

## High Compression Strength with Drivecast™ Piles in Soft Soil

The following tables provide the nominal, LRFD design, and ASD allowable compression strengths of Drivecast piles with various diameter grout shafts in soft soils. The strengths listed are based on an unsupported length of 10 feet (3 meters) with either a fixed or pinned end condition at the pile head. The grout column diameters listed reflect the results in various soil conditions. In clay, the grout column is generally close to the diameter of the small plate on the displacement assembly. In sand, the grout column ranges between the small and large diameter plates on the displacement assembly. In loose sand fill, the grout column can exceed the diameter of the large plate on the displacement assembly. Each table includes the compression strengths of shafts without external grout for comparison.

Per the International Building Code(IBC) 2015 Section 1810.2.1, the depth to fixity of piles driven into soft ground can be considered fixed and laterally supported at 10 feet below ground surface.

Nominal, LRFD Design, and ASD Allowable Compression Strengths of Drivecast Piles, Type SS175 Central Shafts in Soft Soil<sup>1,2,3</sup>

Grout Column Diameter	Nominal, LRFD Design, and ASD Allowable Compression Strengths kip (kN)					
	Soft Soil					
	Pinned			Fixed		
Nominal	Design	Allowable	Nominal	Design	Allowable	
No Grout	25.8 (115.6)	23.2 (103.9)	15.4 (69.0)	50.5 (226.3)	45.4 (203.4)	30.2 (135.3)
8" OD	217.4 (974.4)	163.1 (731.0)	108.7 (487.2)	316.5 (1418.6)	237.3 (1063.6)	158.2 (709.0)
9" OD	280.6 (1257.7)	210.5 (943.5)	140.3 (628.8)	381.2 (1708.6)	285.9 (1281.4)	190.6 (854.3)
10" OD	350.2 (1569.6)	262.7 (1177.4)	175.1 (784.8)	451.4 (2023.2)	338.5 (1517.2)	225.7 (1011.6)
11" OD	426.0 (1909.4)	319.5 (1432.0)	213.0 (954.7)	527.1 (2362.5)	395.3 (1771.8)	263.6 (1181.5)
12" OD	507.9 (2276.5)	380.9 (1707.2)	253.9 (1138.0)	608.6 (2727.8)	456.5 (2046.1)	304.3 (1363.9)

Nominal, LRFD Design, and ASD Allowable Compression Strengths of Drivecast Piles, Type SS200 Central Shafts in Soft Soil<sup>1,2,3</sup>

Grout Column Diameter	Nominal, LRFD Design, and ASD Allowable Compression Strengths kip (kN)					
	Soft Soil					
	Pinned			Fixed		
Nominal	Design	Allowable	Nominal	Design	Allowable	
No Grout	43.7 (195.8)	39.3 (176.1)	26.2 (117.4)	85.6 (383.6)	77.1 (345.5)	51.3 (229.9)
8" OD	262.2 (1175.2)	196.6 (881.2)	131.1 (587.6)	374.8 (1679.9)	281.1 (1259.9)	187.4 (839.9)
9" OD	328.8 (1473.7)	246.6 (1105.3)	164.4 (736.8)	441.6 (1979.3)	331.2 (1484.5)	220.8 (989.6)
10" OD	401.4 (1799.1)	301.1 (1349.5)	200.7 (899.5)	513.6 (2302.0)	385.2 (1726.5)	256.8 (1151.0)
11" OD	479.8 (2150.5)	359.9 (1613.1)	239.9 (1075.2)	590.9 (2648.5)	443.2 (1986.5)	295.5 (1324.4)
12" OD	564.0 (2527.9)	423.0 (1895.9)	282.0 (1263.9)	673.8 (3020.1)	505.3 (2264.8)	336.9 (1510.0)
13" OD	654.1 (2931.8)	490.5 (2198.5)	327.0 (1465.6)	762.3 (3416.7)	571.8 (2562.9)	381.2 (1708.6)
14" OD	749.9 (3361.2)	562.5 (2521.2)	375.0 (1680.8)	856.8 (3840.3)	642.6 (2880.2)	428.4 (1920.1)
15" OD	851.8 (3817.9)	638.8 (2863.2)	425.9 (1908.9)	957.3 (4290.8)	718.0 (3218.2)	478.7 (2145.6)
16" OD	959.7 (4301.5)	719.7 (3225.8)	479.8 (2150.5)	1063.9 (4768.6)	798.0 (3576.8)	532.0 (2384.5)

For SI: 1 kip = 4.448 kN.

<sup>1</sup> Refer to Section 4.1.3 of ESR-2794 for descriptions of fixed condition, pinned condition, soft soil.

<sup>2</sup> Strength ratings are based on a design corrosion level of 50-years and presume the supported structure is braced in accordance with IBC Section 1808.2.5, and the lead section with which the extension is used will provide sufficient helix capacity to develop the full shaft capacity.

<sup>3</sup> Column length to "fixity" of shaft in soil = 10 feet (3 meters)

Nominal, LRFD Design, and ASD Allowable Compression Strengths of Drivecast Piles, Type RS3500.300 Central Shafts in Soft Soil<sup>1,2,3</sup>

Grout Column Diameter	Nominal, LRFD Design, and ASD Allowable Compression Strengths kip (kN)					
	Pinned			Fixed		
	Nominal	Design	Allowable	Nominal	Design	Allowable
No Grout	90.66 (403.3)	81.59 (362.9)	54.28 (241.4)	110.01 (489.3)	99.01 (440.4)	65.88 (293.0)
Grout Inside	104.27 (463.8)	78.20 (347.9)	52.14 (231.9)	131.39 (584.5)	98.55 (438.4)	65.70 (292.2)
8" OD	227.20 (1010.6)	170.40 (758.0)	113.60 (505.3)	275.51 (1225.5)	206.63 (919.1)	137.75 (612.7)
9" OD	273.01 (1214.4)	207.76 (924.2)	136.50 (607.2)	326.56 (1452.6)	244.92 (1089.5)	163.28 (726.3)
10" OD	326.90 (1454.1)	245.18 (1090.6)	163.45 (727.1)	385.18 (1713.4)	288.88 (1285.0)	192.59 (856.7)
11" OD	388.90 (1729.9)	291.68 (1297.5)	194.45 (865.0)	451.33 (2007.6)	338.50 (1505.7)	225.67 (1003.8)
12" OD	458.90 (2041.3)	344.17 (1530.9)	229.45 (1020.6)	524.92 (2335.0)	393.69 (1751.2)	262.46 (1167.5)
13" OD	536.72 (2387.4)	402.54 (1790.6)	268.36 (1193.7)	605.82 (2694.8)	454.36 (2021.1)	302.91 (1347.4)
14" OD	622.20 (2767.7)	466.65 (2075.8)	311.10 (1383.8)	693.90 (3086.6)	520.43 (2315.0)	346.95 (1543.3)

Nominal, LRFD Design, and ASD Allowable Compression Strengths of Drivecast Piles, Type RS4500.337 Central Shafts in Soft Soil<sup>1,2,3</sup>

Grout Column Diameter	Nominal, LRFD Design, and ASD Allowable Compression Strengths kip (kN)					
	Pinned			Fixed		
	Nominal	Design	Allowable	Nominal	Design	Allowable
No Grout	156.30 (700.5)	140.67 (630.5)	93.59 (419.4)	175.30 (785.7)	157.77 (707.1)	104.97 (470.4)
Grout Inside	190.46 (853.6)	142.84 (640.2)	95.23 (426.8)	219.25 (982.7)	164.44 (737.0)	109.63 (491.3)
8" OD	302.24 (1354.7)	226.68 (1016.0)	151.12 (677.3)	344.32 (1543.3)	258.24 (1157.4)	172.16 (771.6)
9" OD	347.89 (1559.3)	260.92 (1169.4)	173.94 (779.6)	395.11 (1770.9)	296.33 (1328.2)	197.56 (885.5)
10" OD	440.88 (1976.1)	300.66 (1347.6)	200.44 (898.4)	453.02 (2030.5)	339.76 (1522.8)	226.51 (1015.2)
11" OD	461.50 (2068.5)	346.12 (1551.3)	230.75 (1034.2)	518.18 (2322.5)	388.64 (1741.9)	259.09 (1161.2)
12" OD	529.87 (2374.9)	397.41 (1781.2)	264.94 (1187.5)	590.67 (2647.5)	443.00 (1985.6)	295.33 (1323.7)
13" OD	606.03 (2965.76)	454.53 (2021.85)	303.02 (1347.9)	670.46 (2982.36)	502.85 (2236.79)	335.23 (1491.18)
14" OD	689.92 (3068.92)	517.44 (2301.69)	344.96 (1534.46)	757.52 (3369.62)	568.14 (2527.21)	378.76 (1684.81)
15" OD	781.42 (3475.93)	586.06 (2606.93)	390.71 (1737.97)	851.77 (3788.86)	638.83 (2841.66)	425.88 (1894.41)
16" OD	880.42 (3916.30)	660.32 (2947.25)	440.21 (1958.15)	953.14 (4239.78)	714.85 (3179.81)	476.57 (2119.89)

Nominal, LRFD Design, and ASD Allowable Compression Strengths of Drivecast Piles, Type RS8625.250 Central Shafts in Soft Soil<sup>1,2,3</sup>

Grout Column Diameter	Nominal, LRFD Design, and ASD Allowable Compression Strengths kip (kN)					
	Pinned			Fixed		
	Nominal	Design	Allowable	Nominal	Design	Allowable
No Grout	272.91	245.62	163.42	280.85	252.76	168.17
Grout Inside	490.33	367.75	245.17	513.39	385.04	256.69
12" OD	674.76	506.07	337.38	708.49	531.37	354.24
13" OD	749.04	561.78	374.52	787.13	590.35	393.56
14" OD	830.02	622.52	415.01	872.47	654.35	436.23
15" OD	917.93	688.45	458.97	964.63	723.47	482.31
16" OD	1012.92	759.69	506.46	1063.69	797.76	531.84
17" OD	1115.13	836.34	557.56	1169.72	877.29	584.86
18" OD	1224.62	918.46	612.31	1282.76	962.07	641.38
19" OD	1341.44	1006.08	670.72	1402.82	1052.12	701.41
20" OD	1465.58	1099.19	732.79	1529.92	1147.44	764.96
21" OD	1597.04	1197.78	798.52	1664.02	1248.02	832.01
22" OD	1735.76	1301.82	867.88	1805.12	1353.84	902.56

For SI: 1 kip = 4,448 kN.

<sup>1</sup> Refer to Section 4.1.3 of ESR-2794 for descriptions of fixed condition, pinned condition, soft soil.<sup>2</sup> Strength ratings are based on a design corrosion level of 50-years and presume the supported structure is braced in accordance with IBC Section 1808.2.5, and the lead section with which the extension is used will provide sufficient helix capacity to develop the full shaft capacity.<sup>3</sup> Column length to "fixity" of shaft in soil = 10 feet (3 meters)

## High Compression Strength with Drivecast™ Piles in Firm Soils

The following tables provide the nominal, LRFD design, and ASD allowable compression strengths of Drivecast piles with various diameter grout shafts in firm soils. The strengths listed are based on an unsupported length of 5 feet (3 meters) with either a fixed or pinned end condition at the pile head. The grout column diameters listed reflect the results in various soil conditions. In clay, the grout column is generally close to the diameter of the small plate on the displacement assembly. In sand, the grout column ranges between the small and large diameter plates on the displacement assembly. In loose sand fill, the grout column can exceed the diameter of the large plate on the displacement assembly. Each table includes the compression strengths of shafts without external grout for comparison.

Per the International Building Code (IBC) 2015 Section 1810.2.1, the depth to fixity of piles driven into firm ground can be considered fixed and laterally supported at 5 feet below ground surface.

Nominal, LRFD Design, and ASD Allowable Compression Strengths of Drivecast Piles, Type SS175 Central Shafts in Firm Soil<sup>1,2,3</sup>

Grout Column Diameter	Nominal, LRFD Design, and ASD Allowable Compression Strengths kip (kN)					
	Firm Soil					
	Pinned		Fixed			
Nominal	Design	Allowable	Nominal	Design	Allowable	
No Grout	103.02 (461.7)	92.82 (416.0)	61.69 (276.5)	164.26 (736.2)	147.83 (662.6)	98.36 (440.8)
8" OD	386.26 (1731.3)	289.6 (1298.4)	193.13 (865.6)	424.24 (1901.5)	318.18 (1426.1)	212.12 (950.7)
9" OD	448.60 (2010.7)	336.4 (1508.0)	224.30 (1005.3)	484.31 (2170.7)	363.24 (1628.1)	242.16 (1085.4)
10" OD	516.53 (2315.1)	387.40 (1736.4)	258.26 (1157.5)	550.36 (2466.8)	412.77 (1850.1)	275.18 (1233.4)
11" OD	590.27 (2645.7)	442.7 (1984.2)	295.13 (1322.8)	622.55 (2790.4)	466.91 (2092.7)	311.27 (1395.1)
12" OD	670.00 (3003.0)	502.5 (2252.3)	335.00 (1501.5)	701.01 (3142.0)	525.76 (2356.5)	350.50 (1571.0)

Nominal, LRFD Design, and ASD Allowable Compression Strengths of Drivecast Piles, Type SS200 Central Shafts in Firm Soil<sup>1,2,3</sup>

Grout Column Diameter	Nominal, LRFD Design, and ASD Allowable Compression Strengths kip (kN)					
	Firm Soil					
	Pinned		Fixed			
Nominal	Design	Allowable	Nominal	Design	Allowable	
No Grout	167.34 (750.0)	150.60 (675.0)	100.20 (449.1)	239.01 (1071.2)	215.11 (964.1)	143.12 (641.4)
8" OD	453.11 (2030.9)	339.83 (1523.1)	226.55 (1015.4)	495.45 (2220.7)	371.59 (1665.5)	247.72 (1110.3)
9" OD	516.55 (2315.2)	387.42 (1736.5)	258.28 (1157.6)	556.10 (2492.5)	417.07 (1869.3)	278.05 (1246.2)
10" OD	585.45 (2624.1)	439.08 (1968.0)	292.72 (1312.0)	622.66 (2790.8)	466.99 (2093.1)	311.33 (1395.4)
11" OD	660.02 (2958.3)	495.02 (2218.7)	330.01 (1479.1)	695.29 (3116.4)	521.47 (2337.3)	347.64 (1558.1)
12" OD	740.48 (3318.9)	555.36 (2489.2)	370.24 (1659.4)	774.13 (3469.8)	580.60 (2602.3)	387.06 (1734.8)
13" OD	826.98 (3706.7)	620.24 (2780.0)	413.49 (1853.3)	859.27 (3851.4)	644.46 (2888.6)	429.64 (1925.7)
14" OD	919.66 (4122.1)	689.74 (3091.5)	459.83 (2061.0)	950.81 (4261.7)	713.10 (3196.2)	475.40 (2130.8)
15" OD	1018.6 (4565.5)	763.95 (3424.1)	509.30 (2282.7)	1048.78 (4700.8)	786.59 (3525.6)	524.39 (2350.4)
16" OD	1123.8 (5037.4)	842.91 (3778.1)	561.94 (2518.7)	1153.25 (5169.1)	864.94 (3876.8)	576.62 (2584.5)

For SI: 1 kip = 4.448 kN.

<sup>1</sup> Refer to Section 4.1.3 of ESR-2794 for descriptions of fixed condition, pinned condition, soft & firm soil.

<sup>2</sup> Strength ratings are based on a design corrosion level of 50-years and presume the supported structure is braced in accordance with IBC Section 1808.2.5.

<sup>3</sup> Column length to "fixity" of shaft in soft soil = 10 feet (3 meters), and 5 feet (1.5 meters).



Nominal, LRFD Design, and ASD Allowable Compression Strengths of Drivecast Piles, Type RS3500.300 Central Shafts in Firm Soil<sup>1,2,3</sup>

Grout Column Diameter	Nominal, LRFD Design, and ASD Allowable Compression Strengths kip (kN)					
	Firm Soil					
	Pinned			Fixed		
Nominal	Design	Allowable	Nominal	Design	Allowable	
No Grout	121.92 (546.4)	109.73 (491.8)	73.01 (327.2)	127.97 (573.5)	115.17 (516.2)	76.63 (343.4)
Grout Inside	148.57 (665.9)	111.43 (499.4)	74.28 (332.9)	157.41 (705.5)	118.06 (529.1)	78.70 (352.7)
8" OD	305.22 (1368.0)	228.92 (1026.0)	152.61 (684.0)	320.30 (1435.6)	240.22 (1076.7)	160.15 (717.8)
9" OD	359.15 (1609.7)	269.37 (1207.3)	179.58 (804.9)	375.60 (1683.5)	281.70 (1262.6)	187.80 (841.7)
10" OD	420.25 (1883.6)	315.19 (1412.7)	210.13 (941.8)	437.84 (1962.4)	328.38 (1471.8)	218.92 (981.2)
11" OD	488.48 (2189.4)	366.36 (1642.1)	244.24 (1094.7)	507.01 (2272.5)	380.26 (1704.4)	253.50 (1136.2)
12" OD	563.78 (2526.9)	422.84 (1895.2)	281.89 (1263.4)	583.05 (2613.3)	437.29 (1960.0)	291.53 (1306.7)
13" OD	646.08 (2895.8)	484.56 (2171.9)	3233.04 (14491.1)	665.94 (2984.8)	499.45 (2238.6)	332.97 (1492.4)
14" OD	735.30 (3295.7)	551.48 (2471.8)	367.65 (1647.8)	755.63 (3386.8)	566.72 (2540.1)	377.81 (1693.4)

Nominal, LRFD Design, and ASD Allowable Compression Strengths of Drivecast Piles, Type RS4500.337 Central Shafts in Firm Soil<sup>1,2,3</sup>

Grout Column Diameter	Nominal, LRFD Design, and ASD Allowable Compression Strengths kip (kN)					
	Firm Soil					
	Pinned			Fixed		
Nominal	Design	Allowable	Nominal	Design	Allowable	
No Grout	186.32 (835.1)	167.69 (751.6)	111.57 (500.0)	191.74 (859.4)	172.57 (773.4)	114.82 (514.6)
Grout Inside	236.28 (1059.0)	177.21 (794.2)	118.14 (529.5)	244.7 (1097.0)	183.56 (822.7)	122.37 (548.4)
8" OD	369.00 (1653.9)	276.75 (1240.4)	184.50 (826.9)	381.23 (1708.7)	285.92 (1281.5)	190.61 (854.3)
9" OD	422.75 (1894.8)	317.07 (1421.1)	211.38 (947.4)	436.42 (1956.1)	327.32 (1467.1)	218.21 (978.0)
10" OD	483.42 (2166.7)	362.57 (1625.1)	241.71 (1083.3)	498.43 (2234.0)	373.82 (1675.5)	249.21 (1117.0)
11" OD	551.08 (2470.0)	413.31 (1852.5)	275.54 (1235.0)	567.27 (2542.6)	425.46 (1907.0)	283.64 (1271.3)
12" OD	625.75 (2804.7)	469.31 (2103.5)	312.88 (1402.3)	642.98 (2881.9)	482.23 (2161.4)	321.49 (1440.9)
13" OD	707.43 (3146.8)	530.57 (2360.1)	353.72 (1573.4)	725.53 (3227.3)	544.15 (2420.5)	362.76 (1613.6)
14" OD	796.09 (3541.2)	597.07 (2655.9)	398.05 (1770.6)	814.91 (3624.9)	611.19 (2718.7)	407.46 (1812.5)
15" OD	891.69 (3966.4)	668.76 (2974.8)	445.84 (1983.2)	911.11 (4052.8)	683.33 (3039.6)	455.56 (2026.4)
16" OD	994.18 (4422.3)	745.63 (3316.7)	497.09 (2211.2)	1014.1 (4510.9)	760.57 (3383.2)	507.05 (2255.4)

Nominal, LRFD Design, and ASD Allowable Compression Strengths of Drivecast Piles, Type RS8625.250 Central Shafts in Firm Soil<sup>1,2,3</sup>

Grout Column Diameter	Nominal, LRFD Design, and ASD Allowable Compression Strengths kip (kN)					
	Firm Soil					
	Pinned			Fixed		
Nominal	Design	Allowable	Nominal	Design	Allowable	
No Grout	285.16	256.64	170.75	287.21	258.49	171.98
Grout Inside	526.07	394.55	263.03	532.15	399.11	266.07
12" OD	727.09	545.32	363.54	736.01	552.01	368.01
13" OD	808.15	606.11	404.07	818.23	613.67	409.12
14" OD	895.89	671.92	447.95	907.13	680.35	453.57
15" OD	990.39	742.79	495.20	1002.75	752.06	501.38
16" OD	1091.68	818.76	545.84	1105.11	828.83	552.55
17" OD	1199.79	899.85	599.90	1214.22	910.66	607.11
18" OD	1314.75	986.07	657.38	1330.09	997.57	665.04
19" OD	1436.57	1077.43	718.28	1452.73	1089.55	726.36
20" OD	1565.23	1173.93	782.62	1582.14	1186.60	791.07
21" OD	1700.75	1275.56	850.37	1718.31	1288.73	859.15
22" OD	1843.09	1382.32	921.55	1861.23	1395.93	930.62

For SI: 1 kip = 4.448 kN.

<sup>1</sup> Refer to Section 4.1.3 of ESR-2794 for descriptions of fixed condition, pinned condition, soft & firm soil.<sup>2</sup> Strength ratings are based on a design corrosion level of 50-years and presume the supported structure is braced in accordance with IBC Section 1808.2.5.<sup>3</sup> Column length to "fixity" of shaft in soft soil = 10 feet (3 meters), and 5 feet (1.5 meters).

**Table 7-8**

DRIVECAST™ PILE THEORETICAL GROUT VOLUME PER FOOT (METER)		
PILE SHAFT DIAMETER in. (mm)	GROUT COLUMN DIAMETER in. (mm)	GROUT VOLUME (ft <sup>3</sup> /ft (m <sup>3</sup> /m)
1.75 (44)	8 (203.2)	0.321 (0.030)
	9 (228.6)	0.413 (0.038)
	10 (254)	0.517 (0.048)
	11 (279.4)	0.632 (0.059)
	12 (304.8)	0.781 (0.073)
2.00 (51)	8 (203.2)	0.304 (0.028)
	9 (228.6)	0.396 (0.037)
	10 (254)	0.500 (0.046)
	11 (279.4)	0.614 (0.0570)
	12 (304.8)	0.774 (0.072)
	13 (330.2)	0.876 (0.081)
	14 (355.6)	1.051 (0.098)
	15 (381)	1.182 (0.110)
	16 (406.4)	1.351 (0.126)
3.5 (89)	8 (203.2)	0.270 (0.025)
	9 (228.6)	0.363 (0.034)
	10 (254)	0.466 (0.043)
	11 (279.4)	0.581 (0.054)
	12 (304.8)	0.706 (0.066)
	13 (330.2)	0.843 (0.078)
	14 (355.6)	0.990 (0.092)
4.5 (114)	8 (203.2)	0.222 (0.021)
	9 (228.6)	0.315 (0.029)
	10 (254)	0.419 (0.039)
	11 (279.4)	0.533 (0.050)
	12 (304.8)	0.659 (0.061)
	13 (330.2)	0.795 (0.074)
	14 (355.6)	0.942 (0.088)
	15 (381)	1.100 (0.102)
	16 (406.4)	1.269 (0.118)
5.5	10 (254)	0.365 (0.034)
	11 (279.4)	0.480 (0.045)
	12 (304.8)	0.605 (0.056)
	13 (330.2)	0.741 (0.069)
	14 (355.6)	0.889 (0.083)
	15 (381)	1.047 (0.097)
	16 (406.4)	1.216 (0.113)
8.625	12 (304.8)	0.359 (0.033)
	13 (330.2)	0.495 (0.046)
	14 (355.6)	0.642 (0.060)
	15 (381)	0.800 (0.074)
	16 (406.4)	0.969 (0.090)
	17 (431.8)	1.149 (0.107)
	18 (457.2)	1.340 (0.124)

## Reinforcement for Upper 6'-0 of Drivecast™ Pile Grout Columns

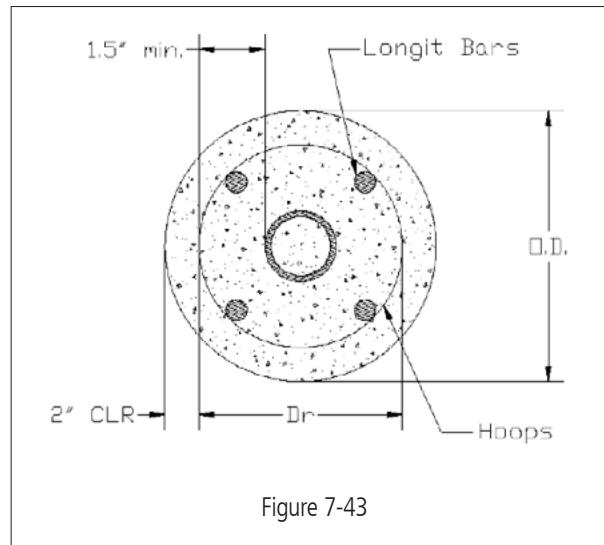
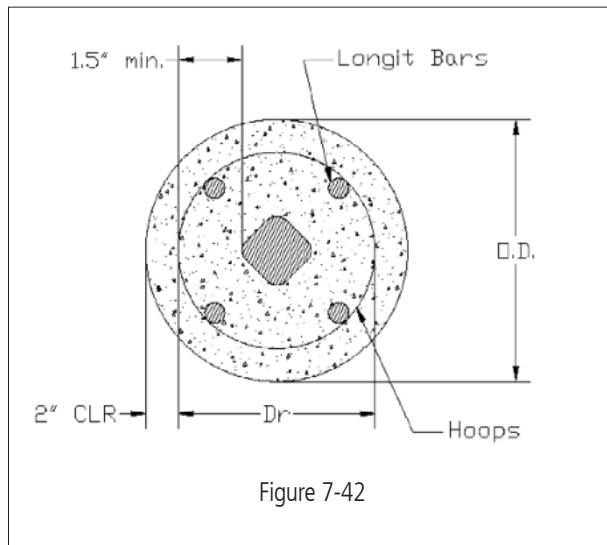
This table provides basic information about the option to add steel reinforcement to the grout column outside the central steel shaft (hollow pipe or solid square) in the upper 6'-0 of soils with minimum 2" cover.

$$Asr = 0.004(Ag)$$

$$\text{Perimeter or Reinf'g (w/2" Clr)} = \pi Dr$$

$$\text{Max} = 0.004 \frac{(\pi)(16")^2}{4} 0.804 \text{ in}^2$$

$$\text{Hoops} = 0.009 \text{ in}^2/\text{in of spacing} = 0.009 \text{ in}^2/(12") = 0.11 \text{ in}^2$$



**Table 7-9: Steel Reinforcement - Drivecast™ Piles**

PILES	O.D.	Asr (in <sup>2</sup> )	REINF'G PERIMETER (in)	LONGIT BARS	HOOPS
SS	10"	0.314	18.85	(3) #3	"3@12"
SS	11"	0.380	21.99	(4) #3	"3@12"
SS, RS	12"	0.452	25.13	(4) #3	"3@12"
SS, RS	13"	0.531	28.27	(5) #3	"3@12"
SS, RS	14"	0.616	31.42	(4) #4	"3@12"
SS, RS	15"	0.707	34.56	(4) #4	"3@12"
SS, RS	16"	0.804	37.70	(4) #4	"3@12"
SS, RS	17"	0.908	40.84	(4) #4	"3@12"
SS, RS	18"	1.018	43.98	(4) #5	"3@12"
SS, RS	19"	1.134	59.69	(4) #5	"3@12"
SS, RS	20"	1.257	62.83	(4) #5	"3@12"
SS, RS	21"	1.385	65.97	(4) #5	"3@12"
SS, RS	22"	1.520	69.12	(5) #5	"3@12"

