



Helical Foundation Contractor Installation Guide

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Overview

The EMI helical pier foundation is designed to minimize soil disturbance and time involved for installation. The minimum requirements for properly installed helical pier are 1) to achieve penetration so the pier's top base plate is 8" or less above grade and 2) achieve a minimum torque value of 3,000 foot-pounds for 10" and 8" diameters and 2,000 foot-pounds for 6" and 4" diameters. A maximum torque value of 15,000 foot-pounds should be used. In the event the helical pier foundations cannot be installed per the standard procedure above, one of the following pre-drill methods should be used.

Pre-Drill Installation Instructions

- Pre-drilling is likely required in soil class 1, 2, 3 and sometimes in class 4.
- Method 1: Recommended when soils are nearly rock-like.
- Method 2: Recommended when soils are very stiff to hard silts and clays.

SOIL CLASSIFICATION CHART			
Class	Common Soil-Type Description	Geological Soil Description	Typical Blow Count "N" Per ASTM-D 1586
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	60-100+
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
**8	Peat, organic silts; inundated silts, fly ash very loose sands, very soft to soft clays	Miscellaneous fill, swamp marsh	0-5

Method 1

- Select an auger that nearly matches or is smaller than the shaft diameter of helical foundation.
- Pre-drill a hole with the auger and remove the soil.
- It is best if the pre-drilled hole does not extend deeper than the length of the helical foundation.
- The helical foundation is then installed in the pre-drilled hole.
- This method is recommended when the soil is nearly rock-like partially cemented, or very dense.

Method 2

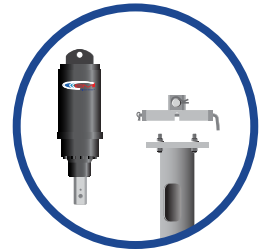
- Select an auger that is equal to or larger than the diameter of the helical foundation.
- Pre-drill the area of install without removing the soil, or the soil is placed back in the pre-drilled hole
- It is best if the pre-drilled hole does not extend deeper than the length of the helical foundation.
- The helical foundation is then installed in the pre-drilled hole.
- This method is recommended when soils are dense to very dense.

Standard Installation Instructions

Section 1

Step 1

- Select an appropriate EMI helical drive tool based on the size of the hydraulic motor drive shaft (Kelly bar) and helical pier diameter.



Step 2

- Secure the helical base plate into the drive tool using the quick-release pins
- Secure the quick release pins with cotter pins.



Section 2

Step 3

- Stand the foundation upright and locate the pilot point above the marked installation point.



Step 4

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



Step 5

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



Section 3

Step 6

- Apply downward pressure to the foundation and torque clockwise to install.
- When the helix has penetrated approximately 1' into the ground, stop the installation and replumb the foundation.



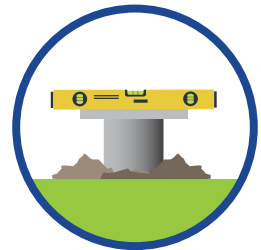
STEP 7

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



Step 8

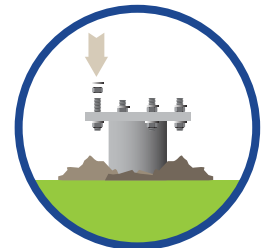
- Stop the installation when the top of the foundation base plate is level to grade and bolts and cableway are in the desired orientation to pole.
- Remove the installation tools from the foundation.
- Notice that the top of foundation base plate must be flush to grade to meet AASHTO requirements.



Section 4

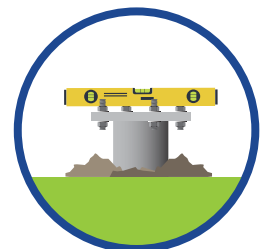
Step 9

- Assemble one heavy hex leveling nut with washer to each threaded rod 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 10

- Lay a carpenter's level diagonal across the baseplate on top of the flat washer to check for level 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 structure after it is set.



Additional information

- There is the potential for soil to travel or erode into the foundation through the cableway openings below grade. This may result in soil settling around the baseplate. To prevent this, the cableway can be blocked with 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 connecting structure.
- Be sure to install all product fasteners in accordance with the manufacturer's instructions/drawings.

EMI Helical Drive Tool

While 3rd party Kelly adapters and plates may be used, we recommend our EMI helical drive tool that uses quick-release pins to attached the helical pier, saving you time on the job site.

Size	Part Number
10" Helical 100mm Sq.	1000-0020-0013
10" Helical 3" Hex	1000-0020-0064
10" Helical 2.5" Hex	1000-0020-0042
10" Helical 2" Hex	1000-0020-0041
8"/6" Helical 100mm Sq.	1000-0020-0015
8"/6" Helical 3" Hex	1000-0020-0085
8"/6" Helical 2.5" Hex	1000-0020-0040
8"/6" Helical 2" Hex	1000-0020-0016

