techno Metal Post

TECHNICAL BROCHURE

HELICAL PILE FOUNDATIONS


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INTRODUCTION

ABOUT US

Techno Metal Post is a Canadian-based company founded in 1993, with headquarters in Thetford Mines, Quebec. Our network has grown to include over 175 dealers located throughout North America and Europe, and to date, our trained and certified installers have completed over 500,000 projects. Currently, our company has five manufacturing plants for piles and specialized equipment, including four in Quebec and one in France, with a workforce of over 100 people who contribute daily to our success. Techno Metal Post also boasts an exceptional engineering service and a cutting-edge R&D department exclusively serving its dealer network.

OUR DEALERSHIP NETWORK

The quality and drive of Techno Metal Post's international operations can be summed up in one phrase: our dealer network. This network, now made up of 175 dealers in 9 countries (Canada, USA, France, Belgium, Luxembourg, Poland, England, Spain, Switzerland), is what gives Techno Metal Post a worldwide reputation. Each dealer undergoes rigorous training to meet the construction regulations of their country, enabling us to ensure high-quality standards for every installation completed by a member of the Techno Metal Post team.

OUR RESIDENTIAL AND COMMERCIAL PROJECTS

Techno Metal Post simplifies life and construction by providing an alternative foundation solution for all types of construction projects. Whether it be residential or commercial, Techno Metal Post adapts to your project requirements.

OUR INSTALLATION EQUIPMENT MAKES ALL THE DIFFERENCE

From the very beginning, Techno Metal Post recognized that investing in the production of their own specialized helical pile installation equipment would give them a competitive edge. Our mechanical engineering team designs and manufactures some of the most versatile equipment available on the market. In an ongoing basis, our engineers are always on the lookout for new features and improvements that can be added to our machines to make the installation process even more reliable and efficient in the field. Considering that each helical pile foundation project is unique, Techno Metal Post has developed machines of different sizes, performance levels and capacities. Regardless of the machine used, they are all designed to perform rigorous and reliable work. Each model is equipped with a torque measurement system. Thanks to this information, our certified installers know the precise load-bearing capacity of each pile installed.

R2D

The smallest and lightest machine that can install helical piles in just about any location imaginable. Do not underestimate its size; this machine is surprisingly powerful!

EM1 / EM2

The mid-size tracked model offers more power when needed. This machine can access any job site more easily than normal-sized hydraulic equipment and will complete the installation faster with better precision.

ET1

The heavy-duty workhorse for industrial jobs. When engineers request higher load capacities, the ET1 is used. This machine also provides a much longer reach.

A UNIQUE PRODUCT

HELICAL PILES

The « Techno Metal Post » helical pile resembles a large screw that is installed into the ground by a specialized machine until it reaches a layer of soil with the required load-bearing capacity, to support your structure.

Our team favors the purchase of Canadian steel and the manufacturing of helical piles in Quebec. Each pile is made of structural steel and compliant with ASTM A500 Grade C, CAN/CSA-G40.21 standards, and is welded following CSA W47.1 and W59 standards. Their design allows for an optimal use of the soil's capacities. They have been load-tested according to ASTM-D1143 and ASTM-D3689 standards in various types of soils around the world.

Various pile and helix sizes have been designed to ensure each project benefits from maximum support. Our engineering team is happy to assist in determining the type of helical pile best suited for your project.

TOP PLATE BRACKET

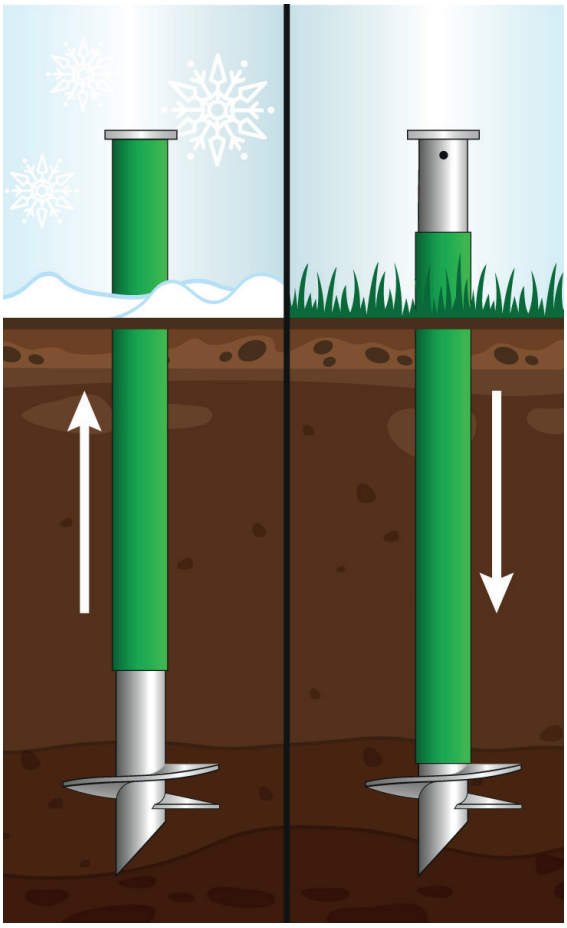
Top plate bracket systems are available to support beams for patios and other residential, commercial and industrial projects. Techno Metal Post has also developed support systems using rebar when piles are used with concrete foundations. For project-specific requirements, the production team can manufacture any custom-made support system, even for underpinning work.

OUR EXCLUSIVE GREEN SLEEVE

Our exclusive green sleeve which is custom-sized, is fitted around the pile at the time of installation. In situations where there are freeze/thaw cycles or swelling clay, the sleeve is designed to glide along the pile shaft, adapting to any ground movements. Meanwhile, the pile itself remains stable, ensuring the stability of your structure throughout the year.

ENGINEERING

Our engineering department handles the analysis and validation process of your projects. Our engineers will then determine which piles to use according to the structure being supported and the characteristics of the soil.



THE ADVANTAGES

NO EXCAVATION

Installing Techno Metal Post's helical piles requires no excavation or backfilling. They are installed with minimal site disruption to your property, resulting in reduced clean-up time and/or landscape work costs.

QUICK & SIMPLE

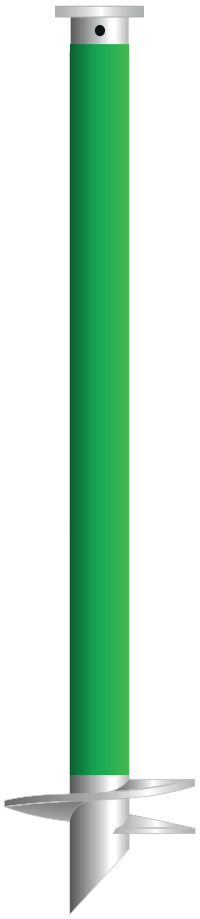
The piles can be installed in just a few hours. No excavation or concrete pouring is required, so you can start building once they have been installed.

WORLDWIDE CERTIFIED TECHNOLOGY

Our technology is certified and accredited by the relevant authorities in several countries. Our quality and reliability are also recognized by thousands of construction professionals and customers around the world.

STRONG, SOLID AND DURABLE

Our helical piles are designed according to the highest engineering and quality standards. As a result, they are guaranteed to withstand heavy loads.



MEETS CONSTRUCTION STANDARDS

GUARANTEED STABILITY

SELECTION TABLE

Model (Outside Diameter)	Project Type	Maximum Allowable Bearing Capacity [1 2 3 4]		Allowable Lateral Capacity [5]	Maximum Installation Torque	Allowable Bending Resistance [7]
		Compression (lb)	Tension (lb)	lb	ft-lb	ft-lb
P1 (1.9")	**Light Residential** (deck without roof, stairs, etc.)	6,700	4,450	250	1,336 [8]	785
P2 (2.375")	**Medium Residential and Light Commercial** (deck, carport, sunroom, single story residential addition, etc.)	11,200	7,450	550	2,242 [8]	1,360
P2HD (2.375")	**Medium Residential and Light Commercial** (deck, carport, sunroom, single storey residential addition, concrete slab, etc.)	20,000	13,300	550	4,000	2,300
P2.5 (2.875")	**Medium Residential and Light Commercial** (deck, carport, sunroom, single storey residential addition, new construction, concrete slab etc.)	20,000	13,300	650	4,444	2,809
P3 (3.5")	**Heavy Residential, Light to Medium Commercial and Industrial** (two-story residential addition, cottage, sign, carport, solar panel, new construction, underpinning, boardwalk, tie-back, etc.)	29,800 to 33,000 [10]	19,850	1,200	8,509 [8]	4,571
P4[6] (4")	**Heavy Residential, Light to Medium Commercial and Industrial** (cottage, sign, light post, solar panel, new construction, boardwalk, tie-back, bollard, etc.)	35,000 to 45,000 [10]	23,100	1,500	11,000	6,371
P3HD[6] (3.5")	**Heavy Residential, Light to Heavy Commercial and Industrial** (new construction, underpinning, tie-back, etc.)	38,500 to 45,000 [10]	25,700	1,400	11,000	6,428
P4HD[6] (4")	**Heavy Residential, Light to Heavy Commercial and Industrial** (new construction, retaining wall, tie-back, etc.)	45,600 to 50,000 [10]	30,400	1,500	14,500	8,944
P5[6] (5.563")	**Heavy Residential, Light to Heavy Commercial and Industrial** (cottage, sign, light post, new construction, boardwalk, solar panel, bollard, retaining wall, etc.)	32,600 to 50,000 [10]	21,700	2,750	14,500 [9]	14,713
P6[6] (6.625")	**Heavy Residential, Light to Heavy Commercial and Industrial** (sign, light post, new construction, solar panel, bollard, retaining wall, etc.)	31,200 to 50,000 [10]	20,900	3,700	14,500 [9]	23,142

1. The maximum compressive bearing capacity (allowable load) includes a safety factor of 2.

2. The maximum bearing capacity (allowable load) is determined by the maximum torque applied by the installation equipment.

3. When the helical foundation is laterally unsupported (soil very loose / soft, liquefiable soils, water and air), the structural strength of the helical foundation must be approved by TMP Engineering department.

4. For tension applications, the helical foundation must be installed such that the minimum depth from the ground surface to the helix is 12D, where D is the diameter of the helix. Contact TMP Engineering department for tension applications when 12D cannot be maintained.

5. Lateral capacity is based on medium dense soils with free head condition with a maximum distance in air or fluid soils of 6'' and embedment of 7 feet. Refer to Appendix A for additional information.

6. TMP Model P4, P3HD, P4HD, P5 and P6 are subject to site specific engineering. TMP Engineering department approval is required to use the upper capacity values shown in table.

7. Allowable bending resistance are based on calculations assuming bare steel, 50 year corrosion per AC358 and 1.67 safety factor.

8. Maximum installation torque for P1, P2 and P3 are based on IAPMO-UES Evaluation report no. 481

9. Maximum installation torque for P5 and P6 are limited to the maximum torque of the ET-1 installation equipment

10. Maximum allowable capacities shown in table may be obtained with site specific analysis and/or load testing.

COMMENTS
- For any technical questions, please contact the TMP Engineering department.
- Larger TMP can be used for applications requiring a lateral or bending resistance higher than shown in the selection table.

TECHNICAL SPECIFICATIONS

HELICAL PILES

EXAMPLE: MODEL P3 - HSS 88.9 MM X 5.5 MM (3.5'' X 0.216'')

Techno Metal Post's helical pile model P3 is the most commonly used pile for both pre-build projects and the stabilization of existing structures. This product having a thickness of 5.5 mm, is also available in different lengths and various helixes diameters. The helix diameter is determined by the type and capacity of the soil, as well as the loads that need to be supported.

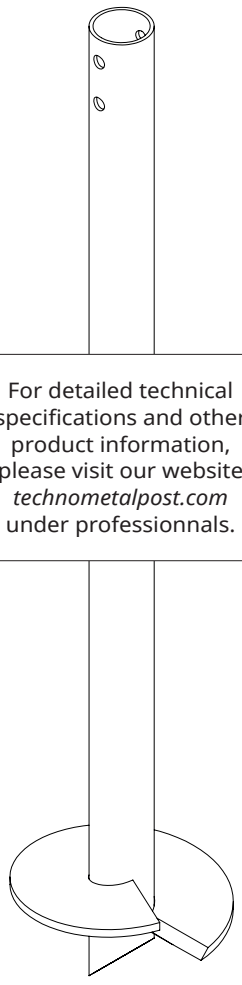
Techno Metal Post also manufactures several other types of helical piles (P1 to P10), to meet your project requirements.

Shaft	
Wall Thickness	0.216" (5.49 mm)
Round HSS Outside Diameter	3.5" (88.9 mm)
Available Standard Lengths	5'-3" (1.6 m)/ 7'-0" (2.1 m) / 10'-6" (3.2 m)

Load Specifications	
Max. Installation Torque :	
with **Regular** and **Expanded** coupling	8,509 ft-lb (11,527 N-m)
with **Reinforced** coupling	11,000 ft-lb (14,902 N-m)
Max. Allowable Capacity*	29.8 kips (132.4 kN) to 33 kips (146.7 kN)

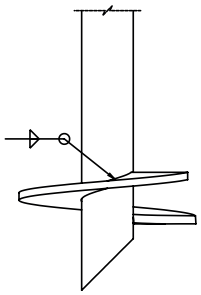
** Higher load ratings could be considered with site-specific engineering.*

Technical Specifications	
Commonly Used Structure	Heavy Residential Light to Medium Commercial Industrial
Code Evaluation	Listed per ICC-ES (ESR-3418) / IAPMO-UES (ER-481)
Standard Steel	ASTM A500 Grade C Fy=51 ksi min (350 MPa)
Black Steel Design Life	50 years per AC358
Coating	Galvanized or Black Steel
Galvanization Compliance	ASTM A123/A123M
Additional Corrosion Protection	Cathodic Protection System available



For detailed technical specifications and other product information, please visit our website *technometalpost.com* under professionnals.

Helix	
Pitch	3" (76.2 mm) / 5" (127 mm)
Thickness	0.5" (12.7 mm)
Standard Steel	CSA G40.21-44W Fy=44 ksi min (300 MPa)
Coating	Galvanized or Black Steel
Multiple Welded Helix	Available
Helix Size*	8" (203 mm) to 24" (610 mm)



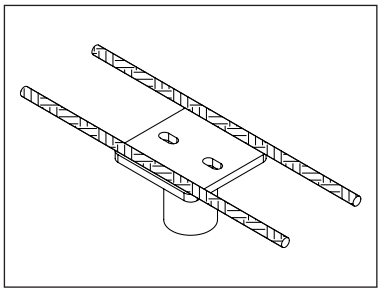
** Other sizes available upon request.*

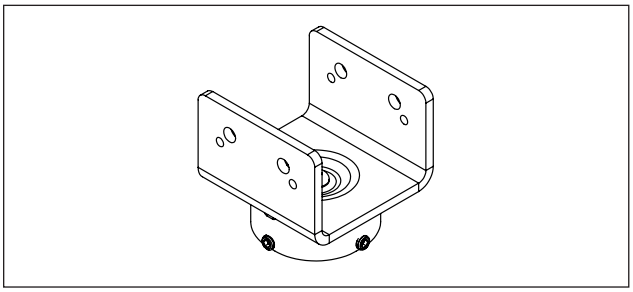
TECHNICAL SPECIFICATIONS

TOP PLATE BRACKET

There are several support plates available that enable the connection between the pile and the supported structure. We offer a range of standard products, as well as custom solutions to meet your needs. Here are just a few examples.

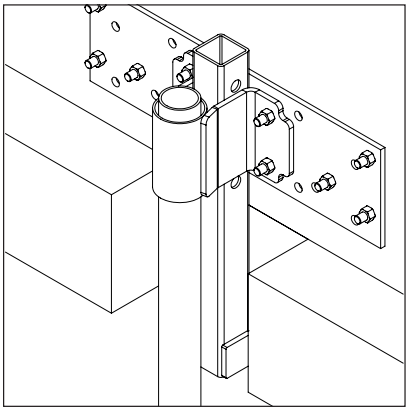
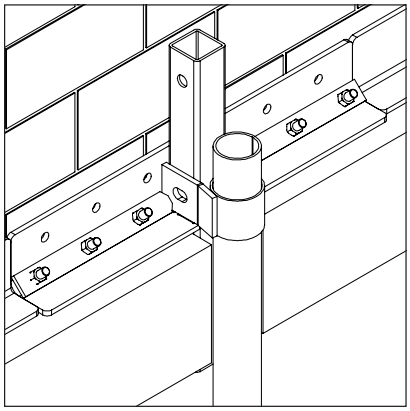
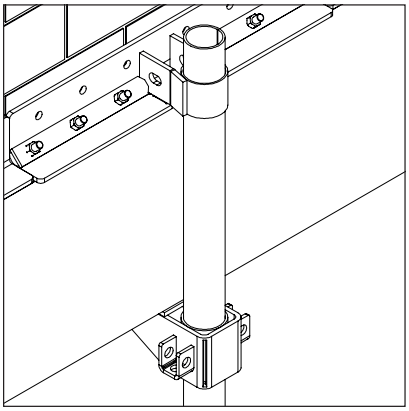
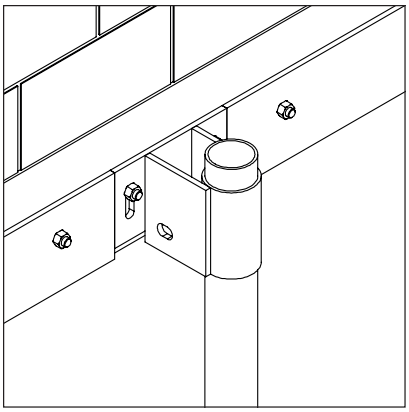
COMPONENT SPECIFICATIONS	
Steel	Standard: CSA G40.21 - 44W - Steel
Coating	Available with a hot dipped galvanization coating compliant with ASTM A123 or Bare steel

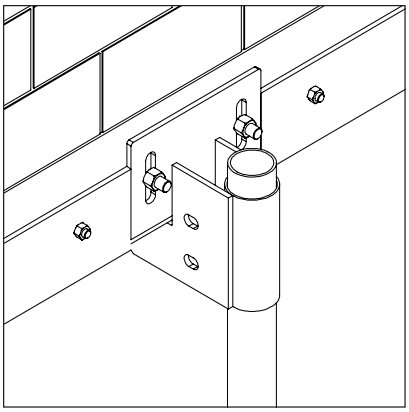


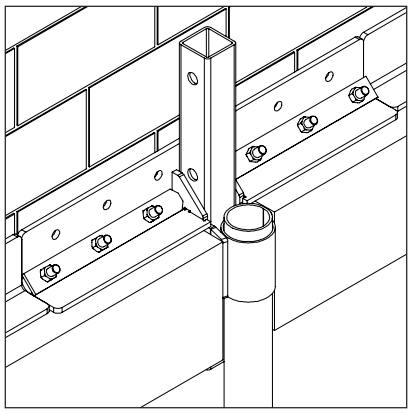


FOUNDATION STABILIZATION AND UNDERPINNING

Many factors can help you spot a foundation problem: cracks on the exterior or interior walls, cracks on a concrete floor, windows and doors that do not open properly, or a chimney that has started to pull away from the wall of the house. Our helical piles are screwed into the ground under your structure until they reach dense and compact soil with the desired bearing capacity. Steel foundation brackets are bolted to the bottom of the existing foundation wall and then welded to the piles. And so, the weight of the structure is directly and permanently supported by the piles. We can also realign or gradually raise the foundations depending on the nature of the problem. Here are the different support systems used for this type of work.






LOAD TESTS

PILES AND SUPPORT PLATES

Our piles have been tested hundreds of times in different types of soil across Canada, the USA and Europe. Compression, tension and lateral load tests can be performed on installed piles at the customer's request, in order to confirm their load-bearing capacity.

TECHNO METAL POST HELICAL PILES ARE GUARANTEED AND CERTIFIED

LIFESPAN EXPECTANCY

Each pile is manufactured from structural steel in compliance with ASTM A500 Grade C and CAN/CSA-G40.21-2013 standards. The Techno Metal Post system is designed to ensure a minimum 50-year foundation lifespan, in accordance with current standards.

TECHNO METAL POST USES **THREE METHODS** THAT EXTEND AND GUARANTEE THE LIFESPAN OF ITS PILES:

EXTRA TUBE WALL THICKNESS

Firstly, the extra steel thickness that forms the wall of Techno Metal Posts is incorporated into the structural design of our piles. This method involves neutralizing part of the pile shaft thickness in anticipation of a possible thickness reduction due to corrosion.

GALVANIZATION

Piles can be protected against corrosion by hot-dip galvanizing in compliance with the ASTM A123-2013. Galvanizing extends the pile's lifespan. It is particularly effective in the above ground section and has the added advantage of an enhanced aesthetic finish.

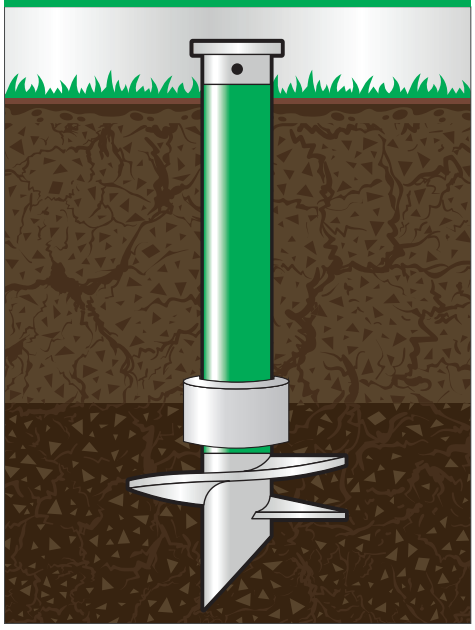
CATHODIC PROTECTION

In keeping with Techno Metal Post's philosophy of offering durable, solid products, cathodic protection technologies have been specially developed to provide additional protection for helical piles, even in corrosive soils. The Techno Metal Post cathodic protection system, installed at the same time as the piles, maintains their integrity for the desired length of time.

THICKNESS

GALVANIZING

CATHODIC PROTECTION



ENGINEERING TEAM

Our **engineering team**, specialized in geotechnical and structural engineering, is able to provide personalized service and assistance to determine the correct type of piles for each of your projects. Techno Metal Posts are designed in compliance with current standards and with our experience acquired over the past 30 years.

JAMES A. CHERRY
Engineer (USA)

MICHAEL HUTSENPILLER
Engineer (USA)

JÉRÔME CHABOT
Engineer (Canada)

RAPHAËL VACHON
Engineer (Canada)

LUDOVIC FORTIER-ROBERGE
Engineer (Canada)

VALÉRIE GROLEAU
Engineer (Canada)

STÉPHANE DE FRANSSU
Engineer (France)

SÉBASTIEN PLANQUART
Engineer (France)

ZUNG NGUYEN
Engineer (France)

UNITED STATES CERTIFICATIONS

TECHNICAL CERTIFICATIONS - AN ASSURANCE OF QUALITY AND RELIABILITY

TMP has worked tirelessly to obtain the required accreditation and acceptance of its products throughout the world. Our engineers have spent countless hours ensuring that our products meet the strictest standards. TMP is the first helical pile company in the world to be recognized and to receive certifications from multiple countries.

INTERNATIONAL CODE COUNCIL EVALUATION SERVICE (ICC-ES)

EVALUATION SERVICE REPORT #3418

ICC-ES is the International Code Council Evaluation Service. This organization is widely accepted and trusted to evaluate products and confirm the compliance with building codes. In November 2013, TMP received an Evaluation Report (ESR-3418), which covers the P3 and P3HD shaft (3.5" O.D.), The report confirms the compliance with the International Building Code (IBC). In addition acceptance for seismic zones DEF was obtained in 2022. The most current version of this report can be found on our corporate website under professional then certifications.

INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICERS (IAPMO)

EVALUATION REPORT #481

In 2018, TMP was the first helical pile manufacturer to receive International Residential Code (IRC Code) approval with the publishing of IAPMO ER 481. ER 481 approval includes pile models P1, P2, and P3 shafts and selected underpinning brackets. In 2022, this approval was updated to include seismic zones DEF and to provide a prescriptive helical pile foundation option to replace concrete deck piers. The most current version of this report can be found on our corporate website under professional then certifications.

WORLDWIDE CERTIFICATIONS

International : TMP has been evaluated and approved by the National Quality Assurance as complying with the ISO 9001. Certificate #17081 requirements.

Canada: In 2002, TMP was the first helical pile company to receive a **Canadian Construction Material Centre (CCMC)** product evaluation stating that it is **compliant with the Canadian National Building Code**, subject to the condition of use described in the Evaluation Report.

CWB: TMP is also certified by the **Canadian Welding Bureau (CWB) CSA W47.1.**

France: Since 2006, TMP has been the first helical pile company to benefit from a technical assessment issued by the Commission Chargée de Formuler des Avis Techniques (CCFAT) N°3/16-873.

Europe: TMP was the first helical pile company to be certified as meeting the requirements of European standard EN 1090-1:2009 + A1:2011 / Execution of steel structures class 2, EN 1090-2.

United Kingdom: TMP is the first to receive the BBA Approval Certificate (Certificate 18/5477), which is recognized by building authorities, government departments, architects, designers and industry insurers.

INSTALLATION EQUIPMENT

SPECIFICATIONS

Our mechanical engineering team designs and manufactures cutting-edge installation equipment to deliver reliable, efficient on-site installation. Our equipment also provides precision installation to ensure proper load transfer to the pile. In addition, the speed at which we install our equipment means that site delivery is unmatched. Our installation equipment is only available through the Techno Metal Post network.

EM1

Dimensions : 93" x 48" x 66" (2,362 mm x 1,219 mm x 1,676 mm)

Weight : 4,464 lbs (2,025 kg)

Maximum mast height : 145" (3,683 mm)

Mast rotation : 360°

Minimum clearance required for installation : 8" (203 mm)

Maximum compressive bearing capacity per installed pile : ± 150 kN

Maximum torque : ± 9,000 ft-lb

EM2

Dimensions : 106" x 48" x 68" (2,692 mm x 1,219 mm x 1,727 mm)

Weight : 6,000 lbs (2,722 kg)

Maximum mast height : 147" (3,733 mm)

Mast rotation : 360°

Minimum clearance required for installation : 8" (203 mm)

Maximum compressive bearing capacity per installed pile : ± 150 kN

Maximum torque : ± 9,000 ft-lb

R2D

Dimensions : 98 ½" x 29" x 59" (2,500 mm x 760 mm x 1,500 mm)

Weight : 1 653 lbs (750 kg)

Maximum mast height : 133 ⅞" (3,400 mm)

Mast rotation : ± 60°

Minimum clearance required for installation : 7" (178 mm)

Maximum compressive bearing capacity per installed pile : ± 115 kN

Maximum torque : ± 5,500 ft-lb

ET1

Dimensions : 168" x 68" x 84" (4,267 mm x 1,727 mm x 2,133 mm)

Weight : 8,900 lbs (4,572 kg)

Maximum mast height : 180" (4,572 mm)

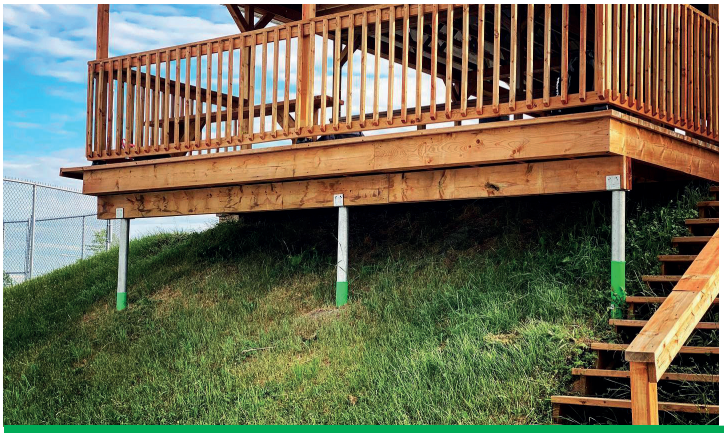
Mast rotation : 360°

Minimum clearance required for installation : 9" (229 mm)

Maximum compressive bearing capacity per installed pile : ± 225 kN

Maximum torque : ± 14,500 ft-lb

RESIDENTIAL PROJECTS



DECKS

ADDITIONS

GARAGES / CARPORTS

HOMES / COTTAGES

OTHER

COMMERCIAL PROJECTS

INDUSTRIAL

COMMERCIAL PROPERTIES

STABILIZATION

RECREATION & TOURISM

SIGNS

techno Metal Post

HELICAL PILE FOUNDATIONS