

ICC-ES Evaluation Report

ESR-5005

Reissued October 2024


This report also contains:

- [City of Chicago Supplement](#)
- [CA Supplement](#)
- [FL Supplement](#)

Subject to renewal October 2025

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<p>DIVISION: 31 00 00 — EARTHWORK</p> <p>Section: 31 63 00 — Bored Piles</p>	<p>REPORT HOLDER: INDEPENDENCE MATERIALS GROUP, LLC (IMG)</p>	<p>EVALUATION SUBJECT: IMG PUSH PIER MODEL NO. IMG PP21617-34</p>	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, and 2012 [International Building Code® \(IBC\)](#)
- 2021, 2018, 2015, and 2012 [International Residential Code® \(IRC\)](#)

Property evaluated:

Structural

2.0 USES

IMG Push Pier is used as support for structures to recover lost elevations and to provide uniform supplemental support to foundations. The IMG Push Pier provides structural lift and is intended to stop further settlement of the structure. This product is used for residential, commercial, and industrial foundation settlement problems, and may be installed in either interior or exterior applications.

When IMG Push Pier is installed under the IRC, an engineered design is required in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

3.1 General: IMG model PP21617-34 is a push pier system consisting of an under footing self-standing bracket body, a reinforcing sleeve that passes through the bracket body, a pier tube shaft that is hydraulically advanced to a firm bearing strata, and the associated hardware consisting of threaded rods and nuts passing through a solid steel cap plate. Certain parts are offered in both a black, non-coated version and a hot dipped coated version designated by the suffix (G).

3.2 System Components and Materials:

3.2.1 Bracket Body: #PP21617-34B is fabricated using 0.375 inch (9.5 mm) ASTM A572 Grade 50 flat plate or ASTM A36 flat plate and CNC cut and bent to the required shapes. Additional bracket body parts consist of two (2) 1.66 inches OD x 0.140-inch (42 mm OD x 4 mm) ASTM A500 Grade B tube spacers and one (1) 4 inches OD x 0.188 inch x 11³/₁₆ inches (102 mm OD x 4.8 mm x 284 mm) ASTM A513 Grade 1026 or A500B(C) tube body. The sand plate is CNC cut from 0.250-inch (6.4 mm) ASTM A36 or A572 steel.

3.2.2 External Sleeve: #PP21617-48ES is fabricated using ASTM A500 Grade B/C 3.5 inches OD x 0.216 inch x 48 inches (89 mm OD x 5.5 mm) wall tube with a 4 inches OD x 0.219 inch x 1 inch (102 mm OD

x 5.6 mm x 25 mm) ASTM A513 Grade 1026 tube ring welded to the end to serve as a hard stop. Alternatively, a ¾ inch (19 mm) long ring of the 4 inches OD x 0.226 inch (102 mm x 5.7 mm) tube may be welded ½ inch (13 mm) down from the leading edge using four (4) 1 inch (25 mm) fillet welds or a flared end on the tube create a hard stop.

3.2.3 Pier Cap Plate: #PP21617-34CAP is fabricated using ASTM A36 1-inch x 4 inches (25 mm x 102 mm) flat bar stock and cut to 9 inches (229 mm) length. A ¾ inch (19 mm) long ring is cut from 3.5 inches OD x 0.216-inch (89 mm x 5.5 mm) ASTM A500 Grade B tube and is stitch welded using four (4) 1-inch (25 mm) evenly spaced ¼ inch (6 mm) fillet welds.

3.2.4 Lifting Rods and Nuts: Lifting rods and nuts consist of two (2) 16 inches (406 mm) long threaded rods and four (4) hex nuts. The flat washers meet ASTM F436 Type 1. See [Table 2](#) for details of the approved threaded rods and nuts.

3.2.5 Starter Pipe: #PP21617-50SP is fabricated using a 2.875 inches OD x 0.165 inch (73 mm x 4 mm) wall thickness tube meeting ASTM A500 Grade C. A 1 inch (25 mm) long section of a 3.5 inches x 0.300 inch (89 mm x 7.6 mm) wall tube meeting ASTM A500 Grade C is fillet welded to the leading edge of one end of the tubing to serve as a friction reducing collar or a ¾ inch (19 mm) long ring welded ½ inch (13 mm) down from the leading edge using four (4) 1 inch (25 mm) fillet welds. Alternately, a 3¹/₈ inches (79 mm) OD x 3³/₁₆ inches (5 mm) wall x 1-inch (25 mm) long tube meeting ASTM A500 is swagged inside the leading edge. Tube shaft material is galvanized using a three-coat inline process meeting ASTM 1057 with a minimum galvanized thickness of 0.85 to 1.19 mils (0.02 to 0.03 mm).

3.2.6 Tube Extension: #PP21617-36PTP is fabricated using a 2.875 inches OD x 0.165 inch (73 mm x 4 mm) wall thickness tube meeting ASTM A500 Grade C. A 2.5 inches x 0.188 inch (64 mm x 8 mm) wall x 6 inches (152 mm) long nipple meeting ASTM A513 Grade 1026 is inserted into one end of the tube and is held in position by three (3) ¼ inch (6 mm) hydraulically punched dimples installed to create a triangular shape and approximately in equal distances around the pipe. Tube shaft material is galvanized using a three-coat inline process meeting ASTM 1057 with a minimum galvanized thickness of 0.85 to 1.19 mils (0.02 to 0.03 mm).

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 General: Engineering calculations (analysis and design) and drawings, must be prepared by a registered design professional, submitted to and be subjected to the approval of the code official for each project, and must be based on accepted engineering principles, as described in IBC Section 1604.4 and must conform to 2021, 2018, 2015 and 2012 IBC Section 1810. The design method for the steel components is in Allowable Strength Design (ASD) as described in IBC Section 1602 and AISC 360 Section B3.4. The engineering analysis must address hydraulically driven foundation system performance related to structural and geotechnical requirements.

A soil investigation report in accordance with this Section must be submitted for each project, when requested by the authority having jurisdiction. The soil interaction capacity between the pier and the soil including the required safety factor and the soil effects of the hydraulically driven steel pier installation must be determined in accordance with the applicable code by a registered design professional.

4.1.2 Bracket Capacity: The compression load ratings of the push pier brackets with a maximum unsupported length below the bracket bearing plate of 5 feet (1.52 m) are provided in [Table 1](#) of this report. The concrete foundation must be designed and justified to the satisfaction of the local code official with due consideration to the eccentricity of the applied loads, including reactions provided by the brackets, acting on the concrete foundation. Only localized limits states of the steel components to the piles have been evaluated in this evaluation report. Other limit states are outside the scope of this evaluation and must be determined by the registered design professional. The effects of reduced lateral sliding resistance due to uplift from wind or seismic loads must be considered for each project.

4.1.3 Tube Shaft Capacity: The tube shaft capacity has not been evaluated and is outside the scope of this report.

4.2 Installation: The IMG Push Pier must be installed by IMG LLC's certified and trained installers in accordance with this section (Section 4.2), the site-specific approved construction documents (engineering plans and specifications), the manufacturer's installation instructions, and the following conditions:

- 1- A site survey is necessary of the area where the piers are going to be driven to locate any possible interference such as utilities, plumbing, electrical or phone lines.
- 2- An area of approximately 2.5 square feet (0.23 square meter) to a depth of 8.5 inches (216 mm) below the bottom of the footing will need to be excavated at each pier location. The excavated concrete bearing surface shall be free of all soil, debris, and loose concrete prior to installation of the push pier system.
- 3- The bearing area around the footing must be a smooth and level condition while adjusting the face of the stem wall to vertical at the point of the bracket attachment. Notching of the concrete footing may be necessary and shall be performed under the guidance of a registered design professional and approval of the code official.
- 4- The existing structure is used as a reaction force with a hydraulic pump and cylinder combination to drive the pier into the soil.
- 5- Adjacent piers must not be advanced simultaneously.
- 6- Each installed Push Pier must follow IMG Push Pier Installation Instructions. In accordance with the 2021, 2018, 2015 and 2012 IRC Section R106.1.2, a copy of these installation instructions must be made available on the job site at the time of installation.

4.3 Special inspection

Special inspection in accordance with 2021, 2018, 2015 and 2012 IBC Section 1705.7, is required for installation of the IMG Push Pier, except as indicated in Section 1704.2 of the IBC. Items to be recorded and confirmed by the special inspector must include, but are not limited to, the following:

1. Verification of the product manufacturer, and the manufacturer's certification of installers.
2. Product identification, including lead sections, extension sections, brackets, bolts, and nuts, as specified in the construction documents and this evaluation report.
3. Installation procedures anticipated and actual piling depth.
4. Tip elevations, the installation pressure and final depth of the driven foundation system.
5. Inclination and position/location of hydraulically driven steel piles.
6. Compliance of the installation with the approved construction documents and this evaluation report.

5.0 CONDITIONS OF USE:

The IMG Push Pier 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 IMG Push Pier is manufactured, identified, and installed in accordance with this report, the approved construction documents, and the manufacturer's published installation instructions. In the event of a conflict between this report, the approved construction documents, and the manufacturer's published installation instructions, the most restrictive governs.
- 5.2** This evaluation report does not address seismic loading for this system, existing footing suitability or attachment requirements to existing footings.
- 5.3** Installation of the hydraulically driven pile systems must be limited to support of uncracked normal-weight concrete, as determined in accordance with the applicable code.
- 5.4** Brackets must be used only to support structures that are laterally braced as defined in 2021, 2018, 2015 and 2012 IBC Section 1810.2.2.
- 5.5** Corrosion resistance and durability are outside the scope of this evaluation report.
- 5.6** The IMG Push Pier is rated for compression loading only. Lateral and uplift loading from wind and seismic are outside the scope of this evaluation report and must be carried by the existing shallow foundation and verified by a registered design professional.
- 5.7** Each push pier that is installed, is load tested against the weight of the structure to ensure that the system can withstand a load greater than needed to restore the structure. A registered design professional must provide the test load safety factor requirements based upon the site-specific soil conditions.

- 5.8 All the excavated soil at each pile location must be replaced and compacted after the piles are proof load tested.
- 5.9 The adequacy of the concrete structures that are connected to the IMG Push Pier must be verified by a registered design professional, in accordance with applicable code provisions, such as Chapter 13 of ACI 318-19 under the 2021 IBC, Chapter 13 of ACI 318-14 under the 2018 and 2015 IBC (Chapter 15 of ACI 318 under the 2012 IBC) and Chapter 18 of IBC, and subject to the approval of the code official.
- 5.10 Special inspection is provided in accordance with Section 4.3 of this report.
- 5.11 Engineering calculations and drawings as described in Section 1604.4 of the IBC and comply with the design and installation requirements of this evaluation report are to be prepared by a registered design professional. All these documents are to be submitted and approved by the local code official.
- 5.12 Settlement of the hydraulically driven pile is outside the scope of this evaluation report and must be determined by a registered design professional as required in 2021, 2018, 2015 and 2012 IBC Section 1810.2.3.
- 5.13 The interaction between the hydraulically driven pile system and the soil is outside the scope of this report.
- 5.14 A copy of the manufacturer’s published installation instructions must be made available on the job site at the time of installation.
- 5.15 The IMG Push Pier is manufactured under a quality control program with inspections monitored by the ICC-ES.

6.0 EVIDENCE SUBMITTED

- Bracket eccentric compression load tests in accordance with ASTM E72.
- Quality control documentation and installation instructions.

7.0 IDENTIFICATION

- 7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5005) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.

In addition, each Push Pier that is covered by this report must be marked with the following information:

1. IMG Push Pier Product/Model Number
2. Bracket Load Rating
3. Manufacturer Address

- 7.2 The report holder’s contact information is the following:

INDEPENDENCE MATERIALS GROUP, LLC (IMG)
1741 CORPORATE LANDING PARKWAY
VIRGINIA BEACH, VIRGINIA 23454
(803) 807-8629
www.independencematerialsgroup.com

TABLE 1—PUSH PIER COMPRESSION LOAD RATINGS¹

Model	Product Designation		Average Tested Ultimate Capacity (lbs)	Allowable Push Pier Capacity ² (lbs)
IMG PP21617-34	Push Pier Bracket		56,293	28,147

For SI: 1 kip (1000 lbf) = 4.48 kN.

¹ Table provides tested bracket assembly capacities only. A licensed engineer shall verify the actual available capacity based on the size of the tube shaft, expected corrosion loss, and the site-specific soil conditions.

² Allowable capacities are based upon the minimum of the average tested yield capacity (Py) multiplied by 0.6 and the average tested ultimate capacity (Pmax) multiplied by 0.5. Allowable capacities shall be utilized with Allowable Strength Design (ASD) loading.

TABLE 2—APPROVED THREADED RODS AND NUTS

Lifting Rod	Lifting Rod Steel	Nut	Nut Steel
3/4" - 10 unc	ASTM A193 Grade B7	3/4"-10 Heavy Hex	ASTM A193
(#7) 7/8" - 5 All Thread Rebar	ASTM A615 Grade 75	7/8" - 16 Hex Head	ASTM A108 or A576
3/4" 4.5 Coil Rod*	ASTM A108 GR 1045	3/4" - 4.5 Coil Nut (2) Nuts required per rod end	ASTM A1035
		3/4" - 4.5 Heavy Coil Nut (1) Nut required per rod end	ASTM A1045

* Coil rod material has minimum 69750 psi (481 MPa) yield strength and 96550 psi (666 MPa) minimum ultimate tensile strength.

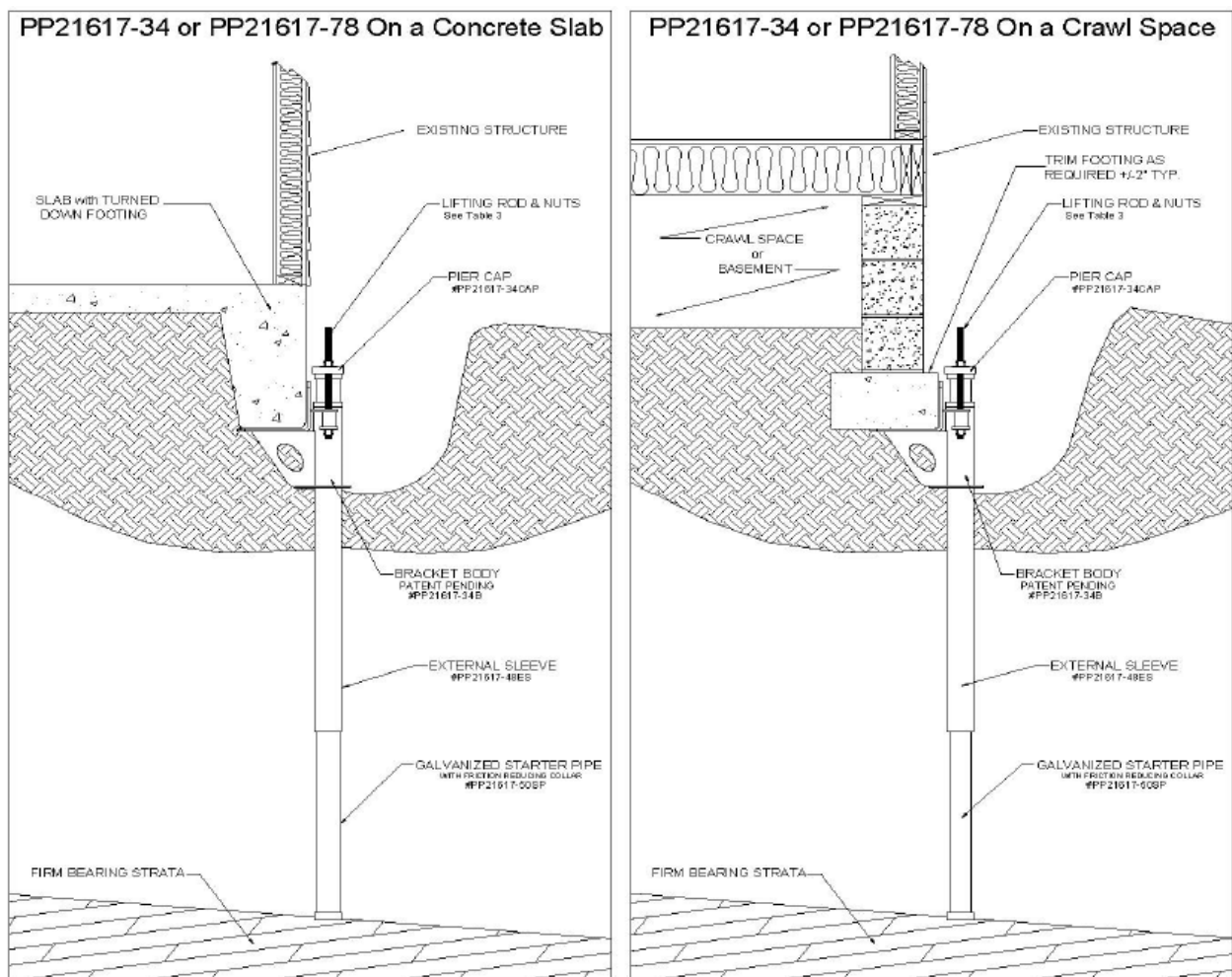
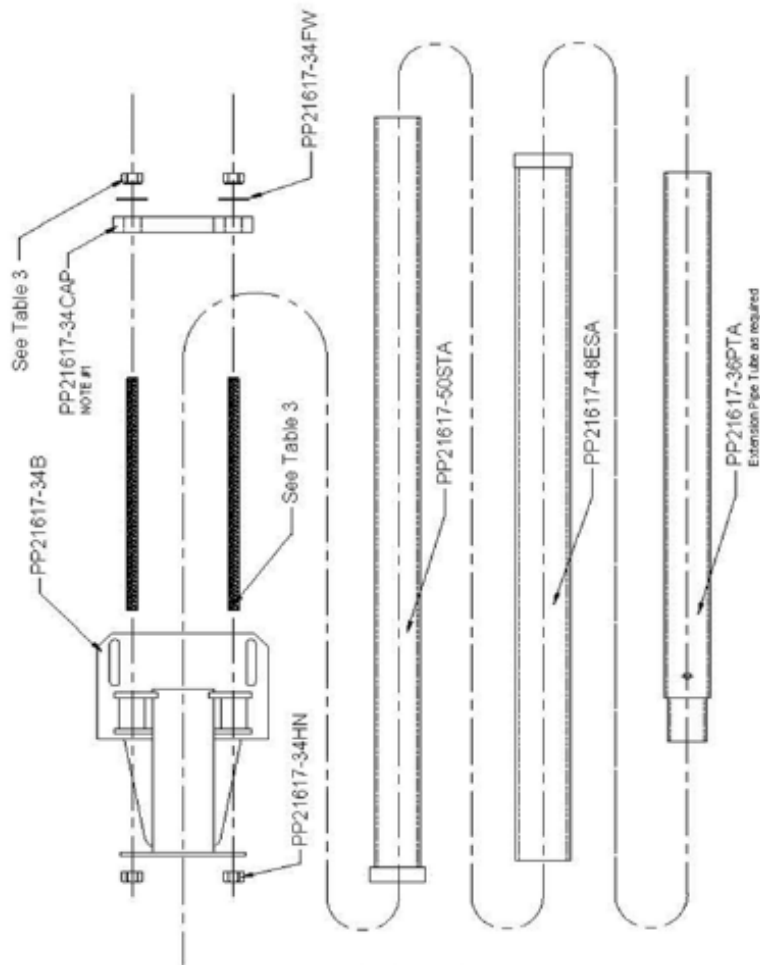


FIGURE 1—PP21617-34 BRACKET ASSEMBLY

PP21617-34 Typical Installation

The IMG Bracket Design is PATENT PENDING



NOTE #1 Cap plate, nuts and washers to be installed after final extension pipe

FIGURE 1 (Continued) —PP21617-34 BRACKET ASSEMBLY

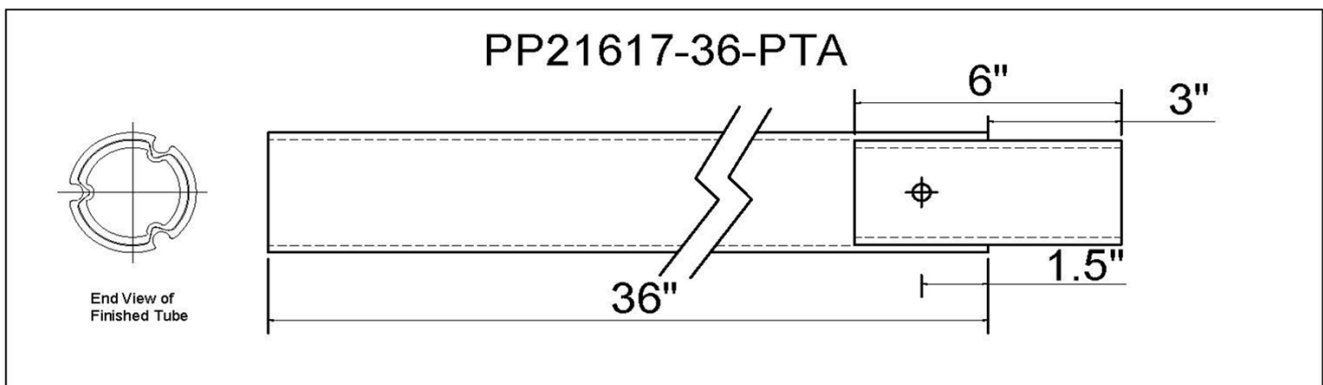


FIGURE 2—PUSH PIN COUPLER DETAILS

DIVISION: 31 00 00—EARTHWORK
Section: 31 63 00—Bored Piles

REPORT HOLDER:

INDEPENDENCE MATERIALS GROUP, LLC (IMG)

EVALUATION SUBJECT:

IMG PUSH PIER MODEL NO. IMG PP21617-34

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the IMG Push Pier, described in ICC-ES evaluation report ESR-5005 has also been evaluated for compliance with the Chicago Construction Codes (Title 14 of the Chicago Municipal Code) as noted below.

Applicable code editions:

- 2019 *Chicago Building Code* (Title 14B)

2.0 CONCLUSIONS

The IMG Push Pier, described in Sections 2.0 through 7.0 of the evaluation report ESR-5005, complies with Title 14B, and is subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The IMG Push Pier described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-5005.
- The design, installation, conditions of use and identification of the IMG Push Pier are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report ESR-5005.
- The design of the tube shaft shall comply with Section 1810 of Title 14B.
- Special inspection in accordance with Section 1705.7 of Title 14B and Section 4.3 of ESR-5005 is required, except as indicated in Section 1704.2 of Title 14B.

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

DIVISION: 31 00 00—EARTHWORK
Section: 31 63 00—Bored Piles

REPORT HOLDER:

INDEPENDENCE MATERIALS GROUP, LLC (IMG)

EVALUATION SUBJECT:

IMG PUSH PIER MODEL NO. IMG PP21617-34

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that IMG Push Pier, described in ICC-ES evaluation report ESR-5005, has also been evaluated for compliance with the code noted below.

Applicable code edition(s):

- 2022 California Building Code (CBC)
- 2022 California Residential Code (CRC)

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.

2.0 CONCLUSIONS**2.1 CBC:**

The IMG Push Pier, described in Sections 2.0 through 7.0 of the evaluation report ESR-5005, complies with CBC Chapter 18, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16, 17, and 18 as applicable.

2.1.1 OSHPD:

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

2.1.2 DSA:

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

2.2 CRC:

The IMG Push Pier, described in Sections 2.0 through 7.0 of the evaluation report ESR-5005, complies with CRC Chapter 3, provided the design and installation are in accordance with the 2021 *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 2024.

DIVISION: 31 00 00—EARTHWORK
Section: 31 63 00—Bored Piles

REPORT HOLDER:

INDEPENDENCE MATERIALS GROUP, LLC (IMG)

EVALUATION SUBJECT:

IMG PUSH PIER MODEL NO. IMG PP21617-34

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the IMG Push Pier, described in ICC-ES evaluation report ESR-5005, have 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 IMG Push Pier, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-5005, complies with the *Florida Building Code—Building* or the *Florida Building Code—Residential*. The design requirements must be determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-5005 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 IMG Push Pier for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* or the *Florida Building Code—Residential* has not been evaluated and is outside the scope of this supplemental report.

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.