

LUNCH & LEARN ENGINEERING PRESENTATION



Presenter
James Buzzell
Technical Specialist

## AGENDA

- Meet GoliathTech manufacturer and installer of helical piles
- What is a helical pile?
- History of helical piles
- Installation
- Advantages of helical piles
- Applications

Question period

# WHO IS GOLIATHTECH?



Manufacturer and installer of helical piles



More than 150 operating franchise units across the world



World leader in Helical Piles

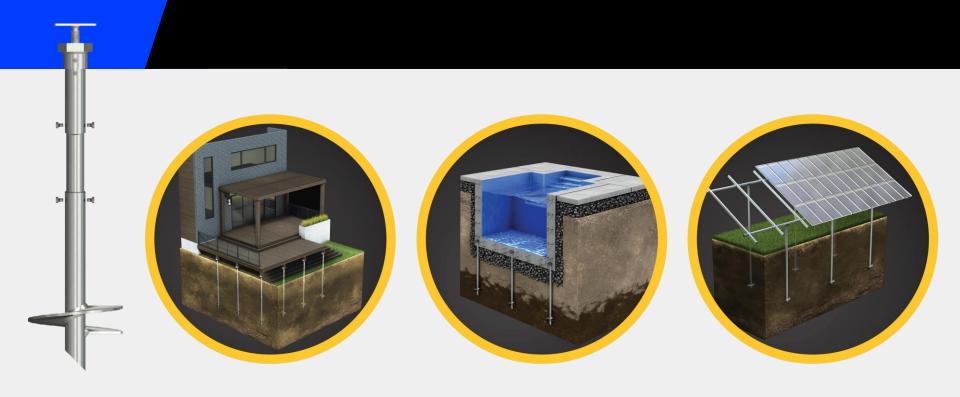


Many certifications / awards

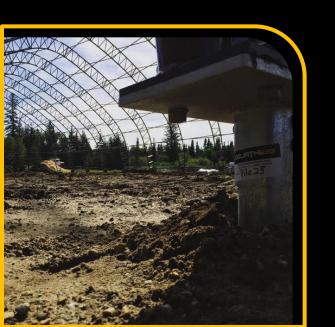


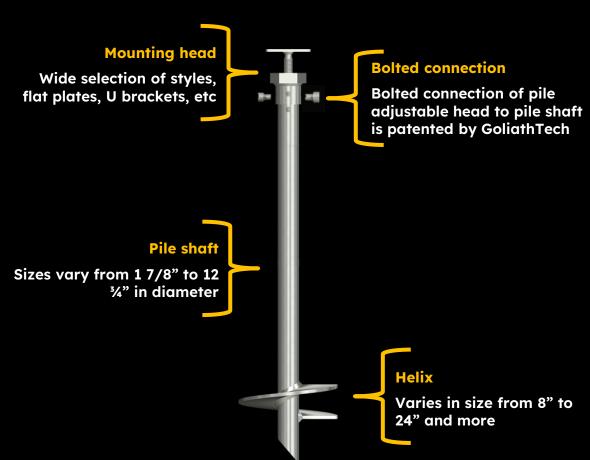
## What is a

## **HELICAL PILE?**



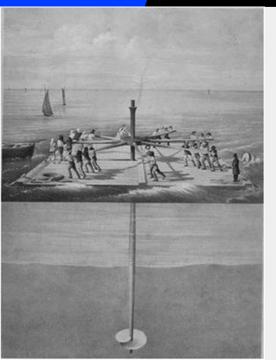
# WHAT IS A HELICAL PILE?





### **HISTORY OF**

## HELICAL PILES

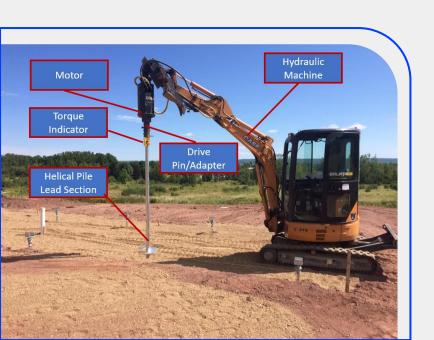


- The earliest recorded use of helical piles can be dated back almost two centuries ago
- Alexander Mitchell : 1836, civil engineer from Ireland
- Lighthouses
- Installation by hand
- Their popularity
- Helical Piles: A Practical Guide to Design and Installation by Howard A. Perko



#### WHAT IS THE

## **INSTALLATION PROCESS**



## Insatallation Equipment

- Mini excavator / skid steer / backhoe
- Calibrated hydraulic anchor drive head
- Torque reading device (TorqPin/TorqHub/PSI Gauge)
- Pile adaptors and pins
- Laser levels and other tools

#### WHAT IS THE

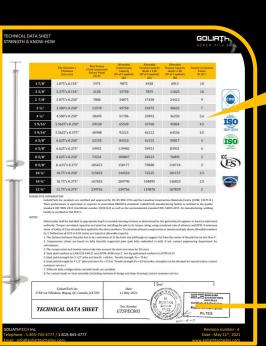
## **INSTALLATION PROCESS**

## **Technical aspects**

- Choose the right pile size
- Pile capacities
- Correlation between installation torque and pile capacity
- Installation logs
- Stamped conformity reports



# STAMPED TECHNICAL SHEETS



	Pile Diameter x Thickness (in) x (in)	Max Torque (Tube Connection Failure Point) (lb-ft)	Allowable Compression Capacity (SF of 2 applied) (lb)	Allowable Tension Capacity depth ≤ 14ft (SF of 2 applied) (lb)	Allowable Tension Capacity depth >14ft (SF of 2 applied) (lb)	Torque Correlation Factor Kt (ft <sup>-1</sup> )
1 7/8"	1.875"x 0.154"	1975	9875	4938	6913	10
2 3/8"	2.375"x 0.154"	3150	15750	7875	11025	10
2 7/8"	2 875"x 0.250"	7800	34875	17438	24413	9
3 ½"	3.500"x 0.250"	12570	43750	21875	30625	7
4 ½"	4.500"x 0.250"	18495	51786	25893	36250	5.6
5 9/16"	5.5625"x 0.250"	29120	65520	32760	45864	4.5
5 9/16"	5.5625"x 0.375"	40988	92223	46112	64556	4.5
6 5/8"	6.625"x 0.250"	42155	84310	42155	59017	4
6 5/8"	6.625"x 0.375"	59951	119902	59951	83931	4
8 5/8"	8.625"x 0.250"	73231	109847	54923	76893	3
8 5/8"	8. 625"x 0.375"	105451	158177	79088	110724	3
10 ¾"	10.75"x 0.250"	115832	144510	72225	101157	2.5
10 ¾"	10.75"x 0.375"	167832	209790	104895	146853	2.5
12 ¾"	12.75"x 0.375"	239756	239756	119878	167829	2



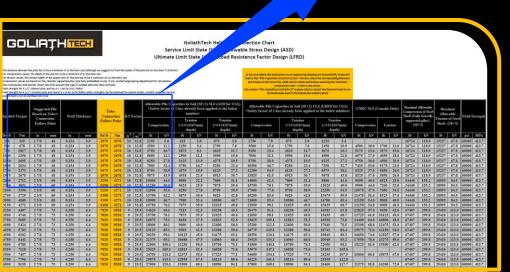
Other technical sheets can be found on our website:

https://www.goliathtechpiles.com/specificationsheets

# GOLIATHTECH SELECTION CHART

\*Safety factor of 2 has already been applied to the below Suggested Pile Tube numbers Based on Tube's **Applied Torque** Wall Thickness Connection KT Factor Connection Tension Tension Failure Point Failure Point (>14'(4267mm) Compression (<14'(4267mm) depth) depth) ft-1 m-1 kNNmin in lbf-ft kNlb  $\mathbf{m}\mathbf{m}$  $\mathbf{m}\mathbf{m}$ 250 339 10 | 32.8 1250 625 2.8 875 1 7/8 48 0.154 3.9 1975 5.6 3.9 500 678 1 7/8 48 0.154 3.9 1975 10 32.8 2500 11.1 1250 5.6 1750 7.8 1017 1 7/8 1975 10 32.8 16.7 8.3 2625 0.154 3.9 1875 11.7 1356 10 32.8 22.2 1000 1 7/8 48 0.154 3.9 1975 5000 2500 11.1 3500 15.6 1250 1695 1 7/8 48 0.154 3.9 1975 10 32.8 6250 27.8 3125 13.9 4375 19.5 1500 2034 2678 10 32.8 3750 16.7 5250 23.4 1 7/8 48 0.154 3.9 1975 7500 33.4 1750 2373 1 7/8 48 0.154 3.9 1975 10 | 32.8 8750 38.9 4375 19.5 6125 27.2 1975 2678 1 7/8 48 0.154 3.9 10 32.8 9875 43.9 4938 22.0 30.7 6913 2000 2712 2 3/8 60 0.154 3.9 3150 4271 10 32.8 10000 44.5 5000 22.2 7000 31.1 2250 3051 2 3/8 0.154 3.9 10 32.8 11250 50.0 5625 25.0 7875 35.0 60 3150 3390 2 3/8 60 0.154 3.9 3150 10 32.8 12500 55.6 6250 27.8 8750 38.9 2750 3729 2 3/8 60 0.154 3.9 3150 10 32.8 13750 61.2 6875 30.6 9625 42.8 4068 2 3/8 0.154 10 32.8 15000 66.7 7500 33.4 10500 3.9 4271 32.8 15750 35.0 49.0 3150 2 3/8 60 0.1543.9 10 70.1 7875 11025

Allowable Pile Capacities in Soil (SF=2) SLS (ASD for USA)



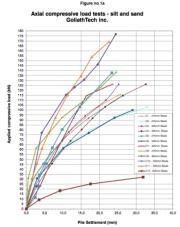
# HELICAL PILE TESTING

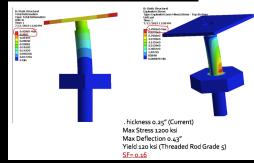




### TECHNICAL EVALUATION REPORT

Master format : 31 62 16.01
August 2018





# WHAT ARE THE

## **ADVANTAGES OF HELICAL PILES**



No excavation



**Year-round installation** 



Suitable in all soil conditions



Removable and reusable



**Rapid installation** 



30 year product warranty



Ideal for restricted spaces



Minimal impact to the landscape

#### **RESIDENTIAL**



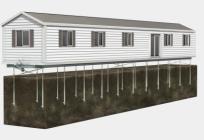
**Concrete reinforcement** 



**Exterior stairs** 



Garage



Modular and manufactured homes



**Homes and buildings** 



Mailboxes



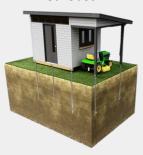
**Fences** 



Home additions

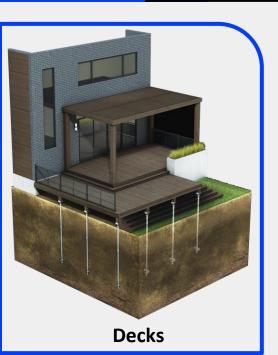


Gazebos



**Sheds** 

### **RESIDENTIAL**













**Balconies** 



Carports



**Cottages and cabins** 



**Docks and boathouses** 

### COMMERCIAL/ AGRICULTURAL



Lamp posts



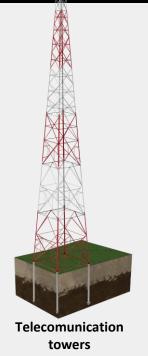
**Railways** 



**Agricultural tents** 



Parks and schools





Wind turbines

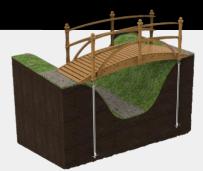
#### COMMERCIAL/ AGRICULTURAL



**Solar panels** 



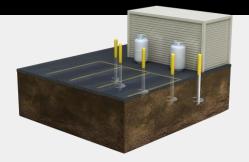
**Electric charging stations** 



Boardwalks, Bridges, and Footbridges



Containers



**Bollards and Guardrails** 



**Retaining walls** 



Signage and Billboards



Warehouses







### **APPLICATION**

## **UNDERPINNING**





Why

## GOLIATHTECH

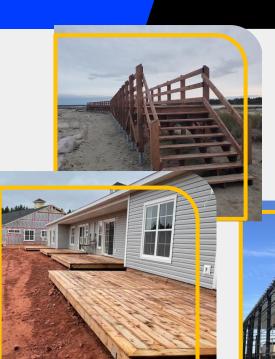












- High quality steel
- Certified installers
- Installation reports
- Certifications
- Engineered connection point (pile head)
- Custom made products/pile heads available
- Pile size for every project or application
- Pile tests
- Fully galvanized helical piles and accessories

### **COMPLIANCE**

## WITH BUILDING CODE

#### GOLIATHTECH SCREW PILE SYSTEM STRENGTH & KNOW-HOW **Building Code Ontario**, When is Uplift Resistance GoliathTech Piles Non-conforming Reg 332/12, Under legally required? alternatives **Building Code Act 1992** the structure is more than 600mm (24 inches) off the ground the Ontario Building Code requires uplift resistance If a structure (for example a terrace) is attached to a home, the Ontario Building Code requires uplift resistance If a structure has a roof, the Ontario Building Code requires uplift resistance If a structure has more than an area of 55 square meters of surface the Ontario Building Code requires uplift resistance If the structure is more than one storey. the Ontario Building Code requires uplift If a structure is more than 4.3 meters (15 Feet) wide, the Ontario Building Code and CSA Z240.10.1 requires uplift All building frames must be anchored to the foundation unless a structural analysis of wind and earthquake pressures shows anchorage is not required





#### **UPLIFT RESISTANCE REQUIREMENTS**

#### BASED ON THE ONTARIO BUILDING CODE WHICH INCORPORATES REQUIREMENTS OF THE 2010 CANADIAN NATIONAL BUILDING CODE

#### 9.23.6. Anchorage

#### 9.23.6.1. Anchorage of Building Frames

- 1) Building frames shall be anchored to the foundation unless a structural analysis of wind and earthquake pressures shows anchorage is not
- 2) Except as provided in Article 9.23.6.3 anchorage shall be provided by
- a) embedding the ends of the first floor joists in
- b) fastening the sill plate to the foundation with not less than 12.7 mm diameter anchor bolts spaced not more than 2.4 m o.c.
- 3) Anchor bolts referred to in Sentences (2) to (4) shall be fastened to the sill plate with nuts and washers and embedded not less than 100 mm in the foundation and so designed that they may be tightened without withdrawing them from the foundation.

#### 9.23.6.2. Anchorage of Columns and Posts

- (1) Except as provided in Sentences (2) and (3), exterior columns and posts shall be anchored to resist uplift and lateral movement.
- (2) Except as provided in Sentence (3), where columns or posts support balconies, decks, verandas and other exterior platforms, and the columns or posts extend not more than 600 mm above finished ground level, the supported joists or beams shall be,
- (a) anchored to a foundation to resist uplift and lateral movement, or

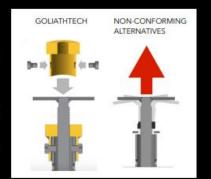
- (b) directly anchored to the ground to resist uplift.
- (3) Anchorage is not required for platforms described in Sentence (2) that,

SCREW PILE SYSTEM STRENGTH & KNOW-HOW

- (a) are not more than 1 storey,
- (b) are not more than 55 m2 in area.
- (c) do not support a roof,
- (d) are not attached to another structure, unless it can be demonstrated that differential movement will not adversely affect the performance of that structure.

#### 9.23.6.3. Anchorage of Smaller Buildings

1) Buildings not more than 4.3 m wide and not more than 1 storey in building height that are not anchored in accordance with Sentence 9.23.6.1.(1) shall be anchored in conformance with the requirements of CSA Z240.10.1, "Site Preparation. Foundation, and Anchorage of Manufactured Homes.



#### WHY

## A FRANCHISE BASED SYSTEM?

Lisa Franchisee since April 2015 Minnesota, USA



Maxwell
Franchisee since December 2015
Vermont, USA



Darci Franchisee since June 2018



- Control over uniformity of installations and quality of work
- Obligatory training program for all franchisees
- Installation logs and conformity reports
- All franchisees have access to internal engineering department

# QUESTION & ANSWER









