



DriveTech Helical Foundation Systems DriveTech Helical Foundation Systems

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## Helical Piles are the Foundation of the Future

**Helical piers** have been around for over 150 years and are used to successfully stabilize a home experiencing foundation settlement. Sometimes referred to as “helical piles” they are structural posts that are drilled into the ground to anchor the foundation in place. A steel shaft with intermittent helix plates is rotated into the ground (much like a screw) until it hits stable soil. A bracket is then attached to both the pier and the home’s foundation to hold them in place for stability and support against shifting or unstable soil. Through this process, the weight of the foundation moves from the unstable soil around it and onto the steel piers which are better prepared and more capable of holding the weight of the structure.



As the building industry is have more focus on the soils in which structure are being Built on they are starting to change the way things are being built by changing the requirements for the foundation designs that they are being built upon.

## Geotechnical Report Requirements Under IBC Section 107

1. A plot showing the location of the soil investigation.
2. A complete record of the soil boring and penetration test logs and soil samples.
3. A record of the soil profile.
4. Information on the groundwater table, frost depth, and corrosion parameters.
5. Soil design parameters, such as shear strength, soil allowable bearing pressure, unit weight of soil, soil deformation characteristics, and other pile support conditions.
6. Confirmation of the suitability of helical foundation systems for the specific project.
7. Recommendations for design criteria, including, but not limited to the mitigation of effects of differential settlement, varying soil strength, and the effects of adjacent loads.
8. Recommended center-to-center spacing of helical pile foundations to accommodate building loads.
9. Field inspection and reporting procedures to include procedures for verification of the installed bearing capacity, when required.
10. Load test requirements.
11. Any questionable soil characteristics and special design provisions that are necessary.
12. Expected total and differential settlement.
13. Axial compression, axial tension, and lateral load soil capacities, if those values cannot be determined from the rest of the report.

14. **The ICC ( International Code Council )also points out:** “Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional.” Geotechnical reports must be completed by a registered engineer, and this engineer may be a third party consultant. Reports must be submitted as required by various departments within a given jurisdiction.

**Conclusion** So with the implementation of these requirements there is more focus on the ground, soils, location and environment in which structures are being built on in return reengineering the foundations of these buildings to increase their longevity by stabilizing the foundation by supporting it on good bearing strata and reducing foundation failures due to poor soil conditions.

## **The Future of Helical Piles**

With a growing number of industry professionals choosing helical piles as a versatile, cost-effective, low-impact alternative, they could make concrete foundations a thing of the past. And due to easy transportation and mobility, as well as short installation time, helical pile systems are a major money saver. The helical pile installation process also reduces mess and additional project clean up. There is no threat to long-term spending either, as virtually no maintenance or upkeep is required. Moreover, these systems are both economic and environmentally friendly.

### **Here are five reasons why:**

#### **1. Immediate Loading**

Helical piles are pre manufactured, and they can be quickly installed with immediate loading. By comparison, establishing a concrete foundation can take several days because that surface has to cure, possibly delaying the project's completion.

## 2. **Small Installation Equipment**

Helical piles are installed by hydraulic motors, which can be attached to a number of different machines. Installation vehicles commonly include skid-steer loaders, rubber-tire backhoes, and compact excavators.

As the project at Fort Jefferson demonstrated, the fact that helical piles require smaller, low-impact installation equipment means they can be installed in tighter access areas. This feature makes them ideal for use in small backyards, narrow alleyways, underneath overhead obstructions, and on hillsides. They can also be implemented with portable installation equipment in crawl spaces, interior rooms, basements, and other areas where bringing in machinery isn't possible.

## 3. **Torque-to-Capacity Correlation**

Helical foundations are well-suited for heavy loads thanks to the relationship between installation torque and capacity. CHANCE helical piles are installed deep into the ground and transfer loads into higher-bearing soils. As a helical pile moves deeper into increasingly dense soil, torque increases. Moreover, higher installation torque means a pile has a greater axial load capacity.

## 4. **No Excavation Needed or Spoils to Remove**

Because helical piles are displacement piles, no excavation is necessary during installation. To install concrete piles or any other type of replacement pile, soil must be drilled and extracted in order to make room for the concrete.

Furthermore, any concrete brought onto the job site that doesn't cure correctly or meet specification requirements will have to be removed — not to mention the waste and spillage.

## 5. **Installs in any Weather**

Mixing and pouring concrete in cold weather can be problematic and expensive.

In subzero temperatures, concrete must be kept from freezing in both the mixing and curing stages. Meanwhile, helical piles can be installed regardless of climate or weather conditions.

## **Research and development**

Carbon fiber materials are now in the testing phases for helical screw or screw foundation projects. Lighthouses, train stations, and airports are just a few places where this new material will be an enormous help. These structures need to last longer than most buildings, and using composite materials is one way to lengthen the corrosion rate. Water will not destroy carbon fiber like it does steel.

## FINDING NEW WAYS TO USE HELICAL PILES

The truth is, there are endless ways to use helical piles whenever any kind of anchoring or foundation is needed for structures large or small. In fact, they are fast changing the way that foundations are installed for many structures. It may be a cliché, but the only real limitation is a builder's imagination and creativity. Here are some non-traditional ways we use helical piles...

### Fencing Posts



When fencing posts or deck foundations are attached to helical piles – they aren't going anywhere. Even when fencing has to be setup in some marshy or soft soils, the fence posts can be attached to the mounting brackets on helical piles secured deep in the ground, where a stable layer of soil exists. Not only is there stability for the posts, but maximum support is also delivered.

### Solar Farms



As the demand for clean energy increases, so does the need for expansive solar farms around the country. There are a few fast, reliable, and cost-effective methods to anchor free-standing solar arrays, including h-piles and helical piles. Both are capable of withstanding tremendous stresses applied by tensile, compressive, and lateral forces.

With no real need for concrete, they can be installed very quickly, allowing more time for the other aspects of solar array construction.

When *expanding an existing solar farm*, it may be difficult to navigate big, pile-driving equipment around existing solar arrays. In cases like this, the small, agile machinery required to drive helical piles may be the only option. A mini-excavator is usually all that's necessary.

## Playgrounds



Of all the potential ways to use helical piles, you might not immediately think of a playground. However, anchoring a modern playground couldn't be simpler than using helical piles. Mounting bracket can connect to the installed piles before securing the recreational equipment. With a totally reliable anchoring system, a playground can be made safe from all manner of forces which might act on it, and when children's safety is an issue, total reliability is always the first priority.

## Party Tents



When you set up party tents in the same location time and time again for a recurring event, or series of events, it makes sense to provide a more permanent anchoring system for those party tents. The perfect solution to the problem is to install however many helical piles are needed to accommodate the number of tents which get erected, and simply attach the tents to the semi-permanent helical piles. Not only will there be

great stability for the tents, but it won't be necessary to re-invent the wheel for each year's setup. As an added bonus, by using semi-permanent piles, certain styles of tents may allow you to eliminate or reduce the number of wires for patrons to trip over.

## **Boardwalks**



Boardwalks are generally located in close proximity to some body of water, usually an ocean, and that makes securing them a bit of a challenge. Not a problem for an experienced helical pile installer. The boardwalk structure itself can be safely installed well above the normal water line, and can be attached with brackets to the piles. Flood-prone areas may even be zoned to mandate helical pile usage in the future, because they are so effective at anchoring structures on or around water. Also important to note is the eco-friendliness of helical piles for wetland boardwalks. It's unmatched by other foundation methods, as there's no grout necessary, no spoils from drilling and only the piles are left behind. As a result, the project has a very low environmental impact and poses no threat to surrounding wildlife.