

# Settlement Analysis

Organization: **SoilStructure.com**  
 Project Name: **Geotechnical Eng., Hunt, 1986**  
 Job #: **p 293**  
 Design by: **LAA**  
 Date: **3/16/2017**

## Foundation Geometry, GWT & Loading

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

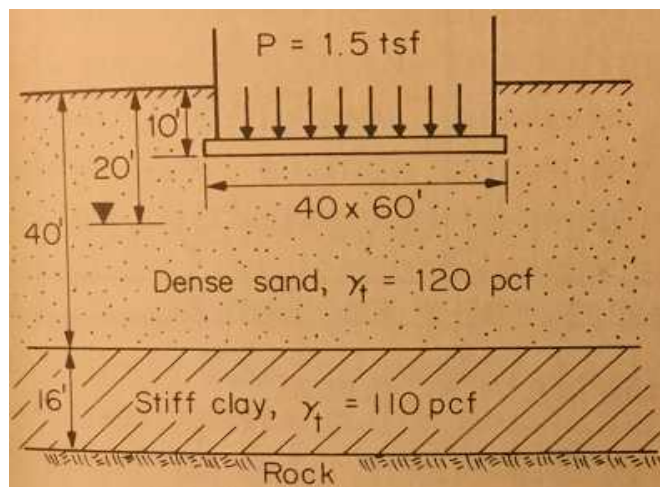
Variable	Value	Variable	Value
Footing Width	40.00 ft	Ground Water Depth	20.00 ft
Footing Thickness	2.00 ft	Rigidity factor	0.80
Footing Length	60.00 ft	Max. Depth	56.00 ft
Embedment Depth	10.00 ft	Axial Load	7200.00 k

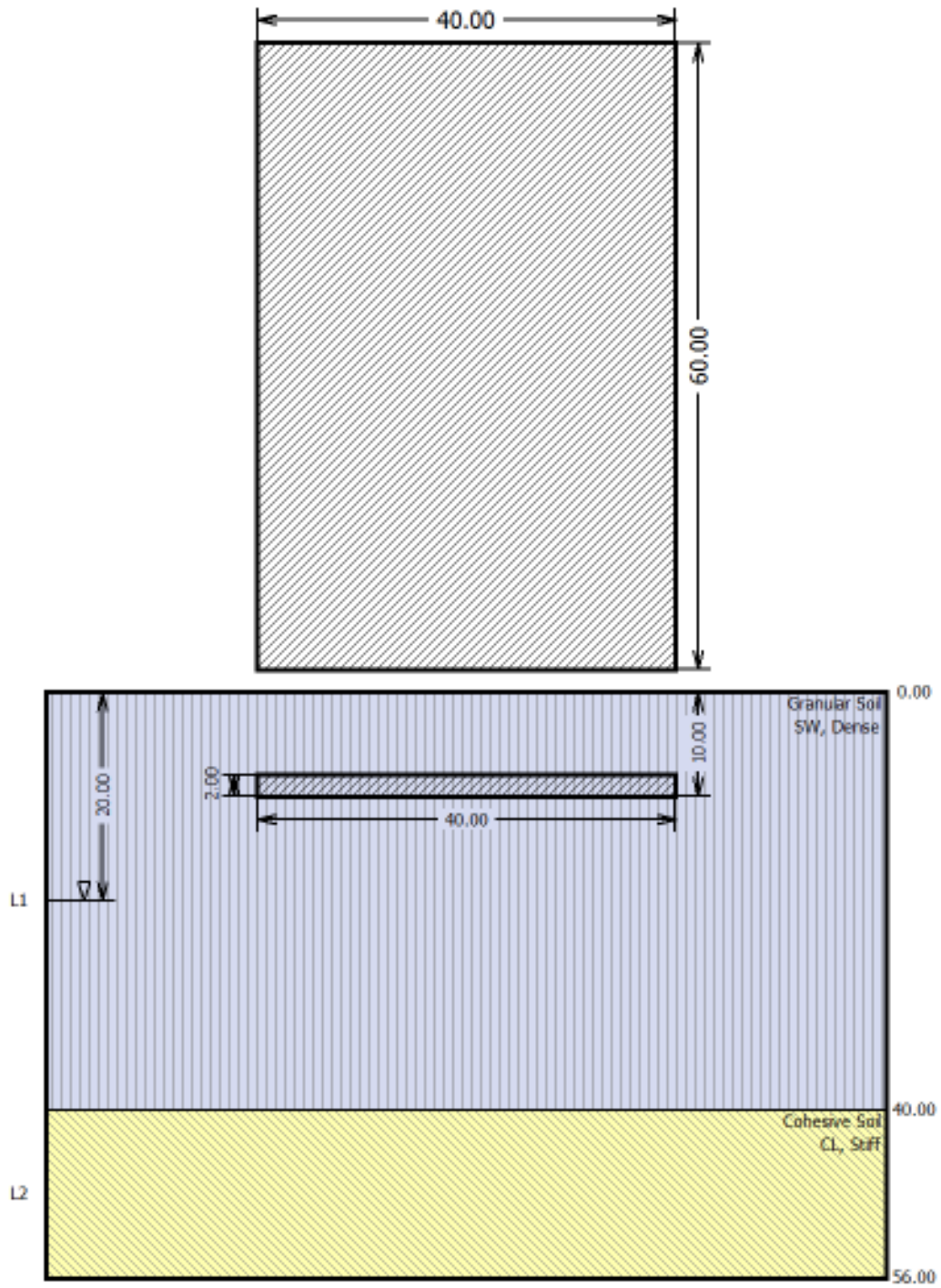
## Geotechnical Properties

#	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	Granular Soil	SW	40.00 0 - 40	Dense	0.020	0.002	500	120.0
2	Cohesive Soil	CL	16.00 40 - 56	Stiff	0.186	0.019	500	110.0

## Results

Applied Pressure, q: 4500.0 lb/ft<sup>2</sup> [Geotechnical Engineering Analysis & Evaluation, Hunt, 1986, p293](#)  
 Total Settlement, S: 2.39 in [2.3 in](#)





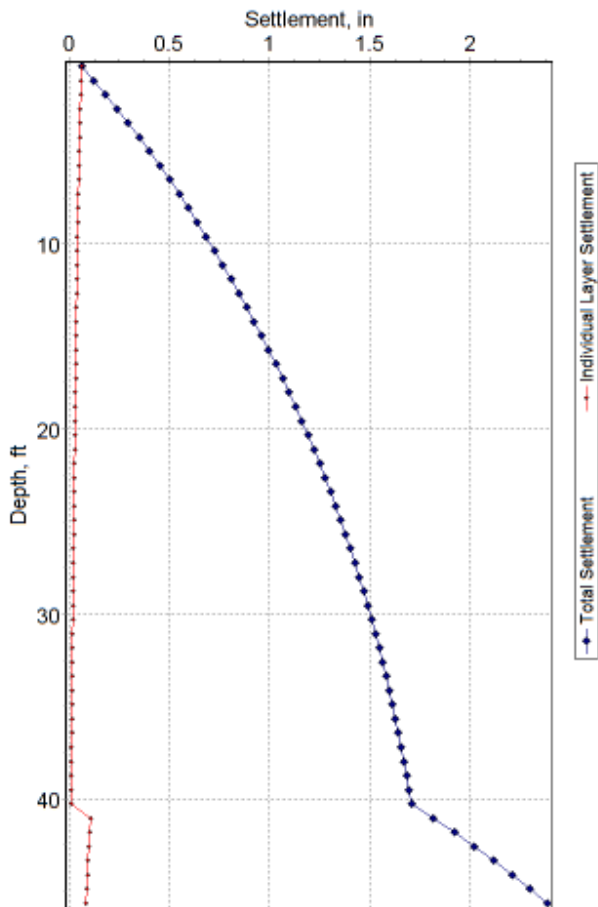
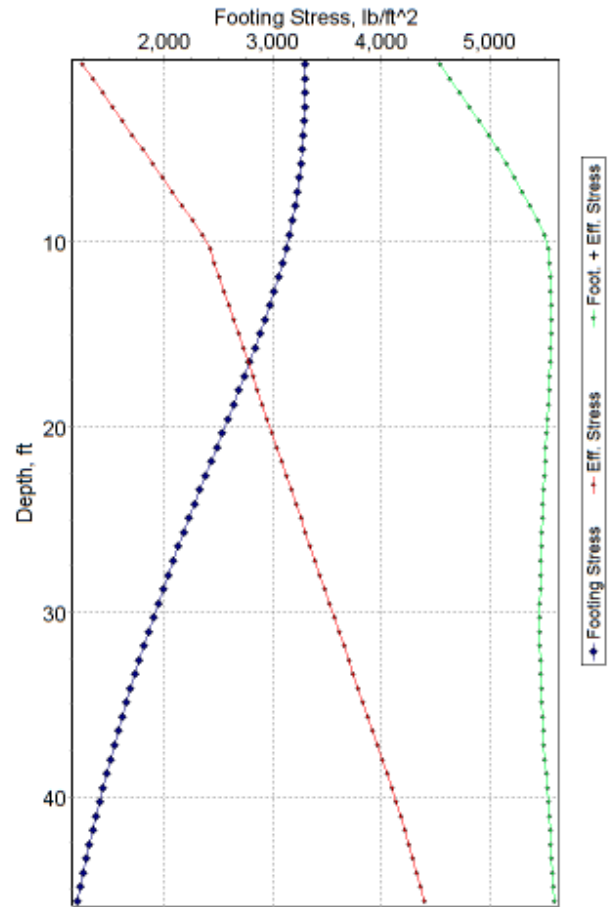
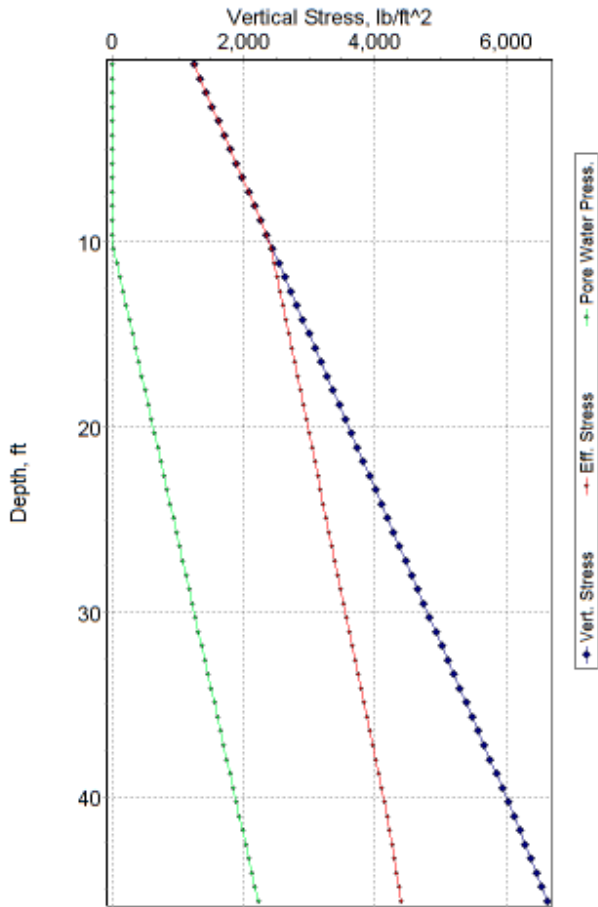
**Fig. 1: Plan and Cross Section**

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Node #	Depth (ft)	O.C.+Eff. Str (psf)	Eff. Stress (psf)	Ftng. Stress (psf)	Ftng. + Eff. Str (psf)
1	0.38	1746.00	1246.00	3299.99	4545.99
2	1.15	1838.00	1338.00	3299.69	4637.69
3	1.92	1930.00	1430.00	3298.56	4728.56
4	2.68	2022.00	1522.00	3296.08	4818.08
5	3.45	2114.00	1614.00	3291.78	4905.78
6	4.22	2206.00	1706.00	3285.23	4991.23
7	4.98	2298.00	1798.00	3276.08	5074.08
8	5.75	2390.00	1890.00	3264.03	5154.03
9	6.52	2482.00	1982.00	3248.90	5230.90
10	7.28	2574.00	2074.00	3230.53	5304.53
11	8.05	2666.00	2166.00	3208.88	5374.88
12	8.82	2758.00	2258.00	3183.96	5441.96
13	9.58	2850.00	2350.00	3155.82	5505.82
14	10.35	2920.16	2420.16	3124.60	5544.76
15	11.12	2964.32	2464.32	3090.44	5554.76
16	11.88	3008.48	2508.48	3053.56	5562.04
17	12.65	3052.64	2552.64	3014.16	5566.80
18	13.42	3096.80	2596.80	2972.48	5569.28
19	14.18	3140.96	2640.96	2928.78	5569.74
20	14.95	3185.12	2685.12	2883.29	5568.41
21	15.72	3229.28	2729.28	2836.27	5565.55
22	16.48	3273.44	2773.44	2787.96	5561.40
23	17.25	3317.60	2817.60	2738.59	5556.19
24	18.02	3361.76	2861.76	2688.39	5550.15
25	18.78	3405.92	2905.92	2637.56	5543.48
26	19.55	3450.08	2950.08	2586.31	5536.39
27	20.32	3494.24	2994.24	2534.80	5529.04
28	21.08	3538.40	3038.40	2483.20	5521.60
29	21.85	3582.56	3082.56	2431.67	5514.23
30	22.62	3626.72	3126.72	2380.34	5507.06
31	23.38	3670.88	3170.88	2329.33	5500.21
32	24.15	3715.04	3215.04	2278.74	5493.78
33	24.92	3759.20	3259.20	2228.68	5487.88
34	25.68	3803.36	3303.36	2179.21	5482.57
35	26.45	3847.52	3347.52	2130.42	5477.94
36	27.22	3891.68	3391.68	2082.37	5474.05
37	27.98	3935.84	3435.84	2035.11	5470.95
38	28.75	3980.00	3480.00	1988.67	5468.67
39	29.52	4024.16	3524.16	1943.10	5467.26
40	30.28	4068.32	3568.32	1898.43	5466.75
41	31.05	4112.48	3612.48	1854.67	5467.15
42	31.82	4156.64	3656.64	1811.84	5468.48
43	32.58	4200.80	3700.80	1769.96	5470.76
44	33.35	4244.96	3744.96	1729.03	5473.99
45	34.12	4289.12	3789.12	1689.05	5478.17
46	34.88	4333.28	3833.28	1650.02	5483.30
47	35.65	4377.44	3877.44	1611.94	5489.38
48	36.42	4421.60	3921.60	1574.79	5496.39
49	37.18	4465.76	3965.76	1538.59	5504.35
50	37.95	4509.92	4009.92	1503.30	5513.22
51	38.72	4554.08	4054.08	1468.92	5523.00
52	39.48	4598.24	4098.24	1435.43	5533.67
53	40.25	4642.40	4142.40	1402.83	5545.23
54	41.02	4682.73	4182.73	1371.08	5553.81
55	41.78	4719.22	4219.22	1340.18	5559.40
56	42.55	4755.71	4255.71	1310.11	5565.82
57	43.32	4792.21	4292.21	1280.85	5573.05
58	44.08	4828.70	4328.70	1252.37	5581.07
59	44.85	4865.19	4365.19	1224.67	5589.87
60	45.62	4901.69	4401.69	1197.73	5599.41

**Table of Test Results - Page 2**

<b>Node #</b>	<b>Strain (%)</b>	<b>Indiv. Sett. (in)</b>	<b>Tot. Sett. (in)</b>	<b>Total Stress (psf)</b>	<b>Pore Water (psf)</b>
1	0.688	0.063	0.063	1246.00	0.00
2	0.665	0.061	0.125	1338.00	0.00
3	0.644	0.059	0.184	1430.00	0.00
4	0.623	0.057	0.241	1522.00	0.00
5	0.604	0.056	0.297	1614.00	0.00
6	0.585	0.054	0.350	1706.00	0.00
7	0.567	0.052	0.403	1798.00	0.00
8	0.550	0.051	0.453	1890.00	0.00
9	0.534	0.049	0.502	1982.00	0.00
10	0.517	0.048	0.550	2074.00	0.00
11	0.502	0.046	0.596	2166.00	0.00
12	0.486	0.045	0.641	2258.00	0.00
13	0.471	0.043	0.684	2350.00	0.00
14	0.459	0.042	0.726	2442.00	21.84
15	0.449	0.041	0.768	2534.00	69.68
16	0.440	0.040	0.808	2626.00	117.52
17	0.430	0.040	0.848	2718.00	165.36
18	0.420	0.039	0.886	2810.00	213.20
19	0.410	0.038	0.924	2902.00	261.04
20	0.400	0.037	0.961	2994.00	308.88
21	0.390	0.036	0.997	3086.00	356.72
22	0.380	0.035	1.032	3178.00	404.56
23	0.370	0.034	1.066	3270.00	452.40
24	0.360	0.033	1.099	3362.00	500.24
25	0.350	0.032	1.131	3454.00	548.08
26	0.340	0.031	1.162	3546.00	595.92
27	0.330	0.030	1.193	3638.00	643.76
28	0.320	0.029	1.222	3730.00	691.60
29	0.310	0.029	1.250	3822.00	739.44
30	0.301	0.028	1.278	3914.00	787.28
31	0.291	0.027	1.305	4006.00	835.12
32	0.282	0.026	1.331	4098.00	882.96
33	0.273	0.025	1.356	4190.00	930.80
34	0.264	0.024	1.380	4282.00	978.64
35	0.255	0.023	1.404	4374.00	1026.48
36	0.247	0.023	1.426	4466.00	1074.32
37	0.238	0.022	1.448	4558.00	1122.16
38	0.230	0.021	1.469	4650.00	1170.00
39	0.222	0.020	1.490	4742.00	1217.84
40	0.214	0.020	1.510	4834.00	1265.68
41	0.207	0.019	1.529	4926.00	1313.52
42	0.200	0.018	1.547	5018.00	1361.36
43	0.192	0.018	1.565	5110.00	1409.20
44	0.185	0.017	1.582	5202.00	1457.04
45	0.179	0.016	1.598	5294.00	1504.88
46	0.172	0.016	1.614	5386.00	1552.72
47	0.166	0.015	1.629	5478.00	1600.56
48	0.160	0.015	1.644	5570.00	1648.40
49	0.154	0.014	1.658	5662.00	1696.24
50	0.148	0.014	1.672	5754.00	1744.08
51	0.142	0.013	1.685	5846.00	1791.92
52	0.137	0.013	1.697	5938.00	1839.76
53	0.131	0.012	1.709	6030.00	1887.60
54	1.177	0.108	1.818	6118.17	1935.44
55	1.133	0.104	1.922	6202.50	1983.28
56	1.090	0.100	2.022	6286.83	2031.12
57	1.048	0.096	2.119	6371.17	2078.96
58	1.008	0.093	2.211	6455.50	2126.80
59	0.969	0.089	2.300	6539.83	2174.64
60	0.931	0.086	2.386	6624.17	2222.48



## References:

1. Foundation Design: Principles & Practices, 3rd edition, Coduto, Kitch & Yeung, 2015
2. Geotechnical Engineering: Principles & Practices, 2nd edition, Coduto, Yeung & Kitch, 2010
3. Theories of Consolidation, R. L. Schiffman, 2001
4. Geotechnical Engineering & Soil Testing, Al-Khafaji & Andersland, 1995
5. Soil Mechanics, A.R. Jumikis, 1984
6. Settlement Analysis v2.0, SoilStructure Software, 2017