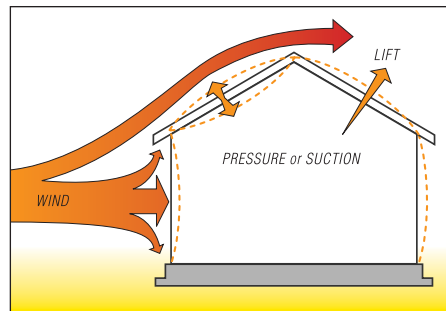


# Addressing Overturning

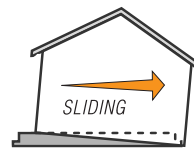
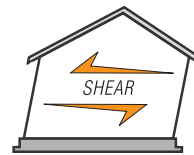


A well-connected house is one that is soundly designed and constructed using the **continuous load path** method of construction. This requires that a home is built using a system of connectors at all the joints – from the roof to the foundation – thereby redistributing the external pressures of wind from the frame of the house to the foundation. Using this system, the home's ability to withstand Mother Nature's forces increases significantly. This flier highlights connectors that, when used properly, will help resist wind's overturning forces.



**During a thunderstorm, blizzard, hurricane or tornado, the force of wind on a house works in three ways:**

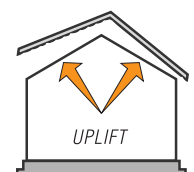
**1** It exerts horizontal pressure on the structure which can cause the structure to "tilt" – this is called **shear or racking**. The structure can move off of the foundation – this is called **sliding**.



**2** It exerts a lateral force. If the structure is unable to slide, it causes the structure to rotate off of its foundation. This is called **overturning**.



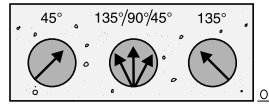
**3** As it flows over the roof the wind creates a strong lifting effect, much like that of air flowing over an airplane wing. This is called **uplift**.



# ANCHORING HOLDOWNS

## SSTB BOLT

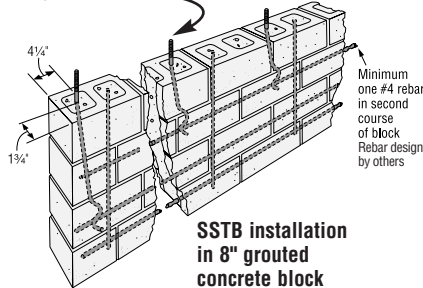
- Rolled threads for higher tensile capacity.
- Offset angle reduces side-bursting, provides more concrete cover.
- Stamped embedment line aids installation.
- Configuration results in minimum rebar interference.
- SSTB is used for monolithic and two-pour in slab and masonry stemwall applications.
- Nuts and washers are not supplied with the SSTB; install standard nuts, couplers and/or washers as required.
- For more information about block reinforcement and installation refer to the current *Wood Construction Connectors* catalog.



Plan View of SSTB Placement in Block Wall



Identification on the bolt head showing embedment angle and model.



SSTB installation in 8" grouted concrete block

## RETROFIT



RFB - Retrofit Bolt

RFBs are pre-cut threaded rods, supplied with nut and round washer. Inspection is easy; the head is stamped with rod length and "No-Equal" symbol for identification after installation. It offers a complete engineered anchoring system when used with Epoxy-Tie™ or Acrylic-Tie®. See our Anchor Systems catalog for performance values with limited edge distances in concrete and block. Reference T-ANCHORSPEC for concrete and wood connector specifications.

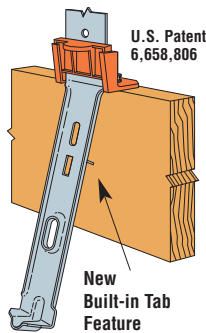
**AT® Acrylic Tie Adhesive** is ideal for cold weather application. Will cure in temperatures down to 0° F. High strength, easy to use, and moisture resistant.

**SET® Epoxy-Tie Adhesive** is ideal for use with threaded rod to anchor hardware, fixtures and equipment to concrete. High strength, easy to use, low odor, and moisture resistant.



SET - Epoxy-Tie™  
10, 22 and 56 oz.

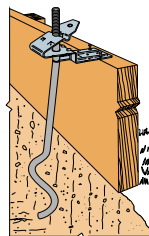
## CAST IN PLACE OPTIONS



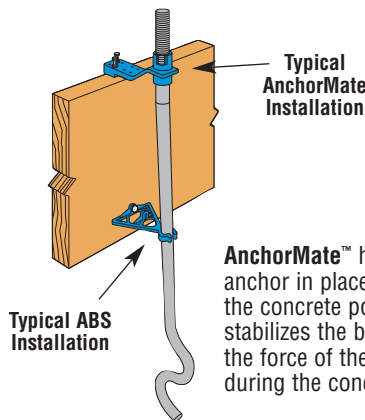
Typical StrapMate Installation

The reusable **StrapMate®** keeps the STHD, LSTHD, HPAHD and PAHD straps vertically aligned during the concrete pour. The friction fit allows for quick and easy installation.

Use the **MKP<sup>5/8</sup>** to install the SSTB16, 20 and 24; **MKP<sup>3/8</sup>** for SSTB28, 34 and 36; other sizes fit commonly-used anchor bolts.



MKP™ attached to formboard with SSTB before the concrete pour



Typical AnchorMate Installation

**AnchorMate™** holds the anchor in place before the concrete pour and stabilizes the bolt against the force of the concrete during the concrete pour.



*This flier reflects information available as of March 1, 2005. This information is updated periodically; contact Simpson for current information and limited warranty or see [www.strongtie.com](http://www.strongtie.com).*

### Home Office

4120 Dublin Blvd., Suite 400  
Dublin, CA 94568  
FAX: 925/833-1496

### Northwest USA

5151 S. Airport Way  
Stockton, CA 95206  
FAX: 209/234-3868

### Southwest USA

260 N. Palm Street  
Brea, CA 92821  
FAX: 714/871-9167

### Southeast USA

2221 Country Lane  
McKinney, TX 75069  
FAX: 972/542-5379

### Northeast USA

2600 International Street  
Columbus, OH 43228  
FAX: 614/876-0636

### Quik Drive Factory

436 Calvert Drive  
Gallatin, TN 37066  
Tel: 888/487-7845  
Fax: 615/451-9806

### Eastern Canada

5 Kenview Blvd.  
Brampton, ON L6T 5G5  
FAX: 905/458-7274

### Western Canada

11476 Kingston St.  
Maple Ridge, BC V2X 0Y5  
FAX: 604/465-0297

### Warehouses:

Enfield, CT; Jacksonville, FL;  
Kent Specials Factory, WA; Langley, B.C.

800-999-5099

[www.strongtie.com](http://www.strongtie.com)

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F-OVERTURN05 3/05

## PRODUCTS TO RESIST OVERTURNING



**PHD**  
The Predeflected Holdown is predeflected during manufacturing and virtually eliminates deflection from material stretch. Simpson's code recognized SDS $\frac{1}{4}$ x3 wood screws are provided with every holdown. Four sizes available.



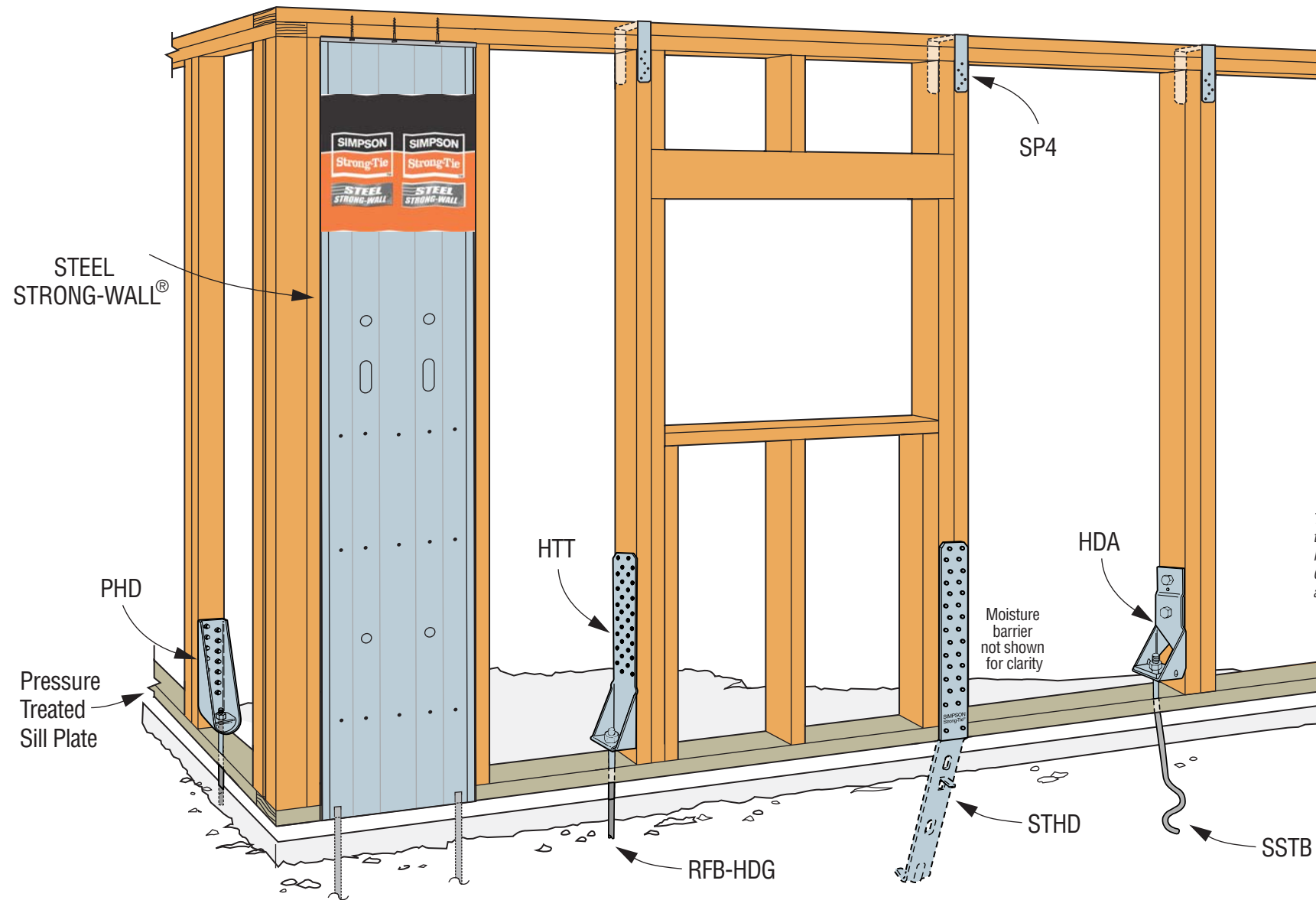
**HTT**  
The Tension Tie Holdown is a single-piece formed holdown with 4-ply formed seat which won't unfold during loading. No washers are required. Two sizes available.



**STHD**  
The Strap Tie Holdown is an embedded strap tie holdown with high load capacity and a staggered nail pattern to help minimize splitting. Six sizes available.



**HDA**  
The HDA Holdown is a single piece non-welded design that results in higher load capacity. It is designed to transfer tension loads. It features a Load Transfer Plate which eliminates the need for a seat washer. Six sizes available.



Allowable loads for more than one direction for a single connection cannot be added together. A design load which can be divided into components in the directions given must be evaluated as follows:

$$\begin{aligned} & \text{Design Uplift/Allowable Uplift} + \\ & \text{Design Lateral Parallel to Plate/Allowable Lateral Parallel to Plate} + \\ & \text{Design Lateral Perpendicular to Plate/Allowable Lateral Perpendicular to Plate} < 1.0 \end{aligned}$$

These are examples of connectors that can help address overturning. Refer to current Wood Construction Connectors catalog for product and allowable load information.



### Steel Strong-Wall®

An engineered composite of steel and wood. Allowable loads are between 2 and 3 times stronger than the original Strong-Wall. Walls as narrow as 12" solve the problem of wider code required walls at garage fronts. Easy installation with 2 anchor bolts, fewer top-of-wall screws and pre-drilled holes for wiring. Pre-attached wood studs to attach interior and exterior finishes.

### I.C.B.O. – Uniform Building Code/1997

#### 1605.2.2 Stability Against Overturning.

Every structure shall be designed to resist the overturning effects caused by the lateral forces.

#### 1615 General.

Every building or structure and every portion thereof shall be designed and constructed to resist the wind effects.

### International Residential Code®/2000/2003

#### R301.1 Design ...

The construction of buildings and structures shall result in a system that provides a **complete load path** capable of transferring all loads from their point of origin through the load-resisting elements to the foundation.

### International Residential Code®/2000/2003

#### R601.2 Requirements.

Wall construction shall be capable of accommodating all loads imposed according to Section R301 and of transmitting the resulting loads to the supporting structural elements.

### International Building Code®/2000/2003

#### 1604.4 Analysis.

... Every structure shall be designed to resist the overturning effects caused by the lateral forces specified in this chapter.

#### 1609.1 Applications.

Buildings, structures and parts thereof shall be designed to withstand the minimum wind loads.

#### 1609.1.3 Anchorage Against Overturning, Uplift and Sliding.

Structural members and systems, and components and cladding in a building or structure shall be anchored to resist wind-induced overturning, uplift and sliding and to provide continuous load paths for these forces to the foundation.

### International Building Code®/2000/2003

#### 1604.4 Analysis...

Any system or method of construction to be used shall be based on a rational analysis in accordance with well-established principles of mechanics. Such analysis shall result in a system that provides a **complete load path** capable of transferring loads from their point of origin to the load-resisting elements.