TECHNICAL DATA SHEET:

# CONCRETE SCREW ANCHORS

ZINC PLATED FOR CONCRETE

ICC ESR-5217

Concrete Screw Anchors are a totally removable, medium duty, rotation setting, thread forming anchor, ideal for either temporary or permanent anchoring into substrates such as concrete, brick, hollow brick or block. The Concrete Screw-Anchor is particularly well suited to close-to-edge or close-to-anchor fixing as it does not expand and burst the surrounding substrate.

ICC Evaluation is for cracked and uncracked concrete substrates.

HEX HEAD

## AVAILABILITY

- Zinc Clear Carbon Steel

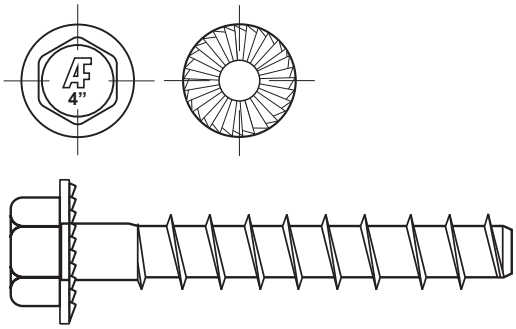
## APPROVALS & CERTIFICATIONS

- ICC-ESR 5217 Evaluation
- 2021, 2018, 2015 & 2012 International Building Code (IBC)
- 2021, 2018, 2015 & 2012 International Residential Code (IRC)
- 2020 City of Los Angeles Building Code (LABC)
- 2020 City of Los Angeles Residential Code (LARC)
- 2022 California Building Code (CBC)
- 2022 California Residential Code (CRC)
- 2020 Florida Building Code - Building
- 2020 Florida Building Code - Residential
- Approved for providing anchorage to cracked & uncracked concrete per ESR-5217
- Supported by AFOS anchor design software

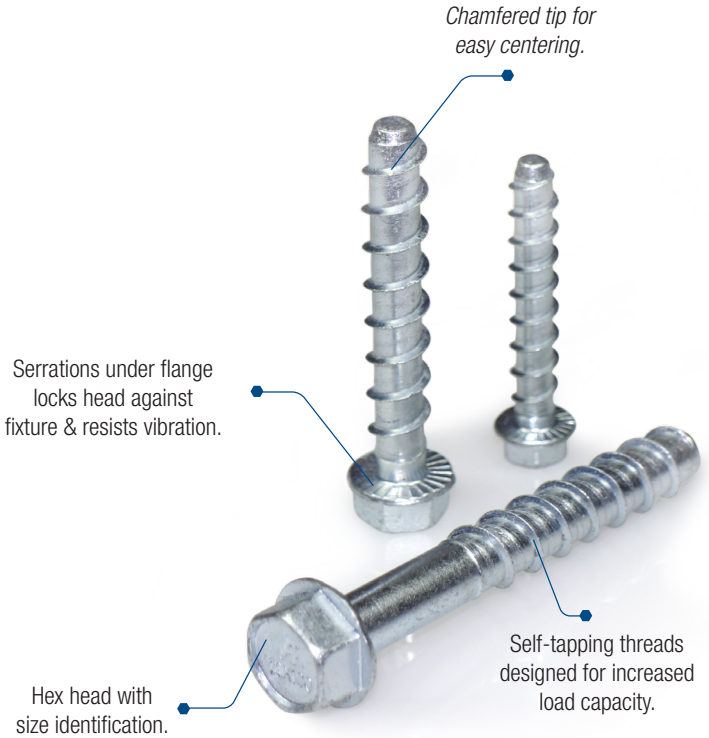
## KEY BENEFITS

- Quick installation with a drill and drive method using a hex socket, ratchet or a torque controlled impact wrench.
- Unlike chemical anchoring or sleeved anchors, Concrete Screw-Anchors can be removed with ease leaving the hole clear of debris
- The large self-tapping thread feature of this bolt is designed for fast advancing and high performance capacity as threads are formed in substrate material on installation.

## PHYSICAL PROPERTIES



HEX HEAD WITH SIZE



# CONCRETE SCREW ANCHORS

ZINC PLATED FOR CONCRETE

ICC ESR-5217

## MATERIAL SPECIFICATIONS

Concrete Screw-Anchors are a fast installation and immediate loading, completely removable anchor. The large diameter self tapping screw by nature makes this anchor ideal for high load applications.

### CARBON STEEL

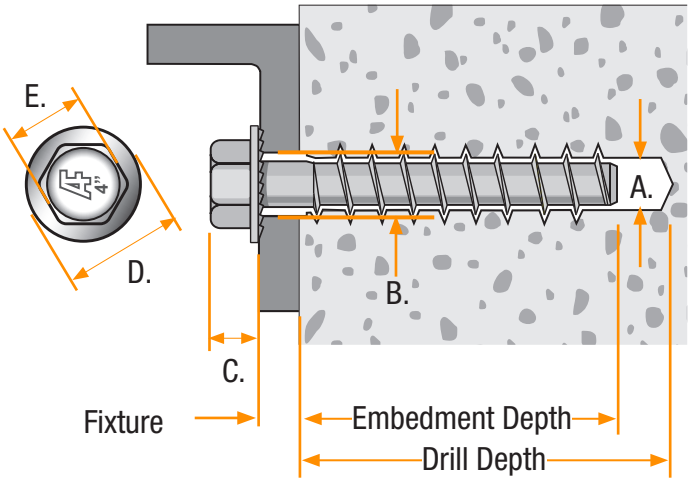
The Carbon Steel Concrete Screw-Anchors material composition consists of carbon steel.

## INSTALLATION SPECIFICATIONS

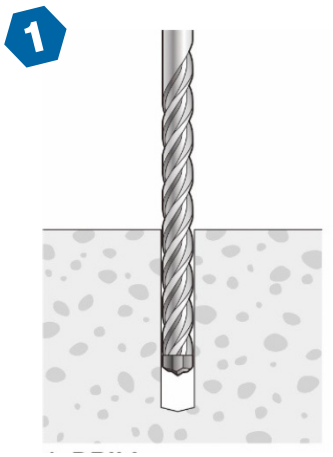
- A. Anchor/Drill Ø, inch.
- B. Clearance hole Ø in fixture, inch (major diameter).
- C. Flanged head height, inch.
- D. Washer Ø, inch.
- E. Wrench size, inch.

**TABLE A1**

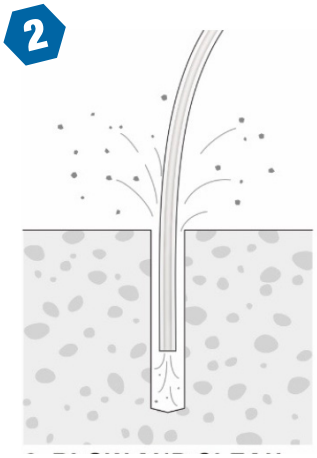
| A. | B. | C. | D. | E. |
|---|---|---|---|---|
| 1/4 | 3/8 | 9/32 | 9/16 | 7/16 |
| 3/8 | 1/2 | 3/8 | 3/4 | 9/16 |
| 1/2 | 5/8 | 1/2 | 1 | 3/4 |
| 5/8 | 3/4 | 9/16 | 1-1/8 | 15/16 |



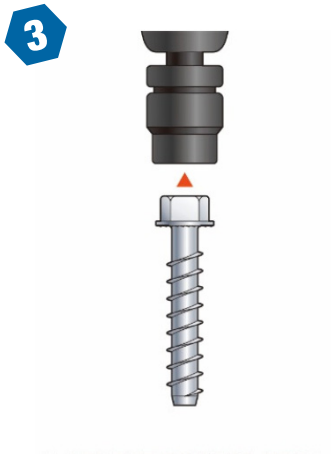

## INSTALLATION GUIDE



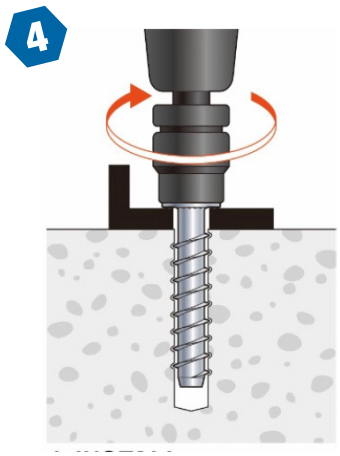

1. Drill a hole into the base material to the required depth using a drill bit that meets the requirements of ANSI B212.15.




2. Remove Dust and debris from the hole using a hand pump or compressed air.




3. Select a powered impact wrench or torque wrench, attach an appropriate sized hex socket to the wrench and mount the screw anchor head into the socket.




4. Drive the anchor through the fixture into the hole until the head of the anchor comes into contact with the fixture.

## PERFORMANCE DATA

### TABLE 1: SAH-Z SCREW ANCHOR WITH HEX WASHER HEAD INSTALLATION PARAMETERS[1]

| CHARACTERISTICS | SYMBOL | UNIT | NOMINAL ANCHOR DIAMETER | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1/4" | | 3/8" | | | 1/2" | | | 5/8" | | | | 3/4" | | | |
| Drill Bit Diameter | $d_o$ | in (mm) | 1/4 (6.4) | | 3/8 (9.5) | | | 1/2 (12.7) | | | 5/8 (15.9) | | | | 3/4 (19.1) | | | |
| Nominal Embedment Depth | $h_{nom}$ | in (mm) | 1-5/8 (41) | 2-1/2 (64) | 1-5/8 (41) | 2-1/2 (64) | 3-1/4 (83) | 2-1/4 (57) | 3 (76) | 4-1/4 (108) | 3-1/4 (83) | 4 (102) | 5 (137) | 5-1/2 (140) | 4 (102) | 5-1/2 (140) | 6-1/4 (159) | |
| Effective Embedment Depth | $h_{ef}$ | in (mm) | 1.24 (31.6) | 2,01 (51.1) | 1.21 (30.8) | 1.98 (50.3) | 2.62 (66.5) | 1.66 (42.1) | 2.30 (58.3) | 3.37 (85.5) | 2.54 (64.6) | 3.19 (80.9) | 3.99 (101.3) | 4.42 (112.3) | 3.14 (79.8) | 4.41 (112.1) | 5.05 (128.3) | |
| Minimum Hole Depth | $h_{hole}$ | in (mm) | 2 (51) | 2-7/8 (73) | 2 (51) | 2-7/8 (73) | 3-5/8 (92) | 2-5/8 (67) | 3-3/8 (86) | 4-5/8 (117) | 3-5/8 (92) | 4-1/2 (114) | 5-3/8 (137) | 6 (152) | 4-1/2 (114) | 6 (152) | 6-3/4 (171) | |
| Fixture Hole Diameter | $d_r$ | in (mm) | 3/8 (9.5) | | 1/2 (12.7) | | | 5/8 (15.9) | | | 3/4 (19.1) | | | | 7/8 (22.2) | | | |
| Maximum Installation Torque[2] | $T_{inst,max}$ | ft.lb (Nm) | 21 (29) | | N/A | | | N/A | | | N/A | | | | 103 (140) | | | |
| Maximum Impact Wrench Torque Rating | $T_{impact,max}$ | ft.lb (Nm) | 135 (185) | | 135 (185) | | | 260 (350) | | | 260 (350) | | | | 440 (600) | | | |
| Minimum Concrete Thickness | $h_{min}$ | in (mm) | 3-5/8 (91) | 4-1/2 (114) | 3-5/8 (91) | 4-1/2 (114) | 5-1/4 (133) | 4-1/4 (107) | 5 (126) | 6-1/4 (158) | 5-1/4 (133) | 6 (152) | 7 (177) | 7-1/2 (190) | 6 (152) | 7-1/2 (190) | 8-1/4 (209) | |
| Critical Edge Distance | $c_{ac}$ | in (mm) | $1.5\ h_{er}$ | | | | | | | | | | | | | | | |
| Minimum Edge Distance ($c_{min}$) | $c_{min}$ | in (mm) | 1-3/4 (44) | | | | | | | | | | | | | | | |
| Minimum Spacing ($s_{min}$) | $s_{min}$ | in (mm) | 3 (76) | | | | | | | | | | | | | | | |
| Wrench Socket Size | - | in | 7/16 | | 9/16 | | | 3/4 | | | 15/16 | | | | 1-1/8 | | | |

1. The tabulated data is to be used in conjunction with the design criteria given in ACI 318 (-19 and -14) Chapter 17 or ACI 318-11 Appendix D, as applicable.
2. N/A - Manual torque wrench installation not evaluated.

## PERFORMANCE DATA

### TABLE 2: SAH-Z SCREW ANCHOR WITH HEX WASHER HEAD INSTALLATION PARAMETERS[1]

| CHARACTERISTICS | SYMBOL | UNIT | NOMINAL ANCHOR DIAMETER | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1/4" | | 3/8" | | | | 1/2" | | | 5/8" | | | 3/4" | | |
| Nominal Embedment Depth | $h_{nom}$ | in (mm) | 1-5/8 (41) | 2-1/2 (64) | 1-5/8 (41) | 2-1/2 (64) | 3-1/4 (83) | 2-1/4 (57) | 3 (76) | 4-1/4 (108) | 3-1/4 (83) | 4 (102) | 5 (137) | 5-1/2 (140) | 4 (102) | 5-1/2 (140) | 6-1/4 (159) |
| Effective Embedment Depth | $h_{ef}$ | in (mm) | 1.24 (31.6) | 2,01 (51.1) | 1.21 (30.8) | 1.98 (50.3) | 2.62 (66.5) | 1.66 (42.1) | 2.30 (58.3) | 3.37 (85.5) | 2.54 (64.6) | 3.19 (80.9) | 3.99 (101.3) | 4.42 (112.3) | 3.14 (79.8) | 4.41 (112.1) | 5.05 (128.3) |
| Anchor Category | 1, 2 or 3 | - | 3 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| **STEEL STRENGTH IN TENSION & SHEAR** | | | | | | | | | | | | | | | | | |
| Minimum Specified Ultimate Strength | $f_{uta}$ | psi ($N/mm^2$) | 101,525 (700) | | 113,130 (780) | | | 113,130 (780) | | | | 113,130 (780) | | | 113,130 (780) | | |
| Minimum Specified Yield Strength | $f_y$ | psi ($N/mm^2$) | 81,220 (560) | | 90,505 (624) | | | 90,505 (624) | | | | 90,505 (624) | | | 90,505 (624) | | |
| Effective Stress Area (Screw Anchor Body) | $A_{se}$ | $in^2$ ($mm^2$) | 0.0453 (29.2) | | 0.1020 (65.8) | | | 0.1827 (117.9) | | | | 0.2888 (186.3) | | | 0.4145 (267.4) | | |
| Steel Strength in Tension | $N_{sa}$ | lb (kN) | 4,585 (20.4) | | 11,535 (51.3) | | | 20,680 (92.0) | | | | 32,665 (145.3) | | | 46,895 (208.6) | | |
| Strength Reduction Factor for Steel Failure in Tension | $\Phi_{sa}$ | - | 0.65 | | | | | | | | | | | | | | |
| Steel Strength in Shear | $V_{sa}$ | lb (kN) | 1,350 (6.0) | | 3,150 (14.0) | | | 6,745 (30.0) | | | | 10,115 (45.0) | | | 15,060 (67.0) | | |
| Steel Strength in Shear, Seismic | $V_{sa,eq}$ | lb (kN) | 1,125 (5.0) | | 1,800 (8.0) | | | 3,730 (16.6) | | | | 6,880 (30.6) | | | 13,240 (58.9) | | |
| Strength Reduction Factor for Steel Failure in Shear | $\Phi_{sa}$ | - | 0.60 | | | | | | | | | | | | | | |
| **PULLOUT STRENGTH IN TENSION[3]** | | | | | | | | | | | | | | | | | |
| Pullout Strength in Uncracked Concrete | $N_{p,uncr}$ | lb (kN) | N/A | 4,025 (17.9) | 1,395 (6.2) | 2,990 (13.3) | N/A | N/A | 4,115 (18.3) | 7,485 (33.3) | N/A | 6,585 (29.3) | 8,320 (37.0) | N/A | N/A | N/A | N/A |
| Pullout Strength in Cracked Concrete | $N_{p,cr}$ | lb (kN) | 605 (2.7) | 1,080 (4.8) | 720 (3.2) | 1,755 (7.8) | 2,630 (11.7) | 1,350 (6.0) | 2,790 (12.4) | 5,195 (23.1) | 3,125 (13.9) | 4,045 (18.0) | 5,195 (23.1) | 5,825 (25.9) | 4,405 (19.6) | 7,330 (32.6) | 8,790 (39.1) |
| Pullout Strength in Cracked Concrete, Seismic | $N_{p,eq}$ | lb (kN) | 605 (2.7) | 1,080 (4.8) | 720 (3.2) | 1,755 (7.8) | 2,630 (11.7) | 1,350 (6.0) | 2,790 (12.4) | 4,720 (21.0) | 2,920 (13.0) | 4,045 (18.0) | 5,015 (22.3) | 5,825 (25.9) | 4,405 (19.6) | 7,330 (32.6) | 8,790 (39.1) |
| Normalization Exponent, Un-cracked Concrete | n | - | 0.50 | | 0.50 | | | 0.50 | | | | 0.50 | | | 0.50 | | |
| Normalization Exponent, Cracked Concrete | n | - | 0.40 | | 0.50 | | | 0.50 | | | | 0.40 | | | 0.50 | | |
| Strength Reduction Factor for Pullout Strength in Tension | $\Phi_p$ | - | 0.45 | 0.55 | 0.65 | 0.65 | 0.65 | 0.55 | 0.55 | 0.55 | 0.65 | 0.65 | 0.65 | 0.65 | 0.55 | 0.55 | 0.55 |

**TABLE CONTINUES ON NEXT PAGE...**

## PERFORMANCE DATA

### TABLE 2: SAH-Z SCREW ANCHOR WITH HEX WASHER HEAD INSTALLATION PARAMETERS[1]

| CHARACTERISTICS | SYMBOL | UNIT | NOMINAL ANCHOR DIAMETER | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1/4" | | 3/8" | | | 1/2" | | | 5/8" | | | | 3/4" | | |
| **CONCRETE BREAKOUT STRENGTH IN TENSION** | | | | | | | | | | | | | | | | | |
| Effective Embedment | $h_{er}$ | in (mm) | 1.24 (31.6) | 2.01 (51.1) | 1.21 (30.8) | 1.98 (50.3) | 2.62 (66.5) | 1.66 (42.1) | 2.30 (58.3) | 3.37 (85.5) | 2.54 (64.6) | 3.19 (80.9) | 3.99 (101.3) | 4.42 (112.3) | 3.14 (79.8) | 4.41 (112.1) | 5.05 (128.3) |
| Effectiveness Factor for Uncracked Concrete | $k_{uncr}$ | in-lb (SI) | 24 (10.0) | 24 (10.0) | 24 (10.0) | 24 (10.0) | 24 (10.0) | 24 (10.0) | 24 (10.0) | 24 (10.0) | 24 (10.0) | 24 (10.0) | 24 (10.0) | 24 (10.0) | 27 (11.3) | 24 (10.0) | 24 (10.0) |
| Effectiveness Factor for Cracked Concrete | $k_{cr}$ | in-lb (SI) | 17 (7.1) | 17 (7.1) | 17 (7.1) | 17 (7.1) | 17 (7.1) | 17 (7.1) | 17 (7.1) | 17 (7.1) | 17 (7.1) | 17 (7.1) | 17 (7.1) | 17 (7.1) | 24 (10.0) | 21 (8.8) | 21 (8.8) |
| Strength Reduction Factor for Concrete Breakout Strength in Tension | $\Phi_{cb}$ | - | 0.45 | 0.55 | 0.65 | 0.65 | 0.65 | 0.55 | 0.55 | 0.55 | 0.65 | 0.65 | 0.65 | 0.65 | 0.55 | 0.55 | 0.55 |
| Axial Stiffness in Service Load Range in Uncracked Concrete | $\beta_{uncr}$ | lb/inch x $10^5$ (N/mm) | 2.719 (48) | 1.928 (34) | 6.240 (109) | 4.502 (79) | 3.670 (64) | 8.809 (154) | 7.079 (124) | 5.649 (99) | 10.377 (182) | 9.099 (159) | 8.080 (1411) | 7.684 (135) | 13.204 (231) | 11.075 (194) | 10.410 (182) |
| COV for $\beta_{uncr}$ | v | % | | | | | | | | 38 | | | | | | | |
| Axial Stiffness in Service Load Range in Cracked Concrete | $\beta_{cr}$ | lb/inch x $10^5$ (N/mm) | 1.451 (25) | 1.100 (19) | 3.318 (58) | 2.563 (45) | 2.179 (38) | 4.887 (86) | 4.120 (72) | 3.487 (61) | 6.134 (107) | 5.568 (98) | 5.117 (90) | 4.941 (86.5) | 8.063 (141) | 7.119 (125) | 6.825 (120) |
| COV for $\beta_{cr}$ | v | % | | | | | | | | 48 | | | | | | | |
| **CONCRETE BREAKOUT STRENGTH IN SHEAR** | | | | | | | | | | | | | | | | | |
| Nominal Diameter | $d_o$[2] | in (mm) | 0.250 (6.4) | | 0.375 (9.5) | | | 0.500 (12.7) | | | 0.625 (15.9) | | | | 0.750 (19.1) | | |
| Load Bearing Length of Anchor | $l_e$ | in (mm) | 1.24 (31.6) | 2.01 (51.1) | 1.21 (30.8) | 1.98 (50.3) | 2.62 (66.5) | 1.66 (42.1) | 2.30 (58.3) | 3.37 (85.5) | 2.54 (64.6) | 3.19 (80.9) | 3.99 (101.3) | 4.42 (112.3) | 3.14 (79.8) | 4.41 (112.1) | 5.05 (128.3) |
| Reduction Factor of Concrete Breakout Strength in Shear | $\Phi_{cb}$ | - | | | | | | | | 0.70 | | | | | | | |
| **CONCRETE PRYOUT STRENGTH IN SHEAR** | | | | | | | | | | | | | | | | | |
| Coefficient for Pryout Strength | $k_{cp}$ | - | 1.0 | 1.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Reduction Factor for Pryout Strength in Shear | $\Phi_{cp}$ | - | | | | | | | | 0.70 | | | | | | | |

1. The tabulated data is to be used in conjunction with the design criteria given in ACI 318 (-19 and -14) Chapter 17 or ACI 318-11 Appendix D, as applicable.
2. The strength reduction factor applies when the load combination from the IBC or ACI 318 are used and the requirements of ACI 318-19 17.5.3, ACI 318-14 17.3.3 or ACI 318-11 D.4.3, as applicable, are met. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of *f* must be determined in accordance with ACI 318-11 D.4.5.

## PERFORMANCE DATA

**TABLE 3: EXAMPLE SAH-Z SCREW ANCHOR W/ HEX WASHER HEAD ALLOWABLE STRESS DESIGN VALUES FOR ILLUSTRATIVE PURPOSES[1,2,3,4,5,6,7,8,9,10]**

| NOMINAL ANCHOR DIAMETER $d_o$ (inch) | NOMINAL EMBEDMENT DEPTH $h_{nom}$ (inch) | ALLOWABLE TENSION LOAD $T_{allowable,ASD}$ (lb) |
|---|---|---|
| 1/4 | 1-5/8 | 504 |
| 1/4 | 2-1/2 | 1,271 |
| 3/8 | 1-5/8 | 613 |
| 3/8 | 2-1/2 | 1,313 |
| 3/8 | 3-1/4 | 2,235 |
| 1/2 | 2-1/4 | 954 |
| 1/2 | 3 | 1,529 |
| 1/2 | 4-1/4 | 2,759 |
| 5/8 | 3-1/4 | 2,133 |
| 5/8 | 4 | 2,892 |
| 5/8 | 5 | 3,654 |
| 5/8 | 5-1/2 | 4,897 |
| 3/4 | 4 | 2,791 |
| 3/4 | 5-1/2 | 4,130 |
| 3/4 | 6-1/2 | 5,061 |

1. Single anchor
2. Single tension loading only
3. Concrete determined to remain uncracked for the life of the anchorage.
4. Load combinations taken from ACI 318 (-19 or -14) Section 5.3 or ACI 318-11 Section 9.2, as applicable with no seismic loading.
5. 30% Dead Load (D) and 70% Live Load (L), controlling load combination 1.2 D +1.6L.
6. Calculation of the weighted average of a= 1.2 x 0.3 +1.6 x 0.7 = 1.48
7. Nominal weight concrete, $f'_c$=2,500 psi.
8. $c_{a1} = c_{a2} \geq c_{ac}$
9. Concrete thickness $h \geq h_{min}$
10. Values are for Condition B (supplementary reinforcement in accordance with ACI 318 (-19 or -14) 17.3.3 or ACI 318-11 D.4.3 is not provided)

## ANCHOR SUMMARY

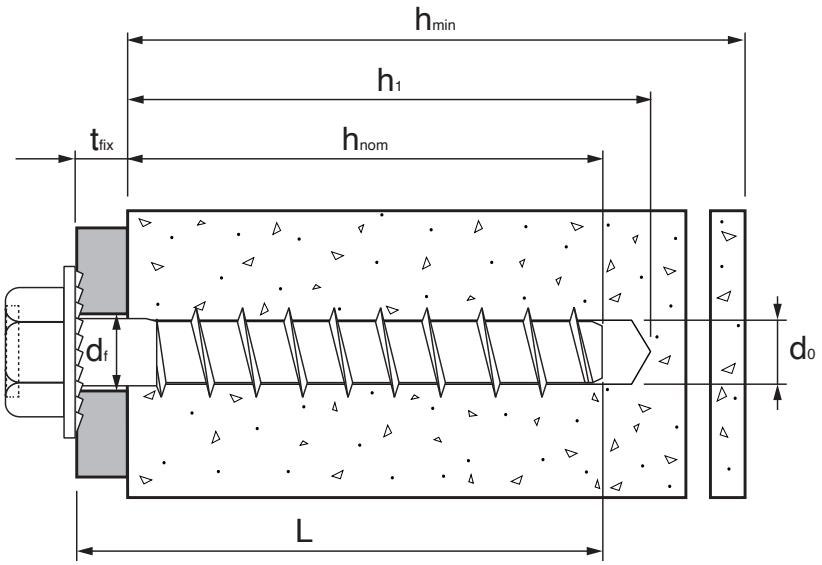
**TABLE 4: SAH-Z ANCHOR SUMMARY**

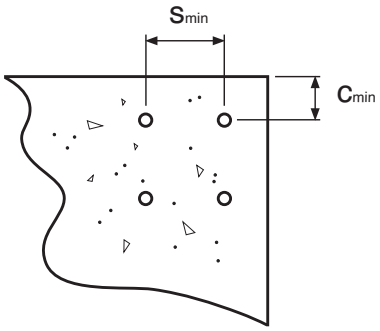
| PART NUMBER | DESCRIPTION DIA. X L | MAX FIXTURE THICKNESS, $t_{fix}$ | EFFECTIVE EMBEDMENT DEPTH, $h_{ef}$ | EMBEDMENT DEPTH, $h_{nom}$ | DRILL HOLE DIA. X DEPTH, $d_o$ x $h_t$ | MINIMUM CONCRETE THICKNESS, $h_{min}$ | DESIGN CAPACITY IN 2,500 PSI CRACKED CONCRETE[1] | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | TENSION | SHEAR |
| 1SAHZ14134 | 1/4 x 1-3/4" | 1/8" | 1.24" | 1-5/8" | 1/4 x 2" | 3-5/8" | 272 lbs. | 820 lbs. |
| 1SAHZ14214 | 1/4 x 2-1/4" | 5/8" | 1.24" | 1-5/8" | 1/4 x 2" | 3-5/8" | 272 lbs. | 820 lbs. |
| 1SAHZ14300 | 1/4 x 3" | 1-3/8" | 1.24" | 1-5/8" | 1/4 x 2" | 3-5/8" | 272 lbs. | 820 lbs. |
| | | 1/2" | 2.01" | 2-1/2" | 1/4 x 2-7/8" | 4-1/2" | 594 lbs. | 810 lbs. |
| 1SAHZ14400 | 1/4 x 4" | 2-3/8" | 1.24" | 1-5/8" | 1/4 x 2" | 3-5/8" | 272 lbs. | 820 lbs. |
| | | 1-1/2" | 2.01" | 2-1/2" | 1/4 x 2-7/8" | 4-1/2" | 594 lbs. | 810 lbs. |
| 1SAHZ38134 | 3/8 x 1-3/4" | 1/8" | 1.21" | 1-5/8" | 3/8 x 2" | 3-5/8" | 468 lbs. | 787 lbs. |
| 1SAHZ38212 | 3/8 x 2-1/2" | 7/8" | 1.21" | 1-5/8" | 3/8 x 2" | 3-5/8" | 468 lbs. | 787 lbs. |
| 1SAHZ38300 | 3/8 x 3" | 1-3/8" | 1.21" | 1-5/8" | 3/8 x 2" | 3-5/8" | 468 lbs. | 787 lbs. |
| | | 1/2" | 1.98" | 2-1/2" | 3/8 x 2-7/8" | 4-1/2" | 1141 lbs. | 1654 lbs. |
| 1SAHZ38400 | 3/8 x 4" | 2-3/8" | 1.21" | 1-5/8" | 3/8 x 2" | 3-5/8" | 468 lbs. | 787 lbs. |
| | | 1-1/2" | 1.98" | 2-1/2" | 3/8 x 2-7/8" | 4-1/2" | 1141 lbs. | 1654 lbs. |
| | | 3/4" | 2.62" | 3-1/4" | 3/8 x 3-5/8" | 5-1/4" | 1709 lbs. | 1890 lbs. |
| 1SAHZ12300 | 1/2 x 3" | 3/4" | 1" | 2-1/4" | 1/2 x 2-5/8" | 4-1/4" | 743 lbs. | 1270 lbs. |
| 1SAHZ12400 | 1/2 x 4" | 1-3/4" | 1.66" | 2-1/4" | 1/2 x 2-5/8" | 4-1/4" | 743 lbs. | 1270 lbs. |
| | | 1" | 2.30" | 3" | 1/2 x 3-3/8" | 5" | 1534 lbs. | 2071 lbs. |
| 1SAHZ12500 | 1/2 x 5" | 2-3/4" | 1.66" | 2-1/4" | 1/2 x 2-5/8" | 4-1/4" | 743 lbs. | 1270 lbs. |
| | | 2" | 2.30" | 3" | 1/2 x 3-3/8" | 5" | 1534 lbs. | 2071 lbs. |
| | | 3/4" | 3.34" | 4-1/4" | 1/2 x 4-5/8" | 6-1/4" | 2857 lbs. | 4047 lbs. |
| 1SAHZ12600 | 1/2 x 6" | 3-3/4" | 1.66" | 2-1/4" | 1/2 x 2-5/8" | 4-1/4" | 743 lbs. | 1270 lbs. |
| | | 3" | 2.30" | 3" | 1/2 x 3-3/8" | 5" | 1534 lbs. | 2071 lbs. |
| | | 1-3/4" | 3.34" | 4-1/4" | 1/2 x 4-5/8" | 6-1/4" | 2857 lbs. | 4047 lbs. |
| 1SAHZ58400 | 5/8 x 4" | 3/4" | 2.54" | 3-1/4" | 5/8 x 3-5/8" | 5-1/4" | 2031 lbs. | 4805 lbs. |
| 1SAHZ58600 | 5/8 x 6" | 2-3/4" | 2.54" | 3-1/4" | 5/8 x 3-5/8" | 5-1/4" | 2031 lbs. | 4805 lbs. |
| | | 2" | 3.19" | 4" | 5/8 x 4-1/2" | 6" | 2629 lbs. | 6069 lbs. |
| | | 1" | 3.99" | 5" | 5/8 x 5-3/8" | 7" | 3377 lbs. | 6069 lbs. |
| | | 1/2" | 4.42" | 5-1/2" | 5/8 x 6" | 7-1/2" | 3786 lbs. | 6069 lbs. |
| 1SAHZ34500 | 3/4 x 5" | 1" | 3.14" | 4" | 3/4 x 4-1/2" | 6" | 2423 lbs. | 9036 lbs. |
| 1SAHZ34600 | 3/4 x 6" | 2" | 3.14" | 4" | 3/4 x 4-1/2" | 6" | 2423 lbs. | 9036 lbs. |
| | | 1/2" | 4.41" | 5-1/2" | 3/4 x 6" | 7-1/2" | 4032 lbs. | 9036 lbs. |
| 1SAHZ34700 | 3/4 x 7" | 3" | 3.14" | 4" | 3/4 x 4-1/2" | 6" | 2423 lbs. | 9036 lbs. |
| | | 1-1/2" | 4.41" | 5-1/2" | 3/4 x 6" | 7-1/2" | 4032 lbs. | 9036 lbs. |
| | | 3/4" | 5.05" | 6-1/4" | 3/4 x 6-3/4" | 8-1/4" | 4835 lbs. | 9036 lbs. |
| 1SAHZ34800 | 3/4 x 8" | 4" | 3.14" | 4" | 3/4 x 4-1/2" | 6" | 2423 lbs. | 9036 lbs. |
| | | 2-1/2" | 4.41" | 5-1/2" | 3/4 x 6" | 7-1/2" | 4032 lbs. | 9036 lbs. |
| | | 1-3/4" | 5.05" | 6-1/4" | 3/4 x 6-3/4" | 8-1/4" | 4835 lbs. | 9036 lbs. |

## INSTALLATION PARAMETERS

**TABLE 5: SAH-Z INSTALLATION PARAMETERS**

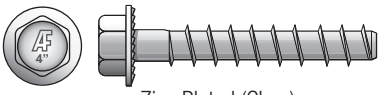
| ANCHOR SIZE | | | 1/4" | 3/8" | 1/2" | 5/8" | 3/4" |
|---|---|---|---|---|---|---|---|
| Nominal Diameter of Drill Bit | $d_o$ | in. | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 |
| Fixture Clearance Hole Diameter | $d_f$ | in. | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 |
| Minimum Edge Distance | $c_{min}$ | in. | 1-3/4 | | | | |
| Minimum Spacing | $s_{min}$ | in. | 3 | | | | |
| Maximum Installation Torque | $T_{inst,max}$ | ft.lb. | 21 | N/A | N/A | N/A | 103 |
| Maximum Impact Wrench Torque Rating | $T_{impact,max}$ | ft.lb. | 135 | 135 | 260 | 260 | 440 |



## ORDERING INFORMATION

ZINC PLATED



Zinc Plated (Clear)

**TABLE 6: SAH-Z ORDERING INFORMATION**

| PART # | ANCHOR* x LENGTH (in.) | CLEARANCE HOLE Ø (in.) | WRENCH SIZE (in.) |
|---|---|---|---|
| 1SAHZ14134 | 1/4 x 1-3/4 | 3/8 | 7/16 |
| 1SAHZ14214 | 1/4 x 2-1/4 | 3/8 | 7/16 |
| 1SAHZ14300 | 1/4 x 3 | 3/8 | 7/16 |
| 1SAHZ14400 | 1/4 x 4 | 3/8 | 7/16 |
| 1SAHZ38134 | 3/8 x 1-3/4 | 1/2 | 9/16 |
| 1SAHZ38212 | 3/8 x 2-1/2 | 1/2 | 9/16 |
| 1SAHZ38300 | 3/8 x 3 | 1/2 | 9/16 |
| 1SAHZ38400 | 3/8 x 4 | 1/2 | 9/16 |
| 1SAHZ12300 | 1/2 x 3 | 5/8 | 3/4 |
| 1SAHZ12400 | 1/2 x 4 | 5/8 | 3/4 |
| 1SAHZ12500 | 1/2 x 5 | 5/8 | 3/4 |
| 1SAHZ12600 | 1/2 x 6 | 5/8 | 3/4 |
| 1SAHZ58400 | 5/8 x 4 | 3/4 | 15/16 |
| 1SAHZ58600 | 5/8 x 6 | 3/4 | 15/16 |
| 1SAHZ34500 | 3/4 x 5 | 7/8 | 1-1/8 |
| 1SAHZ34600 | 3/4 x 6 | 7/8 | 1-1/8 |
| 1SAHZ34700 | 3/4 x 7 | 7/8 | 1-1/8 |
| 1SAHZ34800 | 3/4 x 8 | 7/8 | 1-1/8 |

*Drill Diameter

## RECOMMENDED INSTALL TOOLS

**Bosch® 18V High Torque Impact Wrench with Pin Detent with (2) FatPack Batteries (4.0Ah)**

Bosch Power Tools deliver stronger performance and lasting reliability. The Bosch HTH181-01 high torque impact wrench offers a heavy duty all-metal motor, impact hammer and anvil system, made to hold up in tough environments. It comes with (2) FatPack Lithium-Ion advanced technology batteries that combines Electronic Cell Protection, a unique battery pack design and customized electronics to deliver optimal battery life and performance. Bosch 18V Batteries equipped with Coolpack Technology. This will provide better performance from your tools in extreme heats and frigid temperatures.


**TABLE 5: TORQUE WRENCH ORDERING INFORMATION**

| PART # | TYPE |
|---|---|
| 9HTH181-01 | Pin Detent |

## RECOMMENDED SOCKETS

**Bosch® 1/2-Square Drive Socket - Impact Ready**


Impact tough deep well socket engineered for high torque. Forged steel reduces breakage. Absorbs torque peaks to reduce stress. Hardened core increases socket strength, reduces fractures. Engineered to meet ISO standards.

**TABLE 5: SOCKET ORDERING INFORMATION**

| PART # | SOCKET SIZE |
|---|---|
| 5BS27273 | 3/8 |
| 5BS27274 | 7/16 |
| 5BS27275 | 1/2 |
| 5BS27276 | 9/16 |
| 5BS27279 | 5/8 |
| 5BS27280 | 11/16 |
| 5BS27281 | 3/4 |
| 5BS27282 | 13/16 |
| 5BS27283 | 7/8 |
| 5BS27284 | 15/16 |

## TRADE APPLICATION

| | CARPENTER | CONSTRUCTION | RACKING INSTALLER | CONCRETE FORMWORKER |
|---|---|---|---|---|
| BOTTOM PLATES | ✓ | | | |
| AWNINGS | | ✓ | | |
| PALLET RACKING | | | ✓ | |
| FORMWORK SUPPORT | | | | ✓ |
| FLOORING | ✓ | | | |
| SHELVING | | | ✓ | |
| BRACING | ✓ | | ✓ | |
| RAILINGS / BALUSTRADE / SAFETY BARRIERS | | ✓ | | ✓ |
| MACHINERY | | | ✓ | |
| CURTAIN WALL | | ✓ | | |

## TRADE APPLICATION CONTINUED