Contractor’s Product Submittal/Substitution Request

TO:

PROJECT:

PROJECT LOCATION:

SPECIFIED ITEM:

Section	Page	Paragraph	Description

PRODUCT SUBMITTAL / SUBSTITUTION REQUESTED

Aerosmith® Sure-Bolt® Anchors

The attached submittal package includes the product description, specifications, drawings, and performance data for use in the evaluation of the request.

SUBMITTED BY:

Name: Signature:

Company:

Address:

Date: Telephone: Fax:

FOR USE BY THE ARCHITECT AND/OR ENGINEER

☐ **Approved** ☐ **Approved as Noted** ☐ **Not Approved**

(If not approved, please briefly explain why the product was not accepted.)

By: Date:

Remarks:

Sure-Bolt® Anchors

MIAMI-DADE COUNTY APPROVED

Sure-Bolt® Anchors

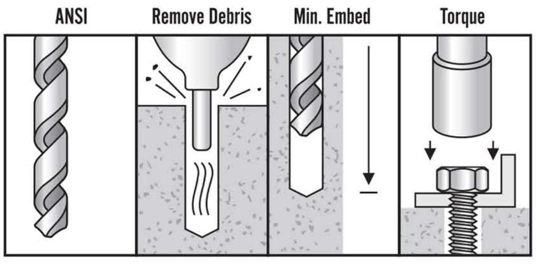
The Aerosmith® Sure Bolt® is a one-piece, heavy duty screw anchor with a finished hex head. The anchor is manufactured from carbon steel and is heat treated. The Sure-Bolt® is available in a variety of sizes from 1/4 to 3/4 inch. The hex head diameter is larger than the diameter of the anchor and is formed with serrations on the underside. The anchor can be installed in a pre-drilled hole with a powered impact wrench or a torque wrench. The anchor threads cut into concrete on the sides of the hole and interlock with the base material during the installation. Once installed they are easily identifiable by head markings with ASF on the head. Suitable base materials include normal weight concrete, and lightweight concrete. The anchor is designed for consistent and reliable performance in cracked and uncracked concrete.

Suitable for installation in CRACKED CONCRETE, UNCRACKED CONCRETE, REINFORCED CONCRETE & STONE.

Applications:

- Structural anchoring in cracked and uncracked concrete, including industrial environments
- Glazing, windows and shop windows
- Industrial racking and conveyor systems
- Installation of railings and handrails in interiors applications
- Anchoring of machinery, boilers, signs, stadium seating, facade substructures, etc.
- Anchoring through wood into concrete base materials
- Removable

Installation Instructions:



Features and Benefits:

- Quick and easy installation
- Use in cracked and uncracked concrete
- Use for medium-heavy duty loads.
- Finished hex head
- Removable
- One piece assembly
- Variety of length and diameters
- Suitable when reduced distance to edge and between anchors is required
- Mechanical interlock between concrete and thread
- For static and quasi static loads
- Can be un-installed leaving the surface clear with no obstructions

Base Material:

- Normal weight and lightweight concrete
- Reinforced concrete
- Cracked and uncracked concrete

Anchor Component Materials:

Carbon Steel Body, Zinc Plated, with a hex washer head

Performance Data:

Download PDF

Approvals:

Category 1 Cracked & Uncracked Concrete ICC-ES ESR-4414
Cracked and Uncracked Masonry ICC-ES ESR-6056
IBC Listed 2015, 2018, 2021, 2024
IRC Listed 2015, 2018, 2021, 2024
CBC 2025 Listed
LABC 2026 Listed
CRC 2025 Listed
LARC 2026 Listed
FBC Building 2020, 2023 Listed
FBC Residential 2020, 2023 Listed
Miami-Dade County Product Control Approved NOA No: 25-0829.06

ICC ES ESR-4414

Download the ESR-4414 (PDF) »

ICC ES ESR-6056

Download the ESR-6056 (PDF) »

Aerosmith® Sure-Bolt® Anchor

Miami-Dade County Product Control Approved NOA No: 25-0829.06

**Miami-Dade Approval Except for CB14114CC, CB14134CC, CB14214CC, CB14300CC

Part ID	Description	Overall Length	Diameter	ANSI Drill Diameter	Min. Embed	Max. Torque	Box Qty.	Carton Qty.
*CB14114CC**	1/4" x 1-1/4"	1-1/4"	1/4"	1/4"	1"	15 ft lbs	100	800
*CB14134CC**	1/4" x 1-3/4"	1-3/4"	1/4"	1/4"	1-5/8"	15 ft lbs	100	800
*CB14214CC**	1/4" x 2-1/4"	2-1/4"	1/4"	1/4"	1-5/8"	15 ft lbs	100	400
*CB14300CC**	1/4" x 3"	3"	1/4"	1/4"	1-5/8"	15 ft lbs	50	400
*CB38134CC	3/8" x 1-3/4"	1-3/4"	3/8"	3/8"	1-1/2"	35 ft lbs	50	200
CB38212CC	3/8" x 2-1/2"	2-1/2"	3/8"	3/8"	2-1/4"	35 ft lbs	50	200
CB38300CC	3/8" x 3"	3"	3/8"	3/8"	2-1/2"	35 ft lbs	50	200
CB38400CC	3/8" x 4"	4"	3/8"	3/8"	2-1/2"	35 ft lbs	50	200
CB38500CC	3/8" x 5"	5"	3/8"	3/8"	2-1/2"	35 ft lbs	50	200
CB38600CC	3/8" x 6"	6"	3/8"	3/8"	2-1/2"	35 ft lbs	50	200
*CB12200CC	1/2" x 2"	2"	1/2"	1/2"	1-3/4"	35 ft lbs	50	100
*CB12212CC	1/2" x 2-1/2"	2-1/2"	1/2"	1/2"	2-1/4"	45 ft lbs	50	100
CB12300CC	1/2" x 3"	3"	1/2"	1/2"	2-3/4"	45 ft lbs	50	100
CB12400CC	1/2" x 4"	4"	1/2"	1/2"	3"	45 ft lbs	50	100
CB12500CC	1/2" x 5"	5"	1/2"	1/2"	3"	45 ft lbs	25	50
CB12600CC	1/2" x 6"	6"	1/2"	1/2"	3"	45 ft lbs	25	50
CB12800CC	1/2" x 8”	8"	1/2"	1/2"	3"	45 ft lbs	20	80
*CB58300CC	5/8" x 3"	3"	5/8"	5/8"	2-3/4"	85 ft lbs	25	50
CB58400CC	5/8" x 4"	4"	5/8"	5/8"	3-1/4"	85 ft lbs	25	50
CB58500CC	5/8" x 5"	5"	5/8"	5/8"	3-1/4"	85 ft lbs	25	50
CB58600CC	5/8" x 6"	6"	5/8"	5/8"	3-1/4"	85 ft lbs	20	40
CB58800CC	5/8" x 8"	8"	5/8"	5/8"	3-1/4"	85 ft lb	20	40
CB34400CC	3/4" x 4"	4"	3/4"	3/4"	3-3/4"	115 ft lbs	20	40
CB34500CC	3/4" x 5"	5"	3/4"	3/4"	4"	115 ft lbs	15	30
CB34600CC	3/4"x 6"	6"	3/4"	3/4"	4"	115 ft lbs	10	20
CB34800CC	3/4" x 8"	8"	3/4"	3/4"	4"	115 ft lbs	10	20
CB34100CC	3/4" x 10"	10"	3/4"	3/4"	4"	115 ft lbs	10	20

*This size is less than the required minimum standard anchor length for strength design

Contact Aerosmith® HQ
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ICC EVALUATION SERVICE®

ICC-ES Evaluation Report

ESR-4414

Reissued March 2026

This report also contains:

- City of LA Supplement

Subject to renewal March 2027

- CA Supplement w/ DSA and OSHPD
- FL Supplement w/ HVHZ

DIVISION: 03 00 00—CONCRETE Section: 03 16 00—Concrete Anchors DIVISION: 05 00 00—METALS Section: 05 05 19—Post-Installed Concrete Anchors	REPORT HOLDER: AEROSMITH FASTENING SYSTEMS	EVALUATION SUBJECT: AEROSMITH SURE-BOLT® EXTREME SURE-BOLT® / SURE-BOLT® MAX SCREW ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, 2012 and 2009 *International Building Code® (IBC)*
- 2021, 2018, 2015, 2012 and 2009 *International Residential Code (IRC)*

Property evaluated:

- Structural

2.0 USES

The Aerosmith Sure-Bolt® Extreme / Sure-Bolt® screw anchors are used as anchorage to resist static, wind and seismic (Seismic Design Categories A through F) tension and shear loads in cracked and uncracked normal weight and lightweight concrete having a specified compressive strength, f'_c, of 2,500 psi to 8,500 psi (17.2 MPa to 58.6 MPa).

The Aerosmith Sure-Bolt® Max screw anchors are used as anchorage to resist static, wind and seismic tension and shear loads in normal weight and lightweight concrete 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) nominal diameter anchor is for use in uncracked concrete applications (Seismic Design Categories A and B only); the $^3/_8$ inch (9.5 mm) and $^1/_2$ inch (12.7 mm) inch nominal diameters anchors are for use in cracked and uncracked concrete applications (Design Categories A through F).

The Aerosmith Sure-Bolt® Extreme / Sure-Bolt® / Sure-Bolt® Max anchors comply with Section 1901.3 of the 2021, 2018 and 2015 IBC, Section 1909 of the 2012 IBC and Section 1912 of the 2009 IBC. The Aerosmith Sure-Bolt® Extreme / Sure-Bolt® / Sure-Bolt® Max screw anchors are an alternative to cast-in-place anchors described in Section 1901.3 of the 2021, 2018 and 2015 IBC, Section 1908 and 1909 of the 2012 IBC, and Section 1911 and 1912 of the 2009 IBC. The anchors may also be used where an engineered design is submitted in accordance with Section R301.1.3 of the IRC.

3.0 DESCRIPTION

3.1 AEROSMITH SURE-BOLT® EXTREME:

Aerosmith Sure-Bolt® Extreme screw anchors are comprised of a body with a hex washer head. The anchor is manufactured from carbon steel and is heat treated. The anchoring system is available in a variety of lengths, with nominal diameters of $^3/_8$ inch, ½ inch, $^5/_8$ inch and ¾ inch. It has an Atlantic epoxy coating in gray or blue colors. The anchors have been tested for corrosion resistance in accordance with ASTM G85-11 Annex 5 for handling purposes (e.g. storage). A typical Sure-Bolt® Extreme screw anchor is illustrated in Figure 3.

The hex head diameter is larger than the diameter of the anchor and is formed with serrations on the underside. The anchor body is formed with threads running most of the length of the anchor body. The anchor is installed in a predrilled hole with a powered impact wrench or torque wrench. The anchor threads cut into the concrete on the sides of the hole and interlock with the base material during the installation.

3.2 AEROSMITH SURE-BOLT®:

Aerosmith Sure-Bolt® screw anchors are comprised of a body with hex washer head. The anchor is manufactured from carbon steel and is heat-treated. The anchoring system is available in a variety of lengths, with nominal diameters of $^3/_8$ inch, ½ inch, $^5/_8$ inch and ¾ inch. It has a minimum of 0.0002-inch-thick (5 µm) zinc coating according to ASTM B633 type SC1, class III. A typical Sure-Bolt® screw anchor is illustrated in Figure 3.

The hex head diameter is larger than the diameter of the anchor and is formed with serrations on the underside. The anchor body is formed with threads running most of the length of the anchor body. The anchor is installed in a predrilled hole with a powered impact wrench or torque wrench. The anchor threads cut into the concrete on the sides of the hole and interlock with the base material during the installation.

3.3 AEROSMITH SURE-BOLT® MAX:

Aerosmith Sure-Bolt® Max screw anchors are comprised of a body with a hex washer head. The anchor is manufactured from stainless steel with carbon steel on the tip. The anchoring system is available in a variety of lengths, with nominal diameters of ¼ inch (6.4 mm), $^3/_8$ inch (9.5 mm) and ½ inch (12.7 mm). A typical Sure-Bolt® Max screw anchor is illustrated in Figure 3.

The hex head diameter is larger than the diameter of the anchor and is formed with serrations on the underside. The anchor body is formed with threads running most of the length of the anchor body. The anchor is installed in a predrilled hole with a powered impact wrench or torque wrench. The anchor threads cut into the concrete on the sides of the hole and interlock with the base material during the installation.

3.4 Concrete:

Normal weight and lightweight concrete must conform to Sections 1903 and 1905 of the IBC, as applicable.

4.0 DESIGN AND INSTALLATION

4.1 Strength Design:

4.1.1 General: Design strength of anchors complying with the 2021 IBC, as well as Section R301.1.3 of the 2021 IRC must be determined in accordance with ACI 318-19 Chapter 17 and this report.

Design strength of anchors complying with the 2018 and 2015 IBC, as well as Section R301.1.3 of the 2018 and 2015 IRC must be determined in accordance with ACI 318-14 Chapter 17 and this report.

Design strength of anchors complying with the 2012 IBC, as well as Section R301.1.3 of the 2012 IRC, must be in accordance with ACI 318-11 Appendix D and this report.

Design strength of anchors complying with the 2009 IBC as well as Section R301.1.3 of the 2009 IRC must be in accordance with ACI 318-08 Appendix D and this report.

Design parameters are based on the 2021 IBC (ACI 318-19), 2018 and 2015 IBC (ACI 318-14) and the 2012 IBC (ACI 318-11) unless noted otherwise in Sections 4.1.1 through 4.1.12 of this report.

The strength design of anchors must comply with ACI 318-19 17.5.1.2, ACI 318-14 17.3.1 or ACI 318-11 D.4.1, as applicable, except as required in ACI 318-19 17.10, ACI 318-14 17.2.3 or ACI 318-11 D.3.3, as applicable. Strength reduction factors, ϕ, as given in ACI 318-19 17.5.3, ACI 318-14 17.3.3 or ACI 318-11 D.4.3, as applicable, and noted in Table 3 and Table 4 of this report, must be used for load combinations calculated in accordance with Section 1605.1 of the 2021 IBC, 1605.2 of the IBC and Section 5.3 of ACI 318 (-19 and -14) or Section 9.2 of ACI 318-11, as applicable. Strength reduction factors, ϕ, as given in ACI 318-11 D.4.4 must be used for load combinations calculated in accordance with ACI 318-11 Appendix C.

The value of f'_c used in the calculations must be limited to a maximum of 8,000 psi (55.2 MPa), in accordance with ACI 318-19 17.3.1, ACI 318-14 17.2.7 or ACI 318-11 D.3.7, as applicable.

4.1.2 Requirements for Static Steel Strength in Tension, N_{sa}: The nominal static steel strength in tension must be calculated in accordance with ACI 318-19 17.6.1.2, ACI 318-14 17.4.1.2 or ACI 318-11 D.5.1.2, as applicable. The values for N_{sa} are given in Table 3 and Table 4 of this report. Strength reduction factors, ϕ, corresponding to brittle steel elements may be used for all Sure-Bolt® Extreme / Sure-Bolt® screw anchors as described in Table 3

Strength reduction factors, ϕ, corresponding to ductile steel elements may be used for Sure-Bolt® Max anchors, as described in Table 4.

4.1.3 Requirements for Static Concrete Breakout Strength in Tension, N_{cb} and N_{cbg}: The nominal concrete breakout strength of a single anchor or group of anchors in tension, N_{cb} and N_{cbg}, respectively, must be calculated in accordance with ACI 318-19 17.6.2, ACI 318-14 17.4.2 or ACI 318-11 D.5.2, as applicable, with modifications as described in this section. The basic concrete breakout strength of a single anchor in tension, N_b, must be calculated in accordance with ACI 318-19 17.6.2.2, 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 3 and Table 4 of this report. The nominal concrete breakout strength in tension, in regions where analysis indicates no cracking in accordance with ACI 318-19 17.6.2.5.1, ACI 318-14 17.4.2.6 or ACI 318-11 D.5.2.6, as applicable, must be calculated with the value of $\psi_{c,N}$ = 1.0 and using the value of k_{uncr} as given in Table 3 and Table 4 of this report.

4.1.4 Requirements for Static Pullout Strength in Tension, N_p: The nominal pullout strength of a single anchor, in accordance with ACI 318-19 17.6.3.1 and 17.6.3.2.1, ACI 318-14 17.4.3.1 and 17.4.3.2 or ACI 318-11 D.5.3.1 and D.5.3.2, as applicable, in cracked and uncracked concrete, $N_{p,cr}$ and $N_{p,uncr}$, respectively, is given in Table 3 and Table 4 of this report. In lieu of ACI 318-19 17.6.3.3, ACI 318-14 17.4.3.6 or ACI 318-11 D.5.3.6, as applicable, $\psi_{c,P}$ = 1.0 for all design cases. In accordance with ACI 318-19 17.6.3, ACI 318-14 17.4.3.2 or ACI 318-11 D.5.3.2, as applicable, the nominal pullout strength in cracked concrete must be adjusted by calculation according to the following equation:

$$N_{p,f'c} = N_{p,cr}\left(\frac{f'_c}{2{,}500}\right)^n \quad \text{(lb, psi)} \quad \text{(Eq-1)}$$

$$N_{p,f'c} = N_{p,cr}\left(\frac{f'_c}{17.2}\right)^n \quad \text{(N, MPa)}$$

In regions where analysis indicates no cracking in accordance with ACI 318-19 17.6.3.3, ACI 318-14 17.4.3.6 or ACI 318-11 D.5.3.6, as applicable, the nominal pullout strength in tension must be calculated according to the following equation:

$$N_{p,f'c} = N_{p,uncr}\left(\frac{f'_c}{2{,}500}\right)^n \quad \text{(lb, psi)} \quad \text{(Eq-2)}$$

$$N_{p,f'c} = N_{p,uncr}\left(\frac{f'_c}{17.2}\right)^n \quad \text{(N, MPa)}$$

n = normalization exponent given in Table 3 and Table 4.

Where values for $N_{p,cr}$ or $N_{p,uncr}$ are not provided in Table 3 and Table 4, the pullout strength in tension need not be evaluated.

4.1.5 Requirements for Static Steel Strength in Shear, V_{sa}: The nominal steel strength in shear, V_{sa}, in accordance with ACI 318-19 17.7.1.2, ACI 318-14 17.5.1.2 or ACI 318-11 D.6.1.2, as applicable, is given in Table 3 and Table 4 of this report and must be used in lieu of the value derived by calculation from ACI 318-19 17.7.1.2b, ACI 318-14 Eq 17.5.1.2b or ACI 318-11 Eq D-29, as applicable. Strength reduction factors, ϕ, corresponding to brittle steel elements may be used for the Sure-Bolt® Extreme / Sure-Bolt® screw anchors, as described in Table 3.

Strength reduction factors, ϕ, corresponding to ductile steel elements may be used for Sure-Bolt® Max anchors, as described in Table 4.

4.1.6 Requirements for Static Concrete Breakout Strength in Shear, V_{cb} or V_{cbg}: The nominal concrete breakout strength in shear of a single anchor or group of anchors, V_{cb} or V_{cbg}, respectively, must be calculated in accordance with ACI 318-19 17.7.2, ACI 318-14 17.5.2 or ACI 318-11 D.6.2, as applicable, with modifications as provided in this section. The basic concrete breakout strength of a single anchor in shear, V_b, must be calculated in accordance with ACI 318-19 17.7.2.2.1, ACI 318-14 17.5.2.2 or ACI 318-11 D.6.2.2, as applicable, using values of l_e and d_o given in Table 3 and Table 4 of this report.

4.1.7 Requirements for Static Concrete Pryout Strength in Shear, V_{cp} or V_{cpg}: The nominal static concrete pryout strength of a single anchor or group of anchors in shear, V_{cp} or V_{cpg}, respectively, must be calculated in accordance with ACI 318-19 17.7.3, ACI 318-14 17.5.3 or ACI 318-11 D.6.3, as applicable, modified by using the value of k_{cp} provided in Table 3 and Table 4 of this report and the value of N_{cb} or N_{cbg} as calculated in accordance with Section 4.1.3 of this report.

4.1.8 Requirements for Seismic Design:

4.1.8.1 General: For load combinations including seismic, the design must be performed in accordance with ACI 318-19 17.10, ACI 318-14 17.2.3 or ACI 318-11 D.3.3, as applicable. Modifications to ACI 318-19 17.10, ACI 318-14 17.2.3 shall be applied under Section 1905.1.8 of the 2021, 2018 and 2015 IBC. For the 2012 IBC, Section 1905.1.9 shall be omitted. Modifications to ACI 318 (-08, -05) D.3.3 shall be applied under Section 1908.1.9 of the 2009 IBC, as applicable.

4.1.8.2 Seismic Tension: The nominal steel strength and the nominal concrete breakout strength for anchors in tension must be calculated in accordance with ACI 318-19 17.6.1 and 17.6.2, ACI 318-14 17.4.1 and 17.4.2 or ACI 318-11 D.5.1 and D.5.2, respectively, as applicable, as described in Sections 4.1.2 and 4.1.3 of this report. In accordance with ACI 318-19 17.6.3.2.1, ACI 318-14 17.4.3.2 or ACI 318-11 D.5.3.2, as applicable, the appropriate value for pullout strength in tension for seismic loads, $N_{p,eq}$ may be adjusted by calculation for concrete strength in accordance with Eq-1 and section 4.1.4 whereby the value of $N_{p,cr}$ must be substituted with $N_{p,eq}$.

4.1.8.3 Seismic Shear: The nominal concrete breakout strength and pryout strength for anchors in shear must be calculated according to ACI 318-19 17.7.2 and 17.7.3, ACI 318-14 17.5.2 and 17.5.3 or ACI 318-11 D.6.2 and D.6.3, respectively, as applicable, as described in Sections 4.1.6 and 4.1.7 of this report. In accordance with ACI 318-19 17.7.1.2, ACI 318-14 17.5.1.2 or ACI 318-11 D.6.1.2, as applicable, the appropriate value for nominal steel strength for seismic loads, $V_{sa,eq}$, described in Table 3 and Table 4, must be used in lieu of V_{sa}.

4.1.9 Requirements for Interaction of Tensile and Shear Forces: For anchors or groups of anchors that are subject to the effects of combined tensile and shear forces, the design must be performed in accordance with ACI 318-19 17.8, ACI 318-14 17.6 or ACI 318-11 D.7, as applicable.

4.1.10 Requirements for Critical Edge Distance: 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 according to ACI 318-19 17.6.2, ACI 318-14 17.4.2 or ACI 318-11 D.5.2, as applicable, must be further multiplied by factor $\psi_{cp,N}$ as given by the following equation:

$$\psi_{cp,N} = \frac{c}{c_{ac}} \qquad \text{(Eq-3)}$$

where 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 318-19 17.9.5, ACI 318-14 17.7.6 or ACI 318-11 D.8.6, as applicable, values for the critical edge distance c_{ac} must be taken from Table 1 and Table 2 of this report.

4.1.11 Requirements for Minimum Member Thickness, Minimum Anchor Spacing and Minimum Edge Distance: In lieu of ACI 318-19 17.9.2, ACI 318-14 17.7.1 and 17.7.3 or ACI 318-11 D.8.1 and D.8.3, respectively, as applicable, values of s_{min} and c_{min} as given in Table 1 and Table 2 of this report must be used. In lieu of ACI 318-19 17.9.4, ACI 318-14 17.7.5 or ACI 318-11 D.8.5, as applicable, minimum member thickness h_{min} as given in Table 1 and Table 2 of this report must be used.

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 $\sqrt{f'_c}$ affecting N_n and V_n.

For ACI 318-19 (2021 IBC), 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.

4.2 Allowable Stress Design (ASD):

4.2.1 General: Design values for use with allowable stress design load combinations calculated in accordance with Section 1605.1 of the 2021 IBC or Section 1605.3 of the IBC shall be established as follows:

$$T_{allowable,ASD} = \frac{\phi N_n}{\alpha} \qquad \text{(Eq-4)}$$

$$V_{allowable,ASD} = \frac{\phi V_n}{\alpha} \qquad \text{(Eq-5)}$$

where,

$T_{allowable,ASD}$ = Allowable tension load (lbf or kN)

$V_{allowable,ASD}$ = Allowable shear load (lbf or kN)

ϕN_n = Lowest design strength of an anchor or anchor group in tension as determined in accordance with ACI 318 (-19 and -14) Chapter 17 or ACI 318 (-11 and -08) Appendix D, as applicable, and 2021, 2018 and 2015 IBC Section 1905.1.8, 2009 IBC Section 1908.1.9 and Section 4.1 of this report, as applicable (lbf or kN). For the 2012 IBC, Section 1905.1.9 shall be omitted.

ϕV_n =Lowest design strength of an anchor or anchor group in shear as determined in accordance with ACI 318 (-19 and -14) Chapter 17 or ACI 318 (-11 and -08) Appendix D, as applicable, and 2021, 2018 and 2015 IBC Section 1905.1.8, 2009 IBC Section 1908.1.9 and Section 4.1 of this report, as applicable (lbf or kN). For the 2012 IBC, Section 1905.1.9 shall be omitted.

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

The requirements for member thickness, edge distance and spacing, described in this report, must apply. An example of allowable stress design values for illustrative purposes is shown in Table 5.

4.2.2 Requirements for Interaction of Tensile and Shear Forces: The interaction must be calculated and consistent with ACI 318-19 17.8, ACI 318-14 17.6 or ACI 318 (-11 and -08) D.7, as applicable, as follows:

For shear loads Vapplied ≤ 0.2Vallowable,ASD, the full allowable load in tension Tallowable,ASD may be taken.

For tension loads $T_{applied} \le 0.2T_{allowable,ASD}$, the full allowable load in shear $V_{allowable,ASD}$ may be taken.

For all other cases:

$$\frac{T_{applied}}{T_{allowable,ASD}} + \frac{V_{applied}}{V_{allowable,ASD}} \le 1.2 \qquad \text{(Eq-6)}$$

4.3 Installation:

Installation parameters are provided in Table 1 and Table 2 and in Figures 1 and 2 of this report. Anchors must be installed per the manufacturer's published instructions and this report. In case of conflict, this report governs. Anchor locations must comply with this report and the plans and specifications approved by the code official. Anchors must be installed in holes drilled into concrete using carbide-tipped drill bits complying with ANSI B212.15-1994. The nominal drill diameter must be equal to the nominal diameter of the anchor. Prior to anchor installation, the hole must be cleaned in accordance with the manufacturer's published installation instructions. The minimum drilled hole depth h_{hole} is given in Table 1 and Table 2. The anchor must be installed into the predrilled hole using a powered impact wrench or installed with a torque wrench until the proper nominal embedment depth is obtained. The maximum impact installation wrench torque, $T_{impact,max}$, and maximum installation torque, $T_{inst.max}$ for the manual torque wrench must be in accordance with Table 1 and Table 2.

Sure-Bolt® Extreme / Sure-Bolt® / Sure-Bolt® Max screw anchors are permitted to be loosened by a maximum of one full turn and retightened with a torque wrench or a powered impact wrench to facilitate fixture attachment or realignment. Complete removal and reinstallation of the anchor is not allowed.

4.4 Special Inspection:

Periodic special inspection is required, in accordance with Section 1705.1.1 and Table 1705.3 of the 2021, 2018, 2015 or 2012 IBC, or section 1704.15 and Table 1704.4 of the 2009 IBC, as applicable. The special inspector must make periodic inspections during anchor installation to verify anchor type, anchor dimensions, concrete type, concrete compressive strength, hole dimensions, anchor spacing, edge distances, concrete thickness, anchor embedment, installation torque, maximum impact wrench torque rating and adherence to the manufacturer's published installation instructions. The special inspector must 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 must be observed, where applicable.

5.0 CONDITIONS OF USE:

The Aerosmith Sure-Bolt® Extreme / Sure-Bolt® / Sure-Bolt® Max screw anchors described in this report comply with, or are a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Anchor sizes, dimensions and minimum embedment depths are as set forth in the tables of this report.

5.2 The anchors must be installed in accordance with the manufacturer's published installation instructions and this report, in cracked and uncracked normal weight 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). In case of conflict between this report and the manufacturer's instructions, this report governs.

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

5.4 The concrete shall have attained its minimum design strength prior to installation of the anchors.

5.5 Strength design values are established in accordance with Section 4.1 of this report.

5.6 Allowable stress design values are established in accordance with Section 4.2 of this report.

5.7 Anchor spacing and edge distance as well as minimum member thickness must comply with Table 1 and Table 2 of this report.

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

5.9 Since an ICC-ES acceptance criteria for evaluating data to determine the performance of anchors subjected to fatigue or shock load is unavailable at this time, the use of these anchors under such conditions is beyond the scope of this report.

5.10 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.

5.11 Sure-Bolt® Extreme / Sure-Bolt® anchors may be used to resist short-term loading due to wind or seismic forces in locations designated as Seismic Design Categories A through F under the IBC, subject to the conditions of this report.

5.12 Sure-Bolt® Max anchors may be used to resist short-term loading due to wind or seismic forces in locations designated as Seismic Design Categories A through F (Sure-Bolt® Max ¼ inch (6.4 mm) nominal diameter anchor Seismic Design Categories A and B only), under the IBC subject to the conditions of this report.

5.13 Anchors are not permitted to support fire-resistance-rated construction. Where not otherwise prohibited by the code, anchors are permitted for installation in fire-resistance-rated construction provided that at least one of the following conditions is fulfilled:

- Anchors are used to resist wind or seismic forces only.
- Anchors that support gravity load-bearing structural elements are within a fire-resistance-rated envelope or a fire-resistance-rated membrane, are protected by approved fire-resistance-rated 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 Sure-Bolt® Extreme / Sure-Bolt® carbon steel anchors is limited to dry, interior locations.

5.15 Use of Sure-Bolt® Max stainless steel anchors made of stainless steel as specified in this report are permitted for exterior exposure or damp environments.

5.16 Use of Sure-Bolt® Max stainless steel anchors made of stainless steel as specified in this report are permitted for contact with preservative-treated and fire-retardant-treated wood.

5.17 Anchors have been evaluated for reliability against brittle fracture and found not to be significantly sensitive to stress-induced hydrogen embrittlement.

5.18 Special inspection must be provided in accordance with Section 4.4 of this report.

5.19 Anchors are manufactured under an approved quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Mechanical Anchors in Concrete Elements (AC193), dated October 2017 (editorially revised December 2020), which incorporates requirements in ACI 355.2(-19 and -07), for use in cracked and uncracked concrete.

6.2 Data in accordance with ASTM G85-11 Annex 5 for corrosion resistance.

6.3 Quality control documentation.

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-4414) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.

7.2 In addition, the anchors are identified by packaging labeled with the evaluation report holder's name (Aerosmith Fastening Systems) and address, anchor name, and anchor size. The anchors have the size (diameter x length, in inches) and letters "afs" stamped on the head of each screw anchor.

7.3 The report holder's contact information is the following:

AEROSMITH FASTENING SYSTEMS
5621 DIVIDEND ROAD
INDIANAPOLIS, INDIANA 46241
(317) 243-5959
www.aerosmithfastening.com
contact@aerosmithfastening.com

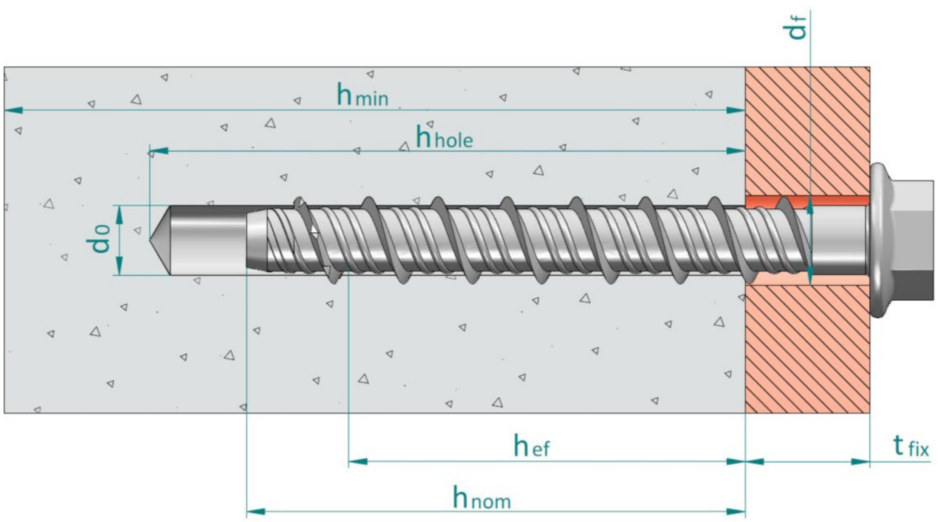


FIGURE 1—ANCHOR DIMENSIONS

TABLE 1—SURE-BOLT® EXTREME/ SURE-BOLT® ANCHOR INSTALLATION PARAMETERS[1]

Characteristic	Symbol	Unit	Nominal Anchor Diameter									
			¼"		3/8"		1/2"		5/8"		3/4"	
Drill Bit Diameter	d_o	in (mm)	1/4 (6.4)	1/4 (6.4)	3/8 (9.5)	3/8 (9.5)	1/2 (12.7)	1/2 (12.7)	5/8 (15.9)	5/8 (15.9)	3/4 (19.1)	3/4 (19.1)
Nominal Embedment Depth	h_{nom}	in (mm)	1 5/8 (41)	2 ½ (64)	2 ½ (64)	3 ¼ (83)	3 (76)	4 ¼ (108)	3 ¼ (83)	5 (127)	4 (102)	6 ¼ (159)
Effective Embedment Depth	h_{ef}	in (mm)	1.23 (31)	1.98 (50)	1.85 (47)	2.49 (63)	2.21 (56)	3.27 (83)	2.36 (60)	3.85 (98)	2.97 (75)	4.89 (124)
Minimum Hole Depth	h_{hole}	in (mm)	2 (51)	2 7/8 (73)	2 ¾ (70)	3 ½ (89)	3 3/8 (86)	4 5/8 (117)	3 5/8 (92)	5 3/8 (137)	4 3/8 (111)	6 5/8 (168)
Fixture Hole Diameter	d_f	in (mm)	3/8 (9.5)		½ (12.7)		5/8 (15.9)		¾ (19.1)		7/8 (22.2)	
Maximum Installation Torque	$T_{inst,max}$	ft.lb (Nm)	15 (20)	24 (33)	35 (47)	50 (68)	45 (61)	65 (88)	85 (115)	100 (136)	115 (156)	150 (203)
Maximum impact wrench torque rating	$T_{impact.max}$	ft lb (Nm)	150 (203)	150 (203)	380 (515)	380 (515)	380 (515)	380 (515)	380 (515)	380 (515)	380 (515)	380 (515)
Minimum Concrete Thickness	h_{min}	in (mm)	3 ¼ (83)	4 (102)	4 (102)	4 ¾ (121)	4 ¾ (121)	6 ¾ (171)	5 (127)	7 (178)	6 (152)	8 1/8 (206)
Critical Edge Distance	c_{ac}	in (mm)	2 ½ (64)	3 (76)	4 (102)	5 (127)	4 ½ (114)	5 (127)	3 ¾ (95)	7 (178)	4 ½ (114)	8 (203)
Minimum Edge Distance (c_{min})	c_{min}	in (mm)	1 ½ (38)	2 (51)	1 ½ (38)	1 ½ (38)	1 ¾ (44)	1 ¾ (44)	1 ¾ (44)	1 ¾ (44)	1 ¾ (44)	1 ¾ (44)
Minimum Spacing (s_{min})	s_{min}	in (mm)	3 (76)	3 (76)	3 (76)	3 (76)	3 (76)	3 (76)	4 (102)	4 (102)	4 (102)	4 (102)
Minimum Overall Anchor Length	l_{anch}	in (mm)	1 ¾ (44)	2 5/8 (67)	2 ¾ (70)	3 ½ (89)	3 ¼ (82)	4 ½ (114)	3 ½ (89)	5 ¼ (133)	4 ¼ (108)	6 ½ (165)
Torque Wrench Socket Size	-	in	7/16		9/16		3/4		15/16		1 1/8	
Maximum Fixture Thickness[2]	t_{fix}	in (mm)	L – 1 5/8 (L-41)	L – 2½ (L-64)	L – 2½ (L-64)	L–3 ¼ (L-.83)	L-3 (L-76)	L-4 ¼ (L-108)	L-3 ¼ (L-83)	L-5 (L-127)	L-4 (L-102)	L-6 ¼ (L-159)

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. L = total anchor length

TABLE 2—SURE-BOLT® MAX ANCHOR INSTALLATION PARAMETERS[1]

Characteristic	Symbol	Unit	Nominal Anchor Diameter					
			¼"		3/8"		1/2"	
Drill Bit Diameter	d_o	in (mm)	1/4 (6.4)	1/4 (6.4)	3/8 (9.5)	3/8 (9.5)	1/2 (12.7)	1/2 (12.7)
Nominal Embedment Depth	h_{nom}	in (mm)	2 (51)	3 (76)	2 3/4 (70)	4 (102)	3 (76)	5 (127)
Effective Embedment Depth	h_{ef}	in (mm)	1.16 (29)	2.01 (51)	1.49 (38)	2.56 (65)	1.60 (41)	3.30 (84)
Minimum Hole Depth	h_{hole}	in (mm)	2 3/8 (60)	3 3/8 (86)	3 (76)	4 1/4 (108)	3 3/8 (86)	5 3/8 (137)
Fixture Hole Diameter	d_f	in (mm)	3/8 (9.5)		½ (12.7)		5/8 (15.9)	
Maximum Installation Torque	$T_{inst,max}$	ft.lb (Nm)	10 (14)	10 (14)	35 (47)	35 (47)	35 (47)	35 (47)
Maximum impact wrench torque rating	$T_{impact.max}$	ft lb (Nm)	100 (136)	100 (136)	157 (213)	157 (213)	157 (213)	157 (213)
Minimum Concrete Thickness	h_{min}	in (mm)	3 1/4 (83)	4 (102)	4 (102)	4 3/4 (121)	4 3/4 (121)	6 3/4 (171)
Critical Edge Distance	c_{ac}	in (mm)	2 1/2 (64)	3 (76)	4 (102)	5 1/2 (140)	4 1/2 (114)	6 1/2 (165)
Minimum Edge Distance (c_{min})	c_{min}	in (mm)	1 3/4 (44)	2 (51)	1 1/2 (38)	1 1/2 (38)	1 3/4 (44)	1 3/4 (44)
Minimum Spacing (s_{min})	s_{min}	in (mm)	3 (76)	3 (76)	3 (76)	3 (76)	3 (76)	3 (76)
Minimum Overall Anchor Length	l_{anch}	in (mm)	2 1/8 (54)	3 1/8 (79)	3 (76)	4 1/4 (108)	3 1/4 (83)	5 1/4 (133)
Torque Wrench Socket Size	-	in	7/16		9/16		3/4	
Maximum Fixture Thickness[2]	t_{fix}	in (mm)	L – 2 (L-51)	L – 3 (L-76)	L – 2 3/4 (L-70)	L – 4 (L-102)	L – 3 (L-76)	L – 5 (L-127)

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. L = total anchor length

TABLE 3— SURE-BOLT® EXTREME/ SURE-BOLT® ANCHOR DESIGN INFORMATION[1,2]

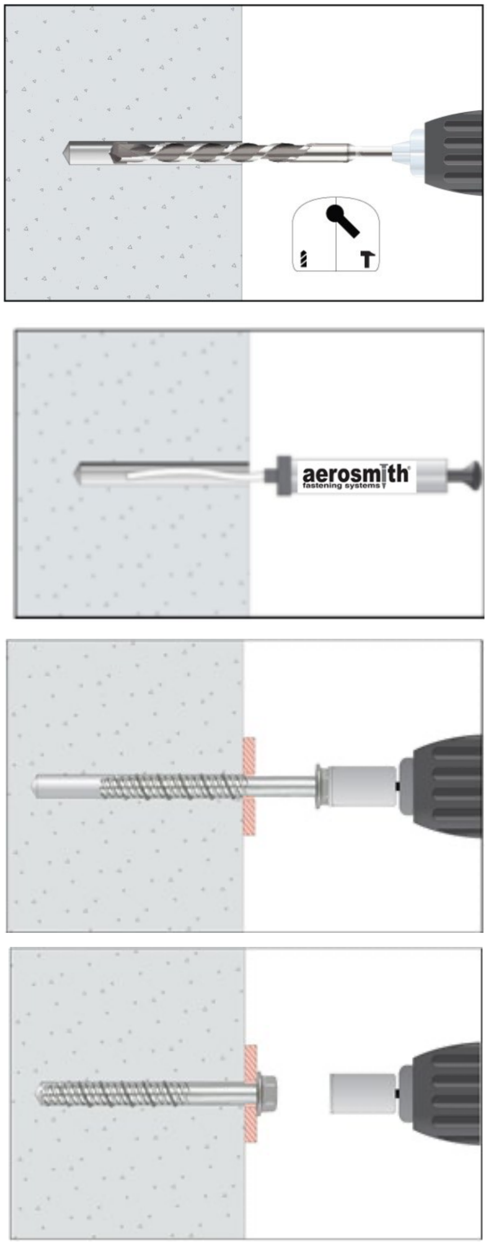
Characteristic	Symbol	Unit	Nominal Anchor Diameter									
			$^1/_4$"		$^3/_8$"		$^1/_2$"		$^5/_8$"		$^3/_4$"	
Nominal Embedment Depth	h_{nom}	in (mm)	1 $^5/_8$ (41)	2 ½ (64)	2 ½ (64)	3 ¼ (83)	3 (76)	4 ¼ (108)	3 ¼ (83)	5 (127)	4 (102)	6 ¼ (159)
Anchor Category	1, 2 or 3	-	2		1							
Steel Strength in Tension and Shear												
Minimum specified ultimate strength	f_{uta}	psi (N/mm^2)	110,000 (758)		111,000 (765)		107,000 (738)		102,000 (703)		99,000 (683)	
Minimum specified yield strength	f_y	psi (N/mm^2)	88,000 (607)		88,800 (612)		85,600 (590)		81,600 (563)		79,200 (546)	
Effective stress area (screw anchor body)	A_{se}	in^2 (mm^2)	0.0438 (28.3)		0.0943 (60.8)		0.1768 (114.1)		0.2703 (174.4)		0.3988 (257.3)	
Steel Strength in Tension	N_{sa}	lb (kN)	4,820 (21.4)		10,465 (46.6)		18,920 (84.1)		27,570 (122.6)		39,480 (175.6)	
Strength Reduction Factor for Steel Failure in Tension	ϕ_{sa}	-	0.65									
Steel Strength in Shear	V_{sa}	lb (kN)	1,555 (6.9)	2,740 (12.2)	4,815 (21.4)	4,850 (21.6)	7,270 (32.3)	9,370 (41.7)	10,300 (45.8)	12,735 (56.7)	14,240 (63.3)	14,240 (63.3)
Steel Strength in Shear, Seismic	$V_{sa,eq}$	lb (kN)	1,555 (6.9)	2,495 (11.1)	4,075 (18.1)	4,075 (18.1)	5,075 (22.6)	7,140 (31.8)	8,030 (35.7)	10,300 (45.8)	12,105 (53.9)	12,105 (53.9)
Strength Reduction Factor for Steel Failure in Shear	ϕ_{sa}	-	0.60									
Pullout Strength in Tension[3]												
Pullout Strength in Uncracked Concrete	$N_{p,uncr}$	lb (kN)	1,600 (7.1)	3,345 (14.9)	-	-	-	-	-	-	-	-
Pullout Strength in Cracked Concrete	$N_{p,cr}$	lb (kN)	730 (3.3)	1,330 (5.9)	-	-	3,225 (14.3)	-	-	-	-	-
Pullout Strength in Cracked Concrete, Seismic	$N_{p,eq}$	lb (kN)	730 (3.3)	1,330 (5.9)	-	-	3,225 (14.3)	-	-	-	-	-
Normalization Exponent, Uncracked Concrete	n	-	0.42	0.37	-	-	0.50	-	-	-	-	-
Normalization Exponent, Cracked Concrete	n	-	0.39	0.50	-	-	0.35	-	-	-	-	-
Strength Reduction Factor for Pullout Strength in Tension	ϕ_p	-	0.55		0.65							
Concrete Breakout Strength in Tension												
Effective embedment	h_{ef}	in (mm)	1.23 (31)	1.98 (50)	1.85 (47)	2.49 (63)	2.21 (56)	3.27 (83)	2.36 (60)	3.85 (98)	2.97 (75)	4.89 (124)
Effectiveness Factor for Uncracked Concrete	k_{uncr}	-	24		27			24				
Effectiveness Factor for Cracked Concrete	k_{cr}	-	17				21	17				
Strength Reduction Factor for Concrete Breakout Strength in Tension	ϕ_{cb}	-	0.55		0.65							
Axial stiffness in service load range in uncracked concrete	β_{uncr}	lb/inch (N/mm)	214,520 (37,570)	178,090 (31,190)	63,150 (11,059)	207,850 (36,400)	139,250 (24,386)	140,060 (24,528)	222,870 (39,031)	254,980 (44,653)	292,630 (51,247)	305,530 (53,506)
Axial stiffness in service load range in cracked concrete	β_{cr}	lb/inch (N/mm)	186,270 (32,620)	178,950 (31,340)	63,150 (11,059)	174,020 (30,476)	130,385 (22,834)	140,060 (24,528)	105,130 (18,411)	192,280 (33,673)	160,050 (28,029)	165,525 (28,968)
Concrete Breakout Strength in Shear												
Nominal Diameter	d_o[2]	in (mm)	1/4 (6.4)	1/4 (6.4)	3/8 (9.5)	3/8 (9.5)	1/2 (12.7)	1/2 (12.7)	5/8 (15.9)	5/8 (15.9)	3/4 (19.1)	3/4 (19.1)
Load Bearing Length of Anchor	l_e	in (mm)	1.23 (31)	1.98 (50)	1.85 (47)	2.49 (63)	2.21 (56)	3.27 (83)	2.36 (60)	3.85 (98)	2.97 75)	4.89 (124)
Reduction Factor for Concrete Breakout Strength in Shear	ϕ_{cb}	-	0.70									
Concrete Pryout Strength in Shear												
Coefficient for Pryout Strength	k_{cp}	-	1.0					2.0	1.0	2.0		
Reduction Factor for Pryout Strength in Shear	ϕ_{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. All values of ϕ were determined from the load combinations of Section 1605.1 of the 2021 IBC, Section 1605.2 of the 2018, 2015, 2012, or 2009 IBC, ACI 318(-19 and -14) Section 5.3 or ACI 318-11 Section 9.2, as applicable. If the load combinations of ACI 318-11 Appendix C are used, then the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4. For reinforcement that meets ACI 318(-19 and -14) Chapter 17 or ACI 318 Appendix D, as applicable, requirements for Condition A, see ACI 318-19 17.5.3, ACI 318-14 17.3.3 or ACI 318-11 D.4.3, as applicable, for the appropriate ϕ factor when the load combinations of Section 1605.1 of the 2021 IBC, Section 1605.2 of the 2018, 2015, 2012 or 2009 IBC , ACI 318 (-19 and -14) Section 5.3 or ACI 318-11 Section 9.2, as applicable, are used.
3. Where no value is reported for pullout strength, this resistance does not need to be considered.

TABLE 4—SURE-BOLT® MAX ANCHOR DESIGN INFORMATION[1,2]

Characteristic	Symbol	Unit	Nominal Anchor Diameter					
			1/4"		3/8"		1/2"	
Nominal Embedment Depth	h_{nom}	in (mm)	2 (51)	3 (76)	2 3/4 (70)	4 (102)	3 (76)	5 (127)
Anchor Category	1, 2 or 3	-	2		2	1	2	1
Steel Strength in Tension and Shear								
Minimum specified ultimate strength	f_{uta}	psi (N/mm^2)	107,328 (740)		107,328 (740)		104,427 (720)	
Minimum specified yield strength	f_y	psi (N/mm^2)	85,862 (592)		85,862 (592)		83,542 (576)	
Effective stress area (screw anchor body)	A_{se}	in^2 (mm^2)	0.0398 (25.7)		0.0904 (58.3)		0.1709 (110.3)	
Steel Strength in Tension	N_{sa}	lb (kN)	4,272 (19.0)		9,702 (43.2)		17,847 (79.4)	
Strength Reduction Factor for Steel Failure in Tension	ϕ_{sa}	-	0.75					
Steel Strength in Shear	V_{sa}	lb (kN)	1,501 (6.68)	2,473 (11.00)	2,824 (12.56)	5,701 (25.36)	4,632 (20.26)	10,161 (45.20)
Steel Strength in Shear, Seismic	$V_{sa,eq}$	lb (kN)	-	-	2,824 (12.56)		4,004 (17.81)	
Strength Reduction Factor for Steel Failure in Shear	ϕ_{sa}	-	0.65					
Pullout Strength in Tension[3]								
Pullout Strength in Uncracked Concrete	$N_{p,uncr}$	lb (kN)	733 (3.26)	2,620 (11.65)	1,895 (8.43)	4,321 (19.22)	2,301 (10.23)	6,541 (29.10)
Pullout Strength in Cracked Concrete	$N_{p,cr}$	lb (kN)	-	-	1,247 (5.55)	-	-	4,913 (21.86)
Pullout Strength in Cracked Concrete, Seismic	$N_{p,eq}$	lb (kN)	-	-	1,247 (5.55)	-	-	4,422 (19.67)
Normalization Exponent, Uncracked Concrete	n	-	0.49	0.32	0.39	0.29	0.43	0.38
Normalization Exponent, Cracked Concrete	n	-	-	-	0.49	0.50	0.50	0.43
Strength Reduction Factor for Pullout Strength in Tension	ϕ_p	-	0.55		0.55	0.65	0.55	0.65
Concrete Breakout Strength in Tension								
Effective embedment	h_{ef}	in (mm)	1.16 (29)	2.01 (51)	1.49 (38)	2.56 (65)	1.60 (41)	3.30 (84)
Effectiveness Factor for Uncracked Concrete	k_{uncr}	-	24		24			
Effectiveness Factor for Cracked Concrete	k_{cr}	-	-		17			
Strength Reduction Factor for Concrete Breakout Strength in Tension	ϕ_{cb}	-	0.55		0.55	0.65	0.55	0.65
Axial stiffness in service load range in uncracked concrete	β_{uncr}	lb/inch (N/mm)	20,697 (3,625)	62,330 (10,916)	46,722 (8,182)	84,144 (14,736)	48,782 (8,543)	136,727 (23,944)
Axial stiffness in service load range in cracked concrete	β_{cr}	lb/inch (N/mm)	-		49,689 (8,702)	72,339 (12,669)	45,342 (7,941)	105,244 (18,431)
Concrete Breakout Strength in Shear								
Nominal Diameter	d_o[2]	in (mm)	1/4 (6.4)	1/4 (6.4)	3/8 (9.5)	3/8 (9.5)	1/2 (12.7)	1/2 (12.7)
Load Bearing Length of Anchor	l_e	in (mm)	1.16 (29)	2.01 (51)	1.49 (38)	2.56 (65)	1.60 (41)	3.30 (84)
Reduction Factor for Concrete Breakout Strength in Shear	ϕ_{cb}	-	0.70					
Concrete Pryout Strength in Shear								
Coefficient for Pryout Strength	k_{cp}	-	1.0		1.0	2.0	1.0	2.0
Reduction Factor for Pryout Strength in Shear	ϕ_{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. All values of ϕ were determined from load combinations of Section 1605.1 of the 2021 IBC, Section 1605.2 of the 2018, 2015, 2012 or 2009 IBC , ACI 318 (-19 and -14) Section 5.3 or ACI 318-11 Section 9.2, as applicable. If the load combinations of ACI 318-11 Appendix C are used, then the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4. For reinforcement that meets ACI 318 (-19 and -14) Chapter 17 or ACI 318 Appendix D, as applicable, requirements for Condition A, see ACI 318-19 17.5.3, ACI 318-14 17.3.3 or ACI 318-11 D.4.3, as applicable, for the appropriate ϕ factor when the load combinations of Section 1605.1 of the 2021 IBC, Section 1605.2 of the 2018, 2015, 2012 or 2009 IBC , ACI 318 (-19 and -14) Section 5.3 or ACI 318-11 Section 9.2, as applicable, are used.
3. Where no value is reported for pullout strength, this resistance does not need to be considered.



1. DRILL

Drill a hole into the base material of the correct diameter and depth using a drill bit that meets the requirements of ANSI B212.15

Caution: oversized holes in base material will reduce or eliminate the mechanical interlock of the threads with the base material and reduce the anchor's load capacity

2. BLOW AND CLEAN

Remove dust and debris from hole using a hand pump, compressed air or a vacuum to remove loose particles left from drilling.

3. INSTALL

Select a powered impact wrench or a torque wrench that does not exceed the maximum torque $T_{impact,max}$ or $T_{inst,max}$ respectively. Attach an appropriate sized hex socket to the wrench. Mount the screw anchor head in the socket.

4. APPLY TORQUE

Drive the anchor with an impact driver or a torque wrench through the fixture and into the hole until the anchor head washer comes in contact with the fixture. The anchor must be snug after installation. Do not spin the hex socket off the anchor to disengage.

The screw anchors are permitted to be loosened by a maximum of one full turn and retightened with a torque wrench or a powered impact wrench to facilitate fixture attachment or realignment

FIGURE 2—MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS

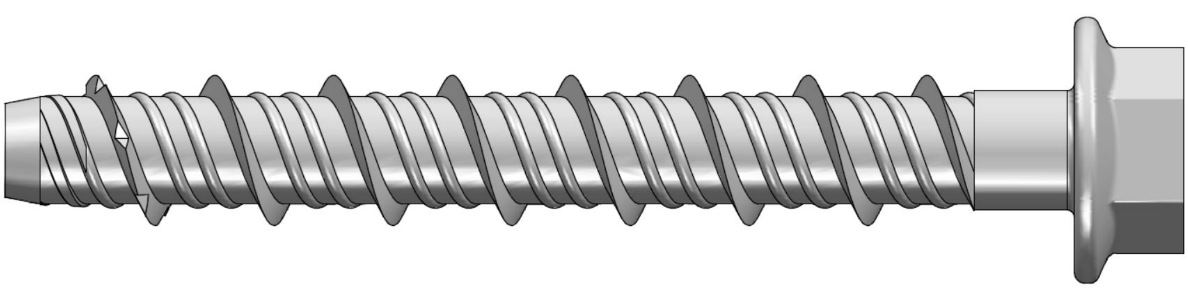


FIGURE 3—SURE-BOLT® EXTREME / SURE-BOLT® / SURE-BOLT® MAX SCREW ANCHOR

TABLE 5—EXAMPLE ALLOWABLE STRESS DESIGN VALUES FOR ILLUSTRATIVE PURPOSES[1,2,3,4,5,6,7,8,9,10]

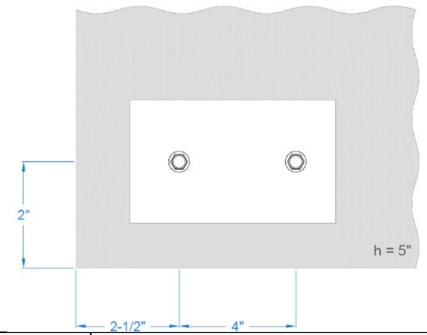
Nominal Anchor Diameter d_o (inch)	Nominal Embedment Depth h_{nom} (inch)	Allowable Tension Load $T_{allowable,ASD}$ (lb)
1/4	1 5/8	595
1/4	2 1/2	1,242
3/8	2 1/2	1,492
3/8	3 1/4	2,330
1/2	3	1,948
1/2	4 1/4	3,116
5/8	3 1/4	1,911
5/8	5	3,981
3/4	4	2,698
3/4	6 1/4	5,699

1. Single anchor.
2. Static tension loading only.
3. Concrete determined to remain uncracked for the life of the anchorage.
4. Load combinations taken from ACI 318(-19 and -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 1.2D + 1.6L.
6. Calculation of the weighted average for $\alpha = 1.2 \times 0.3 + 1.6 \times 0.7 = 1.48$
7. Normal 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 17.5.3, ACI 318-14 7.3.3 or ACI 318-11 D.4.3 is not provided).

Illustrative procedure of Allowable Stress Design calculation. Method ACI 318-19, Chapter 17

Per the figure below and the following information:

- 2 anchors Sure-Bolt® Extreme 1/2” x 3-1/4” anchor length
- Concrete: strength 4,000 psi, cracked, 5 inches thick
- h_{ef} = 2.21 in
- Anchor Layout: as per sketch
- Static or quasi-static loads



Step	ACI 318-19 Section Reference	ESR Section Reference	CALCULATIONS
1	17.9	Section 4.1.11 Table 1	Verify spacing / edge distance / member thickness s = 4 in > 3 in → verifed c_{a1} = 2-1/2 in > 1-3/4 in → verified c_{a2} = 2 in > 1-3/4 in → verified h = 5 in > 4-3/4 in → verified
2	17.6.1.2	Section 4.1.2 Table 3	Calculate steel capacity on a single fastener loaded in tension $\phi\ N_{sa}$= (0.65) (18,920) = 12,298 lbf Group of fasteners $\phi\ N_s$= n $\phi\ N_{sa}$= (2) (12,298) = **24,596** lbf
3	17.6.2.1	4.1.3	Calculation concrete strength capacity on the group of fasteners loaded in tension $\phi N_{cbg} = \phi\ \frac{A_{Nc}}{A_{Nco}}\ \psi_{ec,N}\ \psi_{ed,N}\ \psi_{c,N}\ \psi_{cp,N}\ N_b$
3.1	17.6.2.1	Table 3	A_{Nc} = (c_{a1}+1.5 h_{ef}) (c_{a2}+s+1.5 h_{ef}) = (2+3.32) (2.5+4+3.32) = 52.24 A_{Nco} = 9 $(h_{ef})^2$ = 9 $(2.21)^2$ = 43.96
3.2	17.6.2.3.1		No load eccentricity → e_v = 0 → $\psi_{ec,N} = 1.00$
3.3	17.6.2.4	Table 3	$C_{a,min}$ < 1.5 h_{ef} → $\psi_{ed,N}\ =\ 0.7 + 0.3\ \frac{c_{a,min}}{1.5\ h_{ef}} = 0.7 + 0.3\ \frac{2}{3.32} = 0.88$
3.4	17.6.2.5		Cracked concrete → $\psi_{c,N}\ = 1.00$
3.5	17.6.2.6		Cracked concrete → $\psi_{cp,N}\ = 1.00$
3.6	17.6.2.2	4.1.3	$N_b\ = k_c\ \lambda_a \sqrt{f_c'}\ h_{ef}^{1.5}\ = (21)\ (1.0)\sqrt{4000}\ (2.21)^{1.5}\ = 4{,}363\ \text{lbf}$
	17.6.2.1	4.1.3	thus $\phi N_{cbg} = (0.65)\ \frac{52.24}{43.96}\ (1.0)(0.88)(1.0)(4{,}363) =\ \mathbf{2{,}965}\ \text{lbf}$
4	17.6.3.1	Section 4.1.4 Table 3	Calculate pull out strength on single fastener loaded in tension $\phi N_{p,f} =\ \phi\ \psi_{c,P} N_{p,2500}\ \left(\frac{f_c'}{2{,}500}\right)^n\ = (0.65)(1.00)\ (3{,}225)\ \left(\frac{4{,}000}{2{,}500}\right)^{0.35}\ = 2{,}470\ \text{lbf}$ Group of fasteners ϕN_p= n ϕN_p= (2) (2,470) = **4,940** lbf
5	17.5.2	-	Governing tension strength: Minimum value of steel, concrete breakout, pull out: ϕN_n= min [ϕN_s; ϕN_c; ϕN_p] = **2,965** lbf
6	5.3	Section 4.2.1	Calculation of conversion factor, α, for allowable stress design α = (1.2) D +(1.6) L = (1.2) (0.30) + (1.6) (0.7) = **1.48**
7	-	Section 4.2.1	Calculation of allowable stress design in tension $T_{allowable,ASD} = \frac{\phi N_n}{\alpha} = \frac{2{,}965}{1.48} =\ \mathbf{2{,}003}\ \text{lbf}$

ICC-ES Evaluation Report

ESR-4414 LA Supplement

Reissued March 2026

This report is subject to renewal March 2027.

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DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 19—Post-Installed Concrete Anchors

REPORT HOLDER:

AEROSMITH FASTENING SYSTEMS

EVALUATION SUBJECT:

AEROSMITH SURE-BOLT® EXTREME / SURE-BOLT® / SURE-BOLT® MAX SCREW ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Aerosmith Sure-Bolt® Extreme / Sure-Bolt® / Sure-Bolt® Max screw anchors for use in cracked and uncracked concrete, described in ICC-ES evaluation report ESR-4414, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2023 *City of Los Angeles Building Code* (LABC)
- 2023 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The Aerosmith Sure-Bolt® Extreme / Sure-Bolt® / Sure-Bolt® Max screw anchors for use in cracked and uncracked concrete, described in Sections 2.0 through 7.0 of the evaluation report ESR-4414, comply with the LABC Chapter 19, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Aerosmith Sure-Bolt® Extreme / Sure-Bolt® / Sure-Bolt® Max screw anchors for use in cracked and uncracked concrete described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-4414.
- The design, installation, conditions of use and identification of the anchors are in accordance with the 2021 *International Building Code®* (IBC) provisions noted in the evaluation report ESR-4414.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.
- The allowable strength and design strength values listed in the evaluation report and tables are for the connection of the anchors to the concrete. The connection between the anchors and the connected members shall be checked for capacity (which may govern).
- For use in wall anchorage assemblies to flexible diaphragm applications, anchors shall be designed per the requirements of the City of Los Angeles Information Bulletin P/BC 2023-71.

This supplement expires concurrently with the evaluation report, reissued March 2026.

DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 19—Post-Installed Concrete Anchors

REPORT HOLDER:

AEROSMITH FASTENING SYSTEMS

EVALUATION SUBJECT:

AEROSMITH SURE-BOLT® EXTREME / SURE-BOLT® / SURE-BOLT® MAX SCREW ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Aerosmith Sure-Bolt® Extreme / Sure-Bolt® / Sure-Bolt® Max screw anchors for use in cracked and uncracked concrete, described in ICC-ES evaluation report ESR-4414, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2022 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of the State Architect (DSA), see Sections 2.1 and 2.2 below.

- 2022 *California Residential Code* (CRC)

2.0 CONCLUSIONS

The Aerosmith Sure-Bolt® Extreme / Sure-Bolt® / Sure-Bolt® / Sure-Bolt® Max screw anchors for use in cracked and uncracked concrete, described in Sections 2.0 through 7.0 of the evaluation report ESR-4414, comply with CBC Chapter 19 and CRC Section R301.1.3, provided the design and installation are in accordance with the 2021 *International Building Code®* (IBC) provisions, as applicable, noted in the evaluation report, and the additional requirements of the CBC Chapters 16 and 17, as applicable.

2.1 OSHPD:

The Aerosmith Sure-Bolt® Extreme / Sure-Bolt® / Sure-Bolt® Max screw anchors for use in cracked and uncracked concrete, described in Sections 2.0 through 7.0 of the evaluation report ESR-4414, comply with CBC amended Sections in Chapters 16, 17 and 19, and Chapters 16A, 17A and 19A, provided the design and installation are in accordance with the 2021 *International Building Code®* (IBC)provisions, as applicable, noted in the evaluation report, and the additional requirements in Sections 2.1.1 to 2.1.3 of this supplement:

2.1.1 Verification Test Requirements: The installation verification test loads, frequency, and acceptance criteria shall be in accordance with Sections 1901.3.4 [OSHPD 1R, 2 and 5] and 1910A.5 [OSHPD 1 & 4] of the CBC, as applicable.

2.1.2 Special Inspection Requirements: Periodic special inspection is required, in accordance with Section 1705.1.1 and Table 1705.3 [OSHPD 1R, 2 and 5], or Section 1705A.1.1, and Table 1705A.3 [OSHPD 1 & 4] of the CBC, as applicable. In addition, special inspection is required for special seismic certification for designated seismic system in accordance with amended Section 1705.14.3.1 [OSHPD 1R, 2 and 5] and Section 1705A.13.4 [OSHPD 1 & 4] of the CBC, as applicable.

2.1.3 Conditions of Use:

1. Where moment resistance is assumed at the base of the superstructure elements, deformation of the superstructure to foundation connection shall be considered in accordance with Section 1617A.1.15 [OSHPD 1 & 4] of the CBC.
2. The screw anchors may be loosened and retightened in accordance with Section 4.3 of the evaluation report to perform verification test requirements specified in Section 2.1.1 of this supplement. Re-use of screw anchors or screw anchor holes shall not be permitted.

2.2 DSA:

The Aerosmith Sure-Bolt® Extreme / Sure-Bolt® /Sure-Bolt® Max screw anchors for use in cracked and uncracked concrete, described in Sections 2.0 through 7.0 of the evaluation report ESR-4414, comply with CBC amended Sections in Chapters 16 and 19, and Chapters 16A, 17A and 19A, provided the design and installation are in accordance with the 2021 *International Building Code®* (IBC) provisions, as applicable, noted in the evaluation report, and the additional requirements in Sections 2.2.1 to 2.2.3 of this supplement:

2.2.1 Verification Test Requirements: The installation verification test loads, frequency, and acceptance criteria shall be in accordance with Sections 1909.2.7 [DSA-SS/CC] and 1910A.5 [DSA-SS] of the CBC, as applicable.

2.2.2 Special Inspection Requirements: Periodic special inspection is required, in accordance with Section 1705A.1.1, and Table 1705A.3 [DSA-SS, DSA-SS/CC] of the CBC. In addition, special inspection is required for special seismic certification for designated seismic system in accordance Section 1705A.13.4 [DSA-SS, DSA-SS/CC] of the CBC, as applicable.

2.2.3 Conditions of Use:

1. Where moment resistance is assumed at the base of the superstructure elements, deformation of the superstructure to foundation connection shall be considered in accordance with Section 1617.11.13 [DSA-SS/CC] or Section 1617A.1.15 [DSA-SS] of the CBC.
2. The screw anchors may be loosened and retightened in accordance with Section 4.3 of the evaluation report to perform verification test requirements specified in Section 2.1.1 of this supplement. Re-use of screw anchors or screw anchor holes shall not be permitted.

This supplement expires concurrently with the evaluation report, reissued March 2026.

ICC-ES Evaluation Report

ESR-4414 FL Supplement w/ HVHZ

Reissued March 2026

This report is subject to renewal March 2027.

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DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 19—Post-Installed Concrete Anchors

REPORT HOLDER:

AEROSMITH FASTENING SYSTEMS

EVALUATION SUBJECT:

AEROSMITH SURE-BOLT® EXTREME / SURE-BOLT® SCREW / SURE-BOLT® MAX ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Aerosmith Sure-Bolt® Extreme / Sure-Bolt® / Sure-Bolt® Max screw anchors for use in cracked and uncracked concrete, described in ICC-ES evaluation report ESR-4414, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2023 *Florida Building Code—Building*
- 2023 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The Aerosmith Sure-Bolt® Extreme / Sure-Bolt® / Sure-Bolt® Max screw anchors for use in cracked and uncracked concrete, described in evaluation report ESR-4414, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential.* The design requirements must be determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-4414 for the 2021 *International Building Code®* meet the requirements of *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the Aerosmith Sure-Bolt® Extreme / Sure-Bolt® carbon steel screw anchors in dry, interior locations and Sure-Bolt® Max stainless steel anchors in interior and exterior locations has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and *Florida Building Code—Residential* with the following condition:

a) For anchorage to wood members, the connection subject to uplift must be designed for no less than 700 pounds (3114 N).

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 for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission). Florida Rule 61G20-3 is applicable to products and/or systems which comprise the building envelope and structural frame for compliance with the structural requirements of the Florida Building Code.

This supplement expires concurrently with the evaluation report, reissued March 2026.

ICC EVALUATION SERVICE®

ICC-ES Evaluation Report

ESR-6056

Issued September 2026

This report remains under an active continuous compliance program through the end of September 2027

This report also contains:

- **City of LA Supplement**
- **CA Supplement**
- **FL Supplement w/ HVHZ**

DIVISION: 04 00 00—MASONRY **Section: 04 05 19.16—Masonry Anchors**	**REPORT HOLDER:** **AEROSMITH FASTENING SYSTEMS** aerosmith® fastening systems	**EVALUATION SUBJECT:** **SURE-BOLT® AND SURE-BOLT EXTREME® SCREW ANCHORS FOR USE IN CRACKED AND UNCRACKED MASONRY**	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021, 2018 and 2015 *International Building Code® (IBC)*
- 2024, 2021, 2018 and 2015 *International Residential Code® (IRC)*

Main references of this report are for the 2024 IBC and IRC. See Table 6 and Table 7 for applicable sections of the code for previous IBC and IRC editions.

Property evaluated:

- Structural

2.0 USES

The Sure-Bolt and Sure-Bolt Extreme screw anchors are used as anchorage to resist static, wind and seismic tension and shear loads. The $^{1}/_{4}$-inch (3.4 mm) screw anchor is for use in uncracked fully grouted concrete masonry unit (CMU) construction (Seismic Design Categories A and B only); the $^{3}/_{8}$-inch (9.5 mm) through $^{3}/_{4}$-inch (19.05 mm) screw anchors are for use in uncracked and cracked fully grouted concrete masonry unit (CMU) construction (Seismic Design Categories A and B only). The anchor system is an alternative to cast-in-place anchors described in Section 8.1.4 (2022 edition) of TMS 402/ACI 530/ASCE 5, as applicable, as referenced in Section 2107.1 of the IBC. The anchors may also be used where an engineered design is submitted in accordance with Section R301.1.3 of the IRC.

3.0 DESCRIPTION

3.1 SURE-BOLT EXTREME®:

Sure-Bolt Extreme screw anchors are comprised of a body with hex washer head. The anchor is manufactured from carbon steel and is heat treated. The anchoring system is available in a variety of lengths, with nominal diameters of ¼ inch, $^{3}/_{8}$ inch, ½ inch, $^{5}/_{8}$ inch and ¾ inch. It has an Atlantic epoxy coating in gray or blue colors. The anchors have been tested for corrosion resistance in accordance with ASTM G85-11 Annex 5 for handling purposes (e.g. storage). A typical Sure-Bolt Extreme screw anchor is illustrated in Figure 4.

The hex head diameter is larger than the diameter of the anchor and is formed with serrations on the underside. The anchor body is formed with threads running most of the length of the anchor body. The anchor is installed in a predrilled hole with a powered impact wrench or torque wrench. The anchor threads cut into the masonry on the sides of the hole and interlock with the base material during the installation.

3.2 SURE-BOLT®:

Sure-Bolt screw anchors are comprised of a body with hex washer head. The anchor is manufactured from carbon steel and is heat-treated. The anchoring system is available in a variety of lengths, with nominal diameters of ¼-inch (3.4 mm), $^3/_8$-inch (9.5 mm), ½-inch (12.7 mm), $^5/_8$-inch (15.88 mm) and ¾-inch (19.05 mm). It has a minimum of 0.0002-inch-thick (5 μm) zinc coating according to ASTM B633 type SC1, class III. A typical Sure-Bolt screw anchor is illustrated in Figure 3.

The hex head diameter is larger than the diameter of the anchor and is formed with serrations on the underside. The anchor body is formed with threads running most of the length of the anchor body. The anchor is installed in a predrilled hole with a powered impact wrench or torque wrench. The anchor threads cut into the masonry on the sides of the hole and interlock with the base material during the installation.

3.3 Grout-filled Concrete Masonry: Grouted concrete masonry must comply with IBC Chapter 21. The compressive strength of masonry, f'_m, must be a minimum of 1,500 psi (10.3 MPa) at 28 days. Fully grouted masonry must be constructed from the following materials:

3.3.1 Concrete Masonry Units (CMUs): Grouted concrete masonry walls must be constructed from lightweight, medium-weight or normal-weight, closed-end or open-end, concrete masonry units (CMUs) conforming to ASTM C90. The minimum allowable nominal size of the CMU is 8 inches (203 mm) wide by 8 inches (203 mm) high by 16 inches (406 mm) long.

3.3.2 Grout: Grout must comply with IBC Section 2103.3 or IRC Section R606.2.12, as applicable. Alternatively, the grout must have a minimum compressive strength, when tested in accordance with ASTM C1019, equal to its specified strength, but not less than 2,000 psi (13.8 MPa).

3.3.3 Mortar: Mortar must be Type N, S or M, prepared in accordance with IBC Section 2103.2.1 or IRC Section R606.2.8, as applicable.

4.0 DESIGN AND INSTALLATION

4.1 Strength Design of Anchors in Grouted Concrete Masonry Unit Construction:

4.1.1 General: Sections 4.1 and 4.2 provide strength design requirements used in fully grouted concrete masonry unit construction, where anchors are used to transmit structural loads by means of tension, shear or a combination of tension and shear.

Strength design of screw anchors in grouted concrete masonry unit construction shall be conducted in accordance with the provisions for the design of screw anchors in concrete in ACI 318 Chapter 17, and TMS 402-22 as modified by the sections that follow. Design in accordance with this report cannot be conducted without reference to ACI 318 with the deletions and modifications summarized in Table 4.1 and TMS 402-22 Eq. 9-5.

This report references sections, tables, and figures in both this report and ACI 318, with the following method used to distinguish between the two document references:

- References to sections, tables, and figures originating from ACI 318 are *italicized*. For example, *ACI 318-19 Section 2.2* of ACI 318-19 will be displayed as *ACI 318-19 Section 2.2.*
- References to sections, tables, and figures originating from this report do not have any special font treatment, for example Section 4.2.1.

Where language from ACI 318 is directly referenced, the following modifications generally apply:

- The term “masonry” shall be substituted for the term “concrete” wherever it occurs.
- The modification factor to reflect the reduced mechanical properties for mixtures with lightweight aggregate and lightweight units, λ_a , shall be taken as 1.0.

The following terms shall be replaced wherever they occur:

ACI 318-19 term	Replacement term
f'_c	f'_m
N_{cb} , N_{cbg}	N_{mb} , N_{mbg}
V_{cb} , V_{cbg}	V_{mb} , V_{mbg}
V_{cp} , V_{cpg}	V_{mp} , V_{mpg}

4.1.2 Restrictions for anchor placement are noted in Table 1 and Figure 2. For CMU construction with closed end blocks and hollow head joints, in addition to the ends and edges of walls, the nearest head joint on a horizontal projection from the anchor shall be treated as an edge for design purposes. The minimum distance from the nearest adjacent head joint shall be 2 inches (50.8 mm) as measured from the centerline of the head joint in CMU construction with hollow head joints. For anchor groups installed in CMU construction with solid head joints, the nearest head joint outside of the group on a horizontal projection to the group shall be treated as an edge. If open-ended units are employed, only the ends and edges of walls shall be considered for edge distance determination. For horizontal ledgers in fully-grouted CMU walls with hollow head joint applications, see Section 4.2.23.

4.2 ACI Modifications Required for Design: Table 4.1 provides a summary of all applicable *ACI 318* sections for the design of screw anchors in fully grouted masonry. Where applicable, modifying sections contained within this report are also provided.

4.2.1 *ACI 318-19 Section 17.1.1 and 17.1.5* apply with the general changes prescribed in Section 4.1.1.

4.2.2 In lieu of *ACI 318-19 Section 17.1.2:* Design provisions are included for screw anchors that meet the assessment criteria of ICC-ES AC01.

4.2.3 *ACI 318-19 Sections 17.1.4, 17.2.1 and 17.4.1* apply with the general changes prescribed in Section 4.1.1*.*

4.2.4 *ACI 318-19 Section 17.3.1* applies with the general changes prescribed in Section 4.1.1*.*

4.2.5 In lieu of *ACI 318-19 Section 17.5.2*: The design of anchors shall be in accordance with Table 4.2.

4.2.6 *ACI 318-19 Section 17.5.2.3* applies with the general changes prescribed in Section 4.1.1.

4.2.7 *ACI 318-19 Section 17.5.1.2 excluding Section 17.5.2.1* applies with the general changes prescribed in Section 4.1.1**.**

4.2.8 In lieu of *ACI 318-19 Section 17.5.3*: Strength reduction factor ϕ for anchors in masonry shall be as follows when the LFRD load combinations of ASCE 7 are used:

a) For steel capacity of ductile steel elements as defined in *ACI 318-19 Section 2.3*, ϕ shall be taken as 0.75 in tension and 0.65 in shear.

b) For shear crushing capacity ϕ shall be taken as 0.50.

c) For cases where the nominal strength of anchors in masonry is controlled by masonry breakout or pullout strength in tension, ϕ shall be taken as 0.65 for anchors qualifying for Category 1 and 0.55 for anchors qualifying for Category 2 as indicated Tables 2 and 3 of this report.

d) For cases where the nominal strength of anchors in masonry is controlled by masonry failure modes in shear, ϕ shall be taken as 0.70.

4.2.9 *ACI 318-19 Section 17.6.1* applies with the general changes prescribed in Section 4.1.1.

4.2.10 In lieu *of ACI 318-19 Section 17.6.2.1:* The nominal breakout strength in tension, N_{mb} of a single anchor or N_{mbg} of a group of anchors, shall not exceed:

a) For a single anchor

$$N_{mb} = \frac{A_{Nm}}{A_{Nmo}} \psi_{ed,N,m} \cdot \psi_{c,N,m} \cdot N_{b,m} \qquad (17.6.2.1a)$$

b) For a group of anchors

$$N_{mbg} = \frac{A_{Nm}}{A_{Nmo}} \psi_{ec,N,m} \cdot \psi_{ed,N,m} \cdot \psi_{c,N,m} \cdot N_{b,m} \qquad (17.6.2.1b)$$

Factors $\psi_{ec,N,m}$, $\psi_{ed,N,m}$, $\psi_{c,N,m}$ are defined in *ACI 318-19 Sections 17.6.2.3.1, 17.6.2.4*, and Section 4.2.13, respectively. A_{Nm} is the projected masonry failure area of a single anchor or group of anchors that shall be approximated as the base of the rectilinear geometrical figure that results from projecting the failure surface outward 1.5 h_{ef} from the centerlines of the anchor, or, in the case of a group of anchors, from a line through a row of adjacent anchors. A_{Nm} shall not exceed $n \cdot A_{Nmo}$, where n is the number of anchors in the group that resist tension. A_{Nmo} is the projected masonry failure area of a single anchor with an edge distance equal to or greater than 1.5 h_{ef}.

$$A_{Nmo} = 9h_{ef}^2 \qquad (17.6.2.1.4)$$

4.2.11 In lieu of *ACI 318-19 Section 17.6.2.2.1:* The basic masonry breakout strength of a single anchor in tension in cracked masonry, $N_{b,m}$ shall not exceed

$$N_{b,m(cr,uncr)} = k_{m(cr,uncr)} \sqrt{f'_m}\, h_{ef}^{1.5} \qquad (17.6.2.2.1)$$

Where

$k_{m,cr}$ = effectiveness factor for breakout strength in cracked masonry

= $\alpha_{masonry} \cdot k_{c,cr}$

$k_{c,cr}$ = effectiveness factor for breakout strength in concrete

= 17; and

$\alpha_{masonry}$ = reduction factor for the inhomogeneity of masonry materials in breakout strength determination.

= 0.7

4.2.12 *ACI 318-19 Sections 17.6.2.1.2, 17.6.2.3.1 and 17.6.2.4* apply with the general changes prescribed in Section 4.1.1**.**

4.2.13 In lieu of *ACI 318-19 Section 17.6.2.5.1(a):* For anchors located in a region of a masonry member where analysis indicates no cracking at service load levels, the following modification factor shall be permitted:

$\psi_{c,N,m} = 1.4$ for post-installed anchors, where the value of k_m is 11.9.

4.2.14 *ACI 318-19 Section 17.6.2.6* need not be considered since the modification factor for post installed anchors, ψ_{cp}, is not included in Eq. 17.6.2.1a & b.

4.2.15 The following apply with the general changes prescribed in Section 4.1.1**:**

ACI 318-19 Section 17.6.2.1.3

ACI 318-19 Section 17.5.2.1

4.2.16 In lieu of *ACI 318-19 Section 17.6.3.1:* The nominal pullout strength of a single screw anchor in tension shall not exceed

$$N_{pn} = \psi_{m,P} N_p \qquad (17.6.3.1)$$

where $\psi_{m,P}$ = 1.0.

4.2.17 In lieu of *ACI 318-19 Section 17.6.3.2.1:* The nominal pullout strength of a single anchor in cracked and uncracked masonry, $N_{p,cr}$ and $N_{p,uncr}$, respectively, is given in Tables 2 and 3 of this report.

4.2.18 *The* following apply with the general changes prescribed in Section 4.1.1**:**

ACI 318-19 Section 17.6.3.3

ACI 318-19 Section 17.7.1.1-17.7.2.2

ACI 318-19 Section 17.7.2.1.2, 17.7.2.3 and 17.7.2.4

ACI 318-19 Section 17.7.2.6

ACI 318-19 Section 17.7.3

ACI 318-19 Section 17.8

ACI 318-19 Section 17.9

- *ACI 318-19 Section 26.13.1.5 and 26.13.2.5*

4.2.19 In lieu of *ACI 318-19 Section 17.7.2.5*: For anchors located in a region of masonry construction where *cracking* is anticipated, $\psi_{m,V}$ shall be taken as 1.0. For cases where analysis indicates no cracking at service load levels, it shall be permitted to take $\psi_{m,V}$ as 1.4.

4.2.20 In lieu of *ACI 318-19 Section 17.9*: Minimum edge distances and spacings shall be as indicated in Table 1 of this report.

4.2.21 *[In addition to the ACI 318 provisions]* For screw anchors with embedment depths $5d_a \leq h_{ef} \leq 10d_a$ and $h_{ef} \geq$ 1.5 in, masonry breakout strength requirements shall be considered satisfied by the design procedures of *ACI 318-19 Sections 17.6.2 and 17.7.2.*

4.2.22 *[In addition to the ACI 318 provisions] Masonry crushing strength for anchors in shear*—The nominal strength of an anchor in shear as governed by masonry crushing, V_{mc} , shall be calculated using Eq. (4-1).

$$\boldsymbol{V_{mc} = 1750 \sqrt[4]{f'_{m} A_{se,v}}} \qquad (4\text{-}1)$$

4.2.23 *[In addition to the ACI 318 provisions]* Determination of shear capacity for bolts in horizontal ledgers in fully-grouted CMU walls with hollow head joint applications with an assumed masonry unit length of 16 inches, standard:

Where six or more anchor bolts are placed at uniform horizontal spacing in continuous wood or steel ledgers connecting floor and roof diaphragms to fully grouted CMU walls constructed with hollow head joints (using closed-end block), the horizontal and vertical shear capacity of the bolts shall be permitted to be calculated in accordance with Eq. (4-2) and Eq. (4-3), respectively, in lieu of Section 4.1.2.

$$v_{mb,horiz} = 0.75 \cdot V_{gov,horiz} \cdot \frac{12}{s_{horiz}} \text{ (plf or N/m)} \qquad (4\text{-}2)$$

$$v_{mb,vert} = 0.75 \cdot V_{gov,vert} \cdot \frac{12}{s_{horiz}} \text{ (plf or N/m)} \qquad (4\text{-}3)$$

where

s_{horiz} = horizontal anchor spacing in the ledger, (in). For anchor spacings that are multiples of 8 inches, locate the first anchor in the ledger at least 2 inches from the head joint and the center of the block. For other anchor spacings, minimum edge distance as specified in the evaluation report shall apply.

$V_{gov,horiz}$	=	$\min(V_{sa}, V_{mb,4}, V_{mc}, V_{mp,4})$ (lb or N)
$V_{gov,vert}$	=	$\min(V_{sa}, 2 \cdot V_{mb,4}, V_{mc}, V_{mp,4})$ (lb or N)
V_{sa}	=	shear capacity for a single bolt as given in Tables 2 and 3 of this report (lb or N)
$V_{mb,4}$	=	breakout capacity for a single bolt with edge distance of 4 in. (lb or N)
V_{mc}	=	crushing capacity for a single bolt calculated in accordance with Eq. (4-1) (lb or N)
$V_{mp,4}$	=	pryout capacity for a single bolt with edge distance of 4 in. (lb or N)

4.2.24 Interaction shall be calculated in compliance with *ACI 318-19 Section 17.8* as follows:

- For shear loads $V \leq 0.2V_{allowable,ASD}$, the full allowable load in tension shall be permitted.
- For tensile loads $T \leq 0.2T_{allowable,ASD}$, the full allowable load in shear shall be permitted.
- For all other cases:

$$\frac{T}{T_{allowable}} + \frac{V}{V_{allowable}} \leq 1.2$$

4.3 Conversion of strength design to allowable stress design (ASD):

4.3.1 For post-installed anchors designed using Allowable Stress Design load combinations from the legally adopted building code shall be established using the equations below:

$$T_{allowable,ASD} = \frac{\phi N_n}{\alpha} \qquad (3\text{-}4)$$

and

$$V_{allowable,ASD} = \frac{\phi V_n}{\alpha} \qquad (3\text{-}5)$$

where

$T_{allowable,ASD}$ = Allowable tensile load (lb. or N);

$V_{allowable,ASD}$ = Allowable shear load (lb. or N);

N_n = Lowest design strength of an anchor or anchor group in tension as determined in accordance with this report, as applicable, and IBC Section 1905.7;

V_n = Lowest design strength of an anchor or anchor group in shear as determined in accordance with this report, as applicable, and IBC Section 1905.7;

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 overstrength; and

ϕ = relevant strength reduction factor for load case and Anchor Category.

The requirements for member thickness, edge distance and spacing, described in this report, must apply. An example of allowable stress design calculations is shown in Table 5.

4.4 Installation:

Installation parameters are provided in Table 1 and in Figures 1, 2 and 3 of this report. Anchors must be installed per the manufacturer's published instructions and this report. In case of conflict, this report governs. Anchor locations must comply with this report and the plans and specifications approved by the code official. Anchors must be installed in holes drilled into masonry using carbide-tipped drill bits complying with ANSI B212.15-1994. The nominal drill diameter must be equal to the nominal diameter of the anchor. Prior to anchor installation, the hole must be cleaned in accordance with the manufacturer's published installation instructions. The minimum drilled hole depth h_{hole} is given in Table 1. The anchor must be installed into the predrilled hole using a powered impact wrench or installed with a torque wrench until the proper nominal embedment depth is obtained. The maximum impact installation wrench torque, $T_{impact,max}$, and maximum installation torque, $T_{inst.max}$ for the manual torque wrench must be in accordance with Table 1.

Sure-Bolt and Sure-Bolt Extreme screw anchors are permitted to be loosened by a maximum of one full turn and retightened with a torque wrench or a powered impact wrench to facilitate fixture attachment or realignment. Complete removal and reinstallation of the anchor is not allowed.

4.5 Special Inspection:

At a minimum, periodic special inspections shall be provided for all anchors in accordance with IBC, and is also applicable for installations under the IRC. Installation in head joints shall only be permitted in fully grouted walls constructed with open-ended units. The special inspector must make periodic inspections during anchor installation to verify anchor type, anchor dimensions, masonry type, masonry compressive strength, hole dimensions, hole cleaning, installation outside of hollow head joints, anchor spacing, edge distances, masonry thickness, anchor embedment, installation torque, maximum impact wrench torque rating and adherence to the manufacturer's published installation instructions. The special inspector must 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 must be observed, where applicable.

Subsequent installations of the same anchor type and size by the same construction personnel shall be permitted to be performed in the absence of the special inspector. Any change in the anchor product being installed or the personnel performing the installation shall require an initial inspection in accordance with the list provided in this section. For ongoing installations over an extended period, the special inspector shall make regular inspections to confirm correct handling and installation of the product.

5.0 CONDITIONS OF USE:

The Sure-Bolt and Sure-Bolt Extreme screw anchors described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Anchor sizes, dimensions and minimum embedment depths are as set forth in the tables of this report.

5.2 The anchors have been evaluated for use in cracked and uncracked grouted concrete masonry unit (CMU) construction with a minimum compressive strength of 1,500 psi (10.3 MPa) at the time of anchor installation.

5.3 Strength design values are established in accordance with Section 4.1 and 4.2 of this report.

5.4 Allowable stress design values are established in accordance with Section 4.3 of this report.

5.5 Design of anchors in fully grouted CMU construction must avoid location of anchors in hollow head joints.

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

5.7 The use of anchors to resist fatigue or shock loading is beyond the scope of this report.

5.8 For screw anchors described in Table 2, the design of anchors may be in accordance with the provisions for uncracked masonry where analysis indicates that cracking will not occur ($f_t < f_r$) in the vicinity of the anchor due to service loads or deformations over the anchor service life.

5.9 For screw anchors described in Table 3, the design of anchors shall be in accordance with the provisions for uncracked or cracked masonry where analysis indicates that cracking could occur ($f_t \geq f_r$) in the vicinity of the anchor due to service loads or deformations over the anchor service life.

5.10 Use of the anchors to resist seismic loads in Seismic Design Categories C through F is beyond the scope of this report. The allowable loads or load combinations for the anchors shall not be adjusted for anchors subjected to wind loads.

5.11 Anchors are not permitted to support fire-resistance-rated construction. Where not otherwise prohibited by the code, anchors are permitted for installation in fire-resistance-rated construction provided that at least one of the following conditions is fulfilled:

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

5.12 Use of anchors is limited to dry, interior locations.

5.13 Anchors have been evaluated for reliability against brittle fracture and found not to be significantly sensitive to stress-induced hydrogen embrittlement.

5.14 Special inspection must be provided in accordance with Section 4.5 of this report.

5.15 Anchors are manufactured under an approved quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Mechanical Anchors in Cracked and Uncracked Masonry Elements, AC01 (24) 2nd edition, published April 2025.

6.2 Data in accordance with ASTM G85-11 Annex 5 for corrosion resistance.

6.3 Quality control documentation.

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-6056) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.

7.2 In addition, the screw anchors are identified by packaging labeled with the evaluation report holder's name (AEROSMITH FASTENING SYSTEMS) and address, anchor name and anchor size., The screw anchors also have the size (diameter x length, in inches) and company logo stamped on the head of each screw anchor.

7.3 The report holder's contact information is the following:

AEROSMITH FASTENING SYSTEMS
5621 DIVIDEN ROAD
INDIANAPOLIS, INDIANA 46241
(800) 528-8183
www.aerosmithfastening.com
contact@aerosmithfastening.com

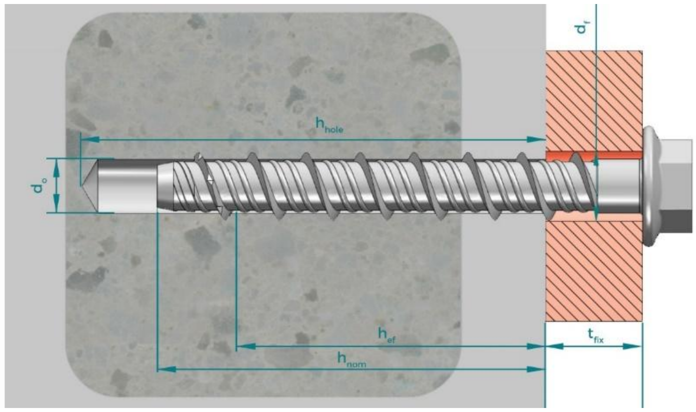


FIGURE 1—ANCHOR DIMENSIONS

TABLE 1—ANCHOR INSTALLATION PARAMETERS[1]

Characteristic	Symbol	Unit	Nominal Anchor Diameter									
			¼"		3/8"		1/2"		5/8"		3/4"	
Drill Bit Diameter	d_o	in (mm)	1/4 (6.4)	1/4 (6.4)	3/8 (9.5)	3/8 (9.5)	1/2 (12.7)	1/2 (12.7)	5/8 (15.9)	5/8 (15.9)	3/4 (19.1)	3/4 (19.1)
Nominal Embedment Depth	h_{nom}	in (mm)	1 5/8 (41)	2 ½ (64)	2 (51)	3 ¼ (83)	2 ½ (64)	4 ¼ (108)	3 ¼ (83)	5 (127)	4 (102)	6 ¼ (159)
Effective Embedment Depth	h_{ef}	in (mm)	1.23 (31)	1.98 (50)	1.42 (36)	2.49 (63)	1.78 (45)	3.27 (83)	2.36 (60)	3.85 (98)	2.97 (75)	4.89 (124)
Minimum Hole Depth	h_{hole}	in (mm)	2 (51)	2 7/8 (73)	2 3/8 (60)	3 5/8 (92)	2 7/8 (73)	4 5/8 (117)	3 5/8 (92)	5 3/8 (137)	4 3/8 (111)	6 5/8 (168)
Fixture Hole Diameter	d_f	in (mm)	3/8 (9.5)		½ (12.7)		5/8 (15.9)		¾ (19.1)		7/8 (22.2)	
Maximum Installation Torque	$T_{inst,max}$	ft.lb (Nm)	5 (7)	5 (7)	15 (20)	15 (20)	30 (41)	30 (41)	40 (54)	40 (54)	40 (54)	40 (54)
Maximum impact wrench torque rating	$T_{impact.max}$	ft lb (Nm)	150 (203)	150 (203)	380 (515)	380 (515)	380 (515)	380 (515)	380 (515)	380 (515)	380 (515)	380 (515)
Minimum Distance to Head Joint[2]	$C_{min,HJ}$	in (mm)	2 (51)									
Critical Edge Distance	C_{cr}	in (mm)	1.85 (47)	2.97 (75)	2.14 (54)	3.73 (95)	2.67 (68)	4.91 (125)	3.54 (90)	5.78 (147)	4.46 (113)	7.34 (186)
Minimum Edge Distance and spacing, field of wall	c_{min}	in (mm)	4 (102)	3 (76)	4 (102)							
	s_{min}	in (mm)	4 (102)	4 (102)	4½ (114)	4 (102)	4 (102)	4 (102)	4 (102)	4 (102)	4 (102)	4 (102)
Minimum Edge Distance and spacing, top of wall	$c_{min,top}$	in (mm)	1 ¾ (44)									
	$s_{min,top}$	in (mm)	4½ (114)	4½ (114)	4½ (114)	4½ (114)	5½ (140)	5½ (140)	6½ (165)	6½ (165)	8½ (216)	8½ (216)
Minimum Overall Anchor Length	l_{anch}	in (mm)	1 ¾ (44)	2 5/8 (67)	2 ¾ (70)	3 ½ (89)	2 ¾ (70)	4 ½ (114)	3 ½ (89)	5 ¼ (133)	4 ¼ (108)	6 ½ (165)
Torque Wrench Socket Size	-	in	7/16		9/16		3/4		15/16		1 1/8	
Maximum Fixture Thickness[2]	t_{fix}	in (mm)	L – 1.6 (L - 41)	L – 2.5 (L - 64)	L – 2 (L - 51)	L – 3.25 (L - 83)	L - 2.5 (L - 64)	L - 4.25 (L - 108)	L - 3.25 (L - 83)	L - 5 (L - 127)	L - 4 (L - 102)	L - 6.25 (L - 159)

[1]The tabulated data is to be used in conjunction with the design criteria given in ACI 318-19 Chapter 17, as applicable.

[2]Minimum distance to head joint applies to solid head joints as shown in Figure 2 of this report. For hollow head joints, the minim distance to head joint must be 2 inches as shown in Figure 2 of this report.

[3]L = total anchor length.

TABLE 2—ANCHOR DESIGN INFORMATION (UNCRACKED FULLY GROUTED CMU CONSTRUCTION)[1,2]

Characteristic	Symbol	Unit	Nominal Anchor Diameter	
			1/4"	
Nominal Embedment Depth	h_{nom}	in (mm)	1 5/8 (41)	2 ½ (64)
Anchor Category	1, 2 or 3	-	1	
Steel Strength in Tension and Shear				
Minimum specified ultimate strength	f_{uta}	psi (N/mm^2)	110,000 (758)	
Minimum specified yield strength	f_y	psi (N/mm^2)	88,000 (607)	
Effective stress area (screw anchor body)	A_{se}	in^2 (mm^2)	0.0438 (28.3)	
Steel Strength in Tension	N_{sa}	lb (kN)	4,820 (21.4)	
Strength Reduction Factor for Steel Failure in Tension	ϕ_{sa}	-	0.75	
Steel Strength in Shear, field of wall	V_{sa}	lb (kN)	1,959 (8.71 kN)	
Steel Strength in Shear, top of wall	$V_{sa,top}$	lb (kN)	553 (2.37 kN)	
Strength Reduction Factor for Steel Failure in Shear	ϕ_{sa}	-	0.65	
Masonry Pullout Strength in Tension				
Pullout Strength in Uncracked Masonry, field of wall	$N_{p,uncr}$	lb (kN)	917 (4.08)	1,353 (6.02)
Pullout Strength in Uncracked Masonry, top of wall	$N_{p,top,uncr}$	lb (kN)	917 (4.08)	1,353 (6.02)
Strength Reduction Factor for Pullout Strength in Tension	ϕ_p	-	0.65	
Masonry Breakout Strength in Tension				
Effective Embedment	h_{ef}	in. (mm)	1.23 (31)	1.98 (50)
Effectiveness Factor for Uncracked Masonry	k_{uncr}	-	16.7	
Strength Reduction Factor for Masonry Breakout Strength in Tension	ϕ_{mb}	-	0.65	
Axial stiffness in service load range in uncracked masonry	β_{uncr}	lb/inch (N/mm)	105,553 (18,485)	121,349 (21,252)
Coefficient of variation for axial stiffness in service load range in uncracked masonry	v_{uncr}	%	65	33
Axial stiffness in service load range in uncracked masonry, top of wall	$\beta_{uncr,top}$	lb/inch (N/mm)	92,150 (16,138)	7,993 (1,400)
Coefficient of variation for axial stiffness in service load range in uncracked masonry	$V_{uncr,top}$	%	37	55
Masonry Breakout Strength in Shear				
Nominal Diameter	d_o	in (mm)	¼ (6.4)	
Load Bearing Length of Anchor	l_e	in (mm)	1.23 (31)	1.98 (50)
Reduction Factor for Masonry Breakout Strength in Shear	ϕ_{mb}	-	0.70	
Masonry Pryout and Crushing Strength in Shear				
Coefficient for Pryout Strength	k_{mp}	-	1.0	
Reduction Factor for Pryout Strength in Shear	ϕ_{mp}	-	0.70	
Reduction Factor for Crushing Strength in Shear	ϕ_{mc}	-	0.50	

[1]The tabulated data is to be used in conjunction with the design criteria given in ACI 318-19 Chapter 17, as applicable.
[2]Screw anchors meet the ductile requirements of ACI 318.

TABLE 3—ANCHOR DESIGN INFORMATION (CRACKED AND UNCRACKED FULLY GROUTED CMU CONSTRUCTION)[1,2]

Characteristic	Symbol	Unit	Nominal Anchor Diameter							
			3/8"		1/2"		5/8"		3/4"	
Nominal Embedment Depth	h_{nom}	in (mm)	2 (51)	3 ¼ (83)	2 1/2 (64)	4 ¼ (108)	3 ¼ (83)	5 (127)	4 (102)	6 ¼ (159)
Anchor Category	1, 2 or 3	-	1						2	
Steel Strength in Tension and Shear										
Minimum specified ultimate strength	f_{uta}	psi (N/mm^2)	111,000 (765)		107,000 (738)		102,000 (703)		99,000 (683)	
Minimum specified yield strength	f_y	psi (N/mm^2)	88,800 (612)		85,600 (590)		81,600 (563)		79,200 (546)	
Effective stress area (screw anchor body)	A_{se}	in^2 (mm^2)	0.0943 (60.8)		0.1768 (114.1)		0.2703 (174.4)		0.3988 (257.3)	
Steel Strength in Tension	N_{sa}	lb (kN)	10,465 (46.6)		18,920 (84.1)		27,570 (122.6)		39,480 (175.6)	
Strength Reduction Factor for Steel Failure in Tension	ϕ_{sa}	-	0.75							
Steel Strength in shear, field of wall	V_{sa}	lb (kN)	3,220 (14.33)		3,837 (17.07)	5,524 (24.57)	6,463 (28.75)	7,700 (34.25)	8,973 (39.91)	9,427 (41.93)
Steel Strength in shear, top of wall	$V_{sa,top}$	lb (kN)	1,335 (5.94)		1,991 (8.86)		2,175 (9.67)		4,203 (18.70)	
Strength Reduction Factor for Steel Failure in Shear	ϕ_{sa}	-	0.65							
Masonry Pullout Strength in Tension										
Pullout Strength in Uncracked Masonry, field of wall	$N_{p,uncr}$	lb (kN)	824 (3.66)	3,953 (17.58)	1,633 (7.26)	1,619 (7.20)	2,706 (12.04)	4,513 (20.08)	3,367 (14.98)	5,744 (25.55)
Pullout Strength in Cracked Masonry, field of wall	$N_{p,cr}$	lb (kN)	437 (1.94)	2,097 (9.33)	873 (3.88)	866 (3.85)	2,591 (11.53)	4,321 (19.22)	2,894 (12.87)	3,791 (16.86)
Pullout Strength in uncracked masonry, top of wall	$N_{p,uncr,top}$	lb (kN)	824 (3.66)	1,175 (5.23)	1,485 (6.61)	1,619 (7.20)	1,747 (7.77)	3,306 (14.70)	3,303 (14.69)	4,082 (18.16)
Masonry Pullout Cracking Factor	$\psi_{m,P}$	-	1.0							
Strength Reduction Factor for Pullout Strength in Tension	ϕ_p	-	0.65						0.55	
Masonry Breakout Strength in Tension										
Effective Embedment	h_{ef}	in. (mm)	1.42 (36)	2.49 (63)	1.78 (45)	3.27 (83)	2.36 (60)	3.85 (98)	2.97 (75)	4.89 (124)
Effectiveness Factor for Uncracked Masonry	k_{muncr}	-	16.7							
Effectiveness Factor for Cracked Masonry	k_{mcr}	-	11.9							
Strength Reduction Factor for Masonry Breakout Strength in Tension	ϕ_{mb}	-	0.65						0.55	
Axial stiffness in service load range in uncracked masonry	β_{uncr}	lb/inch (N/mm)	122,681 (21,485)	121,349 (21,252)	170,136 (29,795)	87,954 (15,403)	119,675 (20,958)	124,779 (21,852)	110,495 (19,351)	226,287 (39,629)
Coefficient of variation for axial stiffness in service load range in uncracked masonry	v_{uncr}	%	66	33	55	30	43	57	29	37
Axial stiffness in service load range in cracked masonry	β_{cr}	lb/inch (N/mm)	144,644 (25,331)	76,812 (13,452)	78,069 (13,672)	113,586 (19,892)	82,924 (14,522)	74,917 (13,120)	101,211 (17,725)	47,422 (8,305)
Coefficient of variation for axial stiffness in service load range in cracked masonry	v_{cr}	%	62	43	72	47	49	35	45	18
Axial stiffness in service load range in masonry, top of wall	$\beta_{cr,top}$	lb/inch (N/mm)	93,455 (16,367)	47,984 (8,403)	100,955 (17,680)	27,476 (4,812)	41,307 (7,234)	54,810 (9,599)	31,215 (5,467)	70,483 (12,344)
Coefficient of variation for axial stiffness in service load range in masonry, top of wall	$v_{cr,top}$	%	77	22	45	34	44	25	42	51
Masonry Breakout Strength in Shear										
Nominal Diameter	d_o	in (mm)	3/8		1/2		5/8		3/4	
Load Bearing Length of Anchor	l_e	in (mm)	1.42 (36)	2.49 (63)	1.78 (45)	3.27 (83)	2.36 (60)	3.85 (98)	2.97 (75)	4.89 (124)
Reduction Factor for Masonry Breakout Strength in Shear	ϕ_{mb}	-	0.70							
Masonry Pryout and Crushing Strength in Shear										
Coefficient for Pryout Strength	k_{mp}	-	1.0	1.0	1.0	2.0	1.0	2.0	2.0	2.0
Reduction Factor for Pryout Strength in Shear	ϕ_{mp}	-	0.70							
Reduction Factor for Crushing Strength in Shear	ϕ_{mc}	-	0.50							

[1]The tabulated data is to be used in conjunction with the design criteria given in ACI 318-19, as applicable.
[2]Screw anchors meet the ductile requirements of ACI 318.

TABLE 4.1—ACI 318-19 ND -14 SECTIONS APPLICABLE OR MODIFIED BY THIS REPORT

318-19 section	*318-14 section*	**Modified by**
2.2	*2.2*	unchanged*
2.3	*2.3*	
17.1.1 and 17.1.5	*17.1.1 – 17.1.2*	
17.1.2	*17.1.3*	4.2.2
17.1.4, 17.2.1 and 17.4.1	*17.1.4 – 17.2.2*	unchanged*
17.3.1	*17.2.7*	unchanged*
17.5.2	*17.3.1.1*	4.2.5
17.5.2.3	*17.3.1.3*	unchanged*
17.5.1.2 excluding 17.5.2.1	*17.3.2 excluding 17.3.2.1*	
17.5.3	*17.3.3*	4.2.8
17.6.1	*17.4.1*	unchanged*
17.6.2.1	*17.4.2.1*	4.2.10
17.6.2.2.1	*17.4.2.2*	4.2.11
17.6.2.1.2, 17.6.2.3.1 and 17.6.2.4	*17.4.2.3 – 17.4.2.5*	unchanged*
17.6.2.5.1(a)	*17.4.2.6*	4.2.13
17.6.2.6, 17.6.2.1.3 and 17.5.2.1	*17.4.2.7 – 17.4.2.9*	unchanged*
17.6.3.1	*17.4.3.1*	4.2.16
17.6.3.2.1	*17.4.3.2*	4.2.17
17.7.1.1-17.7.2.2	*17.5.1.1 – 17.5.2.2*	unchanged*
17.7.2.1.2,17.7.2.3 and 17.7.2.4	*17.5.2.4 – 17.5.2.6*	
17.7.2.5	*17.5.2.7*	4.2.19
17.7.2.6	*17.5.2.8*	unchanged*
17.7.3	*17.5.3*	
17.8	*17.6*	
17.9	*17.7*	4.2.20
26.13.1.5 and 26.13.2.5	*17.8.1*	unchanged*
Additional provisions		4.2.21-4.2.24

*Sections marked as unchanged adopt the general changes prescribed in Section 4.1.1.

TABLE 4.2—REQUIRED STRENGTH OF ANCHORS

Failure mode	**Single anchor**	**Anchor group[(1)]**	
		Individual anchor in a group	**Anchors as a group**
Steel strength in tension	$\phi N_{sa} \geq N_{ua}$	$\phi N_{sa} \geq N_{ua,i}$	
Masonry breakout strength in tension	$\phi N_{mb} \geq N_{ua}$		$\phi N_{mbg} \geq N_{ua,g}$
Pullout strength in tension	$\phi N_{pn} \geq N_{ua}$	$\phi N_{pn} \geq N_{ua,i}$	
Steel strength in shear	$\phi V_{sa} \geq V_{ua}$	$\phi V_{sa} \geq V_{ua,i}$	
Masonry breakout strength in shear	$\phi V_{mb} \geq V_{ua}$		$\phi V_{mbg} \geq V_{ua,g}$
Masonry crushing strength in shear	$\phi V_{mc} \geq V_{ua}$	$\phi V_{mc} \geq V_{ua,i}$	
Masonry pryout strength in shear	$\phi V_{mp} \geq V_{ua}$		$\phi V_{mpg} \geq V_{ua,g}$

[(1)]Required strengths for steel failure modes shall be calculated for the most highly stressed anchor in the group.

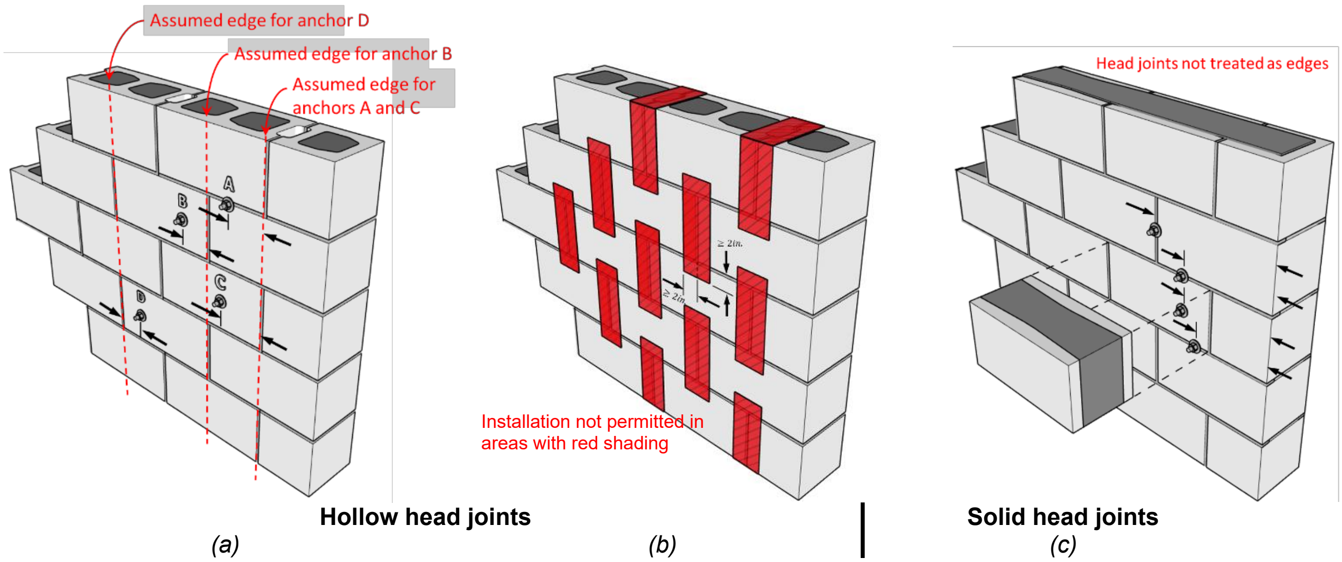
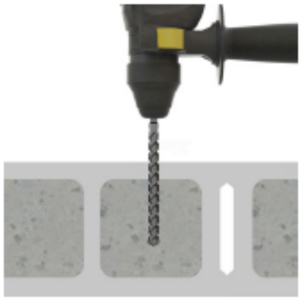


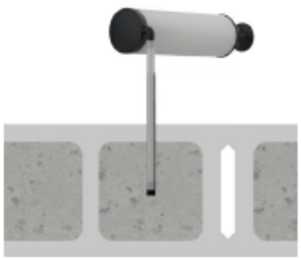
FIGURE 2—(a) Edge distance considerations in fully grouted CMU construction with hollow head joints, (b) exclusion zones in fully grouted construction with closed head joints, and (c) edge distance considerations in fully grouted CMU construction with solid head joints . (Note: dimensions to upper and lower edges omitted for clarity.)



1. DRILL

Drill a hole into the base material of the correct diameter and depth using a drill bit that meets the requirements of ANSI B212.15

Caution: oversized holes in base material will reduce or eliminate the mechanical interlock of the threads with the base material and reduce the anchor's load capacity



2. BLOW AND CLEAN

Remove dust and debris from hole using a hand pump, compressed air or a vacuum to remove loose particles left from drilling.

3. INSTALL

Select a powered impact wrench or a torque wrench that does not exceed the maximum torque $T_{impact,max}$ or $T_{ins,max}$ respectively. Attach an appropriately sized hex socket to the wrench. Mount the screw anchor head in the socket.

4. APPLY TORQUE

Drive the anchor with an impact driver or a torque wrench through the fixture and into the hole until the anchor head washer comes in contact with the fixture. The anchor must be snug after installation. Do not spin the hex socket off the anchor to disengage.

The screw anchor is permitted to be loosened by a maximum of one full turn and retightened with a torque wrench or a powered impact wrench to facilitate fixture attachment or realignment

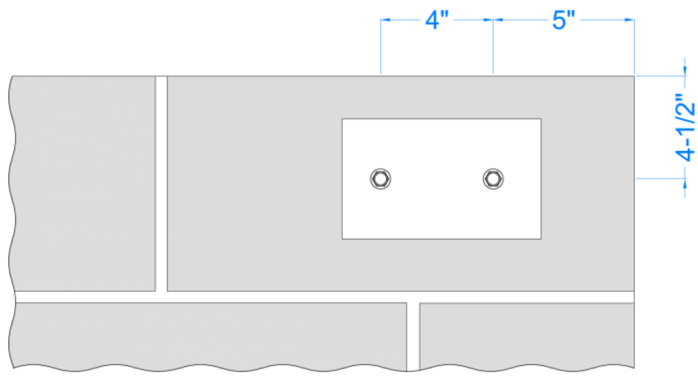
FIGURE 3—MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS

FIGURE 4—SURE-BOLT® AND SURE-BOLT EXTREME® SCREW ANCHOR

TABLE 5- SAMPLE CALCULATION FOR ALLOWABLE STRESS DESIGN

Illustrative procedure of Allowable Stress Design calculation.

Given data:
2 anchors Sure-Bolt Extreme 1/2"x 5", deep embedment depth
8-inch Concrete masonry unit CMU 90 having minimum net area compressive strength of 4,500 psi with Type M or S mortar, cracked (not to scale). Anchors must be embedded in grouted cells. Fully-grouted concrete masonry wall must be constructed in accordance with TMS 402.
Grout strength: 3,000 psi, cracked
h_{ef} = 3.27 in
Anchor Layout: as per sketch
Installation: field of wall
Static or quasi-static loads
Load: tension + shear towards upper edge



Step	AC 01 calculation section 3.3	ESR
1	Verify spacing / edge distance / member thickness s = 4 in ≥ 4 in → verified c_{a1} = 4-1/2 in ≥ 4 in → verified c_{a2} = 5 in ≥ 4 in → verified	4.1.2; Table 1
2	Calculation of steel capacity on a single fastener loaded in tension φN_{sa}= (0.75) (18,917) = 14,187 lbf Group of fasteners φN_s= n φN_{sa}= (2) (14,187) = **28,374** lbf	4.2.9; Table 3
3	Calculation of masonry strength capacity of the group of fasteners loaded in tension $\phi N_{mbg} = \phi \frac{A_{Nm}}{A_{Nmo}} \psi_{ec,N,m} \psi_{ed,N,m} \psi_{c,N,m} N_{b,m}$	4.2.10
3.1	A_{Nmo} = 9 $(h_{ef})^2$ = 9 $(3.27)^2$ = 96.23 A_{Nm} = (c_{a1}+1,5 h_{ef}) (c_{a2}+s+1,5 h_{ef}) = (4.5+4.90) (5+4+4.90) = 130.66	4.2.10; Table 1
3.2	No load eccentricity → e_N = 0 → $\psi_{ec,N,m} = 1.00$	
3.3	$C_{a,min}$ < 1.5 h_{ef} → $\psi_{ed,N,m} = 0.7 + 0.3 \frac{c_{a,min}}{1.5\,h_{ef}} = 0.7 + 0.3 \frac{4.5}{4.9} = 0.98$	4.2.10; Table 1
3.4	Cracked masonry → $\psi_{c,N,m} = 1.00$	4.2.10;
3.5	$N_{b.m,cr} = k_{m,cr} \sqrt{f'_m}\, h_{ef}^{1,5} = \alpha_{masonry}\, k_{c,cr} \sqrt{f'_m}\, h_{ef}^{1,5} = (0.7)\,(17)\sqrt{3000}\,(3.27)^{1.5} = 3{,}854 \text{ lbf}$	4.2.11; Table 1
3.6	thus $\phi N_{mbg} = (0.65)\, \frac{130.66}{96.23}\, (1.0)(0.98)(1.0)(3{,}854) = \mathbf{3,333} \text{ lbf}$	4.2.10
4	Calculation of pull out strength on single fastener loaded in tension $\phi N_{pm} = \phi\, \psi_{m,P} N_p = (0,65)(1.00)\,(866) = 562 \text{ lbf}$ Group of fasteners φN_{pm}= n φN_{pm} = (2) (562) = **1,125** lbf	4.2.16; Table 3
5	Governing tension strength: Minimum value of steel, masonry breakout, pull out: $\varphi N_{n,m}$= min [φN_{sa}; φN_{mbg}; φN_{pm}] = **1,125** lbf	
6	Calculation of conversion factor α α = (1.2) D +(1.6) L = (1.2) (0.30) + (1,6) (0.6) = **1.48**	4.3.1
7	Calculation of allowable stress design in tension $T_{allowable,ASD} = \frac{\phi N_{n,m}}{\alpha} = \frac{1{,}125}{1.48} = \mathbf{803} \text{ lbf}$	4.3.1
8	Calculation of steel capacity on a single fastener loaded in shear φV_{sa}= (0.65) (5,524) = 3,590 lbf Group of fasteners φV_m= n φV_m= (2) (3,866) = **7,181** lbf	Table 3

TABLE 5- SAMPLE CALCULATION FOR ALLOWABLE STRESS DESIGN (CONTINUED)

Step	AC -01 calculation section 3.3	ESR
9	Calculation of masonry edge capacity on the group of fasteners loaded in shear	Table 3
9.1	$$\phi V_{mbg} = \phi \frac{A_{Vm}}{A_{Vm0}} \psi_{ec,V,m} \psi_{ed,V,m} \psi_{c,V,m} \psi_{h,V,m} V_{b,m}$$	
9.2	$A_{Nmo} = 4.5\ (c_{a1})^2 = 4.5\ (4.5)^2 = 91.12$	
9.3	$A_{Vm} = (1.5\ c_{a1})\ (c_{a2}+s+1.5\ c_{a1}) = (1.5)(4.5)\ (5+4+1.5 \cdot 4.5) = 106.31$	
9.4	No load eccentricity $\rightarrow e_V = 0 \rightarrow \psi_{ec,V,m} = 1.00$	
9.5	$C_{a2} < 1.5\ c_{a1} \rightarrow \psi_{ed,V,m} = 0.7 + 0.3 \frac{c_{a2}}{1.5\ c_{a1}} = 0.7 + 0.3 \frac{5}{6.75} = 0.92$	
9.6	Cracked masonry $\rightarrow \psi_{c,V,m} = 1.00$	
9.7	$\psi_{h,V,m} = \sqrt{\frac{1.5\ c_a}{h_a}} = \sqrt{\frac{1.5 \cdot 4.5}{8}} = 0.92 \rightarrow 1.00$ $= \min\left[7 \left(\frac{l_c}{d_a}\right)^{0.2} \sqrt{d_a} \sqrt{f'_m}\ c_{a1}^{1.5} ; 9 \sqrt{f'_m}\ c_{a1}^{1.5}\right] =$ $= \min\left[7 \left(\frac{3.27}{0.5}\right)^{0.2} \sqrt{0.5} \sqrt{3000}\ 4.5^{1.5} ; 9 \sqrt{3000}\ 4.5^{1.5}\right]$ $= \min\ [3{,}767; 4{,}705]\ =\ 3{,}767\ lbf$	
9.9	thus $$\phi V_{mbg} = (0.70) \frac{106.31}{91.12} (0.92)(1.00)(1.00) = \mathbf{2{,}830}\ \text{lbf}$$	
10	Calculation of shear pryout capacity $\varphi V_{cp,m} = \varphi\ k_{cp}\ N_{cp,m} = (0.70)\ (2.0)\ (5{,}127) =$ **7,536** lbf	Table 3
11	Calculation of masonry crushing strength on a single fastener loaded in shear $\varphi V_{mc} = \varphi\ 1750 \sqrt[4]{f'_m A_{se,V}} = (0.50)(1750) \sqrt[4]{(3000)(0.1768)} = 4{,}199$ lbf Group of fasteners $\varphi V_m = n\ \varphi V_m = (2)\ (4{,}199) =$ **8,397** lbf	Table 3
12	Calculation of shear capacity for bolts in horizontal ledgers It does not apply, since there are less than 6 anchors	4.2.23
13	Governing shear strength: Minimum value of steel, masonry breakout, masonry, masonry pryout, masonry crushing: $\varphi V_{n,m} = \min\ [\varphi V_{sa}; \varphi V_{mbg}; \varphi V_{pcp,m,} \varphi V_{mc}] =$ **2,830** lbf	
14	Calculation of allowable stress design in shear $$V_{allowable,ASD} = \frac{\phi V_{n,m}}{\alpha} = \frac{2{,}830}{1.48} = \mathbf{1{,}912}\ \text{lbf}$$	4.3.1

TABLE 6— APPLICABLE SECTIONS OF THE IBC CODE UNDER EACH EDITION OF THE IBC AND IRC

<table>
<tr><th colspan="4">IBC</th></tr>
<tr><th>2024 IBC</th><th>2021 IBC</th><th>2018 IBC</th><th>2015 IBC</th></tr>
<tr><td colspan="4">Section 1705</td></tr>
<tr><td colspan="4">Section 1706</td></tr>
<tr><td colspan="4">Section 1707</td></tr>
<tr><td>1905.7</td><td colspan="3">1905.1.8</td></tr>
<tr><td colspan="4">Chapter 21</td></tr>
<tr><td colspan="4">Section 2103.2.1</td></tr>
<tr><td colspan="4">Section 2103.3</td></tr>
<tr><td colspan="4">Section 2107.1</td></tr>
<tr><th colspan="4">IRC</th></tr>
<tr><th>2024 IRC</th><th>2021 IRC</th><th>2018 IRC</th><th>2015 IRC</th></tr>
<tr><td colspan="4">Section R301.1.3</td></tr>
<tr><td colspan="3">Section R606.2.8</td><td>Section R606.2.7</td></tr>
<tr><td colspan="3">Section R606.2.12</td><td>Section R606.2.11</td></tr>
</table>

TABLE 7— APPLICABLE SECTIONS OF TMS 402 UNDER EACH EDITION OF THE IBC

<table>
<tr><th>2024 IBC</th><th>2021 IBC</th><th>2018 IBC</th><th>2015 IBC</th></tr>
<tr><td>TMS 402-22</td><td colspan="2">TMS 402-16</td><td>TMS 402-13</td></tr>
<tr><td>Section 8.1.4</td><td colspan="3">Section 8.1.3</td></tr>
<tr><td>Eq. 9-5</td><td colspan="3">Eq 9-7</td></tr>
</table>

ICC-ES Evaluation Report

ESR-6056 City of LA Supplement

Issued September 2026

This report remains under an active continuous compliance program through the end of September 2027.

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DIVISION: 04 00 00—MASONRY
Section: 04 05 19.16—Masonry Anchors

REPORT HOLDER:

AEROSMITH FASTENING SYSTEMS

EVALUATION SUBJECT:

SURE-BOLT® AND SURE-BOLT EXTREME® SCREW ANCHORS FOR USE IN CRACKED AND UNCRACKED MASONRY

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Sure-Bolt and Sure-Bolt Extreme screw anchors, described in ICC-ES evaluation report ESR-6056, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2026* *City of Los Angeles Building Code (LABC)*
- 2026* *City of Los Angeles Residential Code (LARC)*

*For evaluation for compliance with the anticipated requirements of the 2026 LABC and LARC

2.0 CONCLUSIONS

The Sure-Bolt and Sure-Bolt Extreme screw anchors, described in Sections 2.0 through 7.0 of the evaluation report ESR-6056, comply with the LABC Chapter 21, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Sure-Bolt and Sure-Bolt Extreme screw anchors described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-6056.
- The design, installation, conditions of use and identification of the Sure-Bolt and Sure-Bolt Extreme screw anchors are in accordance with the 2024 *International Building Code®* (IBC) and 2024 *International Residential Code®* (IRC) provisions, as applicable, noted in the evaluation report ESR-6056.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.
- The connection between the anchors and the connected masonry members shall be checked for capacity (which may govern).
- For use in wall anchorage assemblies to flexible diaphragm applications, anchors shall be designed per the requirements of City of Los Angeles Information Bulletin P/BC 2026-071.

This supplement expires concurrently with the evaluation report issued September 2026.

ICC-ES Evaluation Report

ESR-6056 CA Supplement

Issued September 2026

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DIVISION: 04 00 00—MASONRY
Section: 04 05 19.16—Masonry Anchors

REPORT HOLDER:

AEROSMITH FASTENING SYSTEMS

EVALUATION SUBJECT:

SURE-BOLT® AND SURE-BOLT EXTREME® SCREW ANCHORS FOR USE IN CRACKED AND UNCRACKED MASONRY

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Super-Bolt and Super-Bolt Extreme screw anchors, described in ICC-ES evaluation report ESR-6056, have also been evaluated for compliance with the codes noted below.

Applicable code edition:

- *2025 California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- *2025 California Residential Code* (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The Super-Bolt and Super-Bolt Extreme screw anchors, described in Sections 2.0 through 7.0 of the evaluation report ESR-6056, comply with CBC Chapter 21, provided the design and installation are in accordance with the 2024 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16, 17 and 21, as applicable.

2.1.1 OSHPD: The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2 DSA: The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2 CRC:

The Super-Bolt and Super-Bolt Extreme screw anchors, described in Sections 2.0 through 7.0 of the evaluation report ESR-6056, comply with CRC Chapter 3, provided the design and installation are in accordance with the 2024 *International Residential Code*® (IRC) provisions noted in the evaluation report and the additional requirements of CRC Chapter 3.

This supplement expires concurrently with the evaluation report, issued September 2026.

ICC-ES Evaluation Report

ESR-6056 FL Supplement w/ HVHZ

Issued September 2026

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DIVISION: 04 00 00—MASONRY
Section: 04 05 19.16—Masonry Anchors

REPORT HOLDER:

AEROSMITH FASTENING SYSTEMS

EVALUATION SUBJECT:

SURE-BOLT® AND SURE-BOLT EXTREME® SCREW ANCHORS FOR USE IN CRACKED AND UNCRACKED MASONRY

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Super-Bolt and Super-Bolt Extreme screw anchors, described in ICC-ES evaluation report ESR-6056, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2023 and 2020 *Florida Building Code—Building*
- 2023 and 2020 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The Sure-Bolt and Sure-Bolt Extreme screw anchors, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-6056, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*. The design requirements must be determined in accordance with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-6056 for the 2021 and 2018 *International Building Code®* meet the requirements of the *Florida Building Code—Building* and the *Florida Building Code—Residential*, as applicable.

Use of the Super-Bolt and Super-Bolt Extreme screw anchors have also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential*, with the following conditions:

a) Design and installation must meet the requirements of Section 2122.7 of the *Florida Building Code-Building*.

b) For anchorage to wood members, the connection subject to uplift, must be designed for no less than 700 pounds (3114 N).

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 for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission). Florida Rule 61G20-3 is applicable to products and/or systems which comprise the building envelope and structural frame for compliance with the structural requirements of the Florida Building Code.

This supplement expires concurrently with the evaluation report issued September 2026.