

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	Silty Sand	16.000	18.000	Drained - linear strength	40.000
3	Sandy Clay	20.000	20.000	Drained - linear strength	20.000
4	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 -->							
	4.9540	6.3160	10.300	10.515	10.589	10.687	10.825
1	16.351	16.351	.	.	.	.	.
2	6.6510	6.6510	.	.	.	6.6510	6.6243
3	4.8510	4.8510	.	4.8510	4.8366	.	.
4	2.3510	2.3510	2.3510	.	.	.	.
GW	8.8510	8.8510	.	.	.	.	.
Stratum X -->							
	10.897	11.113	11.614	11.956	12.096	13.061	13.177
1	.	.	16.351	16.285	16.258	.	.
2	.	.	.	.	.	.	.
3	.	.	.	.	.	.	4.6506
4	.	.	.	.	.	2.1524	.
GW	8.8510	8.8093	.	.	.	.	.
Stratum X -->							
	13.260	13.362	13.709	15.180	15.200	15.544	15.645
1	.	.	16.142	.	16.111	.	.
2	6.4492	.	.	.	.	.	6.3996
3	.	.	.	.	.	.	.
4	.	.	.	2.1084	.	.	.
GW	.	8.6476	.	.	.	8.6022	.
Stratum X -->							
	15.728	15.745	15.756	15.768	15.811	15.840	16.390
1	.	.	.	.	16.180	.	.
2	.	.	6.4121	.	.	.	6.3331

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Stratum X -->							
3	15.720	15.745	15.755	15.760	15.811	15.840	16.200
4	4.5975	4.5995	.	.	.	4.5877	.
GW	.	.	.	8.6275	.	.	.
Stratum X -->							
	16.443	17.063	17.591	18.418	19.355	19.429	22.874
1	.	.	.	.	15.739	.	13.876
2	.	.	.	5.2595	.	.	.
3	.	.	3.6606	.	.	.	.
4	1.4399	.	.	.	.	.	.
GW	.	8.4664	.	.	.	7.2138	.
Stratum X -->							
	24.178	25.035	25.652	26.406	28.977	32.989	33.274
1	.	.	.	.	10.794	.	.
2	.	.	1.6064	.	.	.	.
3	.	-0.098560	.	.	.	.	-2.0000
4	-2.4665	.	.	.	.	-4.5000	.
GW	.	.	.	3.6902	.	.	.
Stratum X -->							
	33.479	33.730	34.584	44.584			
1	.	.	9.5000	9.5000			
2	-0.20000	.	.	-0.20000			
3	.	.	.	-2.0000			
4	.	.	.	-4.5000			
GW	.	2.0000	.	2.0000			

Piezometers

Stratum-linked data

No.	Material	Water table	Piezo Set/ Ru value
1	Made Ground: Sandy Gravel	GW	-
2	Silty Sand	GW	-
3	Sandy Clay	GW	-
4	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	4.0000	8.0000	20.000	0.0	Permanent UnFavourable No

Slip Surface Specification

Circle centre specification: GRID
Bottom left of grid: x = 17.00000 m y = 20.00000 m
Inclination of grid: -15.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 20 in x direction at 0.80000m spacing
10 in y direction at 0.80000m 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 (24.217m,22.207m) Radius 8.0000m
Iterations: 5 Horiz acceleration [%g]: 0.0
Net vertical force [kN/m]: 0.0 Slip weight [kN/m] 0.074652
Net horiz force [kN/m]: 0.0 Disturbing moment [kN/m]: 0.27925
Restoring moment [kNm/m]: 0.29579
Reinf.Rest.Moment [kNm/m]: 0.0
Over-Design Factor: 1.0592

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)		

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		[kN/m ²]	[kN/m ²]			
1	20.153	15.317	-	-84.685	0.0	0.0
2	20.175	15.304	-84.667	-84.667	4.9985E-6	11.033E-6
3	20.197	15.291	-84.650	-84.650	21.057E-6	41.092E-6
4	20.219	15.278	-84.634	-84.634	45.568E-6	85.954E-6
5	20.241	15.266	-84.618	-84.618	76.141E-6	141.68E-6
6	20.263	15.253	-84.604	-84.604	110.52E-6	204.48E-6
7	20.285	15.240	-84.590	-84.590	146.90E-6	271.26E-6
8	20.307	15.228	-84.577	-84.577	183.37E-6	338.69E-6
9	20.329	15.216	-84.566	-84.566	218.53E-6	404.26E-6
10	20.351	15.203	-84.555	-84.555	250.88E-6	465.24E-6
11	20.374	15.191	-84.545	-84.545	279.48E-6	519.85E-6
12	20.396	15.179	-84.536	-84.536	303.28E-6	566.07E-6
13	20.418	15.167	-84.528	-84.528	321.62E-6	602.55E-6
14	20.440	15.155	-84.520	-84.520	333.99E-6	628.18E-6
15	20.463	15.143	-84.514	-84.514	339.97E-6	642.02E-6
16	20.485	15.131	-84.508	-84.508	339.50E-6	643.78E-6
17	20.508	15.119	-84.504	-84.504	332.56E-6	633.21E-6
18	20.530	15.107	-84.500	-84.500	319.51E-6	610.84E-6
19	20.553	15.096	-84.497	-84.497	300.57E-6	576.89E-6
20	20.575	15.084	-84.495	-84.495	276.52E-6	532.71E-6
21	20.598	15.073	-84.495	-84.495	247.94E-6	479.28E-6
22	20.621	15.061	-84.494	-84.494	215.91E-6	418.56E-6
23	20.643	15.050	-84.495	-84.495	181.51E-6	352.63E-6
24	20.666	15.039	-84.497	-84.497	146.00E-6	283.95E-6
25	20.689	15.027	-84.500	-84.500	110.78E-6	215.27E-6
26	20.712	15.016	-84.503	-84.503	77.468E-6	149.93E-6
27	20.735	15.005	-84.508	-84.508	47.788E-6	91.525E-6
28	20.757	14.994	-84.513	-84.513	23.586E-6	44.002E-6
29	20.780	14.983	-84.519	-84.519	6.9502E-6	11.918E-6
30	20.803	14.972	-84.526	-	0.0	0.0

Slice No.	Strength Parameters	Average Pore Pressure	Slice Weight	Forces on base [kN/m]			
	c' [kN/m ²]	Tan phi	[kN/m ²]	[kN/m]	Normal	Shear (capacity)	Shear (mobilised)
1	0.0	0.56017	0.0	250.93E-6	217.62E-6	121.91E-6	115.09E-6
2	0.0	0.56017	0.0	736.49E-6	637.41E-6	357.06E-6	337.09E-6
3	0.0	0.56017	0.0	0.0011883	0.0010295	576.71E-6	544.46E-6
4	0.0	0.56017	0.0	0.0016056	0.0013932	780.42E-6	736.77E-6
5	0.0	0.56017	0.0	0.0019879	0.0017278	967.85E-6	913.72E-6
6	0.0	0.56017	0.0	0.0023354	0.0020331	0.0011389	0.0010752
7	0.0	0.56017	0.0	0.0026482	0.0023095	0.0012937	0.0012213
8	0.0	0.56017	0.0	0.0029255	0.0025558	0.0014316	0.0013516
9	0.0	0.56017	0.0	0.0031675	0.0027720	0.0015528	0.0014659
10	0.0	0.56017	0.0	0.0033736	0.0029574	0.0016566	0.0015640
11	0.0	0.56017	0.0	0.0035438	0.0031120	0.0017432	0.0016457
12	0.0	0.56017	0.0	0.0036779	0.0032352	0.0018122	0.0017109
13	0.0	0.56017	0.0	0.0037759	0.0033270	0.0018637	0.0017595
14	0.0	0.56017	0.0	0.0038378	0.0033874	0.0018975	0.0017914
15	0.0	0.56017	0.0	0.0038623	0.0034147	0.0019128	0.0018058
16	0.0	0.56017	0.0	0.0038504	0.0034099	0.0019101	0.0018033
17	0.0	0.56017	0.0	0.0038013	0.0033720	0.0018889	0.0017832
18	0.0	0.56017	0.0	0.0037155	0.0033013	0.0018493	0.0017459
19	0.0	0.56017	0.0	0.0035918	0.0031966	0.0017906	0.0016905
20	0.0	0.56017	0.0	0.0034309	0.0030585	0.0017133	0.0016175
21	0.0	0.56017	0.0	0.0032315	0.0028855	0.0016164	0.0015260
22	0.0	0.56017	0.0	0.0029949	0.0026785	0.0015004	0.0014165
23	0.0	0.56017	0.0	0.0027199	0.0024365	0.0013649	0.0012885
24	0.0	0.56017	0.0	0.0024070	0.0021597	0.0012098	0.0011422
25	0.0	0.56017	0.0	0.0020556	0.0018475	0.0010349	977.04E-6
26	0.0	0.56017	0.0	0.0016658	0.0014997	840.07E-6	793.09E-6
27	0.0	0.56017	0.0	0.0012372	0.0011159	625.07E-6	590.11E-6
28	0.0	0.56017	0.0	769.62E-6	695.63E-6	389.67E-6	367.87E-6
29	0.0	0.56017	0.0	263.20E-6	239.03E-6	133.90E-6	126.41E-6

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



E3P

Vine Street, Gorton
Slope Stability Assessment
Section 3

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Slice	Surface Load [kN/m _{hor} /m]	Point Load [kN/m]	Water Pressure on			
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0
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