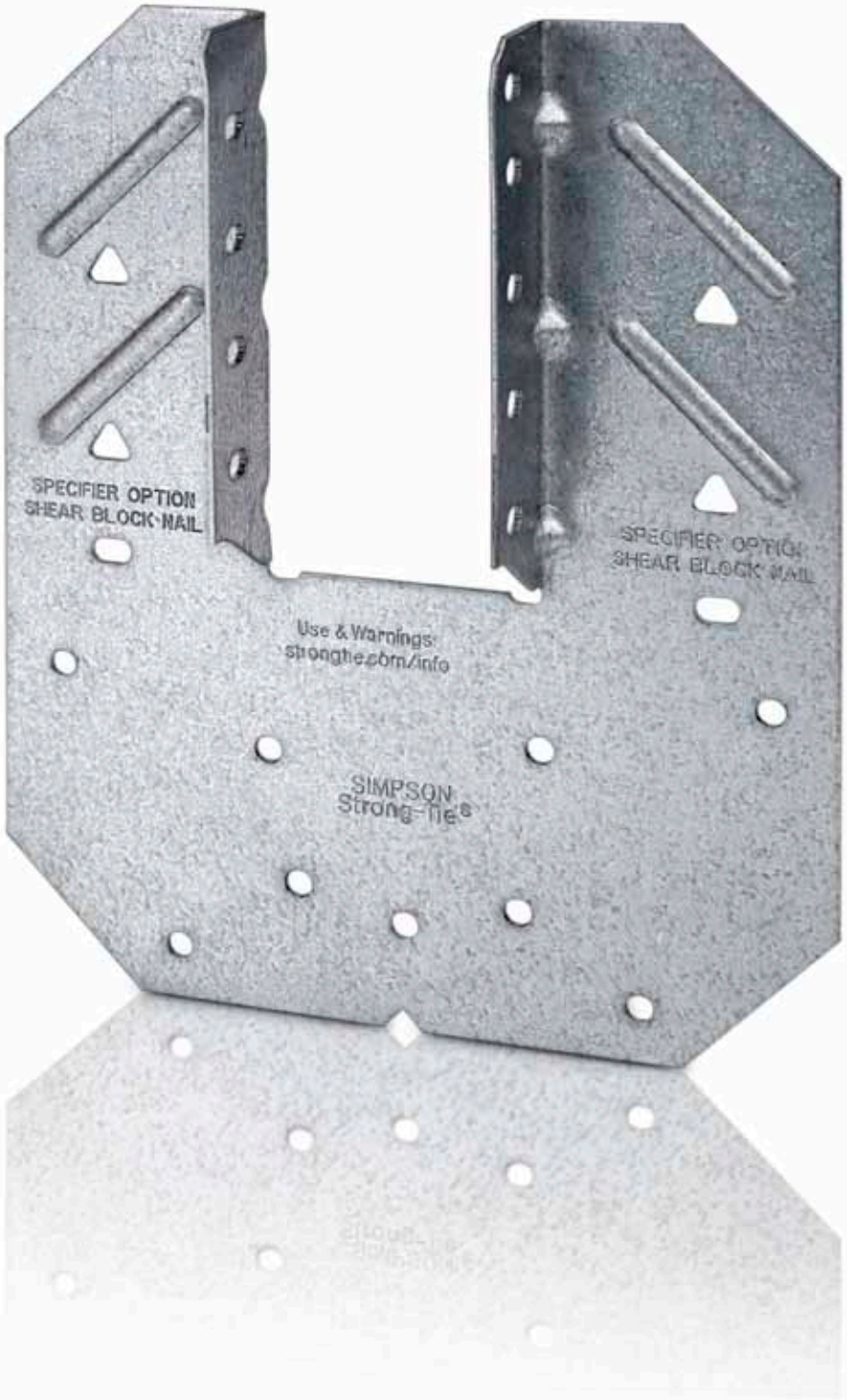
SIMPSON
Strong-Tie
®

HIGH WIND-RESISTANT CONSTRUCTION

C-HW12



(800) 999-5099
www.strongtie.com

In The Specs
On The Job

At Your Service™

We help people build safer structures economically. At Simpson Strong-Tie, this statement doesn't refer to structures built in a vacuum or on paper. We know that structures are built in earthquake regions, in tornado regions, and in hurricane regions. In order for Designers to address these real-world scenarios, they need products and systems designed to address the specific challenges each natural phenomenon presents. Our continued commitment to those who specify, install, and rely on our products is reflected in this *High Wind-Resistant Construction* catalog.

For more information, please call 800-999-5099 or visit **www.strongtie.com**

TABLE OF CONTENTS

Corrosion Information 7-8
Coatings Available 8
General Information 9-10
Fasteners 11-14
Uplift Load Path – Overview 10
Lateral Load Path – Overview 11
Truss/Rafter to Wood Double Top Plates 18
Girder/Truss to Wall Framing 19
I-Joists to Wall Framing 20
I-Joists to Masonry/Concrete 20
Embedded Truss/Rafter to Masonry/Concrete 21
Post Installed Truss/Rafter to Masonry/Concrete 22
Girder/Truss to Masonry/Concrete 23
Truss/Rafter Hip to Wall 24
Truss/Rafter Hip to End Wall 24
Truss/Rafter to Single Top Plate 25
Hollow Column Uplift 25
Truss/Rafter to Stud 26
Top Plates to Stud 27
Stud to Band Joist 28
Stud to Stud 29
Floor to Masonry/Concrete 30
Stud to Sill Plate 31
Sill Plate to Foundation 31
Header to Wall Framing 32
Alternative Wind Uplift Restraint System 33
SDWF-TUW 33
Stemwall/Crawlspace 34
Beam to Pier 35
Wall to Pile/Girder 36
Post/Column to Beam 37
Post/Columntofoundation 38
Post/Column to Foundation 39
Roof Boundary Connection 40
Lateral Load 40
Holdowns 41
Steel Strong-Wall® Shearwalls 42-43
Strong Frame™ Ordinary Moment Frame 43
Gable End to Wall Framing 44
Valley Truss to Roof Framing 45
Drag Strut Connection 45
Hanger Uplift Considerations 46
Load Path Installation Considerations 47-49
Software 50

HOW TO USE THIS CATALOG

The *High Wind-Resistant Construction* catalog (C-HW12) is a guide to assist Designers faced with challenging connections in high-wind regions. C-HW12 compiles technical data from the *Wood Construction Connectors* catalog (C-2011) to offer design solutions as well as installation details that create a load path resistant to increased uplift and lateral forces common to high-wind regions. These solutions and details are organized by framing condition rather than by metal connector group, and products are listed in order of increasing capacity. Unique to this catalog are condition-specific installation details, details showing multiple metal connectors in a single connection, as well as connectors used in non-traditional applications to satisfy challenging design conditions.

- **NEW PRODUCTS**
  New products are shown with the NEW! symbol. There are also many new sizes within existing model series.

EXTRA CORROSION PROTECTION
These icons identify products that are available with additional corrosion protection *(ZMAX®, hot-dip galvanized, stainless steel or the Simpson Strong-Tie® double-barrier coating).* Other products may also be available with additional protection, contact Simpson Strong-Tie for options. The model number suffix will indicate what type of extra corrosion protection is provided *(Z = ZMAX, HDG = hot-dip galvanized or SS = stainless steel).* See pages 7-8 for information on corrosion, and visit our website ***www.strongtie.com/info*** for more technical information on this topic.

STRONG-DRIVE® SD SCREW COMPATIBLE
This icon identifies products approved for installation with the Simpson Strong-Tie® Strong-Drive® SD structural connector screw. See pages 29-30 of the current *Wood Construction Connectors* catalog for more information.

This catalog reflects changes in the allowable loads and configurations of some Simpson Strong-Tie products. This catalog is effective until December 31, 2015, and supersedes all information in earlier publications, including catalogs, brochures, fliers, technical bulletins, etc. Use this edition as a current reference. Information on allowable loads and configurations is updated periodically. After December 31, 2015, contact Simpson Strong-Tie Company Inc. for the most current product information. Allowable loads in this catalog are for the described specific applications of properly-installed products. Product modifications, improper loading, installation procedures, or deviations from recommended applications will affect connector allowable load-carrying capacities.

INTRODUCTION

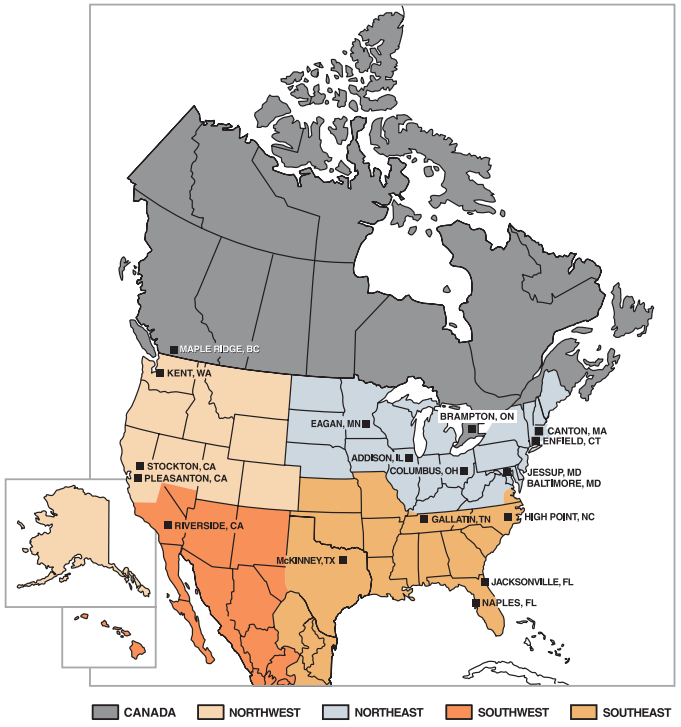
For more than 50 years, Simpson Strong-Tie has focused on creating structural products that help people build safer and stronger homes and buildings. A leader in structural systems research and technology, Simpson Strong-Tie is one of the largest suppliers of structural building products in the world. 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. Simpson Strong-Tie® product lines include:

- Structural connectors for wood and cold-formed-steel construction
- Strong-Wall® prefabricated shearwalls
- Strong Frame™ ordinary moment frames
- Rod systems for multi-story buildings
- Fastening systems including Quik Drive® auto-feed screw driving systems
- Simpson Strong-Tie® anchors and fasteners for concrete and masonry

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

The Simpson Strong-Tie "No Equal" pledge includes:

- Quality products value-engineered for the lowest installed cost at the highest rated performance levels
- Most thoroughly tested and evaluated products in the industry
- Strategically-located manufacturing and warehouse facilities
- National code agency listings
- Largest number of patented connectors in the industry
- European locations with an international sales team
- In-house R&D, and tool and die professionals
- In-house product testing and quality control engineers
- Member of AITC, ASTM, ASCE, AWPA, ACI, AISC, CSI, ICFA, NBMDA, NLBMDA, SETMA, STAFDA, SREA, NFBA, 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

Terry Kingsfather
President

GETTING FAST TECHNICAL SUPPORT

When you call for engineering technical support, we can help you quickly if you have the following information at hand. This 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 is your load requirement?
- What is the carried member's width and height?
- What is the supporting member's width and height?
- What is the carried and supporting members' material and application?

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WE ARE ISO 9001-2008 REGISTERED

Simpson Strong-Tie is an ISO 9001-2008 registered company. ISO 9001-2008 is an internationally-recognized quality assurance system which lets our domestic and international customers know that they can count on the consistent quality of Simpson Strong-Tie® products and services.

NEW PRODUCTS

HDB Holdowns

Now there is a bolted holdown that offers the low-deflection performance of our pre-deflected holdowns: the HDB. Suitable for installation on or above the sill plate as well as back-to-back and compression applications, the HDB is ideal for shearwalls, braced wall panels and lateral applications.

LTA2 Lateral Truss Anchor

The new LTA2 is an embedded truss anchor for grouted CMU and concrete walls that develops high loads with shallow embedment. Designed for 2x4 minimum truss chords, the LTA2 resists uplift and lateral loads parallel and perpendicular to the wall with a minimum heel height requirement.

STRONG-DRIVE® SD Structural-Connector Screw

Designed to replace nails in certain products, the load-rated SD screw has been tested and approved for use in many popular Simpson Strong-Tie® connectors. In certain applications screws are easier and more convenient to install than nails, and the single-fastener load values achieved by the SD9 and SD10 exceed those of typical 10d common or 16d common nails, respectively. In addition, the galvanized coating makes the SD screw ideal for interior and most exterior conditions.

CCQM Column Caps for CMU and Concrete Piers

The new CCQM/CCTQM/ECCLQM embedded column caps are designed for use in raised-pier foundations and applications where heavy timbers rest on concrete or concrete-block columns. The heavy-gauge beam seats and unique SSTB anchor bolts provide the high uplift and lateral resistance needed to help resist high-wind events.

H10A-2 Hurricane Tie

The H10A-2 hurricane tie is designed to connect a wood rafter and ceiling joist or 2-ply wood truss to a double top plate. Designed for 2x4 minimum members, the H10A-2 resists uplift and lateral loads parallel and perpendicular to the wall. It features an improved design with higher uplift as compared to the H10-2.

VALUE-ADDED SOFTWARE

Simpson Strong-Tie offers software solutions to make product selection and specification easier.
Visit ***www.strongtie.com*** to download your free versions.

Connector Selector

Finding the right connector just got easier. Input the details of your application and the Simpson Strong-Tie® Connector Selector software suggests appropriate connectors and lists them by their installed cost. The program offers solutions for solid-sawn lumber, I-joists, engineered wood and trusses, and can also take into consideration factors such as wood species and masonry type. Save, print or email your solutions as well as auto-generated job files and material lists.

Strong-Wall® Shearwall Selector

Looking for a faster way to identify shearwalls for your designs? The Strong-Wall® Shearwall Selector software suggests suitable wood or Steel Strong-Wall® solutions based upon the parameters you input for your project. The program features two design modes, engineered-design and prescriptive wall bracing, to suggest appropriate solutions based on framing and foundation preferences. Solutions for one- and two-story applications as well as for balloon-framed walls are available. Output can be saved, printed or attached to email for maximum versatility.

Strong Frame® Selector

The Strong Frame® ordinary moment frame takes a lot of the work out of specifying moment frames, and the Strong Frame® Selector software will make it even easier. The user inputs information such as size of the opening, lateral/gravity loads and drift requirements and the software suggests the appropriate solution from 368 available stock frames. Custom solutions can also be suggested if we don't offer a stock frame to match the application. Save, print or email solutions depending on your needs.

CORROSION INFORMATION

Understanding the Issues

Metal connectors, anchors, and fasteners will corrode and may lose load-carrying capacity when installed in corrosive environments or exposed to corrosive materials. There are many environments and materials which may cause corrosion including ocean salt air, fire retardants, fumes, fertilizers, preservative-treated wood, dissimilar metals, and other corrosive elements.

The many variables present in a single building environment make it impossible to accurately predict if, or when, significant corrosion will begin or reach a critical level. This relative uncertainty makes it crucial that specifiers and users be knowledgeable of the potential risks and select a product coating or metal suitable for the intended use. It is also important that regular maintenance and periodic inspections are performed, especially for outdoor applications.

It is common to see some corrosion on connectors especially in outdoor applications. Even stainless steel can corrode. The presence of some corrosion does not mean that load capacity has necessarily been affected or that a failure will occur. If significant corrosion is apparent or suspected, then the wood, fasteners and connectors should be inspected by a professional engineer or general contractor and may need to be replaced.

Preservative-treated wood formulations have changed significantly and some of the new formulations are more corrosive to steel connectors and fasteners than the traditionally used formulation of CCA-C. Simpson Strong-Tie testing has shown that ACQ-C, ACQ-D (Carbonate) and CA-B treated woods are approximately 2 times more corrosive than CCA-C, while SBX-DOT (Sodium Borate) treated woods were shown to be less corrosive than CCA-C. Refer to technical bulletin T-PTWOOD for more information.

Due to the many different preservative formulations, fluctuating retention levels, moisture content, and because the formulations may vary regionally, or change without warning, understanding which connectors and fasteners to use with these materials has become a complex task. We have attempted to provide basic knowledge on the subject here, but it is important to fully educate yourself by reviewing our technical bulletins on the topic, and also by viewing information and literature provided by others. This information pertains to Simpson Strong-Tie® connectors only. For corrosion information on other product lines, such as fasteners, see the specific Simpson Strong-Tie product line catalogs. Additionally, because the issue is evolving, it is important to get the very latest connector information on the topic by visiting our website at ***www.strongtie.com/info***.

Stainless steel is always the most effective solution to corrosion risk. However, it is also more expensive and sometimes more difficult to obtain. To best serve our customers, Simpson Strong-Tie is evaluating the options to identify the safest and most cost-effective solutions. Based on our testing and experience there are some specific applications that are appropriate for connectors and fasteners with specific levels of corrosion protection.

Because increased corrosion from some newer preservative-treated wood is a new issue with little historical data, we have to base our recommendations on the testing and experience we have to date. It is possible that as we learn more, our recommendations may change, but these recommendations are based on the best information we have at this time.

See *www.strongtie.com/info* for additional critical information.

CORROSION INFORMATION

General Simpson Strong-Tie Recommendations

- Outdoor environments are generally more corrosive to steel. If you choose to use ZMAX® or HDG finish on an outdoor project *(i.e. deck, patio cover)*, you should periodically inspect your connectors and fasteners or have a professional inspection performed. Regular maintenance including water-proofing of the wood used in your outdoor project is also a good practice.
- For wood with actual retention levels greater than 0.40 pcf for ACQ, 0.34 pcf for MCQ, 0.21 pcf for CA-B, 0.15 pcf for CA-C and MCA or 0.14 pcf for μCA-C (Ground Contact), stainless-steel connectors and fasteners are recommended. Verify actual retention level with the wood treater.
- When using stainless-steel connectors, use stainless-steel fasteners. When using ZMAX®/HDG galvanized connectors, use fasteners with a coating that meets the specifications of ASTM A153 or equivalent coating offered on Simpson Strong-Tie® fasteners.
- Testing indicates wood installed dry (moisture content less than 19%) reduces potential corrosion. If dry wood is used, see our website for additional information.
- Using a barrier membrane can provide additional corrosion protection, see technical bulletin T-PTBARRIER *(see page 215 for details)*.

Due to the many variables involved, Simpson Strong-Tie cannot provide estimates on service life of connectors, anchors or fasteners. We suggest that all users and Designers also obtain recommendations for HDG, ZMAX® (G185), mechanically galvanized, or other coatings from the treated wood supplier for the type of wood used. However, as long as Simpson Strong-Tie recommendations are followed, we stand behind product performance and our standard warranty *(page 23)* applies.

Guidelines for Selecting the Proper Connector

1 Evaluate the Application.

Consider the type of structure and how it will be used. These recommendations may not apply to non-structural applications such as fences.

2 Evaluate the Environment.

Testing and experience indicate that indoor dry environments are less corrosive than outdoor environments. Determining the type of environment where a connector or fastener will be used is an important factor in selecting the most appropriate material and finish for use on the connectors and fasteners. To help in your decision making, consider the following general exposure information:

Interior Dry Use: Includes wall and ceiling cavities, and raised floor applications of enclosed buildings that have been designed to ensure that condensation and other sources of moisture do not develop.

Exterior – Dry: Includes outdoor installations in low rainfall environments and no regular exposure to moisture.

Exterior – Wet: Includes outdoor installations in higher moisture and rainfall environments.

Higher Exposure Use: Includes exposure to ocean-salt air, fire retardants, large bodies of water, fumes, fertilizers, soil, some preservative-treated woods, industrial zones, acid rain, and other corrosive elements. Type 316 stainless steel contains slightly more nickel than other grades, plus molybdenum, giving it better corrosion resistance in high-chloride environments.

3 Evaluate and select a suitable preservative-treated wood for the intended application and environment.

The treated wood supplier should provide all the information needed regarding the wood being used. This information should include: the specific type of wood treatment used, if ammonia was used in the treatment, and the chemical retention level. If the needed information is not provided then Simpson Strong-Tie would recommend the use of stainless-steel connectors and fasteners. You should also ask the treated-wood supplier for a connector coating or material recommendation.

4 Use the chart on the right, which was created based on Simpson Strong-Tie testing and experience, to select the connector finish or material.

If a preservative-treated wood product is not identified on the chart, Simpson Strong-Tie has not evaluated test results regarding such product and therefore cannot make any recommendation other than the use of stainless steel with that product. Manufacturers may independently provide test results or other product use infor-mation; Simpson Strong-Tie expresses no opinion regarding any such information.

5 Compare the treated-wood supplier's recommendation with the Simpson Strong-Tie recommendation.

If these recommendations are different, Simpson Strong-Tie recommends that the most conservative recommendation be followed.

Simpson Strong-Tie recommendations are as follows:

Low = Use standard painted and G90 galvanized connectors, Simpson Strong-Tie® Strong-Drive®. Use standard painted and G90 galvanized connectors, Simpson Strong-Tie® Strong-Drive® screws (SDS) with the double-barrier coating, or Strong-Drive® SD screws as a minimum.

Med = Use ZMAX®/HDG galvanized connectors as a minimum. Use HDG fasteners which meet the specifications of ASTM A153, Simpson Strong-Tie® Strong-Drive® SDS screws with double-barrier coating, or Strong-Drive® SD screws with mechanical galvanization, class 55.

High[6] = Use type 303, 304, 305 or 316 stainless-steel connectors and fasteners.

CONNECTOR COATING RECOMMENDATION – STRUCTURAL APPLICATIONS

Environment	Untreated Wood	SBX/ DOT & Zinc Borate	MCA/ MCQ	ACQ-C, ACQ-D (Carbonate), CA-B, CA-C & μCA-C			ACZA	Other or Uncertain
				No Ammonia	With Ammonia	Higher Chemical Content[1]		
Interior – Dry	Low	Low	Low	Low	Med	High	High	High
Exterior	Med	N/A	Med	Med	High	High	High	High
Higher Exposure	High	N/A	High	High	High	High	High	High
Uncertain	High	N/A	High	High	High	High	High	High

1. Wood with actual retention levels greater than 0.40 pcf for ACQ, 0.34 pcf for MCQ, 0.21 pcf for CA-B, 0.15 pcf for CA-C and MCA or 0.14 pcf for μCA-C (Ground Contact).
2. Borate treated woods are not appropriate for outdoor use.
3. Test results indicate that ZMAX®/HDG and the SDS double-barrier coating will perform adequately, subject to regular maintenance and periodic inspection. However, the nationally-recognized test method used, AWPA E12-94, is an accelerated test, so data over an extended period of time is not available. If uncertain, use stainless steel.
4. Some treated wood may have excess surface chemicals making it potentially more corrosive. If you suspect this or are uncertain, use stainless steel.
5. Type 316 stainless-steel connectors and fasteners are the minimum recommendation for ocean-salt air and other chloride environments.

COATINGS AVAILABLE

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

Finish/Materials	Description	Level of Corrosion Resistance
Gray Paint	Water-based paint intended to protect the product while it is warehoused and in transit to the jobsite.	Low
Powder Coating	Baked on paint finish that is more durable than our standard paint and produces a better looking finished product.	Low
Standard G90 Zinc Coating	Zinc galvanized coating containing 0.90 oz. of zinc per square foot of surface area *(total both sides)*.	Low
ZMAX G185	Galvanized (G185) 1.85 oz. of zinc per square foot of surface area *(hot-dip galvanized per ASTM A653 total both sides)*. These products require hot-dip galvanized fasteners *(fasteners which meet the specifications of ASTM A153)*.	Medium
HOT-DIP HDG GALVANIZED®	Products are hot-dip galvanized after fabrication (14 ga. and thicker). The coating weight increases with material thickness. The minimum specified coating weight is 2.0 oz./ft² *(per ASTM A123 total both sides)*. These products require hot-dip galvanized fasteners *(fasteners which meet the specifications of ASTM A153)*.	Medium
Mechanically-Galvanized Coating, Class 55 *(SD screws)*	Simpson Strong-Tie® Strong-Drive® SD structural-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.	Medium
Double-Barrier Coating *(SDS Screws)*	Simpson Strong-Tie® Strong-Drive® SDS screws are manufactured with two different finishes that together provide a level of corrosion protection that equals that provided by the previous HDG coating.	Medium
SSt300 STAINLESS STEEL®	Connectors are manufactured from Type 316L stainless steel, and provide greater durability against corrosion. Stainless-steel fasteners are required with stainless-steel products, and are available from Simpson Strong-Tie.	High

See Corrosion Information for more specific performance and application information on these finishes.

IMPORTANT INFORMATION & 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 maximum 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 For The Installer, and General Instructions For 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 gun 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, do not bend more than once.
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 ⅛" unless otherwise noted.

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 ***www.strongtie.com*** to obtain additional design and installation information, including:

- Instructional builder/contractor training kits containing an instructional video, an instructor guide and a student guide in both English and Spanish;
- *Installer's Pocket Guide* (form S-INSTALL) which is designed specifically for installers and uses detailed graphics and minimal text in both English and Spanish to explain visually how to install many key products;
- Information on workshops Simpson Strong-Tie conducts at various training centers throughout the country;
- Product specific installation videos;
- Specialty catalogs;
- Code reports;
- Technical fliers and bulletins;
- Master format specifications;
- Material safety data sheets;
- Corrosion information;
- Connector selection guides for engineered wood products *(by manufacturer)*;
- Simpson Strong-Tie® Connector Selector™ software;
- Simpson Strong-Tie® Autocad menu;
- Simpson Strong-Tie® Strong-Wall® Selector software;
- Simpson Strong-Tie® Anchor Tiedown System Selector and anchor related software; and
- Answers to frequently asked questions and technical topics.

Failure to follow fully 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.

GENERAL NOTES

1. Refer to the current Simpson Strong-Tie® *Wood Construction Connectors* catalog for connector load values, installation, fastener schedules and other important information including Terms and Conditions of Sale and Building Code Evaluation listings.
2. Throughout the catalog there are installation drawings showing the load transfer from one element in the structure to another. Additional connections may be required to safely transfer the loads through the structure. It is the Designer's responsibility to specify and detail all necessary connections to ensure that a continuous load path is provided as required by the building code.
3. U.N.O. allowable connector loads are provided with a 160% load duration increase (for wind) on the calculated capacity of the nails. No further load duration increase is allowed by the building code.
4. Unless otherwise noted, the allowable loads published in this catalog are limited to the lowest of: average recorded test load at ⅛" deflection, lowest ultimate recorded test load of 3 tests specimens divided by 3 *(or the average of 6 specimens divided by 3)*, or the calculated value based on steel, wood bearing, and/or fastener capacity.
5. When multiple connectors are used, they must be installed so fastener locations do not overlap.
6. When a connector is loaded simultaneously in more than one direction, the allowable load must be evaluated as shown here. For all connectors use the following equation:

   Design Uplift/Allowable Uplift + Design Lateral Parallel to Plate / Allowable Lateral Parallel to Plate + Design Lateral Perpendicular to Plate / Allowable Lateral Perpendicular to Plate < 1.0.

   The three terms in the unity equation are due to the 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.

   As an alternate, certain roof to wall connectors *(embedded truss anchors, page 21, seismic and hurricane ties and twist straps, page 18 - excluding HGA10KT)* can be evaluated using the following: the design load in each direction shall not exceed the published allowable load in that direction multiplied by 0.75.
7. All references to bolts or machine bolts (MBs) are for structural quality through bolts *(not lag screws or carriage bolts)* equal to or better than ASTM Standard A307, Grade A.
8. Unless otherwise noted, all nails are common nails *(refer to page 11)*.
9. Refer to Simpson Strong-Tie technical bulletin T-ANCHORSPEC for anchorage to concrete design.
10. Illustrations showing hurricane ties installed on the outside of the wall are for clarity and assume a minimum overhang of 3½". Installation on the inside of the wall is acceptable *(see General Note 12 below)*. For uplift continuous load path, connections in the same area *(i.e., truss to plate connector and plate to stud connector)* must be on same side of the wall.
11. When using wood structural panel sheathing for wind uplift continuous load path refer to Simpson Strong-Tie technical bulletins T-WLSHEATH and T-HTIECONPATH for further information.
12. When installing hurricane ties on the inside of the wall special considerations must be taken to prevent condensation on the inside of the completed structure in cold climates.
13. Unless otherwise noted, loads are in pounds; dimensions are in inches.
14. Truss plates shown are not manufactured by Simpson Strong-Tie.
15. 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/Engineer of Record.
16. When connecting DF/SP members to SPF lumber, use SPF allowable loads.
17. Concrete anchorage solutions provided in this catalog are based on applications in uncracked concrete resisting wind and low seismic loads *(any structure in Seismic Design Categories A and B and detached one- and two-family dwellings in Seismic Design Category C)*.

LIMITED WARRANTY

Simpson Strong-Tie Company Inc. warrants catalog products to be free from defects in material or manufacturing. Simpson Strong-Tie Company Inc. products are further warranted for adequacy of design when used in accordance with design limits in this catalog and when properly specified, installed, and maintained. This warranty does not apply to uses not in compliance with specific applications and installations set forth in this catalog, or to non-catalog or modified products, or to deterioration due to environmental conditions.

Simpson Strong-Tie® connectors are designed to enable structures to resist the movement, stress, and loading that results from impact events such as earthquakes and high velocity winds. Other Simpson Strong-Tie products are designed to the load capacities and uses listed in this catalog. Properly-installed Simpson Strong-Tie products will perform in accordance with the specifications set forth in the applicable Simpson Strong-Tie catalog. Additional performance limitations for specific products may be listed on the applicable catalog pages.

Due to the particular characteristics of potential impact events, the specific design and location of the structure, the building materials used, the quality of construction, and the condition of the soils 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 catalog specifications and Simpson Strong-Tie connectors are properly installed in accordance with applicable building codes.

All warranty obligations of Simpson Strong-Tie Company Inc. shall be limited, at the discretion of Simpson Strong-Tie Company Inc., to repair or replacement of the defective part. These remedies shall constitute Simpson Strong-Tie Company Inc.'s sole obligation and sole remedy of purchaser under this warranty. In no event will Simpson Strong-Tie Company Inc. be responsible for incidental, consequential, or special loss or damage, however caused.

This warranty is expressly in lieu of all other warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose, all such other warranties being hereby expressly excluded. This warranty may change periodically – consult our website *www.strongtie.com* for current information.

TERMS & 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 Designer. Modifications to products or changes in installations should only be made by a qualified Designer. The performance of such modified products or altered installations is the sole responsibility of the Designer.

INDEMNITY

Customers or Designers modifying products or installations, or designing 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 non-catalog or modified products.

NON-CATALOG AND MODIFIED PRODUCTS

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 the customer and will be fabricated by Simpson Strong-Tie in accordance with customer specifications.

Simpson Strong-Tie cannot and does not make any representations regarding the suitability of use or load-carrying capacities of non-catalog products. Simpson Strong-Tie provides no warranty, express or implied, on non-catalog products. F.O.B. Shipping Point unless otherwise specified.

STRENGTHENING DWELLINGS IN TORNADO-PRONE AREAS

In recent years, tornadoes have cut savage swaths of destruction throughout the Midwest and Southeast portions of the U.S. Along the storm path, the degrees of damage can appear random, leaving some structures with minimal damage, while others are completely destroyed. Researchers have found two primary factors for the disparity of damage: the wide range of wind speeds within a single tornado, and the quality of construction.

Research on damage caused by past hurricanes clearly indicates that using modern building practices that incorporate properly installed structural connections can economically strengthen structures to withstand wind-related forces caused by some – but not all – tornadoes.

The National Climatic Data Center estimates that 77% of U.S. tornadoes are in the EF0 to EF1 range *(see Enhanced Fujita Scale below for wind speeds)*, and 95% of U.S. tornadoes have wind speeds below EF3 intensity. Further, the track of a tornado is rated for the highest damage seen along its entire length. As can be seen at right, the majority of a tornado's track can have lower wind speeds than the maximum observed. Also, along the track, the maximum wind speeds occur at the location of the vortex and wind speeds decrease as one moves away from the center of the path.

Image courtesy of the University of Alabama.

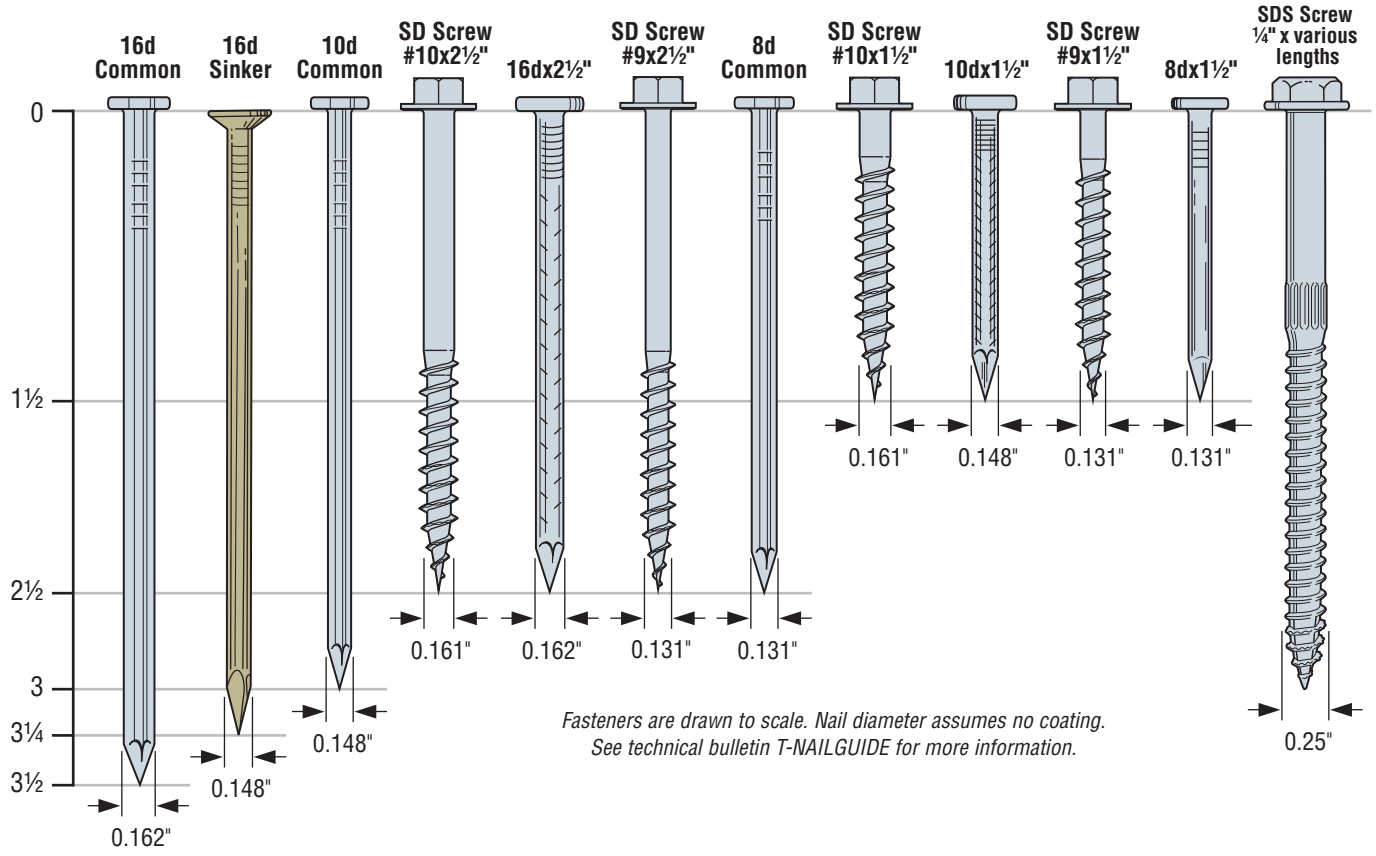
Estimated intensity of the Tuscaloosa, AL tornado as it moved across the city on April 28, 2011.

FASTENER TYPES

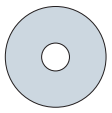
Fastener Types and Sizes Specified for Simpson Strong-Tie® Connectors

Many Simpson Strong-Tie® connectors have been designed and tested for use with specific types and sizes of fasteners. The specified quantity, type and size of fastener must be installed in the correct holes on the connector to achieve published loads. Other factors such as fastener material and coating are also important. Incorrect fastener selection or installation can compromise connector performance and could lead to failure.

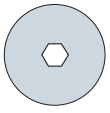
In some cases it is desirable to install Simpson Strong-Tie® straight straps with fasteners that are a different type or size than what is called out in the load table. In these cases these reduction factors must be applied to the allowable loads listed for the connector.



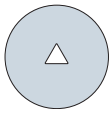
Fasteners are drawn to scale. Nail diameter assumes no coating.
See technical bulletin T-NAILGUIDE for more information.



Round Holes
Purpose: to fasten a connector to wood.
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.

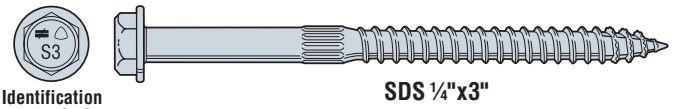
Load Adjustment Factors for Optional Nails Used with Straight Straps

Catalog Nail	Replacement	Adjustment Factor
16d common (0.162"x3½")	10dx1½ (0.148"x1½")	0.84[2]
	10d common (0.148"x3") 16d sinker (0.148"x3¼")	0.84
16d common (0.162"x3½")	16dx2½ (N16) (0.162"x2½")	1.00
10d common (0.148"x3") 16d sinker (0.148"x3¼")	10dx1½ (0.148"x1½")	1.00[3]
10d common (0.148"x3")	16d sinker (0.148"x3¼")	1.00
8d common (0.131"x2½")	8dx1½ (0.131"x1½")	1.00
10d common (0.148"x3")	8d common (0.131"x2½")	0.83

1. For straps installed over sheathing use a 2½" long nail minimum.
2. Where noted, use 0.80 for 10 ga., 11 ga. and 12 ga. products when using SPF lumber.
3. Where noted, use 0.92 for 10 ga., 11 ga. and 12 ga. products when using SPF lumber.
4. For applications involving pneumatic nails, refer to Simpson Strong-Tie® bulletin T-PNEUMATIC.

SDS *Screws*

The Simpson Strong-Tie® Strong-Drive® screw (SDS) is a ¼" diameter structural wood screw ideal for various connector installations as well as wood-to-wood applications. It installs with no predrilling and has been extensively tested in various applications. The new SDS is improved with a patented new easy-driving 4CUT™ tip and a corrosion resistant double-barrier coating.



Identification on all SDS screw heads

SDS ¼"x3"

U.S. Patent 6,109,850 - 5,897,280 - 5,044,853

These products are available with additional corrosion protection.

SS *These products are also available in stainless steel for premium corrosion resistance.*

SDS Screws

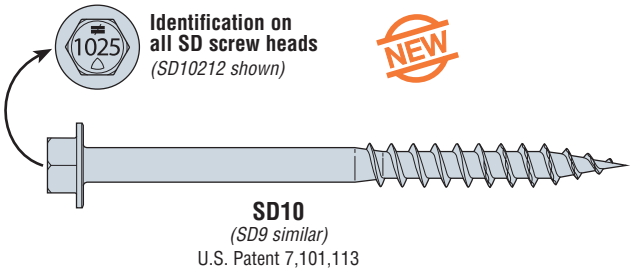
	Size (in.)	Model No.[8]	Thread Length (in.)	Fasteners per Carton[6]	DF/SP Allowable Loads[4] (lbs.)						SPF/HF Allowable Loads[4] (lbs.)					
					Shear (100)					Withdrawal[5] (100)	Shear (100)					Withdrawal[5] (100)
					Wood Side Plate[3]		Steel Side Plate				Wood Side Plate[3]		Steel Side Plate			
					1½"	1¾" SCL	16 ga.	14 ga. and 12 ga.	10 ga. or Greater	Wood or Steel Side Plate	1½"	1¾" SPF LVL	16 ga.	14 ga. and 12 ga.	10 ga. or Greater	Wood or Steel Side Plate
SS	¼ x 1½	SDS25112	1	1500	—	—	250	250	250	170	—	—	180	180	180	120
SS	¼ x 2	SDS25200	1¼	1300	—	—	250	290	290	215	—	—	180	210	210	150
SS	¼ x 2½	SDS25212	1½	1100	190	—	250	390	420	255	135	—	180	280	300	180
SS	¼ x 3	SDS25300	2	950	280	—	250	420	420	345	200	—	180	300	300	240
SS	¼ x 3½	SDS25312	2¼	900	340	340	250	420	420	385	245	245	180	300	300	270
	¼ x 4½	SDS25412	2¾	800	350	340	250	420	420	475	250	245	180	300	300	330
	¼ x 5	SDS25500	2¾	500	350	340	250	420	420	475	250	245	180	300	300	330
	¼ x 6	SDS25600	3¼	600	350	340	250	420	420	560	250	245	180	300	300	395
	¼ x 8	SDS25800	3¼	400	350	340	250	420	420	560	250	245	180	300	300	395

1. SDS screws install best with a low speed ½" drill with a ⅜" hex head driver.
2. All applications are based on full penetration into the main member.
3. Allowable loads are shown at the wood load duration factor of $C_D = 1.00$. Loads may be increased for load duration per the building code up to a $C_D = 1.60$.
4. Withdrawal loads shown are in pounds (lbs.) and are based on the entire threaded section installed into the main member. If thread penetration into the main member is less than the thread length as shown in the table, reduce allowable load by 172 lbs. x inches of thread not in main member. Use 121 lbs./inch for SPF.
5. Fasteners per Carton represent the quantity of screws which are available in bulk packaging. Screws are also available in mini bulk and retail packs. Refer to Simpson Strong-Tie® List Price book or contact Simpson Strong-Tie for more information.
6. LSL wood-to-wood applications that require 4½", 5", 6" or 8" SDS screws are limited to interior-dry use only.
7. Add "SS" to model no. for type 316 stainless steel.

SD *Structural Connector Screws*

The Strong-Drive® SD Screw for Use with Simpson Strong-Tie® Connectors

Simpson Strong-Tie introduces the Strong-Drive® SD structural-connector screw for use with many of our connectors. Designed to replace nails in certain products, the load-rated SD screw has been tested and approved for use in many popular Simpson Strong-Tie® connectors. In certain applications screws are easier and more convenient to install than nails, and the single-fastener load values achieved by the SD9 and SD10 exceed those of typical 10d common or 16d common nails, respectively. In addition, the galvanized coating makes the SD screw ideal for interior and most exterior conditions.



Identification on all SD screw heads
(SD10212 shown)

SD10
(SD9 similar)
U.S. Patent 7,101,113

STRONG-DRIVE® SD SCREW COMPATIBLE

This icon identifies connectors approved for installation with the Simpson Strong-Tie® Strong-Drive® SD structural connector screw. See ***www.strongtie.com/sd*** for the current list of approved connectors.

Size (in.)	Model No.	Thread Length (in.)	DF/SP Allowable Loads (lbs.) (100)		SPF/HF Allowable Loads (lbs.) (100)	
			Shear Steel Side Plate 20 ga.-12 ga.	Withdrawal	Shear Steel Side Plate 20 ga.-12 ga.	Withdrawal
#9x1½	SD9112	1	171	173	112	122
#9x2½	SD9212	1	200		112	
#10x1½	SD10112	1	173	173	138	122
#10x2½	SD10212	1	215		165	

1. Withdrawal loads and steel-side-plate shear loads are based on testing per AC233.
2. Allowable loads are shown at the wood load duration factor of $C_D = 1.00$. Loads may be increased for load duration per the building code up to a $C_D = 1.60$.
3. Withdrawal loads are based on the entire threaded section installed into the main member.
4. Visit ***www.strongtie.com*** for wood-to-wood shear values and wood-side-plate details.

SDWC *Strong-Drive® Structural Wood Screw for Roof-to-Top Plate Connections*

The Strong-Drive® SDWC screw provides a time-saving and reliable option to fastening trusses and rafters to wall top plates. The SDWC offers fully tested loads in accordance with ICC-ES AC233 *(screw)* and ICC-ES AC13 *(roof-to-wall assembly)*, and installs easily and effectively without pre-drilling.

FEATURES:

- Fully-threaded shank engages the entire length of the fastener, providing a secure connection between the roof and wall framing members
- Cap-style head countersinks fully into the double top plate to avoid interference with drywall or finish trades
- Wide installation-angle range makes it easier to install the SDWC correctly
- Can be installed from inside the structure, eliminating exterior work on the upper stories and enhancing job safety
- Fastening can be performed before or after exterior sheathing is applied for added flexibility

Technical Information

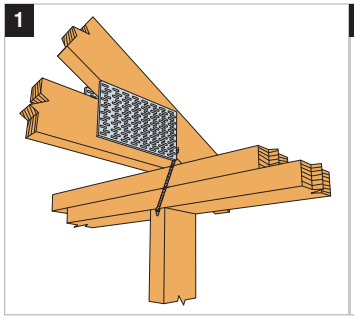
Model No.	Minor Diameter (in.)	Length (in.)	Thread Length (in.)	Allowable Loads (lbs.) (160)					
				DF/SP			SPF/HF		
				Uplift	F_1	F_2	Uplift	F_1	F_2
SDWC15600	0.152	6	5¾	610	130	385	485	115	385

1. Allowable loads are for an SDWC installed per the 'Recommended' or 'Optional' installation instructions. The SDWC is to be installed through a double 2x top plate into a minimum 2x4 truss or rafter.
2. SDWC screws may be used in 2- or 3-ply rafters or trusses. The allowable uplift load for each screw shall be multiplied by 0.90, but may be limited by the capacity of the plate or the connection between the top plate to the framing below. SDWC screws in multi-ply assemblies must be spaced a minimum of 1½" o.c.
3. Screws are shown installed on the interior side of the wall. Installations on the exterior side of the wall are acceptable when the rafter or truss overhangs the top plates a minimum of 3½".
4. For uplift continuous load path, top plate to stud connectors must be located on the same side of the wall as the screw.
5. When the screw is loaded simultaneously in more than one direction, the allowable load must be evaluated using the following unity equation: (Design Uplift ÷ Allowable Uplift) + (Design F_1 ÷ Allowable F_1) + (Design F_2 ÷ Allowable F_2) ≤ 1.0.
6. Table loads do not apply to trusses with end-grain bearing.
7. Top plate, stud and top plate splice fastened per applicable building code.

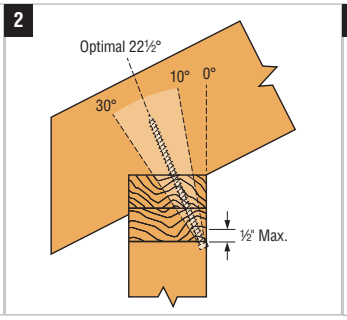
Installation

Note: *SDWC screws install best with a minimum 18V (if cordless) drill using the matched-tolerance bit included in the SDWC15600KT.*

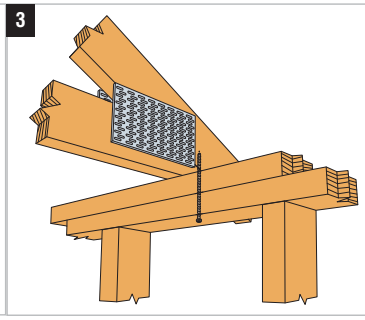
Typical SDWC Installation – Truss Aligned w/Stud
(Offset truss similar)



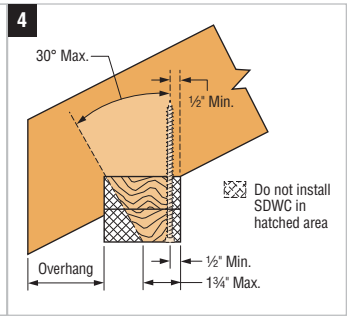
Installation Angle Limit



Optional SDWC Installation – Truss Offset from Stud



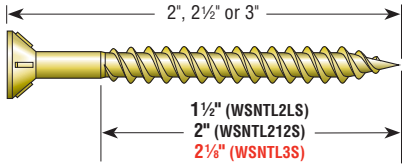
Allowable Installation Range
(Truss offset from stud only)



WSNTL Collated Screw

Simpson Strong-Tie® Quik Drive® auto-feed screw driving systems offer superior performance and reduced installation time in subfloor applications. The holding power of screws reduces the gaps that cause floor squeaks and the tool extension enables stand-up-and-drive installation.

CODES: ICC-ES ESR-1472; City of L.A. RR25661; Florida FL 13731



Withdrawal and Pull-Through Values for Wind or Seismic Loading

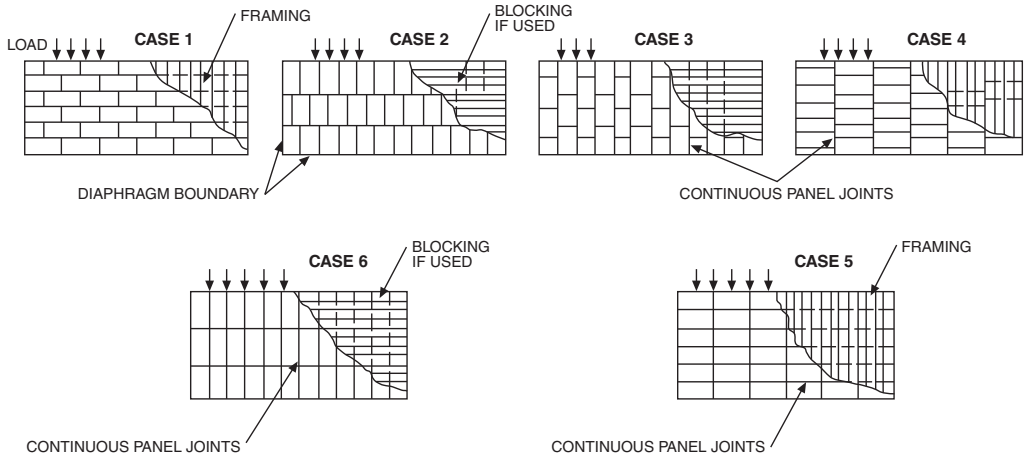
Model No.	Nominal Screw Length (in.)	Thread Length (in.)	Allowable Pull-Through[1] (lbs) Minimum Nominal Panel Thickness (in.) OSB/Plywood Rated Sheathing, Exposure 1				Reference Allowable Withdrawal Load Per Thread Penetration (lbs/in.) Framing Member[3,4]		
			7/16	15/32	19/32	23/32	2x SPF/HF	2x DFL	2x SP
WSNTL2LS	1.94	1.47	70	71	116	116	93	133	175
WSNTL212S	2.50	1.97							
WSNTL3S	3.00	2.17							

1. Use the lower of the pull-through or withdrawal values to determine axial design value.
2. Screws must be installed straight into the side grain of the wood main member with the screw axis at a 90° angle to the wood fibers.
3. The main framing member must be wood having a minimum specific gravity of 0.50 for DFL and SP main members, and 0.42 for SPF and HF main members. DFL is Douglas Fir-Larch. SP is Southern Pine. SPF is Spruce-Pine-Fir. HF is Hem-Fir.
4. Table based on testing conducted in accordance with AC233. Design values presented are based on average ultimate values and divided by 5.
5. Allowable loads are shown at the wood load duration factor of C_D = 1.0. Loads may be increased for load duration up to C_D = 1.6.

Allowable Shear (in Pounds per Foot) for Wood Structural Panel Diaphragms with Framing of Douglas Fir-Larch or Southern Pine for Wind or Seismic Loading

Panel Grade	Minimum Nominal Panel Thickness (in.)	Minimum Nominal Width of Framing Members at Adjoining Panel Edges and Boundaries (in.)[4,5]	BLOCKED DIAPHRAGMS Screw spacing (in.) at diaphragm boundaries (all cases), at continuous panel edges parallel to load (Cases 3 and 4), and at all edges (Cases 5 and 6)[6]				UNBLOCKED DIAPHRAGMS Screws spaced 6 in., maximum, at support edges[6]	
			6	4	2½[7]	2[7]	Case 1 (no unblocked edges or continuous joints parallel to load)	All other configurations (Cases 2,3,4,5 and 6)
			Screw Spacing (in.) at Other Panel Edges					
			6	6	4	3		
Structural 1 Plywood or OSB	3/8	2	270	360	530	600	240	180
		3	300	400	600	675	265	200
	15/32	2	320	425	640	730	285	215
		3	360	480	720	820	320	240
Sheathing single floor, and other grades covered in DOC PS1 and PS2	3/8	2	240	320	480	545	215	160
		3	270	360	540	610	240	180
	7/16	2	255	340	505	575	230	170
		3	285	380	570	645	255	190
	15/32	2	290	385	575	655	255	190
		3	325	430	650	735	290	215
	19/32	2	320	421	640	730	285	215
		3	360	480	720	820	320	240

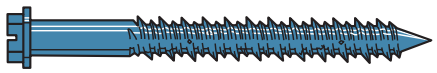
1. Minimum fastener penetration of 1¼" into the framing member is required.
2. For wind design, shear capacities may be increased 40% per section 2306.3.2 of the 2006 IBC and 2306.2.1 of the 2009 IBC.
3. For shear loads of normal or permanent load duration as defined by the AF&PA NDS, the values in the table above must be multiplied by 0.63 or 0.56, respectively.
4. The minimum nominal width of framing members not located at boundaries or adjoining panel edges must be 2".
5. Framing at adjoining panel edges must be 3" nominal or wider, and screws must be staggered where both of the following conditions are met:
   (1) screws having penetration into framing of more than 1½" and
   (2) screws are spaced 3" o.c. or less.
6. Space screws maximum 12" o.c. along intermediate framing members (6" o.c. where supports are spaced 48" o.c.).
7. Framing at adjoining panel edges must be 3" nominal or wider, and screws must be staggered where screws are spaced 2" or 2½" on center.
8. See ESR-1472, Table 1 for illustrations showing Cases 1 through 6.
9. See ESR-1472 for allowable shear loads for high-load diaphragms.



TITEN® *Screws*

Titen screws are 3⁄16" and 1⁄4" diameter masonry screws for attaching various components to concrete and masonry. Available in hex and phillips head and both carbon and stainless steel (see the current Simpson Strong-Tie® *Anchoring and Fastening Systems for Concrete and Masonry* catalog for more information). Use with appropriately sized Titen® drill bits included with each box.

WARNING: Industry studies show that hardened fasteners can experience performance problems in wet or corrosive environments. Accordingly, use this product in dry and noncorrosive environments only, provide moisture barrier, or use a stainless steel fastener. Steps must be taken to prevent inadvertent sustained loads above the listed allowable loads. Overtightening and bending moments can initiate cracks detrimental to the hardened screw's performance. Use the Simpson Strong-Tie® Titen® installation tool kit (Part TTNT01); it has a bit that is designed to reduce the potential for overtightening the screw.



Titen Hex Head

Titen Screw Anchors for Concrete or Masonry

Titen Dia. (in.)	Drill Bit Dia. (in.)	Embed. Depth (in.)	Critical Spacing (in.)	Critical Edge Dist. (in.)	Allowable Loads (lbs.)			
					Concrete		CMU	
					Tension	Shear	Tension	Shear
3⁄16	5⁄32	1	2¼	1⅛	125	255	110	205
3⁄16	5⁄32	1½	2¼	1⅛	305	460	—	—
¼	3⁄16	1	3	1½	145	225	150	250
¼	3⁄16	1½	3	1½	365	400	—	—

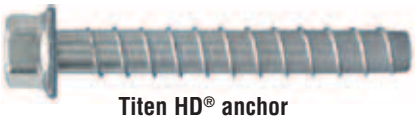
1. Allowable loads may not be increased for short term loading due to wind or seismic forces.
2. Concrete shall have a minimum f'_c = 2000 psi. CMU is based on installation into face shell of hollow and grout-filled CMU.
3. The attached member or element may govern the allowable load. The Designer shall verify allowable load.
4. Refer to the Simpson Strong-Tie® *Anchoring and Fastening Systems for Concrete and Masonry* catalog for complete information on the Titen screws.

TITEN HD® *Heavy Duty Screw Anchors*

Titen HD® Tension and Shear Loads in Face Shell of 8-inch Lightweight, Medium-Weight and Normal-Weight Grout Filled CMU

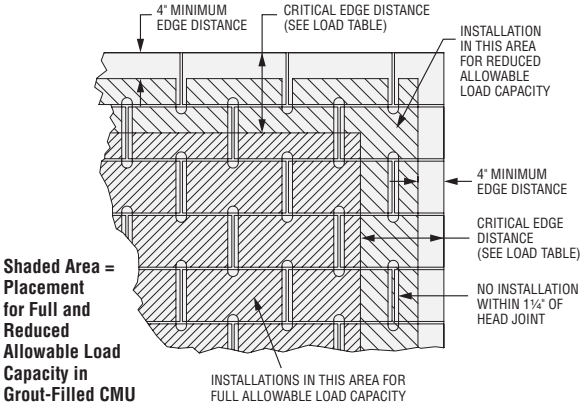
Size (in)	Drill Bit Dia. (in)	Min. Embed. Depth (in)	Critical Edge Dist. (in)	Critical Spacing Dist. (in)	Values for 8-inch Lightweight, Medium-Weight or Normal-Weight Grout Filled CMU	
					Allowable Tension Load (100)	Allowable Shear Load (100)
⅜	⅜	2¾	12	6	480	870
½	½	3½	12	8	690	1385
⅝	⅝	4½	12	10	1060	2085
¾	¾	5½	12	12	1600	3000

1. The tabulated allowable loads are based on a safety factor of 5.0 for installations under the IBC.
2. Values for 8-inch wide CMU Grade N, Type II, lightweight, medium-weight and normal-weight concrete masonry units conforming to ASTM C90.
3. The masonry units must be fully grouted with grout complying with IBC Section 2103.12.
4. Mortar is prepared in accordance with IBC Section 2103.8.
5. The minimum specified compressive strength of masonry, f'_m, at 28 days is 1,500 psi.
6. Embedment depth is measured from the outside face of the concrete masonry unit.
7. Allowable loads may be increased 33⅓% for short-term loading due to wind forces where permitted by code.
8. Grout filled CMU wall design must satisfy applicable design standards and be capable of withstanding applied loads.
9. Refer to the Simpson Strong-Tie® *Anchoring and Fastening Systems for Concrete and Masonry* catalog (C-SAS) for load adjustment factors for spacing and edge distance less than critical.
10. Recommended for permanent dry, interior non-corrosive environments or temporary outdoor applications, or provide moisture barrier.



Titen HD® anchor

U.S. Patent 5,674,035 & 6,623,228



SET® *Epoxy Anchoring Adhesive*

SET® is a high-strength, non-shrink epoxy-based adhesive for anchoring and doweling threaded rod or rebar. Resin and hardener are dispensed and mixed simultaneously through the mixing nozzle.

Features:

- Easy to use, jobsite-proven system
- Suitable for damp, wet and water-filled holes
- Two-component system allows unused material to be saved for later use
- Multiple dispensing options – 1.7, 22 and 56 oz. cartridges, manual and pneumatic dispensing tools, standard and high-flow mixing nozzles
- When properly mixed, adhesive will be a gray color for easy identification

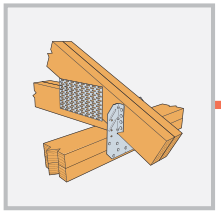
SET® Adhesive

Simpson Strong-Tie is proud to introduce our new Adhesive Cartridge Estimator (ACE) mobile app. This app quickly calculates the number of cartridges of Simpson Strong-Tie® anchoring adhesive necessary to complete your specific installation. Once downloaded, the user selects the type of anchor insert (Threaded rod or rebar, including plastic or stainless steel screen tubes), hole diameter, installation depth, and number of anchors, and ACE instantly calculates the approximate quantity of cartridges in all available cartridge or bulk sizes. The ACE app supports SET-XP®, SET, ET-HP™ (formerly ET), EDOT™, and AT anchoring adhesives. Coming Soon: Metric and European products ACE is a free download in the iTunes® App Store and Android® Marketplace.

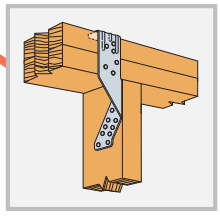
UPLIFT LOAD PATH – OVERVIEW

Uplift refers to the forces which can lift a structure. The forces are generated when the wind blows over the top of the structure causing suction on the roof, which can lift it up. These uplift forces must be transferred down to the foundation to prevent damage. Several connections are required to create a continuous load path.

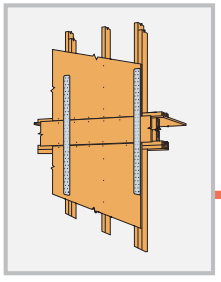
Although homes are built from the bottom up, they are designed from the top down. Product and load selection for the roof, for example, will affect the products and loads for the rest of the house. The tables in this section also begin at the top of the structure and continue to the foundation. All connectors in this section must be used to complete the load path.



Rafter-to-Top Plate Connections:
Transfer forces from the roof to the top plate

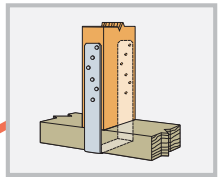


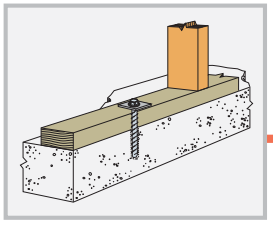
Top Plate-to-Stud Connections:
Transfer forces from the top plate to the stud



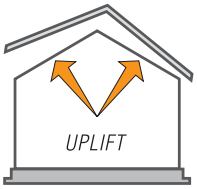
Floor-to-Floor Connections:
Transfer forces from the second story to the first story

Stud-to-Sill Plate Connections:
Transfer forces from wall studs to the mudsill





Sill Plate-to-Foundation Connections:
Transfer forces from the mudsill into the foundation



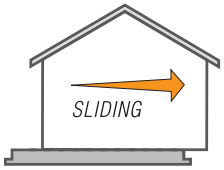
When wind flows over the roof of the structure, creating a strong lifting force on the roof which can cause it to break away.

When wind blows against the side of the structure exerting a lateral force that causes it to lean over (rack) to one side.

LATERAL LOAD PATH – OVERVIEW

Wind not only affects a structure with uplift forces, it also imposes shear forces that can make a structure rack, slide, or overturn. Additional steps must be taken to resist these loads and ensure that the structure will remain strong. This is done by adding bracing, connectors and shearwalls.

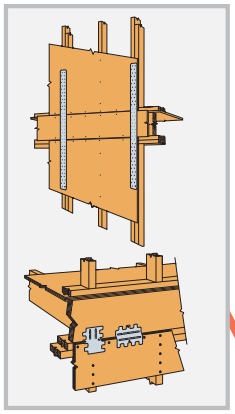
Large openings along wall lines *(such as windows and doors)* create structural challenges in resisting these lateral loads. This is especially true at garage fronts. Such openings often do not leave a large enough wall section to provide sufficient strength. These applications will require the use of prefabricated panels to meet the load requirements.

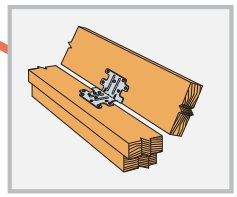


When wind blows against the side of the structure exerting a lateral force, causing it to slide off of its foundation.

When the structure is anchored in place to limit racking or sliding, the lateral force of the wind causes the structure to rotate or overturn.

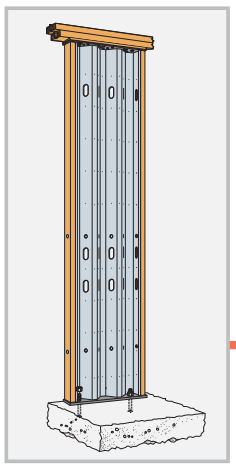
Holdown/Strap Tie:
Ties second floor to first floor

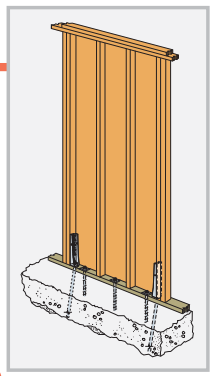




Roof Boundary Clip:
Transfers shear loads between roof and top plates

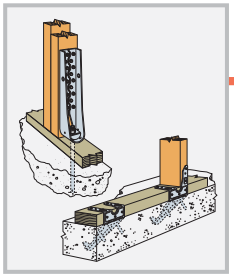
Prefabricated Shear wall:
An alternate to site-built shearwalls





Site-Built Shearwall:
Supports horizontal diaphragms and resists lateral forces

Holdown Anchor:
Anchors shearwall ends to foundation



Mudsill Anchor:
Anchors wall framing to the foundation

TRUSS/RAFTER TO WOOD DOUBLE TOP PLATES

SIMPSON Strong-Tie®

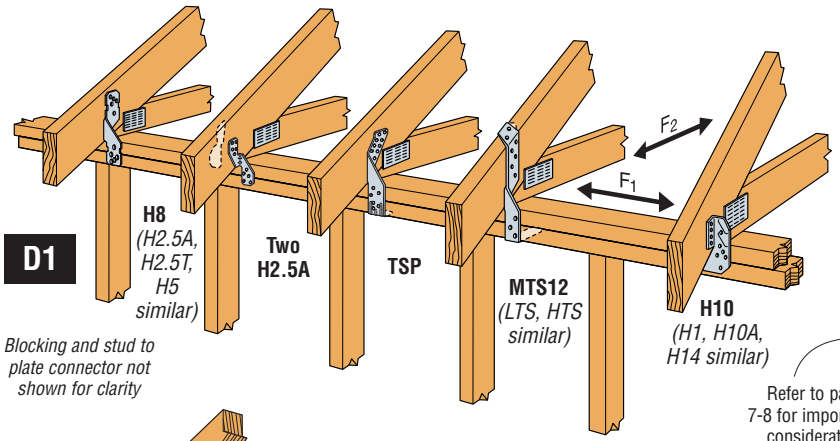
These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

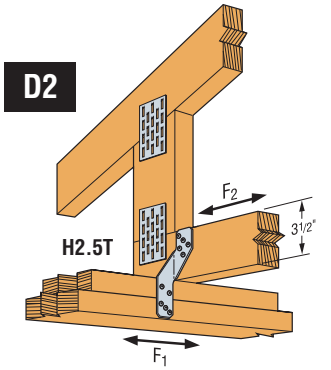
SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

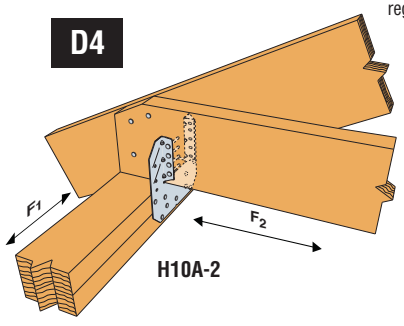
*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

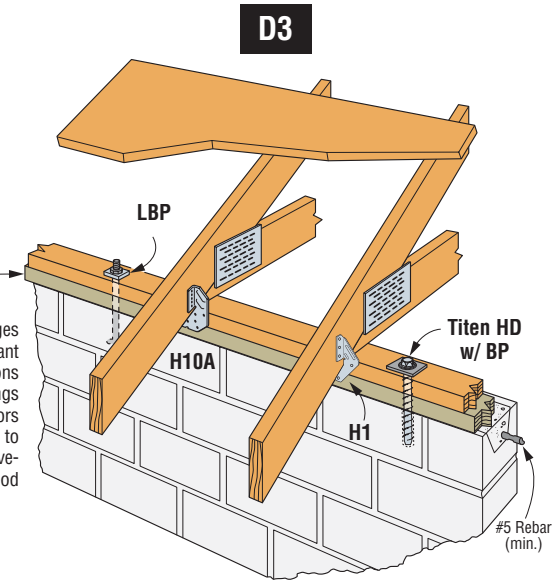
Model	Qty. Required	Fasteners		DF/SP Allowable Loads			SPF Allowable Loads		
		To Truss/Rafters	To Plates	Uplift (160)	Parallel to Plate (F_1) (160)	Perp. to Plate (F_2) (160)	Uplift (160)	Parallel to Plate (F_1) (160)	Perp. to Plate (F_2) (160)
H2.5T	1	(5) 8dx1½"	(5) 8dx1½"	425	135	145	425	135	145
H2.5ASS	1	(5) SS8d	(5) SS8d	440	75	70	380	75	70
SS H5	1	(4) 8dx1½"	(4) 8dx1½"	455	115	200	265	100	170
SS H5	1	(4) 8d	(4) 8d	465	115	200	265	100	170
H2.5A	1	(5) 8dx1½"	(5) 8dx1½"	480	110	110	480	110	110
H2.5T	1	(5) 8d	(5) 8d	545	135	145	545	135	145
H1	1	(6) 8dx1½"	(4) 8d	585	485	165	400	415	140
H2.5A	1	(5) 8d	(5) 8d	600	110	110	535	110	110
HGA10KT	1	(4) ¼"x1½" SDS	(4) ¼"x3" SDS	695	1165	940	500	840	675
LTS12	1	(6) 10dx1½"	(6) 10dx1½"	720	75	125	620	75	125
TSP[9]	1	(9) 10dx1½"	(6) 10dx1½"	740	310	190	635	265	160
SS H8	1	(5) 10dx1½"	(5) 10dx1½"	745	75	—	565	75	—
H10-2	1	(6) 10d	(6) 10d	760	455	395	655	390	340
H2.5T	2	(10) 8dx1½"	(10) 8dx1½"	850	270	290	850	270	290
TSP[9]	1	(9) 10dx1½"	(6) 10d	890	310	190	765	265	160
SS H5	2	(8) 8dx1½"	(8) 8dx1½"	910	230	400	530	200	340
SS H5	2	(8) 8d	(8) 8d	930	230	400	530	200	340
H2.5A	2	(10) 8dx1½"	(10) 8dx1½"	960	220	220	960	220	220
H10ASS	1	(9) SSN10	(9) SSN10	970	565	195	835	485	170
SS MTS12	1	(7) 10dx1½"	(7) 10dx1½"	1000	75[5]	125[5]	860	75[5]	125[5]
H2.5T	2	(10) 8d	(10) 8d	1090	270	290	1090	270	290
H1	2	(12) 8dx1½"	(8) 8d	1170	970	330	800	830	280
H2.5A	2	(10) 8d	(10) 8d	1200	220	220	1070	220	220
NEW H10A-2	1	(9) 10dx3"	(9) 10dx3"	1245	815	260	1070	700	225
H10A	1	(9) 10dx1½"	(9) 10dx1½"	1340[2]	590	285	1015	505	285
SS LTS12	2	(12) 10dx1½"	(12) 10dx1½"	1440	150	250	1240	150	250
HTS20	1	(12) 10dx1½"	(12) 10dx1½"	1450	75[5]	125[5]	1245	75[5]	125[5]
H14	1	(12) 8dx1½"	(13) 8d	1465[2]	515	265	1050	480	245
H16S	1	(2) 10dx1½"	(10) 10dx1½"	1470	—	—	1265	—	—
H16	1	(2) 10dx1½"	(10) 10dx1½"	1470	—	—	1265	—	—

1. For connections to single top plates, see page 25.
2. Douglas Fir allowable uplift loads for H14 = 1350 lbs. (160) and H10A = 1140 lbs. (160).
3. H16/H16-2 factory sloped to 5:12, but 3:12 - 7:12 roof slope is acceptable.
4. Hurricane ties are shown installed on the outside of the wall for clarity and assume a minimum overhang of 3½" installation on the inside of the wall is acceptable. For uplift Continuous Load Path, connections in the same area *(i.e., truss to plate connector and plate to stud connector)* must be on same side of the wall.
5. When installing MTS and HTS connectors, the following installation instructions are required for the lateral loads to apply. The first 7 nail holes after the bend area must be filled with 10dx1½" nails. This applies to straps on either side of bend area. All additional fasteners may be installed in any remaining strap holes.
6. Refer to page 47 for installation details of two connectors on a single truss.
7. Allowable loads in the F_1 direction are not intended to replace diaphragm boundary members or prevent cross grain bending of the truss or rafter members.
8. For simultaneous loads in more than one direction, the connector must be evaluated as described in Note 6, page 9 under General Notes.
9. If installed on outside of wall TSP must be installed to either a min. 2x6 top chord/rafter, or 2x4 at 9:12 pitch.









Refer to pages 7-8 for important considerations regarding coatings on connectors attached to preservative-treated wood

Refer to p.13 for information on the new SDWC fastener

GIRDER/TRUSS TO WALL FRAMING

SIMPSON Strong-Tie®

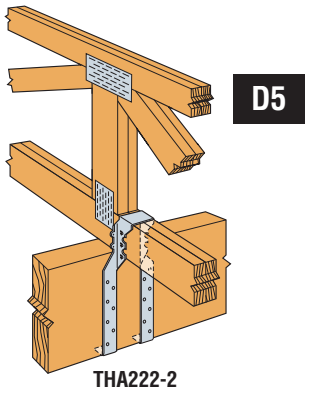
These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

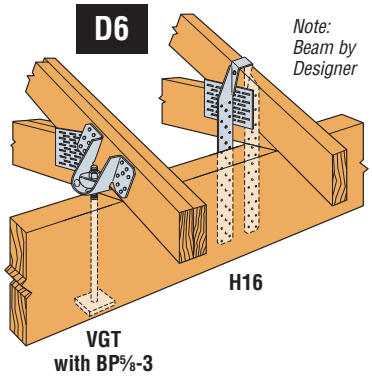
SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

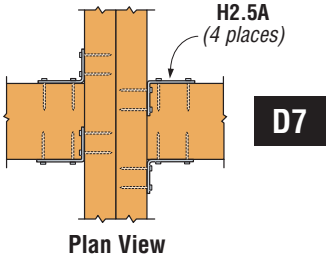
*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

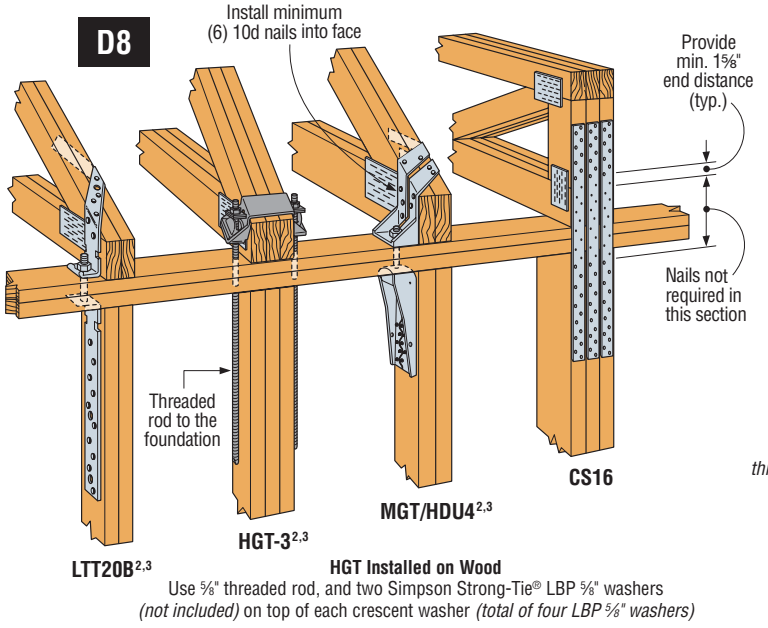
Model No.	Total No. of Connectors Attached to Girder	No. of Plies Min.	Fasteners		DF/SP Uplift	SPF Uplift
			Girder/Truss	Wall Framing	(160)	(160)
H16-2[6]	1	2	(2) 10dx1½"	(10) 10dx1½"	1470	1265
H16-2S[6]	1	2	(2) 10dx1½"	(10) 10dx1½"	1470	1265
LTT20B[2,3,9]	1	2	(10) 10d	(1) ½", ⅝" or ¾" ATR	1500	1290
SS H2.5A	4	2	(20) 8dx1½"	(20) 8dx1½"	1705	1465
SS DTT2Z[2,3,11]	1	1	(8) ¼x1½" SDS	(1) ½" ATR	1825	1800
FSC	1	1	(15) 10dx1½"	(1) ⅜" ATR	1830	1570
LGT2	1	2	(16) 16d Sinkers	(14) 16d Sinkers	2050	1785
THA222-2[1]	1	2	(6) 16dx2½"	(14) 16d	2300	2300
HTT4[2,3]	1	1[8]	(18) 10dx1½"	(1) ⅝" ATR	3610	3105
HDU2-SDS2.5[2,3]	1	2	(6) ¼"x2½" SDS	(1) ⅝" ATR	3075	2215
FSC	2	1	(30) 10dx1½"	(2) ⅜" ATR	3660	3140
LGT3-SDS2.5	1	3	(12) ¼"x3" SDS	(26) 16d Sinkers	3685	2655
MGT[2,3]	1	2	(22) 10d	(1) ⅝" ATR	3965	3330
LGT4-SDS3	1	4	(16) ¼"x3" SDS	(30) 16d Sinkers	4060	2925
HTT4[2,3]	1	1[8], 2	(18) #10x1½" SD	(1) ⅝" ATR	4455	3830
HDU4-SDS2.5[2,3]	1	2	(10) ¼"x2½" SDS	(1) ⅝" ATR	4565	3285
THA222-2[1]	2	2	(12) 16dx2½"	(28) 16d	4600	4600
VGT[2,3]	1	2	(16) ¼"x3" SDS	(1) ⅝" ATR	4940	3555
HTT5[2,3]	1	2	(26) 16dx2½"	(1) ⅝" ATR	5090	4375
CS16	3	3	(33) 10d	(33) 10d	5115	5115
HTT5KT[2,3]	1	2	(26) #10x2½" SD	(1) ⅝" ATR	5445	5360
HDU5-SDS2.5[2,3]	1	2	(14) ¼"x2½" SDS	(1) ⅝" ATR	5645	4065
HDU2-SDS2.5[2,3]	2	2	(12) ¼"x2½" SDS	(1) ⅝" ATR	6150	4430
VGT[2,3]	2	2	(32) ¼"x3" SDS	(2) ⅝" ATR	7185	5175
HTT5[2,3]	2	2	(52) 10dx1½"	(1) ⅝" ATR	8700	7480
VGT[2,3]	2	3	(32) ¼"x3" SDS	(2) ⅝" ATR	8890	6400
HGT-4[2,3]	1	4	(16) 10d	(2) ⅝" ATR	9250	9250
HGT-3[2,3]	1	3	(16) 10d	(2) ⅝" ATR	10530	9035
HGT-2[2,3]	1	2	(16) 10d	(2) ⅝" ATR	10980	6485

1. Parallel to Plate—THA222-2 is 350 lbs. Perpendicular to Plate—THA222-2 is 280 lbs.
2. Rod must connect directly to foundation or to adequately sized connectors to framing below as determined by the Designer.
3. ATR—All-Thread Rod.
4. For multiple holdowns, verify the allowable tension capacity of the wood member.
5. Where noted, 10dx1½" nails may be substituted for same load.
6. H16-2/H16-2S factory sloped to 5:12, but 3:12 - 7:12 roof slope is acceptable.
7. LGT4—Uplift for DF/SP girder and SPF studs is 3860 lbs.
8. HTT4-Tabulated loads are based on a min. nominal 2x6 framing member.
9. A standard cut washer is required under anchor nut for LTT20B when using ½" or ⅝" anchor bolts. No additional washer is required when using a ¾" anchor bolt.
10. Allowable lateral loads (F_1, F_2) for certain girder tie downs may be available. Contact Simpson Strong-Tie for more information.
11. For stainless steel, order DTT2SS.



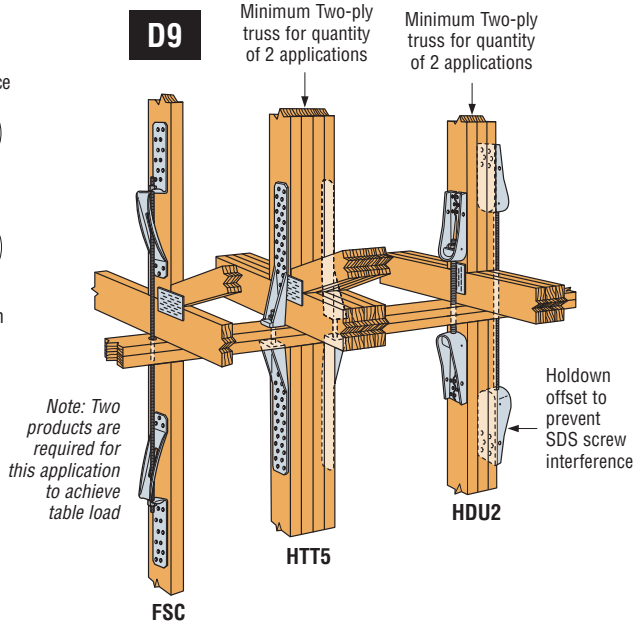




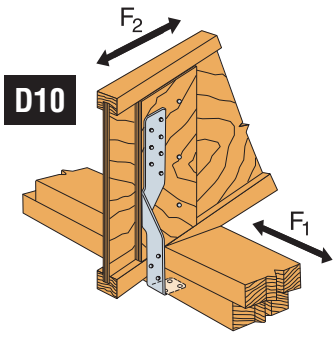


HGT Installed on Wood

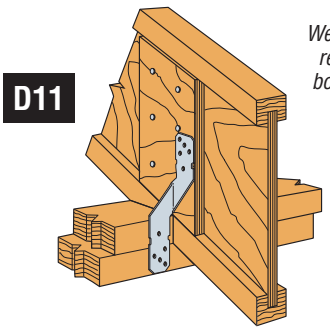
Use ⅝" threaded rod, and two Simpson Strong-Tie® LBP ⅝" washers *(not included)* on top of each crescent washer *(total of four LBP ⅝" washers)*



I-JOISTS TO WALL FRAMING

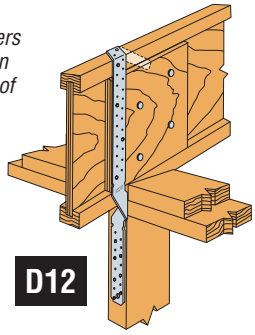


MTS Installation as an I-joist to Top Plate Tie

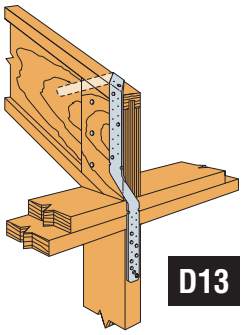


Typical H8 Installation *(I-joist to Top Plate)*

NOTE: Web stiffeners required on both sides of I-joist



MTS30 to Studwall Installation



MTS30 to Studwall Installation

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.

SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

	Model No.	Fasteners		DF/SP Allowable Loads			SPF Allowable Loads		
		To Rafters	To Plates	Uplift (160)	Lateral (160) Parallel to Plate (F_1)	Lateral (160) Perpendicular to Plate (F_2)	Uplift (160)	Lateral (160) Parallel to Plate (F_1)	Lateral (160) Perpendicular to Plate (F_2)
SS	H8	(5) 10dx1½"	(5) 10dx1½"	745	75	—	565	75	—
SS	MTS20[1]	(7) 10dx1½"	(7) 10dx1½"	1000	75	125	860	75	125
	MTS30[1]	(7) 10dx1½"	(7) 10dx1½"	1000	75	125	860	75	125
	HTS20	(12) 10dx1½"	(12) 10dx1½"	1450	75	125	1245	75	125
	HTS30[1]	(12) 10dx1½"	(12) 10dx1½"	1450	75	125	1245	75	125

1. Additional fastener holes are provided on these products. Not all holes are required to be filled to achieve listed loads.
2. Consult I-joist manufacturer for blocking details and uplift limits on joist end application.
3. Connectors may be reversed as long as the required fasteners are installed on either side of the connection.
4. Web stiffener required on both sides to achieve published uplift loads.
5. When installing MTS and HTS connectors, the following installation instructions are required for the lateral loads to apply. The first 7 nail holes after the bend area must be filled with 10dx1½" nails. This applies to straps on either side of bend area. All additional fasteners may be installed in any remaining strap holes.
6. Allowable loads in the F_1 direction are not intended to replace diaphragm boundary members or prevent cross grain bending of the truss or rafter members.
7. For simultaneous loads in more than one direction, the connector must be evaluated as described in Note 6, page 9 under General Notes.

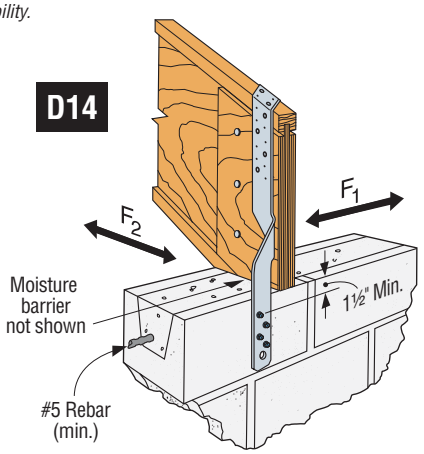
I-JOISTS TO MASONRY/CONCRETE

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.

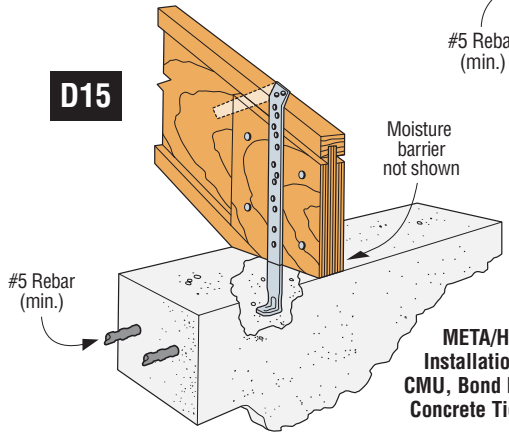
SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

	Model No.	Fasteners		DF/SP Allowable Loads		
		To I-Joist	To Grouted CMU or Bond Beam	Uplift (160)	Lateral Parallel to Plate (F_1)	Lateral Perpendicular to Plate (F_2)
	MTSM16	(7) 10dx1½"	(4) ¼"x2¼" Titen[5]	1000	200[4]	90[4]
	MTSM20	(7) 10dx1½"	(4) ¼"x2¼" Titen[5]	1000	200[4]	90[4]
	HTSM16	(8) 10dx1½"	(4) ¼"x2¼" Titen[5]	1150	200[4]	90[4]
	HTSM20	(10) 10dx1½"	(4) ¼"x2¼" Titen[5]	1150	200[4]	90[4]
	META20	(7) 10dx1½"	Embedded	1450	340	725
SS	HETA20	(9) 10dx1½"	Embedded	1810	340	725
	HETA40	(8) 10dx1½"	Embed 4"	1810	340	725

1. Additional fastener holes are provided on these products. Not all holes are required to be filled to achieve listed loads.
2. Consult I-joist manufacturer for blocking details and uplift limits on joist end application.
3. Web stiffener required on both side to achieve published uplift loads.
4. When installing MTSM and HTSM connectors, the following installation instructions are required for lateral loads to apply:
   a) The first 4 holes for Titen® screws after the bend area must be filled on the concrete/masonry end of the connection.
   b) The first 7 nail holes after the bend area must be filled with 10dx1½" nails on the wood end of the connection. Any additional required nails may be placed in any open hole on the wood end of the strap.
5. Use ¼"x1¾" Titen® screws for concrete application.
6. Allowable loads in the F_1 direction are not intended to replace diaphragm boundary members or prevent cross grain bending of the truss or rafter members.
7. For simultaneous loads in more than one direction, the connector must be evaluated as described in Note 6, page 9 under General Notes.



MTSM20 Fastened Directly to CMU, Bond Beam or Concrete Tie Beam



META/HETA Installation into CMU, Bond Beam or Concrete Tie Beam

NOTE: Web stiffeners required on both sides of I-joist

EMBEDDED TRUSS/RAFTER TO MASONRY/CONCRETE

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.

SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

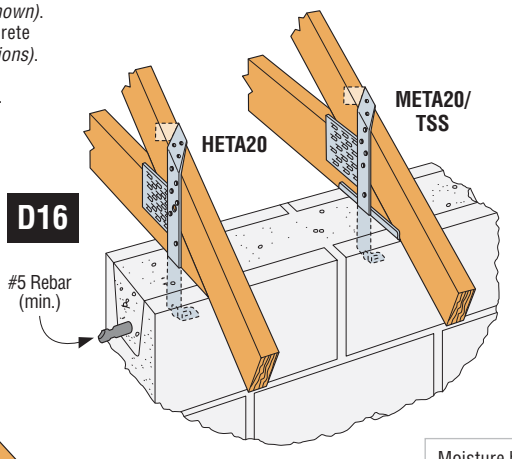
	Model No.	Qty. Required	Application	SP Uplift One-Ply Truss[4]		SP Uplift Two- or Three-Ply Truss		SP Lateral Load	
				Fasteners to Truss/Rafter (Total)	(160)	Fasteners to Truss/Rafter (Total)	(160)	Parallel to Plate (F_1)	Perpendicular to Plate (F_2)
	HETAL12[7]	1	Block/Concrete	(10) 10dx1½"	1085	(10) 16d	1270	415	1100
(META20 Only)	META12, META14 META16, META18, META20, META22, META24, META40	1	Block/Concrete	(7) 10dx1½"	1450	(6) 16d	1450	340	725
	HETA12	1	Block/Concrete	(7) 10dx1½"	1520	(7) 16d	1780	340	725
	HHETA12	1	Block/Concrete	(7) 10dx1½"	1565	(7) 16d	1820	340	725
SS (HETA20 Only)	HETA16, HETA18, HETA20, HETA22, HETA24, HETA40	1	Block/Concrete	(9) 10dx1½"	1810	(8) 16d	1810	340	725
(HETAL20 Only)	HETAL16[7] HETAL20[7]	1	Block/Concrete	(14) 10dx1½"	1810	(13) 16d	1810	415	1100
	HHETA16, HHETA18, HHETA20, HHETA22, HHETA24, HHETA40	1	Block/Concrete	(10) 10dx1½"	2235	(9) 16d	2235	340[9]	725
(META20 Only)	META12, META14, META16, META18, META20, META22, META24, META40	2[12]	Block	(10) 10dx1½"[12]	1985	(14) 16d[13]	1900	1210	1160
			Concrete	(10) 10dx1½"[12]	1985	(14) 16d[13]	2565		
SS (HETA20 Only)	HETA12, HETA14, HETA16, HETA18, HETA20, HETA22, HETA24, HETA40	2[12]	Block	(10) 10dx1½"[12]	2035	(12) 16d[13]	2500	1225	1520
			Concrete	(10) 10dx1½"[12]	2035	(12) 16d[13]	2700		
	HHETA12, HHETA14 HHETA16, HHETA18, HHETA20, HHETA22	2[12]	Block	(10) 10dx1½"[12]	2035	(12) 16d[13]	2500	1225	1520
			Concrete	(10) 10dx1½"[12]	2035	(14) 16d[13]	3350		
	DETAL20[10]	1	Block	(18) 10dx1½"	2480	—	—	2000	1370
			Concrete	(18) 10dx1½"	2480	—	—	2000	1505

1. For SPF trusses multiply table loads by 0.78 for uplift and F_2 directions *(use F_1 values as shown)*.
2. Unless noted otherwise, embedment is into either grout filled block *(f'_m = 1500 psi)* or concrete *(minimum f'_c is 2000 psi for single strap installations and 2500 psi for double strap installations)*.
3. Minimum edge distance for HETA/META is 1½" for concrete and 2" for masonry.
4. Single-ply trusses may use either 10dx1½" or 16d nails with allowable loads as noted in table. Two- or three-ply trusses shall use 16d nails.
5. For simultaneous loads in more than one direction, the connector must be evaluated as described in Note 6, page 9 under General Notes.
6. Allowable loads in the F_1 direction are not intended to replace diaphragm boundary members or prevent cross grain bending of the truss or rafter members.
7. The HETAL requires 5 nails to be installed into the truss seat.
8. Parallel-to-wall load towards face of HETAL is 1975 lbs.
9. The HHETA allowable F_1 load can be increased to 435 lbs. if the strap is wrapped over the truss and a minimum of 12 nails are installed.
10. The DETAL20 requires 6 nails installed in the truss seat and 6 nails in each strap.
11. Double META, HETA, and HHETA are spaced at 1⅝" for single-ply and 3⅛" for two-ply and staggered as shown. Install with spoons facing outward.
12. Where noted, for double anchors install half of the required number of fasteners in each strap.
13. Two HHETA anchors may be installed in a concrete tie beam on a two- or three-ply truss with 2 fewer nails for an allowable uplift load of 3050 lbs.
14. Double embedded anchor lateral loads apply only to two- or three-ply applications with anchors spaced a minimum of 3" apart. For single-ply applications use lateral loads from the Single Embedded Anchor Installation.
15. 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 than 7 fasteners are used with the HETA and HHETA anchors or when fewer than (6) 16d or (7) 10dx1½" fasteners are used with the META anchor. HETAL lateral loads do not apply when fewer than 5 fasteners are installed in strap – 5 fasteners required in the truss seat. DETAL lateral loads do not apply when fewer than 5 fasteners are installed in each strap – 6 fasteners required in the truss seat. Calculate the connector uplift value for a reduced number of fasteners as follows:

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

Example: META20 in SP with (6) 10dx1½" nails total (160)

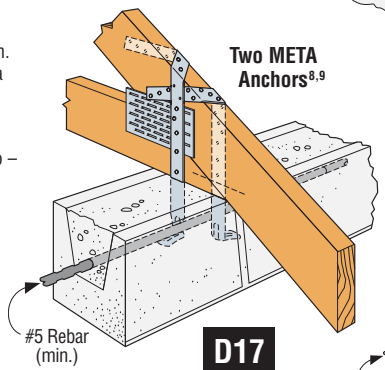
$$\text{Allowable Load} = \frac{\text{6 Nails (Used)}}{\text{7 Nails (Table)}} \times \text{1450 lbs.} = \text{1240 lbs.}$$

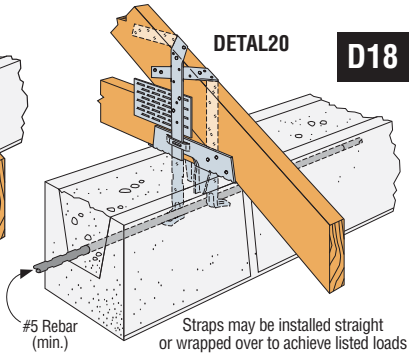


Straps may be installed straight or wrapped over truss

Blocking not shown for clarity

Moisture barrier not shown on this page





Straps may be installed straight or wrapped over to achieve listed loads

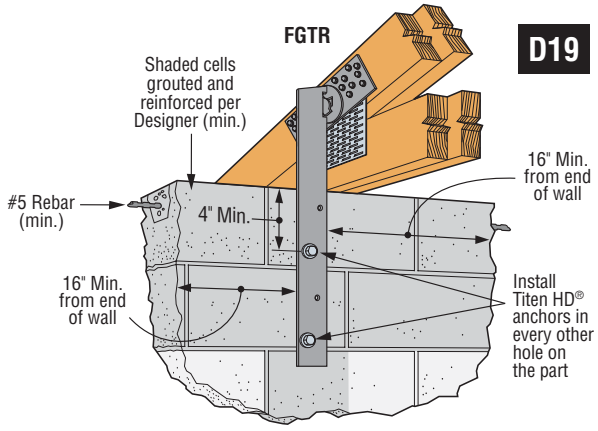
POST-INSTALLED TRUSS/RAFTER TO MASONRY/CONCRETE

SIMPSON Strong-Tie®

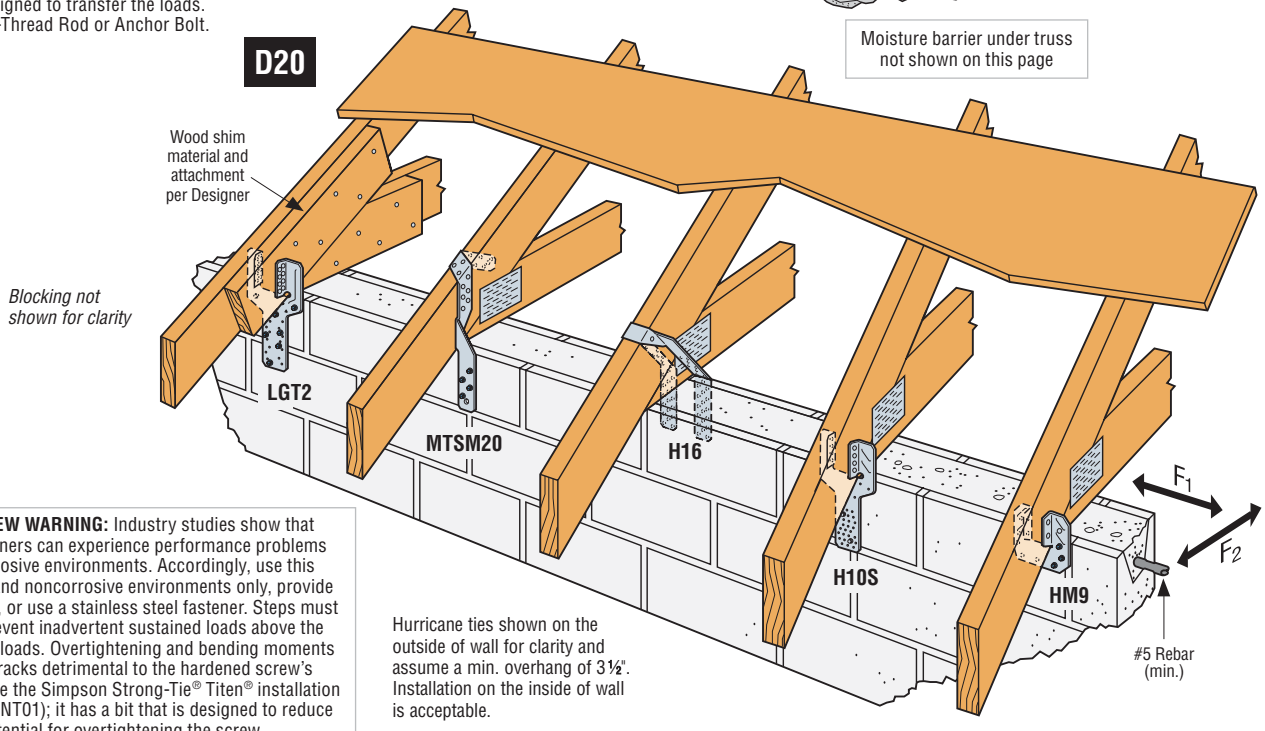
SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

Model No.	Qty. Required	Fasteners to Block	Uplift One-Ply Truss		Uplift Two-Ply Truss		Lateral Load	
			Fasteners to Truss/Rafter (Total)	DF/SP Uplift (160)	Fasteners to Truss/Rafter (Total)	DF/SP Uplift (160)	Parallel to Plate (F_1)	Perp. to Plate (F_2)
HM9KT	1	(5) ¼"x2¼" Titen[4]	(4) ¼"x1½" SDS	595	N/A	N/A	425	200
HGAM10KTA	1	(4) ¼"x2¼" Titen[4]	(4) ¼"x1½" SDS	850	N/A	N/A	1005	1105
MTSM16, MTSM20	1	(4) ¼"x2¼" Titen[4]	(7) 10dx1½"	860	(7) 10d	860	200[6]	90[6]
H10S	1	(2) ⅜"x4" Titen HD	(8) 8dx1½"	1065	N/A	N/A	—	—
HTSM16, HTSM20	1	(4) ¼"x2¼" Titen[4]	(8) 10dx1½"	1175	(8) 10d	1175	200[6]	90[6]
LTT20B[2]	1	(1) ½", ⅝", ¾" ATR[11]	(10) 10dx1½"	1355	(10) 16d	1500	—	—
H16[5]	1	(6) ¼"x2¼" Titen[4]	(2) 10dx1½"	1470	N/A	N/A	—	—
H16-2[5]	1	(6) ¼"x2¼" Titen[4]	N/A	N/A	(2) 10dx1½"	1470	—	—
MTSM16, MTSM20	2	(8) ¼"x2¼" Titen[4]	(14) 10dx1½"	1650[12]	(14) 10d	1650[12]	235[6]	205[6]
HTSM16, HTSM20	2	(8) ¼"x2¼" Titen[4]	(16) 10dx1½"	1900[12]	(16) 10d	1900[12]	235[6]	205[6]
SS DTT2Z[13,14]	1	(1)ATR	(8) ¼"x1½" SDS	1825	(8) ¼"x1½" SDS	2145	—	—
LGT2[3]	1	(7) ¼"x2¼" Titen[4]	(16) 16d Sinkers[3]	2150	(16) 16d Sinkers	2150	700	170
FGTR[7,8,9,10]	1	(2) ½"x5" Titen HD	(18) ¼"x3" SDS[3]	5000	(18) ¼"x3" SDS	5000	—	—

1. For SPF trusses multiply table uplift and F_2 loads by 0.86 for nailed applications and 0.72 for Simpson Strong-Tie® Strong-Drive® screws (SDS) for uplift and F_2 directions *(use F_1 values as shown)*. Higher loads may be possible *(contact Simpson Strong-Tie)*.
2. Add a standard cut washer to seat of LTT20B when ½" or ⅝" diameter anchor bolt is used.
3. Product may be used for a single-ply truss provided the truss is blocked to receive 3" Simpson Strong-Tie® Strong-Drive® screws (SDS) or 16d sinkers and blocking is attached to the truss to act as a single unit.
4. For concrete applications use ¼"x1¾" Titen® screws.
5. H16/H16-2 factory sloped to 5:12, but 3:12-7:12 roof slope is acceptable.
6. When installing MTSM and HTSM connectors, the following installation instructions are required for lateral loads to apply:
   a) The first 4 holes for Titen® screws after the bend area must be filled on the concrete/masonry end of the connection.
   b) The first 7 nail holes after the bend area must be filled with 10dx1½" nails on the wood end of the connection. Any additional required nails may be placed in any open hole on the wood end of the strap.
7. To achieve the published loads, the FGTR must be attached to a grouted and reinforced block wall or reinforced concrete wall designed by others to transfer the uplift loads to the foundation.
8. FGTR installed between 4" and 16" from the end of a wall will have an allowable load of 4685 lbs.
9. FGTR is packaged with Simpson Strong-Tie® Strong-Drive® screws (SDS) and Titen HD® anchors.
10. FGTR can be installed on roof pitches up to 8:12 or on a bottom chord designed to transfer the loads.
11. ATR—All-Thread Rod or Anchor Bolt.
12. MTSM/HTSM connectors shall be installed on opposite faces of masonry/concrete to achieve loads listed for two connectors. If installed on same face of masonry/concrete, maximum uplift is 1340 lbs.
13. For stainless steel, order DTT2SS.
14. DTT2 is 6$^{15}/_{16}$" tall. Truss heel height or rafter vertical depth must accommodate.



Moisture barrier under truss not shown on this page



Hurricane ties shown on the outside of wall for clarity and assume a min. overhang of 3½". Installation on the inside of wall is acceptable.

TITEN® SCREW WARNING: Industry studies show that hardened fasteners can experience performance problems in wet or corrosive environments. Accordingly, use this product in dry and noncorrosive environments only, provide moisture barrier, or use a stainless steel fastener. Steps must be taken to prevent inadvertent sustained loads above the listed allowable loads. Overtightening and bending moments can initiate cracks detrimental to the hardened screw's performance. Use the Simpson Strong-Tie® Titen® installation tool kit (Part TTNT01); it has a bit that is designed to reduce the potential for overtightening the screw.

GIRDER/TRUSS TO MASONRY/CONCRETE

SIMPSON Strong-Tie®

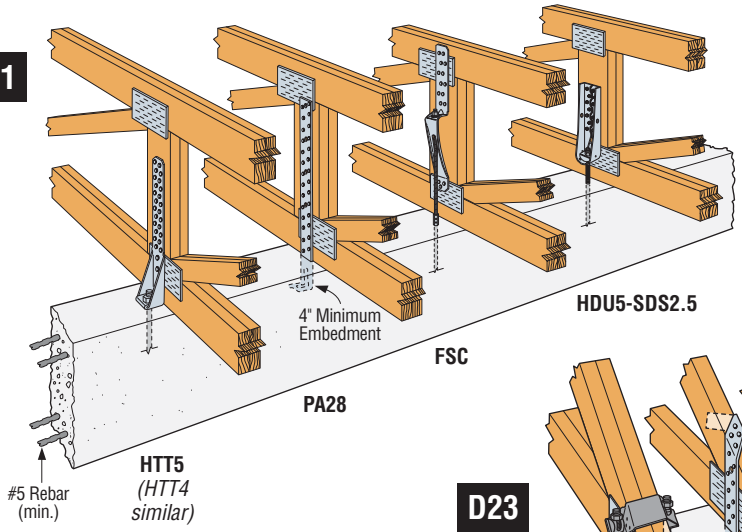
These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

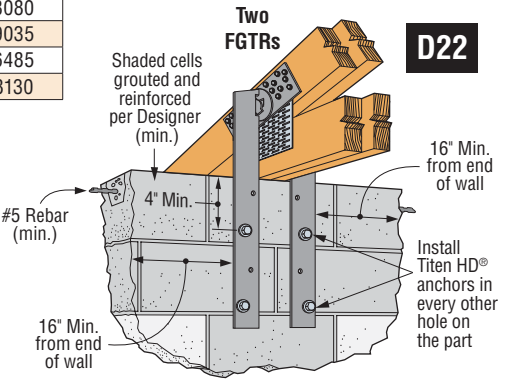
Model No.	Qty. Required[3]	No. of Plies	Fasteners		DF/SP Uplift	SPF Uplift
			Girder/Truss	Masonry/Concrete	(160)	(160)
NEW LTA2 Parallel to Wall Installation	1	1	(10) 10dx1½"	Embedded	1390[13]	1015
NEW LTA2 Perpendicular to Wall Installation	1	1	(10) 10dx1½"	Embedded	1425[13]	1015
H16-2[13]	1	2	(2) 10dx1½"	(6) ¼"x2¼" Titen[7]	1470	1265
FSC	1	1	(15) 10dx1½"	(1) ⅜" ATR[4] or THD37634RC[14]	1830	1570
LGT2	1	2	(14) 16d Sinkers	(7) ¼"x2¼" Titen[7]	2150	1850
THA222-2	1	2	(6) 16dx2½	(14) 3/16"x2¼" Titen[7]	2150	1850
VGT L/R	1	2	(16) ¼"x3" SDS	(1) ⅝" ATR	2230	1605
PA28[5]	1	2	(20) 16d	Embed 4"	2765	2765
HDU2-SDS2.5	1	2	(6) ¼"x2½" SDS	(1) ⅝" ATR	3075	2215
LGT3-SDS2.5	1	3	(12) ¼"x2½" SDS	(4) ⅜"x5" Titen HD	3285	2365
LGT4-SDS3	1	4	(16) ¼"x2½" SDS	(4) ⅜"x5" Titen HD	3285	2365
HTT4	1	2	(18) 10dx1½"	(1) ⅝" ATR	3610	3105
FSC	2	1	(30) 10dx1½"	(2) ⅜" ATR[4] or THD37634RC[15]	3660	3140
MGT	1	2	(22) 10d	(1) ⅝" ATR	3965	3330
HTT4	1	2	(18) 16dx2½"	(1) ⅝" ATR	4235	3640
HTT5	1	2	(26) 10dx1½"	(1) ⅝" ATR	4350	3740
HDU4-SDS2.5	1	2	(10) ¼"x2½" SDS	(1) ⅝" ATR	4565	3285
HTT5	1	2	(26) 10d	(1) ⅝" ATR	4670	4015
VGT[12]	1	2	(16) ¼"x3" SDS	(1) ⅝" ATR	4940	3555
FGTR[8,9,10,11]	1	2	(18) ¼"x3" SDS	(2) ½"x5" Titen HD	5000	4300
HTT5	1	2	(26) 16dx2½"	(1) ⅝" ATR	5090	4375
HPA35[5]	1	2	(27) 16d	Embed 8¼"	5265	4525
VGT L/R[12]	2	2	(32) ¼"x3" SDS	(2) ⅝" ATR	5545	3990
HDU5-SDS2.5	1	2	(14) ¼"x2½" SDS	(1) ⅝" ATR	5645	4065
HDU2-SDS2.5	2	2	(12) ¼"x2½" SDS	(2) ⅝" ATR	6150	4430
VGT[12]	2	2	(32) ¼"x3" SDS	(2) ⅝" ATR	7185	5175
HDQ8-SDS3	1	2	(20) ¼"x3" SDS	(1) ⅞" ATR	8325	7210
HTT5	2	2	(52) 10dx1½"	(2) ⅝" ATR	8700	7480
VGT[12]	2	3	(32) ¼"x3" SDS	(2) ⅝" ATR	8890	6400
HGT-4	1	4	(16) 10d	(2) ¾" ATR	9250	9250
FGTR[8,9,10,11]	2	2	(36) ¼"x3" SDS	(4) ½"x5" Titen HD	9400	8080
HGT-3	1	3	(16) 10d	(2) ¾" ATR	10530	9035
HGT-2	1	2	(16) 10d	(2) ¾" ATR	10980	6485
HDU5-SDS2.5	2	2	(28) ¼"x2½" SDS	(2) ⅝" ATR	11290	8130

1. Holdown load values are based on a 3" thick vertical member. See the current Simpson Strong-Tie® *Wood Construction Connectors* catalog for load values based on different wood thicknesses. Wood member design by Specifier.
2. The Designer must specify anchor type, length and embedment.
3. The Designer must evaluate multiple installations not listed.
4. ATR—All-Thread Rod or Anchor Bolt.
5. PA28 and HPA35 must be embedded in center of a concrete tie beam *(minimum width = 7⅝").*
6. Multiple HDUs and HTTs must be installed staggered on truss.
7. For concrete applications use ¼"x1¾" Titen® screws.
8. To achieve the published loads, the FGTR must be attached to a grouted and reinforced block concrete wall designed by others to transfer the uplift loads to the foundation.
9. FGTR is packaged with Simpson Strong-Tie® Strong-Drive® screws (SDS) and Titen HD® anchors.
10. Screw holes on FGTR and VGT are configured to allow for a double installation on a two ply truss.
11. To achieve the loads listed for the MGT, HGT and VGT single and double connector options, anchor into a 8" wide concrete tie-beam or grouted and reinforced CMU tie-beam can be made using Simpson Strong-Tie® SET® epoxy anchoring adhesive with a minimum embedment depth of 12", a minimum end distance of 12" and centered in the 8" member. Vertical reinforcement may be required to transfer the loads per Designer.
12. H16-2 factory sloped to 5:12, but 3:12 - 7:12 roof slope is acceptable.
13. LTA2 uplift is 1210 lbs. for DF.
14. THDRC listed for use with 8" concrete tie beam, 1¾" edge, 8" end distance, uncracked concrete with no supplementary reinforcement and 2500 psi concrete minimum. Designer shall specify adhesive anchor for CMU bond beam.

D21



D22



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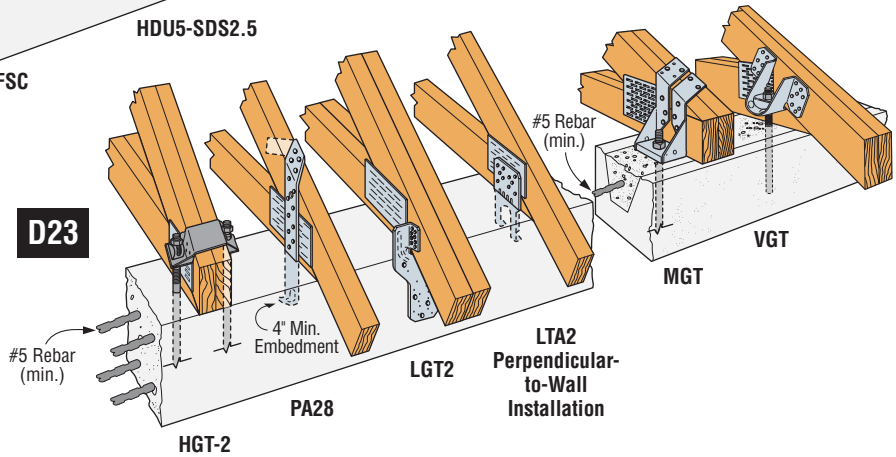


Moisture barrier not shown on this page

TRUSS/RAFTER HIP TO WALL

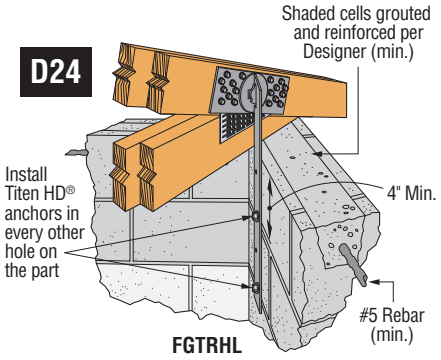
These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

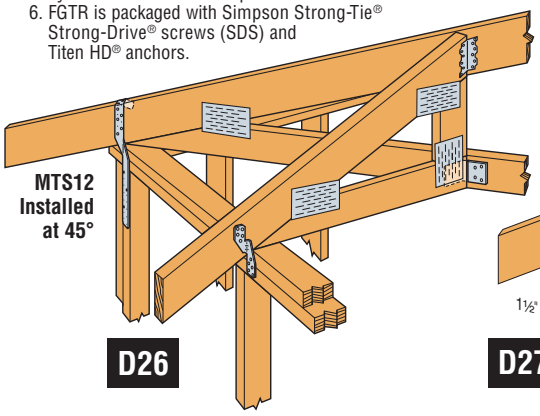
*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

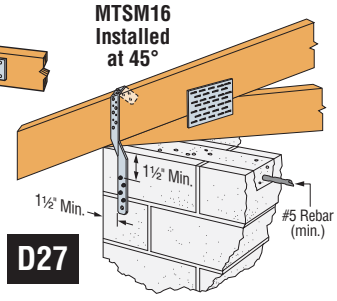
	Model No.	Member Size	Fasteners		DF/SP Allowable Loads (160)			SPF Allowable Loads (160)		
			To Truss/ Rafter	To Wall	Uplift	F_1		Uplift	F_1	
SS	HCP[1]	2x	(6) 10dx1½"	(6) 10dx1½"	605	300		520	260	
SS	HCP1.81[1]	1¾	(6) 10dx1½"	(6) 10dx1½"	605	300		520	260	
SS	MTS12	2x	(7) 10dx1½"	(7) 10dx1½"	840	—		730	—	
	MTSM16	2x	(7) 10dx1½"	(4) ¼"x2¼" Titen[3]	840	—		730	—	
SS	HCP4	4x	(8) 10d	(8) 10d	1000	265		860	230	
SS	HTS16	2x	(8) 10dx1½"	(8) 10dx1½"	1105	—		950	—	
	FGTRH L/R[5,6]	(2)2x	(18) ¼"x3" SDS	(2) ½"x5" Titen HD	3850	—		3850	—	

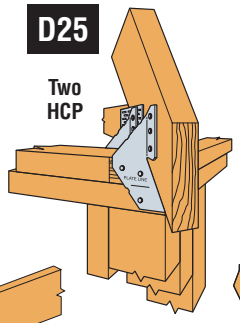
1. The HCP can be installed on the inside and the outside of the wall with a flat bottom chord truss and achieve twice the load capacity.
2. MTS12 and MTSM16 can be field bent to a 45° angle.
3. For concrete applications for the MTSM16, use ¼"x1¾" Titen® screws.
4. Minimum edge distance for ¼" Titen® screw is 1½" and ½" Titen HD® anchor is 4".
5. To achieve the published loads, the FGTR must be attached to a grouted and reinforced block wall or reinforced concrete wall designed by others to transfer the uplift loads to the foundation.
6. FGTR is packaged with Simpson Strong-Tie® Strong-Drive® screws (SDS) and Titen HD® anchors.

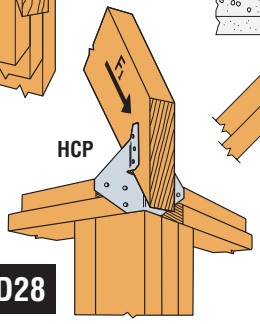


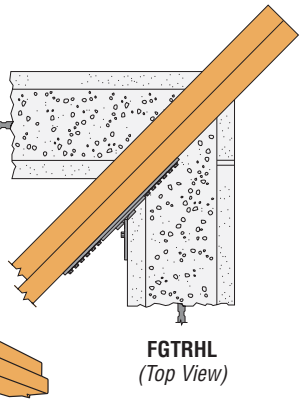
Moisture barrier not shown on this page







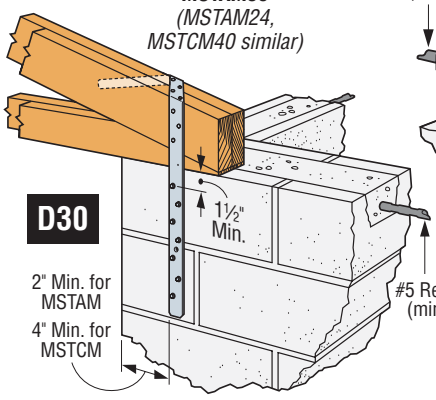


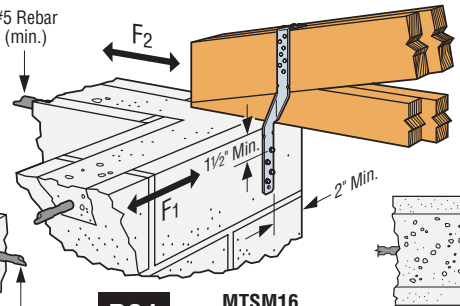


TRUSS/RAFTER HIP TO END WALL

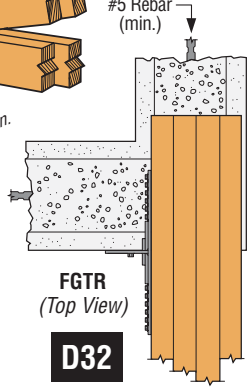
Model No.	Member Size (Min.)	Fasteners		DF/SP Allowable Loads			SPF Allowable Loads		
		To Truss	To Wall	Uplift (160)	F_1	F_2	Uplift (160)	F_1	F_2
MTSM16[1,3,6]	(2)2x	(7) 10d	(4) ¼"x2¼" Titen	860	235	90	750	235	90
HTSM16[1,3,6]	(2)2x	(8) 10d	(4) ¼"x2¼" Titen	1175	235	90	1020	235	90
MSTAM24[1,3]	(2)2x	(9) 10d	(5) ¼"x2¼" Titen	1500	—	—	1500	—	—
MSTAM36[1,3]	(2)2x	(13) 10d	(8) ¼"x2¼" Titen	1870	—	—	1870	—	—
MSTCM40[1,3]	(2)2x	(26) 16d Sinkers	(14) ¼"x2¼" Titen	4220	—	—	4220	—	—
MSTCM60[1,3]	(2)2x	(26) 16d Sinkers	(14) ¼"x2¼" Titen	4220	—	—	4220	—	—
FGTR[2,4,5]	(2)2x	(18) ¼"x3" SDS	(2) ½"x5" Titen HD	4685	—	—	4300	—	—

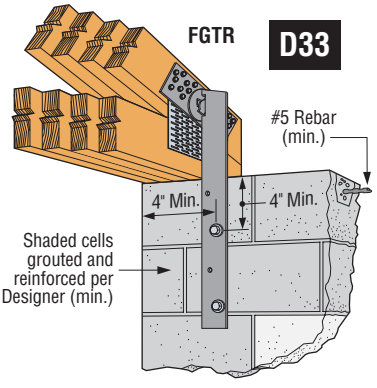
1. Minimum edge distance for ¼" Titen® screw is 1½".
2. Minimum edge distance for ½" Titen HD® anchor is 4".
3. For concrete tie beam applications, use ¼"x1¾" Titen® screws.
4. To achieve the published loads, the FGTR must be attached to a grouted and reinforced block wall or reinforced concrete wall designed by others to transfer the uplift loads to the foundation.
5. FGTR is packaged with Simpson Strong-Tie® Strong-Drive® screws (SDS) and Titen HD® anchors.
6. When installing MTSM and HTSM connectors, the following installation instructions are required for lateral loads to apply:
   a) The first 4 holes for Titen® screws after the bend area must be filled on the concrete/masonry end of the connection.
   b) The first 7 nail holes after the bend area must be filled with 10dx1½" nails on the wood end of the connection. Any additional required nails may be placed in any open hole on the wood end of the strap.





Moisture barrier not shown on this page





TRUSS/RAFTER TO SINGLE TOP PLATE

SIMPSON Strong-Tie®

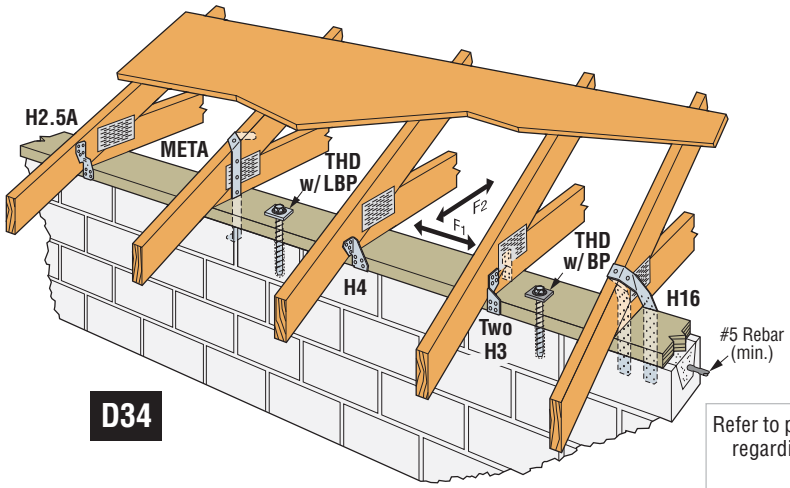
These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

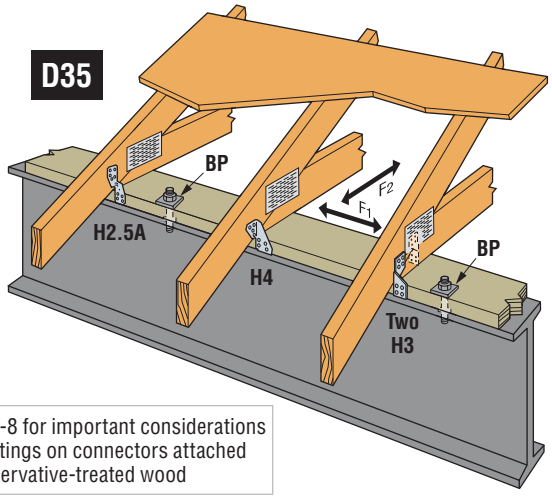
*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

Model No.	Qty. Required	Fasteners (Total)		DF/SP Allowable Loads			SPF Allowable Loads		
		To Truss/ Rafters	To Plates	Uplift (160)	Parallel to Plate (F_1) (160)	Perp. to Plate (F_2) (160)	Uplift (160)	Parallel to Plate (F_1) (160)	Perp. to Plate (F_2) (160)
H2.5ASS	1	(4) SS8d	(4) SS8d	285	—	—	245	—	—
SS H4	1	(4) 8d	(4) 8d	360	165	160	235	140	135
H2.5A	1	(5) 8d	(4) 8d	390	—	—	335	—	—
SS H3	1	(4) 8d	(4) 8d	455	125	160	320	105	140
SS H4	2[4]	(8) 8d	(8) 8d	720	330	320	470	280	270
H2.5A	2[4]	(10) 8d	(8) 8d	780	—	—	630	—	—
SS H3	2[4]	(8) 8d	(8) 8d	910	250	320	640	210	280
META16	1	(7) 10dx1½"	N/R	1450	340	725	1180	340	635
META20	1	(7) 10dx1½"	N/R	1450	340	725	1180	340	635
H16	1	(2) 10dx1½"	(6) ¼"x2¼" Titen[1]	1470	—	—	1265	—	—

1. H16 fastened to masonry or concrete wall below single plate. Use 1¾" Titen® screws for concrete applications.
2. N/R—Not required, product is embedded into concrete or CMU.
3. Refer to page 21 for multiple META loads.
4. Refer to page 47 for installation details of two connectors on a single truss.
5. H16 factory sloped to 5:12, but 3:12 - 7:12 roof slope is acceptable.



D34

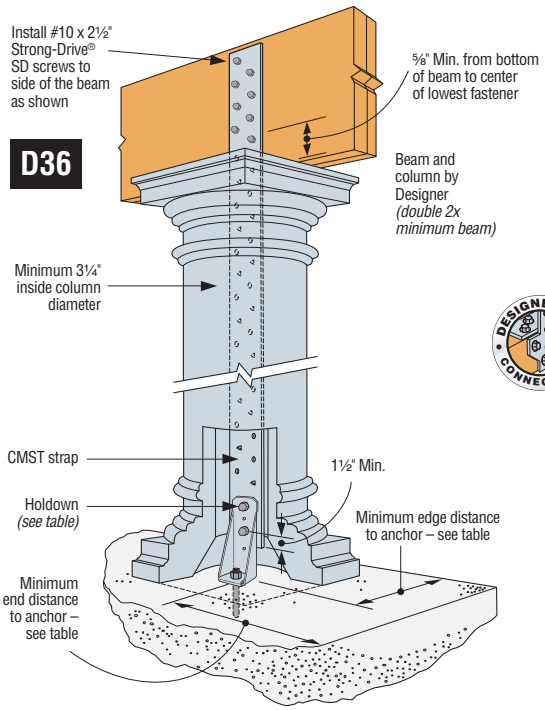


D35

Refer to pages 7-8 for important considerations regarding coatings on connectors attached to preservative-treated wood

HOLLOW COLUMN UPLIFT

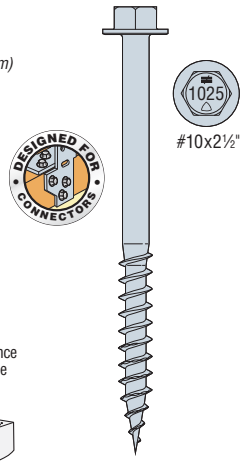
Refer to technical bulletin T-COLUMN for allowable loads and more installation information.



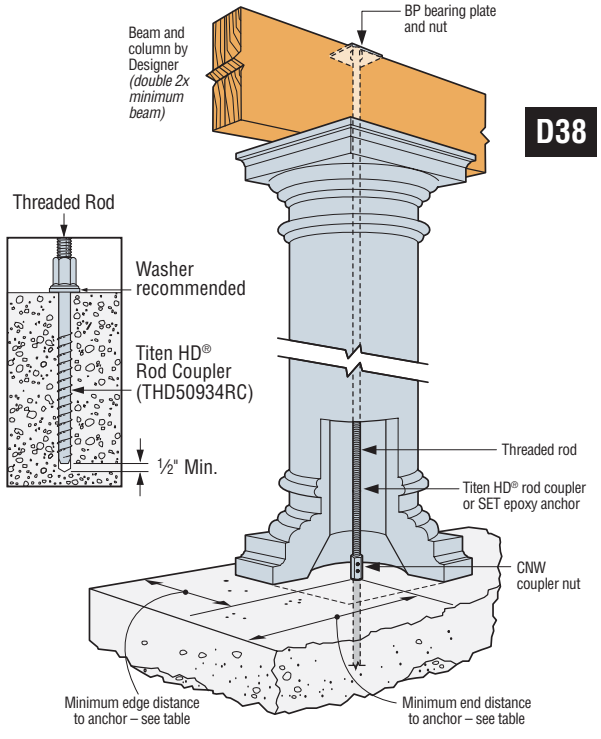
D36

CMST Strap Configuration Installation

D37



SD10
U.S. Patent 7,101,133



D38

All-Thread Rod Configuration Installation

TRUSS/RAFTER TO STUD

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.

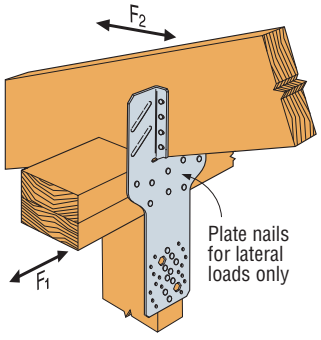
SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

Model No.	Qty. Required	Fasteners (Total)			DF/SP Allowable Loads			SPF Allowable Loads		
		To Truss/ Rafters	To Studs	To Plates	Uplift (160)	Parallel to Plate (F_1) (160)	Perp. to Plate (F_2) (160)	Uplift (160)	Parallel to Plate (F_1) (160)	Perp. to Plate (F_2) (160)
H2ASS	1	(5) SSN8	(5) SSN8	(2) SSN8	400	130	55	345	130	55
H2A	1	(5) 8dx1½"	(5) 8dx1½"	(2) 8dx1½"	575	130	55	495	130	55
LTS12	1	(6) 10dx1½"	(6) 10dx1½"	—	720	75	125	620	75	125
H7Z	1	(4) 8d	(8) 8d	(2) 8d	985	400	—	845	345	—
MTS12	1	(7) 10dx1½"	(7) 10dx1½"	Footnote 1	1000	300	295	860	250	250
MTS20	1	(7) 10dx1½"	(7) 10dx1½"	Footnote 1	1000	300	295	860	250	250
H10S[2,3]	1	(8) 8dx1½"	(8) 8d	(8) 8dx1½"	1010	545	215	870	470	185
H2A	2	(10) 8dx1½"	(10) 8dx1½"	(4) 8dx1½"	1150	260	110	990	260	110
HTS20	1	(12) 10dx1½"	(12) 10dx1½"	Footnote 1	1450	300[1]	295[1]	1245	300[1]	295[1]
LGT2[5]	1	(16) 16d Sinkers	(14) 16d Sinkers	Footnote 4	2050	700[4]	170[4]	1785	700[4]	170[4]

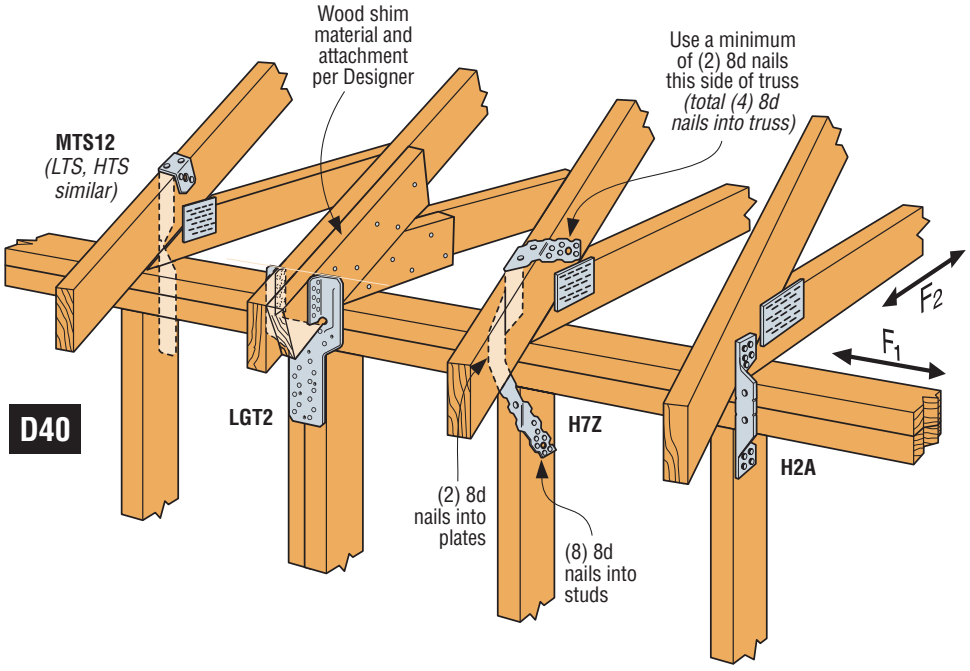
1. When installing MTS and HTS connectors, the following installation instructions are required for the lateral loads to apply. The first 7 nail holes after the bend area must be filled with 10dx1½" nails. This applies to straps on either side of bend area. All additional fasteners may be installed in any remaining strap holes.
2. H10S can have the stud offset a maximum of 1" from rafter *(center to center)* for a reduced uplift of 890 lbs. (DF/SP) and 765 lbs. (SPF).
3. H10S nails to plates are optional for uplift but required for lateral loads.
4. LGT2—F_1 load = 700 lbs.; F_2 load = 170 lbs. with installation of (4) 16d sinkers optional nail holes.
5. LGT2—two-ply member required – attached members must be designed to resist applied loads.

D39



H10S

D40



Refer to p.13 for information on the new SDWC fastener

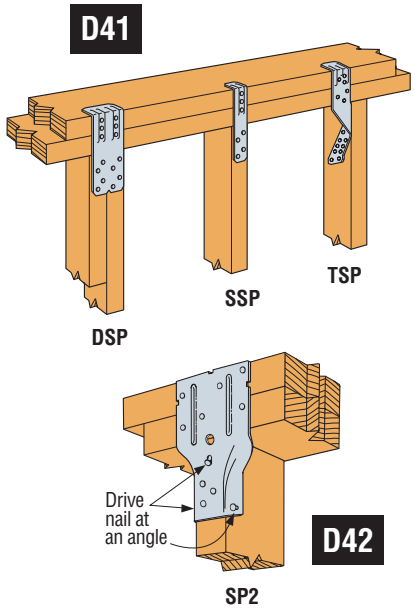
TOP PLATES TO STUD

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.

SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

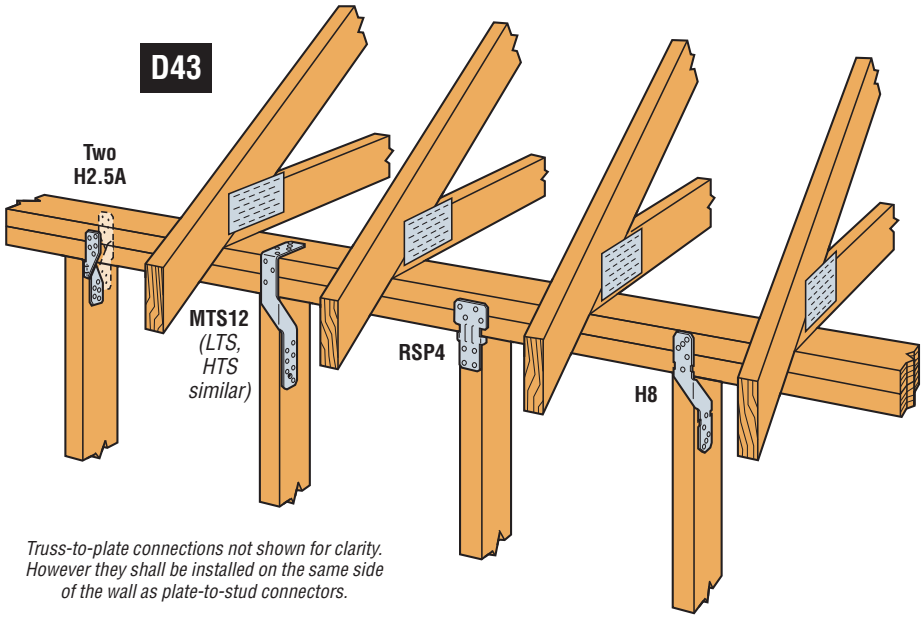
*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

Model No.	Qty. Required	Fasteners (Total)		DF/SP Allowable Loads	SPF Allowable Loads
		To Plates	To Studs	Uplift (160)	Uplift (160)
SSP	1	(3) 10dx1½"	(4) 10dx1½"	350	350
H2.5ASS	1	(5) SS8d	(5) SS8d	440	380
RSP4	1	(4) 8dx1½"	(4) 8dx1½"	450	370
SS H5	1	(4) 8dx1½"	(4) 8dx1½"	455	265
H2.5A	1	(5) 8dx1½"	(5) 8dx1½"	480	480
SS LTS12	1	(6) 10dx1½"	(6) 10dx1½"	720	620
SS H8	1	(5) 10dx1½"	(5) 10dx1½"	745	565
TSP	1	(6) 10dx1½"	(9) 10dx1½"	755	650
DSP	1	(6) 10dx1½"	(8) 10dx1½"	775	775
SS H5[2]	2	(8) 8dx1½"	(8) 8dx1½"	910	530
H2.5A[2]	2	(10) 8dx1½"	(10) 8dx1½"	960	960
SS MTS12	1	(7) 10dx1½"	(7) 10dx1½"	1000	860
TSP	1	(6) 10d	(9) 10dx1½"	1015	875
SP2[3]	1	(6) 10d	(6) 10d	1065	605
SS LTS12[2]	2	(12) 10dx1½"	(12) 10dx1½"	1440	1240
SS HTS20	1	(12) 10dx1½"	(12) 10dx1½"	1450	1245
SS MTS12[2]	2	(14) 10dx1½"	(14) 10dx1½"	2000	1720
SS HTS20[2]	2	(24) 10dx1½"	(24) 10dx1½"	2900	2490

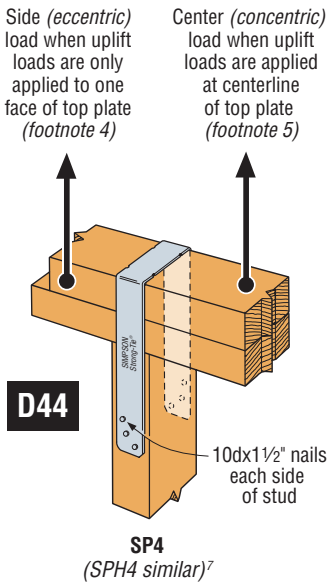


Model No.	Qty. Required	Fasteners (Total)		Allowable Uplift Loads			
				DF/SP		SPF/HF	
		To Plates	To Studs	Side[4] (160)	Center[5] (160)	Side[4] (160)	Center[5] (160)
SP4 SP6 SP8	1	N/R	(6) 10dx1½"	440	885	380	760
SPH4[7] SPH6[7] SPH8	1	N/R	(12) 10dx1½"	745[6]	1490[6]	585	1170

1. N/R—Not required.
2. Where noted in table, when multiple connectors are installed on opposite sides of wall the top plate shall be loaded concentrically. See Figure D44.
3. For SP2, drive one stud nail at an angle throught the stud into the plat to achieve the table load.
4. Use side *(eccentric)* load when uplift loads are applied to only one face of the top plate.
5. Use center *(concentric)* loads when uplift loads are applied at the center of the top plate, or where equal loads are applied to both sides of the top plate. Center loads may also be used for stud to bottom plate loads.
6. Maximum load for SPH in Doug Fir is 1360 lbs. for center loading, and 680 lbs. for side loading.
7. SPH4 and SPH6 can be installed over nominal ½" sheathing with a maximum DF/SP load of 1360 lbs. for center loading. Order SPH4R or SPH6R.



Truss-to-plate connections not shown for clarity. However they shall be installed on the same side of the wall as plate-to-stud connectors.



Refer to www.strongtie.com for information on the SDWC fastener for this application

STUD TO BAND JOIST

SIMPSON Strong-Tie®

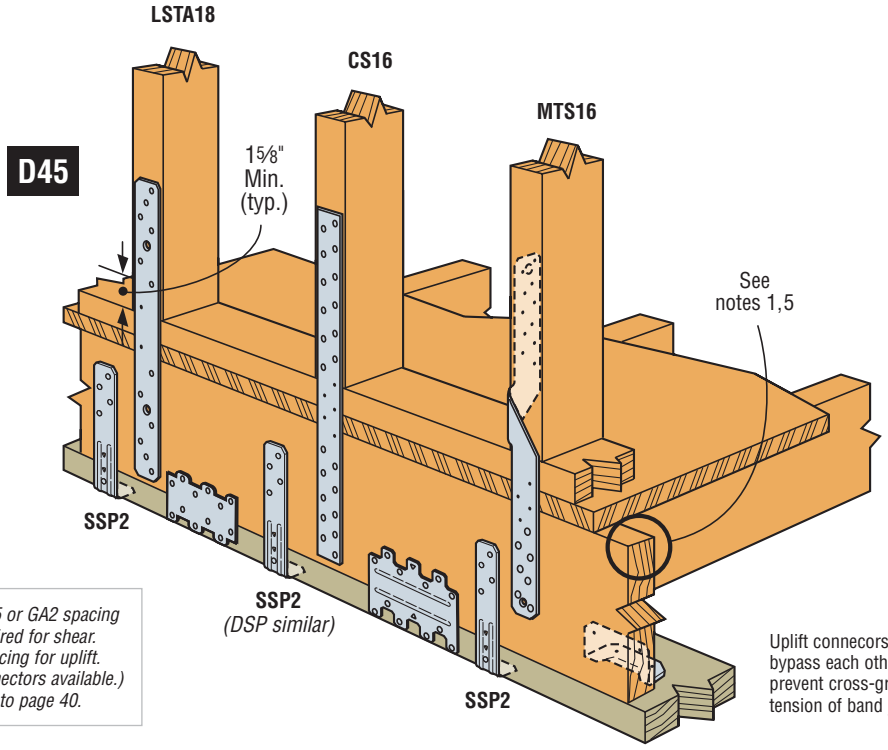
These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

	Model No.	Qty. Required	Single-Ply Band Joist (1½" Wide)				Double-Ply Band Joist (3" Wide)			
			DF/SP Allowable Uplift Loads		SPF Allowable Uplift Loads		DF/SP Allowable Uplift Loads		SPF Allowable Uplift Loads	
			Fasteners (Total)	(160)	Fasteners (Total)	(160)	Fasteners (Total)	(160)	Fasteners (Total)	(160)
SS	LSTA12[1]	1	(6) 10dx1½"	555	(6) 10dx1½"	480	(6) 10d	555	(6) 10d	480
SS	LTS16	1	(12) 10dx1½"	720	(12) 10dx1½"	620	(12) 10d	775	(12) 10d	665
SS	H6	1	(16) 8d	950	(16) 8d	820	(16) 8d	950	(16) 8d	820
SS	MTS16	1	(14) 10dx1½"	1000	(14) 10dx1½"	860	(14) 10d	1000	(14) 10d	860
	CS20[1]	1	(12) 10dx1½"	1030	(14) 10dx1½"	1030	(12) 10d	1030	(14) 10d	1030
SS	LSTA18[1]	1	(12) 10dx1½"	1110	(12) 10dx1½"	955	(12) 10d	1110	(12) 10d	955
SS	HTS20	1	(16) 10dx1½"	1150	(16) 10dx1½"	990	(16) 10d	1450	(16) 10d	1245
SS	LSTA24[1]	1	(14) 10dx1½"	1235	(16) 10dx1½"	1235	(14) 10d	1235	(16) 10d	1235
	CS18[1]	1	(16) 10dx1½"	1370	(18) 10dx1½"	1370	(16) 10d	1370	(18) 10d	1370
SS	LSTA30[1]	1	(16) 10dx1½"	1505	(16) 10dx1½"	1295	(16) 10d	1505	(16) 10d	1295
SS	CS16[1]	1	(18) 10dx1½"	1700	(20) 10dx1½"	1630	(18) 10d	1700	(20) 10d	1630
	CMST14[1,6]	1	(24) 10dx1½"	2390	(24) 10dx1½"	2065	(24) 16d	2810	(24) 16d	2435
	MST37[1,6]	1	(24) 10dx1½"	2530	(24) 10dx1½"	2150	(24) 16d	2950	(24) 16d	2570
	CMST12[1,6]	1	(24) 10dx1½"	2630	(24) 10dx1½"	2210	(24) 16d	3060	(24) 16d	2650
	MSTC28[1,6]	1	(28) 10dx1½"	2690	(28) 10dx1½"	2325	(28) 16d Sinkers	2690	(28) 16d Sinkers	2325

1. Loads for stud to band joist connections are based on a minimum band joist depth of 11¼".
2. Loads for straps based on 2½" clear span between stud and band joist.
3. Multiple members must be fastened together to act as a single unit.
4. For straight straps, use half of the total fasteners listed on each member in the connection.
5. Reduce loads for a single band joist less than 1½" thick.
6. CMST and MST require double studs of a minimum 3" width.
7. Values for straps assume a minimum nail penetration of 10 nail diameters into the stud or rim joist.
8. Nailing over sheathing is acceptable as long as 10 nail diameters minimum penetration into the framing is maintained. See page 13.
9. Where possible cross-grain tension occurs in detail D45, consider full length adjacent connectors or EWP rim designed to resist cross-grain tension loads. Refer to D133 on p. 48.



STUD TO STUD

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.

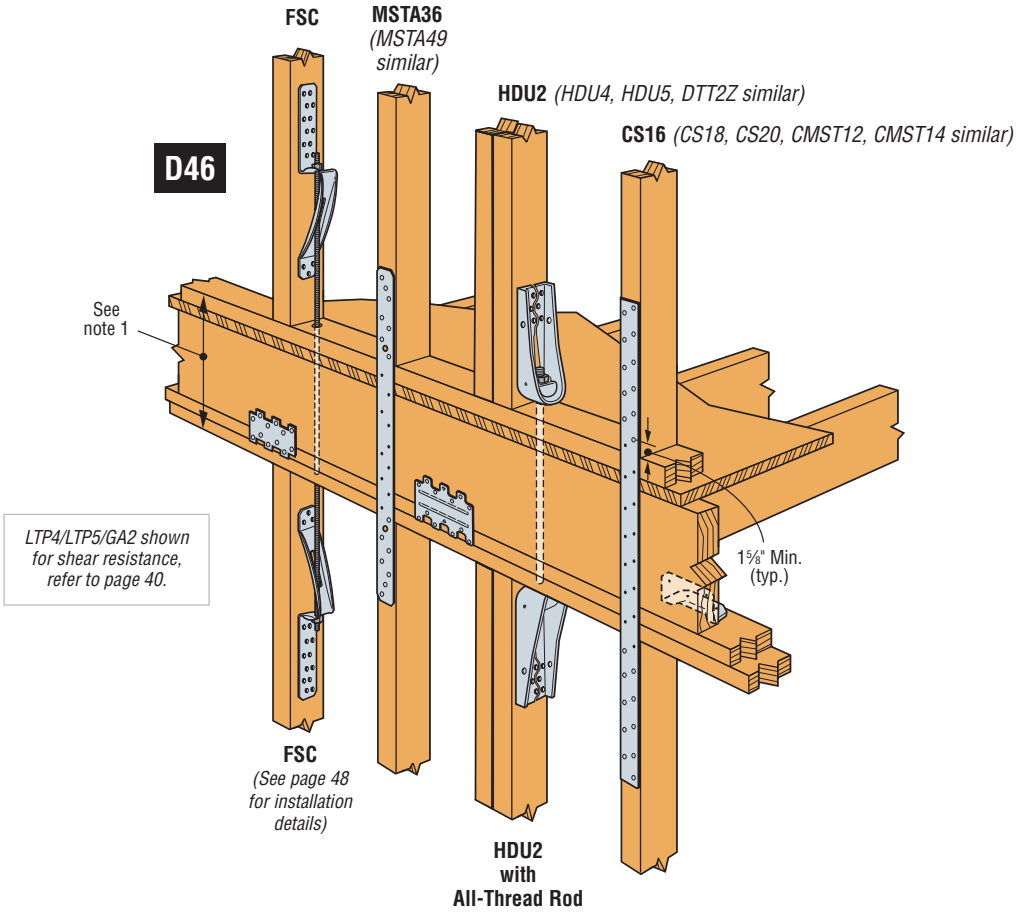
SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

	Model No.	Qty. Required	DF/SP Allowable Loads		SPF Allowable Loads	
			Fasteners (Total)	Uplift (160)	Fasteners (Total)	Uplift (160)
	CS20[2]	1	(14) 8d	1030	(16) 8d	1030
	LSTA36[2]	1	(14) 10d	1315	(14) 10d	1135
SS	MSTA36[2]	1	(14) 10d	1345	(14) 10d	1160
	CS18[2]	1	(18) 8d	1370	(22) 8d	1370
SS	CS16[2]	1	(22) 8d	1705	(26) 8d	1705
	FSC	2	(30) 10dx1½"	1830	(30) 10dx1½"	1570
	MSTA49[2]	1	(26) 10d	2020	(26) 10d	2020
SS	DTT2Z[6]	2	(16) ¼"x1½" SDS	1825	(16) ¼"x1½" SDS	1800
	DTT2Z-SDS2.5[3]	2	(16) ¼"x2½" SDS	2145	(16) ¼"x2½" SDS	2105
	MSTC40[2]	1	(28) 16d Sinkers	2695	(28) 16d Sinkers	2320
	HDU2-SDS2.5[3]	2	(12) ¼"x2½" SDS	3075	(12) ¼"x2½" SDS	2215
	HDU4-SDS2.5[3]	2	(20) ¼"x2½" SDS	4565	(20) ¼"x2½" SDS	3285
	HDU5-SDS2.5[3]	2	(28) ¼"x2½" SDS	5645	(28) ¼"x2½" SDS	4065
	MSTC66[2]	1	(64) 16d Sinkers	5860	(64) 16d Sinkers	5495
	CMST14[2]	1	(56) 16d	6490	(66) 16d	6490
	CMST12[2]	1	(74) 16d	9215	(84) 16d	9215

1. Loads are based on an 18" clear span. ***Note:*** Where straps are used, longer straps will be required to achieve the same loads for larger clear spans or the strap capacity will have to be reduced as described in footnote 7 below.
2. Nailing over ½" minimum wood structural panel sheathing is acceptable provided minimum 2½" long nails are used. See page 13.
3. Allowable loads for DTT2Z-SDS2.5 and HDU based on (2) 2x and greater vertical wood member.
4. Cut lengths for coil strap are CS16 = 46", CS18 = 42", CS20 = 36",CMST14 = 78", CMST12 = 94".
5. For straight straps, use half the total fasteners listed on each member in the connection.
6. For stainless steel, order DTT2SS.
7. Calculate the straight strap value for a reduced number of nails as follows:

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



FLOOR TO MASONRY/CONCRETE

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.

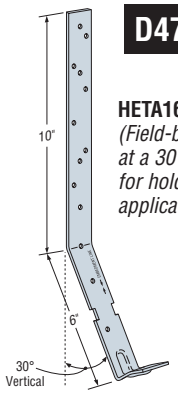
SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

Model No.	Qty. Required	Fasteners To Block/ Concrete	DF/SP Allowable Loads		SPF Allowable Loads	
			Fasteners To Wood Framing	Uplift (160)	Fasteners To Wood Framing	Uplift (160)
HETA16	1	Embedded	(8) 10dx1½"	1355	(8) 10dx1½"	1330
MSTAM24	1	(5) ¼"x2¼" Titen[5]	(9) 10d	1500	(9) 10d	1500
SS HETA20	1	Embedded	(10) 10dx1½"	1810	(11) 10dx1½"	1810
HETA40	1	Embedded	(10) 10dx1½"	1810	(11) 10dx1½"	1810
FSC[8]	1	⅜" ATR or THD37634RC[8]	(15) 10dx1½"	1830	(15) 10dx1½"	1570
MSTAM36	1	(8) ¼"x2¼" Titen[5]	(13) 10d	1870	(13) 10d	1870
THA426	1	(14) ¼"x2¼" Titen[5]	(6) 16d	2150	(6) 16d	1850
HETA16	2	Embedded	(16) 10dx1½"	2815	(16) 10dx1½"	2655
HDU2-SDS2.5	1	⅝" ATR	(6) ¼"x2½" SDS	3075	(6) ¼"x2½" SDS	2215
MSTCM40[3]	1	(14) ¼"x2¼" Titen[5]	(26) 16d Sinkers	4220	(26) 16d Sinkers	4220
MSTCM60[3]	1	(14) ¼"x2¼" Titen[5]	(26) 16d Sinkers	4220	(26) 16d Sinkers	4220
HTT5	1	⅝" ATR	26-10d	4670	26-10d	4015
HDU5-SDS2.5	1	⅝" ATR	(14) ¼"x2½" SDS	5645	(14) ¼"x2½" SDS	4065

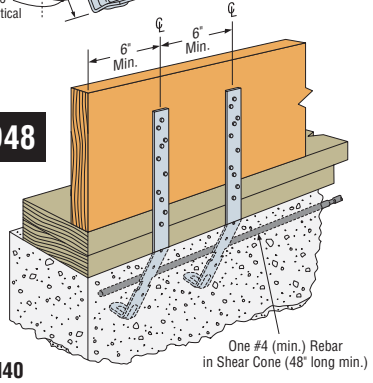
1. Holdown load values are based on a 3" thick vertical member. See the current Simpson Strong-Tie® *Wood Construction Connectors* catalog for load based on different wood thickness. Post design by Specifier.
2. HETA will require a 30° bend and a 4" minimum embedment depth in a concrete tie beam only. Loads based on SP lumber only. Strap may be bent one full cycle only.
3. MSTCM requires attachment to a minimum 3" wide member.
4. When nailing a strap over ½" maximum wood structural panel sheathing, use 2½" long nail minimum.
5. For concrete applications use ¼"x1¾" Titen® screws.
6. ATR—All-Thread Rod. The Designer must specify anchor type, length and embedment.
7. Standard cut washer is required with the ⅜" All-Thread Rod.
8. THDRC listed for use with 8" concrete tie beam, 1¾" edge, 8" end distance, uncracked concrete with no supplementary reinforcement and 2500 psi concrete minimum. Designer shall specify adhesive anchor for CMU bond beam.

D47



HETA16
(Field-bent at a 30° angle for holdown application)

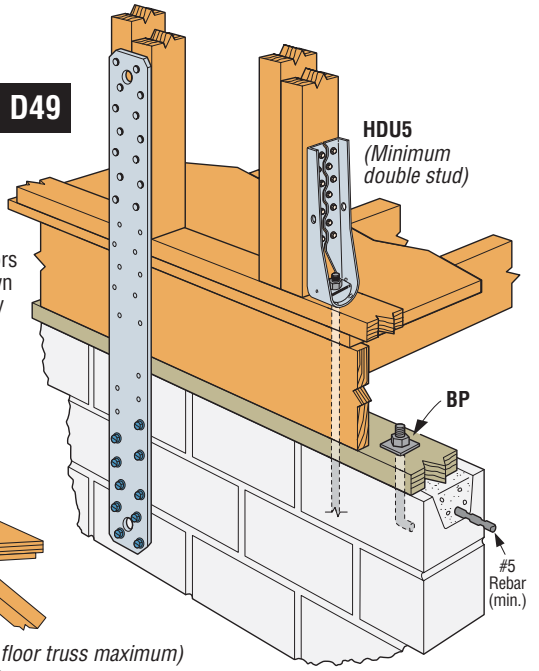
D48



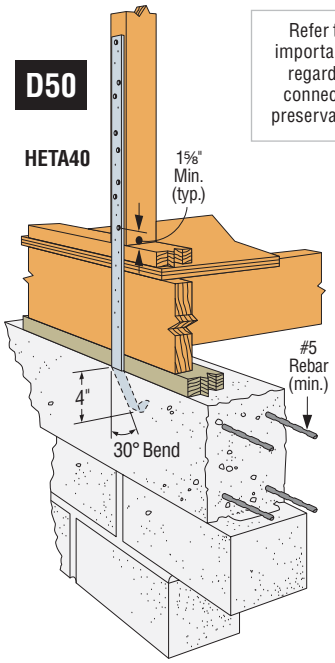
Double HETA16 Installation

MSTCM40

D49

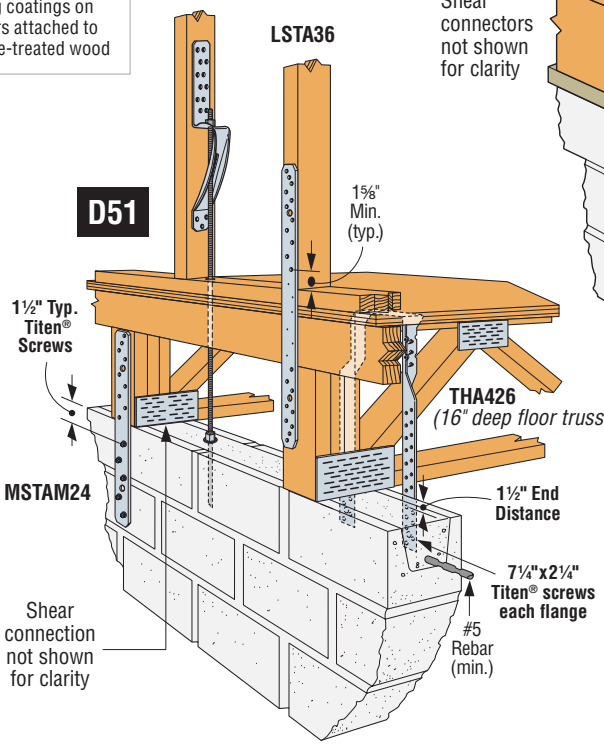


D50



Refer to pages 7-8 for important considerations regarding coatings on connectors attached to preservative-treated wood

D51



TITEN® SCREW WARNING: Industry studies show that hardened fasteners can experience performance problems in wet or corrosive environments. Accordingly, use this product in dry and noncorrosive environments only, provide moisture barrier, or use a stainless steel fastener. Steps must be taken to prevent inadvertent sustained loads above the listed allowable loads. Overtightening and bending moments can initiate cracks detrimental to the hardened screw's performance. Use the Simpson Strong-Tie® Titen® installation tool kit (Part TTNT01); it has a bit that is designed to reduce the potential for overtightening the screw.

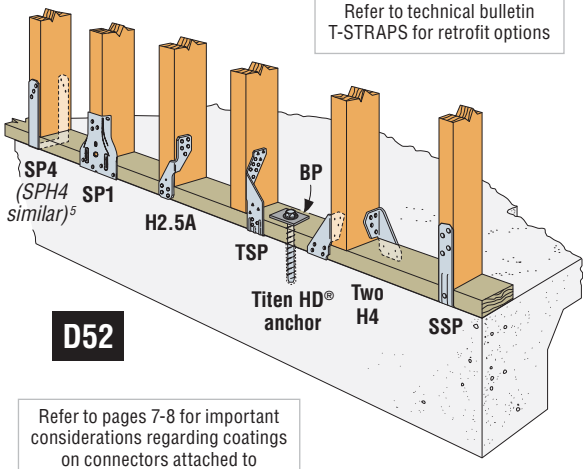
STUD TO SILL PLATE

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.

SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

Model No.	Qty. Required	Fasteners (Total)		DF/SP Allowable Loads	SPF Allowable Loads
		To Stud	To Plate	Uplift (160)	Uplift (160)
H2.5ASS	1	(4) SS8d	(4) SS8d	285	245
SS H8	1	(5) 10dx1½"	(4) 10dx1½"	310	310
RSP4	1	(4) 8dx1½"	(4) 8dx1½"	315	285
SS H4	1	(4) 8dx1½"	(4) 8dx1½"	360	235
H2.5A	1	(4) 8dx1½"	(4) 8dx1½"	390	315
SSP	1	(4) 10dx1½"	(1) 10dx1½"	420	325
SS H3	1	(4) 8d	(4) 8d	455	320
SP1	1	(6) 10d[4]	(4) 10d	585	535
TSP	1	(6) 10dx1½"	(3) 10dx1½"	585	425
DSP	1	(8) 10dx1½"	(2) 10dx1½"	660	545
SS H4	2	(8) 8dx1½"	(8) 8dx1½"	720	470
SS SP4	1	(6) 10dx1½"	N/R	885	760
SS SP6	1	(6) 10dx1½"	N/R	885	760
SP8	1	(6) 10dx1½"	N/R	885	760
SS H3	2	(8) 8d	(8) 8d	910	640
SPH4[6]	1	(12) 10dx1½"	N/R	1490[3]	1170
SPH6[6]	1	(12) 10dx1½"	N/R	1490[3]	1170
SPH8	1	(12) 10dx1½"	N/R	1490[3]	1170



Refer to pages 7-8 for important considerations regarding coatings on connectors attached to preservative-treated wood

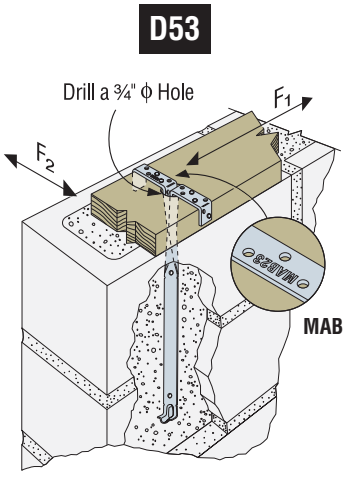
1. N/R—Not required.
2. SPF loads reflect attachment to SPF stud and/or sill.
3. Maximum loads for SPH in Doug Fir is 1360 lbs.
4. SP1 drive one stud nail at an angle through the stud into the plate to achieve table load.
5. SPH4 and SPH6 can be installed over nominal ½" wood structural panel sheathing with a maximum DF/SP load of 1360 lbs. Order SPH4R or SPH6R.
6. Douglas Fir allowable uplift load for TSP is 470 lbs.

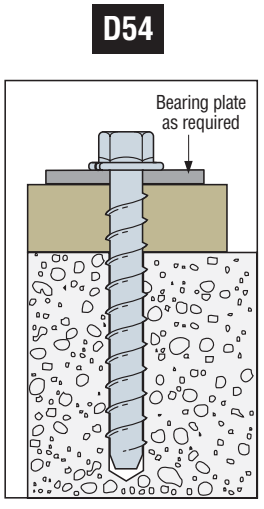
SILL PLATE TO FOUNDATION

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.

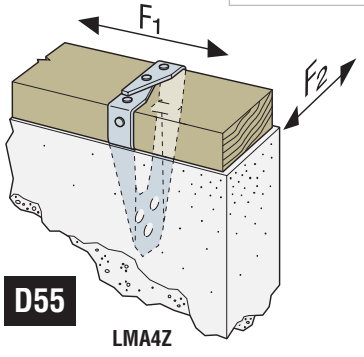
Model No.	Qty. Required	Fasteners (Total)	DF/SP Allowable Loads		
			Uplift (160)	Parallel to Plate (F_1) (160)	Perp. to Plate (F_2) (160)
MAB15	1	(6) 10dx1½"	565	500	500
MAB23	1	(6) 10dx1½"	565	500	500
MA4	1	(4) 10dx1½"	830	575	430
LMA4Z	1	(6) 10dx1½"	905	675	520
MASA	1	(9) 10dx1½"	920	1515	1095
THD50600H	1	—	1375[3]	1005	500

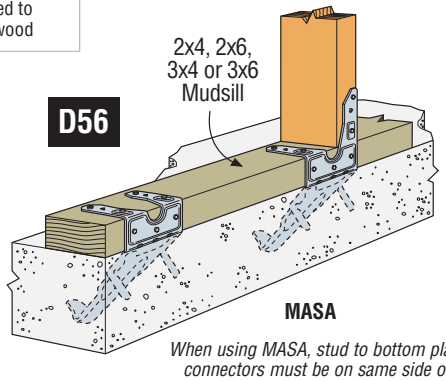
1. Titen HD® anchor ½"x6" is based on SP lumber, 1¾" edge, 8" end distance, uncracked concrete and no supplementary reinforcement.
2. MASA installed with one leg attached to stud has loads of 785 lbs. *(uplift)*, 1005 lbs. *(parallel to plate)* and 995 lbs. *(perp. to plate)*.
3. Uplift shown requires BP⅝ with Titen HD® anchor ½"x6".
4. Minimum concrete strength 2500 psi.
5. Loads are based on single 2x sill plate applications.



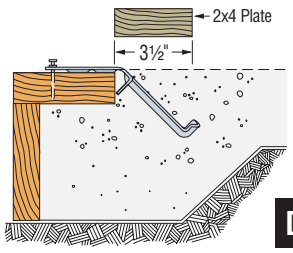


Refer to pages 7-8 for important considerations regarding coatings on connectors attached to preservative-treated wood





When using MASA, stud to bottom plate connectors must be on same side of the wall as the MASA



Alternate MASA Installation for Brick Ledges

HEADER TO WALL FRAMING

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.

SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

HEADER TO STUDS

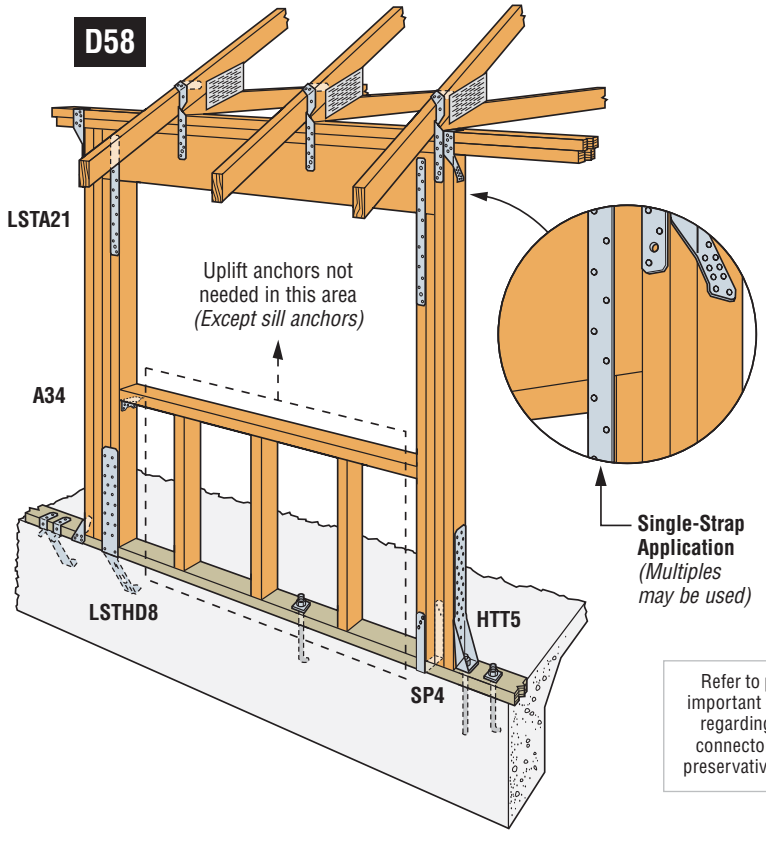
Model No.	Min. Header Height	DF/SP Allowable Loads		SPF Allowable Loads	
		Fasteners (Total)	Uplift (160)	Fasteners (Total)	Uplift (160)
HH4	3.50"	(11) 10dx1½"	575	(11) 10dx1½"	495
HH4[9]	3.50"	(13) 16d	710	(13) 16d	610
SS LSTA12	7.25"	(10) 10d	970	(10) 10d	830
HH6	5.50"	(16) 10dx1½"	1065	(16) 10dx1½"	915
CS16	7.25"	(12) 10d	1180	(12) 10d	1020
SS LSTA18	9.25"	(14) 10d	1235	(14) 10d	1165
SS LSTA21	11.25"	(16) 10d	1235	(16) 10d	1235
CS16	9.25"	(16) 10d	1575	(16) 10d	1360
	11.25"	(18) 10d	1705	(20) 10d	1700

STUDS TO PLATE/FOUNDATION

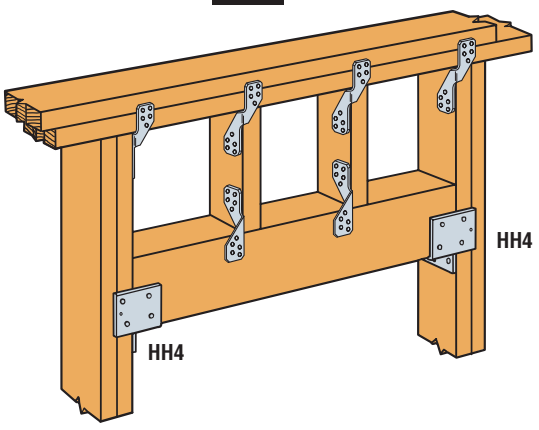
Model No.	Fasteners		DF/SP Allowable Loads	SPF Allowable Loads
	Stud	Plate/ Foundation	Uplift (160)	Uplift (160)
DSP[7]	(8) 10dx1½"	(2) 10dx1½"	660	545
SS SP4, SP6, SP8[10]	(6) 10dx1½"	—	885	760
SPH4[8], SPH6[8], SPH8	(10) 10dx1½"	—	1240	1065
	(12) 10dx1½"	—	1490[6]	1170
SS DTT2Z[5]	(8) ¼"x1½" SDS	½" ATR	1825	1800
LSTHD8[11,12] LSTHD8RJ	(20) 16d Sinkers	Embedded	2700	2700
HDU2-SDS2.5	(6) ¼"x2½" SDS	⅝" ATR	3075	2215
HTT4	(18) 10dx1½"	⅝" ATR	3610	3105
HTT4	(18) 16dx2½"	⅝" ATR	4235	3640
HTT5	(26) 10dx1½"	⅝" ATR	4350	3740
HTT5	(26) 10d	⅝" ATR	4670	4015
HTT5	(26) 16dx2½"	⅝" ATR	5090	4375
HTT5KT	(26) #10x2½" SD	⅝" ATR	5445	5360
HDU5-SDS2.5	(14) ¼"x2½" SDS	⅝" ATR	5645	4065

1. Straps must use half the total fasteners into each member being connected to achieve the listed loads.
2. Multiple straps may be used for increased uplift capacity.
3. For a continuous load path, truss/rafter to top plate/stud/header connections must be on the same side of wall as header to stud connections.
4. ATR—All-Thread Rod or Anchor Bolt. The Designer must specify anchor type, length, and embedment.
5. For stainless steel, order DTT2SS.
6. Maximum load for SPH in Doug Fir is 1360 lbs.
7. DSP is for double-stud connections.
8. SPH4 and SPH6 can be installed over nominal ½" sheathing with a maximum DF/SP load of 1360 lbs. Order SPH4R or SPH6R.
9. Where noted, minimum supporting post thickness is 2½".
10. SP4 and SP6 available in stainless steel. SP8 is not.
11. Where noted in table, load listed is for 6" or 8" stemwall corner condition with ½" min. edge distance into non-cracked 2500 psi concrete. For midwall condition, allowable load is 3115 lbs. for 6" or 8" stemwall. For end-of-wall condition, allowable load is 1690 lbs. for 6" stemwall *(2230 lbs. for 8" stemwall)*.
12. For other STHD models, refer to page 41.

D58

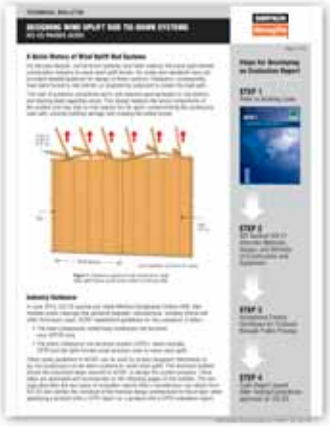


D59



Refer to pages 7-8 for important considerations regarding coatings on connectors attached to preservative-treated wood

ALTERNATIVE WIND UPLIFT RESTRAINT SYSTEM

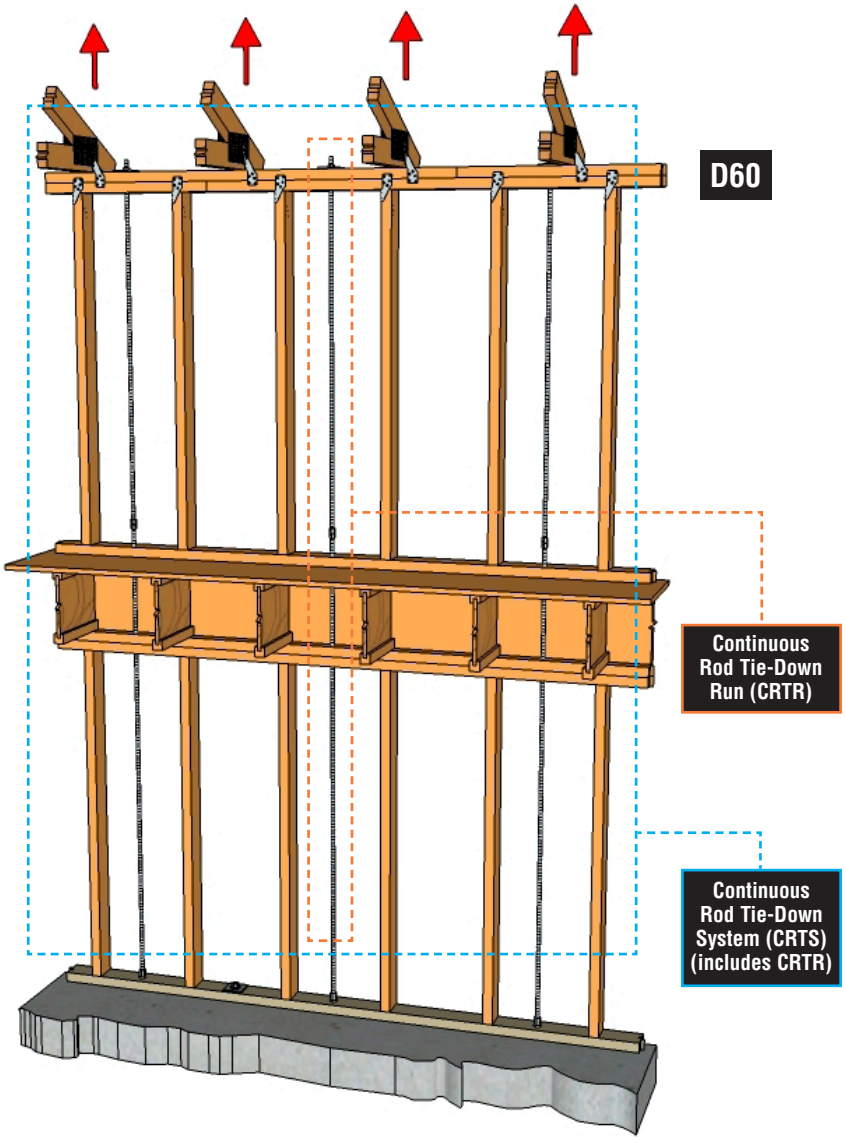


T-AC39110

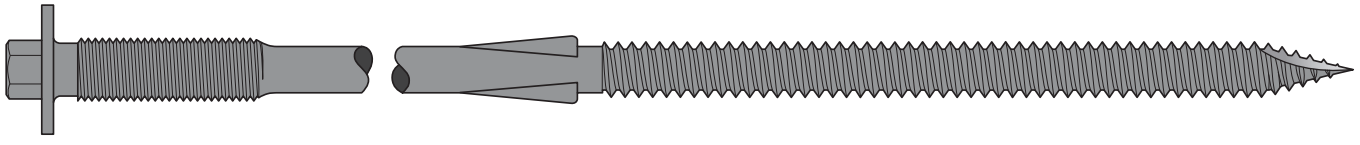
Simpson Strong-Tie offers a variety of effective solutions for providing a continuous load path to resist forces produced by high-wind events. In addition to our full line of proven connector products, we offer a continuous rod tie-down system that resists wind uplift at the roof and creates a continuous load path to the foundation. Whether the loads are produced by wind uplift only or a combination of wind uplift and shear wall overturning, we have a rod tiedown system with the necessary components to meet all building code requirements.

In June 2010, ICC Evaluation Services (ICC-ES) passed Acceptance Criteria 391 (AC391). This standard provides the industry the desired guidance for the design of continuous rod tie-down systems to resist wind uplift in light-frame wood construction. AC391 addresses important design limitations, such as top plate rotation, bending and deflection, steel rod elongation, wood plate crushing and wood shrinkage. (See technical bulletin T-AC39110 for more information.)

An ICC-ES Evaluation Report for the new Simpson Strong-Tie rod system for wind uplift restraint – following the protocol set forth in AC391 – is under way. After the report is finalized Designers will have a code-listed document to follow to easily develop projects using a Simpson Strong-Tie® uplift rod system. In the interim, contact Simpson Strong-Tie for help designing uplift rod systems that meet the intent of AC391.



SDWF *Structural Wood Screw for Floor-to-Floor Connections*



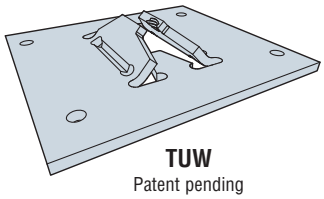
The Simpson Strong-Tie® SDWF structural wood screw is designed to simplify the floor-to-floor connection while providing superior performance over the life of the structure. The unique design of the SDWF allows it to attach the top and bottom walls together from the top, spanning the floor system and providing an easy-to-install connection within the continuous load path of the structure.

A key to the long-term performance of the SDWF lies in the innovative TUW take-up washer that is installed between the screw and the bottom plate of the top floor. As the structure settles due to shrinkage and construction loading, the threaded portion under the head of the screw ratchets up through the tabs of the TUW *(which is secured in place)*. The interlock between the tabs of the take-up washer and the threads under the head of the SDWF prevent the screw from sliding back under load, providing a simple yet reliable means of shrinkage compensation up to ¾" per story.

FEATURES:

- Faster to install than other methods – drive the screw and the connection is made
- Shrinkage compensation ensures a tight connection even after initial shrinkage and settlement occur
- Fastening can be done before or after exterior sheathing is applied for added flexibility
- Installs from inside the structure, eliminating exterior work on the upper stories and enhancing job safety
- The TUW take-up washer installs with (4) #9x2½" Strong-Drive® SD structural-connector screws *(provided)*

MATERIAL: Carbon steel
FINISH: SDWF—E-Coat™; TUW—Galvanized



TUW
Patent pending

STEMWALL/CRAWLSPACE

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.

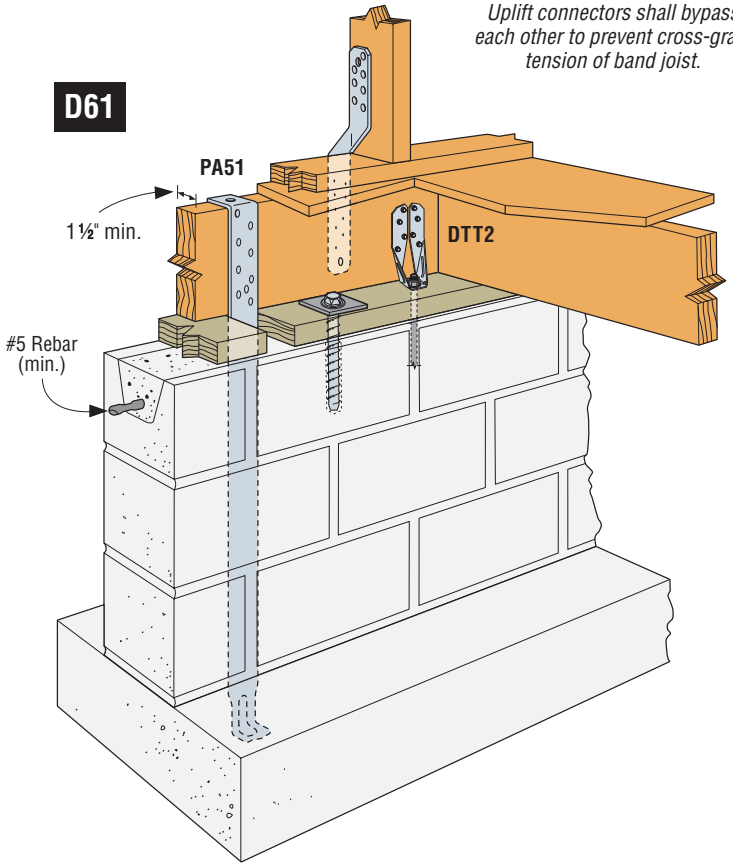
SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

	Model No.	Qty. Required	Fasteners		DF/SP Allowable Loads	SPF Allowable Loads
			Anchors	Fasteners	Uplift (160)	Uplift (160)
	FJA	1	(2) ½" ATR	(8) 10dx1½"	1205	1035
SS	DTT2Z[3]	1	(1) ½" ATR	(8) ¼"x1½" SDS	1825	1800
	PA51[1,2]	1	4" Embed	(9) 16d	2220	1925
	PA68[1,2]	1	4" Embed	(9) 16d	2220	1925
	FJA[3]	2	(4) ½" ATR	(16) 10dx1½"	2410	2070

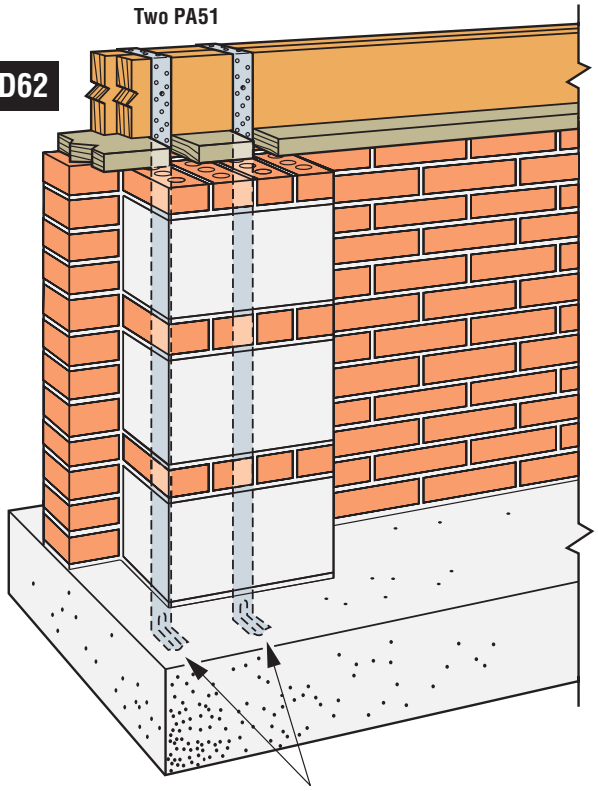
1. Minimum embedment for PA into concrete footing is 4" with a minimum of 5" to nearest edge. 8" minimum spacing between straps. Optional nail holes provided.
2. Refer to Simpson Strong-Tie® technical bulletin T-PAUPLIFT for additional information on use of PA straps as foundation anchors, including strap extension.
3. For stainless steel, order DTT2SS.

Uplift connectors shall bypass each other to prevent cross-grain tension of band joist.

D61



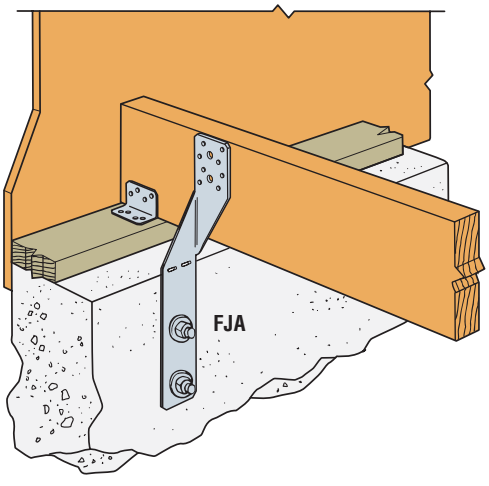
D62



Minimum Two Straps per Pier
Minimum 4" Embedment into Footing

Per ICC 600-2008, Section 305.2.2.2., the assembly shown above is limited to 110 mph and one- and two-story buildings.

D63



Refer to pages 7-8 for important considerations regarding coatings on connectors attached to preservative-treated wood

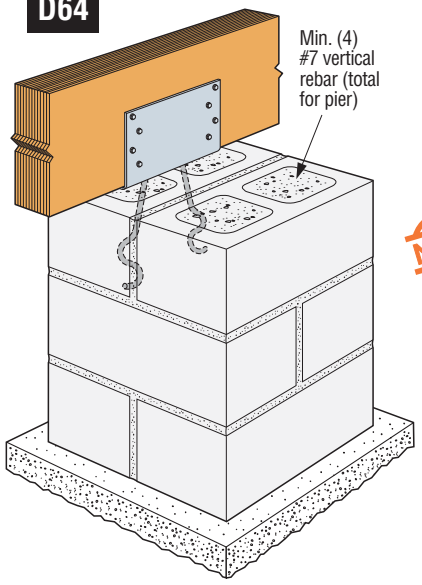
BEAM TO PIER

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.	No. of ¼"x2½" SDS Screws		16" Square Grout-Filled CMU Pier[4]				16" Square CMU Shell Filled with 3000 psi Concrete[5]			
			Uplift (160)			Lateral (160)	Uplift (160)			Lateral (160)
	Main Beam	Side Beam	Main Beam	Side Beam	Total		Main Beam	Side Beam	Total	
CCQM-SDSHDG	12	—	6750	—	6750	2460	6855	—	6855	2770
CCTQM-SDSG	12	8	6750	5375	6750	2460	6855	6720	6855	2770
ECCLQMG-KT[6,7]	16	16	6240	6240	7300	2220	6240	6240	8260	2680

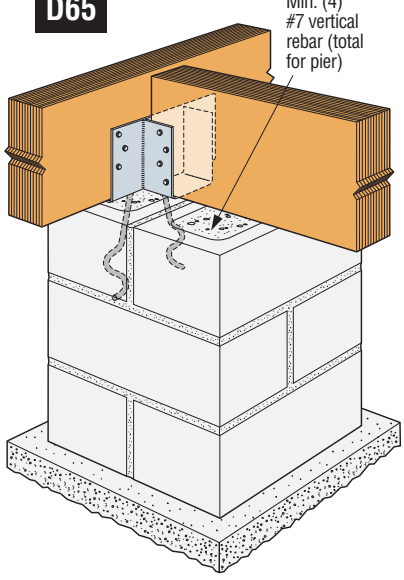
1. Total uplift load and lateral load is based on tested anchor failure in the pier.
2. Allowable loads are based on either a 16" square grout-filled CMU pier with f'_m of 1500 psi or a 16" square CMU shell filled with 3000 psi concrete. A minimum of (4) #7 vertical rebars are required. The Designer shall design and detail the CMU/concrete pier to resist all forces including uplift, shear and moment.
3. Side beam and main beam uplift loads assume DF members and are not additive.
4. The allowable loads listed for grout-filled CMU apply to solid concrete piers of 2500 psi concrete a minimum of 16" square.
5. The allowable loads listed for CMU shell-filled with 3000 psi concrete apply to solid concrete piers of 3000 psi concrete a minimum of 12" square.
6. The ECCLQM-KT is a kit packaged with (2) MSTQM straps and (32) ¼"x2½" SDS screws. One strap may be installed on each face of the ECCLQM, using the SDS screws into the beams and (26) 16dx2½" nails *(not provided)* into the wall framing. The MSTQM strap's allowable tension load is 6240 lbs.
7. Where a deck joist needs to be supported at a corner condition, specify ECCLQMDG-KT.

D64



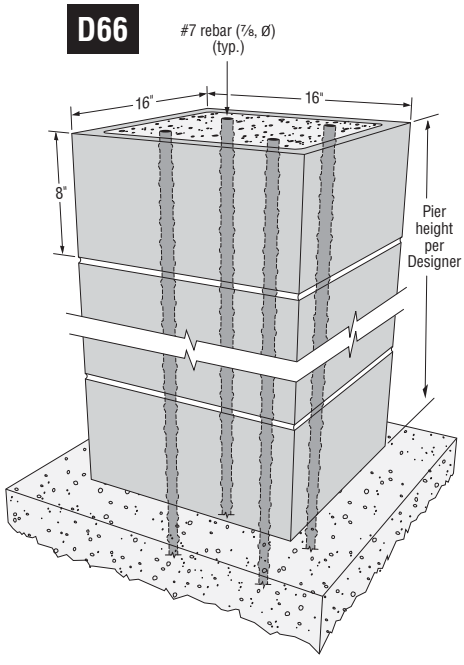
Typical CCQM Installation

D65



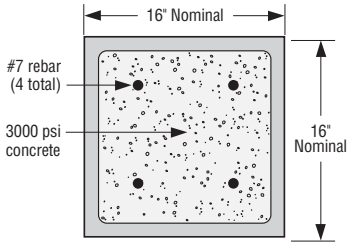
Typical CCTQM Installation

D66



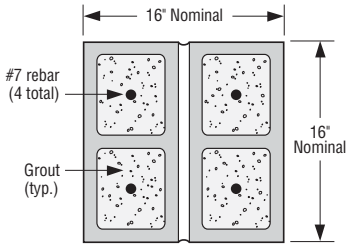
16" Square CMU Shell Filled with 3000 psi Concrete Pier

D67



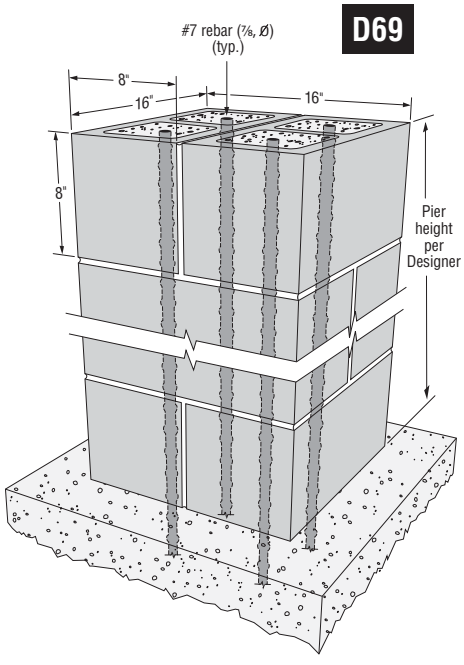
16" Square CMU Shell Filled with 3000 psi Concrete Pier
(Plan View)

D68



16" Square Grout-Filled CMU Pier
(Plan View)

D69



16" Square Grout-Filled CMU Pier

WALL TO PILE/GIRDER

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.

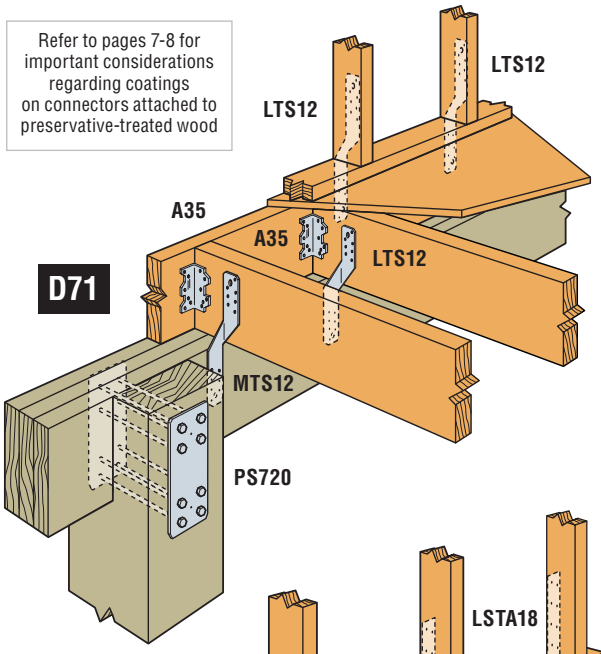
SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

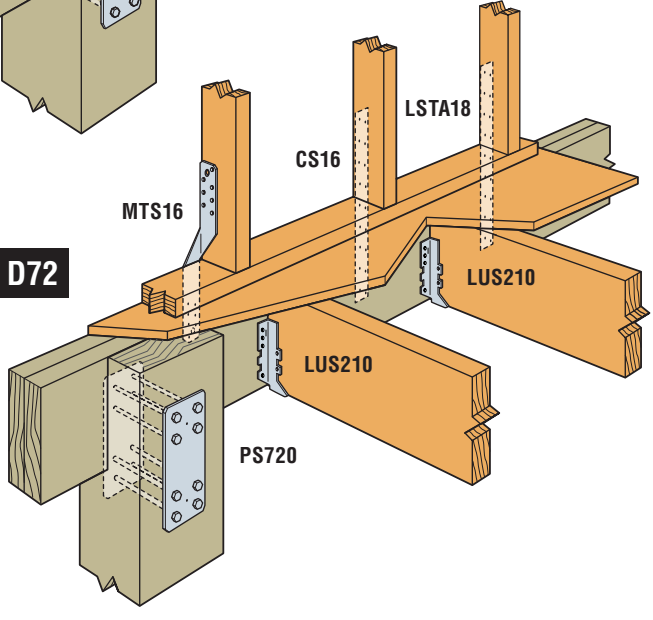
	Model No.	Qty.	DF/SP Allowable Loads		SPF Allowable Loads	
			Fasteners (Total)	Uplift (160)	Fasteners (Total)	Uplift (160)
SS	A35	1	(12) 8dx1½"	450	(12) 8dx1½"	450
SS	LTS12	1	(12) 10dx1½"	720	(12) 10dx1½"	620
SS	LTS16	1	(12) 10dx1½"	720	(12) 10dx1½"	620
SS	MTS12	1	(14) 10dx1½"	1000	(14) 10dx1½"	860
SS	MTS16	1	(14) 10dx1½"	1000	(14) 10dx1½"	860
SS	HTS20	1	(16) 10dx1½"	1150	(16) 10dx1½"	990
SS	LSTA21	1	(12) 10d	1235	(14) 10d	1160
SS	CS16	1	(18) 10d	1705	(20) 10d	1700
	CMST12	1	(24) 16d	3130	(24) 16d	2710
	MSTC48B3	1	(54) 10d	3930	(54) 10d	3380
	HTT4	1	(18) 10dx1½"	3610	(18) 10dx1½"	3105
SS	PS218	2	(4) ¾" MB	4290	(4) ¾" MB	3340
SS	PS418	2	(4) ¾" MB	4330	(4) ¾" MB	3355
	HTT5	1	(26) 10dx1½"	4350	(26) 10dx1½"	3740
	MSTC66B3	1	(56) 10d	4440	(56) 10d	3820
SS	HST2	2	(6) ⅝" MB	5220	(6) ⅝" MB	4835
SS	PS720	2	(8) ½" MB	5795	(8) ½" MB	5155
SS	HST5	2	(12) ⅝" MB	10650	(12) ⅝" MB	9870

1. Loads are based on 11¼" girder depth. See the current Simpson Strong-Tie® *Wood Construction Connectors* catalog for other options.
2. PS and HST are for pile-to-girder applications only and installed in pairs. Published loads are governed by double shear perp-to-grain bolt calculations using a minimum member thickness of 3½". Alternate values may be calculated per the NDS for other girder and pile widths. Straps must be centered about splice joint and bolt edge and end distances must meet the NDS minimum requirements.
3. For straight straps, use half the total number of fasteners listed on each member in the connection.
4. Refer to pages 7-8 for corrosion considerations.

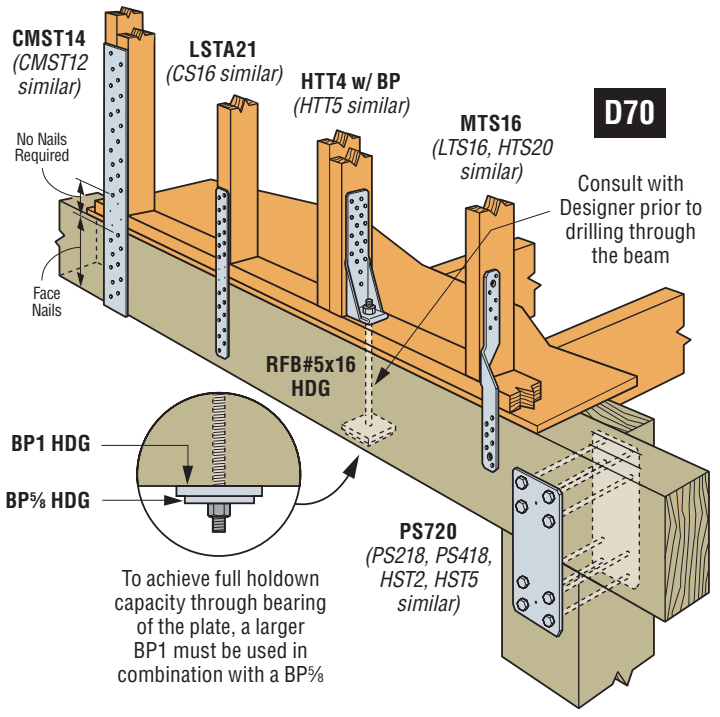
Refer to pages 7-8 for important considerations regarding coatings on connectors attached to preservative-treated wood



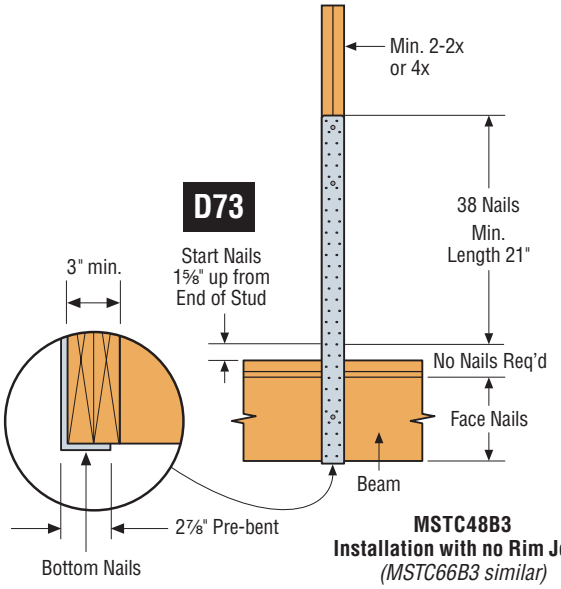
D71



D72



D70



D73

MSTC48B3 Installation with no Rim Joist *(MSTC66B3 similar)*

POST/COLUMN TO BEAM

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.

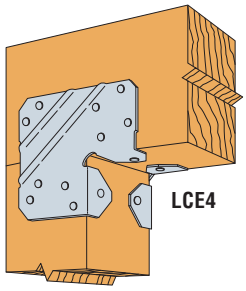
SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

Model No.	Qty. Required	Fasteners		DF/SP Allowable Loads		SPF Allowable Loads
		Beam	Post	Uplift	Lateral F_1	Uplift
				(160)	(160)	(160)
4x4 POST / COLUMN TO 4x BEAM						
ECCU44	1	(2) ⅝" MB	(2) ⅝" MB	205	—	155
LPC4[2]	2	(8) 10d	(8) 10d	760	325	655
SS BC4	1	(6) 16d	(6) 16d	980	1000	845
PC44-16	1	(12) 16d	(8) 16d	1000	925	860
SS AC4 (Min)[2]	2	(12) 16d	(8) 16d	1430	715	1230
CC44	1	(2) ⅝" MB	(2) ⅝" MB	1465	—	—
EPC44	1	(4) 16d	(4) 16d	1700	1070	1460
PC44	1	(12) 16d	(8) 16d	1700	925	1460
SS LCE4[2]	2	(14) 16d	(10) 16d	1800	1425	1545
SS AC4 (Max)[2]	2	(14) 16d	(14) 16d	2500	1070	2150
SS MSTA18	2	(28) 10d	(28) 10d	2630	—	2260
ECCQ44-SDS2.5	1	(14) ¼"x2½" SDS	(14) ¼"x2½" SDS	4040	—	2910
CCQ44SDS2.5	1	(16) ¼"x2½" SDS	(14) ¼"x2½" SDS	5680	—	4090
4x6 POST / COLUMN TO 4x BEAM						
BC46	1	(12) 16d	(6) 16d	980	1000	840
PC46-16	1	(12) 16d	(8) 16d	1000	925	860
EPC46	1	(4) 16d	(4) 16d	1700	1070	1460
PC46	1	(12) 16d	(8) 16d	1700	925	1460
CC46	1	(4) ⅝" MB	(2) ⅝" MB	2800	—	—
ECCQ46-SDS2.5	1	(14) ¼"x2½" SDS	(14) ¼"x2½" SDS	4040	—	2910
CCQ46SDS2.5	1	(16) ¼"x2½" SDS	(14) ¼"x2½" SDS	7145	—	5145
6x6 POST / COLUMN TO 6x BEAM						
LPC6[2]	2	(8) 10d	(8) 10d	915	490	785
PC66-16	1	(12) 16d	(8) 16d	1000	925	860
BC6	1	(12) 16d	(12) 16d	1050	2000	900
ECCU66	1	(4) ⅝" MB	(2) ⅝" MB	1165	—	875
SS AC6 (Min)[2]	2	(12) 16d	(8) 16d	1430	715	1230
EPC66	1	(4) 16d	(6) 16d	1700	1610	1460
PC66	1	(12) 16d	(8) 16d	1700	925	1460
SS LCE4[2]	2	(14) 16d	(10) 16d	1800	1425	1545
SS AC6 (Max)[2]	2	(14) 16d	(14) 16d	2500	1070	2150
CC66	1	(4) ⅝" MB	(2) ⅝" MB	4040	—	—
ECCQ66-SDS2.5	1	(14) ¼"x2½" SDS	(14) ¼"x2½" SDS	4040	—	2910
CCQ66SDS2.5	1	(16) ¼"x2½" SDS	(14) ¼"x2½" SDS	7145	—	5145
4x4 POST / COLUMN TO 2(2x) BEAM						
BCS2-2/4	1	(8) 10d	(6) 10d	780	1025	670
BCS2-2/4SS	1	(8) 10dSS	(6) 10dSS	575	850	—
4x4 POST / COLUMN TO 3(2x) BEAM						
BCS2-3/6	1	(12) 16d	(6) 16d	800	1495	690
BCS2-3/6SS	1	(12) 16dSS	(6) 10dSS	525	1055	—
NEW ECCQ4.62-3.62SDS2.5	1	(16) ¼"x2½" SDS	(14) ¼"x2½" SDS	4040	—	2910
NEW CCQ4.62-3.62SDS2.5	1	(16) ¼"x2½" SDS	(14) ¼"x2½" SDS	5680	—	4090
4x4 POST / COLUMN TO 3⅛" BEAM						
CC3¼-4	1	(4) ⅝" MB	(2) ⅝" MB	3640	—	—
ECCQ3-4SDS2.5	1	(14) ¼"x2½" SDS	(14) ¼"x2½" SDS	3695	—	2660
CCQ3-4SDS2.5	1	(16) ¼"x2½" SDS	(14) ¼"x2½" SDS	5680	—	4090
6x6 POST / COLUMN TO 5⅛" BEAM						
ECCU5¼-6	1	(4)¾" MB	(2) ¾" MB	2735	—	1995
ECCQ5-6SDS2.5	1	(14) ¼"x2½" SDS	(14) ¼"x2½" SDS	5530	—	3980
CCQ5-6SDS2.5	1	(16) ¼"x2½" SDS	(14) ¼"x2½" SDS	7245	—	5210
CC5¼-6	1	(4) ¾" MB	(2) ¾" MB	7530	—	—

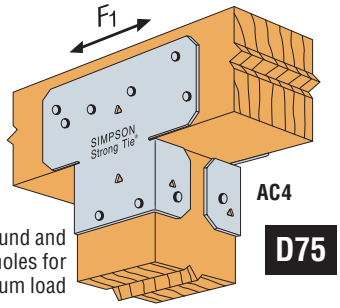
1. " — " in the tables indicates that the product has not been tested in the particular load direction listed.
2. Where noted, connectors must be installed in pairs to achieve listed loads.
3. For end conditions, specify ECCQ or ECCU when heavy column cap required.
4. Straps must use half the total fasteners into each member being connected to achieve the listed loads.
5. For SPF F1 loads, multiply DF/SP F1 loads by 0.86

Refer to pages 7-8 for important considerations regarding coatings on connectors attached to preservative-treated wood



D74

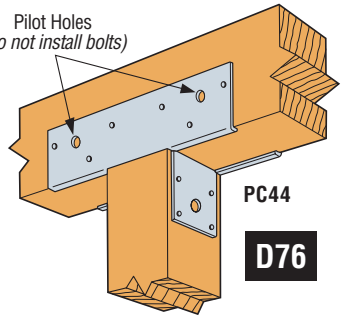
LCE4



AC4

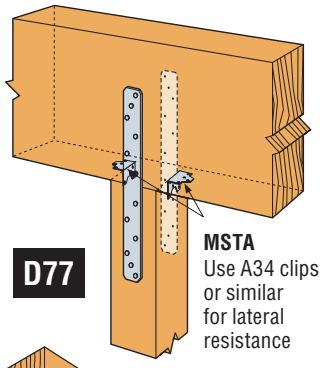
Fill all round and triangle holes for maximum load

D75



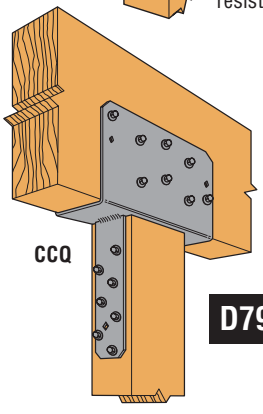
PC44

D76



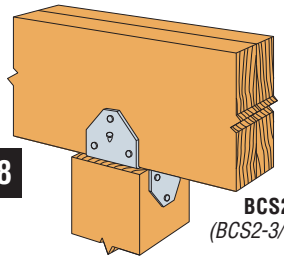
D77

MSTA
Use A34 clips or similar for lateral resistance



CCQ

D79



D78

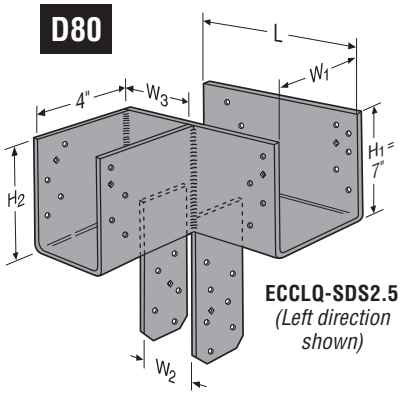
BCS2-2/4
(BCS2-3/6 similar)

BEAM TO CORNER POST/COLUMN

Series	Allowable Loads				
	Uplift (160)			Download (100)	
	Main Beam	Side Beam	Total[3]	Side Beam	Total
ECCLQ-SDS2.5	2835	1840	3795	6780	Refer to note #5
CCCQ-SDS2.5	4780	2390[2]	4780	7000	
CCTQ-SDS2.5	4910	2350	5315	7000	

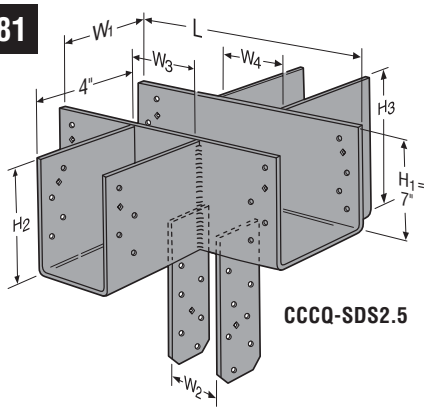
1. Uplift loads have been increased for wind or seismic; reduce where other loads govern. Downloads may not be increased.
2. Allowable load is per seat. Side beams must be loaded symmetrically for the CCCQ.
3. The combined uplift loads applied to all beams in the connector must not exceed the total allowable uplift load listed in the table.
4. The ECCLQ side beam may use a side beam uplift load up to 2350 lbs. The deflection of this load may exceed the standard ⅛" deflection by an additional ⅛".
5. The combined download for all of the carried beams shall not exceed the allowable download for the unmodified product in the current Simpson Strong-Tie® *Wood Construction Connectors* catalog *(CCQ load for CCCQ and CCTQ, or ECCQ load for ECCLQ)*. The download for each side beam shall not exceed the lesser of 35% of the allowable download or 9265 lbs. for the unmodified product.
6. The download to each side beam shall not exceed the allowable load shown, nor 35% of the allowable load for the unmodified product, whichever is lower.
7. Column width in the direction of the beam width must be the same as the main beam width (W_1).
8. Refer to T-CCQLTC-WS for ordering instructions.

D80



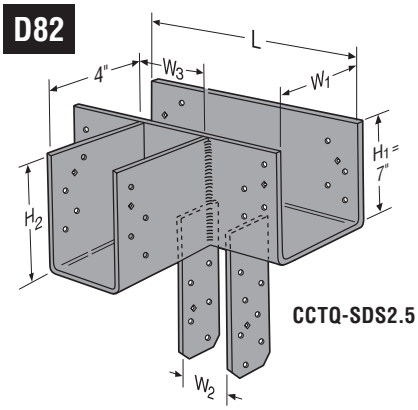
ECCLQ-SDS2.5 *(Left direction shown)*

D81



CCCQ-SDS2.5

D82



CCTQ-SDS2.5

SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

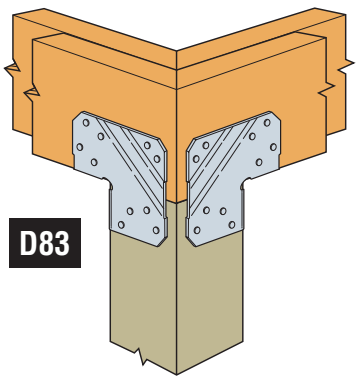
Model No.	Dimensions (in.)		Total No. of Fasteners		DF/SP Uplift Loads (lbs.)	SPF Uplift Loads (lbs.)
	W	L	Beam	Post	Total Uplift (160)	Total Uplift (160)
SS LCE4Z *(Mitered Corner)*	5⅜	5⅜	(14) 16d	(10) 16d	985	845

1. The allowable download for the mitered LCE4 connection is limited to bearing of the mitered section on the post and shall be determined by the Designer.
2. Connectors must be installed in pairs to achieve listed loads.

Model No.	Dimensions (in.)		Total No. of Fasteners		DF/SP Uplift Loads (lbs.)			SPF Uplift Loads (lbs.)		
	W	L	Beam	Post	Side Beam	Main Beam	Total	Side Beam	Main Beam	Total
RTC44[1] *(Mitered Corner)*	3⁹⁄₁₆	4¾	(16) 16d	(10) 16d	900	900	1800	775	775	1550
RTC44[2] *(Square Cut)*	3⁹⁄₁₆	4¾	(16) 16d	(10) 16d	925	1230	1760	795	1060	1515

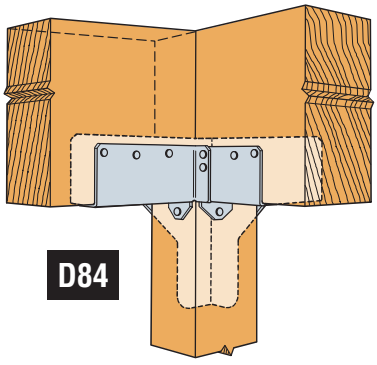
1. The allowable download for the mitered RTC44 connection is limited to bearing of the mitered beams on the post and shall be determined by the Designer.
2. The allowable download for the main beam in the square cut RTC44 connection is limited to bearing of the beam on the post and shall be determined by the Designer. The side beam allowable download is 1170 lbs.
3. The combined uplift loads applied to all beams in the connector must not exceed the total allowable uplift load listed in the table.

D83



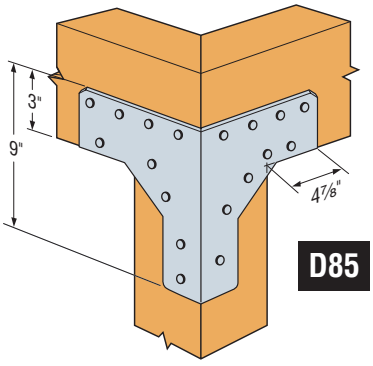
Typical LCE4Z Installation *(Mitered Corner)*

D84



RTC44 Installation *(Square Cut)*

D85



RTC44 Installation *(Mitered Corner)*

POST/COLUMN TO FOUNDATION

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.

SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

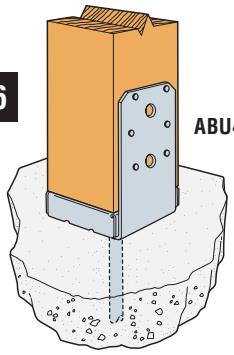
*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

	Model No.	Qty. Required	Anchor Diameter	Fasteners To Wood	DF/SP Allowable Loads Uplift (160)	SPF Allowable Loads Uplift (160)
	4x4 POST / COLUMN BASES					
	ABE44	1	½"	(6)10d	520	—
	ABA44	1	½"	(6) 10d	555	—
	PB44	1	Embed	(12) 16d	1365	—
SS	ABU44	1	⅝"	(12) 16d	2200	—
	PBS44A	1	Embed	(14) 16d	2400	—
	HTT4	1	⅝"	(18) 10dx1½"	3610	3105
SS	CB44	1	Embed	(2) ⅝" MB	4200	—
	HTT4	1	⅝"	(18) 16dx2½"	4235	3640
	LCB44	1	Embed	(2) ½" MB	4250	—
	HTT5	1	⅝"	(26) 10dx1½"	4350	3740
	CPS4	1	⅝"	(4) 10d	4490	—
	HTT5	1	⅝"	(26) 10d	4670	4015
	HTT5	1	⅝"	(26) 16dx2½"	5090	4375
	CBSQ44-SDS2	1	Embed	(14) ¼"x2" SDS	5335	—
	6x6 POST / COLUMN BASES					
	ABA66	1	⅝"	(8) 16d	720	—
	ABE66	1	⅝"	(8) 16d	900	—
	PB66	1	Embed	(12) 16d	1640	—
SS	ABU66	1	⅝"	(12) 16d	2300	—
	PBS66	1	Embed	(14) 16d	3160	—
	HTT4	1	⅝"	(18) 10dx1½"	3320	2855
	PBV6PC	1	⅝"	(4) ¼"x3" SDS	See Note 4	—
SS	CB66	1	Embed	(2) ⅝" MB	4200	—
	LCB66	1	Embed	(2) ½" MB	4230	—
	HTT4	1	⅝"	(18) 16dx2½"	4235	3640
	HTT5	1	⅝"	(26) 10dx1½"	4350	3740
	CPS6	1	⅝"	(4) 10d	4490	—
	HTT5	1	⅝"	(26) 10d	4670	4015
	HTT5	1	⅝"	(26) 16dx2½"	5090	4375
	CBSQ66-SDS2	1	Embed	(14) ¼"x2" SDS	6855	—
	8x8 POST / COLUMN BASES					
SS	ABU88	1	2-⅝"	(18) 16d	2320	—
	CPS7	1	⅝"	(4) 10d	4490	—
	CB88	1	Embed	(2) ¾" MB	6650	—

1. ATR—All-Thread Rod or Anchor Bolt. The Designer must specify anchor type, length, and embedment. Refer to technical bulletin T-ANCHORSPEC for guidance on selected products.
2. For multiple holdowns, verify the allowable tension capacity of the wood member.
3. Horizontal bolts and nails shall not be combined on connectors.
4. Allowable uplift for PBV6PC is 3800 lbs. based on a Ponderosa Pine round wood post.

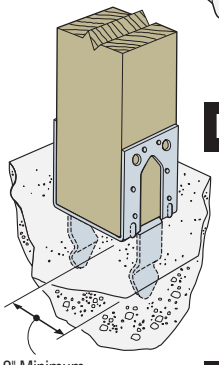
Post bases do not provide adequate resistance to prevent members from rotating about the base and therefore are not recommended for non-top-supported installations such as fences, unbraced carports or a trellis.

D86



ABU44

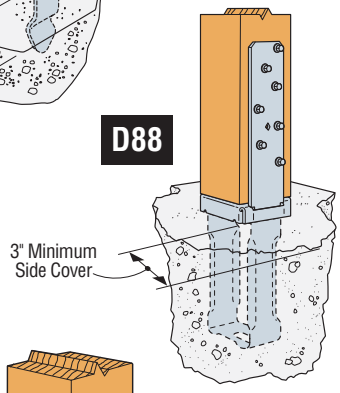
D87



PB44Z

2" Minimum Side Cover

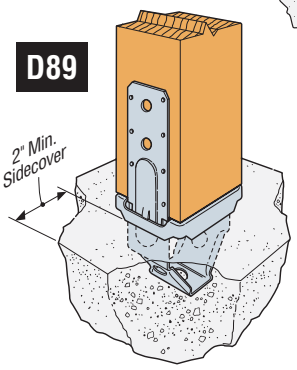
D88



3" Minimum Side Cover

CBSQ44-SDS2

D89



2" Min. Sidecover

PBS44A

CPS/PBV INSTALLATION:

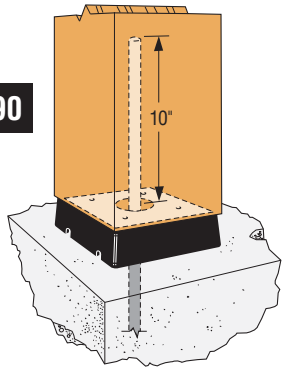
Post:

- Drill a ¾" diameter hole, 10" into the center of the post.
- Clean out dust. Fill hole halfway with Simpson Strong-Tie® SET® epoxy anchoring adhesive.
- Insert All-Thread Rod and allow epoxy to set and cure.
- Secure standoff to post using (4) 10d nails except PBV which uses (4) Simpson Strong-Tie® Strong-Drive® SDS screws.

Concrete:

- Drill a ¾" diameter hole per anchor design.
- Prepare anchor site per instructions on anchoring adhesive package, or refer to C-SAS-2012 pages 70-71.
- Fill hole at least halfway with SET® epoxy anchoring adhesive, insert post subassembly into hole and allow to cure per cure schedule on adhesive packaging.
- Post bases do not provide adequate resistance to prevent members from rotating about the base and therefore are not recommended for non top-supported installations *(such as fences or unbraced carports)*.

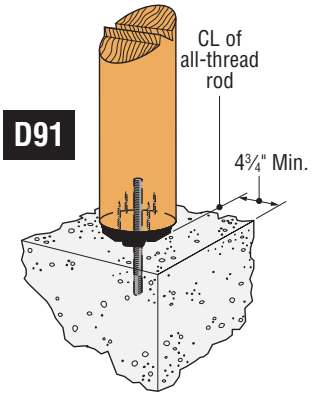
D90



10"

CPS4

D91



CL of all-thread rod

4¾" Min.

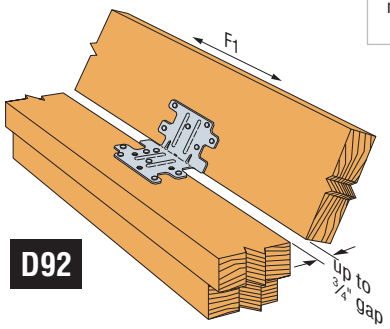
PBV6PC

ROOF BOUNDARY CONNECTION

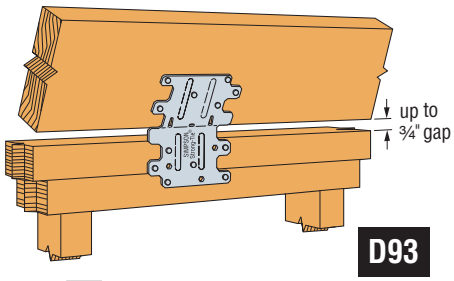
Model No.	Type of Connection	Bending Angle	Fasteners		DF/SP Allowable Loads	SPF Allowable Loads
			To Wall	To Blocking	Lateral (F1) (160)	Lateral (F1) (160)
RBC	1	45° to 90°	(6) 10dx1½"	(6) 10dx1½"	445	380
	2	< 30°	(6) 10dx1½"	(6) 10dx1½"	435	375
		30° to 45°	(6) 10dx1½"	(6) 10dx1½"	480	415
	3	0° to 45°	(3) ¼"x2¼" Titen[4]	(6) 10dx1½"	350	350

1. Allowable loads are for one anchor attached to blocking minimum 1½" thick.
2. RBC can be installed with up to ¾" gap and achieve 100% of the listed load.
3. Allowable loads have been increased for wind or earthquake loading with no further increase allowed. Reduce where other loads govern.
4. When attaching to concrete use (3) ¼" x 1¾" Titen® screws.
5. RBC installed over 1" foamboard has a load of 395 lbs. (160) in a parallel to wall (F_1) load direction for Douglas Fir. For SPF, the load is 340 lbs.
6. RBC may be installed over ½" structural sheathing using 10dx1½" nails with no load reduction.
7. Refer to flier F-RBC for additional information.

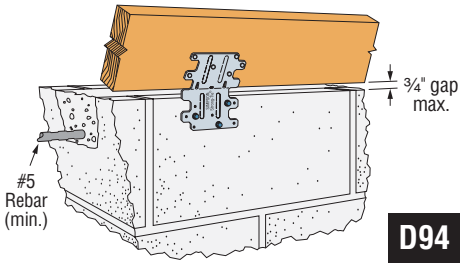
TITEN® SCREW WARNING: Industry studies show that hardened fasteners can experience performance problems in wet or corrosive environments. Accordingly, use this product in dry and noncorrosive environments only, provide moisture barrier, or use a stainless steel fastener. Steps must be taken to prevent inadvertent sustained loads above the listed allowable loads. Overtightening and bending moments can initiate cracks detrimental to the hardened screw's performance. Use the Simpson Strong-Tie® Titen® installation tool kit (Part TTNT01); it has a bit that is designed to reduce the potential for overtightening the screw.



1 Typical RBC Installation



2 Typical RBC Installation



3 Typical RBC Installation to CMU Block

LATERAL LOAD

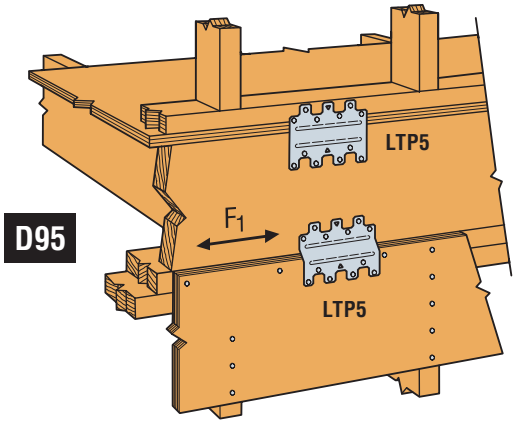
These products are available with additional corrosion protection. Additional products on this page may also be available with this option. Check with Simpson Strong-Tie for details.

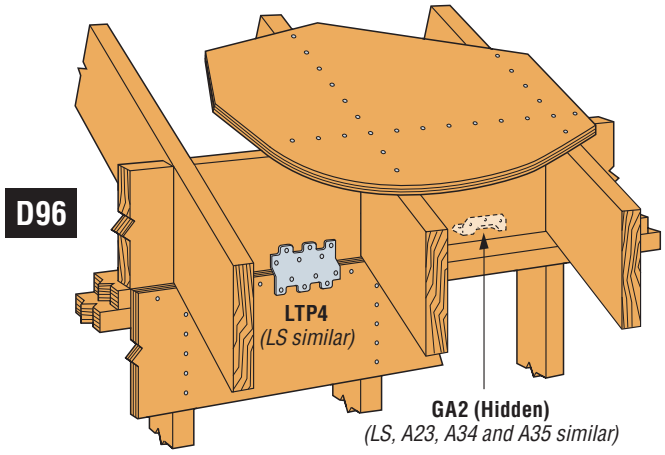
SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

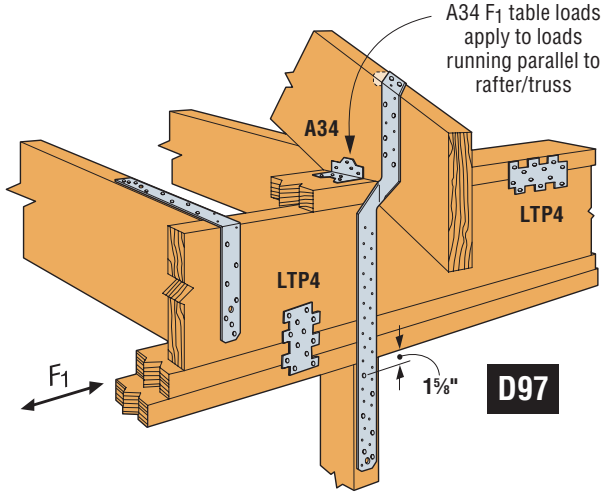
*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

	Model No.	Qty. Required	Fasteners (Total)	DF/SP Allowable Loads F_1 (160)	SPF Allowable Loads F_1 (160)
SS	LS30	1	(6) 10d	395	335
	GA2	1	(6) 8dx1½"	450	335
SS	A34	1	(8) 8dx1½"	515	445
SS	A23	1	(8) 10dx1½"	585	565
SS	A35	1	(12) 8dx1½"	695	600
	LTP5	1	(12) 8dx1½"	620	535
	LTP4	1	(12) 8dx1½"	670	575
SS	LS50	1	(8) 10d	730	630
SS	LS70	1	(10) 10d	915	785
SS	LS90	1	(12) 10d	1040	895

1. LTP4 can be installed over ⅜" wood structural panel sheathing with 8dx1½" nails and achieve 72% of the listed load, or over ½" and achieve 64% of the listed load. 8d commons will achieve 100% load.
2. The LTP5 may be installed over wood structural panel sheathing up to ½" thick using 8dx1½" nails with no reduction in load.







HOLDOWNS

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.

SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

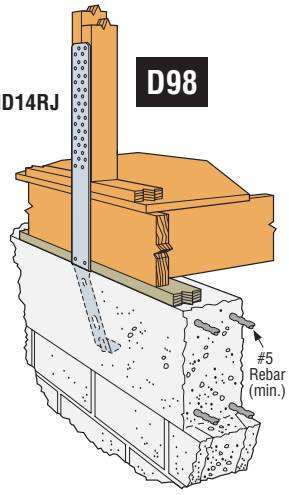
*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

	Model No.	Qty. Required	Anchor Diameter (in.)	Min.[1] Wood Member Thickness (in.)	Fasteners (Stud)	DF/SP Allowable Loads Uplift (160)	SPF Allowable Loads Uplift (160)
SS	DTT2Z[8]	1	½	3	(8) ¼"x1½" SDS	2145	1835
	LSTHD8/STHD8RJ	1	Embed	—	(20) 16d Sinkers	2700[2,10]	2700[2,10]
NEW	HD3B	1	⅝	3	(2) ⅝" MB[6]	3130	3050
	STHD10/STHD10RJ	1	Embed	—	(24) 16d Sinkers	4120[3,10]	4120[3,10]
	HDU2-SDS2.5	1	⅝	3	(6) ¼"x2½" SDS	3075	2215
	HTT4	1	⅝	3	(18) 10dx1½"	3610	3105
	STHD14/STHD14RJ	1	Embed	—	(30) 16d Sinkers	5345[4,10]	5345[4,10]
	HTT5KT	1	⅝	3	(26) #10x2½" SD	5445	5360
	HTT4	1	⅝	3	(18) 16dx2½"	4235	3640
	HTT5	1	⅝	3	(26) 10dx1½"	4350	3740
NEW	HD5B	1	⅝	3	(2) ¾" MB[6]	4505	3785
	HDU4-SDS2.5	1	⅝	3	(10) ¼"x2½" SDS	4565	3285
	HTT5	1	⅝	3	(26) 10d	4670	4015
	HTT5	1	⅝	3	(26) 16dx2½"	5090	4375
	HDU5-SDS2.5	1	⅝	3	(14) ¼"x2½" SDS	5645	4065
NEW	HD7B	1	⅞	3	(3) ¾" MB[6]	6645	5650
	HDU8-SDS2.5	1	⅞	4½	(20) ¼"x2½" SDS	7870	5665
	HDQ8-SDS3	1	⅞	4½	(20) ¼"x3" SDS	9230	6645
	HDC10/22-SDS2.5	1	⅞	3	(24) ¼"x2½" SDS	9665	8425
NEW	HD9B	1	⅞	4½	(3) ⅞" MB[6]	9920	8435
	HDU11-SDS2.5	1	1	7¼	(30) ¼"x2½" SDS	11175	8045
	HDU14-SDS2.5	1	1	7¼	(36) ¼"x2½" SDS	14375[9]	10435[9]
	HD19	1	1¼	7¼	(5) 1" MB[6]	19360	15270

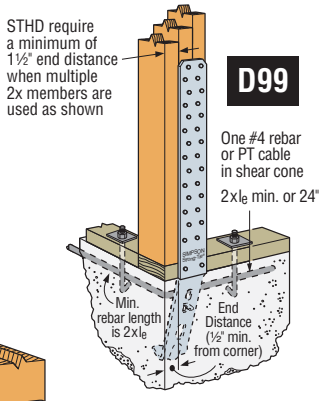
1. See the current Simpson Strong-Tie® *Wood Construction Connectors* catalog for load values based on different wood thickness. Post design by Specifier.
2. Where noted in table, load listed is for 6" or 8" stemwall corner condition with ½" min. edge distance into non-cracked 2500 psi concrete. For midwall condition, allowable load is 3115 lbs. for 6" or 8" stemwall. For end-of-wall condition, allowable load is 1690 lbs. for 6" stemwall *(2230 lbs. for 8" stemwall)*.
3. Where noted in table, load listed is for 8" stemwall corner condition with ½" min. edge distance into non-cracked 2500 psi concrete. For midwall condition, allowable load is 4755 lbs. For end-of-wall condition, allowable load is 3145 lbs. See the current *Wood Construction Connectors* catalog for 6" stemwall loads.
4. Where noted in table, load listed is for 8" stemwall corner or midwall condition with ½" min. edge distance into non-cracked 2500 psi concrete. For end-of-wall condition, allowable load is 4470 lbs. See the current *Wood Construction Connectors* catalog for 6" stemwall loads.
5. ATR—All-Thread Rod or Anchor Bolt. The Designer must specify anchor type, length, and embedment. Refer to technical bulletin T-ANCHORSPEC for guidance on selected products.
6. Lag bolts will not develop the listed loads.
7. STHD straps may be installed over ½" maximum wood structural panel sheathing.
8. For stainless steel, order DTT2SS.
9. Requires heavy hex anchor nut to acheive tabulated loads (supplied with holdown).
10. For further clarification on midwall, end-of-wall and corner conditions, reference the current Wood Construction Connectors catalog.

Refer to pages 7-8 for important considerations regarding coatings on connectors attached to preservative-treated wood

STHD14RJ **D98**

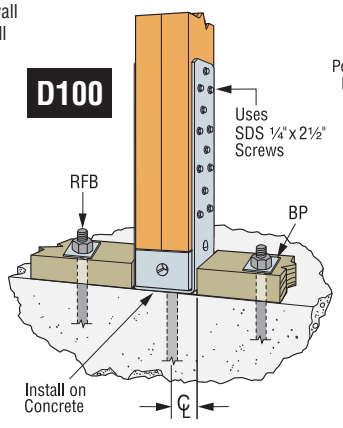


D99

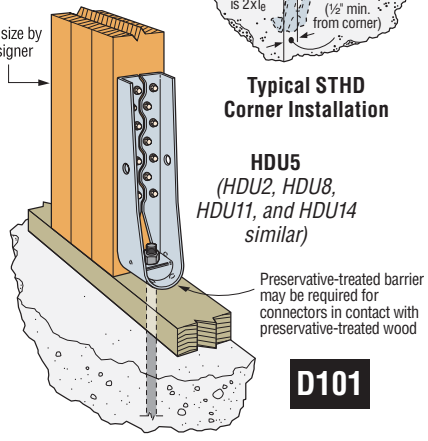


Typical STHD Corner Installation

D100



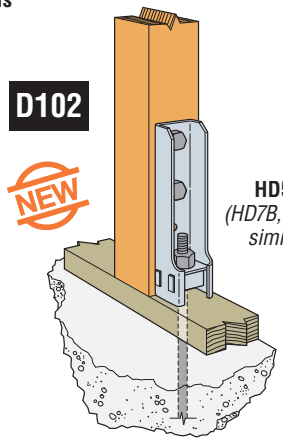
Typical HDC Installation with (2) 2x4 Studs



HDU5 *(HDU2, HDU8, HDU11, and HDU14 similar)*

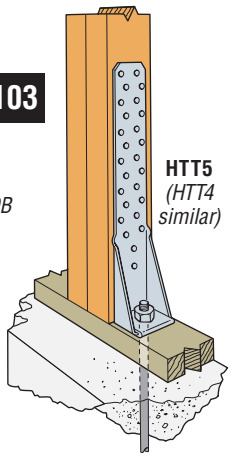
D101

D102



NEW **HD5B** *(HD7B, HD9B similar)*

D103



HTT5 *(HTT4 similar)*

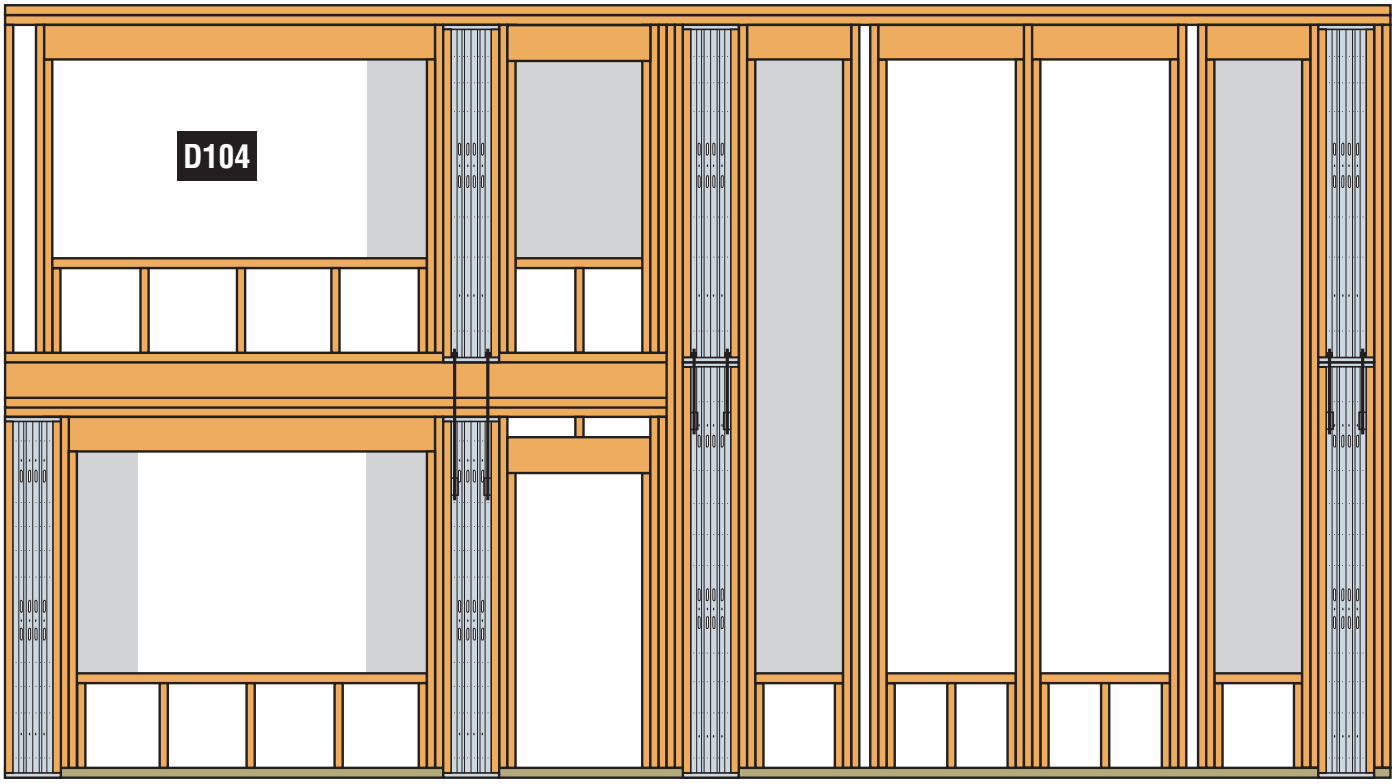
Need a Higher-Capacity Holdown?

When one of our conventional holdowns doesn't offer enough overturning capacity for a multi-story project, consider specifying the Simpson Strong-Tie® Anchor Tiedown System (ATS).

For more information on specification options please see our *Anchor Tiedown Systems Options for Specification* flier (F-ATSD10) or visit ***www.strongtie.com/ats***.

STRONG-WALL® SHEARWALLS

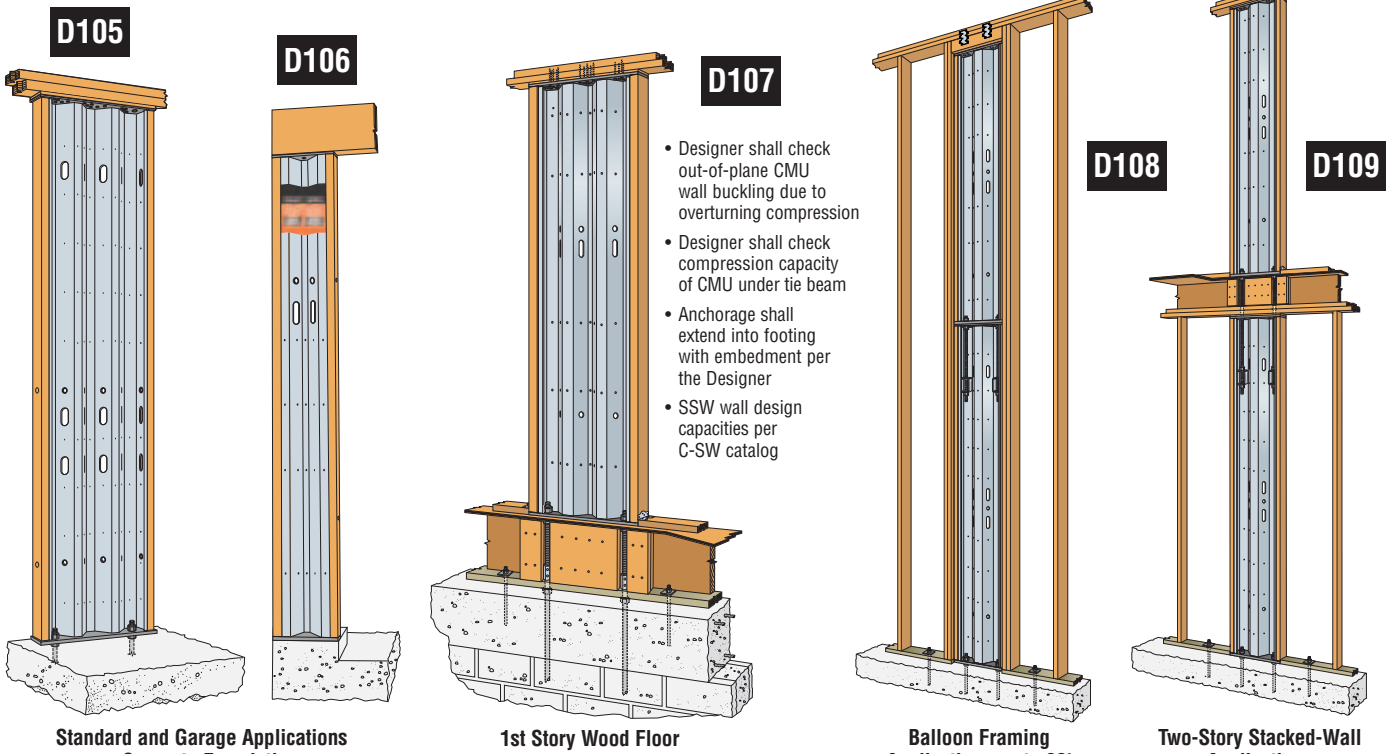
The gray areas represent window openings made possible by Steel Strong-Wall® shearwalls. Simpson Strong-Tie® Steel Strong-Wall® shearwalls provide design flexibility while maintaining high lateral load capacities required in some building designs. As shown in the example below, Steel Strong-Wall® solutions increase the amount of allowable window opening space by 48% when compared to wider, site-built shearwalls with the same capacity.



Uplift connectors not shown for clarity

STEEL STRONG-WALL® SHEARWALLS

The shearwall that combines superior performance with the easiest and fastest installation now offers new applications with simpler and better solutions for maximum design flexibility



Standard and Garage Applications on Concrete Foundations

1st Story Wood Floor Application

Balloon Framing Applications up to 20'

Two-Story Stacked-Wall Applications

STRONG-WALL® SHEARWALLS

The Strong-Wall Catalog

The Simpson Strong-Tie® *Strong-Wall® Shearwalls* catalog is the tool you need when specifying, installing or inspecting prefabricated shearwalls. This 75-page guide contains complete technical and installation information for the extensive line of steel and wood walls as well as prescriptive wall bracing requirements. Twenty pages of installation details are also included to aid in correct specification and installation. Call (800) 999-5099 or visit ***www.strongtie.com*** to request your copy.

STRONG-WALL® SELECTOR SOFTWARE

Simpson Strong-Tie has a tool that helps design professionals select an appropriate wood or steel Strong-Wall® shearwall system.

Optimized Solution

Provides the most cost-effective Strong-Wall® shearwall solution based on the input shear load.

Manual Solution

Allows Designers to choose which type and number of walls meet their requirements.

- Easy-to-use software – free of charge
- Finds lowest cost solution
- Provides actual drift and uplift values
- Provides solutions for different model codes
- Saves, exports and prints solutions
- Software updates automatically

You can download the Strong-Wall® Selector software at ***www.strongtie.com***.

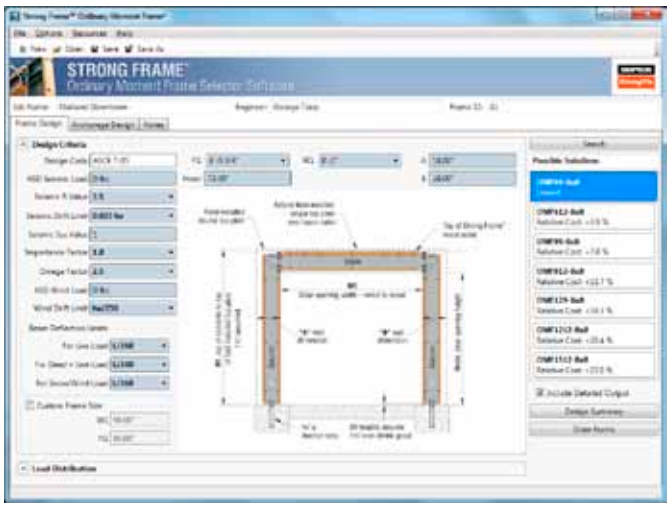
STRONG FRAME® *Ordinary Moment Frame*

The Strong Frame® Catalog

The Simpson Strong-Tie® *Strong Frame® Ordinary Moment Frame* catalog makes designing and building with moment frames more convenient than ever. This 67-page catalog contains 368 pre-designed single-story solutions with 100 percent bolted connections, making the Strong Frame® ordinary moment frame an efficient, cost-effective alternative to traditional frames. The solutions in the *Strong Frame® Ordinary Moment Frame* catalog allow greater design options, such as larger openings and smaller wall sections, all while achieving the loads required by structural designers. As all 368 standard frame models and anchorage solutions are code listed under the 2006/2009 IRC and IBC (IAPMO-ES ER-164), they do not require additional calculation packages for approval. To request your free copy of this catalog, call (800-999-5099) or visit ***www.strongtie.com***.

Two-Story Strong Frame® Moment Frame Solutions

With the new Simpson Strong-Tie® Strong Frame® two-story ordinary moment frame, Designers can reach new heights and widths in creativity. Accommodating clear openings up to 18' tall and 24' wide per story, the new Strong Frame® two-story ordinary moment frame is the ideal solution for projects featuring tall ceilings, expansive windows and other customized designs with space constraints or load requirements that exceed other lateral-force-resisting options for traditional light-frame construction. For more information, see the Simpson Strong-Tie® *Wood Construction Connectors 2012 Addendum*, or visit ***www.strongtie.com***.



Strong Frame® Selector Software

The Simpson Strong-Tie® Strong Frame® Selector software is designed to help the Designer select an appropriate frame for their given geometry and loading. Only minimum inputs are required for the software to select an appropriate frame for the available space. Based on input geometry, the Strong Frame Selector software will narrow down available stock frames to a handful of possible solutions. It can also help with custom frame designs. Download your free copy at ***www.strongtie.com/strongframe***.

GABLE END TO WALL FRAMING

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.

SS *These products may be available in stainless steel for premium corrosion resistance. Contact Simpson Strong-Tie for availability.*

*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

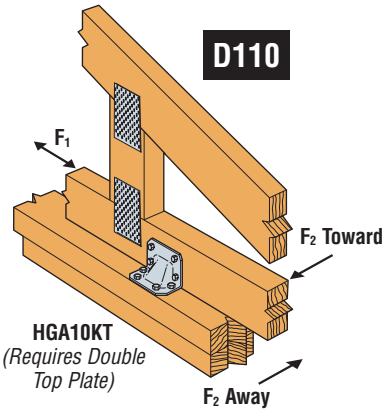
Model No.	Qty. Required	Fasteners (Total)	DF/SP Allowable Loads				SPF Allowable Loads			
			Uplift	Parallel To End-Of-Wall (F_1)	Perp. To End-Of-Wall Toward Anchor (F_2)	Perp. To End-Of-Wall Away From Anchor (F_2)	Uplift	Parallel To End-Of-Wall (F_1)	Perp. To End-Of-Wall Toward Anchor (F_2)	Perp. To End-Of-Wall Away From Anchor (F_2)
			(160)	(160)	(160)	(160)	(160)	(160)	(160)	(160)
SHEAR CONNECTIONS										
LTP4	1	(12) 8dx1½"	—	670	—	—	—	575	—	—
LTP5	1	(12) 8dx1½"	—	620	—	—	—	535	—	—
SS A34	1	(8) 8dx1½"	—	515	455	—	—	340	390	—
SS A35	1	(12) 8dx1½"	—	695	670	—	—	450	575	—
END-OF-WALL CONNECTIONS (CONCRETE/MASONRY)										
HGAM10KTA	1	(4) ¼"x1½" SDS (4) ¼"x2¾" Titen[6]	850	1005	1165	680	610	725	795	530
RBC	1	(3) ¼"x2¼" Titen[6] (6) 10dx1½"	—	350	—	—	—	350	—	—
NEW LTA2	1	(10) 10dx1½"	1390[7]	950	220	220	1015	800	220	220
HETA12[1]	1	(7) 10dx1½"	1515[8]	65	85	85	1210	55	75	75
SS HETA20[1]	1	(12) 10dx1½"	1810	730	335	335	1810	625	215	215
END-OF-WALL CONNECTIONS (WOOD)										
HGA10KT	1	(4) ¼"x1½" SDS (4) ¼"x3" SDS	695	1165	940	780	500	840	675	495
RBC	1	(6) 10dx1½"	—	445	—	—	—	380	—	—
LSTA15	1	(6) 10d	—	—	—	485	—	—	—	415
LSTA18	1	(8) 10d	—	—	—	645	—	—	—	555
LSTA21	1	(12) 10d	—	—	—	965	—	—	—	830
LSTA24	1	(12) 10d	—	—	—	965	—	—	—	830
LSTA30	1	(16) 10d	—	—	—	1305	—	—	—	1125

1. HETA will require a 30° bend and a 4" minimum embedment depth in a concrete tie beam only.
2. Refer to Prescriptive Standards for spacing and construction of assembly shown in detail D111.
3. Straps must use half the total fasteners into each member being connected to achieve the listed loads.
4. LTP4 can be installed over ⅜" wood structural panel sheathing with 8dx1½"nails and achieve 72% of the listed load, or more than ½" and achieve 64% of the listed load. 8d commons will achieve 100% load.
5. The LTP5 may be installed over wood structural panel sheathing up to ½" thick using 8dx1½" nails with no reduction in load.
6. For concrete applications use ¼"x1¾" Titen® screws.
7. LTA2 allowable uplift listed in table is based on SP lumber. Uplift load on DF is 1210 lbs.
8. HETA12 allowable uplift listed in table is based on SP lumber. Uplift load on DF is 1400 lbs.

Model No.	Qty. Required	Fasteners per Connector		DF/SP Allowable Loads (160) Perpendicular to End-Of-Wall (F_2)				SPF Allowable Loads (160) Perpendicular to End-Of-Wall (F_2)			
				Toward Anchors		Away from Anchors		Toward Anchors		Away from Anchors	
		Gable Brace	Top Plates	Gable Brace Angle		Gable Brace Angle		Gable Brace Angle		Gable Brace Angle	
				40°-45°	46°-60°	40°-45°	46°-60°	40°-45°	46°-60°	40°-45°	46°-60°
GBC	2	(5) 8dx1½"	(7) 8d	635	570	425	325	535	480	355	275

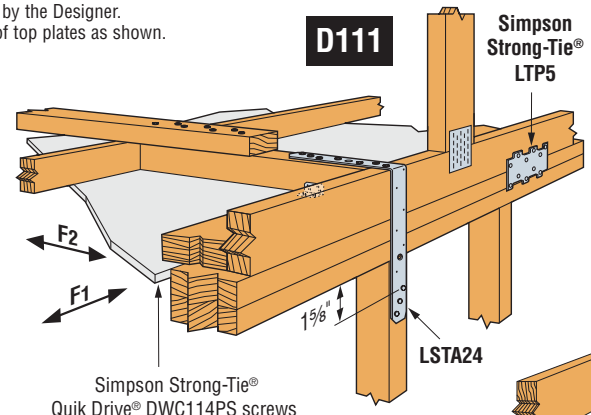
1. For 1¾"x3½" *(or larger)* LVL gable brace, the allowable load at 40° to 45° is 635 lbs. toward anchors, 515 lbs. away from anchors.
2. Use minimum 2x4 gable brace. Larger members may be used or required.
3. Connection of gable brace to roof diaphram is by the Designer.
4. Gable brace should be flush with inside edge of top plates as shown.

D110



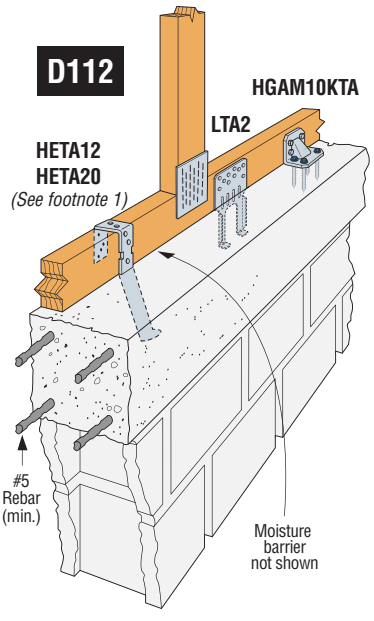
HGA10KT
(Requires Double Top Plate)

D111

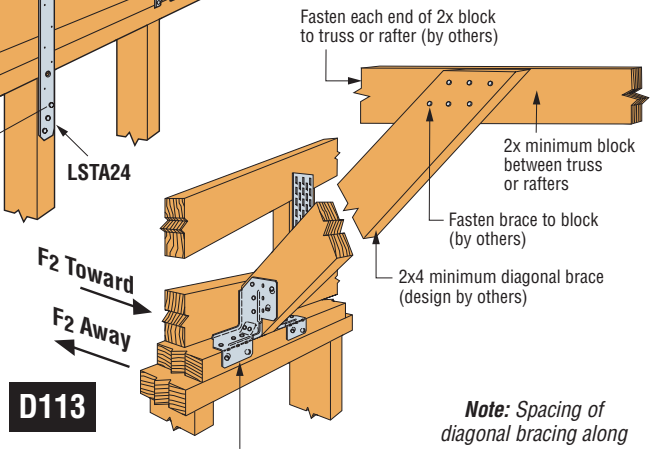


Simpson Strong-Tie® Quik Drive® DWC114PS screws may be used to fasten gypsum board to ceiling framing *(See IBC 2508.5 for further information)*

D112



D113



Simpson Strong-Tie® GBC Connector
(Installed in pairs)

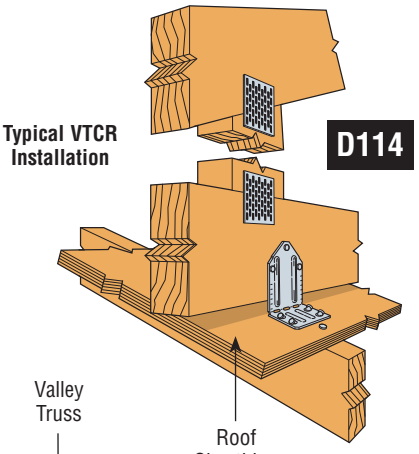
***Note:** Spacing of diagonal bracing along gable end wall per the Designer*

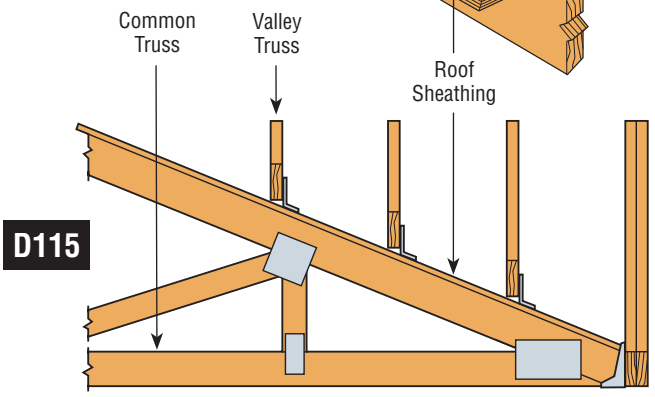
VALLEY TRUSS TO ROOF FRAMING

*These products are approved for installation with the Strong-Drive® SD structural-connector screw. See **www.strongtie.com/sd** for the correct substitution and SD screw size.*

Model No.	Fasteners		Supporting Roof Pitch	DF/SP Allowable Loads		SPF/HF Allowable Loads	
	Supporting Framing	Valley Truss		Uplift[2] (160)	Download[4] (100/115/125/160)	Uplift[2] (160)	Download[5] (100/115/125/160)
VTCR	(4) 10d	(3) 10dx1½"	< 4/12	370	790	320	655
			4/12 to 12/12	370	790	320	655
	(4) #9x2½" SD	(3) #9x1½" SD	< 4/12	390	790	335	655
			4/12 to 12/12	500	790	430	655

1. Loads are based on installation over 7/16" or 15/32" sheathing. For installation over 19/32" or 5/8" sheathing, allowable uplift loads are 285 lbs. (DF/SP) and 245 lbs. (SPF/HF) when installed with nails, or 370 lbs. (DF/SP) and 320 lbs. (SPF/HF) when installed with screws.
2. When attached directly to the supporting framing with either screws or nails, the allowable uplift for pitches less than 4:12 is 240 lbs. (DF/SP) and 205 lbs. (SPF/HF). For pitches 4:12 to 12:12, use the tabulated uplift loads.
3. Allowable uplift loads are based on the lower of the test loads at 3/16" deflection or the ultimate load divided by 3.
4. Southern Pine allowable download is 750 lbs.
5. Hem Fir allowable download is 625 lbs..
6. When the valley truss and supporting framing are of different species, use the lower tabulated values.



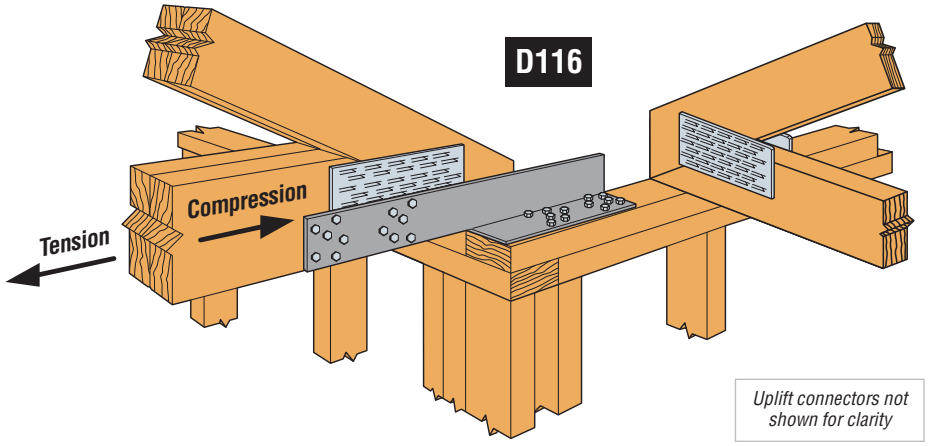


Typical VTCR Side View

DRAG STRUT CONNECTION

Model No.	L (in.)	Fasteners	DF/SP Allowable Loads		SPF/HF Allowable Loads	
			Compression (160)	Tension (160)	Compression (160)	Tension (160)
DSC2R/L-SDS3	16	(20) ¼"x3" SDS	2590	3720	1865	2680
DSC5R/L-SDS3	21	(24) ¼"x3" SDS	4745	5925	3415	4265

1. Simpson Strong-Tie® Strong-Drive® SDS screws minimum penetration is 2¾", minimum end distance is 2½" for DSC2 and 3¾" for DSC5 and minimum edge distance is ⅝" for full load values.
2. Simpson Strong-Tie Strong-Drive SDS screws are permitted to be installed through metal truss plates as approved by the Truss Designer, provided the requirements of ANSI/TPI 1-2007 Section 7.5.3.4 are met *(pre-drilling required through the plate using a maximum of 5/32" bit)*. When installing fasteners through truss plates that will extend out past the back face of the member, care must be taken to ensure that the fastener does not push the truss plate out on the back face.



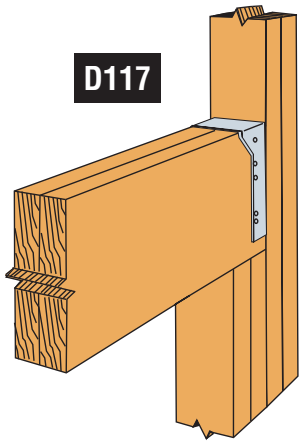
DSC5-SDS3
(DSC2-SDS3 similar)
(Right-hand DSC shown; specify right or left hand when ordering)

HANGER UPLIFT CONSIDERATIONS

- By inverting the proper size and type of Simpson Strong-Tie® connectors in a girder, truss or beam connection, additional uplift loads can be obtained by combining the loads as shown below.
- In a combined installation of an inverted connector with a standard connector, all the component uplift and downloads can be added together *(as shown in the example below with HGUS26-2 hangers)* to obtain higher load values.
- Allowable loads shown are based on the lesser of either National Design Specification (NDS) calculations or the results of static load tests.
- Other hanger and connector options than those shown can be used as specified by the Designer.

Model No.	Fasteners		DF/SYP Allowable Uplift Loads
	Header	Joist	(160)
HUC26-2[1]	(12) 16d	(6) 10d	2700
HUC28-2[1]	(14) 16d	(6) 10d	3040
HUC210-2[1]	(18) 16d	(10) 10d	4100

1. Values based on an inverted hanger installation.
2. Loads include a 60% increase for wind loading with no further increases allowed.
3. Table values also apply to triple 2x and 4x HUC models with the same nailing pattern.
4. Download assumed to be carried by jack studs.

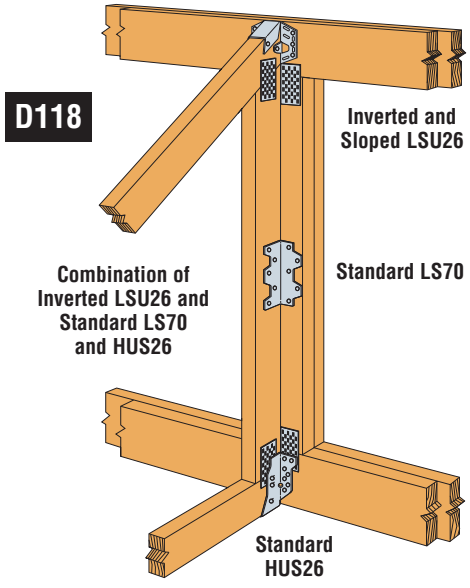


COMBINED-CONNECTOR EXAMPLE

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		DF/SYP Allowable Loads			
	Header	Joist	Uplift Loads	Downloads		
			(160)	Snow (115)	Roof (125)	Roof (160)
LSU26[1]	(6) 10d	(5) 10dx1½"	865	535	535	535
LS70	(5) 10d	(5) 10d	915	675	730	915
HUS26	(14) 16d	(6) 16d	1550	3095	3335	3335
Combined Total Load[3]			3330	4305	4600	4785

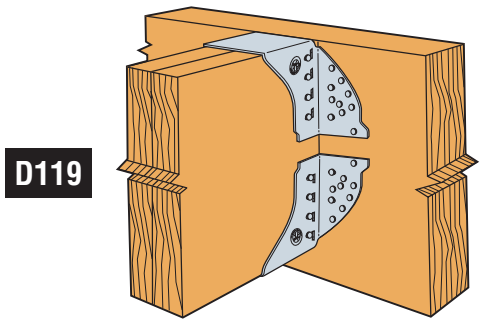
1. Values based on an inverted hanger installation.
2. Where (160) is noted, loads include a 60% increase for wind loading with no further increases allowed.
3. Combined Total Load is based on the combined results of individual connector allowable loads. The Designer shall determine if using the combined total load is appropriate.
4. Other connectors can be used for this application per the Designer.



COMBINED-HANGER EXAMPLE

Model No.	Fasteners		DF/SYP Allowable Loads			
	Header	Joist	Uplift Loads	Downloads		
			(160)	Snow (115)	Roof (125)	Roof (160)
HGUS26-2	(20) 16d	(8) 16d	2155	4875	5230	5575
HGUS26-2[1]	(20) 16d	(8) 16d	5575	2155	2155	2155
Combined Total Load			7730	7030	7385	7730

1. Values based on an inverted hanger installation.
2. Where (160) is noted, loads include a 60% increase for wind loading with no further increases allowed.
3. Other hangers can be used for this application. Contact Simpson Strong-Tie for load information.

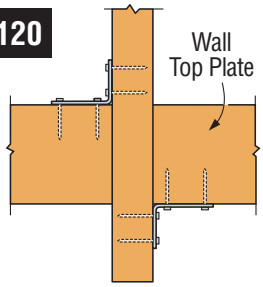


LOAD PATH INSTALLATION CONSIDERATIONS

HURRICANE TIE INSTALLATIONS TO achieve TWICE THE LOAD (Top View)[1]

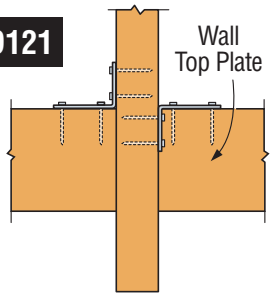
Both connectors shall be same model.

D120



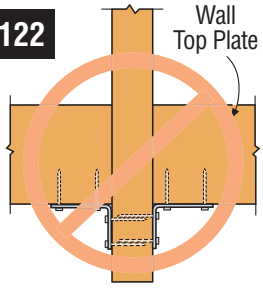
Install diagonally across from each other for minimum 2x truss.

D121



Products can be on the same side of the wall provided they are configured as shown.

D122



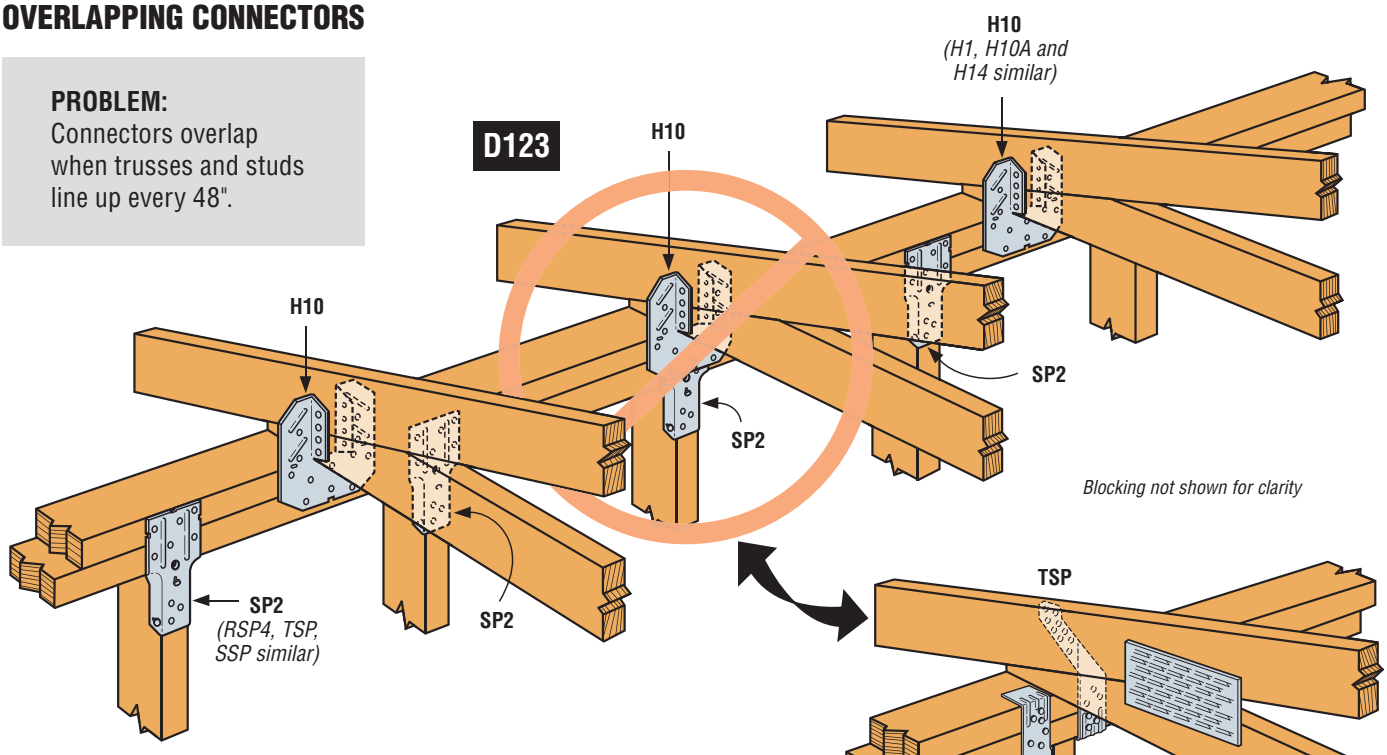
Nailing into both sides of a single ply 2x truss may cause the wood to split.

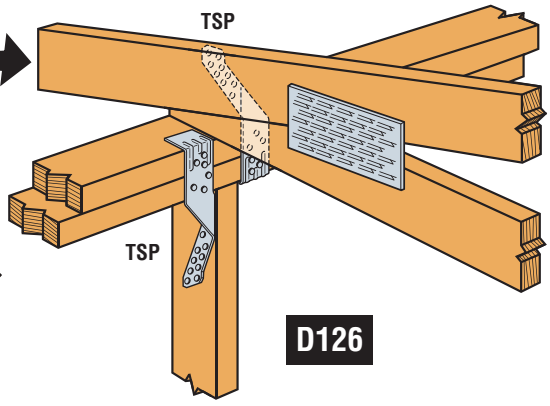
1. Where indicated in tables shown on pages 18 and 25.

OVERLAPPING CONNECTORS

PROBLEM:
Connectors overlap when trusses and studs line up every 48".

D123

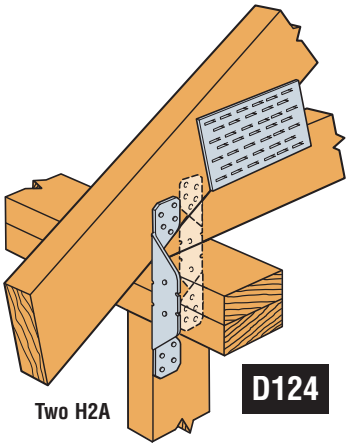




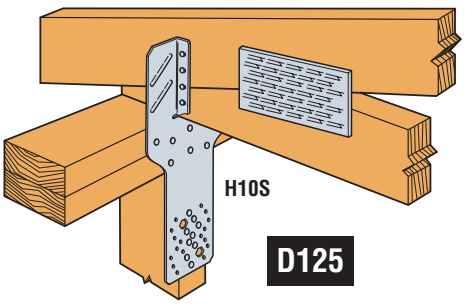
D126

SOLUTION:
Specify TSP from stud to plate and from plate to truss.

(Other connectors offer a similar solution. Contact Simpson Strong-Tie for more information)



D124



D125

SOLUTION:
Specify connector that connects truss to stud below.

LOAD PATH INSTALLATION CONSIDERATIONS

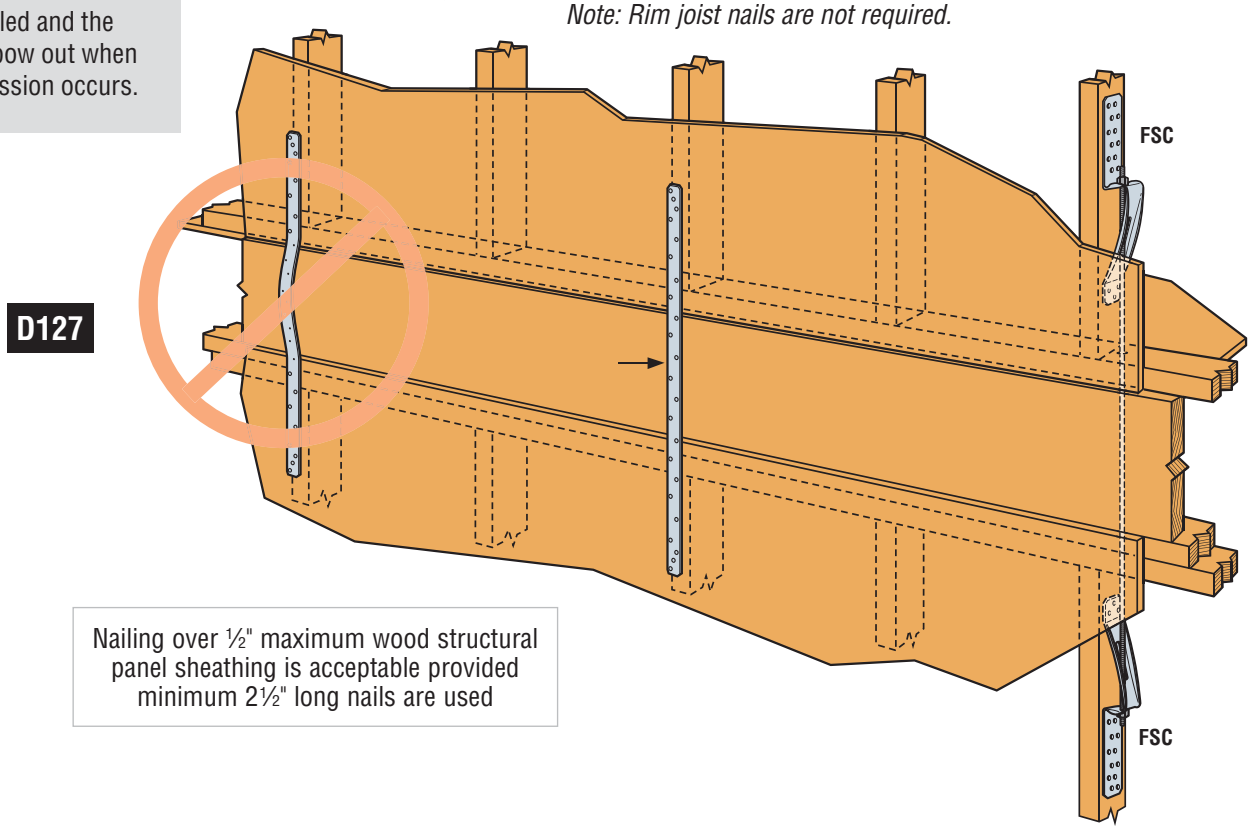
BULGING FLOOR-TO-FLOOR STRAPS

PROBLEM:
All stud nails are filled before the roof is installed and the straps bow out when compression occurs.

SOLUTION 1:
Fill the nail holes in the rim joist area to limit the bowing.

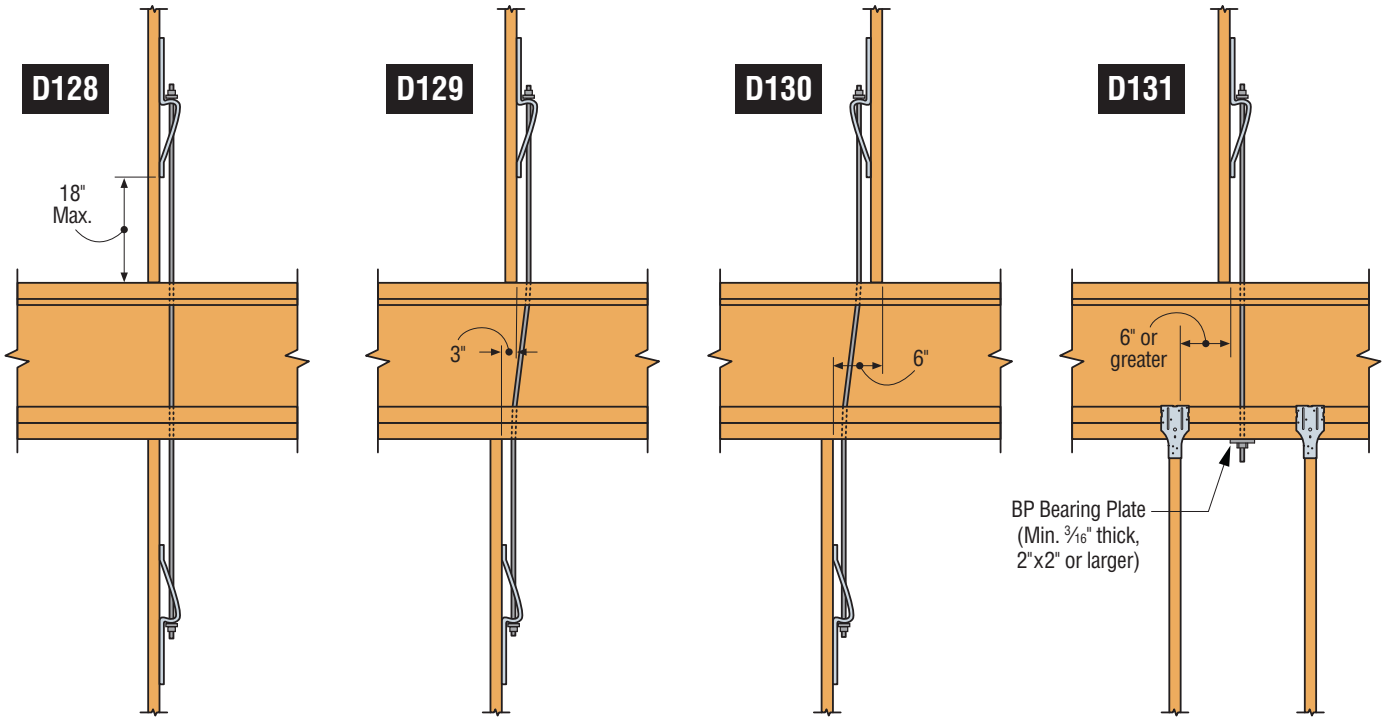
SOLUTION 2:
Fill the nail holes to the top stud before the roof is installed and then fill bottom stud nails after.
Note: Rim joist nails are not required.

SOLUTION 3:
FSC—See below for more information.



D127

Nailing over ½" maximum wood structural panel sheathing is acceptable provided minimum 2½" long nails are used



Studs Perfectly Aligned

Up to 3" Offset
(Install FSCs on same side of studs)

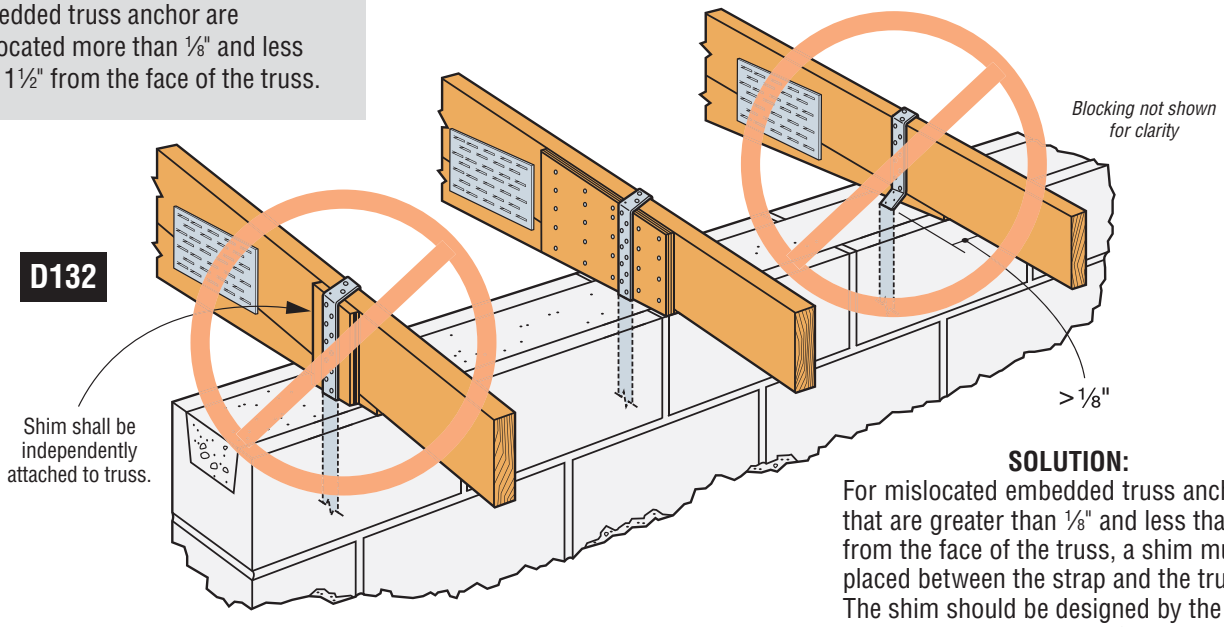
Up to 6" Offset
(Install FSCs on opposite side of studs)

Greater than 6" Offset
(Use top plate-to-stud connectors on lower studs for continuous load path)

LOAD PATH INSTALLATION CONSIDERATIONS

MISLOCATED TRUSS ANCHORS

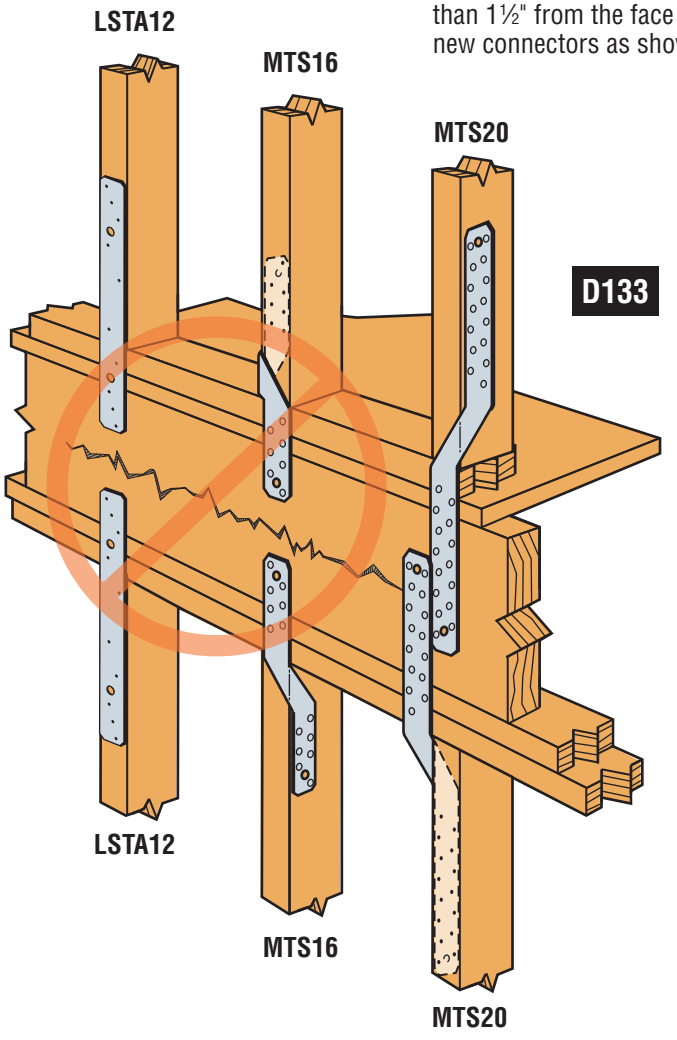
PROBLEM:
Embedded truss anchor are mislocated more than ⅛" and less than 1½" from the face of the truss.



SOLUTION:
For mislocated embedded truss anchors that are greater than ⅛" and less than 1½" from the face of the truss, a shim must be placed between the strap and the truss. The shim should be designed by the Truss Engineer to properly transfer the loads to the connector. When anchors are more than 1½" from the face of the truss, add new connectors as shown on page 22.

CROSS-GRAIN TENSION

PROBLEM:
Wood has very low tension capacity perpendicular to grain.



SOLUTION:
Avoid cross-grain tension by strapping stud-to-stud (see D127, page 48) or by mechanically reinforcing the lumber by overlapping MTS straps on rim board beyond centerline of rim board (as drawn).

TECHNICAL PUBLICATIONS

*Anchoring and Fastening Systems for Concrete and Masonry**

Includes application information, specifications and load values for adhesive and mechanical anchors, P.A.T. and Gas-Actuated fastening systems, and carbide drill bits.

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Strong Frame® Ordinary Moment Frame

The *Strong Frame® Ordinary Moment Frame* catalog contains complete information on the Strong Frame ordinary moment frame including product information, detailed installation instructions and technical data. Performance data is available for engineered designs as well as prescriptive wall-bracing applications.

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This system is designed to provide the over-turning holdown capacity for multi-story commercial buildings. This holdown application is easy to specify, install and inspect.

Strong-Wall® Shearwalls

All the information on our Strong-Wall shearwalls is now in one easy to use catalog: technical data, installation information, structural details and more. The catalog also features new solutions for two-story and balloon frame applications as well as an extensive section on braced frame requirements under the various building codes.

Cold-Formed Steel Connectors Catalog

Thirty products have been developed and tested using screw fasteners to obtain actual load values. Includes installation requirements and illustrations.

Deck Framing Connection Guide

Developed for deck building professionals and general contractors to help explain products and techniques used in designing and constructing residential decks.

Anchoring Solutions for Simpson Strong-Tie® Connectors Catalog

This guide recommends Simpson Strong-Tie® anchoring solutions for our connectors that anchor to concrete.

Stainless-Steel Connectors

Featuring stainless-steel connectors for using in high exposure and some outdoor environments to protect against corrosion and some preservative-treated woods.

Simpson Strong-Tie Free CD-ROM

Our CD-ROM features our latest catalogs, fliers, technical bulletins, code reports, product list prices, UPC information, and the Simpson Strong-Tie® Connector Selector program. It also includes the Drawing Library.

In addition to the publications shown above, Simpson Strong-Tie maintains an extensive library of literature, providing information on a wide variety of subjects. You can access the library by visiting ***www.strongtie.com/tech-bulletins*** or you can call 800-999-5099 and have publications mailed to you.

SOFTWARE

Simpson Strong-Tie offers many software programs and web-based applications to simplify product selection and specification. Each of the software programs is available on CD-ROM; all software and applications are available for free download at www.strongtie.com.

Connector Selector

The Connector Selector finds the products that are appropriate for your connection and sorts them by lowest installed cost. Solutions are available for a wide variety of applications using solid sawn lumber, engineered wood and structural composite lumber, glulam beams and wood trusses. Available in U.S. *(Allowable Stress Design)* and Canadian *(Limit States Design)* versions.

Strong-Wall® Selector

The Strong-Wall Selector helps specifiers choose a lateral force resisting system using Wood or Steel Strong-Wall® Shearwalls. Optimized or Manual input provides the most cost effective solution or allows designers to choose and check whether any type and number of walls satisfy the shear load requirements.

ATS Selector

The ATS Selector recommends the correct ATS system components based upon load requirements and building code options input by the Designer. It can also recommend the corresponding compression post designs. Resulting calculations can be printed and AutoCAD drawings can be inserted into plans.

Strong Frame® Selector

The Simpson Strong-Tie® Strong Frame® Selector software is designed to help the Designer select an appropriate frame for their given geometry and loading. Only minimum input geometries are required for the software to select an appropriate frame for the available space. Based on input geometry, the Strong Frame Selector software will narrow down from the 368 available stock frames to a handful of possible solutions or it will suggest possible custom solutions.

For assistance specifying post-installed anchors for concrete and masonry, visit ***www.strongtie.com*** to download the Anchor Selector software. Two versions are available for allowable stress design and ultimate strength design, including cracked concrete.

NOTES

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