

Belmont Castle - Preliminary pile design

Notes: Current pile design based on assumed SPT values, to be confirmed on site by others
 Depth of existing chalk pit based on historical information, to be confirmed on site by others

Cohesion

Depth	Average SPT	Cu=5*SPT	Ultimate Capacities		Safe Working Load		Assumed SPT	Assumed SPT
			Shaft KN	End KN	KN			
0	5	25					5	5
1	5	25					5	5
2	5	25	0	35.7847	11.92823	2	5	5
3	5	25	15.90431	35.7847	17.22967	3	5	5
4	5	25	31.80863	35.7847	22.53111	4	5	5
5	5	25	47.71294	35.7847	27.83255	5	5	5
6	5	25	63.61725	35.7847	33.13399	6	5	5
7	5	25	79.52156	35.7847	38.43542	7	5	5
8	5	25	95.42588	35.7847	43.73686	8	5	5
9	5	25	111.3302	35.7847	49.0383	9	5	5
10	15	75	254.469	107.3541	120.6077	10	15	15
11	15	75	286.2776	107.3541	131.2106	11	15	15
12	16	80	333.9906	114.5111	149.5005	12	16	16
13	20	100	437.3686	143.1388	193.5025	13	20	20
14	20	100	477.1294	143.1388	206.7561	14	20	20
15	20	100	516.8902	143.1388	220.0097	15	20	20
16	23	115	623.4491	164.6096	262.6862	16	23	23
17	23	115	667.9811	164.6096	277.5303	17	23	23
18	28	140	839.7477	200.3943	346.714	18	28	28
19	28	140	892.2319	200.3943	364.2088	19	28	28
20	28	140	944.7162	200.3943	381.7035	20	28	28
21	32	160	1118.073	229.0221	449.0318	21	32	32
22	32	160	1176.919	229.0221	468.6471	22	32	32
23	32	160	1235.765	229.0221	488.2624	23	32	32
24	38	190	1504.548	271.9637	592.1706	24	38	38
25	38	190	1572.937	271.9637	614.9668	25	38	38
26	38	190	1641.325	271.9637	637.7629	26	38	38

Design Parameters

Pile diameter chosen 0.45 m

Design Factor of Safety 3

Soil Softening Factor (alpha) 0.45

Bearing Capacity Factor (Nc) 9

Maximum Adhesion 140

(note adhesion= alpha x cohesion)

Therefore maximum cohesion = 311.1111