

Job No.	Sheet No.	Rev.
14-944		
Drg. Ref.		
Made by CB	Date	Checked

General Parameters

Direction of slip: DOWNHILL
Minimum slip weight [kN/m] : 0.00000
Type of analysis : STATIC

Analysis Options

Partial Factor Analysis
Minimum number of slices: 25
Method: Bishop (Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NOT ACTIVE

Method Partial Factors

Current selection: BS EN 1997-1:2011 DA1-2
Factor on FAVOURABLE PERMANENT LOAD: 1.00000
Factor on UNFAVOURABLE PERMANENT LOAD: 1.00000
Factor on FAVOURABLE VARIABLE LOAD: 0.00000
Factor on UNFAVOURABLE VARIABLE LOAD: 1.30000
Factor on SOIL UNIT WEIGHT: 1.00000
Factor on DRAINED SOIL COHESION: 1.25000
Factor on UNDRAINED SOIL COHESION: 1.40000
Factor on SOIL FRICTION ANGLE: 1.25000
Factor on reinforcement pullout: 1.50000
Economic ramification of failure: 1.00000
Sliding along reinforcement: 1.50000

Material properties

No	Description	Unit Weight		Shear Strength Parameters	Phi or c or
		Above GWL	Below GWL		
c0'				Condition	Phi0 [°]
		[kN/m3]	[kN/m3]		
1	Made Ground: Sandy Gravel	18.000	18.000	Drained - linear strength	35.000
2	Medium Dense Sand	18.000	18.000	Drained - linear strength	30.000
3	Dense Sand	18.000	18.000	Drained - linear strength	40.000

Coordinates of top of soil strata

The units of the following coordinates are in m

Stratum X -->							
	1.5720	5.0920	9.7781	9.9522	9.9919	10.221	11.988
1	19.001	19.001	.	.	.	19.001	.
2	10.201	10.201	.	10.201	.	.	.
3	4.5010	4.5010	4.5010	.	.	.	4.3659
GW	11.501	11.501	.	.	11.501	.	.
Stratum X -->							
	13.783	13.859	13.951	14.255	14.395	14.843	14.844
1	.	.	.	.	.	.	.
2	9.9668	.	.	9.8730	9.7530	9.3208	.
3	.	3.0764	.	.	.	.	.
GW	.	.	11.259	.	.	.	11.081
Stratum X -->							
	14.915	15.270	15.669	15.755	16.335	16.728	16.837
1	18.714	.	.	18.547	.	18.557	.
2	.	.	.	.	.	.	7.9468
3	.	.	.	.	1.7432	.	.
GW	.	10.715	10.331	.	.	.	.
Stratum X -->							
	17.516	17.829	18.742	19.149	19.791	20.321	20.430
1	.	18.186	17.621	.	.	16.263	16.158
2	.	.	.	6.7013	.	.	.
3	.	.	.	.	.	.	.
GW	9.0576	.	.	.	7.8321	.	.
Stratum X -->							
	21.434	22.170	23.495	24.613	25.089	25.755	26.650
1	15.466	.	14.356	.	.	.	.

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Stratum X -->							
2	21.424	22.170	22.405	24.612	35.000	25.755	22.228
3	.	-1.7439	.	-3.1975	.	.	.
GW	.	.	.	.	.	4.2683	.
Stratum X -->							
	27.115	29.596	29.796	31.674	32.195	32.314	33.000
1	.	10.710	10.591	.	.	.	10.000
2	.	.	.	.	1.2000	.	.
3	.	.	.	-4.5000	.	.	.
GW	3.4590	.	.	.	.	2.5000	.
Stratum X -->							
	39.000						
1	10.000						
2	1.2000						
3	-4.5000						
GW	2.5000						

Piezometers

Stratum-linked data

No.	Material	Water table	Piezo Set/ Ru value
1	Made Ground: Sandy Gravel	GW	-
2	Medium Dense Sand	GW	-
3	Dense Sand	GW	-

Surface Loads

No.	Limits of loaded area	Distributed load	Permanent / Variable load	Favourable / UnFavourable load	Use in pull-out calc
	X1	X2	Vert	Horiz	
	[m]	[m]	[kN/m²]	[kN/m²]	
1	2.0000	7.0000	20.000	0.0 Permanent	UnFavourable No

Slip Surface Specification

Circle centre specification: GRID
Bottom left of grid: x = 15.00000 m y = 26.00000 m
Inclination of grid: -15.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 30 in x direction at 0.80000m spacing
10 in y direction at 1.00000m spacing
Grid extended to find minimum FoS
Initial radius of circle 1.00000 m
Incremented by 1.00000 m until all possible circles considered

WORST CASE

Centre at (28.658m,27.517m) Radius 14.000m
Iterations: 5 Horiz acceleration [%g]: 0.0
Net vertical force [kN/m]: 0.0 Slip weight [kN/m] 0.71189
Net horiz force [kN/m]: 0.0 Disturbing moment [kN/m]: 6.4898
Restoring moment [kNm/m]: 4.2403
Reinf.Rest.Moment [kNm/m]: 0.0
Over-Design Factor: 0.65337

The system of interslice and base forces are in equilibrium when the strengths available at the bases are divided by the computed over-design factor. The interslice forces shown in the following table are in equilibrium with the factored strengths of the soil at the bases of slices.

Slip surface coordinates		Pore Pressure		Interslice forces [kN/m]			
Point	x [m]	y [m]	L	R	T	E	E (u)
			[kN/m²]	[kN/m²]			
1	18.837	17.539	-	-91.931	0.0	0.0	0.0
2	18.878	17.499	-91.751	-91.751	77.137E-6	114.61E-6	0.0
3	18.919	17.459	-91.574	-91.574	347.94E-6	429.26E-6	0.0
4	18.960	17.420	-91.399	-91.399	774.19E-6	907.60E-6	0.0
5	19.001	17.381	-91.227	-91.227	0.0013202	0.0015149	0.0
6	19.042	17.341	-91.058	-91.058	0.0019527	0.0022184	0.0
7	19.084	17.302	-90.890	-90.890	0.0026407	0.0029865	0.0
8	19.126	17.263	-90.726	-90.726	0.0033575	0.0037915	0.0
9	19.167	17.225	-90.564	-90.564	0.0040758	0.0046049	0.0
10	19.209	17.186	-90.404	-90.404	0.0047727	0.0054014	0.0

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Slip surface coordinates	Pore Pressure	Interslice forces [kN/m]
11 19.251 17.148 -90.248 -90.248 0.0054289 0.0061597 0.0		
12 19.294 17.109 -90.093 -90.093 0.0060258 0.0068586 0.0		
13 19.336 17.071 -89.941 -89.941 0.0065480 0.0074797 0.0		
14 19.379 17.034 -89.792 -89.792 0.0069840 0.0080088 0.0		
15 19.422 16.996 -89.646 -89.646 0.0073213 0.0084302 0.0		
16 19.465 16.958 -89.502 -89.502 0.0075538 0.0087351 0.0		
17 19.508 16.921 -89.360 -89.360 0.0076757 0.0089149 0.0		
18 19.551 16.884 -89.221 -89.221 0.0076843 0.0089644 0.0		
19 19.594 16.847 -89.085 -89.085 0.0075813 0.0088833 0.0		
20 19.638 16.810 -88.951 -88.951 0.0073668 0.0086697 0.0		
21 19.681 16.773 -88.820 -88.820 0.0070473 0.0083291 0.0		
22 19.725 16.737 -88.691 -88.691 0.0066300 0.0078679 0.0		
23 19.769 16.701 -88.565 -88.565 0.0061243 0.0072956 0.0		
24 19.813 16.664 -88.455 -88.455 0.0055436 0.0066268 0.0		
25 19.858 16.629 -88.360 -88.360 0.0049017 0.0058768 0.0		
26 19.902 16.593 -88.268 -88.268 0.0042157 0.0050658 0.0		
27 19.946 16.557 -88.178 -88.178 0.0035062 0.0042182 0.0		
28 19.991 16.522 -88.092 -88.092 0.0027947 0.0033610 0.0		
29 20.036 16.487 -88.008 -88.008 0.0021050 0.0025241 0.0		
30 20.081 16.452 -87.926 -87.926 0.0014644 0.0017433 0.0		
31 20.126 16.417 -87.848 -87.848 901.62E-6 0.0010564 0.0		
32 20.171 16.382 -87.772 -87.772 447.32E-6 505.32E-6 0.0		
33 20.217 16.348 -87.699 -87.699 135.07E-6 136.58E-6 0.0		
34 20.262 16.313 -87.628 - 0.0 0.0 0.0		

Slice No.	Strength Parameters	Average Pore Pressure	Slice Weight	Forces on base [kN/m]
	c' [kN/m²]	Tan phi	[kN/m²]	Normal Shear (capacity) Shear (mobilised)
1	0.0	0.56017	0.0	0.0017930 0.0013055 731.32E-6 0.0011193
2	0.0	0.56017	0.0	0.0052886 0.0038169 0.0021381 0.0032724
3	0.0	0.56017	0.0	0.0085859 0.0062053 0.0034760 0.0053201
4	0.0	0.56017	0.0	0.011682 0.0084667 0.0047428 0.0072589
5	0.0	0.56017	0.0	0.014574 0.010598 0.0059366 0.0090861
6	0.0	0.56017	0.0	0.017260 0.012594 0.0070549 0.010798
7	0.0	0.56017	0.0	0.019738 0.014453 0.0080963 0.012391
8	0.0	0.56017	0.0	0.022001 0.016169 0.0090573 0.013862
9	0.0	0.56017	0.0	0.024047 0.017738 0.0099360 0.015207
10	0.0	0.56017	0.0	0.025881 0.019159 0.010732 0.016426
11	0.0	0.56017	0.0	0.027491 0.020425 0.011441 0.017511
12	0.0	0.56017	0.0	0.028877 0.021531 0.012061 0.018460
13	0.0	0.56017	0.0	0.030037 0.022476 0.012591 0.019270
14	0.0	0.56017	0.0	0.030976 0.023262 0.013031 0.019944
15	0.0	0.56017	0.0	0.031676 0.023873 0.013373 0.020467
16	0.0	0.56017	0.0	0.032144 0.024311 0.013618 0.020843
17	0.0	0.56017	0.0	0.032373 0.024570 0.013763 0.021065
18	0.0	0.56017	0.0	0.032369 0.024652 0.013809 0.021135
19	0.0	0.56017	0.0	0.032122 0.024550 0.013752 0.021047
20	0.0	0.56017	0.0	0.031631 0.024258 0.013588 0.020797
21	0.0	0.56017	0.0	0.030893 0.023773 0.013317 0.020381
22	0.0	0.56017	0.0	0.029908 0.023093 0.012936 0.019799
23	0.0	0.56017	0.0	0.028670 0.022212 0.012443 0.019044
24	0.0	0.56017	0.0	0.027182 0.021131 0.011837 0.018117
25	0.0	0.56017	0.0	0.025437 0.019842 0.011115 0.017011
26	0.0	0.56017	0.0	0.023431 0.018338 0.010272 0.015722
27	0.0	0.56017	0.0	0.021171 0.016625 0.0093129 0.014253
28	0.0	0.56017	0.0	0.018644 0.014691 0.0082295 0.012595
29	0.0	0.56017	0.0	0.015854 0.012536 0.0070223 0.010748
30	0.0	0.56017	0.0	0.012797 0.010156 0.0056889 0.0087069
31	0.0	0.56017	0.0	0.0094728 0.0075481 0.0042282 0.0064713
32	0.0	0.56017	0.0	0.0058758 0.0047061 0.0026362 0.0040348
33	0.0	0.56017	0.0	0.0020060 0.0016286 912.30E-6 0.0013963

Slice No.	Surface Load [kN/m_hor/m]	Point Load [kN/m]	Water Pressure on ground surface [kN/m_hor/m]
	Vert Horiz	Vert Horiz	Vert Horiz
1	0.0	0.0	0.0 0.0
2	0.0	0.0	0.0 0.0
3	0.0	0.0	0.0 0.0



E3P

Vine Street, Gorton
Slope Stability Assessment
Section 1

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Slice	Surface Load [kN/m _{hor} /m]	Point Load [kN/m]	Water Pressure on			
4	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0
33	0.0	0.0	0.0	0.0	0.0	0.0