techno Metal Post™

WORLD LEADER IN HELICAL PILES

TECHNICAL DOCUMENT

- Time-saving
- Specialized installation equipment
- In-house engineering services
- Certified & proven technology
- Focus on solutions

TABLE OF CONTENTS

AN EXPERIENCED AND RELIABLE NETWORK OF MORE THAN 150 DEALERS THROUGHOUT THE WORLD

TICAN-0222

INTRODUCTION

A BIT OF HISTORY

Techno Metal Post (TMP) was founded in Thetford Mines, Quebec, Canada in 1993 and is still family-owned. Through the founders' vision, dedication, and hard work, TMP has grown from a local family business to a worldwide network of more than 150 professionally trained and certified dealers – all of whom are welcomed into the TMP community. Over the past 25 years, our dealers have completed over 3 million pile installations for projects throughout the world. They have installed helical piles in almost every soil type that exists throughout Canada, the United States, Europe, the Caribbean, New Zealand, and French Polynesia.

OUR DEALER NETWORK - "THE ENGINE OF OUR ORGANIZATION"

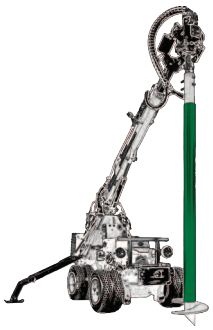
Through the expansion and progress of our worldwide network of dealers, Techno Metal Post has quickly become the world leader in helical piles. We understand that the organization's overall success is dependent on the individual success of our dealers. New dealers undergo a thorough and substantial hands-on training, equipping them with the skills and knowledge to succeed in their market. We also offer new dealers valuable support with marketing, equipment, engineering, and any other need that arises. This support continues after the training and extends throughout the life of the dealer's business. The most valuable support TMP provides is the collective experience and knowledge within our network of dealers. If a new dealer has a question or faces a challenge in starting their dealership, it is very likely another dealer has already overcome that issue and can share their experience.

QUALITY EQUIPMENT MAKES THE DIFFERENCE

Techno Metal Post recognizes that its investment in the production of its own line of equipment, for the sole purpose of installing helical piles, is one of many advantages over other companies. Our team of engineers designs and builds some of the most versatile equipment in the world. They also continually refine and improve the design so that the installation process is made easier and more effective in the field. Our engineers are always researching the next upgrade or feature to add to our equipment.

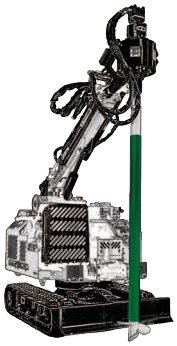
Because every helical pile project is different, TMP produces three machines varying in size, power, and capabilities; each of which is specially made for helical pile installations. No matter which machine you are using, you know that each is designed to deliver an accurate and reliable job. Every machine is built to precisely measure the torque produced during the installation process. From this information, our certified installers know the exact allowable load capacities of each helical pile after its installation.

TMP's latest innovation, the EM2, is now available. Some of the new features and upgrades on this model include: proportional joystick controls, lower emissions, lower fuel consumption, noise reduction, heat reduction, etc., resulting in a state-of-the-art machine.



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!



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.

TIMELINE COMPARISON
TMP HELICAL PILES VS. CONCRETE

Time	TMP Helical Piles	Concrete Foundation
Day 1	• Drive installation machine onto property • Install helical piles and record torque of each pile • Cut piles to final height and install brackets • Clean area and leave jobsite	• Prepare site for excavation equipment • Remove obstacles (e.g.: gate, fence) • Protect landscaping • Excavate trench or dig holes for footings • Deliver forms and rebar to job site • Build rebar cages and forms or set sonotubes • Backfill
Days 2-3	• Send stamped installation report to building department • Ready to build	• Pre-concrete inspection by building department • Pour concrete and remove excess fill material
Days 3-4		• Concrete cures; replace fence, gate • Do landscape remediation
Day 5		• Builder begins construction

"A solarium needs a foundation [...] a concrete slab on grade with posts driven through the slab to lock it in place, so it won't shift or move over time. But the kind of posts your contractor uses will make all the difference. We used Techno Metal Post's helical piles — three at the back of the solarium (the part that's away from the house). They're like giant metal screws, so the frost can't grab them and pull them up.

"Only a certified [Techno Metal Post] technician can install these posts because specialized hydraulic machinery that measures soil conditions has to be used."

Mike Holmes - The Holmes Group / Pressmedia

"We first discovered helical pile technology during the past year. We used this technology to anchor our first two pedestrian bridges in 2013. We were surprisingly impressed by this technology, particularly for its ease of installation and competitive pricing. I would compare the simplicity of this technology to that of the wood screw. We intend to use this technology for all of our marine applications."

Alexandre de la Chevrotière, CEO - MAADI Group Inc.

A COMPLETE SOLUTION
TECHNO METAL POST

HELICAL PILES

The Techno Metal Post helical pile is a giant metal screw that is installed by our company's certified technicians using proprietary hydraulic machinery. The pile is screwed into the ground until the desired bearing capacity is achieved. Bearing capacity is confirmed on-site using the installation machinery, and an in-situ load test, when required.

The Techno Metal Posts are manufactured using structural steel according to ASTM A500 grade C, CSA G40.21-44W and welded according to CWB W47.1 and W59. They can be hot-dipped galvanized according to ASTM A123. The piles have been load tested according to ASTM standards in a variety of soil types around the world. The piles are designed to resist the calculated axial, lateral, and bending moment loads. The use of the helix maximizes the load bearing capacity of soil.

CONNECTION SYSTEM

Different types of structures require different connection brackets. For post structures like decks, we offer adjustable height connectors for standard dimensional lumber sizes (4x4, 6x6, two plies, three plies). Techno Metal Post has also developed connection systems with integrated rebar for using helical piles to pin concrete foundations to deeply located load bearing soil.

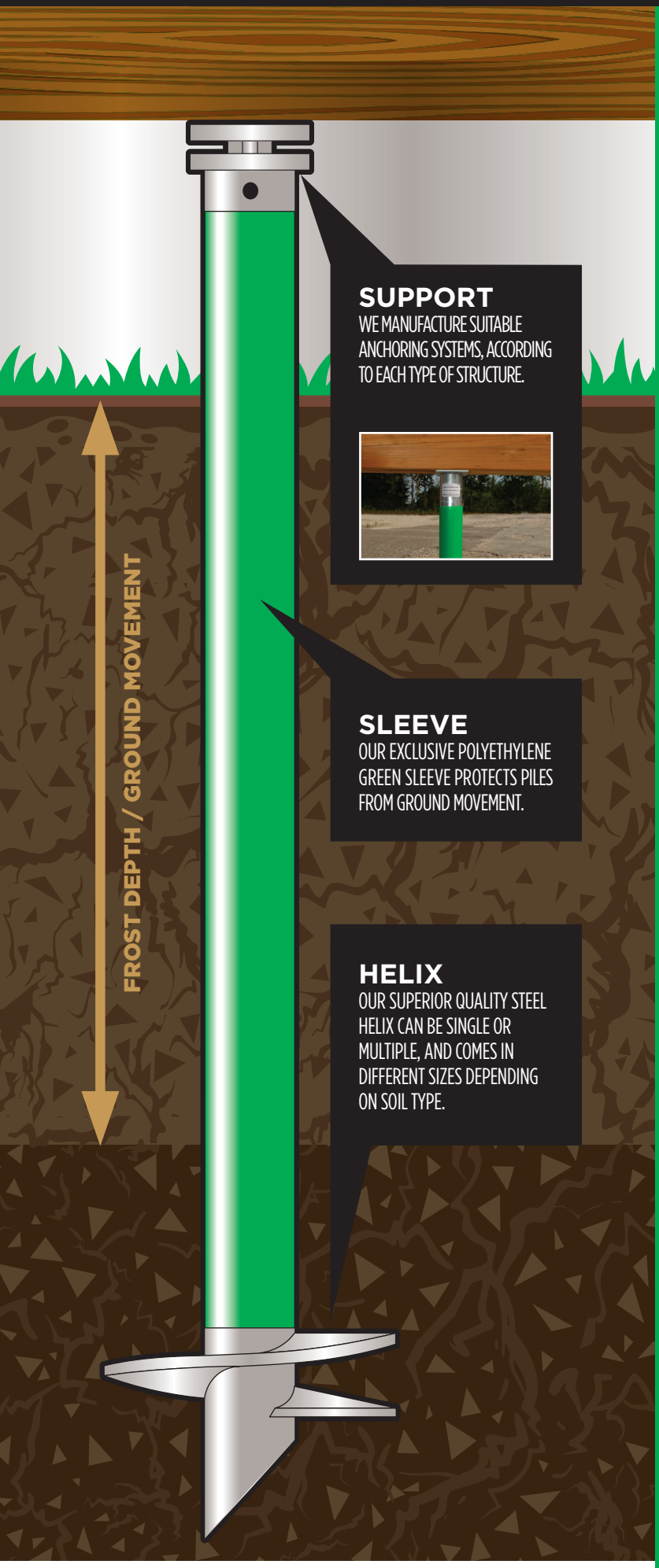
Techno Metal Post can also make custom brackets for special types of connections on request.

HIGH-DENSITY POLYETHYLENE SLEEVE

This sleeve is made of high-density polyethylene, and has been specially designed to surround the Techno Metal Post helical piles. The principle is simple and proven: the polyethylene sleeve slides along the helical pile, allowing the pile to remain stable despite movement caused by periods of freezing, thawing, or drought. Your structure built on a Techno Metal Post foundation will not budge. Guaranteed.

CORROSION PROTECTION SYSTEM

The galvanization already provides years of reliable long-term protection for TMP piles, but additional cathodic protection can ensure the integrity of the structure for an extended lifespan, if the application demands it. Techno Metal Post offers the installation of a cathodic protection system for deep pile installations.



OUR UNIQUE PRODUCT

Our helical piles are designed, engineered, and tested to ensure the highest quality and standards. This guarantees that they will support heavy loads in various soil conditions.

Our exclusive green sleeve is slid onto the pile during installation. Throughout the frost/thaw cycles, the sleeve slides along the pile following the soil movement. The pile will not move, ensuring the stability of the structure.

Our specialized machinery is created and built by a highly competent design team at our factory. Our unique, compact, and powerful machinery can access some of the most difficult areas, while ensuring Techno Metal Post's high-quality installation.

Our Engineering Department will review, analyze, and certify your projects. Our engineers determine which pile size is appropriate, depending on the structure, load requirements, and soil type.

Our proven technology is certified and recognized by industry authorities in many countries. Our quality and reliability are equally recognized by thousands of construction professionals, and customers, worldwide.

Our network of quality dealers is professionally trained and certified to install our Techno Metal Post System. Over the years, we have developed a skilled and trusted network of more than 150 dealers throughout the world.

SELECTION TABLE

techno Metal Post™

Model (Outside Diameter)	Project Type	Maximum Bearing Capacity								Lateral Capacity [6]		Factored Bending Resistance	
		Compression [1 2 4 5]				Tension [1 3 4]							
		SLS [7]		ULS [8]		SLS [7]		ULS [8]		SLS			
		(lb)	(kN)	(lb)	(kN)	(lb)	(kN)	(lb)	(kN)	(lb)	(kN)	(ft-lb)	(kN-m)
P1 48.3 mm (1.9 in)	**Light Residential** (deck without roof, stairs, etc.)	6,800	30	9,520	42	3,400	15	4,760	21	500	2.2	1,010	1.4
P2 60.3 mm (2.4 in)	**Medium Residential and Light Commercial** (deck, carport, sunroom, single-story residential addition, etc.)	11,000	49	15,400	69	5,500	24	7,700	34	1,000	4.4	1,785	2.4
P3 88.9 mm (3.5 in)	**Heavy Residential, Light to Medium Commercial and Industrial** (two-story residential addition, cottage, sign, carport, solar panel, new construction, underpinning, boardwalk, tie-back, etc.)	33,750	150	47,250	210	16,875	75	23,625	105	2,250	10	6,454	8.8
P4 101.6 mm (4 in)	**Heavy Residential, Light to Medium Commercial and Industrial** (cottage, sign, light post, solar panel, new construction, boardwalk, tie-back, bollard, etc.)	45,000	200	63,000	280	22,500	100	31,500	140	2,700	12	9,057	12.3
P3-HD 88.9 mm (3.5 in)	**Heavy Residential, Light to Heavy Commercial and Industrial** (new construction, underpinning, tie-back, etc.)	45,000	200	63,000	280	22,500	100	31,500	140	2,250	10	9,411	12.8
P4-HD 101.6 mm (4 in)	**Heavy Residential, Light to Heavy Commercial and Industrial** (new construction, retaining wall, tie-back, etc.)	50,625	225	70,875	315	25,313	113	35,438	158	2,700	12	13,165	17.9
P5 141.3 mm (5.6 in)	**Heavy Residential, Light to Heavy Commercial and Industrial** (cottage, sign, light post, new construction, boardwalk, solar panel, bollard, retaining wall, etc.)	50,625	225	70,875	315	25,313	113	35,438	158	4,500	20	21,507	29.2
P6 168.3 mm (6.6 in)	**Heavy Residential, Light to Heavy Commercial and Industrial** (sign, light post, new construction, solar panel, bollard, retaining wall, etc.)	50,625	225	70,875	315	25,313	113	35,438	158	5,625	25	33,876	45.9

1. The bearing capacity values in the selection table are an indication and must be validated on-site according to the soil conditions encountered and the driving torque attained during installation.
2. The compression load capacity (SLS) is determined by the driving torque which is provided by the installation equipment when installing the piles.
3. The tension load capacity is obtained according to the driving torque which is attained during installation and according to the penetration depth of the pile. For tension applications, contact the TMP Engineering Department.
4. The maximum compression/tension loads presented in the selection table to limit the settlement to 12 mm (1/2 inch).
5. When the helical pile is laterally unsupported (very loose/soft soil, liquifiable soil, water and wind), the structural strength of the pile must be approved by the TMP Engineering Department.
6. The lateral capacity values are just indicative. They are based on dense granular soil, a free head condition of the pile, an above-ground height of the piles of 150 mm (6 inches) and with the application of only a lateral load. For applications with lateral loads, contact the TMP Engineering Department.
7. The compression load capacity (SLS) values are based on a minimum safety factor of 2 on the ultimate geotechnical resistance.
8. Factored ultimate geotechnical resistance at ULS.

Comments:

- For all technical questions, please contact the TMP Engineering Department at 418 338-8735, or via email at eng@technometalpost.com
- Larger diameter Techno Metal Post piles can be used for applications requiring a lateral or bending resistance higher than shown in the selection table.

TECHNICAL SPECIFICATIONS
HELICAL PILES

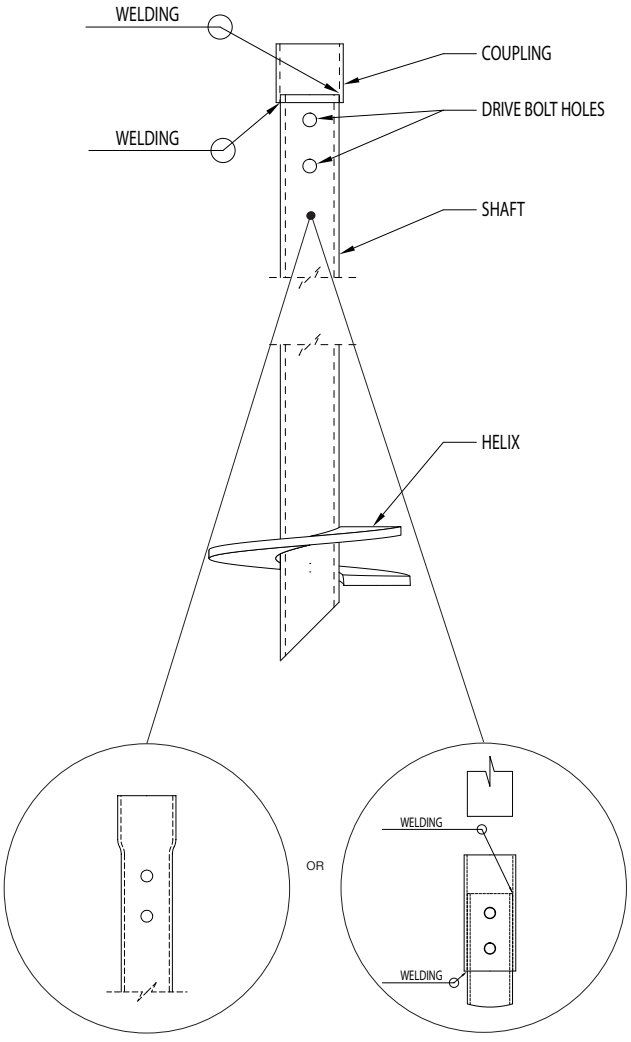
EXAMPLE: MODEL P3 - HSS 88.9 mm (3.5")

Techno Metal Post Model P3 is the helical pile which is commonly used for new construction and underpinning projects. This product is available in regular steel (5.5 mm [0.21"]) wall thickness. It is also available in different lengths (2.13 m [7'], 3.2 m [10.5'], or 4.27 m [14']) for regular steel, and different helix configurations, which are a function of soil conditions and project requirements.

Techno Metal Post makes many other pile models (P1 to P10), so other products may be more appropriate for your project. The variety of pile caps that are commonly used with the pile model P3 are shown on the next page. Techno Metal Post uses unique proprietary equipment for the installation of helical piles. We have 3 different types of equipment available, from the small lightweight machine for limited access areas or indoor projects, to the largest industrial machine for heavier jobs.

Components Specification	Standard Steel
Shaft and Extensions	Round HSS 88.9 mm (3.5") O.D. x 5.5 mm (0.216") wall thickness Standard: ASTM A500 Grade C - Circular steel section Fy=350 MPa (51 ksi min) Available in 2.13 m (7'), 3.2 m (10.5'), or 4.27 m (14') long sections
Helix	12.7 mm (0.5") thick / factory - welded helix Standard: CSA G40.21-44W - Steel 76 mm (3") pitch / available in 203.2 mm (8"), 254 mm (10"), or 304.8 mm (12") diameter Note: Other helix configurations could be considered with site-specific engineering. For multiple helical pile combinations, 2 or 3 helices are welded to the lead sections. The spacing between two consecutive helices along the shaft is 3 times the largest helix diameter.
Coupling	**Regular Coupling** Round HSS 101.6 mm (4") O.D. x 5.7 mm (0.226") wall thickness x 88.9 mm (3.5") long Fy=350 MPa (51 ksi min) **Expanded Coupling** Round HSS 101.6 mm (4") O.D. x 4.8 mm (0.188") wall thickness x 64 mm (2.5") long Fy=350 MPa (51 ksi min) **Reinforced Coupling** Round HSS 101.6 mm (4") O.D. x 5.7 mm (0.226") wall thickness x 228.6 mm (9") long Fy=350 MPa (51 ksi min) Coupling is welded onto shaft and extension, and installation torque validates field weld capacity. Bolted coupling available when welding is not possible.
Coating	Available with a hot dipped galvanization coating compliant with ASTM A123 or Bare steel
Additional Corrosion Protection	Cathodic Protection System available
Load Specifications	**Standard Steel**
Max. Ultimate Capacity	210 kN (47 250 lb)
Max. Allowable Capacity**	150 kN (33 750 lb)
CODE EVALUATION	
CCMC	CCMC (13059-R)

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

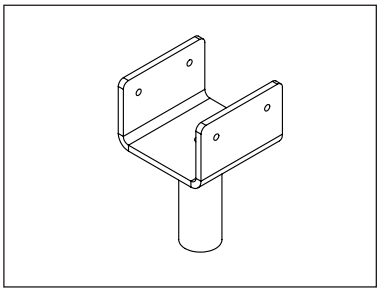


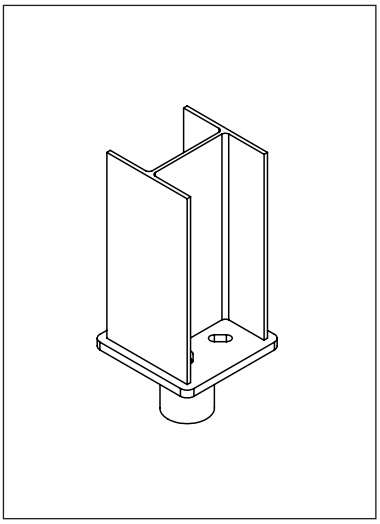
TECHNICAL SPECIFICATIONS

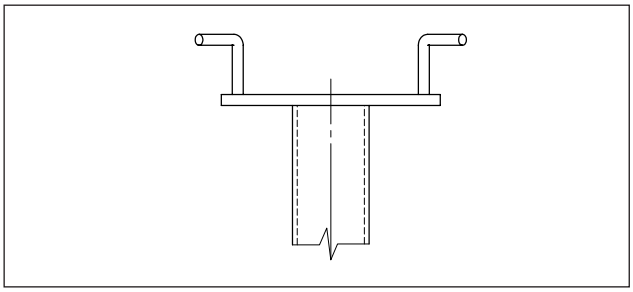
PILE CAPS

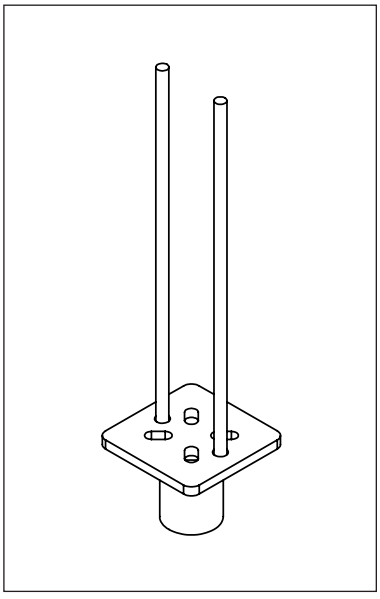
A variety of pile caps is available for connecting piles to the structures they support. We offer a range of current products as well as made-to-measure models that meet your needs. **Below are some examples:**

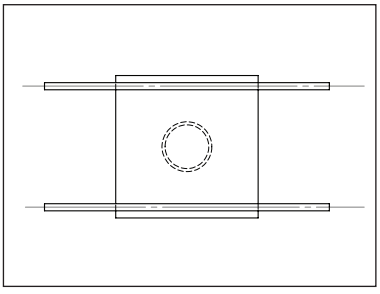
Component Specifications	
Steel	Standard: CSA G40.21-44W - Steel
Coating	Available with a hot dipped galvanization coating compliant with ASTM A123 or Bare steel
Additional Corrosion Protection	Cathodic Protection System available











INSTALLATION EQUIPMENT

Techno Metal Post mechanical engineers design and develop every piece of installation equipment that we offer. By ensuring the installation methods of each post, we can certify our product with 100% confidence. Each of our 3 proprietary installation machines offers unique size and power and we can assure there is an appropriate machine for every unique situation. Our objective is to incorporate your helical pile needs and vision, and to manufacture equipment that will help you meet your objectives.

SPECIFICATIONS

R2D

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

Weight:
1,653 lb (750 kg)

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

Mast rotation:
+/- 60°

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

Maximal allowable bearing capacity in compression per installed TMP helical pile:
110 kN / 25 000 lb

EM2

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

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

Maximal height of mast:
147" (3,733 mm)

Mast rotation:
360°

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

Maximal allowable bearing capacity in compression per installed TMP helical pile:
150 kN / 33 750 lb

ET1

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

Weight:
8,900 lb (4,037 kg)

Maximal height of mast:
180" (4,572 mm)

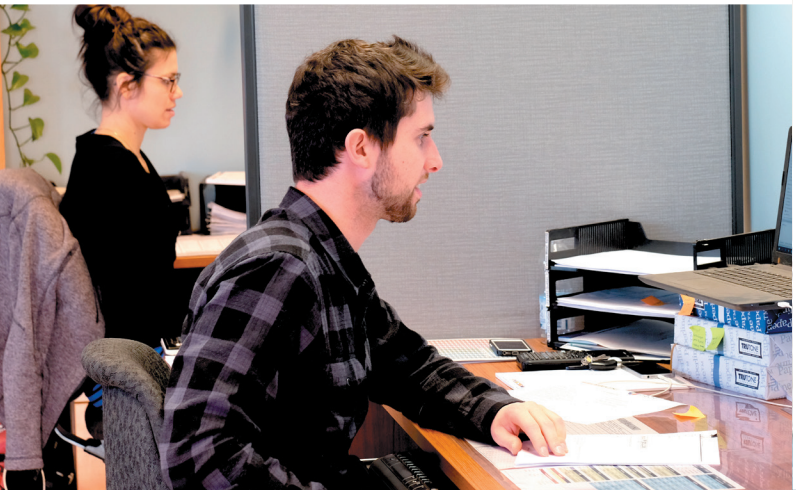
Mast rotation:
360°

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

Maximal allowable bearing capacity in compression per installed TMP helical pile:
225 kN / 50 000 lb

IN-HOUSE ENGINEERING SERVICE

Our **Engineering Team**, specialized in geotechnical and structural engineering, is here to assist and offer you personalized service – from small residential projects to large-scale industrial installations. Whenever you specify a helical pile foundation project, our engineers will focus on solution and will determine the proper helical piles to use for each of your projects. When the project is completed, they will issue a certificate and guarantee the work according to standards.



LOAD TESTING
PILES AND PILE CAPS

Our piles have been tested hundreds of times in different types of soils in Canada, the United States and Europe. At the customer's request, compression, tension and lateral loading tests can be carried out on the installed piles in order to confirm their bearing capacity.

Techno Metal Post helical piles are engineered and guaranteed.

CERTIFICATIONS

CANADA

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.

All certification documents are easily available on our corporate website, under **Professionals sections**, then **Certifications**, where you can find and read the full reports.

CCMC 13059-R
COMPLIED
National Building Code 2015

CANADIAN CONSTRUCTION MATERIALS CENTRE (CCMC)

EVALUATION REPORT CCMC 13059-R

In 2002 (and renewed in 2018), Techno Metal Post received certification from the Canadian Construction Materials Centre (CCMC) attesting that Techno Pieux/Techno Metal Post products comply with the requirements of the **National Building Code of Canada (NBC)**.

ISO 9001 : 2015
CWB
cwbregistration
REGISTERED

ISO 9001:2015

ISO 9001:2015 specifies requirements for a quality management system when an organization:

a) needs to demonstrate its ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements, and

b) aims to enhance customer satisfaction through the effective application of the system, including processes for improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements.

CERTIFICATIONS AROUND THE WORLD

AC 358 Approved
ESR-3418

U.S.A.: Techno Metal Post received an evaluation report **(ESR-3418)** from the **International Code Council Evaluation Service (ICC-ES)**, the equivalent of the CCMC in Canada and the CCFAT in France.

IAPMO UES ER-481

U.S.A.: As of 2018, Techno Metal Post is the first helical pile company in the world to receive approval from the **Association of Plumbing and Mechanical Officers (IAPMO) ER-481**.

AVIS TECHNIQUE
N°3.3/16-873_V1

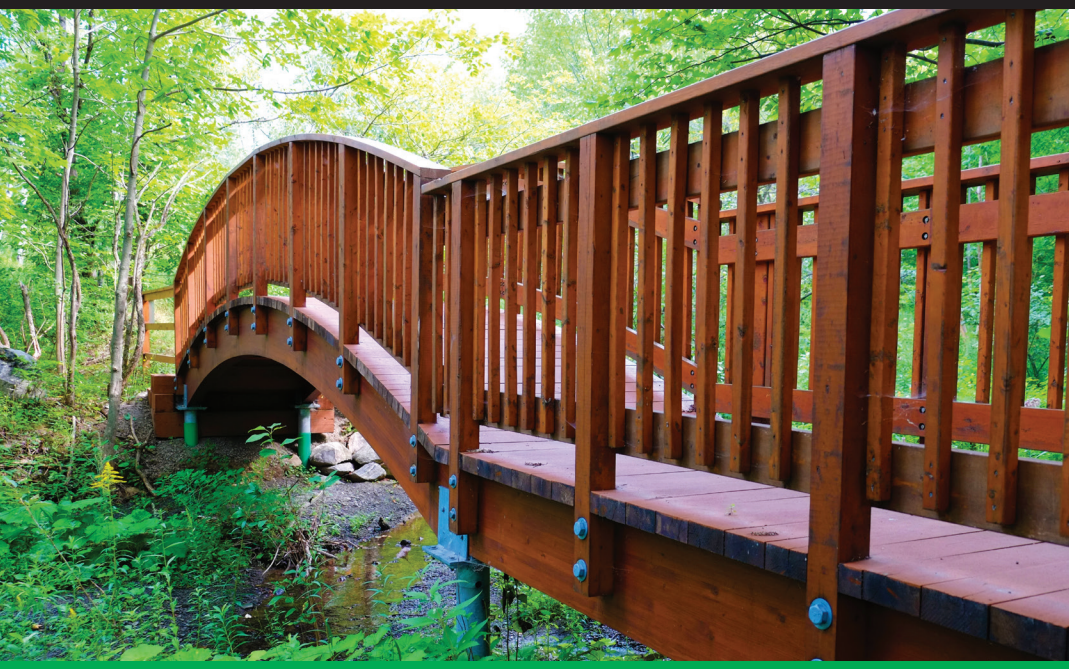
France: In 2006, Techno Metal Post's technology was the first to be granted **technical approval #3/16 873_V1** by the **Commission Chargée de Formuler des Avis Techniques (CCFAT)**.

0086-CPR-654774

Europe: Techno Metal Post has received the certification which confirms its products fulfill all the prescribed requirements for the **European Norm EN 1090-1:2009 + A1:2011**, including **Execution Class 2 in EN 1090-2**.

CERTIFICATE 18/5477

U.K.: Techno Metal Post was the first helical pile company to receive **BBA Approval Inspection Testing Certification (Certificate 18/5477)**, which is recognized in the United Kingdom by building control offices, government ministries, architects, specifiers and industry insurers.



FOOTBRIDGES / TRAILS / BOARDWALKS

SOIL DECONTAMINATION

MONUMENTS

HOUSE FOUNDATION

MODULAR HOMES

PIPELINES

UNDERPINNING

SIGNS

SHADE STRUCTURES

RAFT SLAB

PARKING AREAS

STAIRS

BOARDWALKS

BUILDINGS

SHEAR WALL SEISMIC REINFORCEMENT

SEASONAL DOMES

techno Metal Post™

UP TO 225 kN PER INSTALLED PILE

MAXIMAL ALLOWABLE BEARING CAPACITY IN COMPRESSION

techno Metal Post™

AN EXPERIENCED AND RELIABLE NETWORK OF MORE THAN 150 DEALERS THROUGHOUT THE WORLD.

www.technometalpost.com