

Settlement Analysis

Organization: **SoilStructure.com**
 Project Name: **Soil Mechanics, Cernica, 1995**
 Job #: **p 249**
 Design by: **LAA**
 Date: **3/16/2017**

Foundation Geometry, GWT & Loading

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

Variable	Value	Variable	Value
Footing Width	8.00 m	Ground Water Depth	3.0 m
Footing Thickness	2.00 m	Rigidity factor	0.7
Footing Length	10.00 m	Max. Depth	14.00 m
Embedment Depth	2.00 m	Axial Load	28000.0 kN

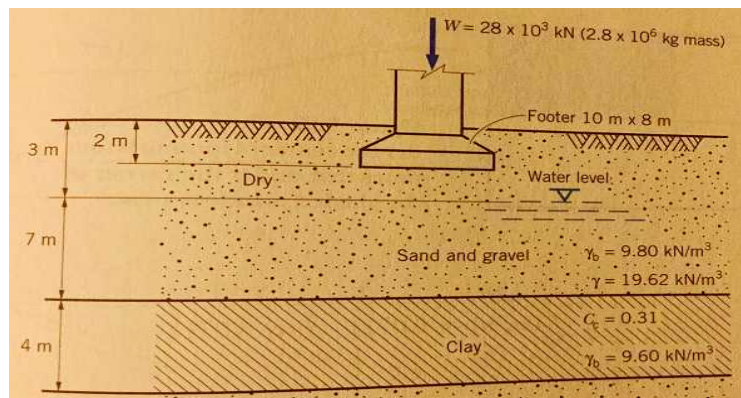
Geotechnical Properties

#	Material Type	USCS	Layer Thick, m	Consistency	Compr. Ratio Cc/(1+e)	Recompr. Ratio Cr/(1+e)	OC Margin sigma m' kPa	Unit Wt gamma kN/m ³
1	Granular Soil	GwGpGc	10.00 0 - 10	Medium Dense	0.040	0.004	20	19.6
2	Cohesive Soil	CL	4.00 10 - 14	Firm	0.171	0.017	20	13.6

Results

Applied Pressure, q: 397.2 kPa
 Total Settlement, S: 163.7 mm

[Geotechnical Engineering: Soil Mechanics, Cernica, 1995, p 249](#)
 154 mm



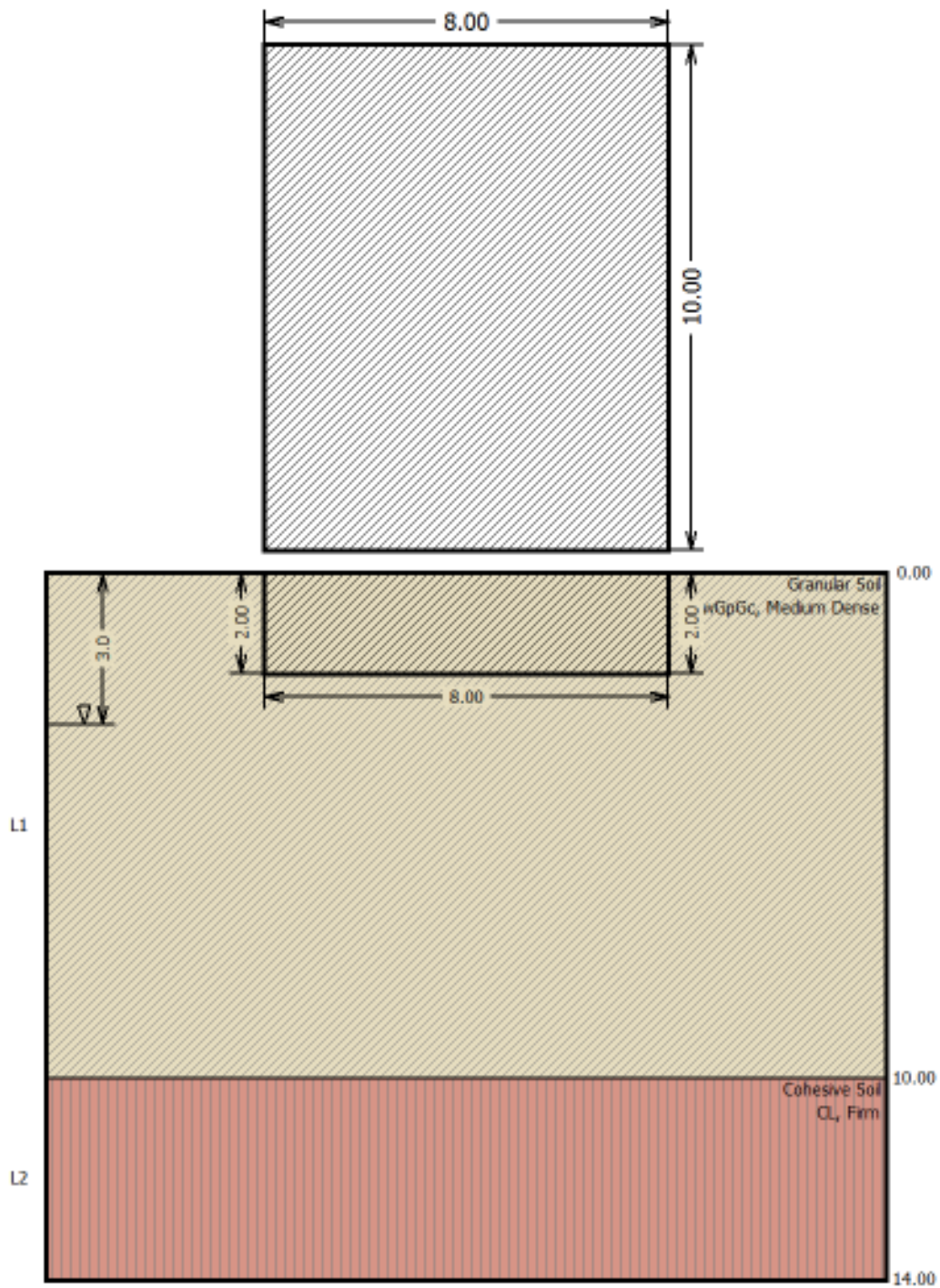


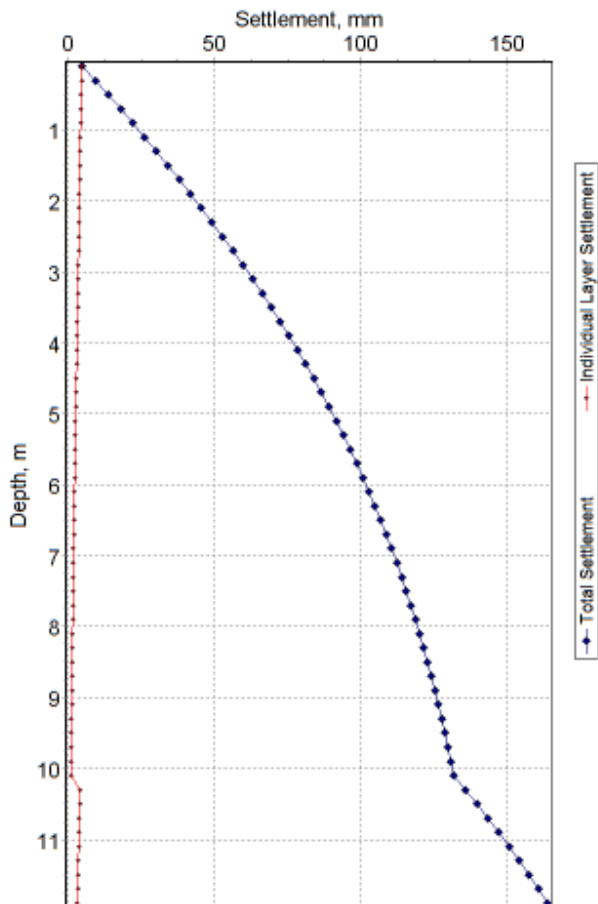
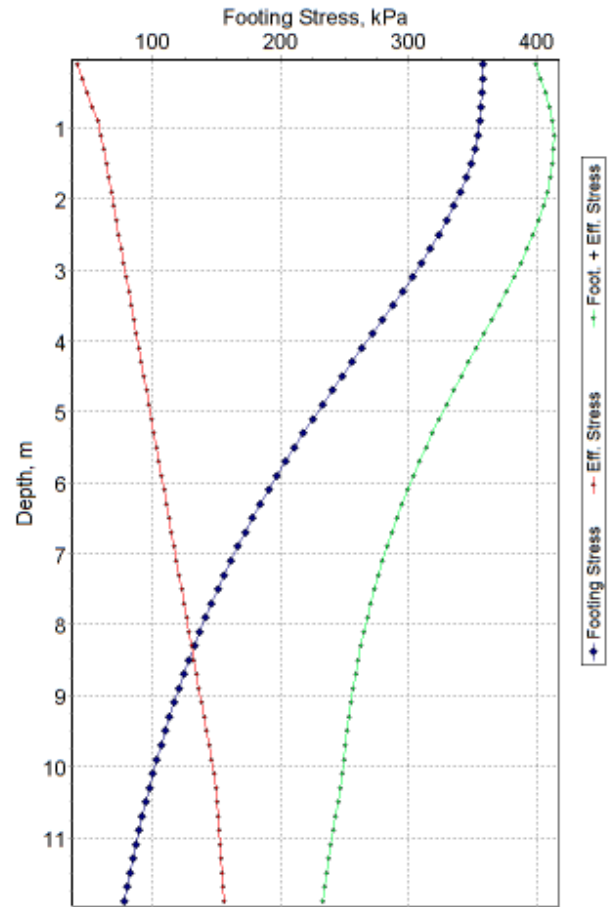
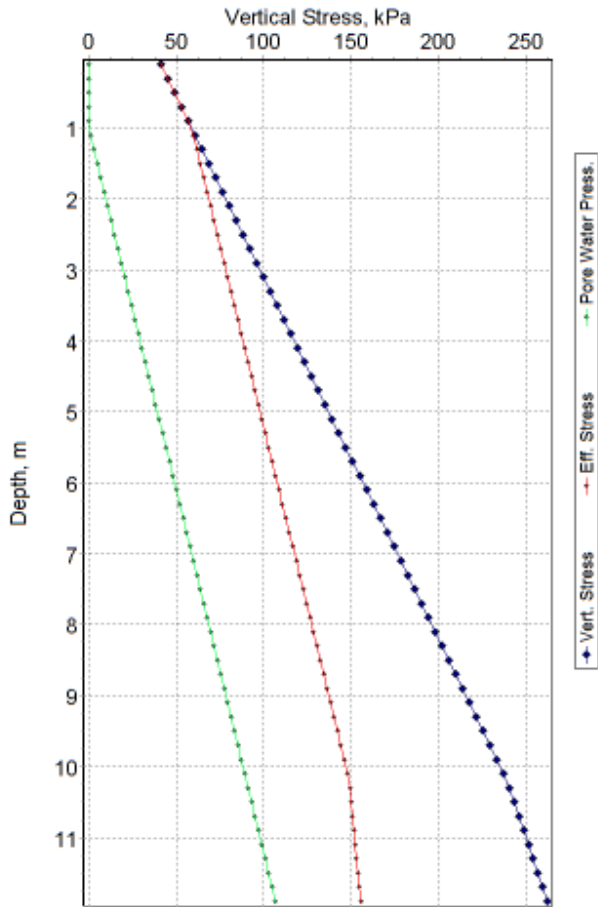
Fig. 1: Plan and Cross Section

Table of Test Results - Page 1

Node #	Depth (m)	O.C. + Eff. Str. (kPa)	Eff. Stress (kPa)	Ftng. Stress (kPa)	Ftng. + Eff. Str (kPa)
1	0.10	61.16	41.16	358.00	399.16
2	0.30	65.08	45.08	357.91	402.99
3	0.50	69.00	49.00	357.61	406.61
4	0.70	72.92	52.92	356.94	409.86
5	0.90	76.84	56.84	355.79	412.63
6	1.10	79.78	59.78	354.07	413.85
7	1.30	81.74	61.74	351.72	413.46
8	1.50	83.70	63.70	348.69	412.39
9	1.70	85.66	65.66	344.97	410.63
10	1.90	87.62	67.62	340.58	408.20
11	2.10	89.58	69.58	335.55	405.13
12	2.30	91.54	71.54	329.93	401.47
13	2.50	93.50	73.50	323.78	397.28
14	2.70	95.46	75.46	317.16	392.62
15	2.90	97.42	77.42	310.16	387.58
16	3.10	99.38	79.38	302.83	382.21
17	3.30	101.34	81.34	295.25	376.59
18	3.50	103.30	83.30	287.49	370.79
19	3.70	105.26	85.26	279.61	364.87
20	3.90	107.22	87.22	271.67	358.89
21	4.10	109.18	89.18	263.71	352.89
22	4.30	111.14	91.14	255.79	346.93
23	4.50	113.10	93.10	247.93	341.03
24	4.70	115.06	95.06	240.18	335.24
25	4.90	117.02	97.02	232.56	329.58
26	5.10	118.98	98.98	225.09	324.07
27	5.30	120.94	100.94	217.79	318.73
28	5.50	122.90	102.90	210.68	313.58
29	5.70	124.86	104.86	203.76	308.62
30	5.90	126.82	106.82	197.05	303.87
31	6.10	128.78	108.78	190.54	299.32
32	6.30	130.74	110.74	184.25	294.99
33	6.50	132.70	112.70	178.16	290.86
34	6.70	134.66	114.66	172.29	286.95
35	6.90	136.62	116.62	166.62	283.24
36	7.10	138.58	118.58	161.16	279.74
37	7.30	140.54	120.54	155.90	276.44
38	7.50	142.50	122.50	150.84	273.34
39	7.70	144.46	124.46	145.97	270.43
40	7.90	146.42	126.42	141.28	267.70
41	8.10	148.38	128.38	136.78	265.16
42	8.30	150.34	130.34	132.45	262.79
43	8.50	152.30	132.30	128.29	260.59
44	8.70	154.26	134.26	124.29	258.55
45	8.90	156.22	136.22	120.44	256.66
46	9.10	158.18	138.18	116.75	254.93
47	9.30	160.14	140.14	113.20	253.34
48	9.50	162.10	142.10	109.79	251.89
49	9.70	164.06	144.06	106.51	250.57
50	9.90	166.02	146.02	103.36	249.38
51	10.10	167.98	147.98	100.33	248.31
52	10.30	169.34	149.34	97.42	246.76
53	10.50	170.10	150.10	94.62	244.72
54	10.70	170.86	150.86	91.93	242.79
55	10.90	171.62	151.62	89.33	240.95
56	11.10	172.38	152.38	86.84	239.22
57	11.30	173.14	153.14	84.44	237.58
58	11.50	173.90	153.90	82.13	236.03
59	11.70	174.66	154.66	79.90	234.56
60	11.90	175.42	155.42	77.76	233.18

Table of Test Results - Page 2

Node #	Strain (%)	Indiv. Sett. (mm)	Tot. Sett. (mm)	Total Stress (kPa)	Pore Water (kPa)
1	2.329	4.7	4.7	41.16	0.00
2	2.262	4.5	9.2	45.08	0.00
3	2.199	4.4	13.6	49.00	0.00
4	2.138	4.3	17.9	52.92	0.00
5	2.081	4.2	22.0	56.84	0.00
6	2.037	4.1	26.1	60.76	0.98
7	2.005	4.0	30.1	64.68	2.94
8	1.972	3.9	34.0	68.60	4.90
9	1.938	3.9	37.9	72.52	6.86
10	1.903	3.8	41.7	76.44	8.82
11	1.866	3.7	45.5	80.36	10.78
12	1.828	3.7	49.1	84.28	12.74
13	1.788	3.6	52.7	88.20	14.70
14	1.748	3.5	56.2	92.12	16.66
15	1.707	3.4	59.6	96.04	18.62
16	1.665	3.3	62.9	99.96	20.58
17	1.623	3.2	66.2	103.88	22.54
18	1.580	3.2	69.3	107.80	24.50
19	1.537	3.1	72.4	111.72	26.46
20	1.494	3.0	75.4	115.64	28.42
21	1.451	2.9	78.3	119.56	30.38
22	1.408	2.8	81.1	123.48	32.34
23	1.366	2.7	83.9	127.40	34.30
24	1.324	2.6	86.5	131.32	36.26
25	1.282	2.6	89.1	135.24	38.22
26	1.241	2.5	91.5	139.16	40.18
27	1.200	2.4	93.9	143.08	42.14
28	1.161	2.3	96.3	147.00	44.10
29	1.122	2.2	98.5	150.92	46.06
30	1.083	2.2	100.7	154.84	48.02
31	1.046	2.1	102.8	158.76	49.98
32	1.010	2.0	104.8	162.68	51.94
33	0.974	1.9	106.7	166.60	53.90
34	0.940	1.9	108.6	170.52	55.86
35	0.906	1.8	110.4	174.44	57.82
36	0.873	1.7	112.2	178.36	59.78
37	0.841	1.7	113.9	182.28	61.74
38	0.810	1.6	115.5	186.20	63.70
39	0.781	1.6	117.0	190.12	65.66
40	0.752	1.5	118.5	194.04	67.62
41	0.724	1.4	120.0	197.96	69.58
42	0.696	1.4	121.4	201.88	71.54
43	0.670	1.3	122.7	205.80	73.50
44	0.645	1.3	124.0	209.72	75.46
45	0.620	1.2	125.3	213.64	77.42
46	0.597	1.2	126.4	217.56	79.38
47	0.574	1.1	127.6	221.48	81.34
48	0.552	1.1	128.7	225.40	83.30
49	0.531	1.1	129.8	229.32	85.26
50	0.510	1.0	130.8	233.24	87.22
51	0.491	1.0	131.8	237.16	89.18
52	2.022	4.0	135.8	240.48	91.14
53	1.955	3.9	139.7	243.20	93.10
54	1.891	3.8	143.5	245.92	95.06
55	1.828	3.7	147.2	248.64	97.02
56	1.767	3.5	150.7	251.36	98.98
57	1.708	3.4	154.1	254.08	100.94
58	1.651	3.3	157.4	256.80	102.90
59	1.596	3.2	160.6	259.52	104.86
60	1.542	3.1	163.7	262.24	106.82



References:

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3. Theories of Consolidation, R. L. Schiffman, 2001
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5. Soil Mechanics, A.R. Jumikis, 1984
6. Settlement Analysis v2.0, SoilStructure Software, 2017