

Settlement Analysis

Organization: **SoilStructure.com**
 Project Name: **Foundation Design Coduto3rd**
 Job #: **P 287**
 Design by: **LAA**
 Date: **3/16/2017**

Foundation Geometry, GWT & Loading

Units: **English**
 Footing Shape: **Square**
 Method: **Terzaghi & Peck**

Variable	Value	Variable	Value
Footing Width	6.00 ft	Ground Water Depth	10.00 ft
Footing Thickness	1.75 ft	Rigidity factor	0.85
Footing Length	6.00 ft	Max. Depth	21.00 ft
Embedment Depth	2.00 ft	Axial Load	100.00 k

Geotechnical Properties

#	Material Type	USCS	Layer Thick, ft	Consistency	Compr. Ratio Cc/(1+e)	Recompr. Ratio Cr/(1+e)	OC Margin sigma m' lb/ft^2	Unit Wt gamma lb/ft^3
1	Cohesive Soil	CL	3.00 0 - 3	Very Stiff	0.110	0.020	4000	115.0
2	Cohesive Soil	CL	6.00 3 - 9	Very Stiff	0.110	0.020	4000	115.0
3	Cohesive Soil	CL	12.00 9 - 21	Very Stiff	0.110	0.020	4000	115.0

Results

Applied Pressure, q: 3077.8 lb/ft^2 [Foundation Design, 3rd Ed. p 287](#)
 Total Settlement, S: 1.10 in **1.04"**

At Midpoint of Soil Layer											
Layer No.	H (ft)	z _f (ft)	σ' _{z0} (lb/ft ²)	Δσ _z (lb/ft ²)	σ' _{zf} (lb/ft ²)	σ' _c (lb/ft ²)	Case	$\frac{C_c}{1 + e_0}$	$\frac{C_r}{1 + e_0}$	δ _c (in)	
1	3.0	1.5	402	2680	3082	4402	OC-I	0.11	0.02	0.54	
2	6.0	6.0	920	925	1845	4920	OC-I	0.11	0.02	0.37	
3	12.0	15.0	1518	190	1708	5518	OC-I	0.11	0.02	0.13	
										Σ = 1.04	

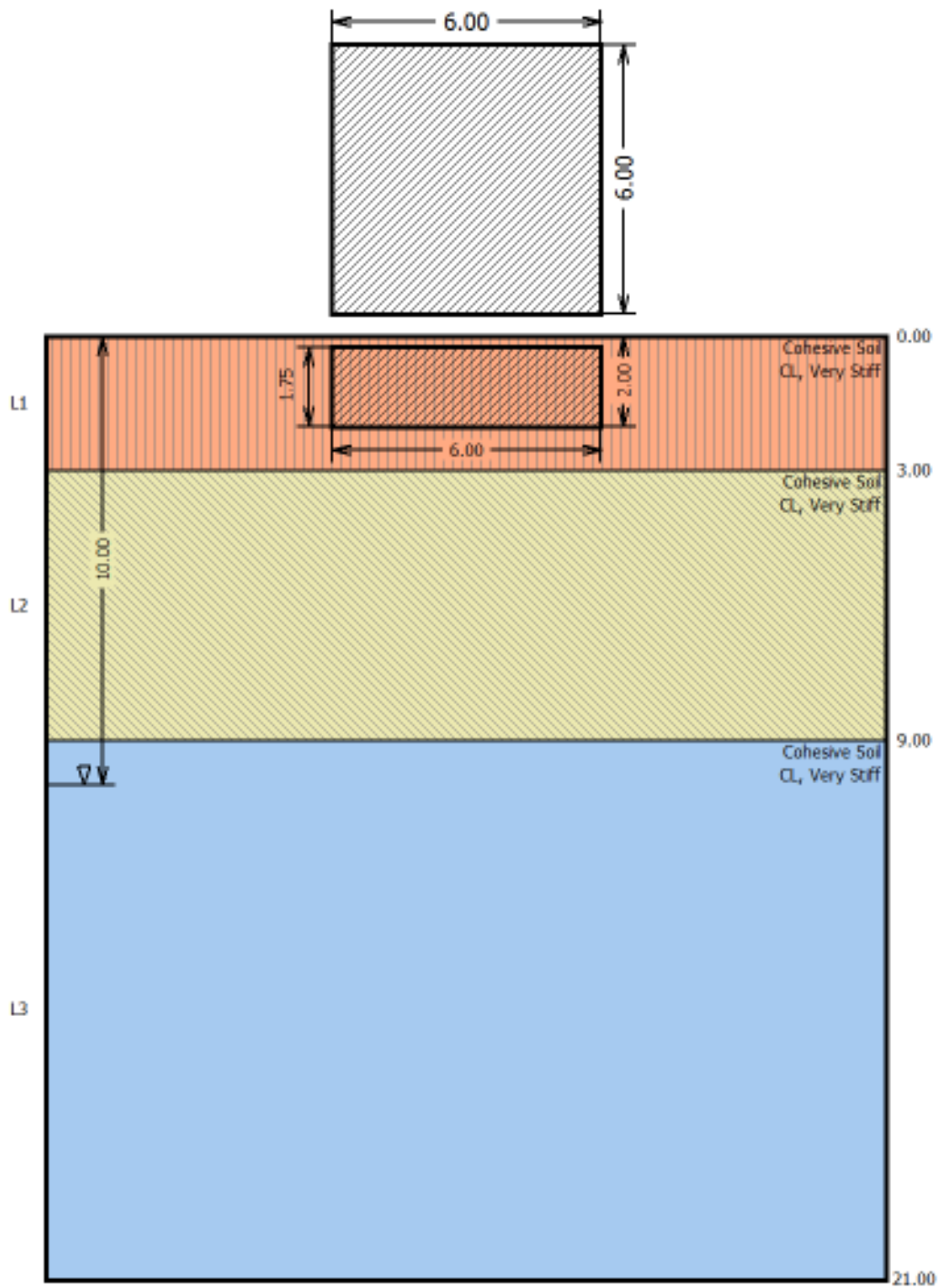


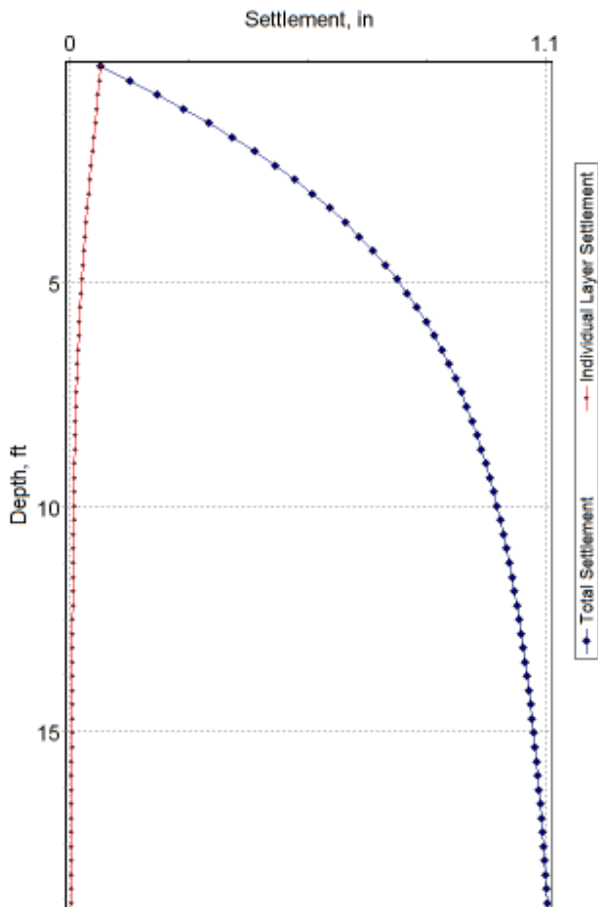
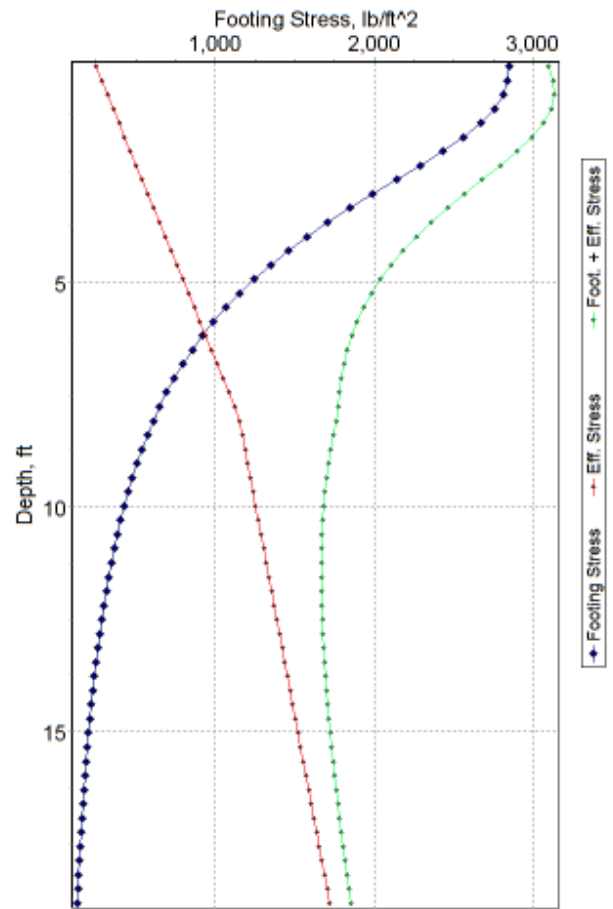
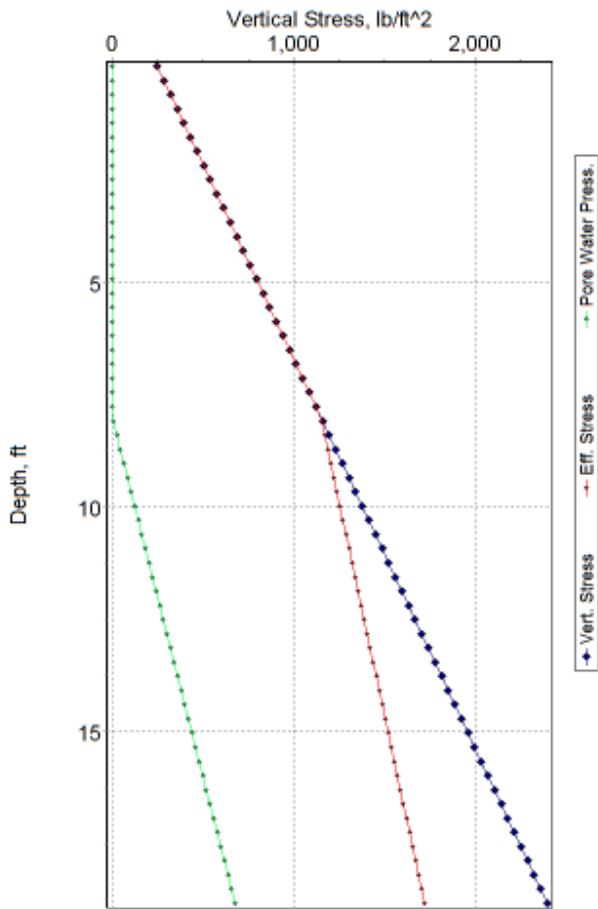
Fig. 1: Plan and Cross Section

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Node #	Depth (ft)	O.C.+Eff. Str (psf)	Eff. Stress (psf)	Ftng. Stress (psf)	Ftng. + Eff. Str (psf)
1	0.16	4248.21	248.21	2847.46	3095.67
2	0.48	4284.63	284.63	2839.56	3124.19
3	0.79	4321.04	321.04	2811.79	3132.83
4	1.11	4357.46	357.46	2756.51	3113.97
5	1.43	4393.88	393.88	2672.05	3065.92
6	1.74	4430.29	430.29	2561.66	2991.96
7	2.06	4466.71	466.71	2431.59	2898.30
8	2.38	4503.13	503.13	2289.01	2792.14
9	2.69	4539.54	539.54	2140.67	2680.21
10	3.01	4575.96	575.96	1992.09	2568.05
11	3.33	4612.38	612.38	1847.38	2459.75
12	3.64	4648.79	648.79	1709.30	2358.09
13	3.96	4685.21	685.21	1579.51	2264.71
14	4.28	4721.63	721.63	1458.84	2180.47
15	4.59	4758.04	758.04	1347.53	2105.57
16	4.91	4794.46	794.46	1245.42	2039.88
17	5.23	4830.88	830.88	1152.10	1982.97
18	5.54	4867.29	867.29	1067.01	1934.30
19	5.86	4903.71	903.71	989.53	1893.24
20	6.18	4940.13	940.13	919.02	1859.14
21	6.49	4976.54	976.54	854.85	1831.39
22	6.81	5012.96	1012.96	796.43	1809.39
23	7.13	5049.38	1049.38	743.20	1792.57
24	7.44	5085.79	1085.79	694.64	1780.43
25	7.76	5122.21	1122.21	650.29	1772.50
26	8.08	5153.95	1153.95	609.73	1763.67
27	8.39	5170.60	1170.60	572.58	1743.18
28	8.71	5187.26	1187.26	538.50	1725.76
29	9.03	5203.92	1203.92	507.20	1711.11
30	9.34	5220.57	1220.57	478.39	1698.96
31	9.66	5237.23	1237.23	451.84	1689.06
32	9.98	5253.89	1253.89	427.33	1681.21
33	10.29	5270.54	1270.54	404.66	1675.21
34	10.61	5287.20	1287.20	383.68	1670.88
35	10.93	5303.86	1303.86	364.22	1668.08
36	11.24	5320.51	1320.51	346.15	1666.66
37	11.56	5337.17	1337.17	329.34	1666.51
38	11.88	5353.83	1353.83	313.68	1667.51
39	12.19	5370.48	1370.48	299.08	1669.56
40	12.51	5387.14	1387.14	285.44	1672.58
41	12.83	5403.80	1403.80	272.69	1676.48
42	13.14	5420.45	1420.45	260.74	1681.20
43	13.46	5437.11	1437.11	249.55	1686.66
44	13.78	5453.77	1453.77	239.04	1692.81
45	14.09	5470.42	1470.42	229.17	1699.59
46	14.41	5487.08	1487.08	219.88	1706.96
47	14.73	5503.74	1503.74	211.13	1714.86
48	15.04	5520.39	1520.39	202.88	1723.27
49	15.36	5537.05	1537.05	195.10	1732.15
50	15.68	5553.71	1553.71	187.74	1741.45
51	15.99	5570.36	1570.36	180.79	1751.15
52	16.31	5587.02	1587.02	174.21	1761.23
53	16.63	5603.68	1603.68	167.98	1771.65
54	16.94	5620.33	1620.33	162.07	1782.40
55	17.26	5636.99	1636.99	156.46	1793.44
56	17.58	5653.65	1653.65	151.13	1804.77
57	17.89	5670.30	1670.30	146.06	1816.37
58	18.21	5686.96	1686.96	141.25	1828.20
59	18.53	5703.62	1703.62	136.66	1840.27
60	18.84	5720.27	1720.27	132.29	1852.56

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Node #	Strain (%)	Indiv. Sett. (in)	Tot. Sett. (in)	Total Stress (psf)	Pore Water (psf)
1	1.863	0.071	0.071	248.21	0.00
2	1.769	0.067	0.138	284.63	0.00
3	1.682	0.064	0.202	321.04	0.00
4	1.598	0.061	0.263	357.46	0.00
5	1.515	0.058	0.320	393.88	0.00
6	1.432	0.054	0.375	430.29	0.00
7	1.348	0.051	0.426	466.71	0.00
8	1.265	0.048	0.474	503.13	0.00
9	1.183	0.045	0.519	539.54	0.00
10	1.104	0.042	0.561	575.96	0.00
11	1.027	0.039	0.600	612.38	0.00
12	0.953	0.036	0.636	648.79	0.00
13	0.883	0.034	0.670	685.21	0.00
14	0.816	0.031	0.701	721.63	0.00
15	0.754	0.029	0.729	758.04	0.00
16	0.696	0.026	0.756	794.46	0.00
17	0.642	0.024	0.780	830.88	0.00
18	0.592	0.023	0.803	867.29	0.00
19	0.546	0.021	0.823	903.71	0.00
20	0.503	0.019	0.843	940.13	0.00
21	0.464	0.018	0.860	976.54	0.00
22	0.428	0.016	0.876	1012.96	0.00
23	0.395	0.015	0.891	1049.38	0.00
24	0.365	0.014	0.905	1085.79	0.00
25	0.337	0.013	0.918	1122.21	0.00
26	0.313	0.012	0.930	1158.63	4.68
27	0.294	0.011	0.941	1195.04	24.44
28	0.276	0.010	0.952	1231.46	44.20
29	0.260	0.010	0.962	1267.88	63.96
30	0.244	0.009	0.971	1304.29	83.72
31	0.230	0.009	0.980	1340.71	103.48
32	0.217	0.008	0.988	1377.13	123.24
33	0.204	0.008	0.996	1413.54	143.00
34	0.193	0.007	1.003	1449.96	162.76
35	0.182	0.007	1.010	1486.38	182.52
36	0.172	0.007	1.016	1522.79	202.28
37	0.163	0.006	1.023	1559.21	222.04
38	0.154	0.006	1.028	1595.63	241.80
39	0.146	0.006	1.034	1632.04	261.56
40	0.138	0.005	1.039	1668.46	281.32
41	0.131	0.005	1.044	1704.88	301.08
42	0.124	0.005	1.049	1741.29	320.84
43	0.118	0.004	1.053	1777.71	340.60
44	0.112	0.004	1.058	1814.13	360.36
45	0.107	0.004	1.062	1850.54	380.12
46	0.102	0.004	1.066	1886.96	399.88
47	0.097	0.004	1.069	1923.38	419.64
48	0.092	0.004	1.073	1959.79	439.40
49	0.088	0.003	1.076	1996.21	459.16
50	0.084	0.003	1.079	2032.63	478.92
51	0.080	0.003	1.082	2069.04	498.68
52	0.077	0.003	1.085	2105.46	518.44
53	0.074	0.003	1.088	2141.88	538.20
54	0.070	0.003	1.091	2178.29	557.96
55	0.067	0.003	1.093	2214.71	577.72
56	0.065	0.002	1.096	2251.13	597.48
57	0.062	0.002	1.098	2287.54	617.24
58	0.059	0.002	1.100	2323.96	637.00
59	0.057	0.002	1.103	2360.38	656.76
60	0.055	0.002	1.105	2396.79	676.52



References:

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