Simpson Strong-Tie Company Inc.
5956 West Las Positas Boulevard
Pleasanton, California 94588
(800) 925-5099
www.strongtie.com

STAINLESS STEEL TITEN HD® SCREW ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE

CSI Division:

03 00 00—CONCRETE
05 00 00—METALS

CSI Section:

03 16 00—Concrete Anchors
05 05 19—Post-installed Concrete Anchors

1.0 SCOPE OF EVALUATION

1.1 Compliance to the following codes & regulations:

- 2018, 2015, 2012, 2009 and 2006 International Building Code® (IBC)
- 2018, 2015, 2012, 2009 and 2006 International Residential Code® (IRC)
- 2020 City of Los Angeles Building Code (LABC) – attached supplement
- 2020 City of Los Angeles Residential Code (LARC) – attached supplement
- 2020 and 2017 Florida Building Code, Building (FBC–Building) – attached supplement
- 2020 and 2017 Florida Building Code, Residential (FBC–Residential) – attached supplement

1.2 Evaluated in accordance with:

- ICC-ES Acceptance Criteria for Mechanical Anchors in Concrete Elements (AC193)

1.3 Property assessed:

- Structural

2.0 PRODUCT USE

Simpson Strong-Tie® Stainless Steel Titen HD® Screw Anchors are used to resist static, seismic and wind tension and shear loads in cracked and uncracked normal-weight and lightweight concrete members having a specified compressive strength, f'_c, of 2,500 psi to 8,500 psi (17.2 MPa to 58.6 MPa).

The $^1/_4$-inch (6.4 mm), $^3/_8$-inch-diameter (9.5 mm) and $^1/_2$-inch-diameter (12.7 mm) anchors may be installed in the topside of cracked and uncracked normal-weight or sand-lightweight concrete-filled steel deck having a minimum member thickness, $h_{min,deck}$, as noted in Table 4 of this report and a specified compressive strength, f'_c, of 2,500 psi to 8,500 psi (17.2 MPa to 58.6 MPa).

The anchoring system is an alternative to anchors described in Section 1901.3 of the 2018 and 2015 IBC, Sections 1908 and 1909 of the 2012 IBC, and Sections 1911 and 1912 of the 2009 and 2006 IBC. The anchors may also be used where an engineered design is submitted in accordance with Section R301.1.3 of the 2018, 2015, 2012, 2009 and 2006 IRC.

3.0 PRODUCT DESCRIPTION

3.1 Stainless Steel Titen HD® Screw Anchors: The Stainless Steel Titen HD® Screw Anchors are stainless steel threaded anchors with a hex-washer or a countersunk head. The Stainless Steel Titen HD® Screw Anchors are manufactured from AISI Type 316 or Type 304 stainless steel material and have a leading hardened carbon steel helical-coil cutting thread. The leading hardened carbon steel helical-coil cutting thread is made of carbon steel complying with the manufacturer's quality documentation. The Type 316 Stainless Steel Titen HD® Screw Anchors are available with nominally ¼-inch, ⅜ -inch, ½ -inch, ⅝-inch and ¾-inch shank diameters with a hex-washer head and ¼-inch, ⅜ -inch shank diameters with a countersunk head, and various lengths in each diameter. The Type 304 Stainless Steel Titen HD® Screw Anchors are available with nominally ⅜-inch, ½-inch, ⅝-inch and ¾-inch shank diameters with a hex-washer head, and various lengths in each diameter. Figure 1 of this report illustrates two typical Stainless Steel Titen HD® Screw Anchors with a hex-washer and a countersunk head.

3.2 Concrete: Normal-weight and lightweight concrete shall comply with Sections 1901 and 1903 of the 2018, 2015 and 2012 IBC or Sections 1903 and 1905 of the 2009 and 2006 IBC. The specified compressive strength of the concrete, f'_c, shall be from 2,500 psi to 8,500 psi (17.2 MPA to 58.6 MPa).

3.3 Profile Steel Deck: The profile steel deck shall comply with the configuration in Figure 3 of this report and have a minimum base steel thickness of 0.035 inch (0.89 mm). Steel deck in Figure 3 of this report shall comply with ASTM A653/A653M SS Grade 50 and have a minimum yield strength of 50 ksi (345 MPA).

4.0 DESIGN AND INSTALLATION

4.1 Strength Design

4.1.1 General: The design strength of anchors under the 2018 and 2015 IBC and Section R301.1.3 of the 2018 and 2015 IRC shall be determined in accordance with ACI 318-14 as amended in IBC Section 1905 and this report. The design strength of anchors under the 2012, 2009 and 2006 IBC and Section R301.1.3 of the 2012, 2009 and 2006 IRC shall be determined in accordance with ACI 318-11 Appendix D and this report.

Design parameters provided in Tables 1 through 4 and in Figures 2 and 3 of this report are based on ACI 318-14 for use with the 2018 and 2015 IBC and ACI 318-11 for use with the 2012, 2009 and 2006 IBC unless noted otherwise in Sections 4.1.1 through 4.1.12 of this report.

The strength design of anchors shall conform to the requirements of ACI 318-14 Section 17.3.1 except as required for earthquake loading in ACI 318-14 Section 17.2.3; or ACI 318-11 Section D.4.1, except as required for earthquake loading in ACI 318-11 Section D.3.3.

Strength reduction factors, ϕ, described in ACI 318-14 Section 17.3.3 or ACI 318-11 Section D.4.3, and noted in Tables 2 and 3 of this report, shall be used for load combinations calculated in accordance with Section 1605.2 of the 2018, 2015, 2012, 2009 or 2006 IBC, ACI 318-14 Section 5.3, and ACI 318-11 Section 9.2, as applicable. Strength reduction factors, ϕ, described in ACI 318-11 Section D.4.4 shall be used for load combinations calculated in accordance with Appendix C of ACI 318-11. The value of f'_c used in the calculations shall be limited to a maximum of 8,000 psi (55.2 MPa), in accordance with ACI 318-14 17.2.7 or ACI 318-11 D.3.7, as applicable. Construction documents shall include information specified in ACI 318-14 Sections 17.7.7 and 26.7, or ACI 318-11 Sections 1.2 and D.8.7.

4.1.2 Requirements for Static Steel Strength in Tension: The nominal steel strength of a single anchor in tension, N_{sa}, calculated in accordance with ACI 318-14 Section 17.4.1.2 or ACI 318-11 Section D.5.1.2 is given in Table 2 of this report. The strength reduction factors, ϕ, corresponding to a ductile steel element in accordance with ACI 318-14 Section 17.3.3 or ACI 318-11 Section D.4.3 are provided in Table 2 of this report for each anchor size referenced in this report.

4.1.3 Requirements for Static Concrete Breakout Strength in Tension: The nominal static concrete breakout strength of a single screw anchor or group of screw anchors in tension, N_{cb} or N_{cbg}, shall be calculated in accordance with ACI 318-14 Section 17.4.2 or ACI 318-11 Section D.5.2, as applicable, with modifications as described in this section. The nominal concrete breakout strength in tension in regions of the concrete where analysis indicates no cracking at service load levels or due to effects of restrained shrinkage in accordance with ACI 318-14 Section 17.4.2.6 or ACI 318-11 Section D.5.2.6, shall be calculated using k_{uncr} given in Table 2 of this report and where $\Psi_{c,N} = 1.0$. The basic concrete breakout strength of a single screw anchor in tension in cracked concrete, N_b, shall be calculated in accordance with ACI 318-14 17.4.2.2 or ACI 318-11 D.5.2.2, as applicable, using the values of h_{ef} and k_{cr} as given in Table 2 of this report. The strength reduction factors, ϕ, corresponding to concrete breakout and anchor category in accordance with ACI 318-14 Section 17.3.3 or ACI 318-11 Section D.4.3 are provided in Table 2 of this report for each anchor size referenced in this report.

4.1.4 Requirements for Static Pullout Strength in Tension: The nominal pullout strength of a single anchor in tension in accordance with ACI 318-14 Sections 17.4.3.1 and 17.4.3.2 or ACI 318-11 Sections D.5.3.1 and D.5.3.2 in cracked and uncracked concrete, $N_{p,cr}$ and $N_{p,uncr}$, respectively is given in Table 2 of this report and shall be used in lieu of N_p. In regions of a concrete member where analysis indicates no cracking at service level loads or due to effects of restrained shrinkage in accordance with ACI 318-14 Section 17.4.3.6 or ACI 318-11 Section D.5.3.6, as applicable, the nominal pullout strength in uncracked concrete, $N_{p,uncr}$, applies. Where values for $N_{p,cr}$ or $N_{p,uncr}$ are not provided in Table 2 of this report, the pullout strength does not need to be considered in the design. For all design cases, $\Psi_{c,p}$ =1.0. The strength reduction factors, ϕ, corresponding to pullout and anchor category in accordance with ACI 318-14 Section 17.3.3 or ACI 318-11 Section D.4.3 are provided in Table 2 of this report for each anchor size referenced in this report.

4.1.5 Requirements for Static Steel Strength in Shear: The nominal static steel strength of a single screw anchor in shear as governed by the steel, V_{sa}, complying with ACI 318-14 Sections 17.5.1.2 or ACI 318-11 Section D.6.1.2 respectively, is given in Table 3 of this report and shall be used in lieu of the values derived by calculation from ACI 318-14 Eq. 17.5.1.2a or ACI 318-11 Eq. D-29, as applicable. The strength reduction factor, ϕ, corresponding to a ductile steel element shall be used for all anchors, as described in Table 3 of this report. The strength reduction factors, ϕ, corresponding to a ductile steel element in accordance with ACI 318-14 Section 17.3.3 or ACI 318-11 Section D.4.3 are provided in Table 3 of this report for each anchor size referenced in this report.

4.1.6 Requirements for Static Concrete Breakout Strength in Shear: The nominal static concrete breakout strength of a single screw anchor or group of screw anchors in shear, V_{cb} or V_{cbg}, shall be calculated in accordance with ACI 318-14 Section 17.5.2 or ACI 318-11 Section D.6.2, with modifications as described in this section. The basic concrete breakout strength of a single screw anchor in shear in cracked concrete, V_b, shall be calculated in accordance with ACI 318-14 Section 17.5.2.2 or ACI 318-11 Section D.6.2.2 using the values of l_e and d_a given in Table 3 of this report. The modification factors in ACI 318-14 17.5.2.4, 17.5.2.5, 17.5.2.6 and 17.5.2.7 and ACI 318-11 D.6.2.4, D.6.2.5, D.6.2.6 and D.6.2.7 shall be applied to the basic breakout strength in shear, V_b, as applicable. The strength reduction factors, ϕ, corresponding to concrete breakout and anchor category in accordance with ACI 318-14 Section 17.3.3 or ACI 318-11 Section D.4.3 are provided in Table 3 of this report for each anchor size referenced in this report.

For anchors installed in the topside of concrete-filled steel deck assemblies, as shown in Figures 3 of this report, the nominal concrete breakout strength of a single anchor or group of anchors in shear, V_{cb} or V_{cbg}, respectively, shall be calculated in accordance with ACI 318-14 17.5.2 or ACI

318-11 D.6.2, as applicable, using the actual member thickness, $h_{min,\,deck,}$ in the determination of A_{vc}. The minimum topping thickness for anchors in the topside of concrete-filled steel deck assemblies is given in Table 4 of this report.

4.1.7 Requirements for Static Concrete Pryout Strength in Shear: The nominal static pryout strength of a single screw anchor or group of screw anchors in shear, V_{cp} or V_{cpg}, shall be calculated in accordance with ACI 318-14 Section 17.5.3 or ACI 318-11 Section D.6.3, using the value of the coefficient of pryout strength, k_{cp}, provided in Table 3 of this report, and the value of nominal breakout strength in tension of a single screw anchor or a group of screw anchors N_{cb} or N_{cbg}, as calculated in Section 4.1.3 of this report. The strength reduction factors, ϕ, corresponding to pryout and anchor category in accordance with ACI 318-14 Section 17.3.3 or ACI 318-11 Section D.4.3 are provided in Table 3 of this report for each anchor size referenced in this report.

4.1.8 Requirements for Seismic Design in Seismic Design Categories C, D, E and F

4.1.8.1 General: When the screw anchor design includes seismic loads, the design shall be performed in accordance with ACI 318-14 17.2.3 or ACI 318-11 D.3.3, as applicable. Modifications to ACI 318-14 17.2.3 shall be applied under Section 1905.1.8 of the 2018 and 2015 IBC. Under the 2012, 2009, and 2006 IBC and IRC, Section 1905.1.9 of the 2012 IBC and IRC shall be replaced with the following:

Modify ACI 318-11 Sections D.3.3.4.2, D.3.3.4.3 (d), and D.3.3.5.2 to read as follows:

D.3.3.4.2 - Where the tensile component of the strength-level earthquake force applied to anchors exceeds 20 percent of the total factored anchor tensile force associated with the same load combination, anchors and their attachments shall be designed in accordance with D.3.3.4.3. The anchor design tensile strength shall be determined in accordance with D.3.3.4.4.

Exception:
Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 shall be deemed to satisfy Section D.3.3.4.3 (d).

D.3.3.4.3 (d) – The anchor or group of anchors shall be designed for the maximum tension obtained from design load combinations that include E, with E increased by Ω_o. The anchor design tensile strength shall be calculated from D.3.3.4.4.

D.3.3.5.2 – Where the shear component of the strength-level earthquake force applied to anchors exceeds 20 percent of the total factored anchor shear force associated with the same load combination, anchors and their attachments shall be designed in accordance with D.3.3.5.3. The anchor design shear strength for resisting earthquake forces shall be determined in accordance with D.6.

Exceptions:

1. For the calculation of the in-plane shear strength of anchor bolts attaching wood sill plates of bearing or non-bearing walls of light-frame wood structures to foundations or foundation stem walls, the in-plane shear strength in accordance with D.6.2 and D.6.3 need not be computed and D3.3.5.3 need not apply provided all of the following are satisfied:

1.1. The allowable in-plane shear strength of the anchor is determined in accordance with ANSI/AWC NDS Table 11E for lateral design values parallel to grain.

1.2. The maximum anchor nominal diameter is $^5/_8$ inch (16 mm).

1.3. Anchor bolts are embedded into concrete a minimum of 7 inches (178 mm).

1.4. Anchor bolts are located a minimum of 1-$^3/_4$ inches (45 mm) from the edge of the concrete parallel to the length of the wood sill plate.

1.5. Anchor bolts are located a minimum of 15 anchor diameters from the edge of the concrete perpendicular to the length of the wood sill plate.

1.6. The sill plate is 2-inch or 3-inch nominal thickness.

2. For the calculation of the in-plane shear strength of anchor bolts attaching cold-formed steel track of bearing or non-bearing walls of light-frame construction to foundations or foundation stem walls, the in-plane shear strength in accordance with D.6.2 and D.6.3 need not be computed and D3.3.5.3 need not apply provided all of the following are satisfied:

2.1. The maximum anchor nominal diameter is $^5/_8$ inch (16 mm).

2.2. Anchors are embedded into concrete a minimum of 7 inches (178 mm).

2.3. Anchors are located a minimum of 1$^3/_4$ inches (45 mm) from the edge of the concrete parallel to the length of the track.

2.4. Anchors are located a minimum of 15 anchor diameters from the edge of the concrete perpendicular to the length of the track.

2.5. The track is 33 to 68 mil designation thickness.

Allowable in-plane shear strength of exempt anchors, parallel to the edge of concrete shall be permitted to be determined in accordance with AISI S100-16 w/S1-18 Section J3.3.1 or AISI S100-12 Section E3.3.1.

3. In light-frame construction, bearing or nonbearing walls, shear strength of concrete anchors less than or equal to 1 inch [25 mm] in diameter attaching a sill plate or track to foundation or foundation stem wall need not satisfy D.3.3.5.3(a) through (c) when the design strength of the anchors is determined in accordance with D.6.2.1(c).

Except for use in Seismic Design Category A or B of the IBC, design strengths shall be determined presuming the concrete is cracked unless analysis demonstrates that the concrete remains uncracked at service load levels.

The nominal steel strength and the nominal concrete breakout strength of anchors in tension and the nominal concrete breakout strength and pryout strength of anchors in shear, shall be calculated according to ACI 318-14 17.4 and 17.5 and ACI 318-11 D.5 and D.6, as applicable, respectively, considering the corresponding values in Table 1 through 4 of this report.

The screw anchors comply with ACI 318-14 2.3 or ACI 318-11 D.1, as applicable, as ductile steel elements and shall be designed in accordance with ACI 318-14 Section 17.2.3.4, 17.2.3.5, or 17.2.3.6 or ACI 318-11 Section D.3.3.4, D.3.3.5 or D.3.3.6 or ACI 318-08 Section D.3.3.4, D.3.3.5 or D.3.3.6 or ACI 318-05 Section D.3.3.4 or D.3.3.5 as applicable, with the modifications noted in this report.

4.1.8.2 Seismic Tension: The nominal steel strength and concrete breakout strength in tension shall be determined in accordance with ACI 318-14 17.4.1 and 17.4.2 or ACI 318-11 D.5.1 and D.5.2, as applicable, as described in Section 4.1.2 and 4.1.3 of this report, in accordance with ACI 318-14 17.4.3.2 or ACI 318-11 D.5.3.2, as applicable, the appropriate value for nominal pullout strength in tension for seismic loads, $N_{p,eq}$ described in Table 2 of this report, shall be used in lieu of N_p.

4.1.8.3 Seismic Shear: The nominal concrete breakout and concrete pryout strength in shear shall be determined in accordance with ACI 318-14 17.5.2 and 17.5.3 or ACI 318-11 D.6.2 and D.6.3, as applicable, as described in Sections 4.1.6 and 4.1.7 or this report. In accordance with ACI 318-14 17.5.1.2 or ACI 318-11 D.6.1.2, as applicable the appropriate value for nominal steel strength in shear for seismic loads, $V_{sa,eq}$, described in Table 3 of this report, shall be used in lieu of V_{sa}.

4.1.9 Interaction of Tensile and Shear Forces: For screw anchors and groups of screw anchors that are subject to combined tension and shear, the interaction of tension and shear loads shall be designed in accordance with ACI 318-14 Section 17.6 or ACI 318-11 Section D.7.

4.1.10 Requirements for Minimum Member Thickness h_{min}, Minimum Anchor Spacing, s_{min}, and Minimum Edge Distance, c_{min}: In lieu of ACI 318-14 Sections 17.7.1 and 17.7.3 or ACI 318-11 Sections D.8.1 and D.8.3, values of c_{min} and s_{min} provided in Tables 1 and 4 of this report shall be used. In lieu of ACI 318-14 Section 17.7.5 or ACI 318-11 Section D.8.5, the minimum member thicknesses, h_{min}, shall be in accordance with Table 1 of this report.

4.1.11 Requirements for Critical Edge Distance, c_{ac}: In applications where $c<c_{ac}$ and supplemental reinforcement to control splitting of the concrete is not present, the concrete breakout strength in tension for uncracked concrete, calculated in accordance with ACI 318-14 Section 17.4.2 or ACI 318-11 Section D.5.2 shall be further multiplied by the factor $\Psi_{cp,N}$ in Eq-1 as follows:

$$\Psi_{cp\,N} = c/c_{ac} \qquad \text{(Eq-1)}$$

whereby the factor $\Psi_{cp,N}$ need not be taken as less than $1.5h_{ef}/c_{ac}$. For all other cases, $\Psi_{cp,N}= 1.0$. In lieu of ACI 318-14 Section 17.7.6 or ACI 318-11 Section D.8.6, the values for critical edge distance, c_{ac}, shall be taken from Tables 1 and 4 of this report.

4.1.12 Lightweight Concrete: For the use of anchors in lightweight concrete the modification factor λ_a equal to 0.8λ is applied to all values of affecting N_n and V_n.

For ACI 318-14 (2018 and 2015 IBC), ACI 318-11 (2012 IBC) and ACI 318-08 (2009 IBC), λ shall be determined in accordance with the corresponding version of ACI 318.

For ACI 318-05 (2006 IBC), λ shall be taken as 0.75 for all lightweight concrete and 0.85 for sand-lightweight concrete. Linear interpolation shall be permitted if partial sand replacement is used. In addition, the pullout strengths $N_{p,cr}$, $N_{p,uncr}$, and N_{eq} shall be multiplied by the modification factor, λ_a, as applicable.

4.2 Allowable Stress Design (ASD)

4.2.1 General: For anchors designed using load combinations in accordance with IBC Section 1605.3, allowable loads shall be established using Eq. (2) or Eq. (3), as follows:

$$T_{allowable,\,ASD} = \phi N_n/\alpha \qquad \text{Eq. (2)}$$

$$V_{allowable,\,ASD} = \phi V_n/\alpha \qquad \text{Eq. (3)}$$

Where:

$T_{allowable,\,ASD}$ = Allowable tension load (lbf or kN)
$V_{allowable,\,ASD}$ = Allowable shear load (lbf or kN)
ϕN_n = The lowest design strength of an anchor or anchor group in tension as determined in accordance with ACI 318-14 Chapter 17 or ACI

318-11 Appendix D as amended in Section 4.1 of this report.

ϕV_n = The lowest design strength of an anchor or group in shear as determined in accordance with ACI 318-14 Chapter 17 or ACI 318-11 Appendix D as amended in Section 4.1 of this report.

α = Conversion factor calculated as a weighted average of the load factors for the controlling load combination. In addition, α shall include all applicable factors to account for non-ductile failure modes and required over-strength.

The requirement for member thickness, edge distance and spacing, described in Tables 1 and 4 of this report, shall apply.

4.2.2 Interaction of Tensile and Shear Forces: In lieu of ACI 318-14 Sections 17.6.1, 17.6.2 and 17.6.3 or ACI 318-11 Sections D.7.1, D.7.2 and D.7.3, interaction of tension and shear loads shall be calculated as follows:

17.6.1 (D.7.1): If $V_{applied} \leq 0.2\ V_{allowable,\ ASD}$ for the governing strength in shear, then the full allowable strength in tension, $T_{allowable,\ ASD}$, shall be permitted.

17.6.2 (D.7.2): If $T_{applied} \leq 0.2\ T_{allowable,\ ASD}$ for the governing strength in tension, then the full allowable strength in shear, $V_{allowable,\ ASD}$, shall be permitted.

17.6.3 (D.7.3): If $V_{applied} > 0.2\ V_{allowable,\ ASD}$ for the governing strength in shear and $T_{applied} > 0.2\ T_{allowable,\ ASD}$ for the governing strength in tension, then:

$$T_{applied}/\ T_{allowable,\ ASD} + V_{applied}/\ V_{allowable,\ ASD} \leq 1.2 \quad \text{Eq. (4)}$$

4.3 Installation: Installation parameters are provided in Tables 1 and 4 and Figures 2 and 3 of this report. The Stainless Steel Titen HD® Screw Anchors shall be installed in accordance with the manufacturer's published installation instructions and this report. Screw anchor locations shall comply with this report and the plans and specifications approved by the building official. Screw anchors shall be installed in holes drilled using carbide-tipped drill bits conforming to ANSI B212.15-1994. For the ¼-inch (6.4 mm) Stainless Steel Titen HD® Screw Anchors, the hole is drilled to the specified nominal embedment depth plus $^1/_8$ inch (3.2 mm).For the ⅜-inch-diameter (9.5 mm) Stainless Steel Titen HD® Screw Anchors, the hole is drilled to the specified nominal embedment depth plus ¼ inch (6.4 mm). For the ½-inch-diameter (12.7 mm), ⅝-inch-diameter (15.9 mm), and ¾-inch-diameter (19.1mm) Stainless Steel Titen HD® Screw Anchors, the hole is drilled to the specified nominal embedment depth plus ½ inch (12.7 mm). Dust and debris in the hole shall be removed by using oil-free compressed air or a vacuum. The screw anchor shall be installed into the predrilled hole to the specified embedment depth using a socket wrench or powered impact wrench. The maximum installation torque and maximum impact wrench torque rating requirements for the Stainless Steel Titen HD® Screw Anchors are detailed in Table 1 of this report. Stainless Steel Titen HD® Screw Anchors may be loosened by a maximum one turn and reinstalled with a socket wrench or powered impact wrench to facilitate fixture attachment or realignment.

For anchors installed in the topside of normal-weight or sand-lightweight concrete over profile steel deck floor and roof assemblies, installation parameters are provided in Table 4 and Figure 3 of this report.

4.4 Special Inspection: Special inspection is required in accordance with 2018, 2015 and 2012 IBC Sections 1705.1 and 1705.3, 2009 IBC Sections 1704.4 and 1704.15 or 2006 IBC Sections 1704.4 and 1704.13 and this report. The special inspector shall make periodic inspections during anchor installation to verify anchor type, anchor dimensions, concrete type and compressive strength, hole dimensions, hole cleaning procedures, drill bit size, anchor spacing, edge distances, concrete thickness, anchor embedment and adherence to the manufacturer's published installation instructions. The special inspector shall be present as often as required in accordance with the "statement of special inspection."

Under the IBC, additional requirements as set forth in Sections 1705, 1706 and 1707 shall be observed, where applicable.

5.0 LIMITATIONS

The Simpson Strong-Tie® Stainless Steel Titen HD® Screw Anchors described in this report are suitable alternatives to what is specified in the codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Stainless Steel Titen HD® Screw Anchors shall be installed in accordance with the manufacturer's published installation instructions and this report. Where conflicts between this report and the published instructions occur, the more restrictive shall prevail.

5.2 Screw anchor sizes, dimensions and minimum embedment depths are as set forth in this report.

5.3 The screw anchors shall be installed in accordance with Section 4.3 of this report in cracked and uncracked normal-weight concrete and lightweight concrete having a specified compressive strength of f'_c = 2,500 psi to 8,500 psi (17.2 MPA to 58.6 MPa).

5.4 The ¼-inch-diameter (6.4 mm), ⅜-inch-diameter (9.5 mm), and ½-inch diameter (12.7 mm) anchors may be installed in the topside of cracked and uncracked normal-weight or sand-lightweight concrete-filled steel deck having a specified compressive strength, f'_c of 2,500 psi to 8,500 psi (17.2 MPa to 58.6 MPa).

5.5 The values of f'_c used for calculation purposes shall not exceed 8,000 psi (55.1 MPa).

5.6 Strength design values shall be established in accordance with Section 4.1 of this report.

5.7 Allowable stress design values shall be established in accordance with Section 4.2 of this report.

5.8 Minimum anchor spacing, minimum edge distance, minimum member thickness, critical spacing, and minimum critical edge distance shall comply with the values described in Tables 1 and 4, and Figure 3 of this report.

5.9 Prior to installation, calculations and details demonstrating compliance with this report shall be submitted to the building official. The calculations and details shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.10 Since an evaluation criterion for evaluating data to determine the performance of anchors subjected to fatigue or shock loading is unavailable at this time, the use of these anchors under such conditions is beyond the scope of this report.

5.11 Screw anchors may be installed in regions of concrete where cracking has occurred or where analysis indicates cracking may occur ($f_t > f_r$), subject to the conditions of this report.

5.12 Screw anchors may be used to resist short-term loads due to wind and to seismic load combinations subject to the conditions of this report.

5.13 Screw anchors shall not be used to support fire-resistive construction. Where not otherwise prohibited in the IBC or IRC, Stainless Steel Titen HD® Screw Anchors are permitted for installation in fire-resistive construction provided at least one of the following conditions are met.

- Anchors are used to resist wind or seismic forces only.
- Anchors that support gravity load-bearing structural elements are within a fire-resistive envelope or a fire-resistive membrane, are protected by approved fire-resistive materials, or have been evaluated for resistance to fire exposure in accordance with recognized standards.
- Anchors are used to support nonstructural elements.

5.14 Use of stainless steel screw anchors is permitted for exterior exposure and damp locations.

5.15 Screw anchors have been evaluated for reliability against brittle failure and found to be not significantly sensitive to stress-induced hydrogen embrittlement.

5.16 Use of the screw anchors made of stainless steel as specified in this report is permitted for contact with code-complying preservative-treated and fire-retardant- treated wood.

5.17 Special inspection shall be provided in accordance with Section 4.4 of this report.

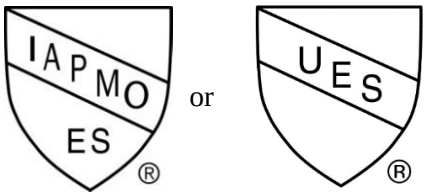
5.18 Stainless Steel Titen HD® Screw Anchors are manufactured under an approved quality control program.

6.0 SUBSTANTIATING DATA

Data in accordance with the ICC-ES Acceptance Criteria for Mechanical Anchors in Concrete Elements (AC193), approved October 2017. Test reports are from laboratories in compliance with ISO/IEC 17025.

7.0 IDENTIFICATION

Stainless Steel Titen HD® Screw Anchors are identified in the field by labels on the packaging, bearing the company name (Simpson Strong-Tie Company, Inc.), product name (Stainless Steel Titen HD®), the anchor diameter and length, catalog number, the IAPMO Uniform ES Mark of Conformity, and the evaluation report number (ER-493). In addition, the ≠ symbol and the anchor length (in inches) are stamped on the head of each screw anchor. Either Mark of Conformity may be used as follows:



IAPMO UES ER-493

Brian Gerber, P.E., S.E.
Vice President, Technical Operations
Uniform Evaluation Service

Richard Beck, PE, CBO, MCP
Vice President, Uniform Evaluation Service

GP Russ Chaney
CEO, The IAPMO Group

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org

TABLE 1

STAINLESS STEEL TITEN HD® SCREW ANCHOR INSTALLATION INFORMATION[1]

Characteristic	Symbol	Units	Nominal Anchor Diameter (inch)									
			1/4		3/8		1/2		5/8		3/4	
Installation Information												
Nominal Diameter	d_a (d_o)[4]	in.	1/4		3/8		½		5/8		3/4	
Drill Bit Diameter	d_{bit}	in.	1/4		3/8		½		5/8		3/4	
Minimum Baseplate Clearance Hole Diameter[2]	d_c	in.	3/8		1/2		5/8		3/4		7/8	
Maximum Installation Torque[3]	$T_{inst,max}$	ft-lbf	N/A		40		70		85		150	
Maximum Impact Wrench Torque Rating	$T_{impact,max}$	ft-lbf	125		150		345		345		380	
Minimum Hole Depth	h_{hole}	in.	$2^1/_4$	$3^1/_8$	$2^3/_4$	$3^1/_2$	$3^3/_4$	$4^1/_2$	$4^1/_2$	6	6	$6^3/_4$
Nominal Embedment Depth	h_{nom}	in.	$2^1/_8$	3	$2^1/_2$	$3^1/_4$	$3^1/_4$	4	4	$5^1/_2$	$5^1/_2$	$6^1/_4$
Effective Embedment Depth	h_{ef}	in.	1.27	2.01	1.40	2.04	1.86	2.50	2.31	3.59	3.49	4.13
Critical Edge Distance	c_{ac}	in.	3	3	$4^1/_2$	$5^1/_2$	6	$5^3/_4$	6	$6\ ^3/_8$	$6^3/_4$	$7\ ^3/_8$
Minimum Edge Distance	c_{min}	in.	$1^1/_2$	$1^1/_2$	$1^3/_4$	$1^3/_4$	$1^3/_4$	$2\ ^1/_4$	$1^3/_4$	$1^3/_4$	$1^3/_4$	$1^3/_4$
Minimum Spacing	s_{min}	in.	$1^1/_2$	$1^1/_2$	3	3	4	3	3	3	3	3
Minimum Concrete Thickness	h_{min}	in.	$3^1/_2$	$4^3/_8$	4	5	5	$6^1/_4$	6	$8^1/_2$	$8^3/_4$	10
Anchor Data												
Yield Strength	f_{ya}	psi	88,000		98,400		91,200		83,200		92,000	
Tensile Strength	f_{uta}	psi	110,000		123,000		114,000		104,000		115,000	
Minimum Tensile & Shear Stress Area	A_{se}[5]	in^2	0.0430		0.0990		0.1832		0.276		0.414	
Axial Stiffness in Service Load Range - Uncracked Concrete	β_{uncr}	lb/in.	139,300		807,700		269,085		111,040		102,035	
Axial Stiffness in Service Load Range - Cracked Concrete	β_{cr}	lb/in.	103,500		113,540		93,675		94,400		70,910	

For **SI:** 1 inch = 25.4 mm, 1 ft-lbf = 1.356 N-m, 1 psi = 6.89 kPa, 1 in^2 = 645 mm^2, 1 lb/in = 0.175 N/mm.

[1]The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable.

[2]The clearance shall comply with applicable code requirements for the connected element.

[3]$T_{inst,max}$ applies to installations using a calibrated torque wrench.

[4]For the 2006 IBC d_o replaces d_a

[5]$A_{se,N} = A_{se,V} = A_{se}$

TABLE 2
STAINLESS STEEL TITEN HD® SCREW ANCHOR CHARACTERISTIC TENSION STRENGTH DESIGN VALUES[1]

Characteristic	Symbol	Units	Nominal Anchor Diameter (inch)									
			1/4		3/8		1/2		5/8		3/4	
Anchor Category	1, 2 or 3	-	3		1							
Nominal Embedment Depth	h_{nom}	in.	$2^1/_8$	3	$2^1/_2$	$3^1/_4$	$3^1/_4$	4	4	$5^1/_2$	$5^1/_2$	$6^1/_4$
Steel Strength in Tension (ACI 318-14 17.4.1 or ACI 318-11 Section D.5.1)												
Tension Resistance of Steel	N_{sa}	lbf	4,730		12,177		20,885		28,723		47,606	
Strength Reduction Factor - Steel Failure[2]	ϕ_{sa}	-	0.75									
Concrete Breakout Strength in Tension (ACI 318-14 17.4.2 or ACI 318 Section D.5.2)												
Effective Embedment Depth	h_{ef}	in.	1.27	2.01	1.40	2.04	1.86	2.50	2.31	3.59	3.49	4.13
Critical Edge Distance	c_{ac}	in.	3	3	$4^1/_2$	$5^1/_2$	6	$5^3/_4$	6	$6^3/_8$	$6^3/_4$	$7^3/_8$
Effectiveness Factor - Uncracked Concrete	k_{uncr}	-	24	24	27	24	27	24	24	24	27	27
Effectiveness Factor - Cracked Concrete	k_{cr}	-	17	17	21	17	17	17	17	17	17	21
Modification factor	$\Psi_{c,N}$	-	1									
Strength Reduction Factor - Concrete Breakout Failure[3]	ϕ_{cb}	-	0.45		0.65							
Pullout Strength in Tension (ACI 318-14 17.4.3 or ACI 318-11 Section D.5.3)												
Pullout Resistance Uncracked Concrete (f'_c = 2,500 psi)	$N_{p,uncr}$	lbf	1,725[5]	3,550[8]	N/A[4]	N/A[4]	N/A[4]	N/A[4]	3,820[5]	9,080[7]	N/A[4]	N/A[4]
Pullout Resistance Cracked Concrete (f'_c = 2,500 psi)	$N_{p,cr}$	lbf	695[5]	1,225[5]	1,675[5]	2,415[5]	1,995[5]	N/A[4]	N/A[4]	N/A[4]	N/A[4]	N/A[4]
Strength Reduction Factor - Pullout Failure[6]	ϕ_p	-	0.45		0.65							
Tension Strength for Seismic Applications (ACI 318-14 17.2.3.3 or ACI 318-11 Section D.3.3.3)												
Nominal Pullout Strength for Seismic Loads (f'_c = 2,500 psi)	$N_{p,eq}$	lbf	695[5]	1,225[5]	1,675[5]	2,415[5]	1,995[5]	N/A[4]	N/A[4]	N/A[4]	N/A[4]	N/A[4]
Strength Reduction Factor for Pullout Failure[6]	ϕ_{eq}	-	0.45		0.65							

For **SI:** 1 inch = 25.4 mm, 1 ft-lbf = 1.356 N-m, 1 psi = 6.89 kPa, 1 in^2 = 645 mm^2, 1 lb/in = 0.175 N/mm.

[1]The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable.

[2]The tabulated value of ϕ_{sa} applies when the load combinations of Section 1605.2 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2 are used, as applicable. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ shall be determined in accordance with ACI 318 D.4.4(b), as applicable.

[3]The tabulated values of ϕ_{cb} applies when both the load combinations of Section 1605.2 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2, as applicable, are used and the requirements of ACI 318-11 D.4.3(c) for Condition B are met. Condition B applies where supplementary reinforcement is not provided in concrete. For installations where complying reinforcement is verified, the ϕ_{cb} factors described in ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c), as applicable, may be used for Condition A. If the load combinations of ACI 318 Appendix C are used, the appropriate value of ϕ shall be determined in accordance with ACI 318 D.4.4(c) for Condition B.

[4]As described in this report, N/A denotes that pullout resistance does not govern and does not need to be considered.

[5]The characteristic pullout resistance for greater compressive strengths may be increased by multiplying the tabular value by $(f'_c/2{,}500)^{0.5}$.

[6]The tabulated values of ϕ_p or ϕ_{eq} applies when both the load combinations of ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2, as applicable, are used and the requirements of ACI 318-11 D.4.3(c) for Condition B are met. Condition B applies where supplementary reinforcement is not provided in concrete. For installations where complying reinforcement is verified, the ϕ_p or ϕ_{eq} factors described in ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c), as applicable, may be used for Condition A. If the load combinations of ACI 318 Appendix C are used, the appropriate value of ϕ shall be determined in accordance with ACI 318 D.4.4(c) for Condition B.

[7]The characteristic pullout resistance for greater compressive strengths may be increased by multiplying the tabular value by $(f'_c/2{,}500)^{0.4}$.

[8]The characteristic pullout resistance for greater compressive strengths may be increased by multiplying the tabular value by $(f'_c/2{,}500)^{0.3}$.

TABLE 3
STAINLESS STEEL TITEN HD® SCREW ANCHOR CHARACTERISTIC SHEAR STRENGTH DESIGN VALUES[1]

Characteristic	Symbol	Units	Nominal Anchor Diameter (inch)									
			1/4		3/8		1/2		5/8		3/4	
Anchor Category	1, 2 or 3	-	3		1							
Nominal Embedment Depth	h_{nom}	in.	$2^1/_8$	3	$2^1/_2$	$3^1/_4$	$3^1/_4$	4	4	$5^1/_2$	$5^1/_2$	$6^1/_4$
Steel Strength in Shear (ACI 318-14 17.5.1 or ACI 318-11 Section D.6.1)												
Shear Resistance of Steel	V_{sa}	lbf	2,285		3,790	4,780	6,024	7,633	10,422	10,649	13,710	19,161
Strength Reduction Factor - Steel Failure[2]	ϕ_{sa}	-	0.65									
Concrete Breakout Strength in Shear (ACI 318-14 17.5.2 or ACI 318-11 Section D.6.2)												
Nominal Diameter	d_a (d_o)[4]	in.	0.250		0.375		0.500		0.625		0.750	
Load Bearing Length of Anchor in Shear	l_e	in.	1.27	2.01	1.40	2.04	1.86	2.50	2.31	3.59	3.49	4.13
Strength Reduction Factor - Concrete Breakout Failure[3]	ϕ_{cb}	-	0.70									
Concrete Pryout Strength in Shear (ACI 318-14 17.5.3 or ACI 318-11 Section D.6.3)												
Coefficient for Pryout Strength	k_{cp}	-	1.0	1.0	1.0	1.0	1.0	2.0	1.0	2.0	2.0	2.0
Strength Reduction Factor - Concrete Pryout Failure[3]	ϕ_{cp}	-	0.70									
Shear Strength for Seismic Applications (ACI 318-14 17.2.3.3 or ACI 318-11 Section D.3.3.3)												
Shear Resistance - Single Anchor for Seismic Loads (f'_c = 2,500 psi)	$V_{sa,eq}$	lbf	1,370	1,600	3,790	4,780	5,345	6,773	9,367	9,367	10,969	10,969
Strength Reduction Factor - Steel Failure[2]	ϕ_{eq}	-	0.65									

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

[1]The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable.

[2]The tabulated value of ϕ_{sa} and ϕ_{eq} applies when the load combinations of Section 1605.2 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2, as applicable, are used. If the load combinations of ACI 318 Appendix C are used, the appropriate value of ϕ shall be determined in accordance with ACI 318 D.4.4(b).

[3]The tabulated values of ϕ_{cb} and ϕ_{cp} applies when both the load combinations of Section 1605.2 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-11 D.4.4(c) for Condition B are met. Condition B applies where supplementary reinforcement is not provided in concrete. For installations where complying reinforcement is verified, the ϕ_{cb} and ϕ_{cp} factors described in ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c), as applicable, may be used for Condition A. If the load combinations of ACI 318 Appendix C are used, the appropriate value of ϕ_{cb} shall be determined in accordance with ACI 318 D.4.5(c) for Condition B.

[4]The notation in parenthesis is for the 2006 IBC.

TABLE 4
STAINLESS STEEL TITEN HD® SCREW ANCHOR SETTING INFORMATION FOR INSTALLATION ON THE TOP OF CONCRETE-FILLED PROFILE STEEL DECK FLOOR AND ROOF ASSEMBLIES[1,2,3,4]

Design Information	Symbol	Units	Nominal Anchor Diameter (inch)		
			1/4	3/8	1/2
Nominal Embedment Depth	h_{nom}	in.	$2^1/_8$	$2^1/_2$	$3^1/_4$
Effective Embedment Depth	h_{ef}	in.	1.27	1.40	1.86
Minimum Concrete Thickness[5]	$h_{min,deck}$	in.	$2^1/_2$	$3^1/_4$	$3^3/_4$
Critical Edge Distance	$c_{ac,deck,top}$	in.	3	$4^1/_2$	$7^1/_2$
Minimum Edge Distance	$c_{min,deck,top}$	in.	$1^1/_2$	$1^3/_4$	$1^3/_4$
Minimum Spacing	$s_{min,deck,top}$	in.	$1^1/_2$	3	3

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

[1]Installation shall comply with Sections 3.3, 4.1.6, 4.1.10 and 4.3 and Figure 3 of this report.
[2]Design capacity shall be based on calculations according to values in Tables 2 and 3 of this report.
[3]Minimum flute depth (distance from top of flute to bottom of flute) shall be 1.5 inches as shown in Figure 3 of this report.
[4]Steel deck thickness shall be minimum No. 20 gauge.
[5]Minimum concrete thickness ($h_{min,deck}$) refers to concrete thickness above upper flute, as shown in Figure 3 of this report.

TABLE 5
STAINLESS STEEL TITEN HD® SCREW ANCHOR IDENTIFICATION INFORMATION

Anchor Size	Model Number (Head Types)		
	316SS		304SS
	Hex-washer head	Countersunk head	Hex-washer head
1/4"	THDC25xxxH6SS	THDC25xxxCS6SS	-
3/8"	THD37xxxH6SS	THD37xxxCS6SS	THD37xxxH4SS
1/2"	THD50xxxH6SS	-	THD50xxxH4SS
5/8"	THDB62xxxH6SS	-	THDB62xxxH4SS
3/4"	THD75xxxH6SS	-	THD75xxxH4SS

FIGURE 1 - STAINLESS STEEL TITEN HD® SCREW ANCHORS

Hex-washer head

Countersunk head

FIGURE 2 – STAINLESS STEEL TITEN HD® SCREW ANCHOR INSTALLATION

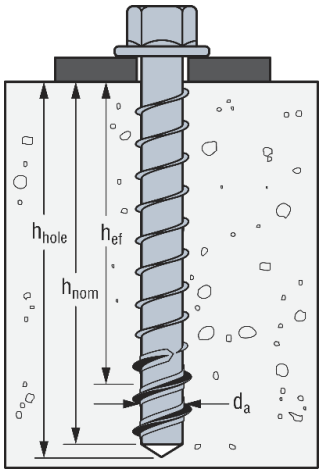
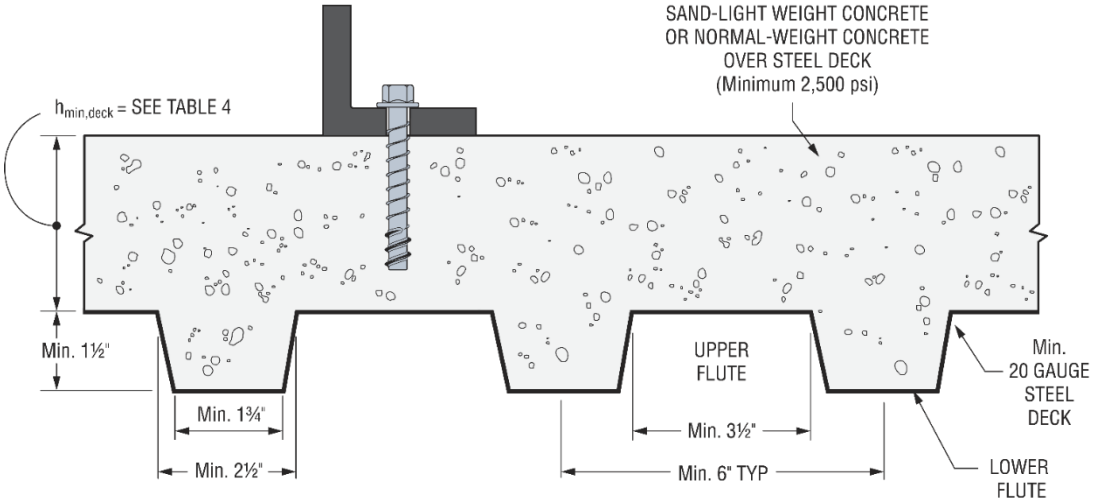


FIGURE 3 – INSTALLATION OF THE ¼-INCH, 3/8-INCH AND 1/2-INCH DIAMETER ANCHORS IN THE TOPSIDE OF CONCRETE-FILLED PROFILE STEEL DECK FLOOR AND ROOF ASSEMBLIES (1 in. = 25.4 mm)



CITY OF LOS ANGELES SUPPLEMENT

Simpson Strong-Tie Company Inc.
5956 West Las Positas Boulevard
Pleasanton, California 94588
(800) 925-5099
www.strongtie.com

STAINLESS STEEL TITEN HD® SCREW ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE

CSI Division:

03 00 00—CONCRETE
05 00 00—METALS

CSI Section:

03 16 00—Concrete Anchors
05 05 19—Post-installed Concrete Anchors

1.0 RECOGNITION

The Simpson Strong-Tie Stainless Steel Titen HD® Screw Anchors for Use in Cracked and Uncracked Concrete as evaluated and represented in IAPMO UES Evaluation Report ER-493 and with changes as noted in this supplement is a satisfactory alternative for use in buildings built under the following codes (and regulations):

- 2020 City of Los Angeles Building Code (LABC)
- 2020 City of Los Angeles Residential Code (LARC)

2.0 LIMITATIONS

Use of the Simpson Strong-Tie Stainless Steel Titen HD® Screw Anchors for Use in Cracked and Uncracked Concrete recognized in this report is subject to the following limitations:

2.1 The design, installation, conditions of use and identification of the Stainless Steel Titen HD® Screw Anchors shall be in accordance with the 2018 International Building Code and the 2018 International Residential Code, as applicable, as noted in ER-493.

2.2 Prior to installation, calculations and details demonstrating compliance with this approval report and the 2020 LABC or 2020 LARC, as applicable shall be submitted to the structural plan check section for review and approval. The calculations and details shall be prepared by a registered engineer, licensed in the State of California.

2.3 The design and installation of the Stainless Steel Titen HD® Screw Anchors shall be in accordance with LABC Chapters 16 and 17.

2.4 The allowable and strength design values listed in ER-493 are for fasteners only. Connected members shall be checked for their capacity (which may govern).

2.5 Periodic special inspection shall be provided by the Registered Deputy Inspector in accordance with Section 1705 of the 2020 LABC, as applicable during installations of the Stainless Steel Titen HD® Screw anchors.

2.6 Under the LARC a design in accordance with Section R301.1.3 shall be submitted.

This supplement expires concurrently with ER-493.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org

FLORIDA SUPPLEMENT

Simpson Strong-Tie Company Inc.
5956 West Las Positas Boulevard
Pleasanton, California 94588
(800) 925-5099
www.strongtie.com

STAINLESS STEEL TITEN HD® SCREW ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE

CSI Division:

03 00 00—CONCRETE
05 00 00—METALS

CSI Section:

03 16 00—Concrete Anchors
05 05 19—Post-installed Concrete Anchors

1.0 RECOGNITION

Simpson Strong-Tie® Stainless Steel Titen HD® Screw Anchors for use in cracked and uncracked concrete recognized in ER-493 has been evaluated for use to resist dead, live, wind, and seismic tension and shear loads. The structural performance properties of the Simpson Strong-Tie Stainless Steel Titen HD® Screw Anchors were evaluated for compliance with the following codes:

- 2020 and 2017 Florida Building Code, Building (FBC–Building)
- 2020 and 2017 Florida Building Code, Residential (FBC–Residential)

2.0 LIMITATIONS

Simpson Strong-Tie® Stainless Steel Titen HD® Screw Anchors described in ER-493 complies with the 2020 and 2017 FBC--Building and the 2020 and 2017 FBC--Residential, subject to the following limitations:

1. The design and installation of the Simpson Strong-Tie® Stainless Steel Titen HD® Screw Anchors shall be in accordance with the 2018 or 2015 International Building Code and the 2018 or 2015 International Residential Code as noted in ER-493.

2. Load combinations shall be in accordance with Sections 1605.2 or 1605.3 of the FBC–Building, as applicable.

3. Design wind loads shall be in accordance with Section 1609.5 of the FBC–Building or Section R301.2.1.1 of the FBC–Residential, as applicable.

4. Use of Simpson Strong-Tie® Stainless Steel Titen HD® Screw Anchors in High-velocity Hurricane Zones (HVHZ) as set forth in Section 2321.5.2 of the FBC–Building and Section 4409 of the FBC–Residential to resist wind uplift is permitted. The anchors shall be designed to resist the uplift forces as required in Section 1620 (HVHZ) of the FBC–Building or 700 pounds (3114 N), whichever is greater, in accordance with FBC--Building Section 2321.7.

5. Use of Simpson Strong-Tie® Stainless Steel Titen HD® Screw Anchors in High-velocity Hurricane Zones (HVHZ) as set forth in Section 2122.7 of the FBC–Building and Section 4407 of the FBC–Residential to resist wind forces is permitted. The anchors shall be designed to resist the horizontal forces as required in Section 1620 (HVHZ) of the FBC–Building or 200 pounds per lineal foot (2919 N/m) of wall, whichever is greater, in accordance with FBC–Building Section 2122.7.3.

6. Use of Simpson Strong-Tie® Stainless Steel Titen HD® Screw Anchors complies with the High-velocity Hurricane Zone (HVHZ) provisions set forth in Sections 2324.2 of the FBC–Building.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission (or the building official when the report holder does not possess an approval by the Commission) is required to provide oversight and determine that the products are being manufactured as described in this evaluation report to establish continual product performance.

This supplement expires concurrently with ER-493.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org