Department of Design and Construction	SPECIFICATION BULLETIN	SB 25-001

Title: **HELICAL PILES (GROUT-FILLED CORE)**

Prepared:	Approved:
6/4/2025	6/4/2025
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APPLICABILITY:

- This Specification Bulletin (SB) is effective for projects advertised on or after 6/13/2025.

SUPERSEDENCE:

- This SB supersedes the following SBs: **None.**

ATTACHMENTS:

1. *Section 70.14 (10 pages)*

REVISIONS TO THE NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION STANDARD SEWER AND WATER SPECIFICATIONS, DATED 8/8/2022:

All references contained below are to the New York City Department of Environmental Protection Standard Sewer and Water Specifications, Dated August 8, 2022. Said Standard Specifications are hereby revised as follows:

a) **Refer** to Section 70.14 Helical Piles
Add the new Section in Attachment 1 (10 pages)

For questions regarding this bulletin, please contact Richard Jones, jonesri@ddc.nyc.gov.

SECTION 70.14 – HELICAL PILES (GROUT-FILLED CORE)

70.14.1 DESCRIPTION

(A) This section covers additional requirements and specifications for the installation of helical piles, as shown on the contract documents and as directed by the Engineer. A helical pile must consist of three (3) or more steel helical bearing plates (helices) attached to a central steel shaft. Piles are extended by adding shaft extensions. Lead shaft must have a minimum of three (3) helices. The subsequent shaft extensions after the lead shaft may have additional helices. This section must be used in conjunction with the requirements of **Section 70.11 – Piles**.

The work consists of furnishing all necessary labor, materials, and equipment to perform the work necessary to install permanent helical piles as per the specifications described herein and as shown on the contract documents.

No additional payment will be made for the use of different equipment as deemed necessary to complete the work as described herein. All costs, with the exception of all load test costs, must be deemed included in the price bid for Item No. 70.14HN - HELICAL PILES (GROUT-FILLED CORE). All load test costs must be deemed included in the price bid for Item No. 70.14HT - HELICAL PILES, LOAD TEST.

(B) Examination Of The Site:

(1) Prior to starting pile installations, the Contractor must make a documented inspection of the existing site conditions, adjacent structures, utilities, pavement, and improvements of the adjacent properties within the radius of influence (25 feet) of each pile installation to examine and record their existing conditions.

The Contractor must prepare a preconstruction condition documentation report of the adjacent properties within the radius of influence in accordance with **Section 76.11 – Construction Report**.

(2) The Contractor must fully examine the existing conditions within the project limits to ensure that the contractor's equipment can operate without damage to or relocating of the existing infrastructures, facilities, or structures. The Contractor must provide all required equipment, modified if needed to accommodate site conditions, including restricted headroom, under and above ground utilities, and other site constraints and limitations. The Contractor must review the boring logs to understand subsurface conditions. The Contractor must review the subsurface soil conditions to meet the requirements of **Subsection 70.14.1(C)**.

(3) The Contractor is required to prepare a report of all such conditions, verified by the photographs and signed and sealed the report by the Contractor's Professional Engineer licensed in New York State, which must be reviewed by the Engineer to verify the existing site conditions and all pre-existing damages that could be affected by the helical pile work. Such work must be included in the preconstruction condition documentation report.

(C) Subsurface Soil Condition:

Helical piles must be installed in subsurface soil that meet all of the requirements specified in Table 70.14.1.1.

Table 70.14.1.1:
Requirements of subsurface soil for installing helical piles

Property	Requirement		Test Method
	Minimum	Maximum	
Soil Resistivity	1,000 Ω-cm		ASTM G57
Soil pH	5.5	9.0	ASTM G51
Sulfates		0.10% (1,000 PPM)	ASTM C1580
Organic Content		1.00% (10,000 PPM)	ASTM D2974
Chlorides		0.01% (100 PPM)	ASTM D4327
Landfills	Not located in landfills		
Mine Waste	No mine waste in soil		

Tests must be performed by taking soil samples from each soil layer for the aforementioned properties. The Contractor is responsible to verify soil tests to ensure the subsurface soil conditions meet the aforementioned criteria. Soil samples must be taken five (5) feet above and below pile cutoff elevation.

(D) Buckling Analysis:

Soil classification must be based on materials disclosed by borings, test pits, or other subsurface exploration methods. Soil classifications must be in accordance with the definitions within ASTM D2487 (Unified Soil Classification System). Laboratory tests must be conducted to ascertain these classifications, where deemed necessary by the Engineer.

Coarse-grained soil classifications (gravels with fines, clean sands, and sands with fines) having a value of N_{60} less than 10 blows per 1-foot (0.3 meter) and inorganic fine-grained soil classifications (lean clay and fat clay) having a value of N_{60} less than 4 blows per 1-foot (0.3 meter), for more than five (5) feet vertical depth, must be considered nominally unsatisfactory bearing materials.

When helical pile shafts are embedded in soils classified as nominally unsatisfactory bearing materials, a buckling analysis must be performed by a recognized method. The allowable axial compressive load must not be more than two-thirds (2/3) of the calculated load-causing buckling. The additional bending moments due to bracket assemblies, structural eccentric forces, and coupling rigidity must be appropriately included in the buckling analysis. Soils with a liquefaction risk factor of safety less than 1.0 or soils with a blow count of weight of rod (WOR) must be considered fluid (i.e. no strength). Buckling analysis must use an unbraced length of ten (10) feet in unsatisfactory bearing materials plus the depth of fluid soils, if any.

Buckling analysis is in addition to, and not in lieu of, the aforementioned subsurface soil requirements for installing helical piles. The result of buckling analysis neither supersedes nor overrides the results of the aforementioned subsurface soil requirements, and vice versa.

(E) Qualifications:

The work must be performed by the Contractor, or a subcontractor experienced in installing a helical piling system in the subsurface conditions similar to project subsurface conditions. The Contractor performing the work described in this specification must submit proof that the Contractor or subcontractor has successfully completed a minimum of two (2) projects within the last three (3) years on which the Contractor or subcontractor has successfully designed, tested, and installed the helical piles.

The Contractor also needs to submit proof that the Contractor has employed a Licensed Professional Engineer, currently registered in the State of New York, having experience in the installation (designing, planning, testing, and inspection) of helical piles at a minimum two (2) completed projects over the past three (3) years. The Professional Engineer must be directly responsible for the helical pile work. The

Contractor must not use manufacturer's representative to satisfy the Contractor's requirements of this section.

In addition, the Engineer will review and approve the Contractor's key field personnel to be employed during installation of the helical piles.

70.14.2 EQUIPMENT AND MATERIAL

Contractor must provide the following equipment and materials for the installation of the helical piles:

(A) Equipment:

(1) Helical Pile Driver: Hydraulic Gear Motor, with a minimum torque capacity of 25 ft-kips or fifteen (15) percent greater than the required installation torque, whichever torque value is higher; maximum torque capacity must not exceed the torque rating of the helical pile.

(2) Installation Torque Indicators, minimum two (2), with an accuracy of 0.25 ft-kip with real-time and remote monitoring. At least one (1) torque indicator must have a hydraulic gauge.

(3) Helical Pile Installing Rig.

(4) Grout Pump/Mixer.

(5) Storage Container, as required.

(6) Water Tanks, as required.

(7) Lifting Equipment, as required.

(B) Material:

(1) Galvanization: All helical pile materials must be hot-dip galvanized per ASTM A123, minimum Grade 75 (75 microns, 3.0 mils, 1.7 oz/ft^2).

(2) Pile Shaft: Pile shaft must be of one kind, and unless otherwise specified, must have a minimum yield strength of 50-ksi. Unless otherwise shown or specified, all round pile shafts must have a minimum outer diameter of 4.5-inches and a minimum shaft thickness of 0.337-inches. Tip of lead pile shaft must be closed end.

(3) Bearing plate: Low carbon steel meeting the general requirements of ASTM A572 with Grade 50 (minimum yield strength of 50-ksi). Lead helix pile section must have minimum three (3) helices and with minimum helix diameter of eight (8) inches. Standard minimum helix thickness must be one-half (1/2) inch. Minimum helix spacing must be three (3) times the diameter of preceding helix or as approved by the Engineer. Minimum spacing of leading helix on flighted extensions must be three (3) times the diameter of the last helix on the preceding shaft or as approved by the Engineer.

(4) Shaft Connection: Pile shafts must be connected through socket couplings and coupling bolts.

(a) Socket coupling: Each shaft extension at its leading end must have a round socket coupling, welded to the shaft or forged integrally. The socket coupling must be designed such that subsequent shafts will be connected flush, in-line, straight, and rigid; with a maximum tolerable slack of 1/8-inch or as directed by the Engineer. Coupling must be of depth to connect shafts by a minimum of two (2) coupling bolts. Shaft must have same quantity of bolt holes at each end. Bolt holes must match the previous and subsequent hole locations.

(b) Coupling bolts: Coupling bolts must be ASTM A193 Grade B7 hex head bolts, minimum one (1) inch diameter, or approved equal. Minimum length of coupling bolt must be six (6) inches.

(c) Coupling nuts: Coupling nuts must be ASTM A194 Grade 2H heavy hex nuts, minimum one (1) inch diameter, or approved equal.

(d) Coupling washers (when applicable): Coupling washers must be ASTM F436 Type 1 circular washers, minimum one (1) inch diameter, or approved equal.

(5) Pile Top Connector: To resist tension force, a helical pile top connector with sewer cradle or pile cap will be required. The pile top connector will consist of minimum one-half (1/2) inch thick 7”-by-7” square steel plate with centrally threaded hole to receive ASTM A615 (or equal) structural threaded bar, minimum Bar Designation #6, minimum Grade 80. The pile top must be held in position with structural hex nut.

(6) All weld connections (shop and field) must conform to the requirements of AWS D1.1.

(7) Industry recognized written Quality Control for all materials and manufacturing process to be provided by manufacturer.

(8) Grout: Except as herein otherwise specified, grout must comply with the requirements of **General Specification 11 - Concrete, as modified in Section 23.01**. The grout mix must be proportioned to provide a hardened mortar in the pile shaft having a minimum 4,000-psi (27.58 MPa) compressive strength at twenty-eight (28) days.

70.14.3 SUBMITTALS

(A) SHOP DRAWINGS

The Contractor must install helical piles as shown on the pile section and elevation drawings to depths and elevations shown on the plan and profiles.

Before commencing any helical pile installation, the Contractor must have approved shop drawings (working drawings and material specifications) from the New York City Department of Design and Construction (NYCDDC). The shop drawings must include, but not limited to:

(1) Means and Methods:

(a) Detailed step-by-step description of proposed grouted helical pile construction procedure, including personnel, testing, and equipment to assure quality control of grout preparation and pile installation. This step-by-step procedure must be shown on the working drawings in sufficient detail to allow the Engineer to monitor the construction and quality of the grouted helical piles.

(i) Contingency procedures for clearing or drilling through obstructions or equipment breakdown.

(ii) All welding procedures, if applicable, which must be certified by a qualified welding specialist.

(iii) Description of how excess waste grout will be controlled and disposed of.

(b) Details of the proposed installation equipment, including manufacturer’s information, make, model, and specification data such as power, rated capacity, grout pump discharge volume and pressures, etc. Also include a detailed description of the drilling equipment and methods proposed to be used to provide drill hole support (when applicable) and prevent detrimental ground movements.

(i) Calibration reports, as required.

(a) All hydraulic jacks and pressure gauges are to be calibrated together in NIST certified Laboratory and within six (6) months of use.

(ii) The grouting equipment (mixer, pump, and batching equipment) capacity and relation to the grouting demand and working conditions, as well as provisions for back-up equipment and spare parts.

(c) Methods and equipment for accurately monitoring and recording the grout volume and grout pressure as the grout is being placed.

(d) Pile load test setup. (See **Subsection 70.14.4**.)

(i) Compressive load test setup(s) must comply with the *Apparatus for Applying and Measuring Loads* and the *Apparatus for Measuring Movement* requirements of ASTM D1143.

(ii) Where tensile load tests are required: Tensile load test setup(s) must comply with the *Apparatus for Applying and Measuring Loads* and the *Apparatus for Measuring Movement* requirements of ASTM D3689.

(iii) Where lateral load tests are required: Lateral load test setup(s) must comply with the *Apparatus for Applying and Measuring Loads* and the *Apparatus for Measuring Movement* requirements of ASTM D3966.

(iv) Load test setup must indicate sizing of the load testing frame and reaction piles, and connections to both the reaction piles and test pile.

(v) Structural design calculations for load test setup, if applicable.

(2) Materials:

(a) Material certification and specifications, including a Certified Mill Test Reports (CMTRs) or Certified Independent Test Reports (CITRs) for the helical pile shafts and for the threaded bar used in the pile top connector. The ultimate strength, yield strength, elongation, and material properties composition must be included.

(b) Grout mix design and type of materials to be used in the grout, including certified laboratory testing data and results, trial batch reports, and estimated curing time for grout to achieve specified strength. (See **Subsection 70.14.2(B)(8)**.) Also include water source, admixture(s), and cement supplier. The Contractor must provide these submittals to the Engineer for approval prior to placing grout.

(c) Laboratory test results or manufacturer's data must be submitted by the Contractor to the Engineer proving that the grout mix design has a minimum compressive strength of 4,000-psi (27.58 MPa) at the end of twenty-eight (28) days.

(B) DESIGN CALCULATIONS

Prior to installation, the Contractor must submit design calculations for the approval of the Engineer. Design calculations, including, but not limited to, the following:

(1) Design assumptions, such as fixed/free head, end bearing, and long/short pile.

(2) Pile group configuration and determination of pile group capacity with group effect.

(3) Geotechnical design computations in compliance with the project location's subsurface soil profile, indicating pile embedment depth with helix in the competent soil layer.

(a) Design criteria including soil/rock shear strengths (friction angle and cohesion), unit weights, minimum grout compressive strength, ground/grout allowable bonded strength (when applicable), and assumptions for each soil/rock strata must be included.

(4) Structural computations

(a) Structural capacity computation (allowable structural capacity ≥ allowable compression capacity).

(b) Structural capacity corrosion computation at minimum period of seventy-five (75) year design life, using most stringent corrosion rate(s).

(i) Soil/rock corrosion rates must be included.

(ii) Pile thickness at corrosion must be design thickness minus the sacrificial thickness, where the design thickness is reduced by one-half (1/2) sacrificial thickness on each side.

(iii) Calculation for sacrificial thickness, in accordance with ICC-ES AC358 *Acceptance Criteria for Helical Pile Systems and Devices* or as directed by the Engineer.

(iv) A corrosion analysis is required if helical pile installation is in a marine environment, has corrosive soils, or there are stray current concerns.

(c) Allowable stresses for helical piles, meeting the relationship(s) as listed in Table 70.14.3.1.

TABLE 70.14.3.1
Allowable Axial Stresses for Materials Used in Helical Piles [a]

Material Type and Condition	Maximum Allowable Stress [b]
1. Concrete or Grout in Compression [c] Cast-in-place in helical pile shaft	$0.33\ f'_c$
2. Structural Steel in Compression	$\min(0.6\ F_y, 0.5\ F_u)$
3. Structural Steel in Tension	$\min(0.6\ F_y, 0.5\ F_u)$

For SI: 1 pound per square inch (psi) = 6.895 kilopascal (kPa).

[a] For combined stresses, the structural capacity must be computed in accordance with AISC 360 for steel piles.

[b] f'_c is the specified compressive strength of the concrete or grout;
F_y is the specified minimum yield strength of steel;
F_u is the specified minimum tensile strength of steel.

[c] The stresses specified must apply to the concrete cross-sectional area for helical piles.

(5) All supporting documentation, such as applicable code(s), requirements, and design reference literature, used in the above computations.

(C) RECORDS, REPORTS, AND PLANS

(1) Pile location plan showing proposed piles with each pile labeled with a unique identification number (ID).

(a) Indicate additional pile locations (for test piles and reaction piles).

(2) Pile location survey(s).

(3) Pile installation log of all production piles. The log must include the following:

(a) Pile ID number,

(b) Date of installation, including start and end times,

(c) Installation torque reading with pile embedment depth,

(d) Final pile tip and cutoff elevations (in reference to NAVD 88),

(e) Outer diameter and thickness of helical pile shaft,

(f) Outer diameter of pile (applicable if different than the outer diameter of helical pile shaft),

(g) Diameter, thickness, and spacing between the helical plates, and

(h) Grout mix.

(4) Load test report(s).

(a) Test setup, including photographs of gauges and readout units.

(b) Net settlement, gross settlement (loading and unloading), and rebound.

(c) Plot(s) of load-settlement curves.

(d) Load test log.

(D) REVIEW AND APPROVAL OF SUBMITTALS

(1) The Contractor must submit six (6) copies of the shop drawings and design calculations pertaining to geotechnical and structural capacities for approval of the helical pile design. The Contractor must allow a minimum of four (4) weeks to review the shop drawings and design calculations. Additional time required due to incomplete or unacceptable submittals must not be cause for delay or impact claims. All costs associated with incomplete or unacceptable Contractor submittals must be the responsibility of the Contractor. Helical pile construction work must not commence without all required submittals being approved.

(2) The Contractor must have shop drawings prepared by a Licensed Professional Engineer, currently registered in the State of New York. The drawings must be submitted together with helical piles design calculations. Both drawings and design calculations must be signed and sealed by the NYS Licensed Professional Engineer. These shop drawings must be on the sheets size of twenty-seven (27) inches by forty (40) inches with one-half (1/2) inch marginal space on three (3) sides and a two (2) inch marginal space for binding on the left side. Each shop drawing and each report for design calculations must be dated and contain both the name of the project and the contract number.

(E) PROJECT RECORD DOCUMENTS

(1) Upon completion of installation of all piles, the Contractor must submit drawings to the Engineer showing the types and installed locations of all piles, including obstructed, damaged, and additional piles, as related to their column lines, the center of the utility pad or other reference points and lines, percentage out of plumb, the cutoff elevation, and length below cutoff for each pile.

70.14.4 LOAD TEST FOR HELICAL PILES

(A) Except as herein otherwise specified, test piles and load tests must be in accordance with **Subsection 70.11.3(A)**. Where requirements herein specified are more stringent than ASTM requirements, the more stringent specification will apply.

(B) Dial extensometer gauges / dial displacement indicators must provide readings to the nearest 0.001 inch (0.025 mm). Electrical transducers / electronic displacement indicators may be used to make settlement observations provided that backup measurements are made using dial extensometer gauges / dial displacement indicators as described in ASTM load test(s) at sufficient times to validate the readings from the electrical transducer / electronic displacement indicator.

(C) Compressive Load Tests:

(1) At least two (2) tests must be performed in each site, as determined by the Engineer. At least one (1) test must be performed within which the subsurface soil conditions are “substantially different” in character, as determined by the Engineer.

(2) The allowable axial compression load must be at least 30 tons.

(3) Compressive load test for helical piles must be in accordance with ASTM D1143 Procedure B: Maintained Test, and as directed by the Engineer. In addition to observations required by ASTM D1143, settlement observations must be performed twenty-four (24) hours after the entire test load has been removed.

(4) Unless otherwise specified, the Contractor must show compliance to the *Pile Top Axial Movements* requirements of ASTM D1143.

(D) Tensile Load Tests:

(1) Where tensile load tests are required: At least two (2) tests must be performed in each site, as determined by the Engineer. At least one (1) test must be performed within which the subsurface soil conditions are “substantially different” in character, as determined by the Engineer.

(2) The allowable axial tensile load must at least 10 tons.

(3) Where tensile/uplift testing is required, tensile load testing must be in accordance with ASTM D3689, and as directed by the Engineer.

(4) Unless otherwise specified, the Contractor must show compliance to the *Pile Top Axial Movements* requirements of ASTM D3689.

(E) Lateral Load Tests:

(1) Where lateral load testing is required: At least two (2) tests must be performed in each site, as determined by the Engineer. At least one (1) test must be performed in each site within which the subsurface soil conditions are "substantially different" in character, as determined by the Engineer.

(2) The allowable lateral load resisted by a helical pile must be at least 3 tons.

(3) Where lateral testing is required, lateral load test for helical piles must be in accordance with ASTM D3966, and as directed by the Engineer.

(4) Unless otherwise specified, the Contractor must show compliance to the *Pile Top Lateral Movements* requirements of ASTM D3966.

(F) The cost for a helical pile load test, including all material, labor, and equipment, must be paid under bid Item No. 70.14HT - HELICAL PILES, LOAD TEST.

(G) All load tests must be conducted to two (2) times the design load plus any anticipated frictional resistance developed along pile shaft above invert elevation. The allowable net settlement of the test pile at two hundred (200) percent of the proposed working load is three-quarters (3/4) inch (19.1 mm), where net settlement equals gross settlement due to the test load, minus the rebound, after removing all of the test load.

(H) The Contractor must submit all load testing plans in compliance with the requirements herein specified.

(1) Test setup and test procedure must be approved by the Engineer prior to installation of any reaction and test piles.

70.14.5 HELICAL PILE INSTALLATION

(A) GENERAL CONSTRUCTION PROVISIONS - The requirements of **DIVISION IV - GENERAL CONSTRUCTION PROVISIONS** apply to the work to be done hereunder.

(B) Except as herein otherwise specified, the Contractor must fully comply with **Subsections 70.11.3(B) through 70.11.3(O)**, inclusively, **Subsection 70.11.3(Q)**, and **Subsection 70.11.4**.

(C) The Contractor will be responsible for the installation of helical piles, which must conform to the approved pile ID plan and specifications, and as directed by the Engineer.

(D) The Contractor must install all piles in the presence of the Engineer.

(E) During pile installation, the torque readings must be recorded at every foot of helical pile advancement to the designed depth that meets the pre-determined torque requirement established through static axial compressive load test.

(F) Subsequent shafts will be connected flush, in-line, straight, and rigid. Shaft extensions must be securely bolted in place by coupling bolts and nuts (and washers when applicable). Bolts must not be over torqued.

(G) Maximum spacing between the center lines of helical piles must be six (6) feet center-to-center. Minimum spacing between the center lines of helical piles must be four (4) times the largest helix plate diameter, not exceeding maximum spacing.

(H) Minimum depth of installation below the invert elevation is twenty (20) feet and the maximum depth is fifty (50) feet, or as approved by the Engineer. For depths exceeding fifty (50) feet, buckling analysis of pile must be submitted to the Engineer for approval. (See **Subsection 70.14.1(D)**.)

(I) The tolerance in location of pile head from the designed location per pile ID plan is permitted three (3) inches without reduction in load capacity of the pile group. Where piles are installed out of position in excess of three (3) inches, the true loading on such piles must be analytically determined from a survey which defines the actual location of the piles using actual eccentricity in the pile group with respect to the line of action of the applied load. If the total load on any pile, so determined, is in excess of 110% of the allowable load bearing capacity, correction must be made by installing additional piles.

(J) Plumbness of the pile must be checked for every helical pile during installation to ensure verticality of the pile. If the axis of pile is installed out of plumb or deviates from the specified batter by more than three (3) inches from designed pile location as per pile ID plan, the design of the foundation must be modified to resist the resulting vertical and lateral forces.

(K) Record the elevation of pile tip, pile length below invert elevation, and all respective helical bearing plates (helices) in reference to NAVD 88. All elevations must be in accordance with **Section 10.09(3)**. Any unusual conditions encountered during pile installation must be noted.

(L) The Contractor must never reverse the direction of torque and back out of the helical pile to achieve the final elevation.

(M) PILE CUTOFF

(1) All the helical pile shafts sticking above the subgrade must be cut at the designed cutoff elevation. Unless otherwise specified, the tolerance for pile head elevation is from +1 inch to -1/2 inch.

(2) Cutoffs are the property of the Contractor and must be disposed of off-site.

(N) GROUT

(1) A hydraulic pump must be capable of pumping 4,000-psi (27.58 MPa) grout in the hollow shaft of the helical pile. The pump must be capable of generating minimum 600-psi (4.14 MPa) pressure and capable of pumping a minimum of twenty (20) gallons per minute.

(2) The Contractor is responsible for ensuring sufficient cement is ordered and grout is mixed to meet contract requirements. Grout must be mixed in accordance with the approved mix design.

(3) The Contractor is responsible for ensuring that the correct method of grout placement is used and recorded.

(4) Grout pumped into the pile shaft must be measured by volume as the grout is pumped into the shaft and checked against theoretical volume. Any excessive grout loss must be brought to the attention of the Engineer.

(5) A set of six (6) cubes of grout samples (2-inch by 2-inch) must be taken for each day during which helical piles are grouted. The cube samples must be tested by an independent testing laboratory in accordance with **General Specification 11 - Concrete, as modified in Section 23.01**.

(6) The Contractor must be responsible for checking and recording the final grout level in the pile relative to the ground level or site datum on the Daily Report.

(O) Install helical pile cap connector as per approved drawing.

(P) Any void made or formed during helical pile installation, below the invert elevation of pipe, must be backfilled with 4,000-psi (27,58 MPa) grout.

70.14.6 MEASUREMENT

The quantities of helical piles to be measured for payment must be the number of vertical feet measured from pile tip to cutoff, furnished and permanently incorporated in the work in accordance with the plans, standards, and specifications, and as directed by the Engineer.

70.14.7 PRICE TO COVER

The contract price for Item No. 70.14HN - HELICAL PILES (GROUT-FILLED CORE) must be the unit price bid per vertical foot and must cover the cost of all labor, materials, plant, equipment, samples, tests (except load tests), shop drawings, preparation of shop drawings, and insurance required and necessary to furnish

and/or install and permanently incorporate in the work all helical piles (grout-filled core) required all in accordance with the plans, standards, and specifications, and as directed by the Engineer.

Included in the contract prices herein above must also be the cost for all design submittals, shop drawing submittals, documentation, connections, and guide works.

70.14.8 NO SEPARATE PAYMENT

No separate or additional payment will be made for any pile which is not permanently incorporated into the work, as per the approved pile ID plan.

70.14.9 SEPARATE PAYMENT

Separate payment will be made for load tests for helical piles. The contract price for Item No. 70.14HT - HELICAL PILES, LOAD TEST must be the unit price bid per load test and must cover the cost of all labor, materials, plant, equipment, samples, tests, shop drawings, preparation of shop drawings, and insurance required and necessary to furnish and/or install for helical pile load test in accordance with the plans, standards, and specifications, and as directed by the Engineer.

Payment for Helical Piles (Grout-filled Core) will be made under the Item Number as calculated below:

The Item Numbers for Helical Piles (Grout-filled Core) have seven characters. (The decimal point is considered a character, the third character.)

(1) The first five characters must define Helical Piles (Grout-filled Core):

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(2) The sixth character must define Helical Piles (Grout-filled Core):

H – Helical Piles (Grout-filled Core)

(3) The seventh character must define the Type of Work:

N – Installation (Complete)
T – Load Test

(4) The Item Numbers together with Description and Pay Unit as provided in the Bid Schedule are provided below:

Item No.	Description	Pay Unit
70.14HN	HELICAL PILES (GROUT-FILLED CORE)	V.F.
70.14HT	HELICAL PILES, LOAD TEST	EACH