



ICC-ES Evaluation Report

ESR-4788

Reissued October 2022

This report is subject to renewal October 2024.

DIVISION: 03 00 00—CONCRETE
Section: 03 15 19—Cast-in Concrete Anchors
Section: 03 16 00—Concrete Anchors

REPORT HOLDER:

AJUSTCO, LLC

EVALUATION SUBJECT:

ANCHOR THREAD®

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)

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see [ESR-4788 LABC and LARC Supplement](#).

For evaluation for compliance with codes 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 Architects (DSA), see [ESR-4788 CBC and CRC Supplement](#).

For evaluation for compliance with codes adopted by the New York City Department of Buildings, see [ESR-4788 NYC Supplement](#).

Property evaluated:

Structural

2.0 USES

The Anchor Thread is a cast-in-place anchor bolt used to attach architectural, mechanical, electrical, plumbing distribution systems, personal fall protection and similar systems that are not part of the primary load bearing or lateral-force resisting systems of the structure (i.e. non-structural components) to resist static, wind, and seismic (Seismic Design Categories A through F) tension load in compliance with ACI 318.

3.0 DESCRIPTION

3.1 General:

The Anchor Thread is a 1/2-inch (12.7 mm) diameter by 5-inches (127 mm) high J-shaped bolt with threaded end

of 2-inches as illustrated in Figure 1. Each Anchor Thread is accompanied by an escutcheon secured with a polycarbonate lock plate and a lock nut, the escutcheon is also fabricated from polycarbonate to create a 1-1/2-inches (38.1 mm) base diameter by 15/16-inch (23.8 mm) depth with a 14-degree taper cavity after removal of the formwork as illustrated in Figure 2. The Anchor Bolt is made of Grade 5 zinc plated steel or 316 stainless steel.

4.0 DESIGN AND INSTALLATION

4.1 Strength Design:

The Anchor Thread must be designed and detailed in accordance with ACI 318 Chapter 17 as cast-in-place anchor.

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 D4.1, 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 and ACI 318-11 D4.3 (ACI 319-08 D.4.4), as applicable, for cast-in anchors, must be used for load combinations calculated in accordance with Section 1605.1 of the 2021 IBC or Section 1605.2 of the 2018, 2015 and 2012 IBC, Section 5.3 of ACI 318 (-19 and -14) and Section 9.2 of ACI 318-11, as applicable. Strength reduction factors, ϕ , as given in ACI 318-11 D4.4 (ACI 318-08) must be used for load combinations calculation in accordance with ACI 318-11 and -08 Appendix C. The value of f'_c used in the calculations must be limited to a maximum of 10,000 psi (68.9 MPa), in accordance with ACI 318-19 17.3.1, ACI 318-14 17.2.7, or ACI 318-11 D3.7, as applicable.

The requirements for minimum concrete thickness and cover, minimum edge distance and minimum spacing must be in accordance with ACI 318.

4.2 Allowable Stress Design (ASD):

4.2.1 General: Design values for use with allowable stress design (working stress design) load combinations calculated in accordance with Section 1605.3 of the IBC must be established using Eq-1 and Eq-2 as follows:

$$T_{allowable,ASD} = \frac{\phi N_n}{\alpha} \tag{Eq-1}$$

$$V_{allowable,ASD} = \frac{\phi V_n}{\alpha} \tag{Eq-2}$$

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 or 14) Chapter 17 and 2021, 2018 and 2015 IBC Section 1905.1.8, ACI 318-11 Appendix D, ACI 318-08 Appendix D and 2009 IBC Section 1908.1.9, and Section 4.1 of this report, as applicable (lbf or kN).

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

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

The requirements for minimum concrete thickness and cover, minimum edge distance and minimum spacing must be in accordance with ACI 318.

A design example in accordance with the ACI 318 is provided in Figure 3 of this report.

4.3 Installation:

The Anchor Thread must be secured with the lock plate attached to the formwork using nails where specified by the approved drawings for the location of the Anchor Thread. The lock nut comes assembled to the end of the threaded portion and secured into the lock nut by turning 90-degrees clockwise. The escutcheon is to be snug tight against the formwork by turning clockwise from the threaded portion of the Anchor Thread. Upon the formwork and escutcheon removal, a portion of the threaded bolt is exposed and can be used to suspend various non-structural components as specified by the registered design professional.

A copy of the manufacturer's published installation instructions and the approved drawings must be available at all times on the jobsite during installation.

4.4 Special Inspection:

Periodic special inspection is required in accordance with Section 1705.1.1 and Table 1705.3 of the 2021 and 2018 IBC, as applicable. The special inspector must make periodic inspections during installation of the Anchor Thread to verify, concrete type, concrete compressive strength, spacing, edge distances, concrete thickness and cover, engagement with the lock plate, slug tight against the formwork and adherence to the manufacturer's published installation instructions.

5.0 CONDITIONS OF USE

The Anchor Thread described in this report complies with, or is 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 The Anchor Thread must be installed in accordance with the manufacturer's published installation instructions (MP11) and this report. In case of conflict, this report governs.
- 5.2 The Anchor Thread is limited to resisting tension forces only.
- 5.3 Where not otherwise prohibited in the code, the Anchor Thread is permitted for use with fire-resistance-rated construction.
- 5.4 Use of Anchor Thread is limited to supporting non-structural components.
- 5.5 Prior to installation, calculations and details demonstrating compliance with ACI 318 must be submitted to the code official for approval. The calculations and details must be prepared by a registered design professional where required by the statutes of the jurisdiction which the project is to be constructed.
- 5.6 Special inspection must be provided in accordance with Section 4.3.
- 5.7 The Anchor Thread are manufactured under an approved quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1 Design requirements in accordance with the IBC and ACI 318.
- 6.2 Quality-control documentation in accordance with ICC-ES Acceptance Criteria for Quality Documentation (AC10), dated January 2019.

7.0 IDENTIFICATION

- 7.1 The Anchor Thread is identified by packaging labeled with the anchor type, the manufacturer's name (Ajustco LLC) and address, and the evaluation report number (ESR-4788).
- 7.2 The report holder's contact information is the following:

AJUSTCO, LLC
110 NORTH FRANKLIN STREET
PEN ARGYL, PENNSYLVANIA 18072
(855) 258-7826
www.ajustco.com
contact@ajustco.com

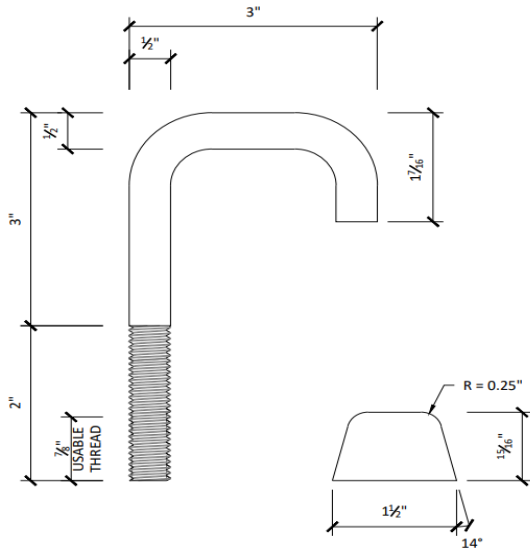


FIGURE 1—ANCHOR THREAD INSERT AND ESCUTCHEON DIMENSIONS

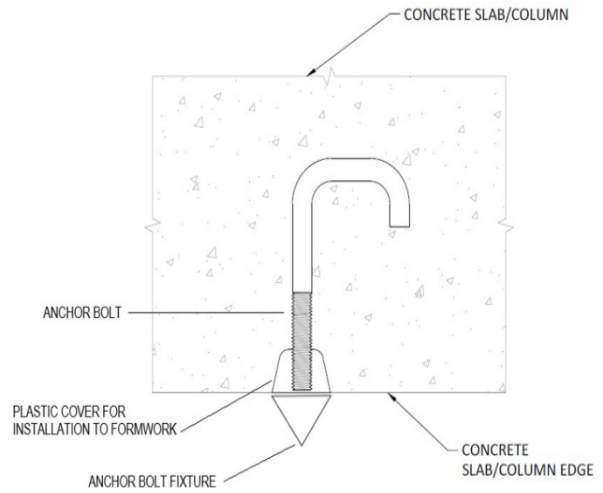


FIGURE 2—ANCHOR THREAD INSERT IN CONCRETE SLAB OR CONCRETE COLUMN

Calculation in accordance with ACI 318 (-19 or -14) Chapter 17 or ACI 318-11:	Code Ref.
<p>Given: Calculate the factored strength design resistance in tension, ϕN_n, and the allowable stress design value, $T_{allowable, ASD}$, for the 1/2-inch diameter Anchor Thread with 5-inch nominal embedment (4.06-inch effective embedment), assuming 6-inch edge distance with f'_c of 4,000 psi.</p> <p>Step 1. Calculate steel strength of a single anchor in tension: $\phi N_{sa} = (0.75)(120,000 \times 0.2) = 18,000 \text{ lbs.}$</p> <p>Step 2. Calculate concrete breakout strength of a single anchor in tension: $\phi N_{cb} = \phi \frac{A_{NC}}{A_{NC0}} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b$ $N_b = k_c \lambda_a \sqrt{f'_c} (h_{ef})^{1.5}$ $N_b = (24)(1.0) \sqrt{4,000} (4.06)^{1.5} = 12,417 \text{ lbs.}$ $\phi N_{cb} = (0.70) \frac{(147.3)}{(148.4)} (1.0)(1.25)(1.0)(12,417) = 10,785 \text{ lbs.}$</p> <p>Step 3. Calculate pullout strength: $\phi N_{pn} = \phi N_{p,uncr} \psi_{c,P}$ $N_p = 0.9 f'_c e_h d_a$ $\phi N_{pn} = 0.7(0.9)(4,000)(2.375)(0.5)(1.4) = 4,190 \text{ lbs.}$</p> <p>Step 4. Determine controlling resistance strength in tension: $\phi N_n = \min[\phi N_{sa}, \phi N_{cb}, \phi N_{pn}] = \phi N_{pn} = 4,190 \text{ lbs.}$</p> <p>Step 5. Calculate allowable stress design conversion factor for loading condition: Controlling load combination: 1.2D + 1.6L $\alpha = 1.2(30\%) + 1.6(70\%) = 1.48$</p> <p>Step 6. Calculate allowable stress design value $T_{allowable, ASD} = \frac{\phi N_n}{\alpha} = \frac{4,190}{1.48} = 2,831 \text{ lbs.}$</p>	<p>D.5.1.2 (318-11) 17.4.1.2 (318-14) 17.6.1.2 (318-19)</p> <p>D.5.2.1 (318-11) 17.4.2.1 (318-14) 17.6.2.1 (318-19)</p> <p>D.5.3.2 (318-11) 17.4.2.2 (318-14) 17.6.2.2 (318-19)</p> <p>D.4.1.1 (318-11) 17.4.3.2 (318-14) 17.6.3.2.1 (318-19)</p> <p>9.2 (ACI 318-11) 5.2 (ACI 318-14) 5.2 (ACI 318-19)</p>

FIGURE 3—EXAMPLE STRENGTH DESIGN CALCULATION INCLUDING ASD CONVERSION FOR ILLUSTRATIVE PURPOSES

Bottom of Slab Application



STEP 1
Nail the lock plate to the formwork where specified.



STEP 2
Install your reinforcing steel.



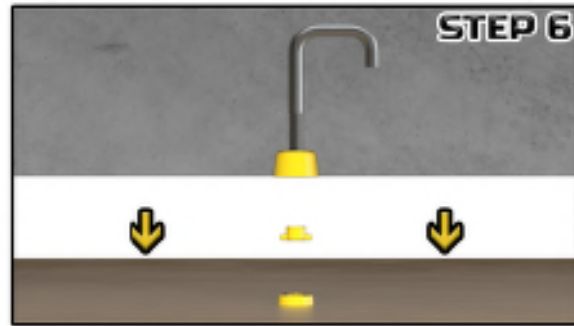
STEP 3
Insert the anchor bolt assembly and turn 90 degrees clockwise to lock it in.



STEP 4
Turn the escutcheon clockwise until it is snug against the formwork to seal the assembly.



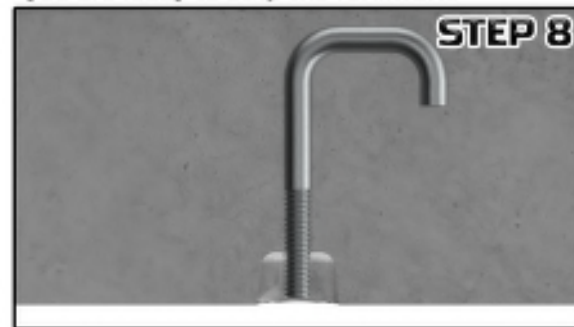
STEP 5
With all of the Anchor Threads installed you are ready to place your concrete.



STEP 6
When the qualified person confirms that the concrete has achieved the required strength you are ready to strip the formwork.



STEP 7
Use the included Escutcheon Removal Tool to back out the escutcheon.



STEP 8
Once all applicable inspections and tests have been successfully completed, the Anchor Threads are ready to be utilized.

FIGURE 4—INSTALLATION TO THE BOTTOM OF CONCRETE SLAB

Column Application



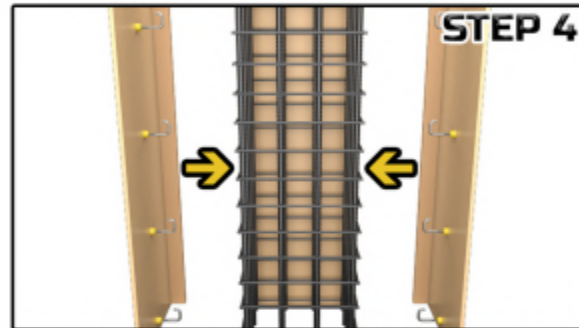
STEP 1
Nail the lock plate to the formwork where specified.



STEP 2
Insert the anchor bolt assembly and turn 90 degrees clockwise to lock it in.
***Do not turn past 90 degrees!**



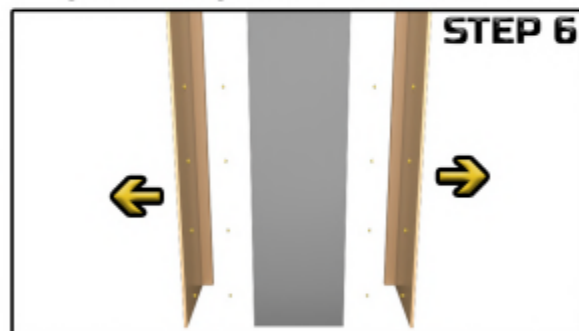
STEP 3
Turn the escutcheon clockwise until it is snug against the formwork to seal the assembly.
***Do not over tighten!**



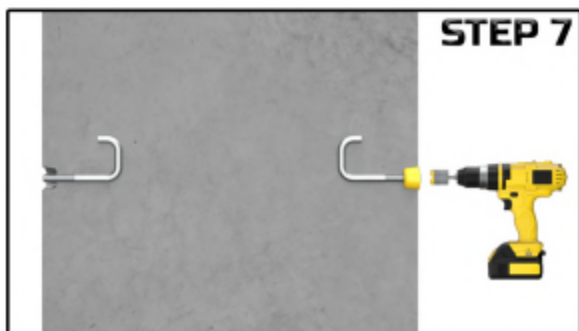
STEP 4
With all of the Anchor Threads installed you are ready to assemble the forms.



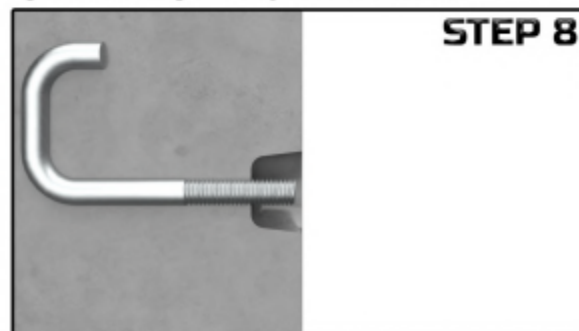
STEP 5
Once all of the forms are assembled you are ready to place your concrete.



STEP 6
When the qualified person confirms that the concrete has achieved the required strength you are ready to strip the formwork.



STEP 7
Use the included Escutcheon Removal Tool to back out the escutcheon.



STEP 8
Once all applicable inspections and tests have been successfully completed, the Anchor Threads are ready to be utilized.

FIGURE 5—INSTALLATION TO THE FACE OF CONCRETE COLUMN

DIVISION: 03 00 00—CONCRETE
Section: 03 15 19—Cast-in Concrete Anchors
Section: 03 16 00—Concrete Anchors

REPORT HOLDER:

AJUSTCO, LLC

EVALUATION SUBJECT:

ANCHOR THREAD®

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that Anchor Thread, described in ICC-ES evaluation report [ESR-4788](#), has also been evaluated for compliance with the Chicago Construction Codes (Title 14) as noted below.

Applicable code edition:2019 *Chicago Building Code* (Title 14B)**2.0 CONCLUSIONS**

The Anchor Thread, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4788](#), complies with the Chicago Construction Codes (Title 14), and is subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Anchor Thread described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-4788](#).
- The design, installation, conditions of use and identification of the anchors are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-4788](#).
- The design, installation and inspection are in accordance with additional requirements of Chicago Building Code (Title 14B) Chapters 16 and 17, as applicable.
- Use of Anchor Thread is limited to supporting non-structural components.

This supplement expires concurrently with the evaluation report, reissued October 2022.

DIVISION: 03 00 00—CONCRETE
Section: 03 15 19—Cast-in Concrete Anchors
Section: 03 16 00—Concrete Anchors

REPORT HOLDER:

AJUSTCO, LLC

EVALUATION SUBJECT:

ANCHOR THREAD®

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that Anchor Thread, described in ICC-ES evaluation report [ESR-4788](#), has 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:

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

2.0 CONCLUSIONS

The Anchor Thread, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4788](#), complies 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 Anchor Thread described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-4788](#).
- The design, installation, conditions of use and identification of the anchors are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-4788](#).
- 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 bolts and the connected members/components must be checked for capacity (which may govern).

This supplement expires concurrently with the evaluation report, reissued October 2022.

DIVISION: 03 00 00—CONCRETE
Section: 03 15 19—Cast-in Concrete Anchors
Section: 03 16 00—Concrete Anchors

REPORT HOLDER:

AJUSTCO, LLC

EVALUATION SUBJECT:

ANCHOR THREAD®

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that Anchor Thread, described in ICC-ES evaluation report ESR-4788, has also been evaluated for compliance with the code noted below as adopted by the New York City Department of Buildings.

Applicable code edition:2014 *City of New York Building Code* (NYCBC)**2.0 CONCLUSIONS**

The Anchor Thread, described in Sections 2.0 through 7.0 of the evaluation report ESR-4788, complies with the NYCBC Sections BC 1908 and BC 1911, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Anchor Thread described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-4788.
- The design, installation, conditions of use and identification of the anchors are in accordance with the 2009 *International Building Code*® (IBC) provisions noted in the evaluation report ESR-4788.
- The design, installation and inspection are in accordance with additional requirements of NYCBC Chapters 16 and 17, and Sections BC 1908 and BC 1911, as applicable.
- The installation of the Anchor Thread shall be subject to the special inspection requirement pursuant to Sections BC 1704.4, BC Table 1704.4 and 1 §RCNY Section 101-06.
- After satisfactory completion of the anchors inspections, the special inspector shall submit a “TR1 Form” in accordance with Section BC 1704.1.2 and 1 §RCNY Section 101-06(b).
- Use of Anchor Thread is limited to supporting non-structural components.

This supplement expires concurrently with the evaluation report, reissued October 2022.

DIVISION: 03 00 00—CONCRETE
Section: 03 15 19—Cast-in Concrete Anchors
Section: 03 16 00—Concrete Anchors

REPORT HOLDER:

AJUSTCO, LLC

EVALUATION SUBJECT:

ANCHOR THREAD®

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Anchor Thread, described in ICC-ES evaluation report ESR-4788, has also been evaluated for compliance with the code(s) noted below.

Applicable code edition(s):

- 2019 *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 and 2.2 below.

- 2019 *California Residential Code* (CRC)

2.0 CONCLUSIONS

The Anchor Thread, described in Sections 2.0 through 7.0 of the evaluation report ESR-4788, complies with CBC Chapter 19 and CRC Section R301.1.3, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC), as applicable, provisions noted in the evaluation report, and the additional inspection requirements of the CBC Sections 16 and 17.

2.1 OSHPD:

The Anchor Thread, described in Sections 2.0 through 7.0 of the evaluation report ESR-4788, complies 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 2018 *International Building Code*® (IBC), as applicable, provisions noted in the evaluation report, and the additional requirements in Section 2.1.1 of this supplement:

2.1.1 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 1705.13.3.1 [OSHPD 1R, 2 and 5] and Section 1705A.12.4 [OSHPD 1 & 4] of the CBC, as applicable.

2.2 DSA:

The Anchor Thread, described in Sections 2.0 through 7.0 of the evaluation report ESR-4788, complies 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 2018 *International Building Code*® (IBC), as applicable, provisions noted in the evaluation report, and the additional requirements in Section 2.2.1 of this supplement:

2.2.1 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.12.4 [DSA-SS, DSA-SS/CC] of the CBC, as applicable.

2.3 CRC:

The Anchor Thread, described in Sections 2.0 through 7.0 of the evaluation report ESR-4788, complies with CRC Chapter 3, provided the design and installation are in accordance with the 2018 *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, reissued October 2022.

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Section: 03 16 00—Concrete Anchors

REPORT HOLDER:

AJUSTCO, LLC

EVALUATION SUBJECT:

ANCHOR THREAD®

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that Anchor Thread, described in ICC-ES evaluation report ESR-4788, has also been evaluated for compliance with the codes noted below.

Applicable code editions:

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

2.0 CONCLUSIONS

The Anchor Thread, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-4788, complies with the *Florida Building Code—Building* and *Florida Building Code—Residential*, provided the design requirements are 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-4788 for the 2018 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the Anchor Thread has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* or the *Florida Building Code—Residential*.

- a) For connections subject to uplift, the connection 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 2022.