ICC EVALUATION SERVICE

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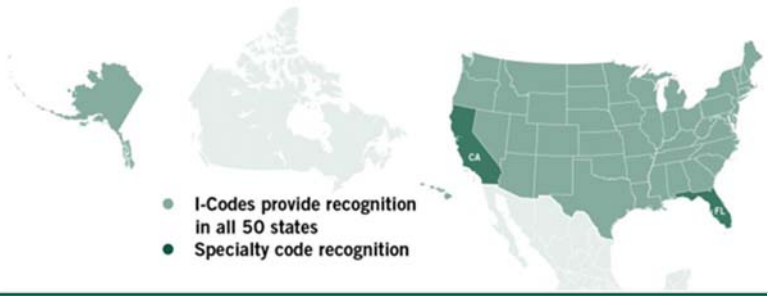


ICC-ES Evaluation Report
ESR-4339

Reissued December 2022

This report is subject to renewal December 2023.

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

REPORT HOLDER:

THE HILLMAN GROUP, INC.

ADDITIONAL LISTEES:

ALL POINTS SCREW, BOLT & SPECIALTY CO.

THE HILLMAN GROUP OF CANADA

EVALUATION SUBJECT:

POWER-PRO CONCRETE SCREW ANCHORS INSTALLED IN CONCRETE MASONRY

1.0 EVALUATION SCOPE

Compliance with the following codes:

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

Property evaluated:

Structural

2.0 USES

The Power-Pro concrete screw anchors installed in concrete masonry are used as anchorage to resist static, tension and shear loads in uncracked, grouted or ungrouted concrete masonry construction.

The Power-Pro concrete screw anchors installed in concrete masonry are alternatives to cast-in-place anchors described in Section 8.1.3 (2016 or 2013 edition), or Section 2.1.4 (2011 edition) of TMS 402/ACI 530/ASCE 5 as referenced in Section 2107.1 of the IBC.

The Power-Pro concrete screw anchors installed in concrete masonry are permitted to be used in structures regulated by the IRC, provided an engineered design is submitted in accordance with Section R301.1.3 of the IRC.

3.0 DESCRIPTION

3.1 Power-Pro Concrete Screw Anchors:

The Power-Pro concrete screw anchors installed in concrete masonry are manufactured from carbon steel, are given a supplementary hardening process and have a corrosion inhibiting coating system available in several colors. The anchors are available with a hex washer head or a flat countersunk head with a star recess. Available nominal diameters are $^{3}/_{16}$-, ¼- and $^{5}/_{16}$-inch (4.8, 6.4 and 7.9 mm) with various lengths.

Product names for the report holder and the additional listees are presented in the following table:

COMPANY NAME	PRODUCT NAME
The Hillman Group	Power Pro® Concrete Screw Anchor
The Hillman Group	Hillman Solid Set™
All Points Screw, Bolt & Specialty Co.	All Points Solid Set™
The Hillman Group of Canada	Pro-Fast Concrete Screw Anchor

The Power-Pro concrete screw anchor with different head styles are illustrated in Figure 1.

3.2 Grout-filled Concrete Masonry:

The specified compressive strength of masonry, f'_m, at 28 days must be a minimum of 1,500 psi (10.3 MPa). Fully grouted masonry walls must be constructed from the following materials:

3.2.1 Concrete Masonry Units (CMUs): Concrete masonry units, conforming to ASTM C90, are lightweight units. As a minimum, CMU nominal size must be 8 inches (203.2 mm) wide by 8 inches (203.2 mm) high by 16 inches (406.4 mm) long.

3.2.2 Grout: Grout must comply with IBC Section 2103.3 (2018 and 2015 IBC), 2013.13 (2012 IBC) or IRC Section R606 (2018 and 2015 IRC), R609.1.1 (2012), as applicable. The grout must have a minimum compressive strength equal to 2,000 psi (13.8 MPa) at 28 days.

3.2.3 Mortar: Mortar must be Type M, S or N in compliance with IBC Section 2103 or IRC Section R606 (2018 and 2015) or R607 (2012), as applicable.

3.3 Hollow (Ungrouted) Concrete Masonry:

The specified compressive strength of masonry, f'_m, at 28 days must be a minimum of 1,500 psi (10.3 MPa). Hollow masonry walls must comply with Chapter 21 of the IBC and must be constructed from the following materials:

3.3.1 Concrete Masonry Units (CMUs): Concrete masonry units, conforming to ASTM C90, are lightweight units. As a minimum, CMU nominal size must be 8 inches (203.2 mm) wide by 8 inches (203.2 mm) high by 16 inches (406.4 mm) long.

3.3.2 Mortar: Mortar must be Type M, S or N in compliance with IBC Section 2103 or IRC Section R606 (2018 and 2015) or R607 (2012), as applicable.

4.0 DESIGN AND INSTALLATION

4.1 Allowable Stress Design (ASD):

4.1.1 General: Anchors described in this report are assigned allowable tension and shear loads for design based on allowable stress design (ASD) under the codes described in Section 1.0 of this report.

4.1.2 Design of Anchors in Concrete Masonry: Allowable tension and shear loads for installation in concrete masonry under the IBC and IRC are noted in Tables 1 and 2. Installation is limited to the face shell of grouted or ungrouted, uncracked concrete masonry members. Masonry wall construction must be fully mortared.

Allowable loads for anchors installed in concrete masonry subjected to combined shear and tension forces must be determined by the following equation:

$$\left(\frac{P_s}{P_t}\right) + \left(\frac{V_s}{V_t}\right) \leq 1 \qquad \text{(Eq-1)}$$

where:

P_s = Applied service tension load.

P_t = Allowable service tension load.

V_s = Applied service shear load.

V_t = Allowable service shear load.

4.1.3 Minimum Spacing and Minimum Edge Requirements: The minimum spacing between anchors and the minimum edge distance between the anchor and the edge of the concrete masonry wall must be as set forth in Tables 1 and 2 and Figure 3

4.2 Installation:

The Power-Pro concrete screw anchors installed in concrete masonry must be installed in accordance with this report as described in Figure 2 and the manufacturer's published instructions (MPII). Anchor locations must comply with this report and the approved plans and specifications by the code official. Holes must be predrilled in masonry with a Power-Pro carbide-tipped drill bit supplied by the manufacturer and a rotary-hammer drill. The hole must be drilled $^1/_4$ inch (6.4 mm) deeper than the embedment depth and cleaned out of any dust or debris. The anchors must then be installed through the attachment into the hole, to the specified nominal embedment depth, using an impact driver with a maximum torque of 1885 in-lbs. Anchors must not be installed until the masonry has fully cured to its specified strength.

4.3 Special Inspection:

Continuous special inspection under the IBC and IRC, in accordance with Section 1704 of the IBC, must be provided during anchor installation as set forth in Tables 1 or 2 of this report. The special inspector must verity that anchor installation is in compliance with this report and in accordance with the manufacturer's printed installation instructions. The code official must receive a report, from an approved special inspector, that includes the following details: fastener type, fastener dimensions, masonry dimensions and compressive strength, grout and mortar compliance with Section 3.2 of this report, drill bit size, edge and end distances, fastener spacing and embedment (as applicable).

5.0 CONDITIONS OF USE

The Power-Pro concrete screw anchors installed in concrete masonry, as described in this report, are suitable alternatives to what is specified in those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Anchor sizes, dimensions and installation must comply with this report and the manufacturer's published installation instructions. In the event of a conflict between this report and the manufacturer's published installation instructions, this report governs.

5.2 Under the IBC or IRC, use of the anchors to resist wind or seismic loads is beyond the scope of this report. The allowable loads or load combinations for the anchors must not be adjusted for anchors subjected to wind or seismic loads.

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

5.4 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 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.

5.5 Since an ICC-ES acceptance criteria for evaluating the performance of screw anchors in cracked masonry is unavailable at this time, the use of anchors is limited to installation in uncracked masonry. Cracking occurs when $f_t > f_r$ due to service loads or deformations.

5.6 Calculations demonstrating that the applied loads are less than the allowable loads described in this report, must be submitted to the code official. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.7 Special inspection must be provided in accordance with Section 4.3 of this report.

5.8 Anchors are limited to dry, interior use.

5.9 See ESR-4357 for installations in which Power-Pro concrete screw anchors installed in concrete masonry are used in contact with treated wood.

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

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Masonry (AC106), dated March 2018.

7.0 IDENTIFICATION

7.1 The Power-Pro concrete screw anchors installed in concrete masonry, are identified in cartons bearing labels that provide the manufacturer name and the name of the product (Power-Pro concrete screw anchor); screw description (type, length, and shank diameter); the company name as set forth in Section 3.0 of this report, and the evaluation report number (ESR-4339). A length identification code letter is stamped on the head of the anchor. See the length identification system indicated in Table 3 of this report.

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

THE HILLMAN GROUP INC.
10590 HAMILTON AVENUE
CINCINNATI, OHIO 45231
info@hillmangroup.com

7.3 The Additional Listees' contact information is the following:

ALL POINTS SCREW, BOLT & SPECIALTY CO.
1590 N.W. 27TH AVENUE, #9
POMPANO BEACH, FLORIDA 33069
info@allpointsscrew.com

THE HILLMAN GROUP OF CANADA
900 PASSMORE AVENUE
TORONTO, ONTARIO M1X 0C6
CANADA
farhad.lajewardi@hillmangroup.com

TABLE 1—ALLOWABLE TENSION AND SHEAR VALUES FOR POWER-PRO CONCRETE SCREW ANCHOR INSTALLED IN GROUTED CONCRETE MASONRY UNITS[1,2,6]

ANCHOR DIAMETER (inch)	DRILL BIT DIAMETER (inch)	MINIMUM DISTANCES[3] (inch)				IBC/IRC[5]	
		NOMINAL EMBEDMENT[4]	EDGE	END	SPACING	TENSION (lbs)	SHEAR (lbs)
3/16	5/32	1 3/4	3 7/8	3 7/8	3	172	166
1/4	3/16	1 3/4	3 7/8	3 7/8	4	257	265
5/16	1/4	1 3/4	3 7/8	3 7/8	5	182	500

For **SI:** 1 inch = 25.4 mm; 1 lb = 4.45 N.

[1]The tabulated values are for anchors installed in the face shell of lightweight concrete masonry units in compliance with ASTM C90.
[2]The tabulated values are for anchors installed in a minimum 8-inch wide grouted CMU wall having reached a minimum *f'm* = 1500 psi at the time of installation.
[3]The tabulated values are for anchors installed at the minimum edge, end and spacing distance in the grouted cell.
[4]The nominal embedment depth is the distance from the concrete masonry unit surface to the end of the screw anchor.
[5]Special inspection shall be provided in accordance with Section 4.3 of this report.
[6]Values are based on a factor of safety of 5.

TABLE 2—ALLOWABLE TENSION AND SHEAR VALUES FOR POWER-PRO CONCRETE SCREW ANCHOR INSTALLED IN HOLLOW CONCRETE MASONRY UNITS[1,2,6]

ANCHOR DIAMETER (inch)	DRILL BIT DIAMETER (inch)	MINIMUM DISTANCES[3] (inch)				IBC/IRC[5]	
		NOMINAL EMBEDMENT[4]	EDGE	END	SPACING	TENSION (lbs)	SHEAR (lbs)
3/16	5/32	1 1/4	3 7/8	3 7/8	3	72	190
1/4	3/16	1 1/4	3 7/8	3 7/8	4	108	264
5/16	1/4	1 1/4	3 7/8	3 7/8	5	94	217

For **SI:** 1 inch = 25.4 mm; 1 lb = 4.45 N.

[1]The tabulated values are for anchors installed in lightweight concrete masonry units in compliance with ASTM C90.
[2]The tabulated values are for anchors installed in a minimum 8-inch wide hollow CMU wall having reached a minimum *f'm* = 1500 psi at the time of installation.
[3]The tabulated values are for anchors installed at the minimum edge, end and spacing distance at any location in the wall face.
[4]The nominal embedment depth is the distance from the concrete masonry unit surface to the end of the screw anchor.
[5]Special inspection shall be provided in accordance with Section 4.3 of this report.
[6]Values are based on a factor of safety of 5.

TABLE 3—LENGTH IDENTIFICATION SYSTEM

LENGTH ID MARKING ON ANCHOR HEAD		#	A	B	C	D	E	F	G	H	I	J
Length of anchor (inches)	From	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
	Up to, but not including	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	6 1/2

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

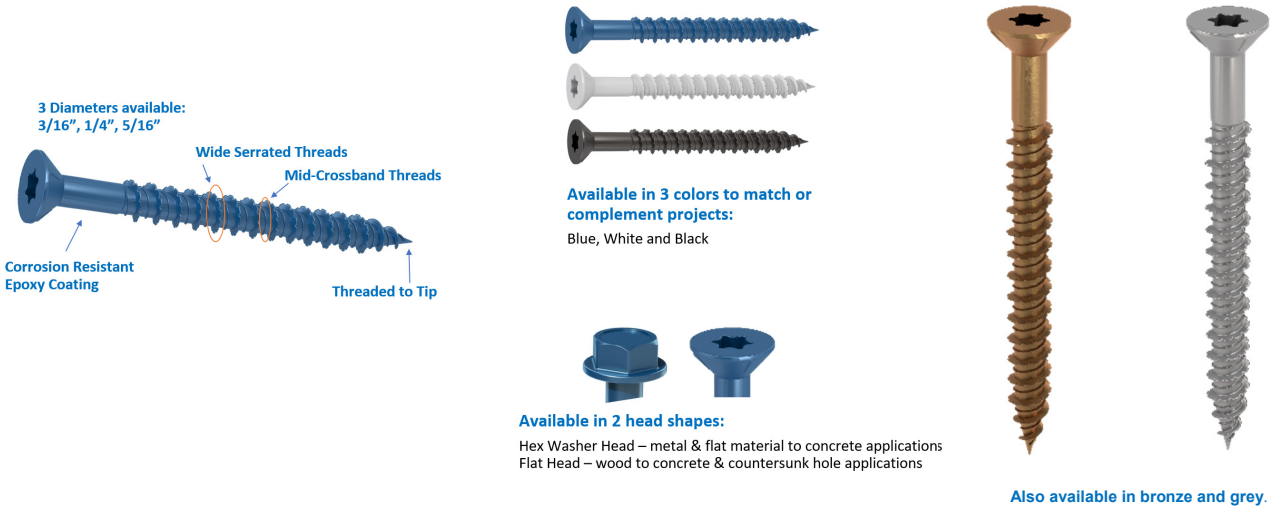
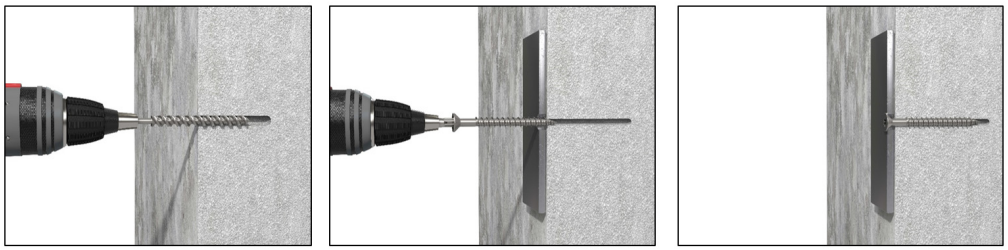


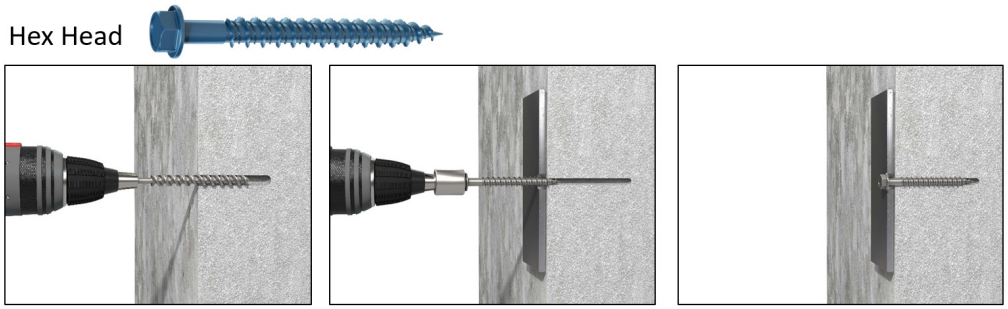
FIGURE 1— POWER-PRO CONCRETE SCREW ANCHORS AND HEAD STYLES

Power Pro Concrete Screw Installation Instructions

Flat Head

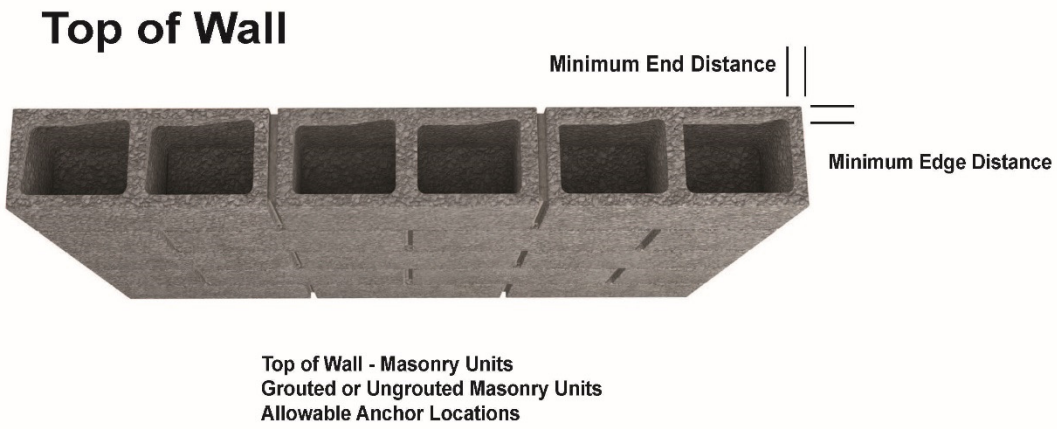


Hex Head



1) Use appropriate size Power Pro drill bit and a hammer drill for best results.
2) Drill the hole ¼" deeper than embedment depth and remove dust from hole with suction or forced air.
3) Disable hammer mode on drill and set to rotary only. Place hex driver or star bit into drill.
4) Drive anchor through fixture and into hole until seated at the proper embedment. Do not overdrive.

FIGURE 2—INSTALLATION INSTRUCTIONS FOR POWER-PRO CONCRETE SCREW ANCHORS



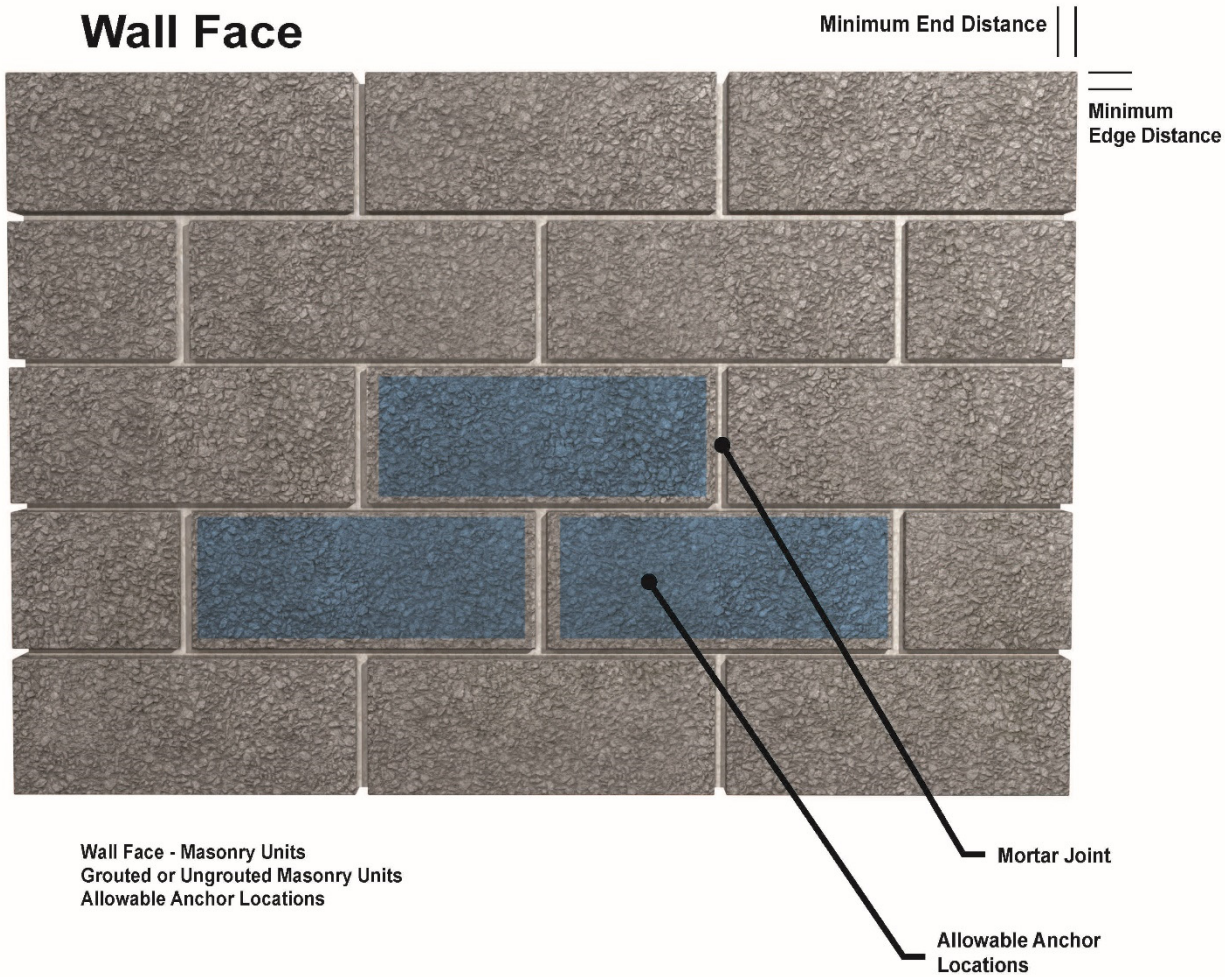


FIGURE 3—INSTALLATION LOCATION FOR POWER-PRO CONCRETE SCREW ANCHORS IN MASONRY UNITS (ALL DIMENSIONS IN INCHES)

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

REPORT HOLDER:

THE HILLMAN GROUP, INC.

EVALUATION SUBJECT:

POWER-PRO CONCRETE SCREW ANCHORS INSTALLED IN CONCRETE MASONRY

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Power-Pro concrete screw anchors installed in concrete masonry, described in ICC-ES evaluation report ESR-4339, have also been evaluated for compliance with the code*(s)* noted below.

Applicable code editions:

- 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 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code* (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The Power-Pro concrete screw anchors installed in concrete masonry, described in Sections 2.0 through 7.0 of the evaluation report ESR-4339, comply with CBC Chapter 21, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16, 17 and 21, as applicable.

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

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

2.2 CRC:

The Power-Pro concrete screw anchors installed in concrete masonry, described in Sections 2.0 through 7.0 of the evaluation report ESR-4339, comply 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 December 2022.

ICC-ES Evaluation Report

ESR-4339 FBC Supplement

Reissued December 2022

This report is subject to renewal December 2023.

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

REPORT HOLDER:

THE HILLMAN GROUP, INC.

EVALUATION SUBJECT:

POWER-PRO CONCRETE SCREW ANCHORS INSTALLED IN CONCRETE MASONRY

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Power-Pro concrete screw anchors installed in concrete masonry, described in ICC-ES evaluation report ESR-4339, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2020 and 2017 *Florida Building Code—Building*
- 2020 and 2017 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The Power-Pro concrete screw anchors installed in concrete masonry, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-4339, comply with the *Florida Building Code—Building* and the *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-4339 for the 2018 and 2015 *International Building Code®* meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential,* as applicable.

Use of the Power-Pro concrete screw anchors installed in concrete masonry has 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 condition:

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

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission 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 December 2022.