

Pei Evaluation Service® is an accredited ISO Standard 17065 Product Certifier, accredited by the IAS. This **Product Evaluation Report** represents a product that **Pei ES** has Evaluated. This product has a Product Evaluation Service Agreement & Follow-up Inspection Service Agreement. This **Product Evaluation Report** in no way implies warranty for this product or relieves **Independence Materials Group** of their liabilities for this product. This **PER** is an official document if it is within one year of the initial or re-approval date.

Initial Approval
October 2017

Re-Approved
October 2018

See all **Pei ES** Listings at: www.p-e-i.com

Report Owner

Independence Materials Group (IMG)

635 Maltby Avenue
Norfolk, VA 23504

Approved Manufacturing Locations

IMG - MVA Facility

1627 Columbia College Drive
Columbia, SC 29203

Brown Equipment Mfg Co.

5930 Northwoods Business Parkway
Charlotte, NC 28269

Product

IMG Push Pier Model No. IMG PP21617-34

Evaluation Report Information

www.independencematerialsgroup.com

IMG contact: Allen Gantt - (803) 807-8629

General Details

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

The **IMG Push Pier** system has been tested and evaluated for eccentric compression strength with a maximum unsupported length below the bracket bearing plate of 5 feet. This **PER** does not address seismic loading for this system, or attachment requirements to buildings. Corrosion resistance and longevity shall be addressed by the registered design professional on a job specific and location basis. **IMG** has a Product Evaluation Service Agreement with **Pei Evaluation Service® (Pei ES)** and a Follow-up Inspection Service Agreement with **Progressive Engineering, Inc. (Pei)**. The approved manufacturing locations have an approved Quality Assurance Manual to manufacture **IMG Push Pier Model IMG PP21617-34** and are audited quarterly by **Pei**.

Product Description

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.

IMG PP21617-34 Bracket Assembly:

IMG Model No. PP21617-34 is a push pier system manufactured using the materials described in this **PER**. Certain parts are offered in both a black, non coated version and a hot dipped coated version designated by the suffix (G).

Bracket Body #PP21617-34B is fabricated using .375" ASTM A572 Grade 50 flat plate and CNC cut and bent to the required shapes. Additional bracket body parts consist of two (2) 1.66" OD x 0.140" ASTM A500 Grade B tube spacers and one (1) 4" OD x 0.188" x 11-3/16" ASTM A513 Grade 1026 tube body. The sand plate is CNC cut from 0.250" ASTM A36 steel.

External Sleeve #PP21617-48ES is fabricated using ASTM A500 Grade B 3.5" OD x 0.216" x 48" wall tube with a 4" OD x 0.226" x 1" ASTM A513 Grade 1026 tube ring welded to the end to serve as a hard stop. Alternatively a 3/4" long ring of the 4"x.226" tube may be welded 1/2" down from the leading edge using four (4) 1" fillet welds.

Pier Cap Plate #PP21617-34CAP is fabricated using ASTM A529 Grade 50 1" x 4" flat bar stock and cut to 9" length. A 3/4" long ring is cut from 3.5" OD x 0.216" ASTM A500 Grade B tube and is stitch welded using four (4) 1" evenly spaced 1/4" fillet welds.

Lifting Rods and Nuts consist of (2) 16" long threaded rods with a safe working load of 15,000Lbs. and four (4) hex nuts. The flat washers must meet ASTM F436 Type 1. See Table 3 for details of the approved threaded rods and nuts.

Starter Pipe #PP21617-50SP is fabricated using a 2.875" OD x 0.165" wall thickness tube meeting ASTM A500 Grade B. A 1" long section of a 3.5" x 0.300" wall tube meeting ASTM A500 Grade B is fillet welded to the leading edge of one end of the tubing to serve as a friction reducing collar. Alternately a 3/4" ring of the 3.5" x .300" wall tube may be welded 1/2" down from the leading edge using four (4) 1" fillet welds. 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.

Tube Extension #PP21617-36PT is fabricated using a 2.875" OD x 0.165" wall thickness tube meeting ASTM A500 Grade B. A 2.5" x 0.188" wall x 6" long nipple meeting ASTM A513 Grade 1026 is inserted into one end of the tube and is held in position by three (3) 1/4" 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.

Design Considerations

A structural evaluation **Shall** be submitted at the request of the building official on a job specific basis with consideration to the existing foundation, soil conditions, and overall system integrity.

Building Code Compliance

Table 1 - Applicable Code Sections

2012 & 2015 International Residential Code® (IRC)		2012 & 2015 International Building Code® (IBC)	
Section R104.11	Section R104.11.1	Section 104.11	Section 1810.2.1
Section R106.1.2	Section R301.1.2	Section 1810.2.2	

General Product Usage and Limitations

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 to a depth of 8.5 inches 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. 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. IMG Push Pier Systems are designed to resist downward vertical loads only and are not approved for uplift and lateral load resistance. As a result, mechanical anchorage of the bracket to the foundation is not necessary to ensure adequate performance, but may be installed if deemed necessary by the building official and registered design professional.
5. The existing structure is used as a reaction force with a hydraulic drive cylinder to drive the pier into the soil. Adjacent pier shall NOT be advanced simultaneously.
6. Each Pier System installed must follow the applicable IMG Installation Instructions. In accordance with the 2012 and 2015 IRC Section 106.1.2, a copy of these installation instructions shall be made available on the job site at the time of installation.
7. When installed under structures meeting the requirements of the 2012 or 2015 IBC, a continuous special inspection shall be performed during installation when specifically required by the building official and/or registered design professional.
8. The allowable capacities shown in Table 2 reflect the installation in soils capable of sufficient lateral support of the push pier in accordance with Section 1810.2.1 of the 2012 and 2015 IBC. Where fluid soils (as defined by the 2012 & 2015 IBC) are present or the foundation elements stand unbraced in air or water, it shall be permitted to consider them laterally supported at a point 5-feet into stiff or 10-feet into soft soil unless otherwise verified through a geotechnical investigation by a registered design professional.
9. A registered design professional shall verify the installation meets the minimum stability requirements of Section 1810.2.2 of the 2012 and 2015 IBC.

Table 2 - Push Pier Compression Load Ratings¹

Model	Product Designation	Average Tested Yield Capacity (lbs)	Average Tested Ultimate Capacity (lbs)	Allowable Push Pier Capacity ² (lbs)
IMG PP21617-34	Push Pier Bracket	48,900	59,900	29,340

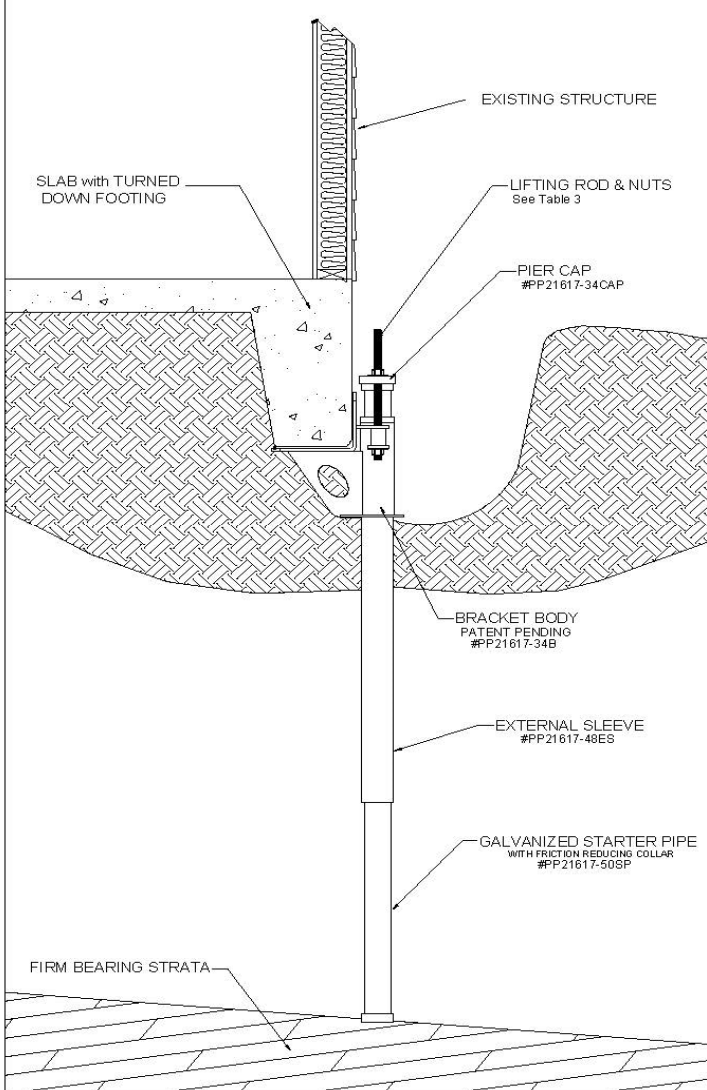
Notes:

1. Table provides tested bracket assembly capacities only. A licensed engineer shall verify the actual available capacity based on the size of the push pin, expected corrosion loss, and the site specific soil conditions.
2. Allowable capacities are based upon the minimum of the average tested yield capacity (P_y) multiplied by 0.6 and the average tested ultimate capacity (P_{max}) multiplied by 0.5. Allowable capacities shall be utilized with Allowable Strength Design (ASD) loading.

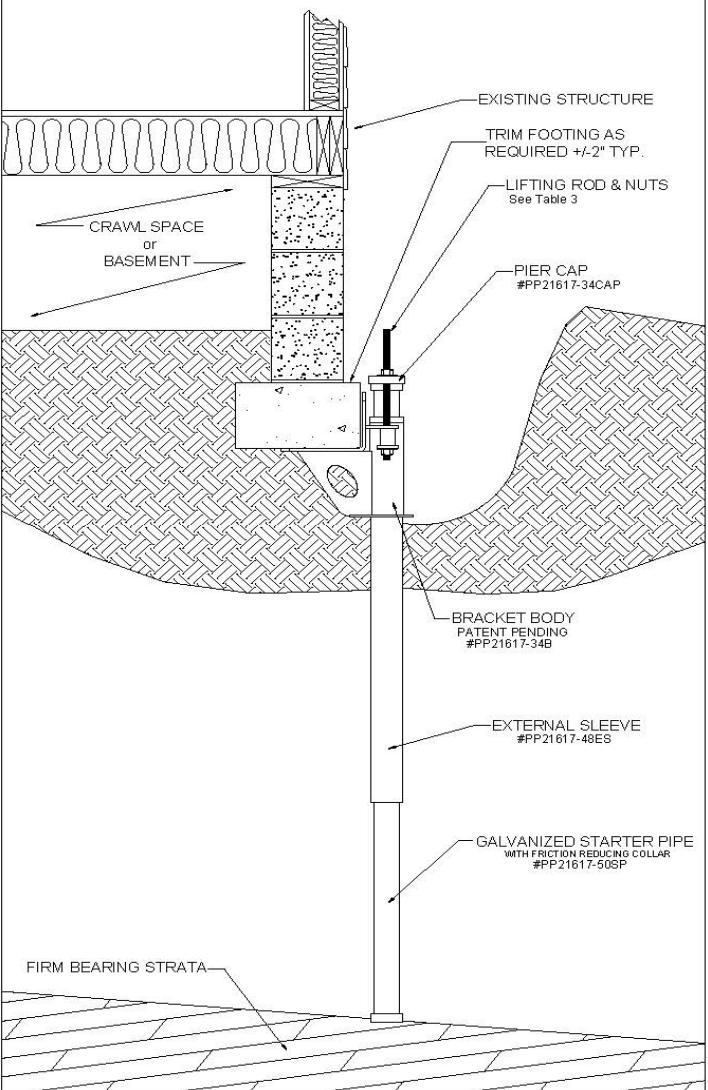
Table 3 - Approved Threaded Rods and Nuts

Lifting Rod	Lifting Rod Steel	Nut	Nut Steel	Minimum Safe Working Load required
3/4" - 10 unc	ASTM A193 Grade B7	3/4"-10 Heavy Hex	ASTM A193	15,000 Lbs.
(#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 A1035 or A1045	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	

PP21617-34 or PP21617-78 On a Concrete Slab

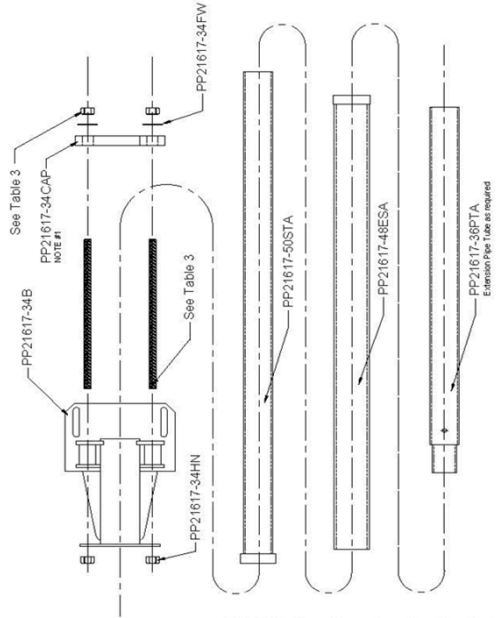


PP21617-34 or PP21617-78 On a Crawl Space



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 2 - PP21617-34 Bracket Assembly

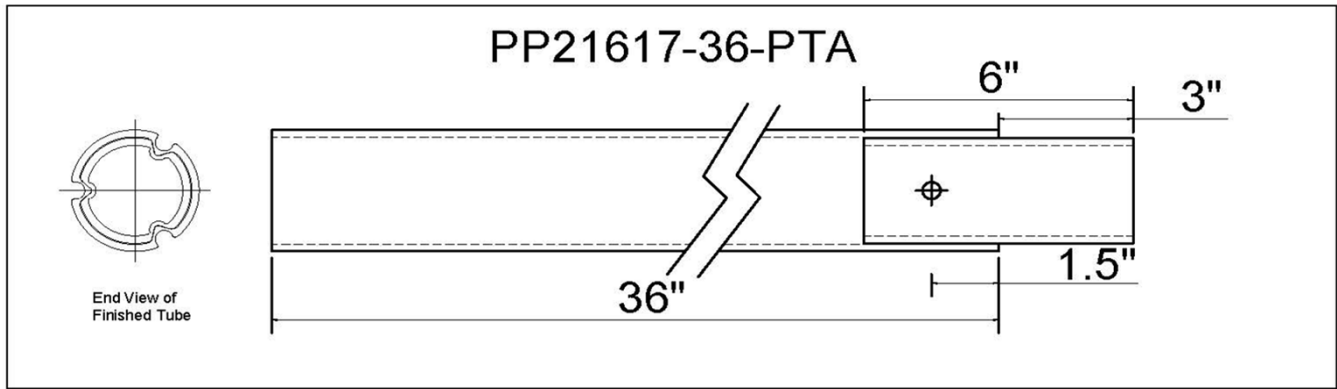
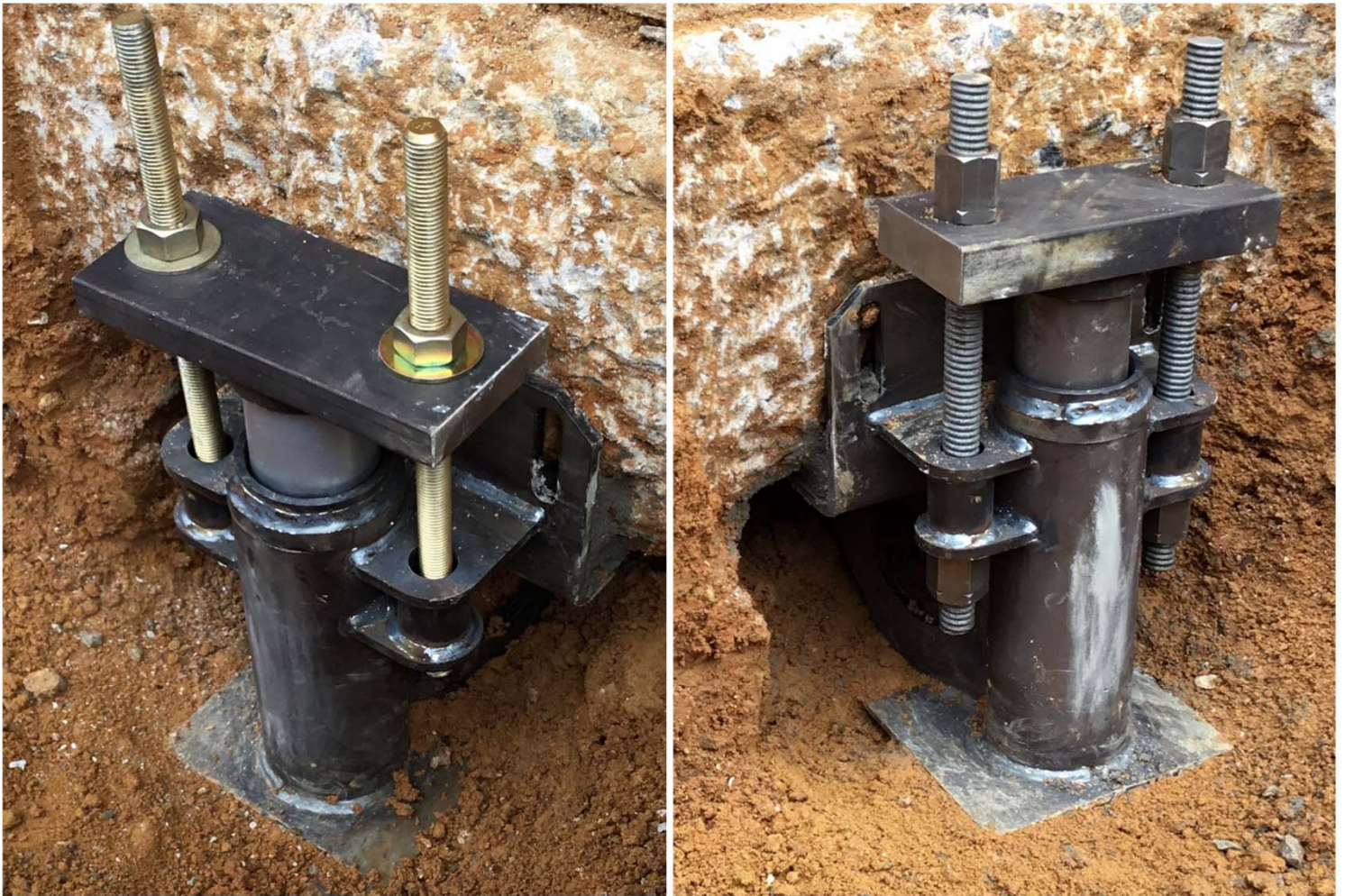


Figure 3 - Push Pin Coupler Details



Standard Rod

WF Rod

Figure 4 - Typical Installation Pictures**Product Labeling**

Each Pier System that is covered by this **PER**, must be marked with the following information:

1. **IMG Push Pier** Product/Model Number
2. This **PER** Number & *Pei* **ES** Name or Logo
3. Bracket Load Rating
4. Manufacturer Address

Acceptable Evaluation Marks**Product Documentation**

A Product Evaluation Service Agreement between *Pei Evaluation Service*® and *Independence Materials Group (IMG)*

A Follow-up Inspection Service Agreement between *Progressive Engineering Inc.* and *Independence Materials Group (IMG)*

Approved Quality Assurance Manual - Dated: 10/2018

IMG Push Pier Installation Instructions

A *Pei* Test Report No. 2017-6030 (A) - Full Scale Axial Compression Tests on **IMG** Push Pier Foundation System, Part No. IMG

PP21617-34 - Dated: 6/29/2017; Revised: 8/16/2017

Engineering Calculations for **IMG** Push Piers - Dated: 8/30/2017

Engineering Calculations for Coil Rod - Dated: 10/29/2018