

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 and this product has a Follow-up Service / Inspection Agreement. This **Product Evaluation Report** in no way implies warranty for this product or relieves **SafeBasements Inc.** 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
December, 2015

Re-Approved
December, 2020

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Report Owner

SafeBasements Inc.
60335 US Hwy 12
Litchfield, MN 55355

Approved Manufacturing Locations

SafeBasements Inc.
28272 Minnie St.
Paynesville, MN 56362

Product

SafeBase™ Push Piers
Light Duty, Standard Duty, Sabertooth LD & SD

Evaluation Report Information

www.safebasementsinc.com

SafeBasements contact: Patrick Nevison - 320-535-0320

General Details

SafeBase™ Push Piers are used as support for structures to recover lost elevations and to provide uniform supplemental support to foundations. The **SafeBase™ Push Pier Systems** provide structural lift and are intended to stop settlement of the structure. These products are used to repair residential, commercial, and industrial foundation settlement problems, and may be installed in either interior or exterior applications.

SafeBase™ Push Pier Systems have been tested and evaluated for Eccentric Compression strength with a maximum unsupported/unreinforced tube length of 6 inches. 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 basis. **SafeBasements Inc.** has an Evaluation and Follow-up Service Agreement with **Pei Evaluation Service (Pei ES)** and an Inspection Agreement with **Progressive Engineering, Inc. (Pei)**. The manufacturing facility has an approved Q.A. Manual to manufacture **SafeBase Light Duty and Standard Duty Push Pier Bracket Systems** and is audited quarterly by **Pei**.

Product Description

SafeBase™ Push Pier Systems use steel tubing as the main Push-Pin and Starter structure. The various system components include the Push-Pin Starter, Push-Pin, Cap (LD or SD), Reinforcing Sleeve, and LD or SD Bracket Assemblies.

The **Light Duty (LD) Bracket Assembly** is manufactured using the following components:

Main Tube (HSS 4"x0.188" ASTM A500 Gr. B/C Tube)	Bottom Plate (1/4" ASTM A36 Plate)
Main Plate (3/4" ASTM A36 Plate)	Back Plate (1/4" ASTM A36 Plate)
Strap (3/8" ASTM A36 Flat Bar)	Threaded Rods (3/4-10 x 12" ASTM A193 B7 YZ)

The **Standard Duty (SD) Bracket Assembly** is manufactured using the following components:

Main Tube (HSS 4"x0.188" ASTM A500 Gr. B/C Tube)	Bottom Plate (1/2" ASTM A36 Plate)
Main Plate (1" ASTM A36 Plate)	Back Plate (3/8" ASTM A36 Plate)
Strap (3/8" ASTM A36 Flat Bar)	Threaded Rods (3/4-10 x 12" ASTM A193 B7 YZ)

The **Sabertooth (SD) Bracket Assembly** is manufactured using the following components:

Main Tube (HSS 4"x0.188" ASTM A500 Gr. B/C Tube)	Low Plate (1/2" ASTM A36 Plate)
Main Plate (1" ASTM A36 Plate)	Ear Plate (3 ga. Grade 50 Plate)
Stiffener (3 ga. Grade 50 Plate)	Angle Plate (3 ga. Grade 50 Plate)
	Threaded Rods (3/4-10 x 12" ASTM A193 B7 YZ)

The **Sabertooth (LD) Bracket Assembly** is manufactured using the following components:

Main Tube (HSS 4"x0.188" ASTM A500 Gr. B/C Tube)	Low Plate (1/2" ASTM A36 Plate)
Main Plate (3/4" ASTM A36 Plate)	Ear Plate (7 ga. Grade 50 Plate)
Stiffener (7 ga. Grade 50 Plate)	Angle Plate (7 ga. Grade 50 Plate)
	Threaded Rods (3/4-10 x 12" ASTM A193 B7 YZ)

The **Push-Pin Starter** is manufactured using the following components:

- Friction Ring (3" S80 ASTM A53 Grade A)
- Standard Duty Push-Pin Tube (HSS 2.875" x .188" ASTM A500 Gr. B/C Tube)
- Light Duty Push-Pin Tube (HSS 2.875" x .165" ASTM A500 Grade 50 Tube, flo-coat galvanized)

The **Push-Pin** is manufactured using the following components:

- Std. Push-Pin Tube (HSS 2.875" x .188" ASTM A500 Gr. B/C Tube)
- Push-Pin coupler (HSS 2.5" x .188" ASTM A500 Gr. B/C Tube)
- Light Duty Push-Pin Tube (HSS 2.875" x .165" ASTM A500 Grade 50 Tube, flo-coat galvanized)

The **Cap** is manufactured using the following components:

- LD Cap (8.5" x 4" x .75"tk. ASTM A36 Flat Bar)
- SD Cap (8.5" x 4" x 1"tk. ASTM A36 Flat Bar)
- Sabertooth SD Cap (8.5" x 4" x 1.25"tk. ASTM A36 Flat Bar)
- Sabertooth LD Cap (8.5" x 4" x 1"tk. ASTM A36 Flat Bar)

The **Reinforcing Sleeve** is manufactured using the following components:

- Support Tube (HSS 3.5" x .220" ASTM A500 Gr. B/C Tube)
- Support Ring (HSS 4" x .188" ASTM A500 Gr. B/C Tube)

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, footers, soil conditions, and overall system integrity.

Building Code Compliance

Table 1 - Applicable Code Sections

2012, 2015 & 2018 International Residential Code		2012, 2015 & 2018 International Building Code	
Section R104.11	Section R104.11.1	Section 104.11	Section 1810.2.1
Section R106.1.2	Section R301.1.3	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. Pier placement should begin no further than 2-feet from any corner with piers typically spaced between 2-feet and 6-feet on center. Spaces between piers greater than 6-feet shall be verified by the Engineer of Record.
3. Presence of footing cracks requires appropriate strength square steel tubing (determined by Engineer of Record) to span the cracks between pier brackets.
4. 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. The footings shall be notched in accordance with the SafeBase™ Push Pier Installation Instructions where required.
5. The utility bracket may be anchored to the foundation utilizing four - 1/2-inch diameter by 5-inch long Titan HD anchors or equivalent. Anchors are meant to hold the bracket tight to the foundation when necessary. SafeBase Push Piers are not rated for uplift loading.
6. The existing structure is used as a reaction force with a hydraulic pump and cylinder combination to drive the pier into the soil.
7. Adjacent piers shall NOT be advanced simultaneously.
8. Each Pier System installed must follow SafeBase™ Push Pier Installation Instructions. In accordance with the 2012, 2015 & 2018 IRC Section R106.1.2, a copy of these installation instructions shall be made available on the job site at the time of
9. When installed under structures meeting the requirements of the 2012, 2015 or 2018 IBC, a continuous special inspection shall be performed during installation when specifically required by the building official and/or registered design professional.
10. The allowable capacities shown in Table 2 reflect installation in soils capable of sufficient lateral support of the push pier in accordance with Section 1810.2.1 of the 2012, 2015 & 2018 IBC. Where fluid soils (as defined by the 2012, 2015 & 2018 IBC) are present or the 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.
11. A registered design professional shall verify the installation meets the minimum stability requirements of Section 1810.2.2 of the 2012, 2015 & 2018 IBC.
12. SafeBase™ Push Piers are rated for compression loading only. Lateral and uplift loading from wind and seismic shall be carried by the existing shallow foundation and verified by a registered design professional.

Product Labeling

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

1. **SafeBase™** Product Number
2. This **PER** Number & **Pei ES** Name or Logo
3. Bracket Load Rating
4. Manufacturer Address

Acceptable Evaluation Marks



Product Documentation

Approved Quality Assurance Manual - Dated: September 14, 2020

SafeBase™ Push Pier Installation Instructions - Dated: December 28, 2020

A *Pei* test report No. 2015-1569 (A) - Eccentric Compression Test on a SafeBase™ Push Pier - LD Bracket - Dated: October 14, 2015

A *Pei* test report No. 2015-1569 (B) - Eccentric Compression Test on a SafeBase™ Push Pier - SD Bracket - Dated: October 15, Engineering Calculations for SafeBase™ Push Pier - SD & LD Bracket - Dated: November 9, 2015

A *Pei* test report No. 2020-6241 - Bracket Capacity Test on a SafeBase™ Push Pier - Sabertooth Standard Duty Bracket - Dated: September 29 2, 2020

A *Pei* test report No. 2021-6061 - Bracket Capacity Test on a SafeBase™ Push Pier - Sabertooth Light Duty Bracket - Dated: March 2, 2021

Table 2 - Push Pier Bracket Compression Load Ratings¹

Model	Product Designation	Average Tested Yield Capacity (lbs)	Average Tested Ultimate Capacity (lbs)	Allowable Bracket Capacity (lbs) ²	Adjusted for Corrosion Loss (lbs) ³
Light Duty (LD)	Push Pier Bracket	36,800	69,700	22,000	19,800
Standard Duty (SD)	Push Pier Bracket	57,300	76,300	34,300	31,600
Sabertooth (SD)	Push Pier Bracket	55,800	91,900	33,400	29,004
Sabertooth (LD)	Push Pier Bracket	48,000	76,000	28,800	24,935

Notes:

1. Table provides tested bracket 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 multiplied by (0.5). Allowable capacities shall be utilized with Allowable Strength Design (ASD) loading.
3. Corrosion adjustment is based upon a 50-year sacrificial thickness of 0.036-in and calculated in accordance with Section 3.9 of ICC-ES AC308. This value is supplied for reference only and the registered design professional shall determine the actual corrosion loss and required longevity on a job specific basis.

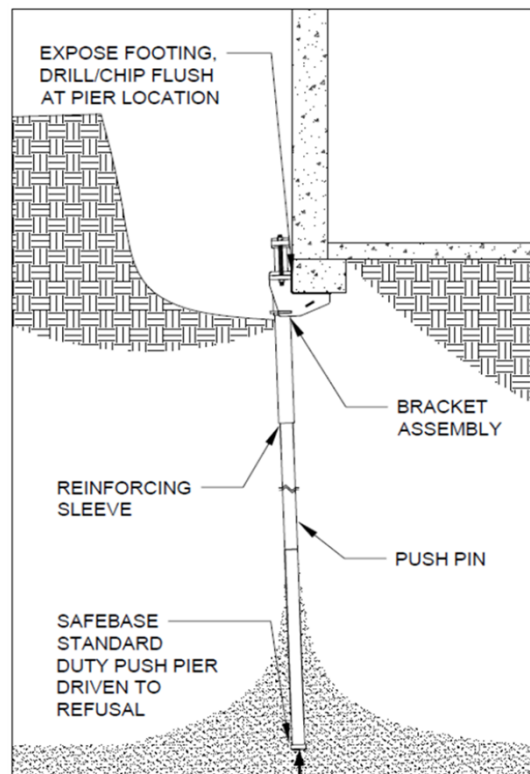


Figure 1 - Typical Installation

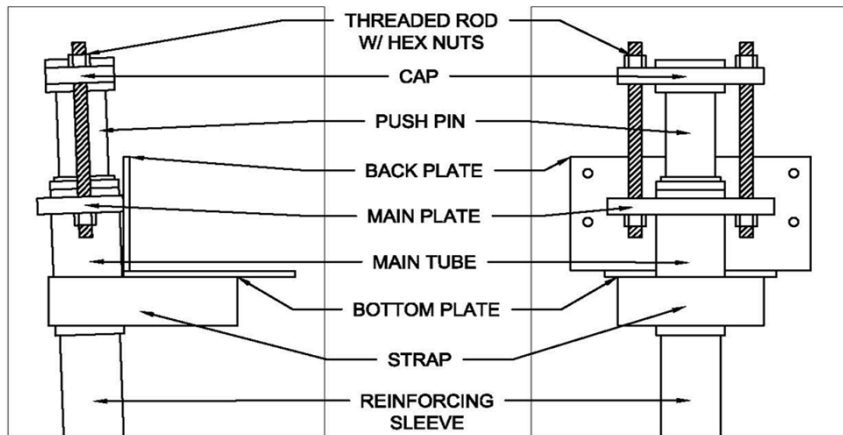


Figure 2 - Light & Standard Duty Bracket Assembly

STANDARD DUTY ASSEMBLY		
COMPONENT	DIMENSION (IN)	MATERIAL
THREADED ROD	3/4-10 x 12	ASTM A193 B7 YZ
HEX NUTS	3/4-10 Hex	ASTM A193 YZ
CAP	8.5 x 4 x 1" tk.	ASTM A36
PUSH PIN	2.875 OD x 0.188" x 36	ASTM A500 Gr B/C
BACK PLATE	7 x 14 x 0.375	ASTM A36
MAIN PLATE	9.75 x 5 x 1	ASTM A36
MAIN TUBE	4 OD x 0.188 t x 9	ASTM A500 Gr B/C
BOTTOM PLATE	10 x 10 x 1/2"	ASTM A36
STRAP	24 x 3 x 0.375	ASTM A36
REINFORCING SLEEVE	3.5 OD x 0.220 t x 36	ASTM A500 Gr B/C

LIGHT DUTY ASSEMBLY		
COMPONENT	DIMENSION (IN)	MATERIAL
THREADED ROD	3/4-10 x 12	ASTM A193 B7 YZ
HEX NUTS	3/4-10 Hex	ASTM A193 YZ
CAP	8.5 x 4 x 3/4" tk.	ASTM A36
PUSH PIN	2.875 OD x 0.165" x 36	ASTM A500 Gr B/C
BACK PLATE	7 x 10 x 0.25	ASTM A36
MAIN PLATE	9.75 x 5 x 0.75	ASTM A36
MAIN TUBE	4 OD x 0.188 t x 9	ASTM A500 Gr B/C
BOTTOM PLATE	10 x 10 x 1/2"	ASTM A36
STRAP	24 x 3 x 3/8"	ASTM A36
REINFORCING SLEEVE	3.5 OD x 0.220 t x 36	ASTM A500 Gr B/C

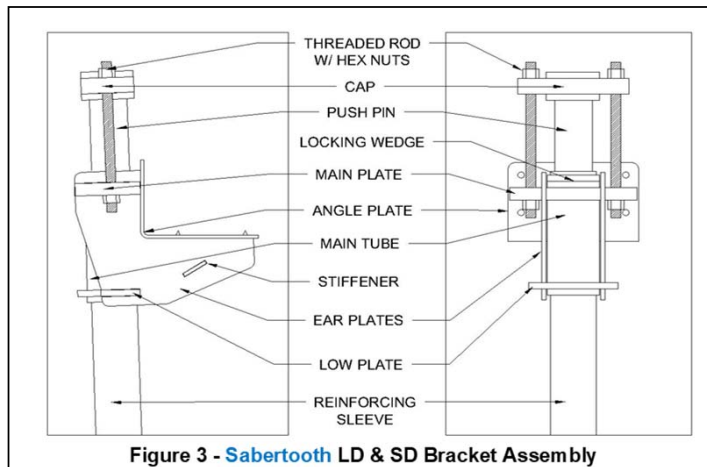


Figure 3 - Sabertooth LD & SD Bracket Assembly

Sabertooth Light Duty Assembly		
COMPONENT	DIMENSION (IN)	MATERIAL
Threaded Rod	3/4-10 x 12	ASTM A193 B7 YZ
Hex Nuts	3/4-10 Hex	ASTM A193 YZ
Cap	8.5 x 4 x 1" tk.	ASTM A36
Push Pin	2.875 OD x .165" x 36	ASTM A500 Gr B/C
Locking Wedge	2-1/4" x .219" x .120"	Hardened Steel
Main Plate	9.75 x 5 x 3/4"	ASTM A36
Angle Plate	10" wide x .171" tk.	Grade 50
Main Tube	4" OD x .188 t x 10"	ASTM A500 Gr B/C
Stiffener	8-1/2" x 4-1/4" x .171" tk.	Grade 50
Ear Plates	10.8" x 13.7" x .171" tk.	Grade 50
Low Plate	7.2" x 5.3" x 1/2" tk.	ASTM A36
Reinforcing Sleeve	3.5" OD x .220" x 36"	ASTM A500 Gr B/C
Coupler	2.5 OD x .188" x 6"	ASTM A500 Gr B/C

Sabertooth Standard Duty Assembly		
COMPONENT	DIMENSION (IN)	MATERIAL
Threaded Rod	3/4 -10 x 12	ASTM A193 B7 YZ
Hex Nuts	3/4-10 Hex	ASTM A193 YZ
Cap	8.5" x 4" x 1.25" tk.	ASTM A36
Push Pin	2.875 OD x 0.188" x 36	ASTM A500 Gr B/C
Locking Wedge	2-1/4" x .219" x .120"	Hardened Steel
Main Plate	9.75 x 5 x 1"	ASTM A36
Angle Plate	10" wide x 1/4" tk.	Grade 50
Main Tube	4" OD x .188 t x 10"	ASTM A500 Gr B/C
Stiffener	8-1/2" x 4-1/4" x 1/4" tk.	Grade 50
Ear Plates	10.8" x 13.9" x 1/4" tk.	Grade 50
Low Plate	7.2" x 5.3" x 1/2" tk.	ASTM A36
Reinforcing Sleeve	3.5" OD x .220" x 36"	ASTM A500 Gr B/C
Coupler	2.5" OD x .188" x 6"	ASTM A500 Gr B/C

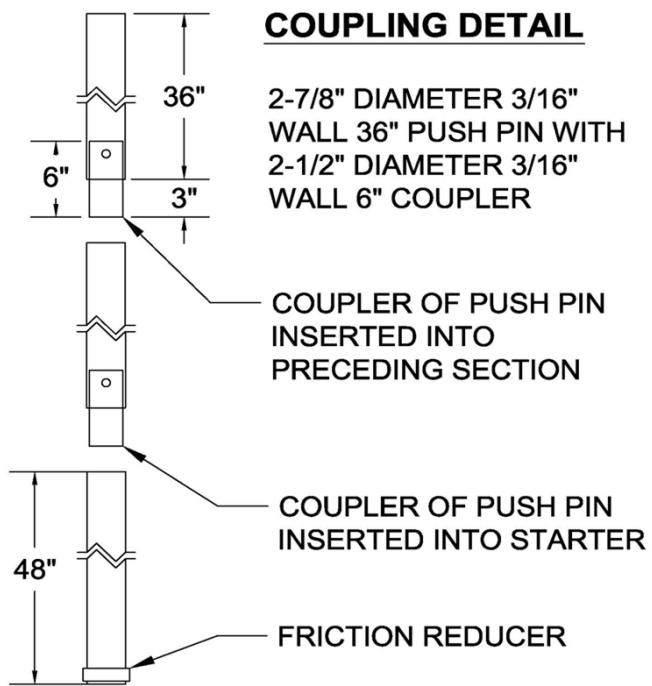


Figure 4 - Push Pin Coupler Detail



Figure 5 - Installation Pictures