ARIZONA HELICAL-PIERS

Dealer / Contractor

ICC ESR-2794, SPEC-DATA, ISO-9001 Certified

ROC #228001 K-05 Dual

Chance Company

a Division of Hubbell Power Systems, Inc.

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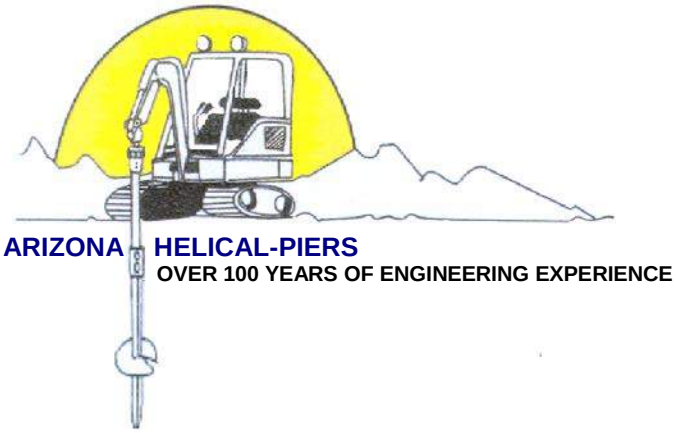
We accept: Visa - American Express - MasterCard - Discover



LETTER OF INTRODUCTION

To Whom It May Concern:

Arizona Helical-Piers, L.L.C. (AHPC) is a **certified installation company** specializing in the Chance Helical-Pier Foundation Systems for **commercial and residential**, i.e., foundations, tiebacks, remedial, new construction and other numerous applications.

This **fully engineered system** has been in production and proven for over 100 years through the Chance Company. In addition, these systems are the **only foundation systems** in the world that have **gained acceptance** from **ICC ESR-2794**. **It is important to note that these approvals are unique to only the Chance Helical-Pier Foundation Systems.**

After reviewing this information, we are confident you will find **Arizona Helical-Piers, L.L.C.** will provide the **world's best and most cost effective** solutions for your problems.

Please feel free to contact **Arizona Helical-Piers, L.L.C.** at **480-854-7661** with any questions.

Thank you for your consideration.

Sincerely,

Ivory A. Bates

Keven Kullberg

Arizona Helical-Piers L.L.C.

More than 100 years ago, A. Bishop Chance developed his first patented earth anchor. Since then, the Chance Company has continued to introduce new anchoring products for tension and compression. Among the most significant milestone in anchoring history are the systems of power-installed screw anchors for electric-power, telephone utilities, pipelines and the construction industry.

These power-installed helical pier systems have proven to be extremely reliable while offering predictable holding capacities at economical installation cost. Moreover, their unique advantages have led to a growing range of compression and tension anchoring applications. Loads as high as 200,000 lbs. per pier are achievable in certain soils. Special termination i.e., new construction, underpinning, tieback and anchoring allow simplified load transfer from the structure to the piers.

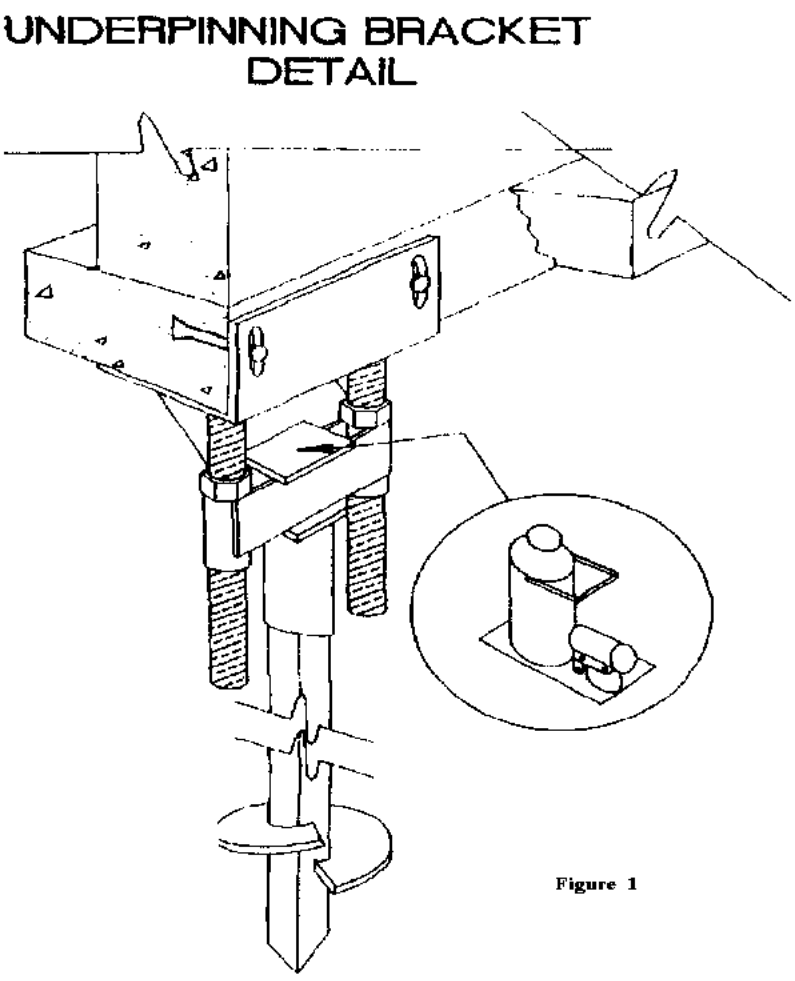
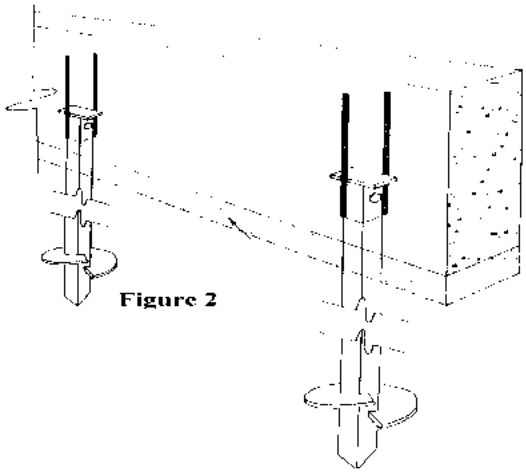


Figure 1

As an engineered solution to foundation settlement, the patented Chance helical anchoring systems have been proven over and over again as a reliable and economical method of foundation stabilization. This process **(figure 1)** is not only cost effective; it is controlled in all aspects, predictable in results and when properly installed, guaranteed against failure.

Over and over again, as foundations are repaired in Arizona, as well as other parts of the southwest, the satisfied customers of **Arizona Helical-Piers, L.L.C.** have commented how they wished the piers would have been required during the initial construction of their home building process. Helical anchors in new construction are being specified more and more by architects and engineers alike throughout the world. California and others are beginning to realize the merits of the helical piers installed during new construction in areas prone to earthquakes. In Arizona alone, there are many cases of newly constructed homes and buildings in litigation over settlement problems due to improper soil compaction, expansive soils, improper drainage design, bad landscape designs, etc. Millions of dollars in legal fees alone are being spent just to defend such cases. Installation of helical piers during new construction is a fraction of the cost as compared to repairs and/or settlements made after occupancy. Below **(figure 2)** is a simple drawing of a helical pier in a new construction design. Engineering test reports, which reflect compression load tests performed on this helical pier and load cap design are available upon, request. Other **(figure 2a)** products for structural slabs and equipment pads are available.



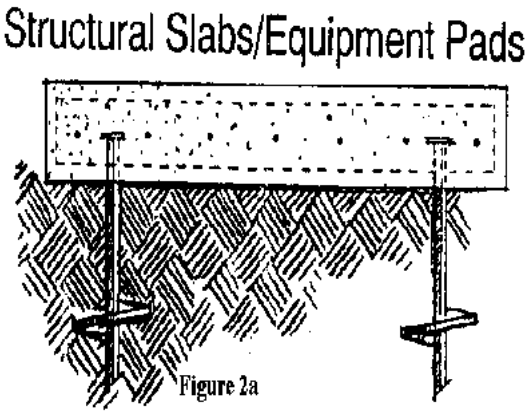


Figure 3 reflects a helical anchor in tension. Helical piers are well known for their tension capacities. Chance Helical-Piers, in tension, has a 70-year success history. These piers are perfect for new, temporary or remedial use on existing retaining walls. This system allows you to immediately load your tieback after installation. No waiting time is necessary for grout or concrete to cure. As with all helical piers, predictable holding capacities are insured once installation torque is achieved.

New construction installation.

Chance Soil Screw; same installation method as the helical pier.

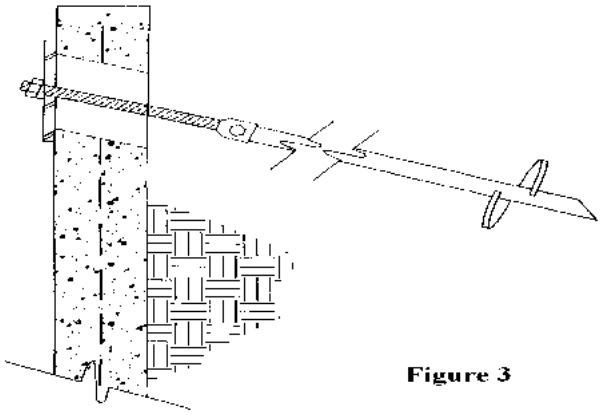


Figure 3

In dealing with steel components, corrosion is always questioned. Chance has over a period of many years studied the affects of corrosion on installed piers. Their experience has shown that for soils having pH's greater than 6 and soil resistively above 500 ohm-cm, or for pH's greater than 5 and resistively greater than 600 ohm-cm, one can expect a useful life in excess of 75 years without galvanization. For soils with very high corrosion potential, additional corrosion protection is available.

The actual pier capacity is determined by measured installation torque. The installation torque method of determining ultimate capacity is analogous to "blows per foot of set" in the pile driving industry. The torque required to install a helical plate into the bearing strata is an accepted method of determining soil-bearing capacity.

A conservative ratio of 10:1 capacity versus torque is recommended for the square shaft series of piers. An example would be if a pier or tieback has a specified ultimate load of 50,000 lbs using the square shaft series, an installation torque of 5,000-ft. lbs would be specified.

With the slender design, buckling has always caused concern among engineers with little history in helical piers. Full-scale load testing and experience has shown buckling of the Chance Helical steel piers is not a concern at the rated capacity when the pier is installed in a soil of 5 blow counts or more. **The soil has been proven sufficient for support against lateral movement.**

The design engineer can utilize the same design approach in designing the helical steel pier as with any other end bearing pile. The helix size(s) is determined by using basic soil mechanics for end bearing piles. The shaft size specified is based upon the rated load carrying capacities for the shaft size and installation torque required installing the pier. The shaft sizes range from 1-1/2 x 1-1/2 to 2x2 inch, 80 ksi solid steel. **Arizona Helical-Piers, L.L.C.** and our engineering support are available to aid the engineer in determining the most appropriate shaft size for the application. Additional design considerations are as follows:

> An existing retail building has exhibited settlement. The design engineer has determined best pier spacing would result in a design load of 32 kips per pier. Soil conditions consist of 10' of uncontrollable fill overlying sandy clay with an average cohesion value of 5,000 psf. Determined helix size(s) and shaft size to carry the design load of 32 kips.

Pier Specification Table for Chance Helical Piers® and Tiebacks

Shaft Size	SS5—1.5 in. (38.1 mm)	SS150—1.5 in. (38.1 mm)	SS175—1.75 in. (44.5 mm)	SS200—2.0 in. (50.8 mm)	SS225—2.25 in. (57.2 mm)
Rated DESIGN† Pier or Tieback Capacity, Compression or Tension	27,500 Lbs. (122 kN) (12,500 kg_f)	35,000 Lbs. (156 kN) (15,900 kg_f)	50,000 Lbs. (222 kN) (22,700 kg_f)	75,000 Lbs. (334 kN) (34,000 kg_f)	100,000 Lbs. (445 kN) (45,400 kg_f)
Rated ULTIMATE Pier or Tieback Capacity, Compression or Tension	55,000 Lbs. (245 kN) (24,900 kg_f)	70,000 Lbs. (311 kN) (31,800 kg_f)	100,000 Lbs. (445 kN) (45,400 kg_f)	150,000 Lbs. (667 kN) (68,000 kg_f)	200,000 Lbs. (890 kN) (90,700 kg_f)
Rated DESIGN† Capacity per Helix	20,000 Lbs. (89.0 kN) (9,070 kg_f)	25,000 Lbs. (111 kN) (11,300 kg_f)	25,000 Lbs. (111 kN) (11,300 kg_f)	30,000 Lbs. (133 kN) (13,600 kg_f)	40,000 Lbs. (178 kN) (18,100 kg_f)

†Design capacity based on Ultimate capacity with a Factor of Safety of 2.

(THEORY)

Using standard bearing equation of:

$Q = A(cNc+\bar{q}Nq)$, drop $\bar{q}$ and Nq for simplification and Nc=9 for deep plates.

Where:
Q = Capacity of the pile
A = Area of the plate(s)
c = Cohesion
$\bar{q}$ = Effective overburden pressure
Nc and Nq = Bearing Capacity Factors

Therefore:
Q =A (9c), with Q = 64 kips using SF of 2, and C=5 ksf from above

Area of bearing plates required would be $A = \frac{Q}{9c} = \frac{64}{45} = 1.42\ ft^2$

surface area of 8″ helix = .34 ft^2
surface area of 10″ helix = .53 ft^2
surface area of 12″ helix = .77 ft^2
TOTAL SURFACE AREA = 1.64 ft^2 O.K.

- Select shaft series: Based upon specification table, 1¾-inch series rated at 40 kips with underpinning bracket O.K.
- Helix rating based upon specification table = 30 kips, two helix pile required, three helix pile specified: O.K.
- Installation torque required = $\frac{64{,}000\ lbs}{10}$ = 6,400 ft. lbs of torque.

Over a century of research, development, and testing have advanced our power-installed foundation system to its present mature stage. Compared to traditional foundation methods, the Chance foundation system offers attractive benefits in the conservation of labor, materials, equipment, and especially time.

Power-installed foundations have been proven in thousands of installations throughout the world. These instant foundations come in two forms; non-extendible foundations, for site lighting or any pole support **(Figure 4a)**, and extendible foundations for deeper bearing soils.

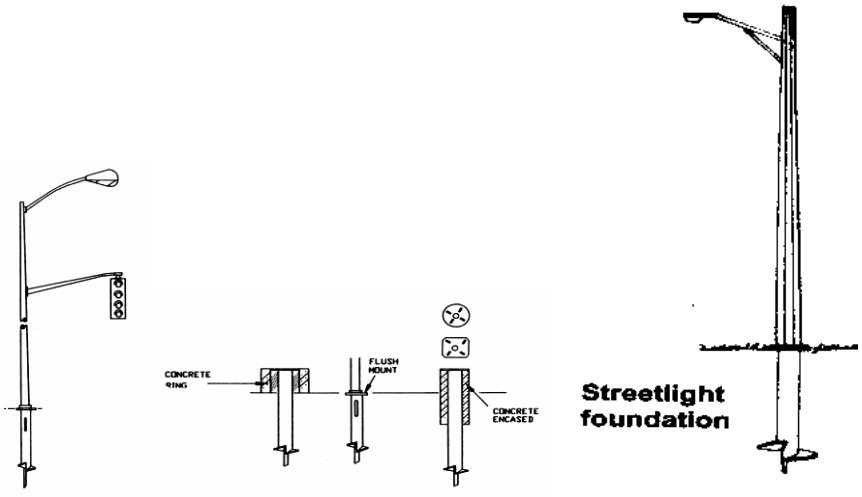


Figure 4a

Chance engineers have installed, tested, and retrieved countless foundations to confirm performance and durability. The predictable holding strength of Chance foundations is achieved by matching the installed torque of the foundation to the retention capacity of the soil. Predictable holding strengths for almost any load are obtainable in most soils from loose **sand** and **clay** to **caliche** and **weathered sandstone**.

A typical foundation can be installed by **Arizona Helical-Piers, L.L.C.** in very little time using standard equipment. The superstructure can be mounted immediately with no waiting for concrete to cure. Chance foundations can be installed in all weather conditions; thus eliminating weather related construction delays. They can function as permanent installations or serve as temporary foundations, which can be easily retrieved and reused.

AHPC on location in Scottsdale, Arizona

The Chance system includes a broad range of foundations with various attachments for field adjustments. The **Arizona Helical-Piers, L.L.C.** support services include analysis of soil test probes and job rated foundation recommendations.

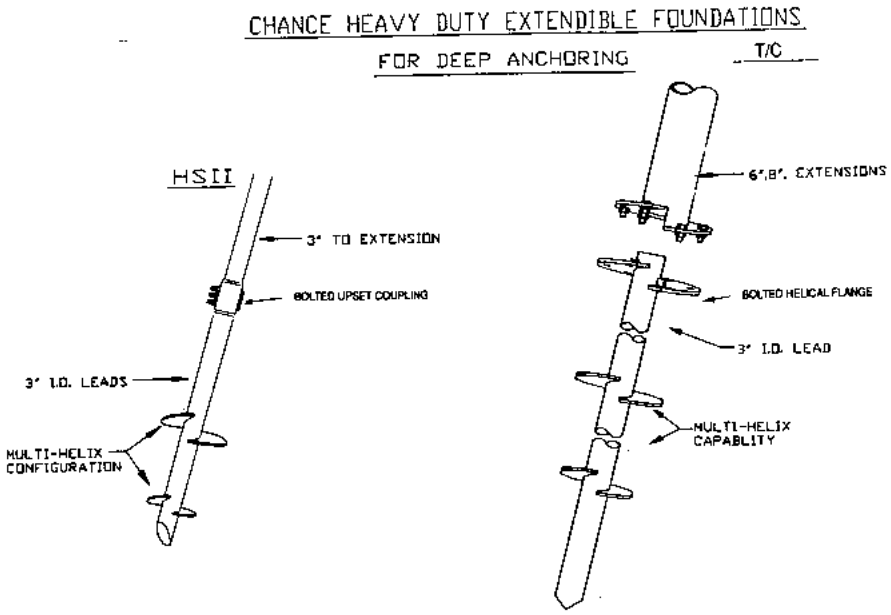


Figure 4b

A typical non-extendible foundation installation can be made in about 30 minutes using conventional rotary equipment. Torque capacities vary from 10,000 to 25,000 foot-pounds depending on diameter of foundations. Once the foundation is installed, load can be applied immediately. Soil parameters usually dictate the number of foundation anchors to support a given load. The lateral-load capacity of an individual element is a function of the pier length, diameter and soil strength properties. The large diameter helix on the foundation usually provides sufficient compression-load capacity and standard base-plate bolt patterns accommodate most attachments. Custom made patterns can be made to meet specific needs.

Each year, hundreds and thousands of helical pier foundation anchors are produced and installed, solving many challenges unattainable by conventional methods. The **"Chance Helical-Pier System"** offers a technically superior and cost-effective approach.

The galvanized steel helical pier units are pre-engineered to transfer projected loads to bearing-capable strata below weak soils. This isolates the structure's integrity from seasonal changes in the surface-layer conditions. To reach a sound geological footing, shaft extensions may be added during installation**. Loads of up to 200 kps can be attained on a single pier**.

From light commercial/industrial, to single and multiple family developments, beginning with on-site development through projects that have been completed and occupied for many years, this helical pier and anchoring system can save time and money while providing you with a guaranteed, proven and fully engineered solution for engineering nightmares.

At the conclusion of an eight year process, the Chance Company with their helical pier installation systems have finally received acceptance through ICC ESR-2794. This approval is unique to our helical piers systems only, mainly due to the many checks and balances the dealers, contractors and distributors have with Chance Company to insure compliance with a higher standard of construction quality.

Arizona Helical-Piers, L.L.C. wants to act with you in solving problems. In doing this, the Chance Helical-Pier can only improve local construction standards and revolutionize the construction industry, as many other markets have done throughout the world. Once instituted, the market can share in the notoriety and satisfaction of knowing that our structures have been engineered with the best foundation and anchoring systems available.

The helical pier has many diverse uses with no problem too tough for AHPC!

BOCA ES Report No. 94-27

SPEC DATA PROGRAM PARTICIPANT

RADCO CERTIFICATION • LISTING • TESTING • INSPECTION I.C.B.O. Listed Report No. ER5110

LISTED SBCCI PST&ESI Report No. 9504

A Sample of
AHPC Case Histories

Other case histories available upon request.

AHPC operations yard located in Gilbert, AZ.

"A home is only as good as the foundation it sits on."

AHPC ANCHORING REPORT

CASE HISTORY #0100296-A		May 5, 1996
Project	**Engineer/Architect**	**Underpinning Contractor**
Ski Lake Dock Piers	**John McAfee P.E.**	**Arizona Helical-Piers Co.**
Buckeye, AZ	New Jersey	Phoenix, AZ

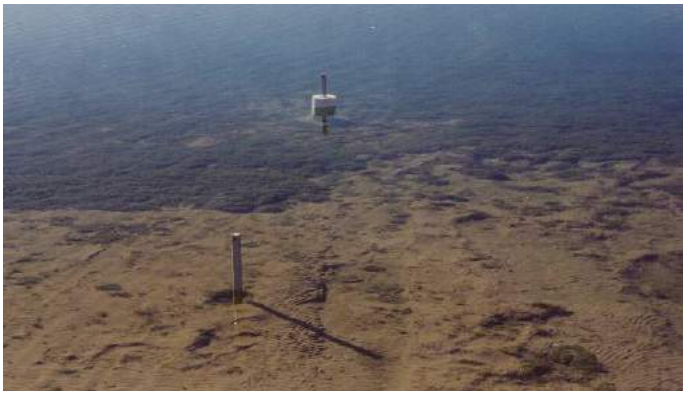
Job Description:

The problem: not installing dock piers prior to the lake being filled with water. **AHPC** was approached by a gentleman who after having purchased a waterfront lot was in need of finding a cost effective solution to the above problem. Upon solving his dilemma, **AHPC** was asked by other property owners if **AHPC** would do the same for them.

Repair:

AHPC solved their problem by installing to an underwater bottom soil depth of **15ft**, **Chance 1½" solid, hot dipped galvanized, multi-helix lead** sections. To improve aesthetics and to satisfy any concerns of future lateral movement, **AHPC** pre-designed and cast (*reinforced with rebar*) concrete sleeves to slide over the installed helical piers.

Piers were installed with a backhoe.



2 piers: one with concrete sleeve and one without.

Piers shown with joist brackets installed.

With **imagination, AHPC** came up with a **new** way to use helical piers**!**

Steel beams welded to pier tops.

Framing completed on neighboring dock.

Finished double-deck dock.

Neighboring finished dock.

AHPC designed/constructed cement sleeves to fit over piers.

AHPC PROJECT REPORT

CASE HISTORY I-2691- AP — September 25, 2013

Project: hardison/downey Constr., inc.	Engineer	Underpinning Contractor NAU
Student Housing – The Suites	Jeff Martin **P.E.,M.S.C.E**	**Arizona Helical-Piers Co.**
Flagstaff, AZ	Steelhead Engineering	Phoenix, AZ

Job Description:

New deep foundations for a pair of four story student dormitories on the campus of Arizona Northern Arizona University in Flagstaff, Arizona. General contractor hardison/downey construction, inc. was advised that the large settlement concerns indicated a deep foundation system. Highly variable site conditions would make foundation construction unpredictable and time consuming. hardison/downey construction, inc. approached **AHPC** to value engineer the pile construction prioritizing construction duration.

The Challenge & Solution:

The site is an old drainage course with weathered rock bearing strata overlain by an undocumented fill of sands and boulders varying in thickness from 0 to 40 feet. Excavation and re-compaction, drilled cast in place piers, driven piles and floating mat foundations were all rejected for performance, price or constructability reasons. Time being critical, the helical pier solution minimized required pier by pier design revisions that had to be approved by the engineering, contracting and regulatory stakeholders. Representative full-scale compression testing verified the capacity and stiffness of per plan installations and up to 70 piers requiring shallow pre-drilling and post grouting.

Install:

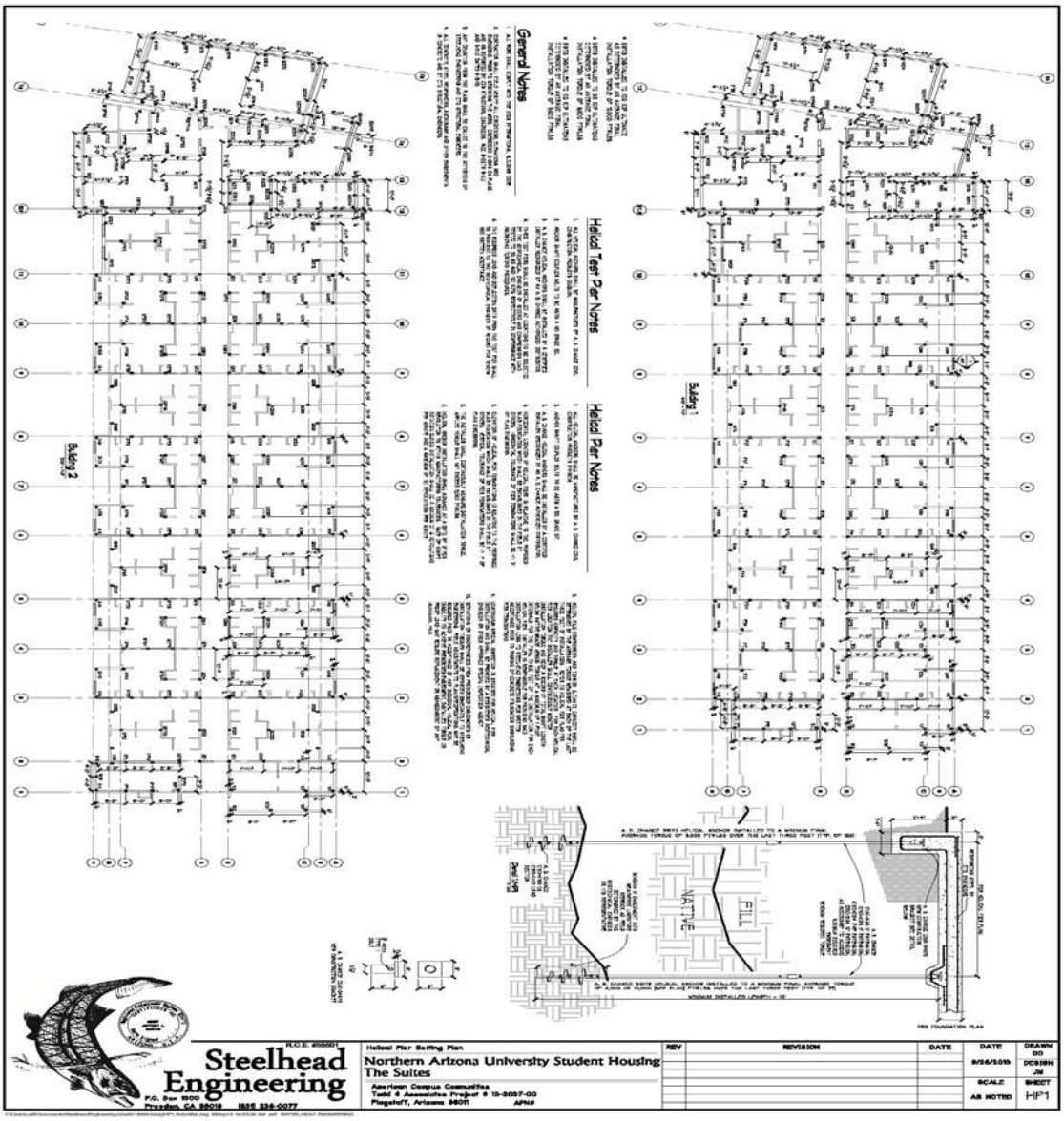
Material distribution of 500 Chance SS175 Helical Piers. Pile engineering was completed by SteelHead Engineering of Freedom, California. Geotechnical engineering was by Speedie & Associates, Inc. of Phoenix, Arizona. Special inspection services were provided by Bingham Engineering Consultants, LLC.

500 Piers installed with 2 excavators. Due to soil conditions some rock drilling was needed

Two four story structures…… construction starts

Crew setting up for required load testing of piers

The plan below indicates final pier Layout for 2 four story dormitories, utilizing 500 Chance Helical Piers in lieu of caissons.



AHPC
HELICAL REPORT

CASE HISTORY #19980520-A **June 19, 1996**

Project	Engineer/Architect	Underpinning Contractor
Edmund Toll, Inc.	**Bingham Engineering**	**Arizona Helical-Piers Co.**
Scottsdale, AZ	Phoenix, AZ	Phoenix, AZ

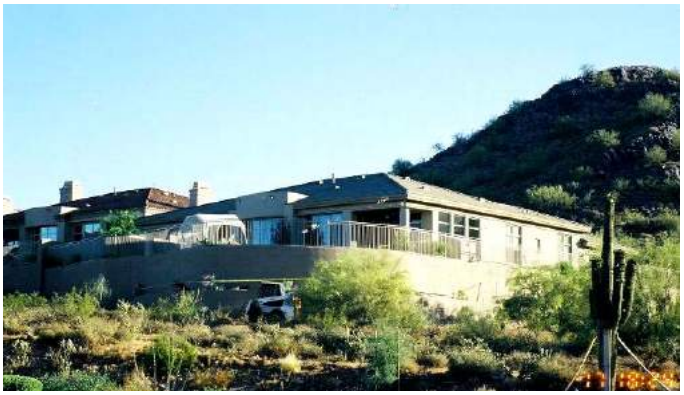
Job Description:

This custom built north Scottsdale home had a problem with sinking of the retaining walls as well as settlement of the south side of the main structure itself. It was unusual for a retaining wall to settle without much rotation involved, therefore underpinning was used instead of the normal tieback.

AHPC crews arrive to set up at the Chapman residence.

Repair:

AHPC contracted to stabilize the south side of this residence and retaining wall. **38 Chance Helical piers**, with **8”** helices were installed. Some of the helices were shaved to a rock cut configuration to achieve penetration through the exceptionally rocky fill. Piers were installed to an average depth of **10ft**.



Each pier was done using a remote hydraulic system.

AHPC staff checking portable guided mast.

AHPC
HELICAL REPORT

CASE HISTORY#I-1296 **June 22, 2004**

Project	Engineering Contractor	Chance certified installer
AZ Cardinal's Stadium	**Schuff Steel Co.**	**Arizona Helical-Piers Co.**
Hunt Construction Group	Ed Carroll/Ron Offenburger	Phoenix, AZ

Job Description:

Anchor cables in retention: Installation of **132 Chance** SS-175, with double heliced leads to be used as roof support guy-wire tension anchors. This was to be done in two phases. The first phase was installation and the second phase was to uninstall the anchors.

Construction of Cardinal Stadium almost completed.

In Tension:

All piers had to be pull tested at a 38 to 45-degree angle, to a minimum of 50-kips and to be held there for one minute with no shaft movement. This using two 3-ft. high I-beams, 40-ft. long and sitting on cribs.

AHPC crew inside stadium drilling holes in cut piers to receive 25-ton shackles

Pier depths:

The minimum installed depth from the upper helix was 42-inches with a maximum of 77-inches. The area at one time was an ancient river bed. **The soils were so bad that AHPC had to rock cut the leads to even get these depths. Even at these shallow depths all the piers held well.**

Helical piers and cables used for support the roof is hydraulically raised without a glitch….

In difficult circumstances, the helical pier is used successfully at the new Arizona Cardinal's Stadium.

End result of a lot of problem solving work and concerned concentration.

After a good rain, working conditions in a state where it rarely rains!

Located in front of the lead truck cables are attached to Chance helical piers. It is two piers per cable in which the cable runs up to the pulley at the top of the trusses.

AHPC
HELICAL REPORT

CASE HISTORY#2000317-A14P		March 23, 2000
Project	**Engineer**	**Underpinning Contractor**
Monti's Restaurant, Mesa		**Arizona Helical-Piers Co.**
Patrick Foley Constr. & Dev., Corp.		Phoenix, AZ

Job Description:

This is an addition to an existing restaurant. Due to past settlement problems, it was decided to use the helical pier in new construction before the footings are poured.

Installing rebar end caps to the helical piers before tying in to cage-work and footing/stem pour. Weight load set at 20,000 (20 kips) with **1½"** pier shafts. Much higher loads can be reached by using larger shafts.

Foundation trench for two story addition at south west corner

Full view of Monti's Restaurant

AHPC

NEW CONSTRUCTION REPORT

CASE HISTORY #19960524-A		May 5, 1996
Project	**Engineer/Architect**	**Underpinning Contractor**
ASU Aquatic Ctr.	**Gabor Lorant Architect**	**Arizona Helical-Piers Co.**
Commercial NC	Cary Stoneman	Phoenix, AZ

Job Description:

The location is the **Mona Plummer Aquatic Center** at **Arizona State University**. The project: To secure the diving platforms. The **helical pier** was found to be the best method in obtaining a deep foundation.

Arizona State University

Dive platforms, Mona Plummer Aquatic Center

New Construction:

Helical anchors in new construction are being specified more and more by architects and engineers alike throughout the world.

Note:

It's a surefire method for avoiding litigation over settlement problems due to improper soil compaction, expansive soils, poor drainage and/or landscape designs, etc.

After the piers are installed to specific pre-engineered capacities, load caps are attached to the top of the shafts. This is for the purpose of tying-in the pier to the rebar before the footing is poured.

AHPC
HELICAL TIEBACK REPORT

CASE HISTORY #19981001-A		October 1, 1998
Project	**Engineer**	**Underpinning Contractor**
Del Webb Sun City	**Bingham Engineering, Inc.**	**Arizona Helical-Piers Co.**
Sun City West, AZ	Daniel Bingham, P.E.	Phoenix, AZ

Job Description:

The **Del Webb Corporation** called on **AHPC** to **tieback** (*using the Chance Helical-Pier*) **333ft** of reinforced block retaining wall.

Repair:

A total of **36 helical piers** were installed to stabilize and stop further movement. The heel side of the wall had to be hand dug, drain holes drilled and then backfilled with gravel for drainage.

8in. X 8in. 3/8 steel plate used in this case as a retaining washer.

Lot #50 completed project

Heel side of previously trenched (330ft. X 4ft. deep) wall

AHPC

answers an emergency, i.e. retaining wall tieback for the **Del Webb Corporation.**

Look closely, see numerous helical piers **(used in the tieback configuration)** can be seen coming through the retaining wall into the heel side trench and then into the soil. Here, capacities are reached through torque; retention capacities were **25 kips working load per pier with an ultimate of 50 kips.**

AHPC received a letter of recommendation from the Del Webb Corp. for the courteous attention and respect shown towards the clients' yards we worked.

AHPC
HELICAL TIEBACK REPORT

CASE HISTORY #0500196-A		**June 7, 1996**
Project	**Engineer**	**Underpinning Contractor**
Tieback application	**Glen Copeland, Geotech.**	**Arizona Helical-Piers Co.**
Prescott, AZ	Prescott, AZ	Phoenix, AZ

Job Description:

This two year old custom home was built 1/3rd on a fill wedge using a solid grouted concrete wall as a retention structure. 2/3rds of the home **cantilevered out over a canyon** supported by beams and posts. With the introduction of water, the retaining wall began to bulge and crack.

Repair:

11 Chance Helical-Piers with **8" helices** were installed by **AHPC** in tension to act as a tieback. Piers were installed to an average depth of **29ft.** The piers were tied together with a whaler made up of two continuous 6in. steel channels. Each pier was set in tension and tested with cracks grouted. The retaining wall was secured and no further movement will occur.

The wall had to be cored with a slight batter at each site.

Each pier was installed using a portable guided mast.

AHPC work crew inspecting installed final whalers.

AHPC FLOATING WALKWAY HELICAL REPORT

CASE HISTORY #19990920-B12P		September 12, 1999
Project	**Engineer**	**Underpinning Contractor**
Riparian Preserve	**Ed Glenn Engineering**	**Arizona Helical-Piers Co.**
City of Gilbert, AZ (SW Regional Library)	Glendale, AZ	Phoenix, AZ

Job Description: AHPC installed **26 Chance Helical-Piers**, to anchor & connect **254** ft. of floating bridge.

City of Gilbert Library & lake floating bridge

Repair: 4 inch T-40 galvanized pipe is used to slip over the piers and **1 7/8** pipe for cross member supports. Piers were installed to depths up to **24**ft.

Scuba diving was necessary to do deep underwater connecting work.

A small excavator was used for installation due to weight concerns on the floating bridge.

The final floating bridge with its many anchored sections

AHPC NEW CONSTRUCTION AND UNDERPINNING REPORT

CASE HISTORY #19980107-B		February 25, 1998
Project	**Engineer**	**Underpinning Contractor**
Washington School District	**Caruso-Turley-Scott**	**Arizona Helical-Piers Co.**
Commercial Underpin & NC.	Target General, Inc.	Phoenix, AZ

Job Description:

This is a **4-building, 64** helical pier **underpin** and **new construction** project, located at the Washington School District; **Cactus Wren Elementary School** in Phoenix, Arizona. All structures exhibited signs of distress with a pronounced settlement causing horizontal cracking on many of the walls. The helical pier was used in new construction to avoid future problems in buildings being constructed.

Front entrance to Cactus Wren Elementary School

Repair:

A total of **64 helical piers** were installed with **40** of these to stabilize existing outside load bearing walls by underpinning. **Twenty-four piers** were **new construction** with rebar load caps before the footings were poured.

South side of Building B as **AHPC** crews readied to start.

AHPC used **underpinning** & **new construction** at Cactus Wren.

Excavator with power head

New pier before footing pour.

Rotating pier into the ground

Building C, underpinning

Building A, new construction

AHPC
HELICAL REPORT

CASE HISTORY #19970910-A		**September 9, 1997**
Project	**Engineer**	**Contractor**
Rio Verde Wastewater Treatment Facility	**Nationwide Construction, Inc.** In house	**Nationwide Constr., Inc.** Paramount, CA

Job Description:

The California based Nationwide Construction Company, Inc. called on **AHPC** to underpin two structures which had sunk 5 inches on one side. Both buildings were less than a year old.

Building A at the Rio Verde Facility

Repair:

A total of **8 helical piers** were installed to stabilize and stop further movement. Due to the loads needing to be carried, we doubled up on the brackets (*all set at 40 kips)*.

Separation of footing from soil; Building B

Side by side brackets; capacities set at 20 tons each (40 kips)

AHPC
HELICAL REPORT

CASE HISTORY #19971110-A		May 11, 1995
Project	**Engineer**	**Underpinning Contractor**
Bank bldg; Flagstaff	**Shephard-Wesnitzer, Inc.**	**Arizona Helical-Piers Co.**
Co. Commercial Underpin	Roger Hocking	Phoenix, AZ

Job Description:

This **3-story building** owned by Dr. Anthony Choi of Flagstaff exhibited signs of distress and settlement.

Front entrance to 3-story office building

Repair:

A total of **6 helical piers** were installed to stabilize and lift the side of structure back to level. **Depths** reached by the piers ranged from **39ft.** to **68ft.** before a proper torque was reached.

Southwest side of building

Note:

AHPC reached depths of over **60ft.** at the first two pier sites. A switch to **multiple helix leads** was done for the purpose of reaching torque faster at shallower pier depths and to save steel cost. This reduced the depths needed to reach the proper torque to **40ft.**

AHPC
HELICAL REPORT

CASE HISTORY #19991208-A13P		December 12, 1999
Project	**Engineer**	**Underpinning Contractor**
Desert Mtn. / Cave Creek	**Bingham Engineering**	**Arizona Helical-Piers Co.**
KNC Construction	Scottsdale	Phoenix, AZ

Description: This custom built multi-million dollar Cave Creek home had a problem with interior and exterior settlement.

Outside triangular rock pillars had to be underpinned and lifted back to level using **8 Chance Helical-Piers** connected by redheads to the squire underground reinforced concrete footings.

All patio rock slabs were removed. Underpinning of an elaborate BBQ area was done to save the structure.

Underpinning brackets mounted and grouted to the outside BBQ footings.

Repair: Two interior fireplaces had to be underpinned and lifted. The kitchen fireplace was leveled but the entry way fireplace needed to be reinforced due to an extremely small and inadequate footing. **AHPC** used two I-beams welded together to reinforce the footing.

Don, **AHPC** fabricator welding I-beams to be placed under the footing.

AHPC used **I-beams** to support a poor & failing footing @ a Desert Mtn. residence.

Twin welded I-beams were placed under the main living room fireplace footings and the I-beams were then welded to the brackets.

The other end of the I-beams came out underneath the master shower room stall.

Two of the piering points at the kitchen fireplace

AHPC GUIDED MAST SYSTEM UNDERPINNING REPORT

CASE HISTORY #19980414-A **April 22, 1998**

Project	Engineer	Underpinning Contractor
Residential Underpin	Declined	**Arizona Helical-Piers Co.**
Gilbert, AZ		Phoenix, AZ

Job Description:

This single story home located in Gilbert, Arizona experienced front and side settlement due to the area's expansive soils. The property owners were concerned with what they believed to be the inevitable destruction of many landscaping plants. We were able to save most of them.

Front entry area to the Halcomb residence

Repair:

AHPC used **8 helical piers** to stabilize outside load bearing walls. Because of front decorative retaining walls and foliage, all access holes to reach footing had to be hand dug and our remote hydraulic powered **Guided Mast System** was employed to do the actual pier installations.

The remote **Guided Mast System** with hydraulic hose lines running to a Bobcat. This is a hand operated system used when tracked equipment can not be applied to the project.

AHPC
UNDERPINNING REPORT

CASE HISTORY #19990917-A11P		September 17, 1999
Project	**Engineer/General**	**Underpinning Contractor**
Flaming Mini Storage, Yuma	**Ron Starling, P.E.**	**Arizona Helical-Piers Co.**
Commercial Underpin	**Robert E. Porter Construction**	Phoenix, AZ

Job Description:

This storage facility surrounded by working farms was built on collapsing fill. Irrigation through capillary action was sucked under the building's footings causing 1 to 3 inches of settlement. Massive internal slab cracking was evident throughout the more than 100 storage units.

Repair:

A total of **131 helical piers** were installed to lift the footings and bring them back to level. **Depths** reached by the piers ranged from **18ft.** to **105ft.** before a proper torque was reached. **30** piers were put in as tiebacks.

Note: Triple helices were used to reach torque faster.

A 121 Kubota excavator was used because of the need for boom length.

AHPC had to have an access road made to reach the north side of the building.

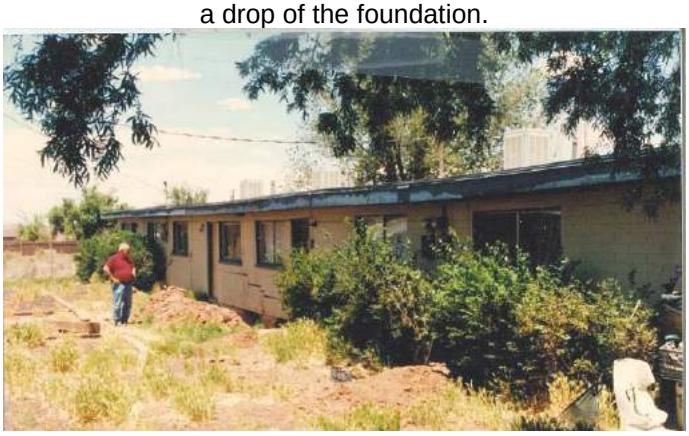
AHPC
UNDERPINNING REPORT

CASE HISTORY #19971009		November 10, 1997
Project	**Engineer**	**Underpinning Contractor**
Commercial Underpin	**Western Technologies, Inc.**	**Arizona Helical-Piers Co.**
Holbrook, AZ	Geotechnical	Phoenix, AZ

Job Description:

This is a single-story, **40 year-old five-plex apartment building** located in Holbrook in North Eastern Arizona. Slab-on-grade structure supported on shallow spread footings. The structure exhibited signs of distress along the west side as with a pronounced horizontal wave to the roof line *(not shown)* all due to settlement, caused by a leaking water line.

Before underpinning, notice cinderblock cracking due to a drop of the foundation.



Before: roof rolling like ocean waves.

Repair:

AHPC installed a total of **19 helical piers** with three of these to underpin inside load bearing walls. Fig. #2 is of structure after it was lifted to level.

Fig. #2 Roof waves gone after underpinning

The helical pier underpinning results at the Holbrook Apts.

Inside before

Inside after

Outside before

Outside after

Before

After

AHPC ADDING CAPACITY HELICAL REPORT

CASE HISTORY #19970501-A		May 5, 1996
Project	**Engineer/Architect**	**Underpinning Contractor**
Lockheed Martin	**Lockheed Martin**	**Arizona Helical-Piers Co.**
Tactical Defense Systems	In-house Engineers	Phoenix, AZ

Job Description:

Lift and stabilize columns in building #16. The columns were massive in design to support the all-steel roof and were set with huge concrete footings. The **helical pier** was found to be the best method for obtaining the needed deep foundation support.

Support columns in Building #16 at Lockheed Martin

Repairs:

The concrete around each column had to be cut and removed with access holes hand dug and the piers put in using remote hydraulics.

Note: All work had to be done after normal daylight working hours.

Bottom of the support column for roof support

AHPC RE-LEVEL COLUMNS HELICAL REPORT

CASE HISTORY #19990311-B9P		March 21, 1999
Project	**Engineer**	**Underpinning Contractor**
SSA/Registrar of Contr. Office	Speedie & Assoc.	**Arizona Helical-Piers Co.**
Show Low, AZ	Phoenix, AZ	Phoenix, AZ

Job Description:

This building is home to the **Social Security Administration** and the **Registrar of Contractors** offices in Show Low, AZ. Four of the support columns were sinking.

AHPC setting torque bar in tight conditions

AHPC remote hydraulic foot control.

Kevin Fox installing connecting extension bolt

Repair:

Four **Chance Helical-Piers** with **8** inch helices were used placing **one at each column site** and installed with a **hand operated**, **2,500ft. lbs. power head**. The pier depths were approximately **8** to **10ft. at 25 kips.**

Tieback Plate Examples

Wall with diamond plates

Diamond plate showing drilled drain hole below

Both capped and uncapped plates (washers)

A capped round plate

Wall of capped plates

New Construction

Helical piers installed at load capacities up to 100 kips each with end caps ready for footing pour.

Aquatic applications in new construction

Used to combat the overturn factor (wind-shear)

New construction installation

Used in deep foundations

The stem & footing crack below the surface, (not visible prior to excavation), turns a single foundation into two separate foundations.

Using angle-iron and super strong grout to re-enforce an area where there are no footings or stem to speak of.

"THE HOMEOWNER'S MANUAL"
UNBIASED ARTICLE ON FOUNDATION 'FIXES'
DIFFERENT METHOD COMPARISONS

PUBLISHER: National Reality Marketing: Feb. 2000
Section: Structural Soundness Issue: AZ, Page 22

The possibility of foundation failure in Arizona is something that everyone buying, selling, or occupying a home should consider. Foundation problems are commonplace, largely because soil conditions upon which residential and commercial buildings are constructed tend to be very unstable. Foundations are only as strong as the soil properties they are placed on. These soils are made up of thousands of years of sediments consist mainly of silts, clays and some granular soils. Also, Arizona has several large irrigated agricultural areas that have been turned into beautiful neighborhoods, most of which display evidence of foundation movement.

DO I HAVE A FOUNDATION PROBLEM?

The following check list of symptoms should help you identify serious foundation movement: (1) Inspect for cracks in brickwork/stem walls/footings. Look for previous patching. Look for separation between door, windows and brickwork. Also, check to see if chimneys or porches are moving away from the house or structure. (2)Look for cracks in interior wall of ceiling finishes and/or tearing of wallpaper, floor coverings, etc. (3)Check to see if windows or doors bind or stick or appear to be out of square. (4)Re-occurring leaks in ceilings, around chimneys, or increases in water bills.

If it is apparent that foundation failure has occurred, you should be aware that there are many different methods of repair available. They range greatly in cost, longevity, predictability and warranty.
These methods are:

(a)Concrete Underpinning: Shallow concrete pads placed less than 3 feet under existing foundation are used for additional support when settlement occurs. This method is costly, time consuming and offer only short lived stability as concrete pads are still bearing on unstable soils.

(b)Mud Jacking: The injection of grout under higher pressure to raise slabs or foundations. Most commonly used to fill voids beneath slabs or leveling driveways, etc. Mud Jacking is moderately priced, however, it offers no stabilization value. The grout is bearing on top of the failed soils. It has no longevity. Also, it is crucial to understand that you are adding moisture to unstable soil in addition to a considerable amount of weight. In addition, in porous soils, the grouter can not control the flow of grout sometimes resulting in grout filled sewer systems, etc.

(c)Drilled Concrete Piers: The boring of shafts to a depth of 9 to 12 feet, then filling them with concrete, used to offer additional support when settlement occurs, or to raise and level structures. Generally heavy external site disturbance with equipment and excavation and spoils removal. It is time consuming and unpredictable. Failure is possible if bearing on clays. It can actually be pushed up if placed in expansive soils. There are no guarantees and it is expensive.

(d)Driven Steel Piers, Ram jacking: The hydraulic advancement of steel sections of low-grade tubing, to rock or permanent bearing strata, used primarily to offer additional support when settlement occurs as well as to raise and level structures. Minimal site disturbance. This product is sold as inexpensive however; it is usually billed by the foot, which runs the cost up. With this hydraulic advancement system, no controls are given for tubing deflection, buckling or carry. It is leveraged by the building it is lifting *(uses the buildings weight to push down pipes*) and offers no safety factors for lifting and maintaining compressive loads. It relies mainly on skin fraction to support the structure. It offers longevity with no warranty to performance

(e)A.B. Chance Helical-Piers: Helical piers are a slow-rotated, steel pier with various sized pitched plates that are installed below the existing foundation with minimal excavation, no spoils removal. Piers are constructed of high-strength 80ksi steel, connected with forged couplers as piers are advanced into a solid-bearing strata several feet below the active soil zones. Piers are installed using a pre-engineered, torque vs. capacity process that insures solid bearing for the compressive load demands of structure before structure weight is transferred to the installed piers. Special haunch brackets are attached to the existing foundation.

These piers are end bearing piers, meaning that all weight is transferred to the end of the pier, deep in stable bearing strata, and is not reliant on skin friction of the pier for support. This process is quick, cost effective, has minimal site disturbance and is a permanently guaranteed method for foundation repair. This system is the only system with ICBO (UBC) acceptance (ER-5110).

These piers can also secure retaining walls, basement walls or other earth retention issues. They can be used in new construction as well as for remedial repairs. *

If you feel you may have a foundation problem or know someone who does, or if you are planning to build a home and would like to secure yourself against these types of failures, call a professional for a consultation, survey and estimate.

*Blue print color added by AHPC to emphasize the section on Helical-Piers. FREE NATIONAL DISTRIBUTION (WITH STATE EDITIONS) TO REAL ESTATE PROFESSIONALS, HOME BUYERS, AND SELLERS.

ARIZONA HELICAL-PIERS, L.L.C.

COMMERCIAL / RESIDENTIAL FOUNDATION & TIEBACK SPECIALIST

Certified Chance * ICC ESR-2794
Insured & Bonded
ROC #228001 K-05 Dual

References

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ARIZONA HELICAL-PIERS, L.L.C.

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Phoenix, AZ 85029
602-375-5357

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Paul Davis
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480-892-8755
(Certificates Upon Request)

Banking: Bank of America
Phoenix, AZ

Certifications: Chance Co.
(Div. of Hubbel, Inc.)
ICC ESR-2794
SPEC.DATA Program

Contractor's Licenses: State of Arizona

ROC #228001 K-05 Dual

Memberships: *BBB; Better Business Bureau

*SEAoA; Structural Engineers Association of Arizona

*ACEC; American Council of Engineering Companies of Arizona

Charities: *MAM; Military Assistance Mission

*Marine Toys; Toys for Tots Foundation

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SAMPLE WARRANTY

The work to be performed by **ARIZONA HELICAL-PIERS L.L.C.** under this transferable agreement is guaranteed for **Ten (10) Years** against failure, and all defects in material and workmanship. If any significant movement occurs at the location of the new CHANCE steel pier(s) other than movement caused by collapsed void beneath the foundation, earthquake, severe wind, flood, extreme change in the water table, other Acts of God, or any man-made conditions, **ARIZONA HELICAL-PIERS L.L.C.** will, at no cost or expense to Owner, correct any defect in workmanship or material that may have occurred in order to stabilize such area.

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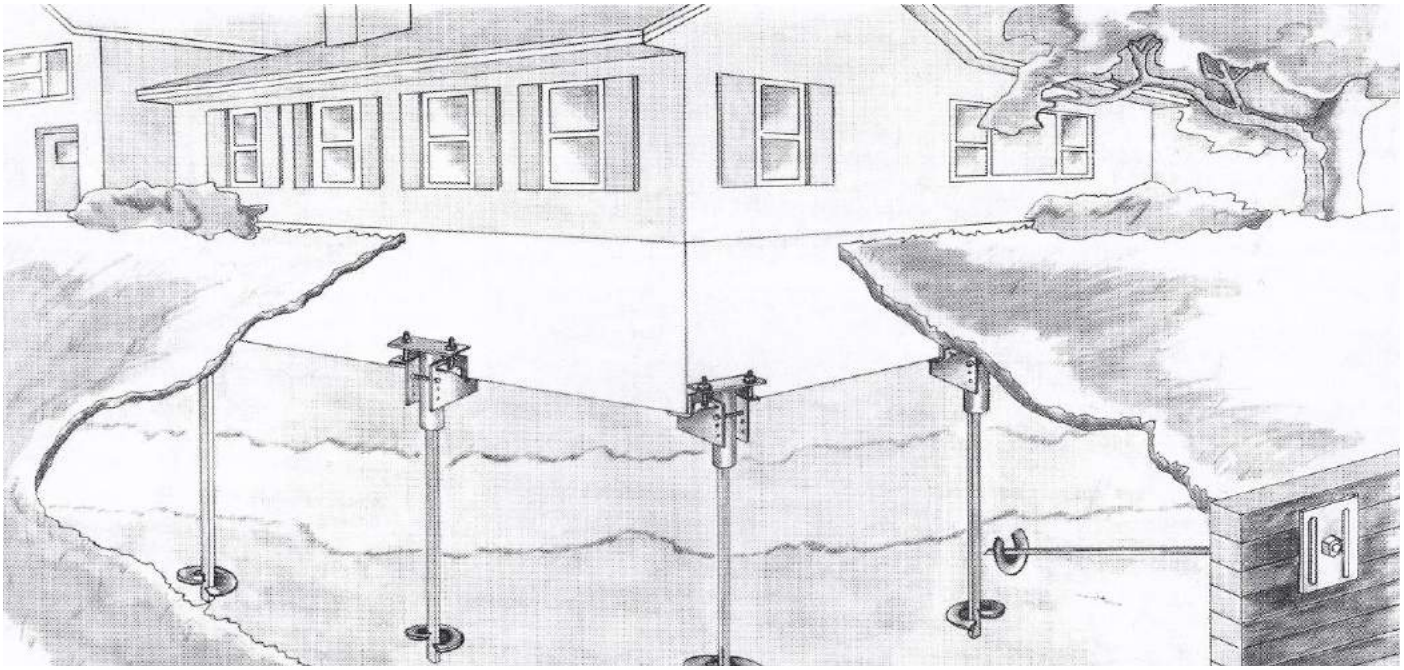

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** **Installs** in limited-access situations
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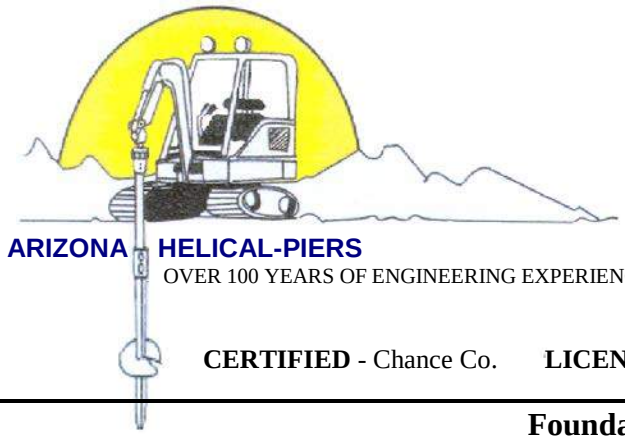
** **Seismic** applications
** **New construction**
** **Tie-back,** retaining walls
** **Roadways,** docks, bridges, walls, shoring, soil nails & anchoring



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Remedial underpinning installation

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