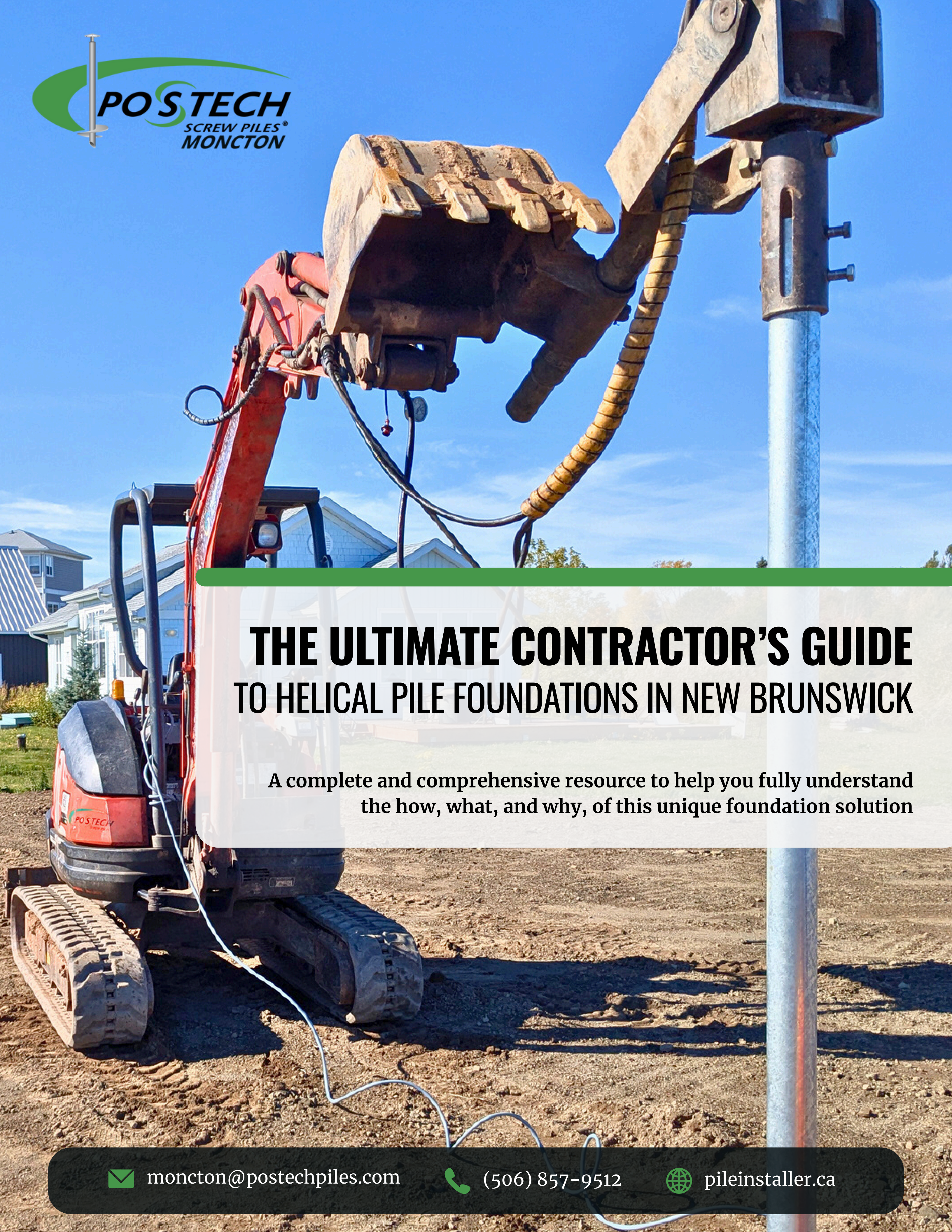

POSTECH SCREW PILES® MONCTON

THE ULTIMATE CONTRACTOR'S GUIDE
TO HELICAL PILE FOUNDATIONS IN NEW BRUNSWICK

A complete and comprehensive resource to help you fully understand the how, what, and why, of this unique foundation solution

moncton@postechpiles.com (506) 857-9512 pileinstaller.ca

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1) INTRODUCTION

Whether you're familiar with helical screw pile foundations or are just learning about them now, it can feel like a daunting subject. Understanding how they work, when you should use them, and what goes into designing the foundation, can seem complex at first.

Thankfully, it doesn't have to be that way! At the core, helical foundation technology works on straightforward and easy-to-understand principles. You don't have to be an engineer to understand, or use, helical piles for your construction projects.

We wrote this guide to help contractors like you gain a clear and comprehensive understanding of this foundation solution. It skips the tech speak and focuses on delivering essential info that will help you:

- See how helical piles work (design, components, installation)
- Understand how we choose the right size and quantity for your structure
- Recognize where and when a helical foundation is right for you
- Navigate the permitting process in Moncton and area
- Uncover answers to commonly-asked questions

Think of this guide like your helical pile handbook, containing the essentials you should know about this quick and clean foundation solution. You can read it through from cover-to-cover, or jump to specific sections. There's no wrong way to use it!

Oh, and if you have any questions at all about helical foundations, don't hesitate to get in touch with our team. We're always happy to help.

Alright, enough preamble, let's dig into the good stuff.

2) THE ESSENTIALS OF HELICAL PILE FOUNDATIONS

If you've never seen a helical screw pile before, it might seem like an odd design for a deep foundation. Especially one that can hold tens of thousands of pounds. Not only that, but their installation process is unlike other solutions like drilled shaft or driven piles.

So, the best place to start is by defining **what** exactly a helical screw pile is. And the first thing we have to talk about, is the name itself.

There's a few terms you may see used to refer to helical piles, which are:

1. Helical piles
2. Screw piles
3. Helical piers
4. Screw piers

These are all ways to describe the same technology. The reason for the different names comes down mostly to the region you're in. Here in eastern Canada, **screw piles** or **helical piles** are the most common names. But, in other places, you may find the term **helical or screw piers** being used.

Now, a quick note about technologies which seem similar to helical piles, but are in fact quite different. If you go to a hardware or building supply store, you might see products with names like:

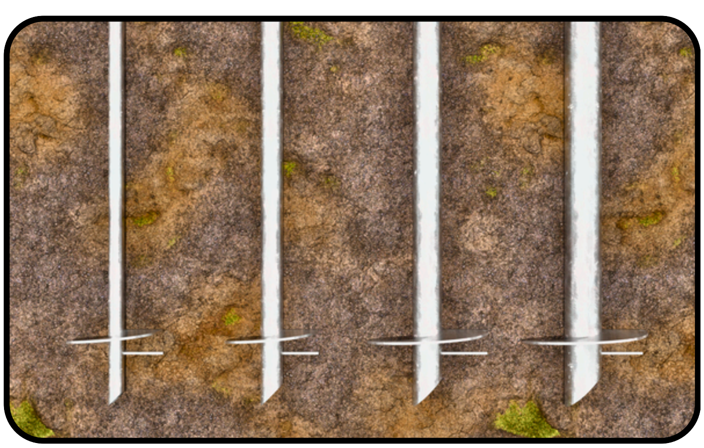
1. Ground anchors
2. Ground screws
3. Pylex posts/piles
4. Groundhog anchors

On the left is a typical "Pylex" pile commonly sold at hardware stores. You can see the difference between its design and construction compared to a true helical pile on the right.

To be clear, those are *not* true helical piles. They're based on roughly the same idea, but don't follow the specific design guidelines that make helical piles so effective. You'll often find those products are smaller, weaker, built to lesser standards, and can't hold the same weight, as a proper helical foundation.

That doesn't mean those products are bad or don't have their use-cases - but it's important to be aware of the difference. Here in Moncton, those foundations typically **aren't approved** for use under larger projects like attached decks, home additions, and so on.

2.1) DEFINITION OF A TRUE HELICAL PILE



Examples of some typical helical piles sizes. From left to right; 2-3/8", 3-1/2", 4-1/2", 5-1/2

So, what makes a **true** helical pile? An excellent definition comes from Howard Perko's book, "Helical Piles: A Practical Guide to Design and Installation". In that work, he defines helical piles as:

> ***"A manufactured steel foundation consisting of one of more helix-shaped bearing plates affixed to a central shaft that is rotated into the ground to support structures."***

The key here is the **helix plates**, which are the 'secret' to a helical pile's performance. These plates are stamped and formed into a true helix shape from sheets of steel, with a specific pitch that ensures they advance into the ground without "auguring" the soil.

This is different to those non-helical pile products we listed above. Those generally have bearing plates which *look* like a helix at first, but upon closer inspection don't have the correct geometry. That means you can't apply the principles from helical piles to those other solutions.

Helical piles are a type of **displacement** foundation, which means they push the soil out to the sides and below the helix plates during installation. This is different to a **replacement** foundation, like concrete piers, which remove soil and *replace* it with concrete. The displacement action serves to compact the material, enhancing bearing capacity and eliminating spoils.

Now that you know the technical definition of a helical pile, it's time to move on to something more practical. Let's take a close look at their specific **design**, **materials**, and **how** they work to support structural loads.

2.2) DESIGN OF A HELICAL PILE

The basic design of a helical pile is, in all honestly, pretty straightforward and simple. But, aren't the best things usually that way?

At the core of a helical pile is the **pile shaft**. This is responsible for transferring loads down into the **helix plate**. The pile shaft is usually made from round steel pipe, which provides high strength and durability. However, there are solid square shaft piles as well for specific applications.

It's relatively rare to see a solid square shaft pile, so we won't spend time on them in this guide. Just know that their overall functionality is exactly the same as round pipe shafts. Square shafts can pierce through very tough soil with heavier cobbles, but this is rarely something to worry about in our region.

Also, it's important to note that a helical pile can be installed all the way to an impenetrable layer such as bedrock. In this case, structural loads are transferred down to the end of the pile shaft and onto the impenetrable material.

That results in an increase to the pile's ultimate load capacity. While the helix plate doesn't provide axial bearing capacity in this scenario, it does still provide uplift resistance.

2.3) THE HELIX PLATE

Next, you have the helix plate. As we mentioned earlier, this is what gives a helical pile its unique properties and high strength. This plate is stamped from a sheet of steel that's usually 3/8" or 1/2" thick. It's manufactured with a particular geometry that allows it to smoothly "cut" through the soil.

A proper helix plate will have the leading and trailing edges **perpendicular** to the pile shaft. If those edges *are not* perpendicular, it can cause **auguring** in the soil and will not perform as expected. This is why using quality helical piles manufactured to industry standards is crucial.

As the helical pile is advanced into the ground, surrounding soil will exert **increasing pressure** on the helix plate. This pressure serves to anchor the helix in-place, preventing it from moving. Increasing soil density equals more pressure, which results in a greater load capacity for the pile.

We can read this **soil resistance** as the **torque** required to continue advancing the pile. Using an empirical calculation, we're able to translate these torque figures into a solid estimate of that pile's **ultimate load capacity**. We'll talk about this later, for now let's continue to the next component of a helical pile - the **pile cap**.

2.4) THE PILE CAP

The pile cap attaches to the top of an installed helical pile and transitions to whatever structure you're supporting. They come in a virtually-limitless variety of designs to suit any application you can think of.

That said, there's **four main types** of pile caps which cover a vast range of projects. These are:

→ U-BRACKET

Designed to support wood or steel beams under structures like decks, patios, sheds, home additions, and so on. They're available with interior diameters from 3-1/2" up to 8" to suit different beam dimensions. You can get them either as fixed caps which rest at a specific height, or in an adjustable model that uses a threaded rod to set precise elevation.

→ L-BRACKET

Similar to the U-Bracket cap, this can also be used to support wood or steel beams. It's also good for re-supporting an existing foundation, as a helical pile can be installed underneath a beam and an adjustable L-Bracket secured to it. Our L-Brackets come in one standard size that suits most applications.

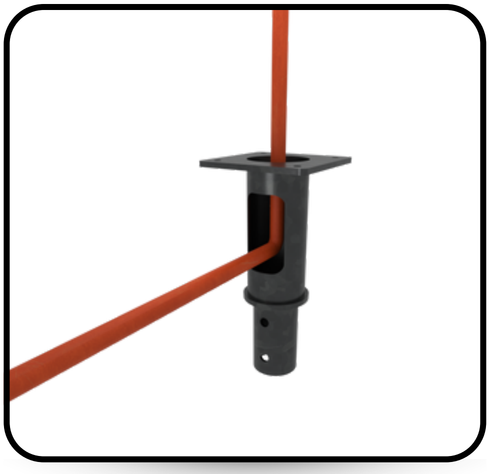
→ FLAT CAP

This one is as simple as it sounds. It's a flat piece of square steel welded to a threaded rod that allows for adjustments. Available in sizes from 3" x 3" to 5-1/2" x 5-1/2", it's a true multi-purpose cap that works well under many structures.

→ CONCRETE CAP

One of the under-appreciated use cases for a helical pile is providing deep support for poured concrete. The Concrete Cap looks similar to the Flat Cap, however it includes two vertical studs. Once concrete is poured on-top of the caps, these studs anchor the pile to the concrete and transfer loads into firm soil layers. This protects against heaving, sinking, and cracking. You can use helical piles to support slabs, pads, grade beams, and even ICF blocks. They eliminate the need for frost walls or footers.

→ OTHER TYPES OF PILE CAP



Beyond the common caps listed here, there's also a huge selection of models designed for more particular applications. For example, we have an EV charger cap that has a hole in the side for easy cable runs. You can also get caps to support light standards, flag poles, solar panel legs, and all kinds of other projects.

2.5) HELICAL PILE MATERIAL

A proper and approved helical pile needs to abide by certain standards outlined by the **Canadian Construction Materials Centre (CCMC)**. Specifically, they outline the requirements for the steel material, welding, and galvanization.

The applicable standards are as-follows (*current as of Sep., 25, 2025*):

Component	Standard
Steel Material	CSA G40.20/G40.21 or ASTM A 500
Welding	CSAW59-13
Pile Strength & Stiffness	CAN/CSA-S16.1
Galvanization	CAN/CSA-G164 or ASTM A123/A123M

The piles we use at Postech Moncton are manufactured by Postech head office in Sherbrooke, QC. They abide by current standards and are designed to be a sturdy, long-lasting, and high-quality foundation.

3) INSTALLATION OF HELICAL PILES

Now that you're familiar with the design of a helical pile, you may already be starting to form an idea of how the installation process works. One common way to describe the installation of a helical pile, is that it's like driving a screw into a piece of wood.

While there's more involved when it comes to installing a helical pile compared to a wood screw, the overall idea is fairly similar! However, unlike a wood screw, a helical pile doesn't have threads running up most (or all) of the shaft. Instead, as we covered, it has one (or more) helical-shaped plates which provide bearing capacity and advance it into the ground.

The other big difference is that, while a screw is typically driven at **high speeds** and **lower torque**, helical piles are the opposite. They rely on **high torque**, **low speed** drive heads to apply that rotational force. In fact, if a helical pile is installed *too* quickly it can lead to problems.

3.1) MACHINES AND EQUIPMENT

The drive heads used to install helical piles are known as 'anchor drives'. They're powered by hydraulics, and so can be fitted to a wide variety of machines. **Excavators** and **skidsteers** are among the most popular options, but you can find all kinds of equipment being used for this task. Some companies will even produce their own custom equipment to install helical piles depending on the application.

At Postech Moncton, our go-to machines are **mini-excavators**. They provide the hydraulic power needed to rotate piles through dense layers of earth, but are also compact and easy to maneuver. Having the boom arm allows us to access areas that would be tricky for other machines.

As for the anchor drives, they come in a variety of **torque ratings** to suit certain sizes of helical piles and soil conditions. Using an anchor drive that's too powerful can be like driving a penny nail with a sledgehammer - overkill. Conversely, an under-powered anchor drive may not be able to install larger piles to the correct specification.

Anchor drives are also fitted with **pressure** or **torque** sensing equipment that helps us ensure each pile is installed correctly. This is done by using torque to calculate estimated pile capacity, but we'll get into that topic in a bit.

First, we want to walk you through how a typical **helical pile foundation install** works - from start to finish.

3.2) PROCESS FOR INSTALLING A HELICAL FOUNDATION

Step 1 PLANNING

Before we get anywhere near your job site, we need a solid foundation plan. This outlines:

- How many piles will be installed
- Their locations
- Pile size, depth, torque specifications
- Pile-to-structure connection
- Other relevant details

The foundation plan will be based on factors like your structure, load requirements, soil conditions, and geographic location.

Sometimes, building plans will include fairly specific details for a helical foundation. They may indicate what pile sizes to use, minimum embedment depth, helix plate diameter, and so on. Even in these cases, an engineer will need to **review** and **approve** those details to ensure the approach is adequate for your project.

Other times the building plans will contain relatively few, if any, hard specifications for the helical piles. When this occurs, you should **collaborate** with your foundation contractor to come up with a sound foundation plan. You'll still need an engineer's review and approval to give it the go-ahead.

Speaking of collaboration, that's something worth highlighting. At Postech Moncton, we've seen countless building plans that specify helical piles. And there have been many times where the indicated pile sizes, helix plate diameters, and embedment depths, **aren't** necessarily the best approach.

For example, we once had a project that called for **4-1/2" helical piles**. However, we determined that a **3-1/2" pile** was more than suitable for the indicated structural loads. By collaborating with engineering, we devised a solution that saved the client from spending unnecessary money on over-sized piles.

By **engaging** a dedicated foundation team early in your design process, you allow them to help ensure your plans are as **efficient** and **effective** as possible.

Step 2 REVIEW & ACCEPT BID

Based on the information gathered in the design phase, your foundation team will (or at least **should**) assemble a clear and honest bid. When you review bids for your helical foundation, there's a big potential pitfall you'll want to look out for:

Some foundation contractors have a mentality of: "*Tell them what they want to hear in the estimate, then just issue change orders later.*" This is, honestly, a problem throughout the construction industry, so no surprise it happens in the helical pile world as well.

In fact - here's an example we personally saw...

We once bid on a helical foundation project where, given the structure's design and location, it was clear that **pile extensions** would be required. So, our team included those pile extensions on the estimate. While this increased the bid cost, it ensured we were reflecting the **reality** of the project.

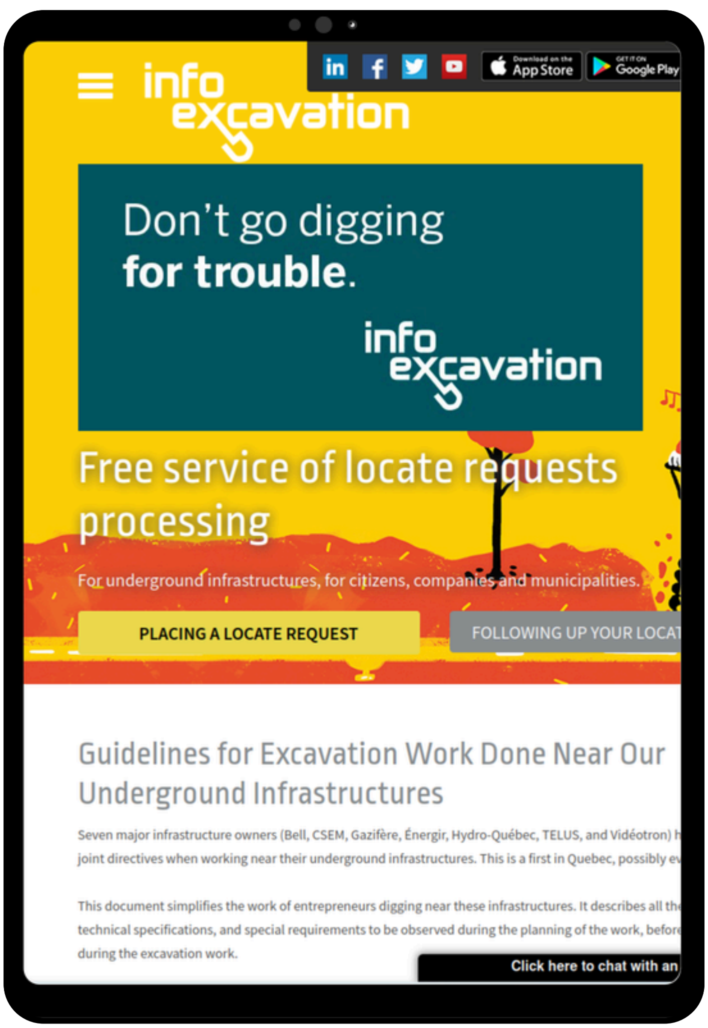
However, competing bids aimed to present a lower, and more attractive, price by **neglecting extensions** on their estimates. This made them look like a better deal, but they weren't an **accurate** picture of the project's foundation needs. **Change orders** were inevitable with these bids, as extensions were a **necessity** to reach solid soil layers.

This isn't to point fingers or brag, because there's many pile contractors who **don't** follow this practice. But, it does highlight the importance of having **clear** and **honest** quotes. Better to have a realistic idea of **true foundation costs** at the beginning, rather than being surprised by change orders later on.

When you're assessing bids, ask the contractor **how** they arrived at that price and **what** exactly it includes. It's an easy way to save yourself future stress and awkward conversations with your own clients when the foundation price takes an unexpected jump.

That said, there are going to be situations where a change order is **unavoidable**. While good helical contractors do what they can to prevent those, sometimes soil conditions can surprise us. But, if a contractor is being cagey about pricing from the start, that could be a red flag.

Step 3 DEPOSIT, LOCATES, SCHEDULE



Once you've accepted a bid, most helical contractors will require you to pay a deposit so they can secure your spot and pay for foundation materials. After that, underground locates should be applied for ASAP so they don't cause delays. It can take up to **7 days** for locates in Moncton, so doing that early ensures a smooth process.

Finally, your contractor will get your project on their schedule. Depending on the season they may have a busy calendar, so it's always a good idea to start your foundation process at least a few weeks **before** you need it installed.

Step 4 MARK PILE LOCATIONS & ELEVATIONS

In order to install your helical piles, the foundation contractor needs to know **where** you want them and their **final elevation** above grade. While a simple splotch of spray-paint is a common way to mark pile locations, we recommend inserting a **large metal nail, flag, or pin,** where you need the piles installed.

This is because spray paint isn't always the most accurate representation of the pile location. Most foundation contractors, ourselves included, will install the pile in the **middle** of the painted area. However, if the paint splotch is off-center, that means your pile will be as well.

Using a metal pin is a more precise way of marking the exact pile location and preventing alignment issues post-install.

Noting **elevations** is important as well, because your foundation contractor can then trim the pile tops to suit your exact needs.

Step 5 MOBILIZATION & INSTALL

Depending on how many helical piles your project requires, **mobilization** can look a bit different. If your foundation contractor can fit all the piles on a single trailer, then mob is as simple as them simply driving to your site on installation day.

When you need more piles than fit on a trailer, then they might deliver them to your site in advance if there's room. One of the benefits of helical piles is they require very little **lay-down space** and can be stored outside, simplifying mobilization.

As for the installation itself, the process generally goes like this:

01

Helical pile is **attached** to the anchor drive

02

An operator **positions** the pile over a marked location

03

The pile is **advanced** into the ground at a steady rate

04

Extensions can be added to the installed piles to continue advancing them

05

Once the pile has reached install **specifications**, it can be trimmed to elevation and a pile cap placed on top

06

This process continues until all the piles are **successfully** installed

07

Since there's no cure time, you can begin building on your foundation **immediately**

If you require a **post-install piling report**, your foundation contractor should be able to provide this to you. And with that, you can move on to building on a solid and sturdy support.

3.3) PILE INSTALLATION TORQUE & PREDICTING CAPACITY: HOW IT WORKS

We've mentioned that our crew monitors the **torque** applied to a helical pile during installation, and that it can help calculate its **ultimate load capacity**. This is a unique feature of helical piles, and so it's a good idea to take a closer look at this subject.

The relationship between installation torque and helical pile performance is a deep topic, so we'll avoid getting into the scientific weeds. If you'd like to learn more about the technical aspects, there's some great resources recommended at the end of this guide (Appendix A). For now, we're going to cover the **essentials** of how this relationship works.

As a helical pile is rotated into the ground, the soil will exert **resistance** on it. We can read this resistance as the **torque** required to continue advancing that pile. As the soil becomes more dense, that resistance (and therefore the torque) will increase.

3.4) THE TORQUE-TO-CAPACITY CORRELATION

Thanks to extensive testing, research, and studies, performed over the years by researchers, **empirical torque correlations** were established for helical piles. There's several equations which can be used to express this correlation, but for our purposes we'll focus on the most common and straightforward solution.

This equation is:

Qu = Kt * T

Qu represents the ultimate pile capacity, measured in pounds.

Kt is the empirical torque correlation factor, determined by **helical pile shaft size** and **helix plate geometry**. This information can be obtained from your foundation contractor or the pile manufacturer.

T is the final installation torque measured by the field crew. This measurement is obtained by averaging the torque readings obtained from the **final three feet** of pile installation, to ensure an accurate result.

In order to understand how this equation works, we'll use some example numbers to illustrate:

The **Kt factor** has been set to to **7**, which represents a **3-1/2" OD** round pile shaft.

Final installation torque will be **5,000 ft-lbs**.

By entering these figures into the equation, we arrive at this:

Qu = 7 * 5000
Predicted load capacity: 35,000 lbs

According to the calculation, this hypothetical helical pile should have an ultimate capacity of **35,000 lbs**. However, we also need to apply a **safety factor** to that figure - in this case let's assume it's a **2.0 factor**:

35000 / 2.0 = 17500

So, you can see with the safety factor included this pile should be capable of holding **17,500 lbs**.

This is not the only method which can correlate installation torque to pile capacity. But it is the most straightforward method, and has been proven accurate in real-world testing.

That said, using torque to predict capacity is **not** 100% infallible. For instance - if a pile is installed at higher-than-normal RPMs it could create false torque readings. Some ground conditions may also affect torque. While torque is a reliable way to perform real-time quality control and ensure an accurate install, nothing can beat a **full load test** to 100% confirm a pile's performance.

3.5) WHAT ELSE CAN INSTALLATION TORQUE TELL YOU?

Predicting pile capacity is not the only thing torque can tell us. There's other interesting, and useful, things we can do by monitoring installation torque.

If we collect torque readings at, let's say, **every foot** of installation depth, those numbers can be used to create a **soil strength profile**. You could, for example, have a test pile installed at a site where you're unsure about the soils. The torque data collected will provide a better picture of subsurface conditions.

Torque readings can also help **confirm**, or **disprove**, assumptions made in a geotechnical report. This information will improve the foundation design and identify potentially-problematic soils.

Finally, as mentioned earlier, torque also allows for **real-time quality control**. Since installers know in advance what torque figures they need to achieve, it's immediately apparent when they have (or haven't) installed the pile to specification.

This relationship between torque and capacity is one of the reasons helical piles have become a popular foundation solution. The ability to **monitor** installation, **identify** potentially-problematic conditions, and **ensure** a sound result, is a powerful tool.

4) HELICAL FOUNDATION DESIGN CONSIDERATIONS

Determining the correct **size** and **design** of a helical pile is crucial for developing an efficient, effective, and economical, foundation for your project. In order to do this, your helical contractor will assess a variety of factors to understand the best approach for your specific needs.

It's not only about ensuring the helical foundation is **strong** enough to support your structural loads, either. Of course that's incredibly important - but it's **equally** critical to avoid using over-sized piles as well. While **over-sized** piles aren't a risk to the stability of your structure, they're wasteful as you'd be paying for **unnecessary** material.

Much like the topic of torque-to-capacity correlations in the previous section, there's a lot that could be said about the factors which drive pile design. In the interest of brevity, we decided to break down the **three biggest factors** that impact the choice of helical pile(s) for a given project.

4.1) SOIL CONDITIONS

Since helical piles are a deep foundation, it's no surprise that soil conditions are one of (if not **the**) most important factor that influences helical pile size.

Here in New Brunswick, soils range from **loose sand** to **sticky clay** and everything in-between. Some areas have high water tables and soft soils, where others are dry and dense. Structures built near the shoreline must account for **erosion** or **flooding**, while other buildings may need to resist **expansive** and **shifting** soils.

That's why you can encounter situations where two **identical** structures can require two **different** sizes of helical pile. We'll illustrate this with a hypothetical example...

Let's say you have a client who's looking to build a cabin, but they haven't decided on the location. There's two potential sites they're considering, one located along a **river** and the other in a **wooded area**.

The river site has soils that are highly **saturated** and comprised of a **mucky clay/sand mixture**. Conversely, the wooded site has relatively **dense** soils that don't see excessive moisture - plus the ground is **well-drained**.

While the design of the cabin won't change between the two sites, the foundation approach will likely need adjusting.

For the river site, we may recommend a helical pile with a **larger helix plate** that's better-suited for the loose and muddy conditions. By increasing the helix plate diameter, there's more surface area for the soil to put pressure on.

But, if building in an area with dense and consolidated soils, a **smaller helix plate** may deliver the same load capacity. That's because dense soil can exert more pressure on the helix plate, meaning it doesn't need as much surface area to provide the specified load capacity.

That's a simplified demonstration, but it illustrates the outsize effect **soil conditions** have on the choice of helical pile. It also shows why we might produce two different foundation designs for the same type of structure. Modifying specific aspects of the pile allows us to achieve the precise support required, no matter the conditions.

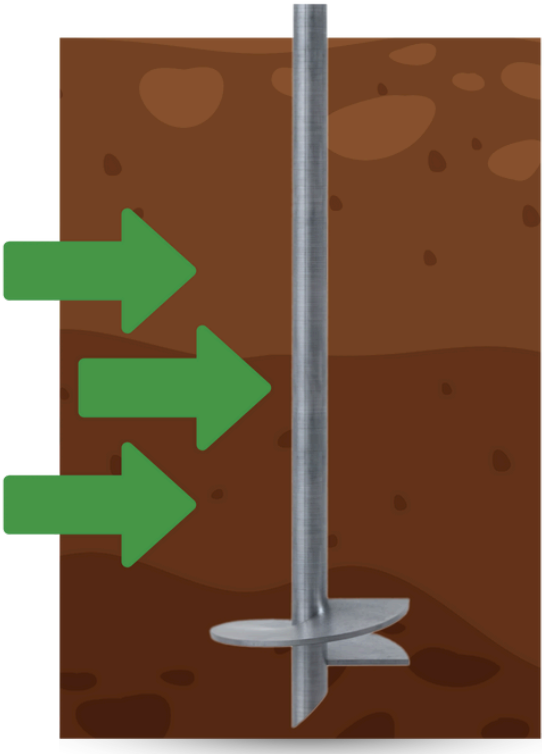
4.2) LOAD REQUIREMENTS

While soil conditions play a large role in determining pile design, your **structural load requirements** are (naturally) a key aspect as well. Whether it's a backyard deck, a boardwalk, or a row of townhouses, each project has a set of structural needs that must be met.

The best way to demonstrate this is, no surprise, another hypothetical example.

Consider the structural needs of a **boardwalk**, which is a popular application for helical foundations. Since boardwalks are generally built in wet, marshy, coastal, or sandy areas, the odds are good a **larger helix plate** will be desirable for overcoming the soft conditions. However, the pile shaft diameter is an important aspect to consider as well.

Boardwalks do not have strictly **axial** (vertical) loads applied to them. There's also **lateral** (horizontal) loads which need to be accounted for. This is especially true if the boardwalk is built over the water where currents, tides, or waves, will exert lateral pressures.



Even though the bulk of a helical pile's strength comes from the helix plates, the pile shaft also has a role to play beyond.

As a helical pile is installed, the soil surrounding the pile shaft creates skin friction. A simplified way to think about **skin friction** is that it's how **tightly** the soil "sticks" to the pile shaft.

Picture a thick milkshake with a straw inserted into the middle. When the milkshake is frozen, there's a high amount of **skin friction** along the straw - making it difficult to move laterally.

If that milkshake melts a little bit, the skin friction will **decrease** and the straw can be easily pushed-over.

Of course, we're not installing helical piles into milkshakes - we install them into soil. But, a similar principle applies. **Dense soil** exerts more skin friction, meaning a greater lateral force is needed to push the pile over. The inverse is true for **loose soil** that exerts less skin friction.

So, what happens if we increased the straw size in our milkshake example by 50%? That creates **more surface area** for skin friction to act upon, thereby increasing lateral load resistance. Even if the milkshake melts a little, the larger straw will still be more difficult to push over compared to the smaller one.

Let's go back to our boardwalk project.

When soil conditions are loose or saturated, we may recommend a larger-diameter pile shaft not for the axial loads - but for lateral loads. The **increased** skin friction will provide **greater** resistance and ensures the piles do not move laterally.

This same concept applies to any other structure as well, whether it's a boardwalk or a custom home. It's also why a larger-diameter pile shaft can make sense when lateral loads are more significant.

4.3) PHYSICAL PILE LIMITATIONS

Take the milkshake straw from our previous example and imagine you're holding it in your hands. Then, picture that you **rotate** both ends of the straw in **opposite** directions. As you increase **rotational pressure** you'll notice the "body" of the straw begins to deform, eventually giving way and "corkscrewing".

This force is known as **torsional torque**, and it's another key factor in determining the appropriate pile size for your project.

Like we covered earlier, when a helical pile is rotated into the ground it experiences **resistance** from the soil. We can read this resistance as torque, and so understand how much torsional force is being exerted on the pile shaft.

As resistance from the soil increases, more torque is required to continue advancing the pile. This increases **torsion** on the pile shaft - and like the drinking straw example it is possible to apply too much force. When this happens the pile shaft can **twist** or **snap**, meaning it will have to be removed from the ground and replaced.

It's important to choose the right combination of shaft and helix plate diameters to ensure the pile won't exceed its **torsional resistance** during installation. This may mean opting for a **smaller** diameter helix plate in very dense soils, or **increasing** shaft size so it can withstand more installation torque.

The key with helical foundations isn't to simply choose a pile that's "technically" strong enough. It's about finding the correct pile size for your specific soil conditions and structural loads.

5) COMMON APPLICATIONS FOR HELICAL PILES IN MONCTON & AREA

We've covered a lot of theory and technical aspects of helical foundations, but what about the real-world applications? Where can you **actually** use helical piles?

The short answer is that a helical foundation can be used for virtually **any** type of structure. From typical decks or home additions, all the way to commercial buildings. Because of the wide variety of "off the shelf" and custom pile caps, they can transition to whatever you're building.

However, that's not always a satisfying answer. Which is why we wanted to showcase some of the **common use-cases** for helical piles in Moncton and area. This doesn't represent all the projects where helical foundations apply, rather it's to give you an idea of their capabilities.

DECKS, PORCHES, SUNROOMS

- Fast, efficient, mess-free installation with no digging required
- Resists soil heave under lightweight, unheated structures like decks
- Ideal for supporting decks with hot tubs or other heavy equipment
- Can be used to increase support or repair an existing foundation

HOME ADDITIONS & RENOVATIONS

- Installs without disturbing the soil, prevents damage to existing foundation
- Adapts to pier-and-beams, crawlspaces, basements, ICF blocks
- Range of load capacities for all types and sizes of additions
- Able to strengthen existing foundation to support renovations

DETACHED HOUSING (PRE-FAB & SITE BUILD)

- Holds significant structural loads, ideal for large or small homes
- Transitions to any type of foundation structures (i.e. basements, crawlspaces, etc)
- Makes placing modular/RTM homes extremely fast and efficient
- Economical and effective for remote or hard-to-reach areas

COTTAGES & CABINS

- Quick and easy support for pre-fab or site-built structures
- Minimal install equipment allows for remote site access
- Overcomes challenging soil conditions (i.e. coastal areas)
- Supports other structures like docks, boathouses, and sheds

CONCRETE SLABS & GRADE BEAMS

- Supports slabs and grade beams in weak, saturated, or loose soils
- Reinforces concrete slabs to increase strength and prevent cracking
- Can support pre-cast concrete structures, such as tilt-up construction
- Special pile caps makes transition to concrete quick and easy

SHEDS, GARAGES, OUTBUILDINGS

- Ensures lighter structures like sheds will not shift, sink, or heave
- Excellent alternative to concrete blocks, skids, or poured piers
- Strengthens concrete floors to protect against movement or damage
- Easy installation in tight spaces or narrow confines

BOARDWALKS, PIERS, BRIDGES

- Delivers lasting support in challenging soil conditions (coastal, marshy, etc)
- Can be installed underwater to support bridges or boardwalks over water
- Galvanized coating provides long-term protection against corrosion
- Virtually zero disturbance to the local environment, great for sensitive areas

SOLAR PANELS

- High uplift and lateral resistance protects panels from wind loads
- Fast installation, ready to use over 75% faster than concrete
- Minimal land impact, can be removed and recycled/reused
- Special pile caps make for easy transition to racking/legs

STEEL FRAME BUILDINGS

- Significant load capacity for large structures (garages, warehouses, etc)
- Reinforces concrete floors to hold heavy equipment or vehicles
- Expedites construction timelines, ready for immediate loading after install
- Long service life, galvanized piles can last over 75 years

AGRICULTURAL

- Sturdy support for barns, storage tanks, grain bins, animal housing
- Underpins and repair foundations for existing structures
- Install equipment can access difficult or hard-to-reach areas
- Ideal for temporary foundations, can be removed and reused

RETAINING WALLS & FENCING

- Battered piles support wood, concrete, or composite walls
- Provides strong lateral resistance for fencing (i.e. wind loads)
- Prevents uplift on light fencing like chain link
- Easier and quicker than auguring holes for concrete

6) OBTAINING A PERMIT FOR HELICAL PILE FOUNDATIONS IN MONCTON

A common concern among contractors regarding helical piles is the perceived difficulty in obtaining **permits** for their use. In reality, obtaining a permit for a helical pile foundation isn't significantly different than other solutions.

The exact documentation you'll need for a permit differs based on the type of project you're building. For example, a simple deck with light loads will typically require less information than a detached home.

You can find checklists published by the City of Moncton that outline the permit application requirements for various structures. However, in the interest of brevity, we're going to outline the **typical** helical pile-specific information you'll need to provide. This can vary between projects, so take is as a **guideline** rather than the **rule**.

Pre-Engineered & Stamped Shop Drawings

This document specifies information about the helical piles to be used on your project. They generally include:

- Pile shaft and helix plate dimensions
- Pile extension dimensions (if applicable)
- Manufacturing/building standards the piles adhere to
- Maximum load capacities and installation torque
- Corrosion control measures (i.e. galvanized coating standards)

Your helical foundation contractor will be able to help you acquire these documents, and any others which are required for your project. In some cases you may also need a **post-installation piling report** which details the depth and torque specifications for each pile. Again, your contractor will (or at least **should**) be able to provide this for you!

7) FREQUENTLY ASKED QUESTIONS

1 How is the load-bearing capacity of a helical pile actually verified on site?

This is a key question, and the answer showcases one of the *biggest* advantages of helical piles: **predictable and provable performance**.

Pile load capacity is determined by an engineering principle called the **torque-to-capacity correlation** (Section 3.3). During installation, our installers measure the torque (rotational force) required to advance the pile into the ground.

This torque reading tells us when the pile has anchored in firm and supportive soil layers that are capable of holding your structure. That torque figure can then used in a proven calculation to determine the ultimate load capacity of that specific pile.

It’s not an estimate or a guess, it's real-time on-site verification. A post-installation pile report will confirm that each pile meets, or exceeds, the load requirements for your project.

2 What soil conditions are problematic for helical piles?

Helical piles perform well in the wide range of soils we see here in New Brunswick - from dense clay to soft sand. That said, **no** foundation system is perfect for every single situation.

There's two main scenarios that could cause problems for a helical pile install:

→ Shallow Bedrock, Large Boulders, Cobbles

If bedrock is very close to the surface, the ground filled with large boulders, or there's heavy cobbles, the pile may not be able to advance to the correct depth. We can often work around isolated obstructions, but widespread rocky conditions may require a different approach such as rock anchors.

→ Extremely Dense Soils

This isn't as common in New Brunswick, but some areas do have particularly dense soils which are difficult to advance a helical pile into. For instance, the pile may simple spin in place without going down. There are techniques to overcome this, such as using a smaller helix plate or pre-drilling the soil. But, in extreme cases, you may need to use a different solution.

The key to determining if helical piles could be a good fit is having **proper site assessment** performed. Your foundation contractor should be able to help you evaluate ground conditions and see if piles are a solid solution.

3 What are the site access and equipment requirements?

Typical helical pile installation equipment is compact, relatively lightweight, and minimally invasive. At Postech Moncton, we use mini-excavators for their compact nature and maneuverability. Since we don't need to use cement trucks, soil augurs, or pumps, our equipment can access tight spaces or difficult-to-reach areas.

Our smallest machines can drive through a 42" wide space, making them ideal for suburban backyards or narrow commercial sites. For you, this means no access hassles, less site prep, and minimal cleanup.

4 How does winter weather affect installation?

Helical piles can be installed **year-round** in practically any weather, which includes our winter freeze.

The installation process isn't affected by frozen topsoil, as we have a few tactics to tackle frosty ground. We may **pre-drill** the soil, allowing the pile to "bite" and begin advancing. There's also **ground heating rods** that will soften the upper frost layer, again allowing the pile to gain traction.

This allows you to extend your building season, keep crews working, and complete winter projects on a timeline that would be difficult with other options.

5 How do helical piles compare to concrete sonotubes in terms of cost and time?

If you look strictly at the per-pile cost, then a helical foundation can seem more expensive than concrete at first. However, you need to look beyond that factor to understand the full **economy** of a helical pile:

→ Time

Some helical foundations can be fully and ready to use in just a few hours. In fact, helical piles can be over **75% faster** to install compared to concrete. Since there's zero cure time, you can start building immediately. Compared to digging, pouring, and waiting for concrete to cure, it allows you to get more projects done in a season.

→ Overall Cost

While the material cost of a single helical pile might be more than one sonotube, you save on time, site prep, and cleanup. When you factor in the shorter project timelines, less mess, and increased versatility, helical piles are a more **economical** solution overall.

6 What kind of engineering and compliance documentation do I get?

While this guide can't speak for other helical foundation contractors, we can share the information you'll receive from our team at Postech Moncton.

Our piles are certified by the Canadian Construction Materials Centre (CCMC), meaning they comply with the National Building Code of Canada. Beyond the information we provide so you can apply for a permit (Section 6), we can also supply a **post-install report** that includes:

- The type and size of piles used.
- The installed depth of each pile.
- The final installation torque and the confirmed load capacity.

This gives you, the inspector, and your client, confidence in the long-term integrity of the foundation.

8) CONCLUSION

Congratulations on making it through the guide! We've covered a lot of ground - from the **essential** components of a helical pile to the **engineering** that makes them a reliable and versatile solution.

You should now have a fairly comprehensive understanding of:

- What makes a **true helical pile** and how it differs from other ground screw products.
- How the **installation** process works and why **monitoring torque** is key to verifying load capacity in real-time.
- Critical factors like **soil conditions**, **structural loads**, and **torsional limits** that inform a proper foundation design.
- The wide range of **applications** where helical piles can save you **time**, **labor**, and **headaches**.

When it comes to choosing a foundation for your project, there's never going to be **one** technology that beats every other. It's always going to come down to aspects like your **soil**, **structural loads**, **location**, and **site access**.

That said, helical piles offer a range of unique benefits to both small and large construction projects. Some of these key benefits are:

→ Predictable & Provable Performance

The load-bearing capacity of each pile is verified on-site through a torque-to-capacity correlation, giving you reliable and trustworthy results.

→ Significant Speed and Efficiency

A typical helical foundation can be installed in as little as a few hours and is ready for immediate loading. Zero cure time expedites your project timelines and helps you get projects done faster.

→ Minimal Site Disruption

Installation is clean and easy - no excavation, no spoils, no hassles. Most projects can use compact and maneuverable equipment able to access tight spaces with no damage to landscaping.

→ Year-Round Construction

Helical piles can be installed in virtually any weather, including when the ground is frozen. This eliminates seasonal delays and allows you to make the most of our chilly winter months - and get a jump on spring construction.

Our goal in creating this guide was to develop a practical resource that skips technical lingo and focuses on what you, as a contractor, need to know. We encourage you to keep this **on-hand** as a reference when designing and planning future projects!

Of course, every project comes with its own unique **questions** and **challenges**. If you ever want to talk about a specific job, ask us questions, or get some help brainstorming a foundation solution, **contact our team** at Postech Moncton.

We're here to help you build every project on a solid foundation.

APPENDIX A) ADDITIONAL RESOURCES

Looking to go even *deeper* with helical pile foundations? There's excellent resources available that help you dive into the nitty-gritty of this technology.

TECHNICAL MANUALS & TEXTBOOKS

Helical Piles: A Practical Guide to Design and Installation

Amazon Link

- Widely regarded as the most detailed and complete guide to helical piles ever written
- Written by Howard Perko, a foremost authority on helical piles with decades of experience
- Isn't cheap to purchase, but a valuable resource for those who want to know practically everything about this technology

Chance Technical Design Manual

Direct PDF Link

- Centered around Chance's line-up of helical and push pile products, but much of the information is applicable to piles from other manufacturers (such as Postech)
- Over 340 pages of technical information, pictures, drawings, and diagrams
- Free to download

DFI Helical Pile Foundation Design Guide

Link to Purchase on DFI Website

- A shorter, but still comprehensive, guide to the design and application of helical piles
- Published by the Deep Foundations Institute, an organization that promotes the use of deep foundations
- $25USD for non-DFI members

Helical Anchors Inc. Engineering Design Manual

Direct PDF Link

- Great free resource that concisely details the essentials of helical pile foundation design
- Easy to read with plenty of informative diagrams, images, and figures
- Free to download

Helical Pile Foundation Guide for Bridge Structures

Direct PDF Link

- While this guide details a relatively specific use-case for helical piles, there's plenty of great general information to be found
- An interesting look at some of the larger and more demanding projects that helical foundations can support
- Free to download

APPENDIX B) GLOSSARY OF HELICAL PILE TERMS

Below is a list of terms you may run into when researching, planning, or working with, a helical pile foundation. Some companies may refer to their helical piles or components with different terms. This glossary uses generally-accepted terms and definitions.

Angle of Installation

The angle at which a pile is installed. Helical piles can be angled to overcome lateral loads.

Bearing Capacity

The ability of soil or a helical pile to support loads without failure.

Helix Plate (Bearing Plate)

Helical-shaped plate(s) welded to the shaft of a helical pile that advance into the soil and provide load capacity.

Cross Bracing

Structural supports attached to piles to provide lateral stability.

Buckling

Failure of a helical pile due to compressive forces causing it to bend or collapse.

Cap (Pile Cap)

Attaches to the top of a helical pile, transitions to the building or structure.

Corrosion Protection

Coatings, such as galvanization, that protect against rust and degradation.

Dead Load

The permanent static weight of a structure supported by the piles.

Displacement Pile

A pile installed without removing soil,. Helical piles are a type of displacement pile.

Extensions

Additional lengths of shaft added to a helical pile to reach the required depth.

Factor of Safety

A multiplier applied to a pile's capacity to ensure it's not loaded to the maximum limit.

Galvanization

The application of a protective zinc coating to steel helical piles to prevent corrosion.

Geotechnical Report

Provides information about the soil, rock, and groundwater characteristics. Guides the foundation design.

Helical Anchor

A type of helical pile specifically designed to resist tension loads.

Helical Pile (Screw Pile)

A deep foundation technology that uses helical plates to advance into the ground via rotation and provide bearing capacity.

Installation Torque

The rotational force required to advance a helical pile into the ground, used as an indicator of load capacity.

Lead Section

The first, bottom-most section of a helical pile, containing one or more helix plates.

Live Load

Temporary or movable forces imposed on a structure (e.g., people, furniture, snow).

Load Test

A field test to determine the actual bearing or tension capacity of a helical pile after installation.

Pile Shaft

The central steel tube or square bar to which helix plates are welded. Forms the core of the pile.

Soil Profile

A description of the types and properties of soil layers encountered at a site, generally identified through a geotechnical report.

Tension Load (Uplift Load)

A force pulling the pile upward, which helical anchors are designed to resist.

Torque Correlation Method

A method for estimating pile capacity based on installation torque measurements.

Ultimate Capacity

The maximum load a helical pile can support before failure.

Axial Load (Vertical Load)

The downward force applied to a pile, including dead and live loads from the structure.

Uplift Resistance

A pile’s capacity to resist pullout or uplift forces from the ground.

Yield Strength

The amount of stress a material (e.g., steel) can withstand before permanently deforming.

APPENDIX C) HELICAL PILE CONTRACTOR ASSESSMENT CHECKLIST

Choosing the right helical pile (sub)contractor is **crucial** for the success of your project. This checklist highlights key qualities you should look for (and red flags to avoid) when assessing helical contractors in Moncton or area. It's the easy way to steer clear of bad operators and (potentially) costly mistakes.

Essential Qualities of Top-Tier Helical Contractors

Check (✓) if the contractor meets the mark:

- ◯ **Proven Experience**
  - Has a strong portfolio of successful projects (ideally in similar conditions). Can provide references and case studies.
- ◯ **Strong Problem-Solving Ability**
  - Proactively identifies potential issues (e.g., soil conditions, obstructions). Quickly communicates challenges and proposed solutions.
- ◯ **Open and Effective Communication**
  - Responds quickly and clearly to questions and concerns. Keeps you informed throughout the project.
- ◯ **Custom Solutions, Not "One Size Fits All"**
  - Invests time to understand your project's unique needs. Offers tailored recommendations (not just a standard package).
- ◯ **Solid Safety and Professional Practices**
  - Prioritizes jobsite safety for staff and clients. Maintains accurate and clear documentation.
- ◯ **Collaborates with Engineers and Project Stakeholders**
  - Works smoothly with engineers and other subcontractors. Welcomes oversight and input.
- ◯ **Understands Helical Technology**
  - Stays updated on best practices and evolving standards. Invests in ongoing staff training and education.

Red Flags to Watch For

Mark any which apply:

- ◯ No portfolio or past project info available
- ◯ Reluctant to give references or reviews
- ◯ Pushes a “one size fits all” approach, doesn’t try to understand your project
- ◯ Lax on safety, poor documentation, or sloppy work habits
- ◯ Bid is dramatically lower than others (risk of change orders/corner cutting)
- ◯ Communication is slow, vague, argumentative, or disrespectful
- ◯ Doesn’t engage with project engineers or stakeholders
- ◯ Little or no training in helical foundations, poor understanding

If you check any red flags above, be wary of that contractor!

Tips for Getting the Most Value from This Checklist

→ **Use it for all contractors you’re considering.** Keep a copy for each, so you can compare objectively.

→ **Request (and follow up on) references.** Speaking to past clients is an excellent way to judge their quality.

→ **Don’t be tempted by the lowest price.** Quality, reliability, and communication, saves you money in the long run.

→ **Ask detailed questions.** A solid contractor welcomes questions and offers detailed and experienced answers.

→ **Trust your instincts.** If something feels “off”, especially regarding communication or safety, listen to your gut.

Need more help or have questions?

With over 13 years experience installing sturdy helical foundations in Moncton and area, our team at Postech Moncton is ready to support your residential and light commercial projects! **Contact us at**:

moncton@postechpiles.com (506) 857-9512 pileinstaller.ca