

**NOTES:**

Blue information = notes for you, which you can delete before printing.

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For assistance call 800.789.4810 or email us at info@idl-grp.com

**STANDARD TECHNICAL SPECIFICATIONS**

HELICAL PILES FOR NEW CONSTRUCTION

 Helical piles and related hardware by Ideal Manufacturing, Inc.

 999 Picture Parkway, Webster, NY 14580 1-800-789-4810

Each helical pile shall have a steel shaft with an outside diameter of at least \_\_\_\_\_ inches, and a wall thickness of at least \_\_\_\_\_ inches. Steel shall be Grade \_\_\_\_\_.

Each pile shall have \_\_\_\_\_ helices. From the bottom upward, the helix diameters shall be \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ inches. The thickness of each steel helix shall be at least \_\_\_\_\_ inch. Steel shall be Grade \_\_\_\_\_.

Helical piles shall be installed at the locations shown on the accompanying drawing. The deviation of the top of each pile from the design location shall not exceed \_\_\_\_\_ inches.

Each pile shaft shall be inclined at an angle of zero to 4 degrees from vertical.

All piles shall be advanced into stable natural soil or rock, below any compressible materials. Based on the available subsurface information, each pile should be advanced to or below Elevation \_\_\_\_\_ feet.

Each pile shall be installed using a combination of torque and downward force. The minimum final torque shall be \_\_\_\_\_ foot-pounds. The maximum torque shall be \_\_\_\_\_ foot-pounds.

Each pile shall achieve an ultimate capacity of at least \_\_\_\_\_ pounds, and an allowable working capacity of at least \_\_\_\_\_ pounds.

The top of each pile shaft shall be equipped with a snug-fitting load-distribution bracket. The bracket shall include a horizontal steel plate having a thickness of at least \_\_\_\_\_ inch. The plate shall be round, square or rectangular in plan view, shall have a minimum width of \_\_\_\_\_ inches, and shall have a top area of at least \_\_\_\_\_ square inches. The deviation of the top of each plate from the design elevation shall not exceed \_\_\_\_\_ inches.

Each pile installation shall be recorded including pile number, shaft size, helix diameter and thickness, total pile length, torque readings during installation, and description of unusual occurrences.

END

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**COMPREHENSIVE TECHNICAL SPECIFICATIONS**

**SECTION ( ) - HELICAL PILES/ANCHORS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

A. Section Includes

 1. Helical Piles/Anchors consist of one or more helically shaped steel plates attached to a central

steel shaft. Extend piles by adding shaft extensions.

 2. Helical piles and related hardware by: Ideal Manufacturing, Inc.

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B. Related Sections

 1. Section \_\_\_\_\_\_\_ - Earthwork

 2. Section \_\_\_\_\_\_\_ - Structural Concrete

**1.02 REFERENCES**

A. Conform to applicable requirements of the Building Code of \_\_\_\_\_\_\_ and applicable requirements of other

 referenced documents.

B. References include documents from:

 1. ACI - American Concrete Institute- ACI 301 - "Specifications for Structural Concrete for Buildings"

 2. API - American Petroleum Institute

 3. ASTM - American Society for Testing and Materials

 a. ASTM A29/A 29M - "Steel Bars, Carbon and Alloy, Hot-Wrought and Cold Finished"

 b. ASTM A53 - "Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless"

 c. ASTM 123- “Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products”

 d. ASTM A153 - "Zinc Coating (Hot-Dip) on Iron and Steel Hardware"

e. ASTM SAE J429 - "Mechanical and Material Requirements for Externally Threaded Fasteners"

 e. ASTM A572 - "Latest Revision, HSLA Columbian-Vanadium Steels of Structural Quality"

 f. ASTM A607 - "Steel, Shaft and Strip, High-Strength, Low-Alloy Chromium or Vanadium,

 for Both, Hot-Rolled and Cold-Rolled"

 4. AWS - American Welding Society- AWS D1.1 “Structural Welding Code- Steel”

 5. PTI - Post Tensioning Institute

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**1.03 SYSTEM DESCRIPTION**

A. Furnish all labor, materials, equipment and services for the design (including design submittals) and installation

 of all helical piles, in accordance with Drawings and Specification, including cut-offs and Load Transfer Device

 installation.

B. Design helical pile system to support loads as indicated on Drawings and outline in this Section. Submit helical

 pile design calculations and other pertinent data for approval as specified in Submittals below.

 1. Obtain Architect's approval of design calculations and drawings before commencing pile installation.

 Approval of submittals does not relieve Contractor of responsibility for performing the pile installation

 in accordance with Contract Documents.

**1.04 SUBMITTALS**

A. Comply with requirements of Section \_\_\_\_\_\_\_\_

B. Pre-Installation Submittals: Submit following items for approval not less than 14 days prior to commencing

 pile installation.

 1. Delegated Design Data - Submit following data, sealed by Professional Engineer registered in \_\_\_\_\_\_\_:

 a. Calculations for pile design capacities

 b. Shop drawings showing pile shaft diameters, helical plate data, length, and other pertinent data.

 c. Details of installation sequence and equipment to be used in pile construction

 d. Sample copies of daily pile reports/field reports to be used

C. Construction Submittals: Submit following items on regular and timely basis:

 1. Record of daily pile installation

D. Post-Installation Submittals: Submit following items upon completion of pile installation:

 1. Record drawings showing location of piles as specified in Part 3 - Field Quality Control

E. Quality Control Submittals

 1. Qualifications Certification: Submit written certification or similar documentation signed by applicable

 subcontractor, Prime Contractor and manufacturer (where applicable) indicating compliance with

 applicable "Qualifications" requirements specified below in "Quality Assurance" section.

 2. Installer Experience Listing: Submit list of completed projects using products proposed for this project,

 including owner's contact and telephone number for each project, demonstrating compliance with

 applicable "Qualifications" requirements specified in "Quality Assurance" article.

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**1.05 QUALITY ASSURANCE**

A. Qualifications

 1. Installer: Certified Installer (Certified by Helical Pile Manufacturer), with a minimum 5 years experience

 in type of design and construction specified in this Section and able to demonstrate sufficient competent

 personnel to complete specified construction. Capable of providing job superintendent or foreman with

 at least 5 years construction experience in construction specified in this Section and ensuring such

 supervision will be present at Site during pile construction.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURERS**

A. For convenience, details and specifications have been based on the following specified product/manufacturer:

 [See products to fill this section.

 Example: Ideal Foundation Systems Product 278 High Torque, 2.875 O.D. Central Shaft with a

 12" O.D. x 1/2" thick helix as manufactured by Ideal Manufacturing, Inc.]

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**2.02 MATERIALS**

A. Helical Plate:

 1. Cold Rolled A572

B. Pile/Anchor Shaft:

 [See table in section 4, page A.1 in Products to fill this section.

 Example: API 5CT J55 Structural Grade]

 1. Lead section of shaft to be minimum \_\_\_\_\_ in length

C. Steel Pile Cap:

 1. Plate ASTM A572

 2. Pipe: API 5CT J55 Structural Grade or XT80

*Optional*

*D. Helical piles, extensions, caps, and appurtenances are to be hot-dipped galvanized steel in accordance with*

 *ASTM A123/A153.*

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**PART 3 - EXECUTION**

**3.01 EXAMINATION**

A. Verification of Conditions: Examine conditions under which piles are to be installed in coordination with Installer

 of materials and components specified in this Section and notify affected Prime Contractors and Architect in

 writing of any conditions detrimental to proper and timely installation. Do not proceed with installation until

 unsatisfactory conditions have been corrected in a manner acceptable to Installer.

 1. When Installer confirms conditions as acceptable to ensure proper and timely installation and to

 ensure requirements for applicable warranty or guarantee can be satisfied, submit to Architect written

 confirmation from applicable Installer. Failure to submit written confirmation and subsequent installation

 will be assumed to indicate conditions are acceptable to Installer.

 *Optional - May be another party responsible for this item*

**3.02 PREPARATION**

A. Employ licensed land surveyor or registered professional engineer to establish all lines and grades required

 for pile installation.

**3.03 INSTALLATION**

A. Pile Installation:

 1. Provide installation equipment capable of installing pile of required minimum diameter to design depth

 and required minimum torque.

 2. Position helical pile in accordance with the contract documents.

 3. Use only manufacturer-approved connectors, adapter and accessories.

 4. All welding to be by certified welders in accordance with AWS D1.1- “Structural Welding Code- Steel”

 5. Provide torque monitoring device as part of the installing unit. Monitor and record torque applied during

 the installation of each pile.

 6. Remove encountered obstructions, or relocate helical piles as required. Relocation of helical pile must be

 approved by A/E. Obstructions and relocations shall be considered "extra work."

**3.04 FIELD QUALITY CONTROL** *may be same contractor as item 3.02*

A. Survey of Piles (Record Drawings) - Prime Contractor

 1. Testing and survey work required to establish pile locations and elevations. Record drawings and

 other ancillary operations required for completion of pile installation.

 2. Accurately locate each pile by means of survey performed by licensed surveyor or registered professional

 engineer. Record survey data with other required information on reproducible drawing.

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 3. Include following information on record drawings:

 a. Each pile identified by separate number

 b. Angle of pile installation

 c. Elevation of each pile top

 d. Plan location of each pile

 e. Deviation from plan location in inches, measured to nearest 1/4 inch

 f. Torque reading for the last three feet of elevation

 g. Description of lead section and extensions installed

 h. Helical plate size and shaft size

 4. Furnish prints of record drawings to Architect at completion of pile installation.

B. Tolerances and Criteria for Acceptance

 1. Minimum torque of \_\_\_\_\_ foot-pounds, with a minimum depth of \_\_\_\_\_ feet

 2. Install piles as close as practical to design location. Do not exceed \_\_\_\_\_ inches lateral deviation

 from center of pile design location.

 3. Piles improperly installed because of mislocation, misalignment, or failure to meet other specified

 design/installation criteria are not acceptable. Abandon rejected piles and install additional piles

 as required.

C. Pile Installer Records - Maintain daily record (using Ideal Pile Installation Record, attached) of all data pertinent

 to installation of piles, including the following:

 1. Pile number

 2. Date of installation

 3. Helical plate diameter

 4. Pier shaft size

 5. Pile length

 6. Torque readings during installation

 7. Description of any unusual occurrences during pile construction

D. Load Tests - Requirements

 1. Provide compression pile load tests by Pile Installer in accordance with ASTM Load Test Specifications.

 At each location, test a minimum of \_\_\_\_\_ pile(s).

 2. Load test piles incrementally to \_\_\_\_\_ times design load with deflection measured at each addition

 of load.

3. Submit detailed drawings, design data and installation procedures for approval 14 days prior to initiation of pile installation.

4. Furnish and install complete load test system including jacks, reaction beam, dial indicators, reference beams, test enclosure, and all other equipment, materials and labor that will satisfactorily perform required pile load test.

5. Test piles, if successfully tested and properly located, \_will/will not\_ be accepted as permanent and may be left in place.

E. Quality Control/Inspection:

 1. Owner's Geotechnical Engineer or representative is to observe all pile installations and load tests.

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3.17 End of Section