

CHANCE[®]

Helical Pier Foundation System

Installation Specifications for Remedial Applications

NOTICE

The following suggested specifications are written as a guide to assist the specifier in writing his own specifications. Specific circumstances involving the structure, the soils and other factors must be considered on each project to assure an adequate installation specification. Please consult state and local building codes and authorities to ascertain and verify compliance to their rules, regulations and requirements.

Chance shall not be responsible or liable for the adoption, revision, implementation, use or mis-use of these suggested specifications. Chance's sole responsibility shall be with respect to CHANCE[®] products, and any such responsibility shall be subject to and limited by the Terms & Conditions set forth in Chance's SCS Policy Sheet as amended.

NOTE: Because Hubbell has a policy of continuous product improvement, we reserve the right to change design and specifications without notice.

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I. General

A. The CHANCE® Helical Pier Foundation System shall be installed by authorized Chance Dealers. These Dealers shall have satisfied the certification requirements relating to the technical aspects of the product and the ascribed installation techniques.

B. All work as described herein shall be performed in accordance with all applicable safety codes in effect at the time of installation.

C. The Dealer shall employ a skilled, experienced work force who are familiar with the requirements and methods necessary for proper performance of the work as outlined in these specifications.

II. Helical Pier Location

It is the responsibility of the dealer to determine the location of, and avoid contacting, underground utilities (gas, electricity, water, telephone, TV, etc.).

A. Helical piers should be installed as shown on the Engineer's Plan of Repair (PR). If an Engineer's PR is not available, then the Dealer shall submit a written plan of repair to the owner or owner's representative.

B. Plan of Repair shall include, but is not limited to the following:

- 1.** Total number of helical piers required
- 2.** Locations of the individual helical piers
- 3.** Size and number of helices per helical pier
- 4.** Minimum installed depth of the helical pier
- 5.** Minimum final installation torque of the helical piers
- 6.** If testing is required, plan per paragraph IX.C.

III. Helical Pier Selection

A. The lead sections with helices and extension sections shall be manufactured by Chance and as shown on attached drawings.

B. All units shall conform to the material specifications as referenced on these drawings.

C. The number and sizes of helices, and the shaft size of helical pier shall be as shown on the Plan of Repair.

D. The Dealer shall have the option of performing a soil test using either the CHANCE® Soil Probe or other method approved by the engineer. The data acquired along with other information available about the site shall be used in determining the proper helical pier.

IV. Installation Equipment

A. Installing Units

1. Installation units shall consist of rotary type torque motors with forward and reverse capabilities. These units shall be either electrically or hydraulically powered.

2. These units shall be capable of developing the minimum torque as required by the Plan of Repair.

3. These units shall be capable of positioning the helical pier at the proper installation angle. This angle varies between 0 (vertical) to 10 degrees depending upon application and type of foundation termination specified.

4. These units shall be in good working condition and capable of being operated in a safe manner

B. Installation Tooling

1. Adapters approved by the Engineer of Record shall be employed to safely connect the installation units to the helical piers and extensions.

2. These adapters shall have torque capacity ratings at least equal to the minimum ultimate torque rating of the helical piers as specified for the project.

3. These adapters shall be securely connected to the helical pier during installation so as to prevent accidental separation.

C. Torque Monitoring Devices

1. The torque being applied by the installing units shall be monitored throughout the installation process.

2. Torque monitoring devices shall be either a part of the installing unit or an independent device in-line with the installing unit. Calibration data for either unit shall be available for review by the owner or owner's representative.

V. Installation Procedures

It is the responsibility of the dealer to determine the location of, and avoid contacting, underground utilities (gas, electricity, water, telephone, TV, etc.).

A. The helical pier shall be positioned as shown on the Plan of Repair. Proper angular alignment shall be established at the start of installation.

B. The helical pier shall be installed in a smooth, continuous manner. The rate of helical pier rotation shall be in the range of 5 to 20 revolutions per minute.

C. Sufficient down pressure shall be applied to advance the helical pier.

D. Plain extension material may be required to position the helical pier at the depth required by the Plan of Repair. Extensions shall be coupled to the helical pier using the bolts provided with the extension. These bolts shall be installed and tightened to approximately 40 ft. lb. of torque.

E. Installation torque shall be monitored throughout the installation process.

F. If underground obstructions are encountered during installation, the Dealer shall have the option of removing the obstruction if possible or relocating the helical pier. This latter option may require the relocation of adjacent helical piers.

VI. Termination of Installation

A. The maximum installation torque shall at no time exceed the torque rating of the helical pier shaft as specified for the project.

B. Helical piers shall be installed to the minimum torque value as shown on the Plan of Repair. *If the Plan of Repair is an Engineer's Plan of Repair, the approval of the Engineer of Record shall be obtained before option b or c is implemented.*

1. If the minimum torque requirement has not been satisfied at the minimum depth level, the Dealer shall have the following options:

a. Install the helical pier deeper using additional plain extension material until the specified torque level is obtained, or

b. Remove the existing helical pier and install a helical pier with larger and/or more helices. This revised helical pier shall be installed at least three (3) feet beyond the termination depth of the original helical pier.

c. Add additional helical piers.

C. The minimum depth of installation shall be as shown on the Plan of Repair. If the installer cannot achieve the depth shown on the Engineer's Plan of Repair, the engineer shall be contacted before proceeding further.

If the maximum torque rating of the installing unit has been reached but that of the helical pier has not prior to satisfying the minimum depth requirement, the Dealer shall have the option of utilizing a higher torque installing unit meeting the requirement of paragraph IV to drive the helical pier deeper.

1. If the minimum torque rating of the helical pier and/or installing unit has been reached prior to satisfying the the minimum depth level, the Dealer shall have the following options:

If the Plan of Repair is an Engineer's Plan of Repair, the approval of the Engineer of Record shall be obtained before option a or b is implemented.

a. Terminate the installation at the depth obtained, or

b. Remove the existing helical pier and install a helical pier with smaller and/or fewer helices. This revised helical pier shall be installed at least three (3) feet beyond the termination depth of the original helical pier.

VII. Connection Bracket/Haunch

A. The helical pier shall be connected to the structure using a Chance approved steel bracket or properly designed steel-reinforced concrete haunch capable of safely transferring the structural loads to the helical pier.

VIII. Installation Records

Written installation records shall be maintained for each helical pier. These records shall include, but are not limited to the following:

A. Project name and/or location

B. Name of authorized Chance Dealer

C. Name of Dealer's foreman or representative who witnessed the installation

D. Date and time of installation

E. Location and reference number of helical pier

F. Descriptions of lead section and extensions installed

G. Overall depth of installation as referenced from bottom of grade beam or footing

H. Torque readings for the last three (3) feet of installation if practical. In lieu of this requirement, the termination torque shall be recorded as a minimum

I. Any other applicable information relating to the installation

IX. Helical Pier Testing

A. Testing shall be required only if specified on the Plan of Repair or if deemed necessary by the Engineer of Record due to unusual subsurface conditions.

B. Testing, if required, shall be performed in accordance with the test plan contained in the Plan of Repair or, if required by the Engineer of Record due to unusual subsurface conditions, in accordance with the test plan set forth by the Engineer of Record prior to the beginning of the test.

C. The test plan shall include, but not be limited to, the following:

- 1.** The number and locations of tests, based on site and subsurface conditions
- 2.** The maximum load to be applied during the test
- 3.** The acceptance criteria including load versus displacement.

D. The test equipment shall be capable of applying a compression load equal to the maximum test load specified in the test plan.

E. If the compression test requires additional helical piers for reaction, these helical piers shall be installed to the same torque requirements as the test helical pier.

F. The helical pier shall be tested to the greater of the safety factored load or its ultimate capacity, defined as the maximum load the helical pier can resist at continuous creep conditions.

G. Test records shall include the following:

- 1.** Items as outlined in Section VIII of this Specification
- 2.** Magnitudes of applied loads and corresponding displacements

MATERIAL SPECIFICATIONS

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SS5, SS150 (1½")
SS175 (1¾")
278 (2⅞" OD Pipe Shaft)

HELIX BEARING PLATE:

1. SS5 - Hot rolled carbon steel sheet, strip, or plate per ASTM A572, or A1018, or A656 with minimum yield strength of 50 ksi. Plate thickness is ⅜".
2. SS150 and SS175 - Hot rolled steel sheet, strip, or plate per ASTM A656 or A1018 with minimum yield strength of 80 ksi. Plate thickness is ⅜".
3. 278 - Hot rolled steel sheet, strip, or plate per ASTM A36 or A572 with minimum yield strength of 36 ksi. Plate thickness is ⅜".
4. Helix bearing plates are formed on matching metal dies to true helical shape.

HELICAL PIER SHAFT:

1. SS5 - Hot rolled **Round-Cornered-Square (RCS)** 1½" solid steel shafts conforming to the general requirements of ASTM A29. Medium carbon steel grade with improved strength due to fine grain size.
 - Installation Torque Rating: 5,500 ft.-lbs.
 - Minimum Ultimate Tension Strength: 70 kips (Criteria - Coupling Bolt)
 - Minimum Ultimate Tension Strength: 55 kips (Criteria - Torque)
2. SS150 (1½" solid steel shaft), and SS175 (1¾" solid steel shaft) - Hot rolled **Round-Cornered-Square (RCS)** conforming to the general requirements of ASTM A29. **High Strength Low Alloy (HSLA)**, low to medium carbon steel grade with improved strength due to fine grain size.

SS Anchor Type	Torque Strength Rating, ft.-lb.	Minimum Ultimate Tension Strength, kips
SS150	7,000	70
SS175	10,000	100

3. 278 - Structural steel tube or pipe, welded or seamless, in compliance with ASTM A500. Wall thickness is 0.203 inch (Schedule 40). Torque strength rating is 5,500 ft.-lb. Minimum yield strength is 50 ksi. Minimum ultimate tension/compression strength is 60 kip.

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COUPLING BOLTS:

1. SS5, SS150 - 3/4" diameter bolt per ASTM A320 Grade L7, S_y (min) = 105 ksi, S_u (min) = 125 ksi.
2. SS175 - 7/8" diameter bolt per ASTM A193 Grade B7, S_y (min) = 105 ksi, S_u (min) = 125 ksi.
3. 278 - 3/4" diameter bolt per SAE J429 Grade 5, S_y (min) = 92 ksi, S_u (min) = 120 ksi.

EXTENSION SECTION COUPLINGS:

1. Shall be formed as integral part of the plain extension shaft material. For SS anchors, couplings shall be hot upset forged sockets.
2. Shall be formed as integral part of the plain extension shaft material. For 278 material, couplings shall be hot upset expanded sockets.

FOUNDATION REPAIR BRACKET:

1. Brackets are formed from steel that meets or exceeds the requirements of ASTM A36, and have a hot-dipped galvanized coating per ASTM A153.

WELDING:

1. All welding shall be in accordance with AWS D1.1, latest revision.
2. All welders shall be Chance certified to AWS specifications.

FINISH, GALVANIZED:

1. All material shall be hot-dipped galvanized in accordance with ASTM A153 after fabrication.