CHANCE™

# Pole Base
# Instant Foundation® Systems

## Installation Guide

HUBBELL

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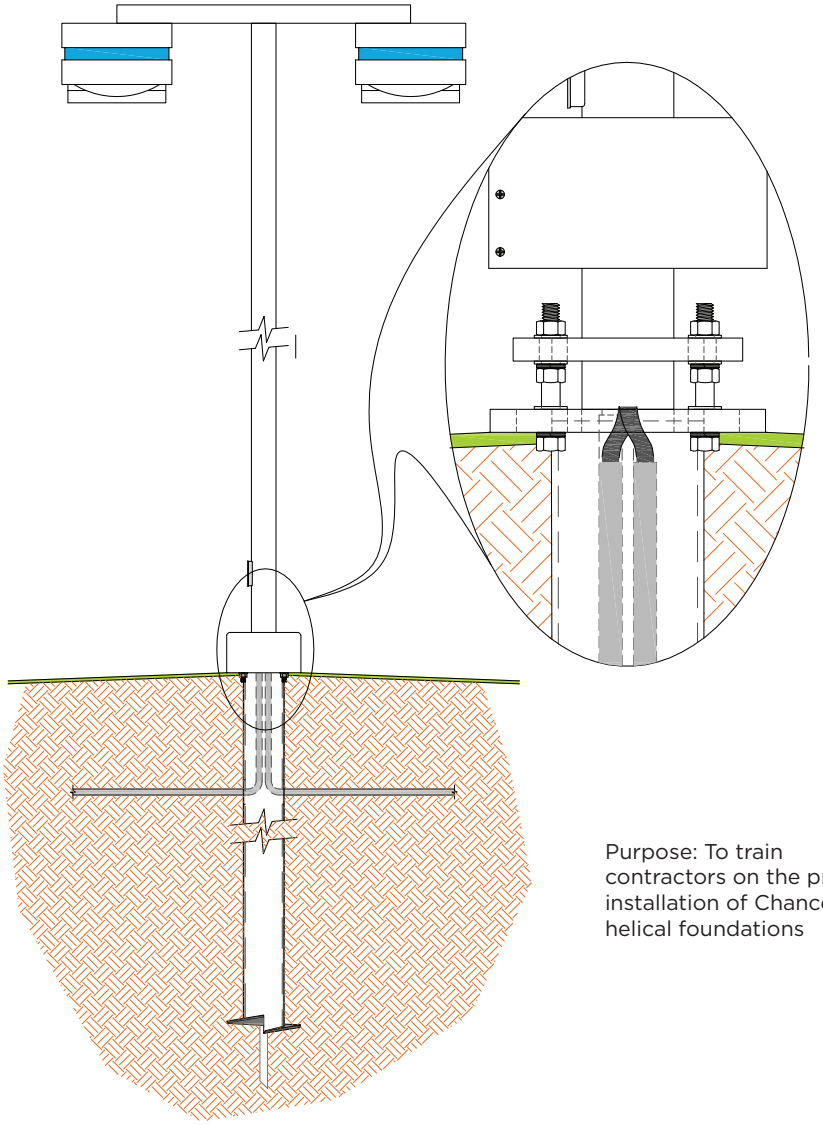


Purpose: To train contractors on the proper installation of Chance steel helical foundations

# Foundation & Tooling Components

See the labeled image to familiarize yourself with the parts of the Chance steel helical foundation.

The baseplate is a square plate where the foundation sits and is connected to the light pole, using fully threaded hex head bolts.

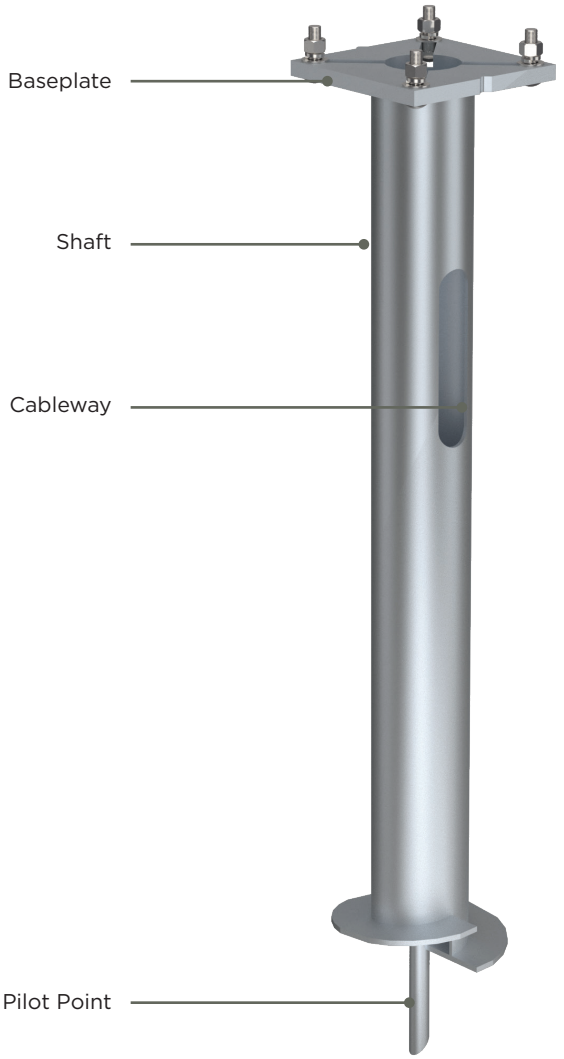
The shaft is a hollow pipe, allowing conduit to pass through the cableway and up to the light fixture.

Two cableways, 180 degrees apart, allow several light fixtures to be daisy-chained together.

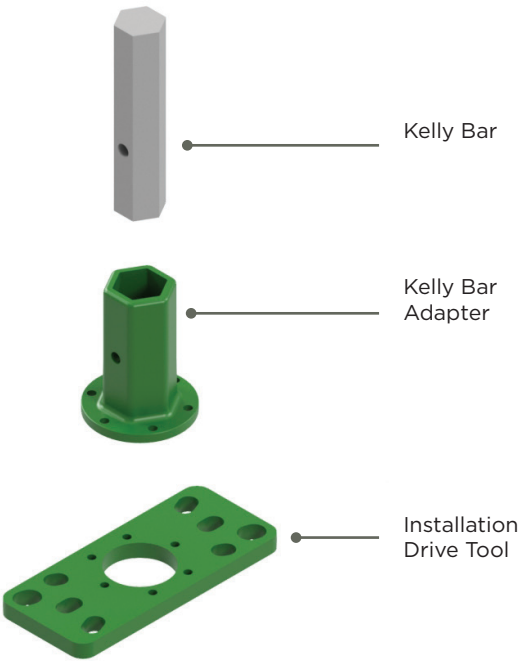
The pilot point is not a structural member but does allow precise placement of the foundation during installation.

A Chance Helical Streetlight Foundation is connected to the truck's Kelly bar using a Chance Kelly bar adapter and locking dog drive tool. Shown here is a typical tooling string which includes a Kelly bar adapter and locking dog drive tool.

## Foundation




## Tooling String



# Equipment Selection

Install with a hydraulic drive head with an appropriate gear motor torque rating:

**Drive Head Torque Rating Guide**

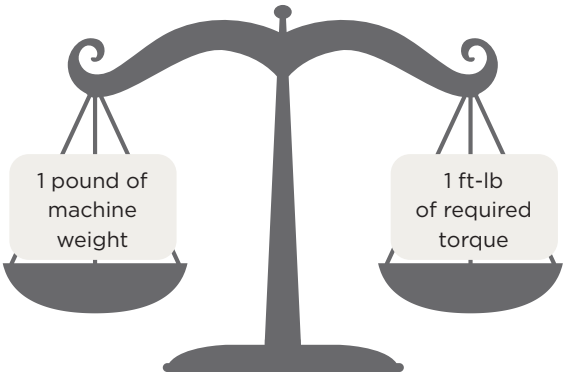
| Foundation Length | Minimum Torque (ft-lb) |
|---|---|
| Up to 7 feet | 12,000 |
| Up to 12 feet | 20,000 |

Two speed drive head recommended

Prevent equipment damage:

- 6″ nominal diameter pipe shaft = 15,000 ft-lb max torque
- 8″ nominal diameter pipe shaft = 20,000 ft-lb max torque

Do not disturb ground prior to installation




**Machine weight "Rule of Thumb" is 1 pound of machine weight to 1 ft-lb of torque**


# Torque Motor

To run a torque motor properly, the machine it's mounted to must provide the necessary hydraulic flow rate and operating pressure to provide the necessary torque and RPM.

Most 10-12 thousand pound mini-excavators can install up to 7FT long helical foundations in most soils ranging from soft/loose to medium-dense/stiff. Longer length helical foundations will require a digger derrick truck or a 10-ton mini-excavator for proper installation. In soils that are dense and very stiff, a 20,000 ft-lb drive head is required to install helical foundations.

Higher operating pressures are required to turn a higher torque ft-lb drive head.

| **Installation Examples** | **Up to 7 FT Long Foundation** | **8″ or 10″ Diameter Foundation in Dense/Stiff Soil** | **Up to 12″ Diameter x 12 Ft Long Foundation** |
|---|---|---|---|
| Hydraulic Flow Rate | 40 GPM | 45 GPM | 61 GPM |
| Operating Pressure | 1,500 psi | 2,800 psi | 1,800 psi |
| RPM | 14 RPM | 15 RPM | 15 RPM |
| Required Torque Output | 12,000 ft-lb | 20,000 ft-lb | 31,000 ft-lb |

It is **CRITICAL** to verify the machine the drive head is mounted to can handle the output torque, flow rate, operating pressure, and gear ratios.

The numbers above are generalizations. Consult with the project engineer for actual requirements.

There are two different styles of torque motors in the construction industry. The first being low torque, high speed units that are made to provide higher RPMs to auger holes for posts or small foundations. They are not recommended for helical pile installation.

✗ **Low torque – high speed torque motors** may have a published torque output greater than what is required but will not sustain this as a running torque during the installation. Field experience has shown that low torque, high speed motors sustain torque values that are less than half of the motor's rated torque.

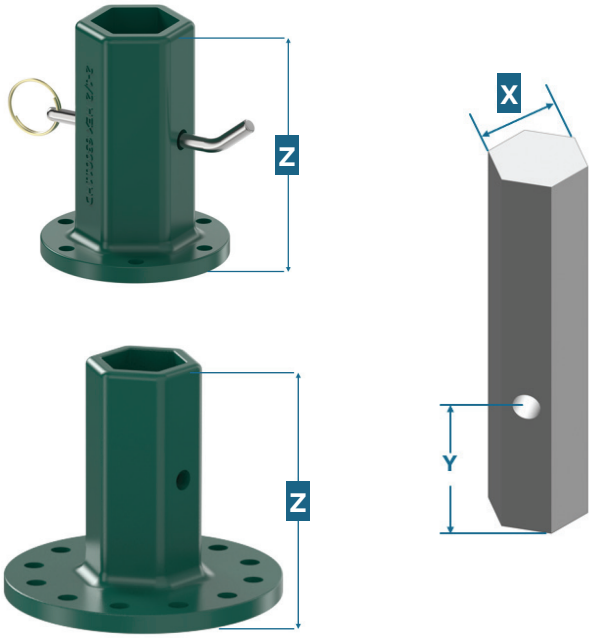
✓ **High torque, low speed torque motors** are recommended for helical pile installation. These motors are designed to sustain high torques at low RPMs. Recommended installation rates for helical piles are 8 to 20 revolutions per minute, or RPM. It is recommended that the drive head be matched with a machine that can resist the installation torque and provide the hydraulic flow needed for this RPM range.

# Kelly Bar Adapter Selection

Select the Kelly Bar adapter based on the size of the hydraulic motor drive shaft (Kelly bar). Several options are available based on the dimensions and shape of your Kelly bar and the required installation torque.

1. Remove the auger from the driver and carefully measure the X and Y dimensions of the Kelly bar as shown
2. Match the shape of the Kelly bar and the X and Y dimensions with the chart below. The Y dimension on the Kelly bar adapter must be equal to or greater than the Y dimension on the intended Kelly bar

Chance anchor installing tools are provided with appropriate bolt circles for the expected service. The torque limitations for the two standard bolt circles are given in the chart. **Never exceed the rated torque of any Chance installing tool.**




| Kelly Bar Adapter Catalog No. | Use With Drive Tool | Bolt Circle Dia. | Kelly Bar Shape | Max. Install Torque (ft-lb) | Dimensions | | | Bolts* |
|---|---|---|---|---|---|---|---|---|
| | | | | | X | Y | Z | |
| 630013 | C3030139 | 5-1/4″ | Hex | 10,000 | 2″ | 5″ | 6-1/8″ | (6) 1/2″ Grade 5 bolts |
| 630013A | C3030139 | 5-1/4″ | Hex | 10,000 | 2″ | 3-1/4″ | 6-1/8″ | (6) 1/2″ Grade 5 bolts |
| 630012HD | C3030139 | 5-1/4″ | Hex | 10,000 | 2-5/8″ | 4-1/4″ | 8-1/8″ | (6) 1/2″ Grade 5 bolts |
| 630011HD | C3030139 | 5-1/4″ | Hex | 10,000 | 2-1/2″ | 4-1/4″ | 8-1/8″ | (6) 1/2″ Grade 5 bolts |
| 630012HD | C3030139 | 5-1/4″ | Hex | 10,000 | 2-5/8″ | 4-1/4″ | 8-1/8″ | (6) 1/2″ Grade 5 bolts |
| C3030936 | C3030684 | 7-5/8″ | Hex | 12,000 | 2-1/2″ | 4-3/8″ | 8-1/4″ | (12) 5/8″ Grade 5 bolts |
| C3030937 | C3030684 | 7-5/8″ | Hex | 15,000 | 2-5/8″ | 4-3/8″ | 8-1/4″ | (12) 5/8″ Grade 5 bolts |
| C3030940 | C3030684 | 7-5/8″ | Hex | 25,000 | 3″ | 3-1/2″ | 8″ | (12) 5/8″ Grade 5 bolts |
| C3030955 | C3030684 | 7-5/8″ | Square | 17,000 | 2-1/2″ | 2-1/4″ | 7″ | (12) 5/8″ Grade 5 bolts |
| C3030958 | C3030684 | 7-5/8″ | Square | 20,000 | 3″ | 3-1/2″ & 2-1/16″ | 7″ | (12) 5/8″ Grade 5 bolts |

** In addition to the number of bolts indicated, all Chance Kelly bar adapters come with the appropriate quantity of nuts and lock washers, as well as the required bent-arm pin with coil lock. Additional hardware is available for purchase.*

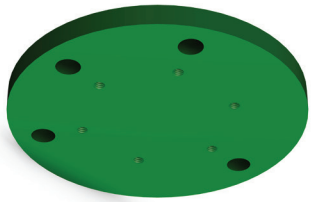
# Universal Drive Tool Selection

Based on your Kelly bar size and torque requirements, attach the appropriate Kelly Bar adapter to the universal drive tool using the hex head bolts and spring lock washers supplied with the manufacturer's Kelly bar adapter assembly. Tighten the bolts to 1/4 turn past hand tight for proper clamp force. Or use a torque wrench to tighten the 1/2" bolts to 75 ft-lb on the C3030139 Drive Tool; or tighten the 5/8" bolts to 95 ft-lb on the C3030684 Drive Tool.

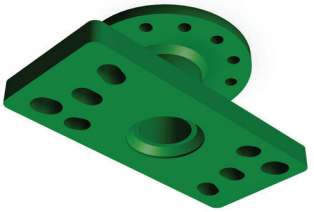
The Universal Tools fit foundation anchors with 9" through 13-1/2" bolt circles.

The Decorative Lighting Tool has a 10" diameter drive plate which fits an 8" bolt circle.

C3030139



T3030247



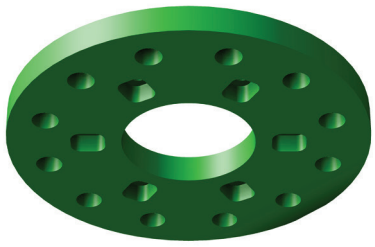
C3030684

| Catalog Number | Description | Max. Torque Rating (ft-lb) | Bolt Circle | Holes | Hardware included |
|---|---|---|---|---|---|
| C3030139 | Universal Tool | 10,000 | 5-1/4" | (6) tapped holes | (6) 1/2" bolts |
| C3030684* | Universal Tool | 20,000 | 7-5/8" | (12) drilled holes | (12) 5/8" bolts |
| T3030247 | Decorative Lighting Tool | 10,000 | 5-1/4" | (6) 1/2" tapped holes | (6) 1/2" bolts |
| C3030737 | Bumper Post Tool | 10,000 | 5-1/4" | (6) holes | (6) 1/2" bolts |

** Coupling C3030684 to a Kelly bar adapter with a 5-1/4" bolt circle requires use of T303166N adapter (below) and limits tool's maximum torque rating to 10,000 ft-lb.*

## Bolt Circle Adapter

The T3030166N is for use between a tool having a 5-1/4" bolt circle and one having a 7-5/8" bolt circle. It is limited to 10,000 ft-lb.



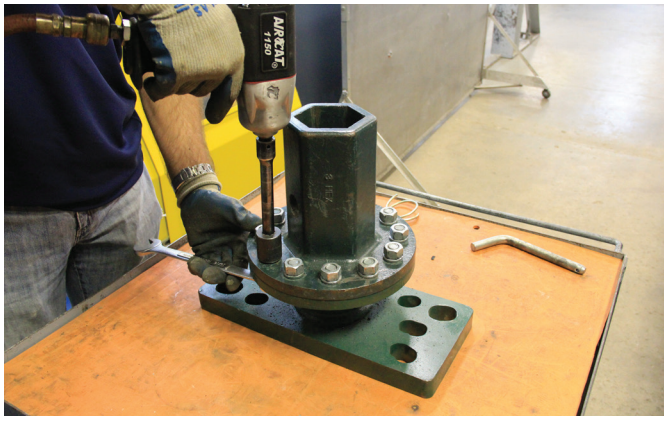
T3030166N

| Catalog No. | Description | Weight (LB) |
|---|---|---|
| T3030166N | Bolt circle adapter with one 1/2" x 5-1/4" bolt circle and one 5/8" x 7-5/8" bolt circle | 11 |

# Standard Installation Instructions

### Step 1

- Select an appropriate Kelly Bar adapter based on the size of the hydraulic motor drive shaft (Kelly bar). See previous page for details
- Attach the appropriate Kelly Bar adapter to the universal drive tool using the 6 hex head bolts and spring lock washers supplied with the manufacturer's Kelly bar adapter assembly
- Tighten the bolts to 1/4 turn past hand tight

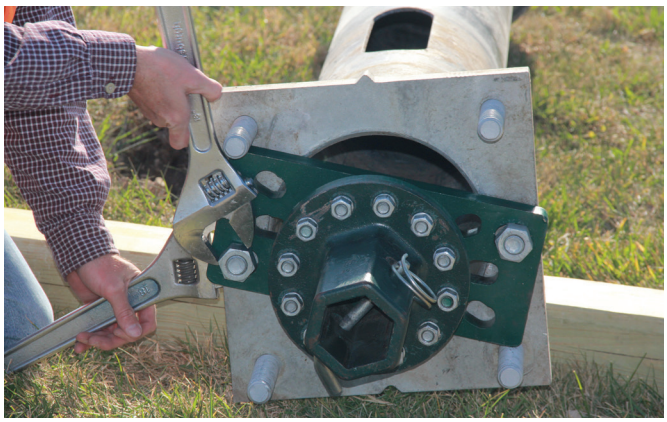



### Step 2

- Install the four fully threaded hex head bolts provided with the E and H foundation or the four fully threaded carriage bolts provided with the P base into the foundation base plate
- Tighten the bolts such that the bolt head is locked into the base plate. When installed properly, 4" of the bolt will extend above the foundation base plate nut so that it locks the stud to the base plate
- Use the "turn-of-nut" method for tightening the bolts to the baseplate. Use a marker pen to make a straight line on the baseplate and bolt head. Tighten the bolt to 1/3 past hand tight using the marks as a reference
- Repeat this process with all 4 bolts

### Step 3

- Center the drive tool assembly on the foundation base plate and attach using the two hex head drive bolts (provided) into the corresponding drive holes



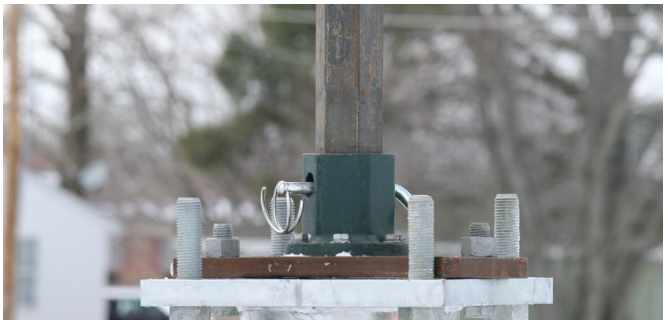
# Standard Installation Instructions

**Step 4**

- Stand the foundation upright and attach the Kelly bar to the Kelly bar adapter
- Secure with bent arm pin and coil lock provided by the manufacturer


**Step 5**

- Raise the Kelly bar until the foundation swings free of the ground. Move the foundation and tooling string until the pilot point is located above the marked installation location. The pilot point is not a structural member, but aids in precise placement when beginning the installation
- Move the foundation until the pilot point is located above the marked installation location



**Step 6**

- Lower the foundation until the pilot point is forced into the ground and the helix is flush with the ground

**Step 7**

- Use a carpenter's level to plumb the foundation in two directions 90° from each other

**Step 8**

- Apply down pressure to the foundation and torque clockwise to install at a rate of 8 to 20 revolutions per minute
- When the helix has penetrated approximately 1 foot into the ground, stop the installation, and replumb the foundation

# Standard Installation Instructions

### Step 9

- Continue applying down pressure and clockwise torque, so the foundation installs itself in one smooth continuous process
- A ground man can be of assistance in keeping the foundation plumb during installation
- Proper installation rate is 8 to 20 revolutions per minute
- Check foundation for plumbness at least three times during installation, at the start, middle and end of installation

### Step 10

- Stop the installation when the top of the foundation base plate is level to grade and bolts and cableway are in the desired orientation to pole
- Turn the foundation shaft cableways parallel with the roadway unless specified elsewhere in Contract Documents or when directed by the Engineer
- The notches on the baseplate show which sides correspond with the two precut cableways in the foundation
- Remove the installation tools from the foundation
- Notice that the top of foundation base plate must be flush to grade to meet AASHTO requirements. Installation may be stopped before the baseplate is flush to grade in order to accommodate a Chance bumper or a cast-in-place concrete bumper

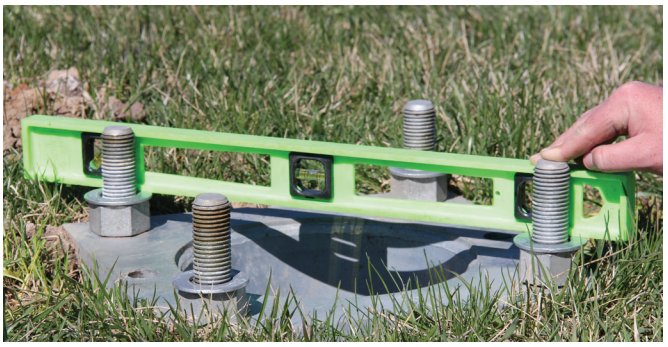
# Standard Installation Instructions

**Step 11**

- Assemble one heavy hex leveling nut to each bolt in the foundation baseplate
- Make sure the heavy hex nuts are screwed tight against the top of the foundation baseplate (This allows max pole leveling adjustment)
- Then assemble one flat washer to each bolt above the heavy hex leveling nut

**Step 12**

- Lay a carpenter's level diagonal across the baseplate on top of the flat washer to check for levelness of the foundation
- Repeat the above in the opposite diagonal direction
- Adjust leveling nuts to create levelness across the tops of the washers
- These leveling steps will save time plumbing the pole after it is set



**Step 13**

- There is the potential for soil to travel or erode into the foundation through the cableway openings below grade. This may allow the soil to settle around the baseplate. To prevent this, the cableway may be blocked by use of filter cloth, expanding foam sealant or by filling the interior of the foundation with sand after installing the conduits
- Backfill and compact the cable trench for a minimum distance of 5 feet from the foundation
- Installation is complete. You are ready to install the pole

# Pre-Drill Instructions

- Steel screw-in foundations are not suitable for Class 0 and 8 soils
- Class 1 through 7 soils are acceptable for steel screw-in foundations
- Soil classes 1-3 will likely require pre-drilling - obtain engineer's approval before pre-drilling
- Classes 4, 5, 6, and 7 are suitable for installing steel screw-in foundations, although Class 4 may require predrilling also

**Soil Classification Chart**

| Class | Common Soil-Type Description | Geological Soil Description | Typical Blow Count "N" per ASTM-D 1586 |
|---|---|---|---|
| X 0 | Sound hard rock, unweathered | Granite, basalt, massive limestone | N.A. |
| ✓ 1  | Very dense and/or cemented sands; coarse gravel and cobbles | Caliche, (nitrate-bearing gravel/rock) | 60-100+ |
| ✓ 2  | Dense fine sands; very hard silts and clays (may be preloaded) | Basal till; boulder clay; caliche; weathered laminated rock | 45-60 |
| ✓ 3  | Dense sands and gravel; hard silts and clays | Glacial till; weathered shales, schist, gneiss and siltstone | 35-50 |
| ✓ 4  | Medium dense sand and gravel; very stiff to hard silts and clays | Glacial till; hardpan; marls | 24-40 |
| ✓ 5 | Medium dense coarse sands and sandy gravels; stiff to very stiff silts and clays | Saprolites, residual soils | 14-25 |
| ✓ 6 | Loose to medium dense fine to coarse sands to stiff silts and clays | Dense hydraulic fill; compacted fill; residual soils | 7-14 |
| ✓ 7 | Loose fine sands; Alluvium; loess; medium - stiff and varied clays; fill | Flood plain soils; lake clays; adobe; gumbo, fill | 4-8 |
| X 8 | Peat, organic silts; inundated silts, fly ash very loose sands, very soft to soft clays | Miscellaneous fill, swamp marsh | 0-5 |

# Pre-Drill Method Comparison

**Chance Predrill Method #1**

- Used for nearly rock-like, partially cemented or very dense soils
- Select an augur that nearly matches or is smaller than the shaft diameter of the helical foundation
- Pre-drill a hole with the augur and remove the soil
- It is best if the pre-drilled hole does not extend deeper than the length of the helical foundation
- Then the helical foundation can be installed in the pre-drilled hole

**Chance predrill method #2**

- Used for dense soils that are very stiff to hard silts and clay
- Select an auger that is equal to or larger than the diameter of the helical foundation
- Pre-drill the area of install without removing the soil. Alternatively, you can place the soil back in the pre-drilled hole after drilling. Then the foundation is ready to install
- As with method 1, it is best for the augured hole not to be any deeper than needed to accommodate the foundation

> **Obtain engineer's approval before pre-Drilling.**

| Condition | Chance Method 1 | Chance Method 2 |
|---|---|---|
| Soil type | Class 0, 1 and 2 | Class 3, sometimes 4 |
| Augered hole diameter | Same or **smaller** than pile shaft diameter | Same or **larger** than pile shaft diameter |
| Augered hole depth | Same as foundation length | Same as foundation length |
| Remove soil from hole? | Yes | No |

# Collar or Bumper Instructions

Instant Foundations designed for a collar or bumper have two baseplates. Once the foundation is installed, the concrete can be poured or the bumper can be lowered onto the foundation. The conduit must be trenched, wired, and placed through the foundation before a cast-in-place bumper can be poured. If using a Chance pre-cast collar, the installation can occur before or after trenching and requires no time for curing. The Chance bumper must be installed before setting the pole.

**Chance Pre-Cast**

**Cast-In-Place Concrete**

# How to Order

### Before Placing An Order For Steel Screw In Foundations, Do The Following

- Review the Soils Classification for Steel Screw In Foundation Installation table in the Construction Requirements section for acceptable and suitable soils for steel screw in foundations
- Perform an onsite field review of the soils and general locations where light foundations will be installed on the project
- Review the Plans for lighting unit foundations surrounded by concrete or bituminous (e.g., placed in sidewalk or a parking lot)
- If wire theft is a concern, inquire about the various Anti-theft options available
- Specify "Buy America" when you place your order so the Hubbell team can share the appropriate documentation to fulfill this requirement
- Specify mounting hardware requirements

### Design And Product Selection

Chance Select-A-Base Software is available and free to use at www.hpsapps.com/base.

Search the literature at
www.chancefoundationsolutions.com to use the Pole Load Determination Data Sheet (TD04196E).

Contact Chance Civil Construction at civilconstruction@hubbell.com for ordering or design assistance.

# Notes

Since 1912, Chance® has engineered and manufactured industry-leading deep foundation solutions in Centralia, Missouri. Our helical piles and anchors have been specified for more jobs than any other helical pile brand and are still going strong.

**GET IN TOUCH:**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