ICC-ES Evaluation Report

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This report also contains:

- City of LA Supplement
- FL Supplement w/ HVHZ

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DIVISION: 04 00 00—MASONRY Section: 04 05 19.16—Masonry Anchors	REPORT HOLDER: SIMPSON STRONG-TIE COMPANY INC.	EVALUATION SUBJECT: SIMPSON STRONG-TIE® ET-3G™ EPOXY ADHESIVE ANCHORS IN CRACKED AND UNCRACKED, GROUTED AND UNGROUTED CONCRETE MASONRY UNIT WALLS	

1.0 EVALUATION SCOPE

Compliance with the following codes:

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

Property evaluated:

Structural

2.0 USES

The Simpson Strong-Tie® ET-3G™ Epoxy Adhesive Anchors are used as anchorage in cracked and uncracked concrete masonry unit (CMU) walls to anchor building components to grouted and ungrouted lightweight, medium-weight, or normal-weight concrete masonry wall construction. The adhesive anchors are designed to resist static, wind, and earthquake (Seismic Design Categories A through F) tension and shear loads.

The adhesive anchors are an alternative to cast-in-place anchors described in Section 8.1.3 (2016 or 2013 editions), or Section 2.1.4 (2011 edition) of TMS 402 as referenced in Section 2107.1 of the IBC.

The anchors are permitted to be used in structures regulated by the IRC, provided an engineered design is submitted in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

3.1 General:

The ET-3G Epoxy Epoxy Adhesive Anchor System is comprised of the following components:

- ET-3G epoxy adhesive packaged in cartridges
- Adhesive mixing and dispensing equipment
- Equipment for hole cleaning and adhesive injection
- A steel anchoring element
- Opti-Mesh screen tubes (ungrouted masonry)

ET-3G epoxy adhesive is used with continuously threaded steel rods or deformed steel reinforcing bars. The manufacturer's printed installation instructions (MPII) are included with each adhesive unit package as shown in Figure 2 of this report.

3.2 Materials:

3.2.1 ET-3G Epoxy Adhesive: ET-3G epoxy adhesive is an injectable, two-component, 100 percent solids, epoxy-based adhesive mixed as a 1-to-1 volume ratio of hardener-to-resin. ET-3G is available in 8.5-ounce (251 mL), 22-ounce (650 mL), and 56-ounce (1656 mL) cartridges. The two components combine and react when dispensed through a static mixing nozzle attached to the cartridge. The shelf life of ET-3G in unopened cartridges is two years from the date of manufacture when stored at temperatures between 45°F and 90°F (7°C and 32°C) in accordance with the MPII.

3.2.2 Dispensing Equipment: ET-3G epoxy adhesive must be dispensed using Simpson Strong-Tie manual dispensing tools, battery-powered dispensing tools or pneumatic dispensing tools as listed in Tables 14, 15 and 16 of this report.

3.2.3 Hole Cleaning Equipement: Hole cleaning equipment consists of hole-cleaning brushes and air nozzles. Brushes must be Simpson Strong-Tie hole cleaning brushes, identified by Simpson Strong-Tie catalog number series ETB. See Tables 14, 15 and 16 in this report, and the installation instructions shown in Figure 2, for additional information. Air nozzles must be equipped with an extension capable of reaching the bottom of the drilled hole.

3.2.4 Anchor Materials:

3.2.4.1 Threaded Steel Rods: Threaded anchor rods, having diameters from $^3/_8$ inch to $^7/_8$ inch (9.5 mm to 22.2 mm), must be carbon steel conforming to ASTM F1554, Grade 36 or 55, or ASTM A193, Grade B7; or stainless steel conforming to ASTM A193, Grade B6, B8, or B8M or ASTM F593 CW. Table 6 in this report provides additional details. Threaded rods must be clean, straight and free of indentations or other defects along their lengths.

3.2.4.2 Steel Reinforcing Bars: Steel reinforcing bars are deformed reinforcing bars (rebar), having sizes from No. 3 to No. 5, must conform to ASTM A615 Grade 60 or ASTM A706 Grade 60. Table 7 in this report provides additional details for anchor applications. The embedded portions of reinforcing bars must be straight, and free of mill scale, rust, mud, oil, and other coatings that may impair the bond with adhesive.

3.2.4.3 Opti-Mesh Screen Tubes: The Simpson Strong-Tie® Opti-Mesh screen tubes are used in ungrouted masonry as described in sections 4.3 and 4.4 of this report. The screens are cylindrical with a flange that contacts the masonry surface when fully inserted and include an integral cap.

3.2.4.4 Ductility: In accordance with ACI 318-19 and ACI 318-14 2.3, as applicable, in order for a steel element to be considered ductile, the tested elongation must be at least 14 percent and reduction of area must be at least 30 percent. Steel elements with a tested elongation of less than 14 percent or a reduction of area less than 30 percent, or both, are considered brittle. Where values are nonconforming or unstated, the steel must be considered brittle.

3.2.5 Grout-filled Concrete Masonry: Grouted concrete masonry must comply with Chapter 21 of the IBC. The specified compressive strength of masonry at the time of installation, f'_m, at 28 days must be a minimum of 2,000 psi (13.8 MPa). Fully grouted masonry walls must be constructed from the following materials:

3.2.5.1 Concrete Masonry Units (CMUs): CMUs must be minimum Grade N, Type II, lightweight, medium-weight, or normal-weight, closed-end or open-end, conforming to ASTM C90. The minimum allowable nominal size of the CMU must be 8 inches (203.2 mm) wide by 8 inches (203.2 mm) high by 16 inches (406.4 mm) long.

3.2.5.2 Grout: Grout must comply with IBC Section 2103.3 (2021, 2018 and 2015 IBC), or IRC Section R606.2.12 (2021 and 2018 IRC), or IRC Section R606.2.11 (2015 IRC), 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).

3.2.5.3 Mortar: Mortar must be Type M or S in compliance with IBC Section 2103.2.1 (2021, 2018 and 2015 IBC), or IRC Section R606.2.8 (2021 and 2018 IRC), or IRC Section R606.2.7 (2015 IRC), as applicable.

3.2.6 Ungouted Concrete Masonry: Ungouted concrete masonry must comply with Chapter 21 of the IBC. The compressive strength of masonry, f'_m, at 28 days must be a minimum of 2,000 psi (13.8 MPa). Ungrouted concrete masonry must be constructed from the following materials:

3.2.6.1 Concrete Masonry Units (CMUs): CMUs must be minimum Grade N, Type II, lightweight, medium-weight, or normal-weight, closed-end or open-end, conforming to ASTM C90. The minimum allowable nominal size of the CMU must be 8 inches (203.2 mm) wide by 8 inches (203.2 mm) high by 16 inches (406.4 mm) long.

3.2.6.2 Mortar: Mortar must be Type M or S in compliance with IBC Section 2103.2.1 (2021, 2018 and 2015 IBC), or IRC Section R606.2.8 (2021 and 2018 IRC), or IRC Section R606.2.7 (2015 IRC), 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 for anchors used in 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 adhesive anchors in grouted concrete masonry unit construction shall be conducted in accordance with the provisions for the design of adhesive anchors in concrete in *ACI 318 (-19 or -14) Chapter 17,* and TMS 402-16 as modified by the sections that follow. Design in accordance with this report cannot be conducted without reference to *ACI 318 (-19 or -14)* with the deletions and modifications summarized in Table 1A and TMS 402-16 Eq. 9-7.

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*, with the leading reference corresponding to 318-19 and the parenthetical reference corresponding to 318-14. For example, Section 2.2 in ACI 318-19, which is analogous to Section 2.2 in ACI 318-14, will be displayed as *ACI 318-19 Section 2.2 (ACI 318-14 Section 2.2)*.
- •References to sections, tables, and figures originating from this report do not have any special font treatment, for example Section 4.5.

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 or -14)* term**	**Replacement term**
$f_c^{'}$	$f_m^{'}$
N_{cb}, N_{cbg}	N_{mb}, N_{mbg}
N_a, N_{ag}	N_{ma}, N_{mag}
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 2 and Table 3 and shown in Figure 1. For CMU construction with 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 4.2.20.

4.2 ACI modifications required for design: Table 1A provides a summary of all applicable *ACI 318-19* and *ACI 318-14* sections for the design of adhesive anchors in masonry. Where applicable, modifying sections contained within this report are also provided.

4.2.1 *ACI-19 Section 17.1.1, 17.1.6 & 17.2.2 (ACI 318-14 Section 17.1.1-17.1.2)* apply with the general changes prescribed in Section 4.1.1.

4.2.2 In lieu of *ACI 318-19 Section 17.1.2 (ACI 318-14 Section 17.1.3):* Design provisions are included for adhesive anchors that meet the assessment criteria of ICC-ES AC58.

4.2.3 *ACI 318-19 Section 17.1.4, 17.2.1, 17.4.1 & 17.5.1.3.1 (ACI 318-14 Section 17.1.4-17.2.2)* apply with the general changes prescribed in Section 4.1.1.

4.2.4 *In* lieu of *ACI 318-19 Section 17.2.10 (ACI 318-14 Section 17.2.3):* The design of anchors in structures assigned to Seismic Design Category (SDC) C, D, E, or F shall satisfy the requirements of this section.

4.2.4.1 The design of anchors in the plastic hinge zones of masonry structures under earthquake forces is beyond the scope of this report.

4.2.4.2 The anchor or group of anchors shall be designed for the maximum tension and shear obtained from the design load combinations that include E, with E_h increased by Ω_o. The anchor design tensile strength shall satisfy the tensile strength requirements of Section 4.2.4.3.

4.2.4.3 The anchor design tensile force for resisting earthquake forces shall be determined from consideration of (a) through (c) for the failure modes given in Table 1B assuming the masonry is cracked unless it can be demonstrated that the masonry remains uncracked.

(a) ϕN_{sa} for a single anchor, or for the most highly stressed individual anchor in a group of anchors.

(b) 0. 75 ϕN_{mb} or 0.75 $\phi N_{mbg.}$

(c) 0.75 ϕN_{ma} or 0.75 $\phi N_{mag.}$

(d) where ϕ is in accordance with Section 4.2.9.

4.2.5 In lieu of *ACI 318-19 Section 17.5.1.3 & 17.5.2.2.1 (ACI 318-14 Section 17.2.5):* For anchors designed for sustained tension loading, *ACI 318-19 Section 17.5.2.2 (ACI 318-14 Section 17.3.1.2)* shall be satisfied. For groups of anchors, *ACI 318-19 Eq. 17.5.2.2 (ACI 318-14 Eq. 17.3.1.2)* shall be satisfied for the anchor that resists the highest sustained tension load. Inspection requirements for horizontal anchors designed for sustained tension loading shall be in accordance with *ACI 318-19 Section 26.13.3.2(e) (ACI 318-14 Section 17.8.2.4).* Installers of such anchors shall be qualified for the installation of the anchor type used.

4.2.6 *In lieu of ACI 318-19 Section 17.5.2 (ACI 318-14 Section 17.3.1.1)*: The design of anchors shall be in accordance with Table 1B. In addition, the design of anchors shall satisfy Section 4.2.4 for earthquake loading and *ACI 318-19 Section 17.5.2.2 (ACI 318-14 Section 17.3.1.2* for anchors designed for sustained tensile loading.

4.2.7 *ACI 318-19 Section 17.5.2.2-17.5.2.3 (ACI 318-14 Section 17.3.1.2-17.3.1.3)* applies with the general changes prescribed in Section 4.1.1.

4.2.8 *ACI 318-19 Section 17.5.1.2* (*ACI 318-14 Section 17.3.2 excluding Section 17.3.2.1*) applies with the general changes prescribed in Section 4.1.1.

4.2.9 In lieu of *ACI 318-19 Section 17.5.3 (ACI 318-14 Section 17.3.3):* Strength reduction factor ϕ for anchors in masonry shall be as follows when the LRFD load combinations of ASCE 7 are used:

(a) For steel capacity of ductile steel elements as defined in *ACI 318-19 Section 2.3* (*ACI 318-14 Section 2.3)*, ϕ shall be taken as 0.75 in tension and 0.65 in shear. Where the ductility requirements of Section 3.2.4.3 are not met, ϕ shall be taken as 0.65 in tension and 0.60 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 in tension, ϕ shall be taken as 0.65.

(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.

(e) For cases where the nominal strength of anchors in masonry is controlled by bond failure or pullout failure, ϕ shall be taken as 0.65 for anchors qualifying for Category 1 and 0.55 for anchors qualifying for Category 2.

4.2.10 *ACI 318-19 Section 17.6.1 (ACI 318-14 Section 17.4.1)* applies with the general changes prescribed in Section 4.1.1.

4.2.11 In lieu of *ACI 318-19 Section 17.6.2.1 (ACI 318-14 Section 17.4.2.1)*: 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:

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

Factors $\psi_{ec,N,m}$,$\psi_{ed,N,m}$,$\psi_{c,N,m}$ are defined in *ACI 318-19 Section 17.6.2.3-17.6.2.5 (ACI 318-14 Section 17.4.2.4-17.4.2.6)*. 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 $1.5h_{ef}$ 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 $1.5h_{ef}$.

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

4.2.12 In lieu of *ACI 318-19 Section 17.6.2.2 (ACI 318-14 Section 17.4.2.2):* The basic masonry breakout strength of a single anchor in tension in cracked masonry, $N_{b,m}$, shall not exceed:

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

where

k_m = effectiveness factor for breakout strength in masonry

= $\alpha_{masonry} \cdot k_c$

k_c = effectiveness factor for breakout strength in concrete

= 17; and

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

= 0.7

4.2.13 *ACI 318-19 Section 17.6.2.1.2 & 17.6.2.3-17.6.2.4 (ACI 318-14 Section 17.4.2.3-17.4.2.5)* apply with the general changes prescribed in Section 4.1.1.

4.2.14 In lieu of *ACI 318-19 Section 17.6.2.5 (ACI 318-14 Section 17.4.2.)*: The basic masonry breakout strength of a single anchor in tension, $N_{b,m}$, must be calculated using the values of $k_{m,cr}$ and $k_{m,uncr}$ as described in Table 5. Where analysis indicates no cracking is anticipated, $N_{b,m}$ must be calculated using $k_{m,uncr}$ and $\Psi_{c,N,m}$ = 1.0.

4.2.15 *ACI 318-19 Section 17.6.2.6 (ACI 318-14 Section 17.4.2.7)* need not be considered since the modification factor for post installed anchors, $\psi_{cp,N}$ is not included in Eq. 17.6.2.1a & b.

4.2.16 In lieu of *ACI 318-19 Section 17.6.5.1 (ACI 318-14 Section 17.4.5.1)*: The nominal bond strength in tension, N_{ma} , of a single anchor or N_{mag} of a group of anchors, shall not exceed:

4.2.16.1 For a single anchor:

$$N_{ma} = \frac{A_{Na}}{A_{Nao}} \psi_{ed,Na} \cdot N_{ba,m} \qquad (17.6.5.1a)$$

4.2.16.2 For a group of anchors:

$$N_{mag} = \frac{A_{Na}}{A_{Nao}} \psi_{ec,Na} \cdot \psi_{ed,Na} \cdot N_{ba,m} \qquad (17.6.5.1b)$$

Factors $\psi_{ec,Na}$ and $\psi_{ed,Na}$ are defined in ACI 318-19 Sections 17.6.5.3-17.6.5.4 (ACI 318-14 Sections *17.4.5.3-17.4.5.4)*. A_{Na} is the projected influence area of a single anchor or group of anchors that shall be approximated as a rectilinear area that projects outward a distance c_{Na} 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_{Na} shall not exceed nA_{Nao}, 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 c_{Na}.

$$A_{Nao} = (2c_{Na})^2 \qquad (17.6.5.1.2a)$$

where

$$c_{Na} = 10d_a \sqrt{\frac{\tau_{uncr}}{1100}} \qquad (17.6.5.1.2b)$$

and constant 1100 carries the unit of lb./in.^{2}

4.2.17 *In lieu of ACI 318-19 Section 17.6.5.2 (ACI 318-14 Section 17.4.5.2)*: The basic bond strength of a single adhesive anchor in cracked masonry, $N_{ba,m}$, shall not exceed:

$$N_{ba,m} = \tau_{cr,m} \cdot \pi \cdot d_a \cdot h_{ef} \qquad (17.6.5.2.1)$$

The characteristic bond stresses $\tau_{cr,m}$ shall be taken from Tables 8, 9, 10, and 11. For adhesive anchors located in a region of a masonry member where analysis indicates no cracking at service load levels, $\tau_{uncr,m}$ shall be permitted to be used in place of $\tau_{cr,m}$ in *ACI 318-19 Eq. 17.6.5.2.1 (ACI 318-14 Eq. 17.4.5.2)* and shall be taken as the value of $\tau_{k,uncr}$determined from Tables 8, 9, 10, and 11.

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

1. *ACI 318-19 Section 17.6.5.3-17.6.5.4 (ACI 318-14 Section 17.4.5.3-17.4.5.4).*
2. *ACI 318-19 Section 17.7.1 excluding Sections 17.7.1.2a & 17.7.1.2c (ACI 318-14 Sections 17.5.1 excluding Sections 17.5.1.2a & 17.5.1.2c).*
3. *ACI 318-19 Sections 17.7.2.1-17.7.2.2.1 (ACI 318-14 Sections 17.5.2.1-17.5.2.2).*
4. *ACI 318-19 Section 17.7.2.1.2 & 17.7.2.3-17.7.2.4 (ACI 318-14 Section 17.5.2.4-17.5.2.6).*
5. *ACI 318-19 Section 17.7.2.6 (ACI 318-14 Section 17.5.2.8).*
6. *ACI 318-19 Section 17.7.3 (ACI 318-14 Section 17.5.3).*
7. *ACI 318-19 Section 17.2.5 (ACI 318-14 Section 17.8.1).*

4.2.19 In lieu of *ACI 318-19 Section 17.7.2.5 (ACI 318-14 Section 17.5.2.7):* 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 levels, it shall be permitted to take $\psi_{m,V}$ as 1.4.

[In addition to the ACI 318 provisions] Masonry crushing strength for anchors in shear shall be calculated in accordance with TMS 402-16 Eq. 9-7 —The nominal strength of an anchor in shear as governed by masonry crushing, V_{mc}, shall be calculated using Eq. (4-1).

$$V_{mc} = 1750\sqrt[4]{f'_m A_{se,V}} \qquad (4\text{-}1)$$

4.2.20 Determination of shear capacity for anchors 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 anchors 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 anchors may be permitted to be calculated in accordance with Eq. (4-1.1) and Eq. (4-1.2), respectively, in lieu of ACI 318-19 Section 17.7.2.

$$V_{mb,horiz} = 0.75 \cdot V_{gov,horiz} \cdot \frac{12}{s_{horiz}} \qquad (4\text{-}1.1)$$

$$V_{mb,vert} = 0.75 \cdot V_{gov,vert} \cdot \frac{12}{s_{horiz}} \qquad (4\text{-}1.2)$$

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).

$V_{gov,vert}$ = min(V_{sa}, $2 \cdot V_{mb,4}$, V_{mc}, $V_{mp,4}$), (lb).

V_{sa} = shear capacity for a single anchor calculated in accordance with *ACI 318-19 Section 17.7.1.2 (ACI 318-14 Section 17.5.1.2),* (lb).

$V_{mb,4}$ = breakout capacity for a single anchor with edge distance of 4 inches, (lb).

V_{mc} = crushing capacity for a single anchor calculated in accordance with Eq. (3-1), (lb).

$V_{mp,4}$ = pryout capacity for a single anchor with edge distance of 4 inches, (lb).

4.2.21 In lieu of *ACI 318-19 Section 26.7.1(i) (ACI 318-14 Section 17.8.2.1):* The construction documents shall specify all parameters associated with the characteristic bond stress used for design in accordance with Section 4.2.16 and Section 4.2.17, including minimum age of masonry; masonry temperature range; moisture condition of masonry at time of installation; type of lightweight masonry, if applicable; and requirements for hole drilling and preparation.

4.2.22 *ACI 318-19 Section 26.7.2(e) (ACI 318-14 Section 17.8.2.4)* apply with the general changes prescribed in Section 4.1.1.

4.2.23 Interaction shall be calculated in compliance with *ACI 318-19 17.8 (ACI 318-14 Section 17.6)* 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:

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

4.2.24 Satisfying the parabolic equation complying with *ACI 318-19 Section R17.8 (ACI 318-14 Section R17.6)* may be used in lieu of satisfying Section 4.2.23. The parabolic equation is given as:

$$\left(\frac{N_{ua}}{\phi N_n}\right)^{5/3} + \left(\frac{V_{ua}}{\phi V_n}\right)^{5/3} = 1$$

4.3 Strength Design in Ungrouted Concrete Masonry Unit Construction:

4.3.1 General: This section provides strength design requirements for anchors used in ungrouted concrete masonry unit construction, where anchors are used to transmit structural loads by means of tension, shear or a combination of tension and shear.

4.3.2 The use of an Opti-Mesh screen tube to prevent unrestricted flow of adhesive is required.

4.3.3 Anchors shall be designed for critical effects of factored loads as determined by elastic analysis. Plastic analysis shall not be permitted.

4.3.4 Group effects shall not be considered. Dimensional requirements specified in Table 4 shall be observed for the design of individual anchors as follows:

4.3.4.1 The critical edge distance, c_{cr}, is the smallest edge distance to consider full capacity of an individual anchor and the minimum edge distance, c_{min}, shall be the smallest distance an anchor may be installed with a reduced capacity per the multiplier listed in Table 4. For anchors installed with edge distances between c_{cr} and c_{min}, capacities shall be linearly interpolated. The minimum distance from hollow head joints shall be 2 inches (50.8 mm) as measured from the centerline of the head joint.

4.3.4.2 For anchor spacings less than the minimum spacing, s_{min}, the strength of the group shall equal the strength of a single anchor.

4.3.5 Seismic design requirements: Anchors designed in ungrouted CMU shall be in accordance with Section 4.2.4, as applicable.

4.3.6 Anchors designed for sustained tensile loading shall be in accordance with Section 4.2.5.

4.3.7 Strength design checks shall be in accordance with Table 1C. In addition, the design of anchors shall satisfy Section 4.2.4 for earthquake loading and Section 4.2.5 for anchors designed for sustained tensile loading.

4.3.8 The strength reduction factors, ϕ, shall be in accordance with Section 4.2.9, as applicable.

4.3.9 The nominal steel strength of anchors in tension shall be calculated in accordance with Section 4.2.10.

4.3.10 The nominal pullout strength of anchors in tension, $N_{k,ug}$, shall be taken from Table 12.

4.3.11 The nominal anchorage strength of anchors in shear, $V_{s,ug}$, shall be taken from Table 13.

4.3.12 The nominal steel strength of an anchor in shear, V_{sa}, shall be calculated in accordance with Section 4.2.18 (2).

4.3.13 The nominal strength of an anchor in shear as governed by crushing, V_{mc}, shall be calculated in accordance with Section 4.2.19.

4.3.14 Anchors designed for combinations of tension and shear shall satisfy the provisions of Section 4.3.23.

4.3.15 The provisions of Sections 4.2.18.7, 4.2.21, and 4.2.22 shall apply.

4.4 Strength Design in Partially Grouted Concrete Masonry Unit Construction:

4.4.1 In all cases, the minimum distance from hollow head joints shall be 2 inches as measured from the centerline of the head joint.

4.4.2 For cases where the location of grouted cells is known, the following provisions shall apply:

4.4.2.1 Group effects shall not be considered between anchors in grouted masonry and anchors in ungrouted masonry.

4.4.2.2 Anchors located in grouted cells shall be designed in accordance with Sections 4.1 and 4.2, whereby the distance to the extent of the ungrouted cell shall be taken as a free edge.

4.4.2.3 Anchors in ungrouted cells shall be designed in accordance with Section 4.3, whereby the use of a screen tube or similar device to prevent unrestricted flow of adhesive is required.

4.4.3 For cases where the location of grouted cells is unknown, the design of anchors shall be in accordance with Section 4.3.

4.5 Conversion of Strength Design to Allowable Stress Design:

For adhesive anchors designed using load combinations in accordance with IBC Section 1605.3 (Allowable Stress Design) allowable loads shall be established using the equations below:

$$T_{allowable,ASD} = \frac{\phi N_n}{\alpha} \quad (4\text{-}2)$$

and

$$V_{allowable,ASD} = \frac{\phi V_n}{\alpha} \quad (4\text{-}3)$$

where

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

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

N_n = Lowest design strength of an anchor or anchor group in tension as determined in accordance with this report, as applicable, and 2021, 2018, and 2015 IBC Section 1905.1.8 (lb. or kN);

V_n = Lowest design strength of an anchor or anchor group in shear as determined in accordance with this report, as applicable, and 2021, 2018, and 2015 IBC Section 1905.1.8 (lb. or KN);

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

4.6 Installation:

Installation parameters are provided in Tables 2, 3, 4, 14, 15, 16 and 17 and in Figures 1, and 2. Installation must be in accordance with ACI 318-19 26.7.2, or ACI 318-14 17.8.1 and 17.8.2, as applicable. Anchor locations must comply with this report and the plans and specifications approved by the building official. Installation of the ET-3G Epoxy Adhesive Anchors must conform to the manufacturer's printed installation instructions included in each package unit and as described in Figure 2. The nozzles, brushes, and dispensing tools listed in Tables 14, 15 and 16 and Figure 2, supplied by the manufacturer, must be used along with the adhesive cartridges.

Anchors installed in the face of fully grouted CMU construction must be limited to the face shell of the CMU unit (center web and grouted cores) and the horizontal mortared bed joints, as indicated in Figure 1. Anchors installed in a T-joint, the hollow head joint, or the end webs of a CMU unit, as indicated in Figure 1, are outside the scope of this report.

For anchors installed in the top of fully grouted concrete masonry (CMU grouted cores and CMU webs), anchor location must comply with the minimum edge and end distances noted in Table 3. Anchors installed in hollow head joints are outside the scope of this report.

Anchors installed in the face of ungrouted CMU construction must use an Opti-Mesh screen tube and are limited to the face shell of the CMU unit (center web and ungrouted cores) and the horizontal mortared bed joints, as indicated in Figure 1. Anchors installed in a T-joint, the hollow head joint, or the end webs of a CMU unit, as indicated in Figure 1, are outside the scope of this report.

4.7 Special Inspection:

Anchors must be installed with special inspection. For the IBC and IRC, special inspection must conform to Sections 1704 and 1705 of the IBC.

At a minimum, periodic special inspection shall be provided for all anchors. Continuous special inspection shall be provided for anchors installed in horizontally inclined orientations and designed to resist sustained tension loads. Installation in head joints shall only be permitted in fully grouted walls constructed with open-ended units, fully grouted bond beams or other types of construction where the head joint void is filled.

The special inspector must be on the jobsite initially during anchor installation to verify anchor type, anchor dimensions, masonry type, masonry compressive strength, adhesive identification and expiration date, drill bit size and compliance with ANSI B212.15-1994, hole dimensions, hole cleaning procedures, installation outside of hollow head joints, anchor spacing, edge distances, masonry thickness, anchor embedment, tightening torque and adherence to the manufacturer's printed installation instructions.

The special inspector must verify the initial installations of each type and size of adhesive anchor by construction personnel on site. For periodic inspection, 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. For ongoing installations over an extended period, the special inspector shall make regular inspections to confirm correct handling and installation of the product.

The special inspector must inspect and verify that anchor installation complies with this evaluation report and Simpson Strong-Tie Company's published installation instructions.

5.0 CONDITIONS OF USE:

The Simpson Strong-Tie ET-3G Epoxy Adhesive Anchors described in this report are suitable alternatives to what is specified in the codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Anchors are identified and installed in accordance with this report and the manufacturer's printed installation instructions (MPII). In case of conflict, this report governs.

5.2 Anchors have been evaluated for use in cracked and uncracked grouted concrete masonry unit (CMU) construction with a minimum compressive strength of 2,000 psi (13.8 MPa) at the time of anchor installation.

5.3 Anchor sizes, dimensions, and minimum embedment depths must be as set forth in this report.

5.4 Construction documents prepared or reviewed by a registered design professional, where required by the statutes of the jurisdiction in which the project is to be constructed, specifying the ET-3G anchors must indicate compliance with this evaluation report, applicable codes, and must be submitted to the code official for approval.

5.5 Anchors installed in the face or the top of fully grouted CMU masonry may be used to resist short-term loading due to wind or seismic forces in structures assigned to Seismic Design Categories A through F under the IBC.

Loads applied to the anchors must be adjusted in accordance with Section 1605.1 of the 2021 IBC or Section 1605.2 of the 2018, and 2015 IBC for strength design and in accordance with Section 1605.1 of the 2021 IBC or Section 1605.3 of the 2018 and 2015 IBC for allowable stress design.

5.6 Strength design values shall be established in accordance with Sections 4.1, 4.2, 4.3 and 4.4 of this report.

5.7 Allowable design values shall be established in accordance with Section 4.5 of this report.

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

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

5.10 Adhesive anchors are permitted to be used to resist tension and shear forces in the face of wall installations only if consideration is given to the effects of elevated temperature conditions on anchor performance.

5.11 Anchors are not permitted to support fire-resistive construction. Where not otherwise prohibited by the applicable code, anchors are permitted for use with 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 fire-resistance-rated construction or 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 The design of anchors must be in accordance with the provisions for cracked masonry where analysis indicates that cracking may occur ($f_t > f_r$) in the vicinity of the anchor due to service loads or deformations over the anchor service life.

5.13 Anchors must be installed in masonry base materials in holes predrilled with carbide-tipped drill bits complying with ANSI B212.15-1994 in accordance with the instructions provided in Figure 2 of this report.

5.14 Simpson Strong-Tie ET-3G Epoxy Adhesive Anchors may be installed in base materials having interior temperatures between 50°F (10°C) and 110°F (43°C) for threaded rods and rebars at the time of installation. For water-saturated masonry, the cure times must be doubled. For installation of anchors in masonry where the temperature is below 70°F (21°C), the adhesive must be conditioned to a minimum temperature of 70°F (21°C). Installation of anchors in base materials having temperatures beyond this range is outside the scope of this report.

5.15 Special inspection, when required, must be provided in accordance with Section 4.7. Continuous special inspection must be provided for anchors designed to resist sustained tension loads.

5.16 Steel anchoring materials in contact with preservative-treated and fire-retardant-treated wood shall be of zinc-coated steel or stainless steel. The coating weights for zinc-coated steel shall be in accordance with ASTM A153 class C or D or ASTM B695 with a Class 55 min. coating.

5.17 Anchors shall not be torqued until adhesive cure time indicated in the MPII is fully reached.

5.18 Anchors are not permitted for overhead installations.

5.19 Use of carbon steel anchors is limited to dry, interior locations.

5.20 Hot-dipped galvanized carbon steel threaded rods with coating weights in accordance with ASTM A153 Class C and D, or stainless steel threaded rods, are permitted for exterior exposure or damp environments.

5.21 ET-3G epoxy adhesive is manufactured and packaged into cartridges by Simpson Strong-Tie Company Inc., in West Chicago, Illinois, under a quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Adhesive Anchors in Cracked and Uncracked Masonry (AC58), dated July 2023.

6.2 Quality-control documentation.

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5309) 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 ET-3G Epoxy Adhesive is identified in the field by labels on the cartridge or packaging, bearing the company name (Simpson Strong-Tie Company, Inc.), product name (ET-3G), the batch number, and the adhesive expiration date.

7.3 Threaded rods, nuts, washers and deformed reinforcing bars are standard elements and must conform to applicable national or international specifications.

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

SIMPSON STRONG-TIE COMPANY INC.
5956 WEST LAS POSITAS BOULEVARD
PLEASANTON, CALIFORNIA 94588
(800) 999-5099
www.strongtie.com

TABLE 1A—ACI 318-19 and -14 SECTIONS APPLICABLE OR MODIFIED BY THIS REPORT

ACI 318-19 Section	*ACI 318-14 Section*	Modified by this report Section:
2.2	*(2.2)*	unchanged*
2.3	*(2.3)*	
17.1.1 & 17.1.5	*(17.1.1 – 17.1.2)*	
17.1.2	*(17.1.3)*	Section 4.2.2
17.1.4, 17.2.1, 17.4.1, & 17.5.1.3.1	*(17.1.4 – 17.2.2)*	unchanged*
17.10	*(17.2.3)*	Section 4.2.4
17.5.1.3 & 17.5.2.2	*(17.2.5)*	Section 4.2.5
17.5.2	*(17.3.1.1)*	Section 4.2.6
17.5.2.2 – 17.5.2.3	*(17.3.1.2 – 17.3.1.3)*	unchanged*
17.5.1.2	*(17.3.2 excluding 17.3.2.1)*	
17.5.3	*(17.3.3)*	Section 4.2.9
17.6.1	*(17.4.1)*	unchanged*
17.6.2.1	*(17.4.2.1)*	Section 4.2.11
17.6.2.2	*(17.4.2.2)*	Section 4.2.12
17.6.2.1.2 & 17.6.2.3 – 17.6.2.4	*(17.4.2.3 – 17.4.2.5)*	unchanged*
17.6.2.5	*(17.4.2.6)*	Section 4.2.14
17.6.2.6	*(17.4.2.7)*	Section 4.2.15
17.5.2.1	*(17.4.2.9)*	unchanged*
17.6.5.1	*(17.4.5.1)*	Section 4.2.16
17.6.5.2	*(17.4.5.2)*	Section 4.2.17
17.6.5.3 – 17.6.5.4	*(17.4.5.3 – 17.4.5.4)*	unchanged*
17.7.1.1 – 17.7.2.2	*(17.5.1.1 – 17.5.2.2)*	
17.7.2.1.2 & 17.7.2.3 – 17.7.2.4	*(17.5.2.4 – 17.5.2.6)*	
17.7.2.6	*(17.5.2.8)*	
17.7.3	*(17.5.3)*	
17.8	*(17.6)*	
26.7.1	*(17.8.1)*	
17.7.2.5	(17.5.2.7)	Section 4.2.19
26.7.1(i)	*(17.8.2.1)*	Section 4.2.21
26.7.2(e)	*(17.8.2.4)*	unchanged*
17.8	(17.6)	
R17.8	(R17.6)	

*Sections marked as unchanged adopt the general changes prescribed in Section 4.1.2.

TABLE 1B—REQUIRED STRENGTH OF ANCHORS IN GROUTED CMU

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	$\phi N_{mb} \geq N_{ua}$		$\phi N_{mbg} \geq N_{ua,g}$
Bond strength in tension	$\phi N_{ma} \geq N_{ua}$		$\phi N_{mag} \geq N_{ua,g}$
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, pullout, and crushing failure modes shall be calculated for the most highly stressed anchor in the group.

TABLE 1C—REQUIRED STRENGTH OF ANCHORS IN UNGROUTED CMU

Failure mode	Single anchor
Steel strength in tension	$\phi N_{sa} \geq N_{ua}$
Pullout strength in tension	$\phi N_{k,ug} \geq N_{ua}$
Steel strength in shear	$\phi V_{sa} \geq V_{ua}$
Masonry anchor strength in shear	$\phi V_{s,ug} \geq V_{ua}$
Masonry crushing strength in shear	$\phi V_{mc,ug} \geq V_{ua}$

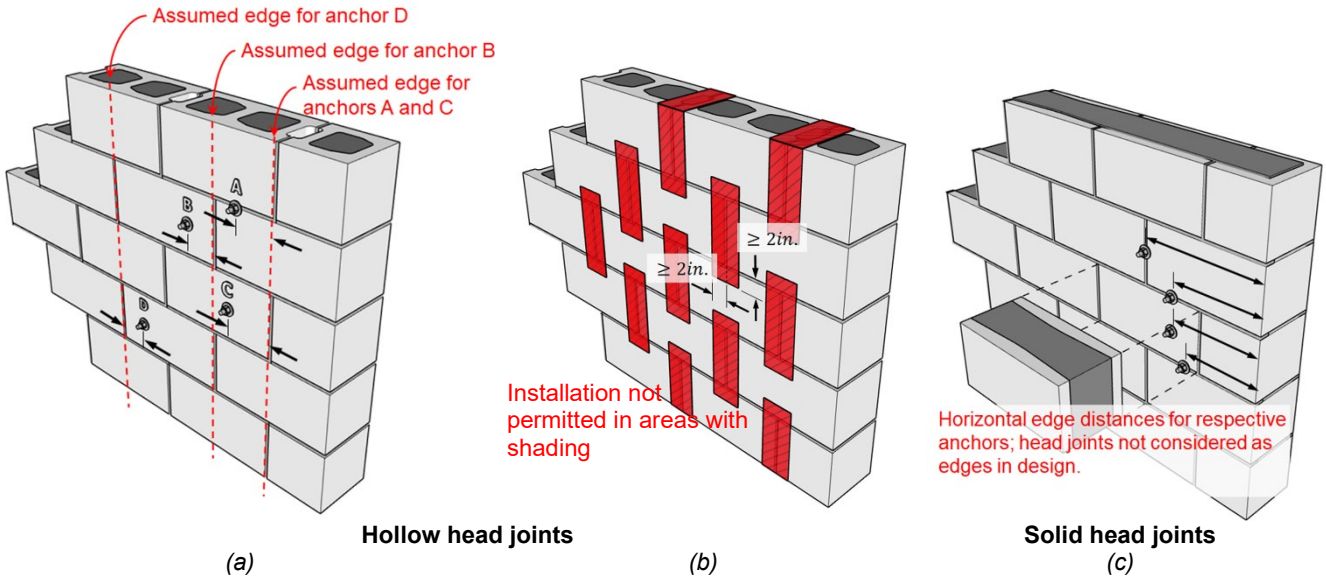


FIGURE 1—(a) Edge distance considerations in fully grouted CMU construction with hollow head joints, (b) exclusion zones in fully grouted construction with hollow head joints, and (c) edge distance considerations in fully grouted CMU construction with solid head joints . Note: dimensions to upper and lower edges omitted for clarity.

TABLE 2—ET-3G INSTALLATION INFORMATION FOR THREADED ROD/REBAR ANCHORS- FULLY GROUTED CMU CONSTRUCTION, FACE OF WALL

Installation Information	Symbol	Units	Nominal Rod Diameter / Rebar Size			
			$^3/_8$" or #3	$^1/_2$" or #4	$^5/_8$" or #5	$^3/_4$"
Drill Bit Diameter - Threaded Rod	d_o	in.	$^1/_2$	$^5/_8$	$^3/_4$	$^7/_8$
Drill Bit Diameter - Rebar	d_o	in.	$^1/_2$	$^5/_8$	$^3/_4$	N/A
Maximum Tightening Torque	T_{inst}	ft-lbs.	10	20	30	45
Minimum Embedment Depth	$h_{ef,min}$	in.	3			
Maximum Embedment Depth[1]	$h_{ef,max}$	in.	$7^1/_2$	10	$10^1/_8$	$10^1/_8$
Minimum Masonry Thickness	h_{min}	in.	$7^5/_8$			
Minimum Edge Distance[2]	c_{min}	in.	4			
Minimum Anchor Spacing	s_{min}	in.	4			

For **SI:** 1 inch = 25.4 mm, 1 ft-lb = 1.356 Nm.

[1]Maximum embedment for installation into the face of 8-inch nominal ($7^5/_8$ actual) CMU wall is $6^1/_8$ inches. Maximum embedment for installation into the face of 10-inch nominal CMU wall is $8^1/_8$ inches, and maximum embedment for installation into the face of 12-inch nominal CMU wall is $10^1/_8$ inches

[2]The minimum distance from the center of an anchor to the centerline of a hollow head joint (vertical mortar joint) is 2 inches, as shown in Figure 1.

TABLE 3—ET-3G INSTALLATION INFORMATION FOR THREADED ROD/REBAR ANCHORS- FULLY GROUTED CMU CONSTRUCTION, TOP OF WALL

Installation Information	Symbol	Units	Nominal Rod Diameter / Rebar Size		
			1/2" or #4	5/8" or #5	7/8"
Drill Bit Diameter - Threaded Rod	d_o	in.	5/8	3/4	1
Drill Bit Diameter - Rebar	d_o	in.	5/8	3/4	N/A
Maximum Tightening Torque	T_{inst}	ft-lbs.	20	30	60
Minimum Embedment Depth	$h_{ef,min}$	in.	3		
Maximum Embedment Depth	$h_{ef,max}$	in.	10	12 1/2	17 1/2
Minimum Masonry Thickness	h_{min}	in.	7 5/8		
Minimum Edge Distance	c_{min}	in.	1 3/4		2 3/4
Minimum Anchor Spacing	s_{min}	in.	4		
Minimum End Distance	$c_{min,end}$	in.	4		

For **SI:** 1 inch = 25.4 mm, 1 ft-lb = 1.356 Nm.

TABLE 4—ET-3G INSTALLATION INFORMATION FOR THREADED ROD ANCHORS- UNGROUTED CMU CONSTRUCTION, FACE OF WALL

Installation Information	Symbol	Units	Nominal Rod Diameter / Rebar Size		
			3/8"	1/2"	5/8"
Drill Bit Diameter - Threaded Rod	d_o	in.	9/16	3/4	7/8
Maximum Tightening Torque	T_{inst}	ft-lbs.	3	6	10
Embedment Depth	h_{ef}	in.	3 1/2	3 1/2	3 1/2
Minimum Masonry Thickness	h_{min}	in.	7 5/8		
Critical Edge Distance (Tension)	$c_{cr,N}$	in.	4		
Minimum Edge Distance (Tension)	$c_{min,N}$	in.	2		
Reduction Factor at Minimum Edge Distance (Tension)	-	-	0.80		
Critical Edge Distance (Shear)	$c_{cr,V}$		4 1/2	6	7 1/2
Minimum Edge Distance (Shear)	$c_{min,V}$		2 1/4	3	3 3/4
Reduction Factor at Minimum Edge Distance (Shear)	-	in.	0.50		
Minimum Anchor Spacing	s_{min}	in.	8		

For **SI:** 1 inch = 25.4 mm, 1 ft-lb = 1.356 Nm.

TABLE 5—ET-3G MASONRY BREAKOUT AND SHEAR CRUSHING DESIGN INFORMATION FOR THREADED ROD/REBAR ANCHORS[1]

Design Information	Symbol	Units	Nominal Rod Diameter / Rebar Size				
			3/8" or #3	1/2" or #4	5/8" or #5	3/4"	7/8"
Nominal Diameter	d_a	in.	3/8	1/2	5/8	3/4	7/8
Minimum Embedment Depth	$h_{ef,min}$	in.	3				
Effectiveness Factor for Cracked Masonry	$k_{m,cr}$		12				
Effectiveness Factor for Uncracked Masonry	$k_{m,uncr}$		17				
Strength Reduction Factor - Masonry Breakout Failure in Tension	ϕ		0.65				
Strength Reduction Factor - Masonry Breakout Failure in Shear	ϕ		0.70				
Strength Reduction Factor - Shear Crushing	ϕ		0.50				

For **SI:** 1 inch = 25.4 mm, 1 ft-lb = 1.356 Nm.

[1] The tabulated value of ϕ applies when the load combinations of Section 1605.1 of the 2021 IBC or Section 1605.2 of the 2018, and 2015 IBC are used.

TABLE 6—STEEL DESIGN INFORMATION FOR THREADED ROD

Characteristic	Symbol	Units	Nominal Rod Diameter (inch)				
			3/8	1/2	5/8	3/4	7/8
Nominal Diameter	d_a	in.	0.375	0.50	0.625	0.75	0.875
Minimum Tensile Stress Area	A_{se}	in.^{2}	0.078	0.142	0.226	0.334	0.462
Tension Resistance of Steel - ASTM F1554, Grade 36	N_{sa}	lb.	4525	8235	13110	19370	26795
Tension Resistance of Steel - ASTM F1554, Grade 55			5850	10650	16950	25050	34650
Tension Resistance of Steel - ASTM A193, Grade B7			9750	17750	28250	41750	57750
Tension Resistance of Steel - Stainless Steel ASTM A193, Grade B8 and B8M (Types 304 and 316)			4445	8095	12880	19040	26335
Tension Resistance of Steel - Stainless Steel ASTM A593 CW (Types 304 & 316)			7800	14200	22600	28390	39270
Tension Resistance of Steel - Stainless Steel ASTM A193, Grade B6 (Type 410)			8580	15620	24860	36740	50820
Strength Reduction Factor for Tension - Steel Failure[1]	ϕ	-	0.75				
Minimum Shear Stress Area	A_{se}	in.^{2}	0.078	0.142	0.226	0.334	0.462
Shear Resistance of Steel - ASTM F1554, Grade 36	V_{sa}	lb.	2715	4940	7865	11625	16080
Shear Resistance of Steel - ASTM F1554, Grade 55			3510	6390	10170	15030	20790
Shear Resistance of Steel - ASTM A193, Grade B7			5850	10650	16950	25050	34650
Reduction for Seismic Shear - Carbon Steel	$\alpha_{V,seis}$	-	0.50				
Shear Resistance of Steel - Stainless Steel ASTM A193, Grade B8 & B8M (Types 304 & 316)	V_{sa}	lb.	2665	4855	7730	11425	15800
Shear Resistance of Steel - Stainless Steel ASTM A593 CW (Types 304 & 316)			4680	8520	13560	17035	23560
Shear Resistance of Steel - Stainless Steel ASTM A193, Grade B6 (Type 410)			5150	9370	14915	22040	30490
Reduction for Seismic Shear - Stainless Steel	$\alpha_{V,seis}$	-	0.50				
Strength Reduction Factor for Shear - Steel Failure[1]	ϕ	-	0.65				

For **SI:** 1 inch = 25.4 mm, 1 ft-lb = 1.356 Nm.

[1]The tabulated value of ϕ applies when the load combinations of Section 1605.1 of the 2021 IBC or Section 1605.2 of the 2018, and 2015 IBC, ACI 318-19 and ACI 318-14 5.3 are used.

TABLE 7—STEEL DESIGN INFORMATION FOR REINFORCING BAR (REBAR)

Characteristic	Symbol	Units	Bar Size		
			#3	#4	#5
Nominal Diameter	d_a	in.	0.375	0.50	0.625
Minimum Tensile Stress Area	A_{se}	in.^{2}	0.11	0.20	0.31
Tension Resistance of Steel - Rebar (ASTM A615 Gr.60)	N_{sa}	lb.	9900	18000	27900
Tension Resistance of Steel - Rebar (ASTM A706 Gr.60)			8800	16000	24800
Strength Reduction Factor for Tension - Steel Failure[1]	ϕ	-	0.75		
Minimum Shear Stress Area	A_{se}	in.^{2}	0.11	0.20	0.31
Shear Resistance of Steel - Rebar (ASTM A615 Gr. 60)	V_{sa}	lb.	5940	10800	16740
Shear Resistance of Steel - Rebar (ASTM A706 Gr. 60)			5280	9600	14880
Reduction for Seismic Shear	$\alpha_{V,seis}$	-	0.50		
Strength Reduction Factor for Shear - Steel Failure[1]	ϕ	-	0.65		

For **SI:** = 1 inch = 25.4 mm, 1 ft-lb = 1.356 Nm.

[1]The tabulated value of ϕ applies when the load combinations of Section 1605.1 of the 2021 IBC or Section 1605.2 of the 2018, and 2015 IBC, ACI 318-19 and ACI 318-14 5.3 are used.

TABLE 8—ET-3G EPOXY ANCHOR BOND STRENGTH DESIGN INFORMATION FOR THREADED ROD ANCHORS- FULLY GROUTED CMU CONSTRUCTION, FACE OF WALL[1,2]

Design Information			Symbol	Units	Nominal Rod Diameter			
					3/8"	1/2"	5/8"	3/4"
Minimum Embedment			$h_{ef,min}$	In.	3	3	3	3
Maximum Embedment			$h_{ef,max}$	In.	7 1/2	10	10 1/8	10 1/8
Periodic Inspection	Characteristic Bond Strength in cracked masonry[3,4]		$\tau_{k,cr}$	psi	325	290	255	215
	Characteristic Bond Strength in uncracked masonry[3,4]		$\tau_{k,uncr}$		600	490	395	305
	Anchor Category	Dry Masonry	-	-	1			
	Strength Reduction Factor[5]	Dry Masonry	ϕ_{dry}	-	0.65			
	Anchor Category	Water-saturated masonry	-	-	2			
	Strength Reduction Factor[5]	Water-saturated masonry	ϕ_{wet}	-	0.55			
Strength Reduction Factor for Seismic Tension[6]			$\alpha_{N,seis}$	-	0.89	0.90		

For **SI:** 1 inch = 25.4 mm, 1 ft-lb = 1.356 Nm.

[1]Bond strength values shown are for fully grouted CMU construction with lightweight, medium-weight, or normal-weight masonry units, having a compressive strength of f'_m = 2,000psi.
[2]Characteristic bond strength values are for sustained loads, including dead and live loads.
[3]Maximum short term temperature = 140°F, Maximum long term temperature = 110°F.
[4]Short term concrete temperatures are those that occur over short intervals (diurnal cycling). Long term temperatures are roughly constant over significant periods of time.
[5]The tabulated value of ϕ applies when the load combinations of Section 1605.1 of the 2021 IBC or Section 1605.2 of the 2018 and 2015 IBC are used.
[6]For anchors installed in regions assigned to Seismic Design Category C, D, E or F, the bond strength values must be multiplied by $\alpha_{N,seis}$.

TABLE 9—ET-3G EPOXY ANCHOR BOND STRENGTH DESIGN INFORMATION FOR THREADED ROD ANCHORS- FULLY GROUTED CMU CONSTRUCTION, TOP OF WALL[1,2]

Design Information			Symbol	Units	Nominal Rod Diameter		
					1/2"	5/8"	7/8"
Minimum Embedment			$h_{ef,min}$	In.	3	3	3
Maximum Embedment			$h_{ef,max}$	In.	10	12 1/2	17 1/2
Periodic Inspection	Characteristic Bond Strength in cracked masonry[3,4]		$\tau_{k,cr}$	psi	130	85	N/A
	Characteristic Bond Strength in uncracked masonry[3,4]		$\tau_{k,uncr}$		220	130	80
	Anchor Category	Dry Masonry	-	-	1		
	Strength Reduction Factor[5]	Dry Masonry	ϕ_{dry}	-	0.65		
	Anchor Category	Water-saturated masonry	-	-	2		
	Strength Reduction Factor[5]	Water-saturated masonry	ϕ_{wet}	-	0.55		
Strength Reduction Factor for Seismic Tension[6]			$\alpha_{N,seis}$	-	0.90		

For **SI:** 1 inch = 25.4 mm, 1 ft-lb = 1.356 Nm.

[1]Bond strength values shown are for fully grouted CMU construction with lightweight, medium-weight, or normal-weight masonry units, having a compressive strength of f'_m = 2,000psi.
[2]Characteristic bond strength values are for sustained loads, including dead and live loads.
[3]Maximum short term temperature = 140°F, Maximum long term temperature = 110°F.
[4]Short term concrete temperatures are those that occur over short intervals (diurnal cycling). Long term temperatures are roughly constant over significant periods of time.
[5] The tabulated value of ϕ applies when the load combinations of Section 1605.1 of the 2021 IBC or Section 1605.2 of the 2018 and 2015 IBC are used.
[6]For anchors installed in regions assigned to Seismic Design Category C, D, E or F, the bond strength values must be multiplied by $\alpha_{N,seis}$.

TABLE 10—ET-3G EPOXY ANCHOR BOND STRENGTH DESIGN INFORMATION FOR REBAR ANCHORS- FULLY GROUTED CMU CONSTRUCTION, FACE OF WALL[1,2]

Design Information			Symbol	Units	Nominal Rebar Size		
					#3	#4	#5
Minimum Embedment			$h_{ef,min}$	In.	3	3	3
Maximum Embedment			$h_{ef,max}$	In.	$7^1/_2$	10	$10^1/_8$
Periodic Inspection	Characteristic Bond Strength in cracked masonry[3,4]		$\tau_{k,cr}$	psi	270	230	195
	Characteristic Bond Strength in uncracked masonry[3,4]		$\tau_{k,uncr}$		455	390	325
	Anchor Category	Dry Masonry	-	-	1		
	Strength Reduction Factor[5]	Dry Masonry	ϕ_{dry}	-	0.65		
	Anchor Category	Water-saturated masonry	-	-	2		
	Strength Reduction Factor[5]	Water-saturated masonry	ϕ_{wet}	-	0.55		
Strength Reduction Factor for Seismic Tension[6]			$\alpha_{N,seis}$	-	0.75		

For **SI:** 1 inch = 25.4 mm, 1 ft-lb = 1.356 Nm.

[1]Bond strength values shown are for fully grouted CMU construction with lightweight, medium-weight, or normal-weight masonry units, having a compressive strength of f'_m = 2,000psi.
[2]Characteristic bond strength values are for sustained loads, including dead and live loads.
[3]Maximum short term temperature = 140°F, Maximum long term temperature = 110°F.
[4]Short term concrete temperatures are those that occur over short intervals (diurnal cycling). Long term temperatures are roughly constant over significant periods of time.
[5] The tabulated value of ϕ applies when the load combinations of Section 1605.1 of the 2021 IBC or Section 1605.2 of the 2018 and 2015 IBC are used.
[6]For anchors installed in regions assigned to Seismic Design Category C, D, E or F, the bond strength values must be multiplied by $\alpha_{N,seis}$.

TABLE 11—ET-3G EPOXY ANCHOR BOND STRENGTH DESIGN INFORMATION FOR REBAR ANCHORS- FULLY GROUTED CMU CONSTRUCTION, TOP OF WALL[1,2]

Design Information			Symbol	Units	Nominal Rebar Size	
					#4	#5
Minimum Embedment			$h_{ef,min}$	In.	3	3
Maximum Embedment			$h_{ef,max}$	In.	10	$12^1/_2$
Periodic Inspection	Characteristic Bond Strength in cracked masonry[3,4]		$\tau_{k,cr}$	psi	130	110
	Characteristic Bond Strength in uncracked masonry[3,4]		$\tau_{k,uncr}$		220	190
	Anchor Category	Dry Masonry	-	-	1	
	Strength Reduction Factor[5]	Dry Masonry	ϕ_{dry}	-	0.65	
	Anchor Category	Water-saturated masonry	-	-	2	
	Strength Reduction Factor[5]	Water-saturated masonry	ϕ_{wet}	-	0.55	
Strength Reduction Factor for Seismic Tension[6]			$\alpha_{N,seis}$	-	0.75	

For **SI:** 1 inch = 25.4 mm, 1 ft-lb = 1.356 Nm.

[1]Bond strength values shown are for fully grouted CMU construction with lightweight, medium-weight, or normal-weight masonry units, having a compressive strength of f'_m = 2,000psi.
[2]Characteristic bond strength values are for sustained loads, including dead and live loads.
[3]Maximum short term temperature = 140°F, Maximum long term temperature = 110°F.
[4]Short term concrete temperatures are those that occur over short intervals (diurnal cycling). Long term temperatures are roughly constant over significant periods of time.
[5] The tabulated value of ϕ applies when the load combinations of Section 1605.1 of the 2021 IBC or Section 1605.2 of the 2018 and 2015 IBC are used.
[6]For anchors installed in regions assigned to Seismic Design Category C, D, E or F, the bond strength values must be multiplied by $\alpha_{N,seis}$.

TABLE 12—ET-3G EPOXY ANCHOR TENSION STRENGTH DESIGN INFORMATION FOR THREADED ROD ANCHORS- UNGROUTED CMU CONSTRUCTION, FACE OF WALL[1]

Design Information			Symbol	Units	Nominal Rod Diameter		
					3/8"	1/2"	5/8"
Minimum Embedment			$h_{ef,min}$	In.	3 1/2	3 1/2	3 1/2
Periodic Inspection	Characteristic Pullout Strength in cracked masonry[2,3]		$N_{k,ug,cr}$	lb	145	150	130
	Characteristic Pullout Strength in uncracked masonry[2,3]		$N_{k,ug,uncr}$	lb	295	305	255
	Anchor Category	Dry Masonry	-	-	1		
	Strength Reduction Factor[5]	Dry Masonry	ϕ_{dry}	-	0.65		
	Anchor Category	Water-saturated masonry	-	-	2		
	Strength Reduction Factor[5]	Water-saturated masonry	ϕ_{wet}	-	0.55		
Reduction Factor for Sustained Tension Loads[4]			$\alpha_{N,sust}$	-	0.70		
Reduction Factor for Seismic Tension[6]			$\alpha_{N,seis}$	-	1.0		0.87

For **SI:** 1 inch = 25.4 mm, 1 ft-lb = 1.356 Nm.

[1]Pullout strength values shown are for ungrouted CMU construction with lightweight, medium-weight, or normal-weight masonry units, having a compressive strength of f'_m = 2,000psi.
[2] Temperature Range : Maximum short term temperature = 140°F, Maximum long term temperature = 110°F..
[3] Short term concrete temperatures are those that occur over short intervals (diurnal cycling). Long term temperatures are roughly constant over significant periods of time
[4] For anchors designed to resist sustained tension loads, the pullout strength must be multiplied by $\alpha_{N,sust}$.
[5] The tabulated value of ϕ applies when the load combinations of Section 1605.1 of the 2021 IBC or Section 1605.2 of the 2018 and 2015 IBC are used.
[6]For anchors installed in regions assigned to Seismic Design Category C, D, E or F, the bond strength values must be multiplied by $\alpha_{N,seis}$.

TABLE 13—ET-3G EPOXY ANCHOR SHEAR STRENGTH DESIGN INFORMATION FOR THREADED ROD ANCHORS- UNGROUTED CMU CONSTRUCTION, FACE OF WALL WALL[1]

Design Information	Symbol	Units	Nominal Rod Diameter		
			3/8"	1/2"	5/8"
Minimum Embedment	$h_{ef,min}$	In.	3 1/2	3 1/2	3 1/2
Shear Strength in cracked masonry[2,3]	$V_{s,ug,cr}$	lb	145	150	130
Shear Strength in uncracked masonry[2,3]	$V_{s,ug,uncr}$	lb	295	305	255
Reduction Factor for Seismic Shear[4]	$\alpha_{V,seis}$	-	0.50		

For **SI:** 1 inch = 25.4 mm, 1 ft-lb = 1.356 Nm.

[1]Shear strength values shown are for ungrouted CMU construction with lightweight, medium-weight, or normal-weight masonry units, having a compressive strength of f'_m = 2,000psi.
[2] Temperature Range : Maximum short term temperature = 140°F, Maximum long term temperature = 110°F..
[3] Short term concrete temperatures are those that occur over short intervals (diurnal cycling). Long term temperatures are roughly constant over significant periods of time.
[4]For anchors installed in regions assigned to Seismic Design Category C, D, E or F, the bond strength values must be multiplied by $\alpha_{V,seis}$.

TABLE 14—INSTALLATION DETAILS FOR THREADED ROD ANCHORS- FULLY GROUTED CMU CONSTRUCTION

Anchor Diameter (in)	Drill Bit Diameter[1,2] (in)	Nylon Brush Part Number	Nozzle Part Number	Dispensing Tool Part Number
3/8	1/2	ETB6	EMN22i	CDT10S, EDT22S, EDTA22P, EDTA22CKT, EDTA56P
1/2	5/8	ETB6		
5/8	3/4	ETB6		
3/4	7/8	ETB8		
7/8	1	ETB10		

For **SI:** 1 inch = 25.4 mm.

[1]Rotary Hammer must be used to drill all holes.
[2]Drill bits must meet the requirements of ANSI B212.15.

TABLE 15—INSTALLATION DETAILS FOR REBAR ANCHORS- FULLY GROUTED CMU CONSTRUCTION

Anchor Diameter (in)	Drill Bit Diameter[1,2] (in)	Nylon Brush Part Number	Nozzle Part Number	Dispensing Tool Part Number
#3	1/2	ETB6	EMN22i	CDT10S, EDT22S, EDTA22P, EDTA22CKT, EDTA56P
#4	5/8	ETB6		
#5	3/4	ETB6		

For **SI:** 1 inch = 25.4 mm.

[1]Rotary Hammer must be used to drill all holes.
[2]Drill bits must meet the requirements of ANSI B212.15.

TABLE 16—INSTALLATION DETAILS FOR THREADED ROD ANCHORS- UNGROUTED CMU CONSTRUCTION

Anchor Diameter (in)	Drill Bit Diameter[1,2] (in)	Nylon Brush Part Number	Nozzle Part Number	Dispensing Tool Part Number	Opti-Mesh Screen Tube Part Number
3/8	9/16	ETB6	EMN22i	CDT10S, EDT22S, EDTA22P, EDTA22CKT, EDTA56P	EWS373P
1/2	3/4	ETB6			EWS503P
5/8	7/8	ETB8			EWS623P

For **SI:** 1 inch = 25.4 mm.

[1]Rotary Hammer must be used to drill all holes.
[2]Drill bits must meet the requirements of ANSI B212.15.

TABLE 17—CURE SCHEDULE[1]

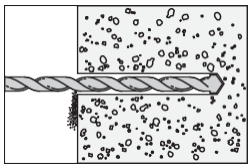
Masonry Temperature		Gel Time (minutes)	Cure Time[1] (hours)
(°F)	(°C)		
50	10	75	72
70	21	45	24
90	32	35	24
110	43	20	24

For **SI:** 1°F = (c x 9/5) + 32.

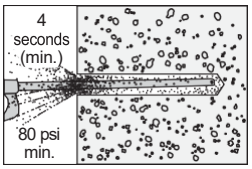
[1] For water-saturated masonry, the cure times must be doubled.

FULLY GROUTED CMU — INSTALLATION INSTRUCTIONS

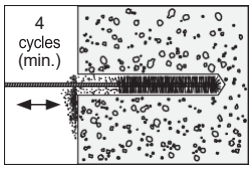
1 Hole Preparation



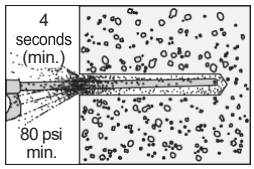
1. Drill.
Drill hole to specified diameter and depth.



2. Blow.
Remove dust from hole with oil-free compressed air for a minimum of 4 seconds. Compressed air nozzle must reach the bottom of the hole.



3. Brush.
Clean with a nylon brush for a minimum of 4 cycles. Brush MUST reach the bottom of the hole. Brush should provide resistance to insertion. If no resistance is felt, the brush is worn and must be replaced.



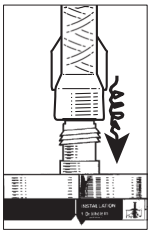
4. Blow.
Remove dust from hole with oil-free compressed air for a minimum of 4 seconds. Compressed air nozzle must reach the bottom of the hole.

Note: Refer to Tables A and B for proper drill bit size and brush part number.

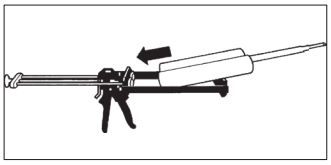
2 Cartridge Preparation

1. Check.
Check expiration date on product label. Do not use expired product. Product is usable until end of printed expiration month.

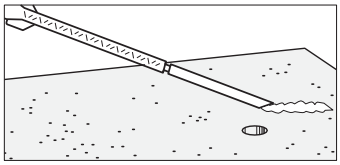
2. Open.
Open cartridge per package instructions.



3. Attach.
Attach proper Simpson Strong-Tie® nozzle and extension to cartridge. Do not modify nozzle.



4. Insert.
Insert cartridge into dispensing tool.



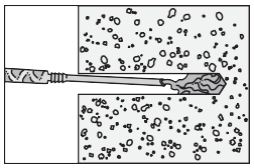
5. Dispense.
Dispense adhesive to the side until properly mixed (uniform color).

Note: Review MSDS prior to use. Refer to Tables A and B for proper nozzle and dispensing tool part numbers.
Refer to Tables D and F for proper adhesive storage temperatures, permitted masonry temperature range, and adhesive gel times.

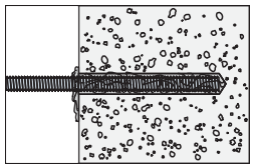
3 Filling the Hole

Prepare the hole per "Hole Preparation."

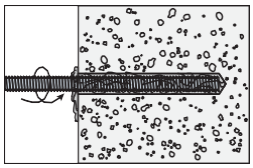
DRY AND DAMP HOLES:



1. Fill.
Fill hole ⅔ full, starting from bottom of hole to prevent air pockets. Withdraw nozzle as hole fills up.



2. Insert.
Insert clean, oil-free anchor, (marked with the required embedment depth), turning slowly until the anchor contacts the bottom of the hole.



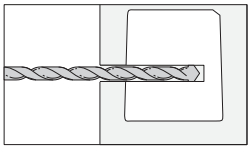
3. Do not disturb.
Do not disturb load or torque anchor until fully cured.

Note: Refer to Table D for proper gel times and cure times, and to Table E for maximum tightening torque.
Nozzle extensions (PPFT25) may be needed for deep holes.

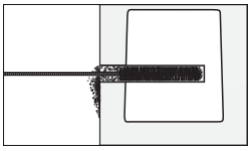
FIGURE 2—MANUFACTURERS PRINTED INSTALLATION INSTRUCTIONS (MPII) FOR GROUTED MASONRY

UNGROUTED CMU — INSTALLATION INSTRUCTIONS

1 Hole Preparation



1. Drill.
Drill hole through face shell of ungrouted CMU using rotation mode only.

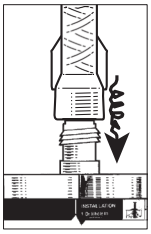


2. Brush.
Clean with a nylon brush for a minimum of two (2) cycles. Brush should provide resistance to insertion. If no resistance is felt, the brush is worn and must be replaced.

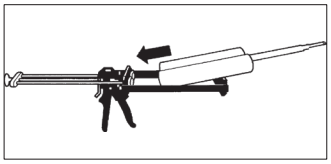
2 Cartridge Preparation

1. Check.
Check expiration date on product label. Do not use expired product. Product is usable until end of printed expiration month.

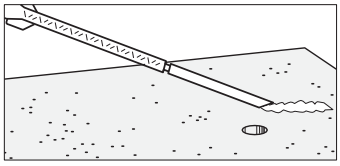
2. Open.
Open cartridge per package instructions.



3. Attach.
Attach proper Simpson Strong-Tie® nozzle and extension to cartridge. Do not modify nozzle.



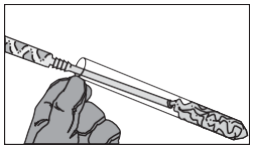
4. Insert.
Insert cartridge into dispensing tool.



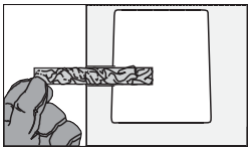
5. Dispense.
Dispense adhesive to the side until properly mixed (uniform color).

Note: Review MSDS prior to use. Refer to Table C for proper nozzle and dispensing tool part numbers.
Refer to Tables D and F for proper adhesive storage temperatures, permitted masonry temperature range, and adhesive gel times.

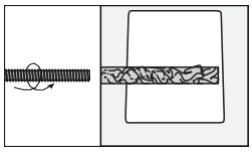
3 Filling the Hole



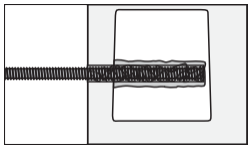
1. Fill.
Fill screen completely. Fill from the bottom of the screen and withdraw the nozzle as the screen fills to prevent air pockets. (Close integral cap after filling.)



2. Insert.
Insert adhesive-filled screen into hole.



3. Insert.
Insert clean, oil-free anchor, turning slowly until the anchor contacts the bottom of the screen.



4. Do not disturb.
Do not disturb anchor until fully cured. (See cure schedule for specific adhesive.)

Note: Refer to Table D for proper gel times and cure times, and to Table E for maximum tightening torque.

FIGURE 2— MANUFACTURERS PRINTED INSTALLATION INSTRUCTIONS (MPII) FOR UNGROUTED MASONRY

Table A — Installation Details for Threaded Rod Anchors — Fully Grouted CMU

Anchor Diameter (in.)	Drill Bit Diameter[1,2] (in.)	Wire Brush Part Number	Nozzle Part Number	Dispensing Tool Part Number
⅜	½	ETB6	EMN22i	CDT10S, EDT22S, EDTA22P, EDTA22CKT, EDTA56P
½	⅝	ETB6		
⅝	¾	ETB6		
¾	⅞	ETB8		
⅞	1	ETB10		

1. Rotary Hammer must be used to drill all holes.
2. Drill bits must meet the requirements of ANSI B212.15.

Table B — Installation Details for Reinforcing Bar Anchors — Fully Grouted CMU

Anchor Size	Drill Bit Diameter[1,2] (in.)	Wire Brush Part Number	Nozzle Part Number	Dispensing Tool Part Number
#3	½	ETB6	EMN22i	CDT10S, EDT22S, EDTA22P, EDTA22CKT, EDTA56P
#4	⅝	ETB6		
#5	¾	ETB6		

1. Rotary Hammer must be used to drill all holes.
2. Drill bits must meet the requirements of ANSI B212.15.

Table C — Installation Details for Threaded Rod Anchors — Ungrouted CMU

Anchor Diameter (in.)	Drill Bit Diameter[1,2] (in.)	Wire Brush Part Number	Nozzle Part Number	Dispensing Tool Part Number	Opti-Mesh Screen Tube Part Number
⅜	9/16	ETB6	EMN22i	CDT10S, EDT22S, EDTA22P, EDTA22CKT, EDTA56P	EWS373P
½	¾	ETB6			EWS503P
⅝	⅞	ETB8			EWS623P

1. Rotary Hammer must be used to drill all holes.
2. Drill bits must meet the requirements of ANSI B212.15.

Table D — Cure Schedule[1]

Masonry Temperature		Gel Time (minutes)	Cure Time (hours)
(F°)	(C°)		
50	10	75	72
70	21	45	24
90	32	35	24
110	43	20	24

1. For water-saturated masonry, the cure times should be doubled.

Table E — Anchor Tightening Torque and Embedment Depth for Threaded Rod Anchors

Anchor Diameter (in.)	Fully Grouted CMU		Ungrouted CMU	
	Maximum Tightening Torque T_{inst} (ft.-lb.)	Min. Emb. Depth $h_{ef,min}$ (in.)	Maximum Tightening Torque T_{inst} (ft.-lb.)	Emb. Depth $h_{ef,min}$ (in.)
⅜	10	3	3	3½
½	20	3	6	3½
⅝	30	3	10	3½
¾	45	3		
⅞	60	3		

Table F — Storage Information

Storage Temperature		Shelf Life
(F°)	(C°)	(months)
45 to 90	7 to 32	24

FIGURE 2— MANUFACTURERS PRINTED INSTALLATION INSTRUCTIONS (MPII) FOR GROUTED AND UNGROUTED MASONRY (CONTINUED)

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

REPORT HOLDER:

SIMPSON STRONG-TIE COMPANY INC.

EVALUATION SUBJECT:

SIMPSON STRONG-TIE® ET-3G™ EPOXY ADHESIVE ANCHORS IN CRACKED AND UNCRACKED, GROUTED AND UNGROUTED CONCRETE MASONRY UNIT WALLS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Simpson Strong-Tie® ET-3G™ Epoxy Adhesive Anchors, described in ICC-ES evaluation report ESR-5309, 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 Simpson Strong-Tie ET-3G Epoxy Adhesive Anchors, described in Sections 2.0 through 7.0 of the evaluation report ESR-5309, 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 Simpson Strong-Tie ET-3G Epoxy Adhesive Anchors described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-5309.
- The design, installation, conditions of use and identification of the Simpson Strong-Tie ET-3G Epoxy Adhesive Anchors are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report ESR-5309.
- 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 2020-071.

This supplement expires concurrently with the evaluation report, reissued October 2024.

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

REPORT HOLDER:

SIMPSON STRONG-TIE COMPANY INC.

EVALUATION SUBJECT:

SIMPSON STRONG-TIE® ET-3G™ EPOXY ADHESIVE ANCHORS IN CRACKED AND UNCRACKED, GROUTED AND UNGROUTED CONCRETE MASONRY UNIT WALLS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Simpson Strong-Tie® ET-3G™ Epoxy Adhesive Anchors, recognized in ICC-ES evaluation report ESR-5309, 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 Simpson Strong-Tie ET-3G Epoxy Adhesive Anchors, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-5309, 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-5309 for the 2021 *International Building Code®* meet the requirements of the *Florida Building Code—Building* and the *Florida Building Code—Residential*, as applicable.

Use of the Simpson Strong-Tie ET-3G Epoxy Adhesive 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).

This supplement expires concurrently with the evaluation report, reissued October 2024.