SUPPORTWORKS, INC.
11850 Valley Ridge Drive
Papillion, Nebraska 68046
www.supportworks.com
jkortan@supportworks.com

SUPPORTWORKS MODEL HP288 HELICAL FOUNDATION SYSTEM

CSI Section:

31 66 00 Special Foundations
31 66 15 Helical Foundation Piles

1.0 RECOGNITION

The structural and geotechnical performance of the Supportworks, Inc. (Supportworks) Model HP288 helical foundation system, recognized in this report, has been evaluated for use as an alternative to prescriptive foundations and footings for residential occupancies and comply with the intent of the following codes:

- 2018, 2015, and 2012 International Residential Code® (IRC)

2.0 LIMITATIONS

Use of the Supportworks Model HP288 helical foundation system recognized in this report is subject to the following limitations:

2.1 Use shall comply with the provisions of the applicable codes, the manufacturer's published installation instructions, and this report. Where conflicts occur in these provisions, the most restrictive shall govern.

2.2 The helical foundation system is for use in seismic design categories A, B, and C. Use of the system in seismic design categories D_0, D_1, D_2, and E is outside the scope of this report.

2.3 Any required field welding shall be performed and verified in accordance with the provisions of the IRC.

2.4 The building official may require a soil test in accordance with IRC Section R401.4, where, based on quantifiable data, the presence of questionable soil characteristics such as expansive, compressible, or shifting soils are likely.

2.5 Allowable lateral load resistance capacities of the system are outside the scope of this report and shall be determined by site specific testing or using an analysis method acceptable to the building official.

2.6 The capacity of the supported structure to transfer the design loads to the foundation system is outside the scope of this report.

2.7 The effects of corrosion shall be considered, and adequate sacrificial material shall be provided to maintain helical foundation support capacity for a period of 50 years. Table 1 shows the assumed effects of corrosion on the shaft physical properties over the assumed 50-year period using moderately corrosive soil properties. The helical foundation system has not been evaluated for use in soil conditions that that are characteristic of a potential pier deterioration or corrosion situation as defined by the following: (1) soil resistivity less than 1,000 ohm-cm; (2) soil pH less than 5.5; (3) soils with high organic content; (4) soil sulfate concentrations greater than 1,000 ppm; (5) soils located in a landfill, or (6) soil containing mine waste.

2.8 When use of helical foundations falls outside the limitations of this evaluation report, or when capacities are in doubt, field testing may be used to determine the capacity of the helical foundation systems. Where field tests are required to confirm the capacity of a helical foundation installation, these tests shall be supervised by a registered design professional.

2.9 The helical foundation system, recognized in this report, is produced by: Behlen Technology & Manufacturing, Omaha, NE; Behlen Manufacturing, Columbus, NE; or TSA Manufacturing, Omaha, NE.

3.0 PRODUCT USE

3.1 General: Supportworks helical foundation systems function as foundation support at residential structures, additions, decks, or accessory structures. The helical foundation systems uses include support of new construction foundations or additional support of existing foundations.

3.2 Design: The Allowable Stress Design (ASD) method shall be used for design, considering all applicable limit states. The ASD capacity of the installed helical foundation shall be taken as the lesser of the individual ASD capacities, for the bracket (P1), shaft (P2), helix plates (P3) or the soil bearing capacity (P4). The individual and overall system ASD capacities for the helical foundation system are shown on Tables 2, 3 and 4.

3.2.1 Bracket Capacity (P1): The concrete bearing strength has been evaluated in relation to bracket capacity. All other structural requirements and limit states applying to the concrete foundation, as described in ACI 318 (anchorage per Appendix D, punching (two-way) shear, beam (one-way) shear, and flexural (bending) related limit states), have

not been evaluated in this evaluation report. Tables 2, 3 and 4 provide the ASD compressive strengths of the retrofit and new construction brackets.

3.2.2 Shaft Capacity (P2): Portions of helical foundation shafts in air, water or fluid soils are considered unbraced and shall be designed, by a registered design professional, as columns using appropriate engineering standards in accordance with the AISC 360. Soils that have a Standard Penetration Test (SPT) blow count resulting in zero [weight of hammer (WOH) or weight of rods (WOR)] shall be defined as fluid soils. Testing in accordance with ASTM D1586 shall be used to determine the SPT blow counts. Any soils except fluid soils shall be deemed to provide the required lateral support to prevent buckling of systems that are braced. When piers are unbraced in air, water or fluid soils, the unbraced length is the actual length of pier that is unbraced in air, water or fluid soils plus an additional 5 feet (1524 mm) when embedded into firm soil or an additional 10 feet (3048 mm) when embedded into soft soil. Firm soils shall be defined as any soil with a SPT blow count of five or greater. Soft soil shall be defined as any soil with a SPT blow count greater than zero and less than five. For fully braced conditions and where the and piers do not extend in air, water, or fluid soils, the shaft capacities shall not exceed the ASD shaft compression capacities shown in Tables 2 and 3 of this report.

3.2.3 Helix Plate Capacity (P3): The ASD compression and tension capacities of the individual helix plate diameters (8, 10, 12 or 14 inches) are 40 kips (177.9 kN) For helical piles with multiple helix plates, the allowable helix plate strength of the system (P3) is the total of the allowable strengths of each helix.

3.2.4 Soil Capacity (P4): The maximum axial soil compression and tension capacities of the helical foundations shall be limited to the capacities established by applying the torque-to-capacity ratio (K_t) and the applicable factor of safety (FOS) to the final torque achieved during installation. The helical foundation system is allowed a K_t of 9 ft^{-1} (29.5 m^{-1}) and has a shaft torsional rating of 7,900 ft-lb (10.71 kN-m). The maximum installation torque shall not exceed the shaft torsional rating. The allowable tension and compression soil capacity (P_a) for the helical foundations are determined using the following equations:

$$P_a = P_u/FOS \text{ and:}$$
$$P_u = K_t \times T, \text{ where:}$$

P_u = Ultimate pile soil capacity (lb/N)
K_t = Torque-to-capacity ratio (ft^{-1}/m^{-1})
T = Final installation torque (ft-lb/N-m)
FOS = Applicable factor of safety

The FOS used for determination of P_a shall be as follows:

- For compression capacity, when a geotechnical report is not available, a minimum FOS = 2.5 shall be used.
- For compression capacity, when a geotechnical report is available and the soil is considered adequate, a minimum FOS = 2.0 may be used.
- For tension capacity, a minimum FOS = 2.5 shall be used.

The helical foundation maximum allowable soil axial capacities (P4) are shown in Tables 2, 3, and 4.

3.3 General Installation: The helical foundation systems shall be installed using a manufacturer supplied drive adapter. Installers shall be trained and certified by Supportworks. The drive equipment shall include a method of monitoring torque during installation of the shaft sections. The torque monitoring equipment shall have the calibration verified as necessary for the project requirements. The installer training and equipment calibration documentation shall be presented to the building official upon request.

3.3.1 Helical Pile Installation: Helical piles are installed with hydraulic drive equipment by rotating them into the ground until a suitable bearing depth and termination torque is achieved. Extensions shall be added as necessary to reach the desired bearing depth. The extensions shall be joined and bolted in accordance with the manufacturer's published instructions. The bolts shall be snug-tight in accordance with the AISC. The helical pile installation shall continue until the appropriate installation torque is reached, indicating that the helical foundation has achieved the desired bearing capacity. The torque-to-capacity ratio and appropriate factors of safety specified in Section 3.2.4 shall be used to determine the allowable soil capacity of the helical pile. The torque applied to a helical foundation during installation shall not exceed the maximum rated torque specified in Section 3.2.4

In the absence of data indicating the presence of questionable soils, and unless the building official determines that a soil test is required, the helix plates shall bear in undisturbed soil or engineered fill. The helix plates shall be installed below the regional frost line. For helical piles loaded in compression, the uppermost helix plate shall bear at least 5D below existing grade, where D is equal to the topmost helix plate diameter. For helical foundations loaded in tension, the topmost helix plate shall bear at least 12D below existing grade. Where the installation depth is less than 12D, the tension capacity shall be determined by a registered design professional based on site specific conditions and subject to the approval of the building official.

The helical foundations shall be positioned at the building support locations as specified on the design drawings. The

spacing between helical foundations (center to center of pile shaft) shall be a minimum of three times the diameter of the largest helix plate in adjacent helical foundations. For retrofit applications, the foundation shaft shall be installed at an angle of 2.5 ± 1.0 degree. For new construction pile installation, the foundation shaft shall be installed at an angle of ± 1.0 degree from vertical. Adequate drainage shall be provided where appropriate to direct water away from the foundation support locations. Where helical foundations are installed in or adjacent to slopes, the negative effects of drainage, erosion, and shallow failures shall be avoided in accordance with IRC Section R403.1.7.

3.3.2 Bracket Installation: Once adequate pile depth and torsional resistance is reached, an appropriate cap or bracket shall be attached to transfer the supported load to the helical foundation. For remedial foundation work, a retrofit bracket (Figure 1) that imposes an eccentric load on the helical foundations in accordance with design, may be used. For new construction applications where the piles are concentrically loaded and the pile caps are embedded in concrete, a new construction bracket (Figure 2), may be used. For tension loads, the new construction bracket shall be through bolted to the helical pile shaft using the bolts and nuts specified in Section 4.3.

3.4 Field reports: A helical foundation installation log shall be prepared describing the installation results and the soil axial capacities shall be determined from the installation data in accordance with Section 3.2.4. Installers shall record all helical foundation locations and types including shaft diameters, helix sizes and configurations, embedment depths, pile lengths and final torque readings. In addition, a torque profile shall be recorded for every project, and at least one out of every ten piles in multi-pile installations.

A field report containing this information, along with the type of project, relevant details of the supported structure, sketch or drawing of the support locations with dimensions, the types of helical foundation brackets used at each location and information related the connection of the brackets to the helical shaft and the supported structure, allowable soil axial capacity based on torque-to-capacity ratio, and other relevant notes and comments as needed, shall be reviewed and sealed by a registered design professional. The report shall be submitted to the building official for approval within 10 days after helical foundation installation.

4.0 PRODUCT DESCRIPTION

4.1 General: The Supportworks helical foundation system is a steel foundation assembly consisting of a lead shaft, shaft extensions, and a retrofit bracket or new construction bracket. The retrofit bracket (FS288BL2) is secured against and below existing footings and the new construction brackets (HP288NCB or HP288NCB8) are embedded in new concrete footings. Both bracket systems are connected to the helical shaft to transfer the building load into the shaft.

4.2 HP288 Lead and Extension Sections: The helical pile lead sections (HP288L) consists of a central steel shaft with one or more factory-welded helix plates which are used to transfer the load from the shaft to the appropriate soil bearing strata. Shaft extensions (HP288E) may also have factory-welded helix plates and are connected to the lead section or other extension sections with bolted coupling connections. The extension sections are used as necessary to extend the helical pile to the required bearing depth.

The central steel shafts are produced from round, 2.875-inch (73 mm) outer diameter by 0.276-inch (7 mm) nominal wall thickness hollow structural sections conforming to ASTM A500 Grade B or Grade C. The shafts have a minimum yield strength of 60 ksi (413 MPa) and a minimum tensile strength of 70 ksi (483 MPa). One end of the extension sections includes a factory-welded steel coupling and two steel coupling bolts for connecting the lead and extension sections together. The lead and extension shaft finish is plain steel or hot-dip galvanized in accordance with ASTM A123. The mechanical properties of the shaft under corroded or uncorroded conditions, as described in Section 2.7, with plain steel or hot-dip galvanized coating are included in Table 1.

4.3 Couplings: The HP288 extension shaft includes a factory-welded, round, outer steel, coupling sleeve consisting of a 6-inch-long (152 mm), $3^1/_2$-inch-OD (89 mm) by 0.281-inch (7.14 mm) nominal wall thickness, hollow structural section. The coupling sleeves conform to ASTM A513, Type 5, Drawn over a Mandrel (DOM), Grade 1026 having a minimum yield strength of 70 ksi (483 MPa) and a minimum tensile strength of 80 ksi (552 MPa). Each coupling includes two standard hex bolts and matching standard hex nuts. The bolts are ¾-10 UNC 2A standard hex bolts conforming to SAE J429, Grade 5, with a minimum yield strength of 92 ksi (634 MPa) and a minimum tensile strength of 120 ksi (827 MPa). The matching nuts are ¾-10 UNC 2B standard hex nuts conforming to SAE J995, Grade 5. The bolts and nuts are zinc-coated in accordance with ASTM B633, with coating classification Fe/Zn 8.

4.4 Helix Plates: The helical bearing plates have a standard pitch of 3 inches (76 mm), are 0.375 inch (9.53 mm) thick, and are made from ASTM A572 Grade 50 steel plate material having minimum yield strength of 50 ksi (345 MPa) and minimum tensile strength of 65 ksi (448 MPa). The helix plates are available in diameters of 8, 10, 12, and 14 inches (203 mm, 254 mm, 305 mm, or 356 mm) and are factory welded to the shafts in accordance with the manufacturer's quality control documentation. The helix plate finish is plain

steel or hot-dip galvanized in accordance with ASTM A123 and matches the finish of the factory-welded shaft section.

4.5 FS288BL2 Retrofit Bracket Assembly: The FS288BL2 bracket assembly consists of an FS288BL2 bracket, an external pipe sleeve (FS288ES30) a cap plate (FS288C), two threaded rods and matching nuts. The assembly is illustrated in Figure 1 of this report.

4.5.1 FS288BL2 Brackets: The FS288BL2 bracket is constructed from factory-welded, 0.250-, 0.3125-, 0.375-, and 0.500-inch-thick (6.35 mm, 7.94 mm, 9.53 mm, and 12.7 mm) steel plates. The steel plates conform to ASTM A572, Grade 50, with a minimum yield strength of 50 ksi (345 Mpa) and a minimum tensile strength of 65 ksi (448 Mpa). The bracket finish is plain steel or hot-dip galvanized in accordance with ASTM A123.

4.5.2 FS288ES30 External Sleeve: The external sleeve (FS288ES30) is manufactured from a 30-inch-long (762 mm), $3^1/_2$-inch outside diameter (89 mm) and 0.216-inch (5.49 mm) nominal wall thickness pipe conforming to ASTM A500, Grade B or C, having a minimum yield strength of 50 ksi (345 Mpa) and a minimum tensile strength of 62 ksi (427 Mpa). One end of the external sleeve has a 1.00-inch long (25.4 mm) section trumpeted to a final outer diameter of 4.00 inches (101.6 mm). The sleeve finish is plain steel or hot-dip galvanized in accordance with ASTM A123.

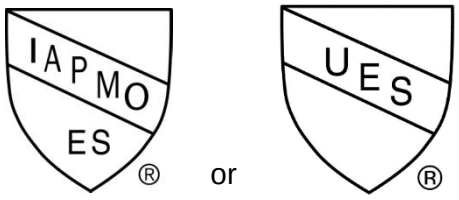
4.5.3 FS288C Cap Plate: The FS288C cap plate is produced from a 1-inch-thick (25.4 mm), 4-inch-wide (102 mm), 8.25-inch-long (210 mm) steel plate. The plate complies with ASTM A572, Grade 65, having a minimum yield strength of 65 ksi (448 MPa) and a minimum tensile strength of 80 ksi (552 MPa). The cap plate assembly finish is plain steel or hot-dip galvanized in accordance with ASTM A123.

4.5.4 Threaded Rod and Nuts: The cap plate is connected to the bracket with two $^3/_4$-inch-diameter by 16-inch-long (19.1 mm by 406 mm) threaded rods, and matching $^3/_4$-inch (19.1 mm) heavy hex nuts. The $^3/_4$-inch-diameter (19.1 mm) steel threaded rods conform to ASTM A193, Grade B7, having a minimum yield strength of 105 ksi (724 MPa) and a minimum tensile strength of 125 ksi (862 MPa). The matching $^3/_4$-inch-diameter (19.1 mm) steel heavy hex nuts conform to ASTM A563 Grade DH or DH3, or ASTM A194 Grade 2H. The threaded rods and nuts are zinc-coated in accordance with ASTM B633, with coating classification Fe/Zn 8.

4.6 HP288NCB and HP288NCB8 New Construction Brackets: The HP288NCB and HP288NCB8 new construction brackets are fastened to the top of the helical pile shaft using the same bolts and nuts as specified for the couplings (Section 4.3) and are intended to be embedded in new concrete foundations as illustrated in Figure 2. The brackets are manufactured from a 4.65-inch (118.1 mm) long, 3½-inch (89 mm) OD by 0.250-inch (6.4 mm) nominal wall thickness steel pipe sleeve with a factory-welded ¾-inch thick (19.1 mm) steel cap plate. The cap plates are either 6-inch (152 mm) square (HP288NCB) or 8-inch (203 mm) square (HP288NCB8). The steel plate conform to ASTM A36 with a minimum yield strength of 36 ksi (248 MPa) and minimum tensile strength of 58 ksi (400 MPa). The pipe sleeves conform to ASTM A513, Type 5, DOM, Grade 1026 having a minimum yield strength of 70 ksi (483 MPa) and a minimum tensile strength of 80 ksi (552 MPa). The bracket finish is plain steel or hot-dip galvanized in accordance with ASTM A123. The assembly is illustrated in Figure 2 of this report.

6.0 IDENTIFICATION

Supportworks helical foundation systems are identified by the report holder's name, Supportworks, Inc., the manufacturing location identifier, helical foundation model name, and evaluation report number (ER-691). The identification also includes the IAPMO Uniform Evaluation Service Mark of Conformity as shown below:



IAPMO UES ER-691

7.0 SUBSTANTIATING DATA

The following documentation has been provided and evaluated in accordance with IAPMO-UES EC 027-2019 "*Evaluation Criteria for Helical Foundations for Use under the International Residential Code*":

- Reports of field and lab testing to establish structural capacity and torque-to-capacity ratio for Supportworks helical foundation system. Test reports are from laboratories in compliance with ISO/IEC 17025.
- Manufacturer's descriptive literature, quality control documentation, and installation instructions.

8.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on the Supportworks helical foundation system to assess conformance to the codes shown in Section 1.0 of this report and documents the product's certification. The Supportworks helical foundation system is produced at locations noted in Section 2.9 of this report under a quality control program with periodic inspection under the supervision of IAPMO UES.

For additional information about this evaluation report please visit www.uniform-es.org or email at info@uniform-es.org

TABLE 1—MECHANICAL PROPERTIES OF HP288 SHAFT

Mechanical Properties	Uncorroded	After 50-Year Corrosion Loss	
	Plain Steel	Plain Steel	Hot-dip Galvanized Steel
Steel Minimum Yield Strength, Fy	60 ksi	60 ksi	60 ksi
Steel Minimum Ultimate Strength, Fu	70 ksi	70 ksi	70 ksi
Modulus of Elasticity, E	29,000 ksi	29,000 ksi	29,000 ksi
Nominal Wall Thickness	0.276 in.	0.276 in.	0.276 in.
Design Wall Thickness	0.257 in.	0.221 in.	0.247 in.
Outside Diameter, OD	2.875 in.	2.839 in.	2.865 in.
Inside Diameter, ID	2.361 in.	2.397 in.	2.371 in.
Cross Sectional Area, A	2.11 in^2	1.82 in^2	2.03 in^2
Moment of Inertia, I	1.83 in^4	1.57 in^4	1.76 in^4
Radius of Gyration, r	0.93 in.	0.93 in.	0.93 in.
Elastic Section Modulus, S	1.27 in^3	1.10 in^3	1.23 in^3
Plastic Section Modulus, Z	1.77 in^3	1.52 in^3	1.70 in^3

For SI: 1 inch=25.4 mm, 1 kip = 1,000 lbf = 4.448 kN, 1000 psi = 1 ksi = 6.9 MPa

TABLE 2—HP288 WITH RETROFIT BRACKET - ASD COMPRESSION CAPACITIES

Bracket Part No.[1]	Sleeve Part No.[1]	Bracket Description	Allowable Compression Capacity (kips)						
			Bracket (P1)[2]	Shaft (P2)[3]	Helix (P3)[4] (Per Helix Plate)	Soil FOS=2 (P4)[5]	Soil FOS=2.5 (P4)[5]	Foundation System with Soil FOS=2[6]	Foundation System with Soil FOS=2.5[6]
FS288BL2	FS288ES30	HP288 Low Profile 2 Bracket w/30" sleeve	24.0	63.6	40.0	35.5	28.4	24.0	24.0
FS288BL2-G	FS288ES30-G		26.8	71.1	40.0	35.5	28.4	26.8	26.8

For SI: 1 inch = 25.4 mm, 1 kip = 1000 lbf = 4.448 kN

[1]Part numbers with "G" suffix indicate hot-dip galvanized coating. Part numbers without a "G" suffix indicate plain steel.
[2]Bracket capacities are based on full scale load tests and assumes a minimum concrete compressive strength (f'_c) of 2,500 psi (17.24 MPa).
[3]Shaft capacities are limited to foundation systems with fully braced shafts as described in Section 3.1.2 of this report.
[4]Helix capacity is based on a single helix plate with outer diameter of 8, 10, 12 or 14 inches (203 mm, 254 mm, 305 mm, or 356 mm).
[5]Soil capacity is derived from torque correlation calculations per Section 3.1.1 of this report, with piles installed at the maximum torsion rating.
[6]Foundation system allowable capacities are based on the lowest of P1, P2, P3 and P4 listed in this table.

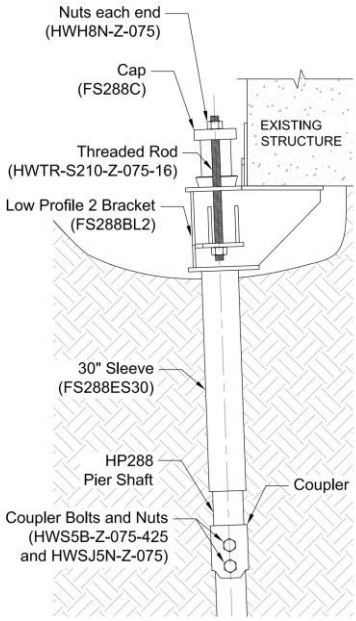


FIGURE 1—FS288BL2 RETROFIT BRACKET AND SHAFT ASSEMBLY

TABLE 3—HP288 WITH NEW CONSTRUCTION BRACKET - ASD COMPRESSION CAPACITIES

Bracket Part No.[1]	Bearing Plate Dimensions (in)	Minimum Concrete Compressive Strength (psi)	Edge Distance "A" (in)	Allowable Compression Capacity (kips)						
				Bracket (P1)[2]	Shaft (P2)[3]	Helix (P3)[4] (Per Helix Plate)	Soil FOS=2 (P4)[5])	Soil FOS=2.5 (P4)[5]	Foundation System with Soil FOS=2[6]	Foundation System with Soil FOS=2.5[6]
HP288NCB or HP288NCB-G	6 x 6 x 0.75	2500	3	33.1	63.6	40.0	35.5	28.4	33.1	28.4
			≥ 4	44.1	63.6	40.0	35.5	28.4	35.5	28.4
		3000	≥ 3	39.7	63.6	40.0	35.5	28.4	35.5	28.4
HP288NCB8 or HP288NCB8-G	8 x 8 x 0.75	2500	≥ 4	43.1	63.6	40.0	35.5	28.4	35.5	28.4

For SI: 1 inch = 25.4 mm, 1 kip = 1000 lbf = 4.448 kN

[1]Part numbers with "G" suffix indicate hot-dip galvanized coating. Part numbers without a "G" suffix indicate plain steel.
[2]Bracket capacity is based on concrete bearing strength only. All other design provisions related to the concrete foundation, such as punching shear, are outside the scope of this evaluation report, and shall be determined in accordance with ACI 318.
[3]Shaft capacities are limited to foundation systems with fully braced shafts as described in Section 3.1.2 of this report.
[4]Helix capacity is based on a single helix plate with outer diameter of 8, 10, 12 or 14 inches (203 mm, 254 mm, 305 mm, or 356 mm).
[5]Soil capacity is derived from torque correlation calculations per Section 3.1.1 of this report, with piles installed at the maximum torsion rating.
[6]Foundation system allowable capacities are based on the lowest of P1, P2, P3 and P4 listed in this table.

TABLE 4—HP288 WITH NEW CONSTRUCTION BRACKET - ASD TENSION CAPACITIES

Bracket Part No.[1]	Bearing Plate Dimensions (in)	Minimum Concrete Compressive Strength (psi)	Edge Distance "A" (in)	Allowable Tension Capacity (kips)				
				Bracket (P1)[2]	Shaft (P2)	Helix (P3)[3] (Per Helix Plate)	Soil FOS=2.5 (P4)[5]	Foundation System with Soil FOS=2.5[6]
HP288NCB or HP288NCB-G	6 x 6 x 0.75	2500	3	24.3	34.1	40.0	22.1	22.1
			≥ 4	32.4	34.1	40.0	22.1	22.1
		3000	≥ 3	29.1	34.1	40.0	22.1	22.1
		3500	≥ 3	34.0	34.1	40.0	22.1	22.1
HP288NCB8 or HP288NCB8-G	8 x 8 x 0.75	2500	≥ 4	34.1	34.1	40.0	22.1	22.1

For SI: 1 inch = 25.4 mm, 1 kip = 1000 lbf = 4.448 kN

[1]Part numbers with "G" suffix indicate hot-dip galvanized coating. Part numbers without a "G" suffix indicate plain steel.
[2]Bracket capacity is based on concrete bearing strength only. All other design provisions related to the concrete foundation, such as punching shear, are outside the scope of this evaluation report, and shall be determined in accordance with ACI 318.
[3]Shaft capacities are limited to foundation systems with fully braced shafts as described in Section 3.1.2 of this report.
[4]Helix capacity is based on a single helix plate with outer diameter of 8, 10, 12 or 14 inches (203 mm, 254 mm, 305 mm, or 356 mm).
[5]Soil capacity is derived from torque correlation calculations per Section 3.1.1 of this report, with piles installed at the maximum torsion rating.
[6]Foundation system allowable capacities are based on the lowest of P1, P2, P3 and P4 listed in this table.

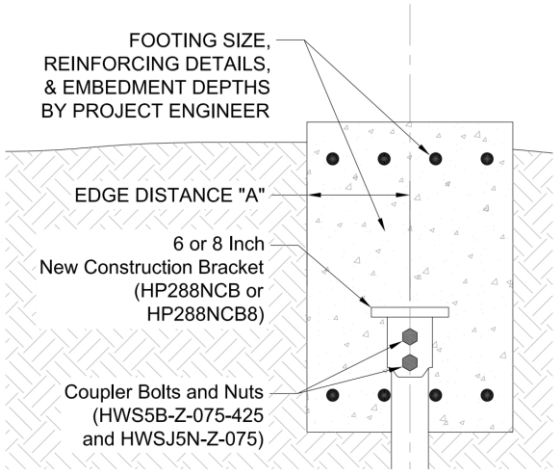


FIGURE 2—HP288 NEW CONSTRUCTION BRACKET ASSEMBLIES