

# Titen HD® Anchors for Mudsill Applications



**Use the Titen HD anchor instead of cast-in-place anchor bolts and save as much as 30%.**

## Drill, Drive, Done!

Installing the Titen HD® anchor after the pour allows you to install the anchor one time, in the right location and move on. It eliminates complications before the pour and afterward, resulting in less time and money spent anchoring the mudsill.

### INSTALL THE TITEN HD AFTER THE MUDSILL IS DOWN:

- ▶ Avoid costly repairs for misplaced bolts
- ▶ No time consuming layout before the pour
- ▶ Easier finishing and better slabs
- ▶ No installation and removal of interior forms
- ▶ No need to adjust bolts after the pour

Anchor bolts may be less expensive to buy, but with all the labor and expense associated with installation and repairs, the Titen HD anchor saves money when looking at total installation cost.

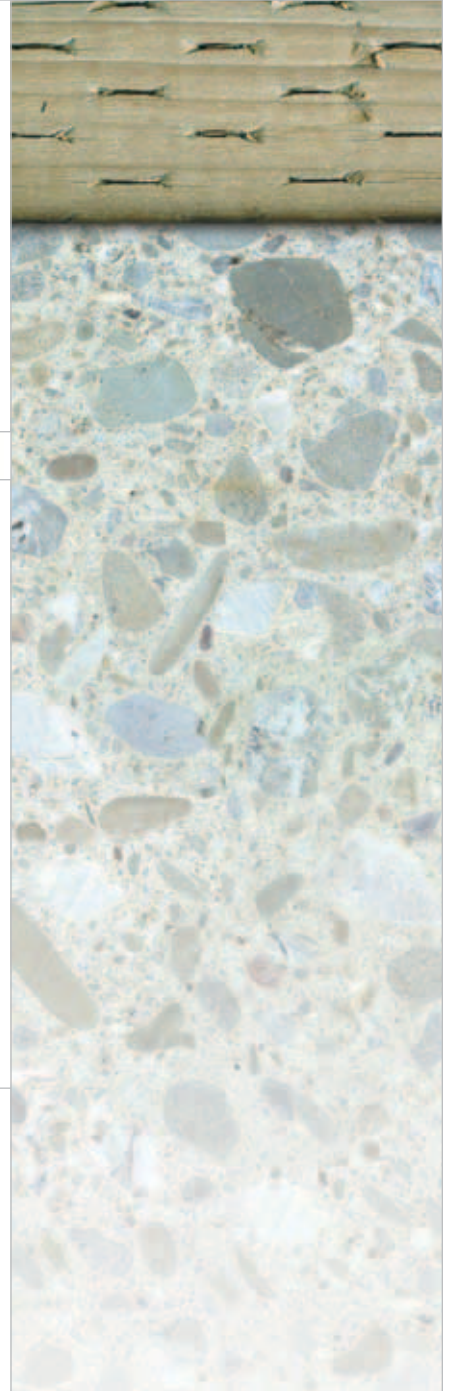
Code listed under the 2006 and 2009 IBC for cracked and uncracked concrete (ICC-ES ESR-2713).

### TITEN HD: THE ONE THAT CUTS®

The threads on the Titen HD anchor hold the key to its performance. As the anchor is driven into the hole, the hardened cutting threads undercut the base material. The result is a continuous mechanical interlock between the anchor and base material that provides superior load resistance. The Titen HD anchor is available in zinc plated and galvanized finishes.

### PERFORMANCE CLOSE TO THE EDGE

Because the Titen HD anchor gets its holding power from cutting into the sides of the concrete hole, there are no expansion forces. This allows the anchor to perform very well at smaller edge distances where other post-installed anchors may not work.



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

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## Installed Cost Research: TITEN HD® Anchors vs. cast-in-place bolts

**Casting bolts in the concrete slab creates more work, extra cost and creates opportunities for mistakes.**

Research was done to quantify the cost of casting bolts in place on an average slab-on-grade production home. Concrete crews were observed installing cast-in-place bolts on forms prior to the concrete pour as well as performing the tasks during and after the pour associated with cast-in-place bolts. These included:

- 1 Measuring and laying out the bolts on the forms
- 2 Installing additional forms in the interior of the slab from which to hang bolts
- 3 Installing anchor bolts on the forms using anchor bolt holders
- 4 Stripping of anchor bolt holders and finishing around the anchors
- 5 Wet-setting bolts and adjusting bolts that moved during the pour
- 6 Removing interior forms immediately after the pour and re-finishing these areas

Taking into account the number of installers working on bolts at any given time, the time necessary to install all the bolts and the prevailing hourly wage (\$55.00/hour), labor cost per bolt was \$2.14. The cost of installing retrofit anchors to make up for any misplaced bolts breaks down to another \$0.20 per bolt. **Therefore, the total labor cost for each cast-in-place anchor was \$2.34.**



Setting interior forms requires precise placement and extra labor.



Hanging bolts on forms before the pour takes time and creates an opportunity for error.



Eliminating bolts results in a slab that is flatter and easier to finish.



Removing interior forms, adjusting anchors and refinishing slows down the pour.



### Misplaced Bolts: Costly Mistakes

On average, 20% of cast-in-place bolts are misplaced, requiring that a post-installed anchor be installed in their place. If added onto the labor cost of each cast-in-place bolt (for comparison purposes) the labor cost for retrofitted anchors\* breaks down to an additional \$0.20 per bolt.

\*Labor cost for Titen HD anchor installation was used in this analysis. There is no post-installed anchor on the market that installs faster.

## Installed Cost Research: TITEN HD® Anchors vs. cast-in-place bolts

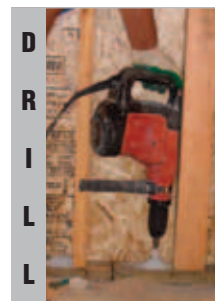
**Install the Titen HD anchor after the mudsill is down and save as much as 30%.**

Observation was also done of crews that installed the Titen HD anchor after the walls were framed instead of casting bolts into the concrete. The installation steps included:

- 1 Locating bolt placement within the walls
- 2 Drilling the hole through the mudsill and into the concrete using a rotohammer
- 3 Blowing the hole out with compressed air
- 4 Installing the Titen HD anchor using a corded, electric impact wrench

Taking into account the team of two installers working continuously, the time required for installation and the prevailing wage (\$55.00/hour), **the labor cost per Titen HD anchor was \$0.98 per bolt.**

**The Titen HD anchor is a high quality, heat-treated anchor that naturally costs more than a typical anchor bolt. However even with the added material cost, the Titen HD anchor still yields an overall installed cost savings of 30% when compared with cast-in-place bolts.**



**As a mudsill anchor the Titen HD anchor provides the most benefit to the concrete contractor, but it also allows the framer to eliminate these time consuming steps:**

- 1 Pre-drilling of sill plates to accommodate cast-in-place bolts
- 2 Notching studs due to bolt interference
- 3 Installing nuts and washers on the bolts
- 4 Cleaning hardened concrete from bolt threads to get nuts and washers on



### Titen HD® Anchors: As a Direct 1-to-1 Replacement for 1/2" Diameter Mudsill Bolts

Titen HD Size in.	Titen HD Model No.	Sill Plate Size in.	Minimum Edge Distance in.	Minimum End Distance in.
1/2 x 6	THD50600H <sup>2</sup>	Single 2x	1 1/4	6
1/2 x 8	THD50800H <sup>2</sup>	Double 2x or single 3x	1 1/4	6

1. Minimum concrete strength 2500 psi.
2. Mechanically Galvanized (MG) may be required by code when used with treated wood. For additional information, visit [www.strongtie.com](http://www.strongtie.com).
3. Minimum edge and end distances are based on distance from edge of concrete to center of bolt.
4. Use bearing plate as required by code (see BP/LBT section in Simpson Strong-Tie® Wood Construction Connectors catalog).

### Longer Titen HD anchors now available for Holdown applications

1/2" Titen HD anchors are available in 12", 13", 14" and 15" lengths to provide loads sufficient for use with some Simpson Strong-Tie® holdowns. Whether retrofitting a misplaced bolt or avoiding a cast-in-place bolt altogether, the Titen HD anchor offers a quick and easy solution. See the Simpson Strong-Tie® Wood Construction Connectors catalog or flier F-SAS-THD4HD.



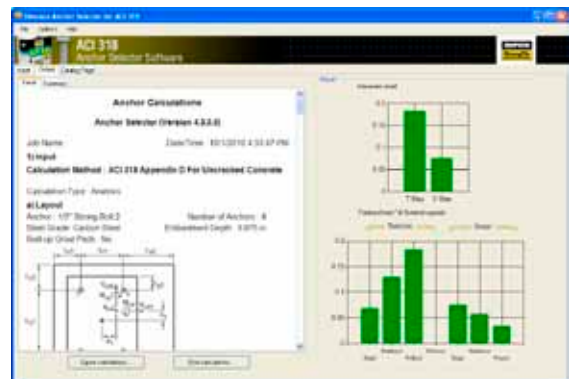
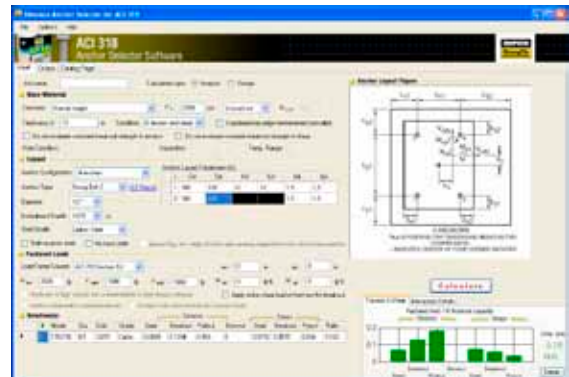
## Anchor Selector™ Software ACI 318

Anchor Selector Software for ACI 318 analyzes and offers anchor solutions using the ACI 318, Appendix D strength design methodology (or CAN/CSA A23.3 Annex D limit states design methodology). It provides cracked- and uncracked-concrete anchor solutions for many Simpson Strong-Tie Anchor Systems® mechanical and adhesive anchors.

With its easy-to-use graphical interface, Anchor Selector Software for ACI 318 eliminates the need for tedious calculations by hand that would otherwise be necessary to determine cracked concrete anchor solutions.

### Features/Benefits

- Free download
- Quick and accurate analysis or design of anchor solutions results in increased productivity by eliminating the need to conduct time consuming calculations
- Graphical User Interface is intuitive and easy to use
- Includes prequalified post-installed mechanical and adhesive anchor solutions for cracked and/or uncracked concrete
- Includes a variety of concrete base material configurations
  - Normal weight concrete
  - Lightweight concrete
  - Normal weight concrete over metal deck
  - Sand-lightweight concrete over metal deck
- Includes cast-in-place anchor solutions
- Single and multiple anchor layouts provide solutions for multiple design applications
- Determines proper anchor solutions in situations where tension and shear forces will be acting simultaneously
- Capability to save input and results allows the designer to save data for later use. Additionally, input files can be easily modified to create new analysis/ design cases.
- Ability to save and print detailed calculations allows for verification of results
- Capability to resolve bi-axial bending moments imposed from attached member into anchor forces
- Auto update feature allows notification and download of the latest version of the software as updates become available



To download this free software, go to [www.simpsonanchors.com/software/as-aci318](http://www.simpsonanchors.com/software/as-aci318).

*This flier is effective until January 31, 2013, and reflects information available as of January 1, 2012. This information is updated periodically and should not be relied upon after January 31, 2013; contact Simpson Strong-Tie for current information and limited warranty or see [www.strongtie.com](http://www.strongtie.com).*