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Ref: 16-571-L1-R2
Date: 29th October 2024

The Mineral Planning Group
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ANALYSIS OF SLOPE STABILITY
PEACE WOOD QUARRY, HUDDERSFIELD

1. BACKGROUND

E3P understands that The Mineral Planning Group (MPG) are assisting their client who require a slope stability assessment on the existing Peace Wood Quarry site located in Huddersfield to assist in the permit application for waste recovery to restore the quarry to its historic levels.

This assessment will only appraise the slip circles associated with Made Ground and drift deposits. A detailed rock face assessment would be required to look at the dip, strike, erosion and general stability of the rock to full appraise the full rock slope.

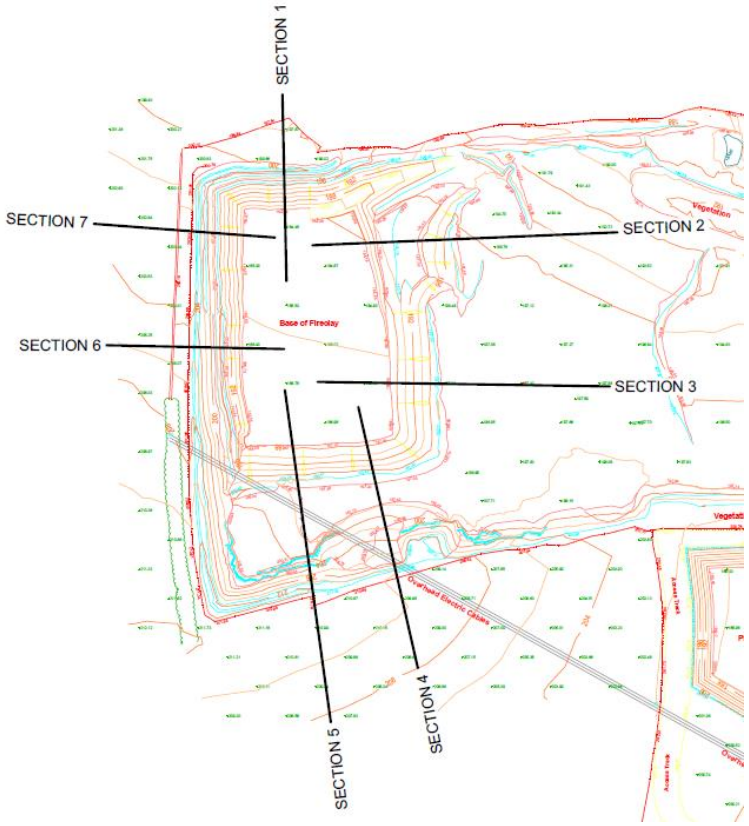
The restoration works require infilling with inert waste through a recovery operation that will alter the existing profile of the site topography and associated slopes.

Prior to the restoration works being undertaken an assessment of the existing slopes is required to ensure these are stable prior to any material being placed or cut. E3P has been commissioned to undertake detailed slope stability analysis to assess the pertinent / relevant factory of safety and potential failure mechanism in its current state.

This assessment is for the fo r quarry area located to the west of the site with slopes forming the perimeter of the excavation area, a general reduction in elevation of 21.0 m.

The slopes have been modelled around the perimeter of the quarried area to the west of the site and extend in the south to include the quarry upper face and in the east to include the area where further infilling is proposed. The slope sections being investigated are presented in Figure 1.1.

FIGURE 1.1 SLOPE SECTIONS LOCATION PLAN



The site comprises of a rectangular shaped parcel of land located to the north of Huddersfield Road, Shelley. The land is currently utilised for the extraction of fireclay and weathered mudstones, it is proposed to restore the quarry to its original levels and become agricultural/amenity grassland. The site generally slopes from north to south with a large extraction area present in the west. A bund is present to the east of the site with a number of embankments present around the site perimeter.

Peace Wood is located to the north of the site. Agricultural land is located to the east, south and west of the site. The nearest residential properties are located to the south-east of the site.

For the avoidance of doubt this update follows a response from planning who have requested that the assessment also considers the slope in the final ground level design. It is understood that the existing quarry will be backfilled and so the risk of collapse from existing slopes will be lessened as a result however the additional assessment considers slopes and gradients formed at the surface.

2. GEOMORPHOLOGY AND TOPOGRAPHY

Based on the initial geological assessment, a review of available topographic data and pertinent mapping, E3P has undertaken a preliminary geomorphological assessment of the landform and its possible mechanism for formation.

The site is predominantly underlain by a thin band of topsoil underlain by gravelly clay to depths of between 0.90 m bgl and 2.10 m bgl. The underlying rock formations are associated with the Pennine Lower Coal Measures Formation comprising of mudstone, siltstone and sandstone.

The top of the extraction area to the west of the site has been recorded at 206.0 m AOD and the base has been recorded at 184.44 m AOD.

A visual assessment of the existing slope will be required to ensure there are no evidence of slope slips or tension cracks showing either historical or current slope failure. It is report currently that there is no visual failure in the slope surface currently experienced.

3. GROUND CONDITIONS

An intrusive site investigation has been undertaken by Wardell Armstrong (report ref: ST15986-RPT-002- 2 November 2018) on an area of the site to the south of the quarry. Boreholes TP1, BH1, BH2 and BH6 were undertaken to the north of the site which are the closest to the Peace Wood quarry. The borehole information for this area is consistent and confirms that the area predominantly consists of a thin band of cohesive deposits underlain by sandstone and mudstone. These ground conditions have been utilised in the E3P slope model in the absence of site specific data.

Topsoil deposits were encountered within all exploratory hole locations located within the area to the south of the site to depths of between ground level and 0.40 m bgl. This hasn't been taken into consideration within the slope stability modelling as this topsoil has been stripped during the earthworks.

The north of the site to the south of the quarry is underlain by cohesive deposits to depths of 2.10 m bgl. The deposits typically comprised of a soft sandy slightly gravelly CLAY. The cohesive deposits are underlain by interbedded bands of SANDSTONE and MUDSTONE.

It is understood that the backfill materials will be generated from site won soils from development in the local area and are likely to consist largely of CLAY and clayey SAND with sandstone gravel. It is possible that elements of crushed brick and concrete could also be part of the materials make up. Conservative literature values have been utilised in the model to consider any outcome.

4. GEOTECHNICAL SLIP CIRCLE ANALYSIS

To ensure the potential risk associated with the existing quarry levels is accurately appraised, E3P has developed a detailed slope stability model to assess any potential degree of risk.

To ensure the perceived risk is fully appraised, E3P have created a slope stability model to assess the perceived location of all slip circles, their zone of influence, Factor of Safety and thus the potential of negative impact on the proposed development and existing embankment.

This slope stability analysis involves Limit Equilibrium (LE) analysis due to its simplicity and accuracy. This method consists of cutting the slope into fine slices and applying appropriate equilibrium equations (equilibrium of the forces and/or moments). According to the assumptions made on the efforts between the slices and the equilibrium equations considered, many alternatives were proposed, such as the Bishop and Fellenius methods. In most cases, they are shown to give similar results. For this study, Oasys Slope, EC7 Ultimate Limit State (ULS) scenario slope stability analysis program has been used.

4.1. LIMITATIONS OF THE STUDY

The comments made and conclusions drawn concerning the proposed earthworks associated with existing slopes within the subject site are appropriate at this point in time only and are based on the information available to E3P at the time of writing.

If more information becomes available or the site conditions alter then the aforementioned comments and conclusions may have to be re-assessed. If any ambiguity exists concerning any point, for the avoidance of doubt guidance should be sought from E3P, in all instances.

The slope stability modelling has been based on the information available from the Wardell Armstrong site investigation undertaken in November 2018 for the site to the south of the quarry and BGS online mapping data due to no site investigation information being available for the site.

A detailed rock face assessment will be required in order to assess the stability of the rock face.

4.2. INPUT PARAMETERS & DATA

Appropriate soil mechanics parameters derived from the Wardell Armstong site investigation for the site to the south and BGS online mapping were analysed and interpreted in the Oasys Slope software.

Furthermore, the existing topographical levels for the quarry have been taken from the existing levels drawing provided by MPG (Ref: 4-Phase 2 Exc Nov 22 3D). The slope stability assessment will need revising if the site conditions alter.

For this assessment, the Bishops method has been utilised.

An assessment of the slope has been undertaken at 7 critical sections as detailed within the E3P Drawing (ref: 16-571-001). The locations for the slope assessment have been chosen around the perimeter of the excavated area to the west of the site choosing the areas that are at a higher risk, such as steeper slopes.

To ensure a suitably robust assessment, conservative values of the soil material property parameters were utilised in the development of the Slope Modelling as detailed below. The slope has been modelled in an undrained scenario.

TABLE 4.1 GEOTECHNICAL INPUT PARAMETERS

Depth	Material Type	C' – Effective Cohesion (kPa)	Angle of Internal Friction (°)	γ (kN/m2) Bulk Unit Weight
0.00 – 1.65	Soft Sandy Clay	2.0	26.0	19.0
1.65 – 4.40	Weathered Sandstone	10000.0	45.0	33.0
4.40 – 5.00	Weathered Mudstone	10000.0	45.0	33.0
5.00 – 6.70	Weathered Sandstone	10000.0	45.0	33.0
>6.70	Weathered Mudstone	10000.0	45.0	33.0
GL->6.0	Backfill Materials	5.00	38.00	20.00

No groundwater was encountered during the site investigation for the site to the south of the quarry.

4.3. SLOPE ANALYSIS RESULTS

E3P have completed a detailed analysis on the proposed slope sections, the results of each of the 7 sections are detailed below in Table 4.2.

The sections pertinent to the finished external level design are presented in table 4.3. 4 sections have been assessed through the area following the finished levels provided.

TABLE 4.2 SUMMARY OF SLOPE STABILITY RESULTS

Section	Factor of Safety
1	0.819
2	1.137
3	1.049
4	0.987

5	0.781
6	1.251
7	1.095

TABLE 4.3 SUMMARY OF SLOPE STABILITY RESULTS (FINISHED LEVELS)

Section	Factor of Safety
1	4.794
2	5.296
3	6.513
4	9.657

A comparison of the required FoS as defined within EC7 ULS assessment requirements, would suggest that sections 1, 4 and 5 did not achieve the FoS requirement of '1' for this classification of design and therefore show the slope to be unstable. However, the slip circles just show the slopes to be unstable within the surface of the drift stratum. The FoS is much greater within the bedrock strata and shows the quarry face to be stable. The assessment shows that no deep seated slip circles are present from the modelling completed, however a rock face assessment is required to fully appraise the site and its stability.

The calculus was performed following the Bishop's Method utilising the calculus for Design Approach 1 Combination 2 according to EN 1997:2004 Eurocode 7: Geotechnical Design which requires the compliance with the following partial FoS for a ULS analysis for DA1-C2 to be >1.

The assessment of the finished levels confirms that with this design and change in gradient is intrinsically safe far beyond the FOS limit of 1 with a range of 4.794 – 9.657.

5. CONCLUSIONS & RECOMMENDATIONS

The slope stability assessment carried out on the current quarry levels for the excavation area show that the quarry is stable. The modelling shows the soft sandy clay material to have a FoS of <1 or just above 1 and shows this as unstable within sections 1, 4 and 5. It is recommended that the angle of the upper drift layer is re-profiled with a machine to shallow up the gradient to stabilise this and reduce the risk of failure. The slope modelling shows that there are no concerns with deep seated slip within the quarry, however an on-site rock face assessment is required to be able to appraise the stability of the quarry face. It is important to note that currently it is reported that there is no visual failure occurring in the face of the slopes.

The slope modelling shows the existing slopes within the excavation area to the west of the site to be stable and it is unlikely that any backfilling works to take the site back to previous levels would cause the slope to become unstable.

However, it should be noted that further analysis is required if levels on site alter from the assessment carried out. Also, if additional site investigation or geotechnical data becomes available the assessment will require updating to assess the site specific conditions.

I trust that the above information is sufficient at this time and if you require anything further please do not hesitate to contact me.

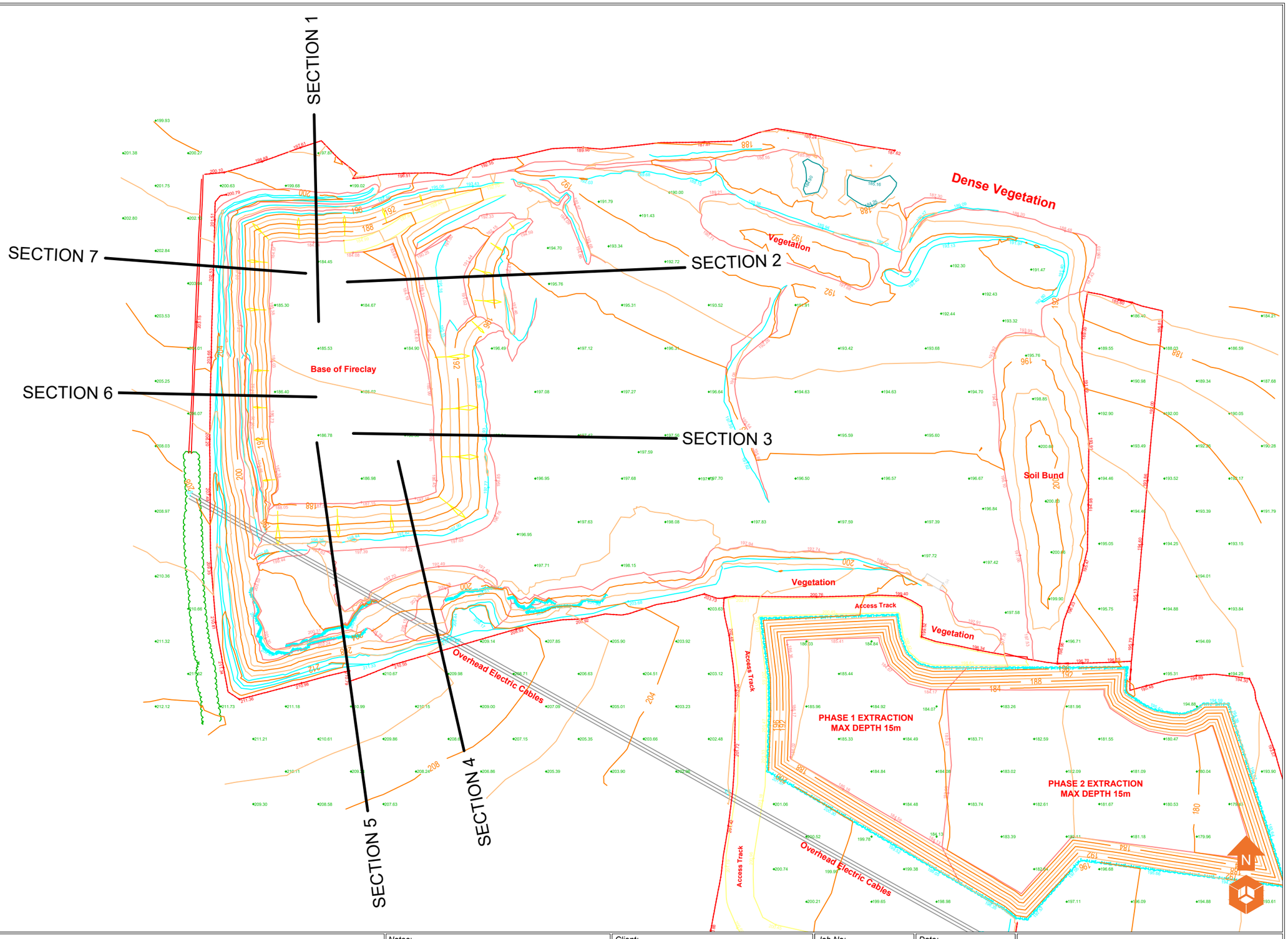
Yours sincerely,
For and on behalf of E3P Ltd

Charlotte Beardall
Geotechnical Consultant

Roy Walker
Associate Director

Enclosed:

Drawing No. 16-571-001 Section Location Plan
Drawing No. 16-571-001(RevA) Section Location Plan
Slope Stability Analysis Sections 1-7 (Current Ground Levels)
Slope Stability Analysis Sections 1-4 (Finished Ground Levels)



P1	REVA	03.03.2023	CB	RJW
Phase	Issue	Date	Drawn	Checked

Notes:

Client: The Mineral Planning Group

Job No: 16-571

Date: 03.03.2023

Drawing No: 001

Scale: NTS @ A3

Job Title: Peace Wood Quarry, Huddersfield

Drawing Title: Section Location Plan

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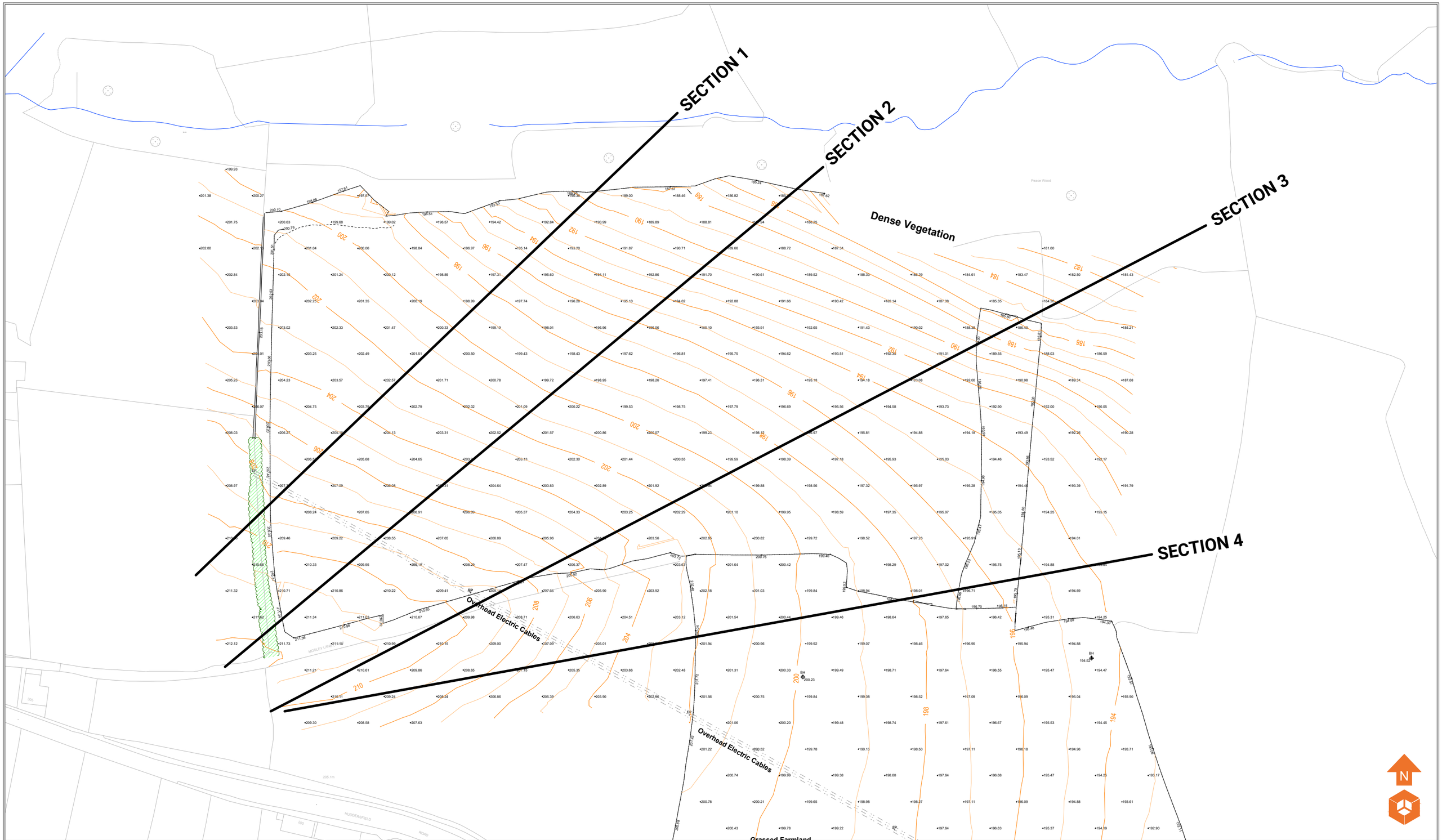

P1	REVA	25.10.2024	CB	RJW	RJW	
Phase	Issue	Date	Drawn	Checked	PM	

Notes:

Client: The Mineral Planning Group

Job No: 16-571

Date: 25.10.2024

Drawing No: 001

Scale: NTS @ A3

Job Title: Peacewood Quarry

Drawing Title: Section Location Plan

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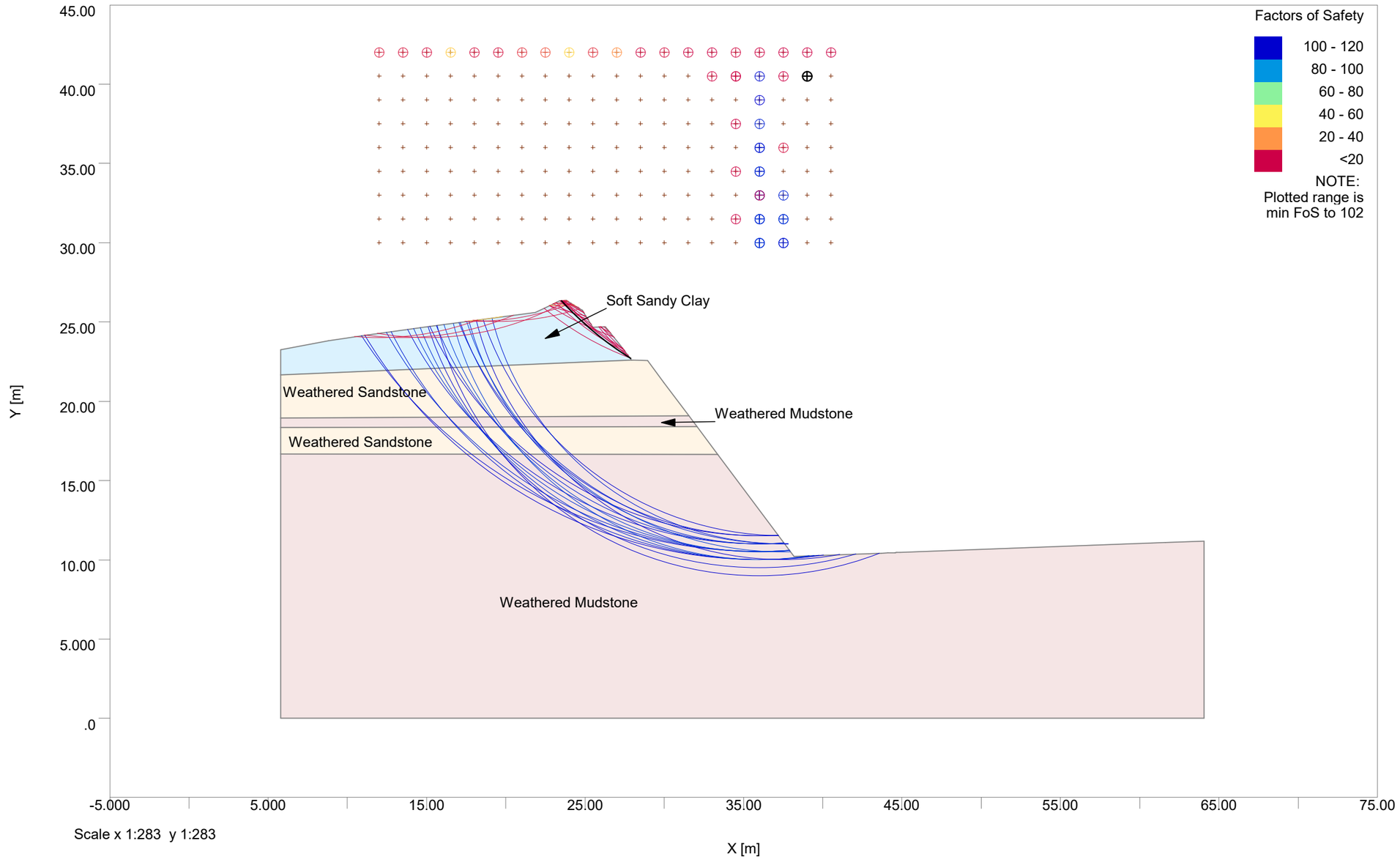
Oasys

Peace Wood Quarry, Huddersfield
Section 1

Job No.	Sheet No.	Rev.
16-571		
Drg. Ref.		
Made by CB	Date	Checked / Date

More than one slip surface shown, minimum factor of 0.819



Specification

Slip Type: CIRCULAR
Direction of slip: Downhill
Minimum slip weight [kN/m] :0.00000
Type of analysis: STATIC
Partial factor analysis
Minimum number of slices 25
Method: Bishop(Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NONE

Material Properties

No	Description	Unit Weight Above GWL [kN/m3]	Unit Weight Below GWL [kN/m3]	Shear Strength Parameters Condition	Phi or Phi0 [°]	c or c0' [kN/m²]
1	Soft Sandy Clay	19.000	19.000	Drained	26.000	2.0000
2	Weathered Sandstone	33.000	33.000	Drained	45.000	10000.
3	Weathered Mudstone	33.000	33.000	Drained	45.000	10000.

Slip Surface Specification

Circle centre specification:
Bottom left of grid: x = 12.00000 m y = 30.00000 m
Inclination of grid: 0.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 20 in x direction at 1.50000m spacing
                  8 in y direction at 1.50000m 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 (39.000m,40.500m) Radius 21.000m
Iterations: 5 Horiz acceleration [%g]: 0.0
Net vertical force [kN/m]: 0.0058516 *Slip weight [kN/m] 41.718*
Net horiz force [kN/m]: 0.0070398 Disturbing moment [kN/m]: 556.84
Restoring moment [kNm/m]: 455.96
Reinf.Rest.Moment [kNm/m]: 0.0
Over-Design Factor: 0.81884

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 Point	x [m]	y [m]	Pore Pressure L [kN/m²]	R [kN/m²]	Interslice forces [kN/m] T	E	E(u)
1	23.500	26.332	-	0.0	0.0	0.0	0.0
2	23.666	26.152	0.0	0.0	-0.26487	-0.23494	0.0
3	23.831	25.978	0.0	0.0	-0.35006	-0.30727	0.0
4	24.001	25.802	0.0	0.0	-0.32278	-0.27193	0.0
5	24.171	25.631	0.0	0.0	-0.24771	-0.18822	0.0
6	24.341	25.463	0.0	0.0	-0.12819	-0.058142	0.0
7	24.511	25.299	0.0	0.0	0.024884	0.10974	0.0
8	24.681	25.139	0.0	0.0	0.20366	0.30897	0.0
9	24.829	25.002	0.0	0.0	0.37843	0.50590	0.0
10	24.921	24.919	0.0	0.0	0.47112	0.61373	0.0
11	25.067	24.788	0.0	0.0	0.56659	0.72843	0.0
12	25.213	24.659	0.0	0.0	0.59976	0.77419	0.0
13	25.360	24.533	0.0	0.0	0.57083	0.74882	0.0
14	25.506	24.409	0.0	0.0	0.48570	0.65667	0.0
15	25.669	24.274	0.0	0.0	0.39733	0.55908	0.0
16	25.833	24.141	0.0	0.0	0.37922	0.54616	0.0
17	25.996	24.011	0.0	0.0	0.42005	0.60682	0.0
18	26.159	23.884	0.0	0.0	0.50978	0.73160	0.0
19	26.279	23.792	0.0	0.0	0.60365	0.86100	0.0
20	26.421	23.684	0.0	0.0	0.70976	1.0088	0.0
21	26.584	23.564	0.0	0.0	0.77284	1.1040	0.0

Slip surface coordinates		Pore Pressure		Interslice forces [kN/m]		
Point	x [m]	y [m]	L [kN/m²]	R [kN/m²]	T	E	E(u)
22	26.747	23.445	0.0	0.0	0.79893	1.1493	0.0
23	26.910	23.329	0.0	0.0	0.78049	1.1331	0.0
24	27.073	23.216	0.0	0.0	0.72180	1.0581	0.0
25	27.236	23.104	0.0	0.0	0.63240	0.93770	0.0
26	27.395	22.998	0.0	0.0	0.51267	0.76765	0.0
27	27.554	22.893	0.0	0.0	0.36647	0.55582	0.0
28	27.713	22.791	0.0	0.0	0.19622	0.30007	0.0
29	27.872	22.691	0.0	-	0.0058516	0.0070398	0.0

Slice No.	Strength Parameters		Average Pore Pressure	Slice Weight	Forces on base [kN/m]		
	c' [kN/m²]	Tan phi	[kN/m²]	[kN/m]	Normal	Shear (capacity)	Shear (mobilised)
1	1.6000	0.39019	0.0	0.30659	0.21384	0.47467	0.57969
2	1.6000	0.39019	0.0	0.91033	0.63369	0.63148	0.77119
3	1.6000	0.39019	0.0	1.3534	0.94670	0.76090	0.92925
4	1.6000	0.39019	0.0	1.5714	1.1143	0.82059	1.0021
5	1.6000	0.39019	0.0	1.7765	1.2700	0.87795	1.0722
6	1.6000	0.39019	0.0	1.9687	1.4232	0.93327	1.1397
7	1.6000	0.39019	0.0	2.1479	1.5705	0.98631	1.2045
8	1.6000	0.39019	0.0	2.0021	1.4748	0.89813	1.0968
9	1.6000	0.39019	0.0	1.2210	0.90998	0.55331	0.67573
10	1.6000	0.39019	0.0	1.7145	1.2825	0.81456	0.99477
11	1.6000	0.39019	0.0	1.4463	1.0901	0.73735	0.90049
12	1.6000	0.39019	0.0	1.1712	0.89270	0.65719	0.80258
13	1.6000	0.39019	0.0	0.88920	0.68357	0.57351	0.70039
14	1.6000	0.39019	0.0	1.0561	0.81981	0.65882	0.80458
15	1.6000	0.39019	0.0	1.4981	1.1674	0.79240	0.96771
16	1.6000	0.39019	0.0	1.9324	1.5175	0.92600	1.1309
17	1.6000	0.39019	0.0	2.3558	1.8652	1.0587	1.2929
18	1.6000	0.39019	0.0	1.9859	1.5802	0.85852	1.0485
19	1.6000	0.39019	0.0	2.3567	1.8808	1.0193	1.2448
20	1.6000	0.39019	0.0	2.4497	1.9784	1.0958	1.3383
21	1.6000	0.39019	0.0	2.1927	1.7766	1.0161	1.2409
22	1.6000	0.39019	0.0	1.9294	1.5776	0.93565	1.1427
23	1.6000	0.39019	0.0	1.6569	1.3672	0.85081	1.0390
24	1.6000	0.39019	0.0	1.3782	1.1414	0.76178	0.93032
25	1.6000	0.39019	0.0	1.0619	0.88883	0.65256	0.79694
26	1.6000	0.39019	0.0	0.76582	0.64432	0.55627	0.67934
27	1.6000	0.39019	0.0	0.46372	0.39551	0.45657	0.55758
28	1.6000	0.39019	0.0	0.15558	0.13685	0.35393	0.43223

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	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

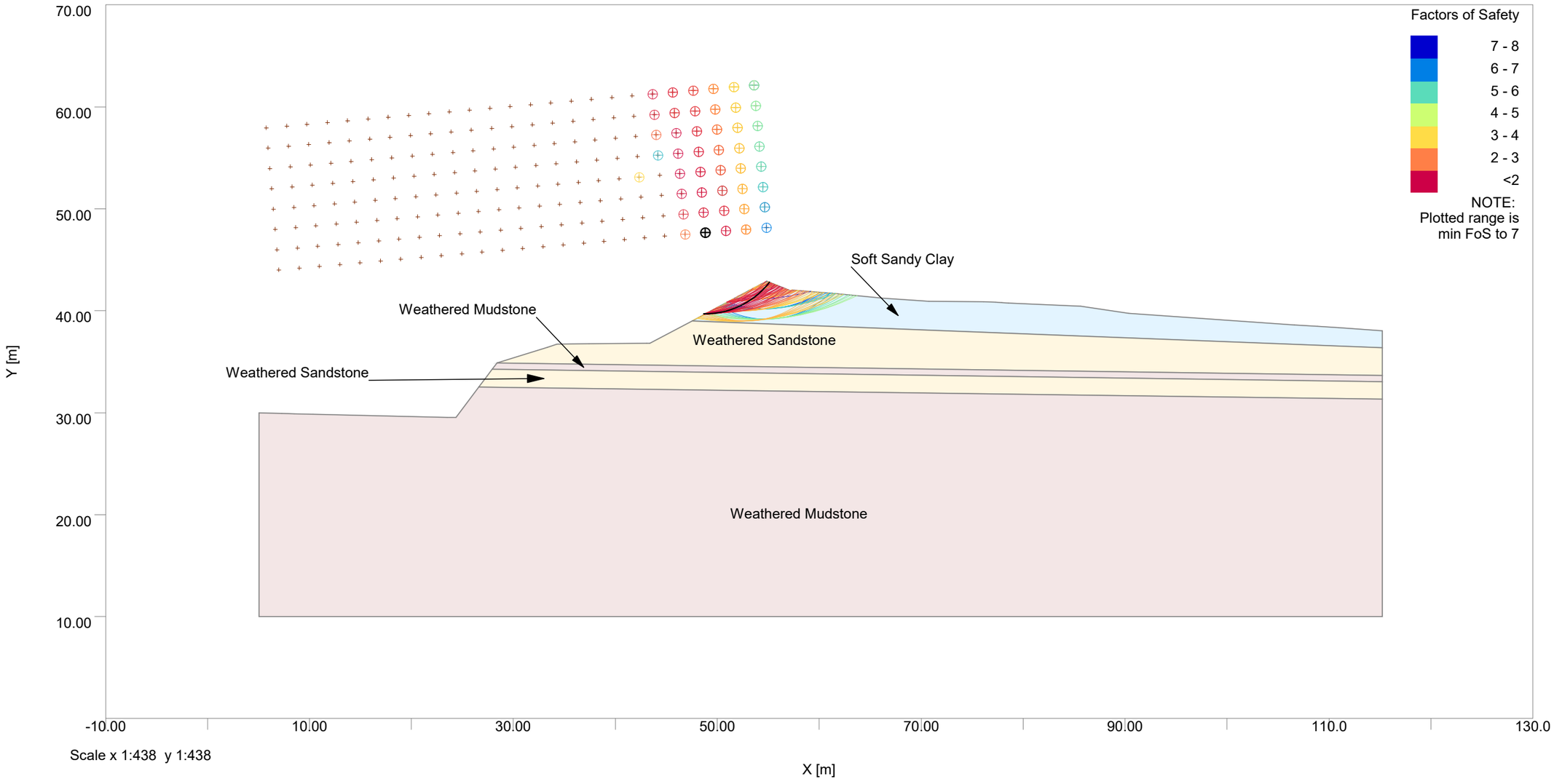
Slice No.	Surface Load [kN/m_hor/m] Vert	Surface Load [kN/m_hor/m] Horiz	Point Load [kN/m] Vert	Point Load [kN/m] Horiz	Water Pressure on ground surface [kN/m_hor/m] Vert	Water Pressure on ground surface [kN/m_hor/m] Horiz
28	*0.0*	*0.0*	0.0	0.0	0.0	0.0

Oasys

Peace Wood Quarry, Huddersfield
Section 2

Job No.	Sheet No.	Rev.
16-571		
Drg. Ref.		
Made by CB	Date	Checked / Date

More than one slip surface shown, minimum factor of 1.137



Scale x 1:438 y 1:438

Specification

Slip Type: CIRCULAR
Direction of slip: Downhill
Minimum slip weight [kN/m] :0.00000
Type of analysis: STATIC
Partial factor analysis
Minimum number of slices 25
Method: Bishop(Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NONE

Material Properties

No	Description	Unit Weight Above GWL [kN/m3]	Unit Weight Below GWL [kN/m3]	Shear Strength Parameters Condition	Phi or Phi0 [°]	c or c0' [kN/m²]
1	Soft Sandy Clay	19.000	19.000	Drained	26.000	2.0000
2	Weathered Sandstone	33.000	33.000	Drained	45.000	10000.
3	Weathered Mudstone	33.000	33.000	Drained	45.000	10000.

Slip Surface Specification

Circle centre specification:
Bottom left of grid: x = 7.00000 m y = 44.00000 m
Inclination of grid: 5.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 25 in x direction at 2.00000m spacing
                  8 in y direction at 2.00000m spacing
Initial radius of circle 1.00000 m
Incremented by 1.00000 m until all possible circles considered

WORST CASE

Centre at (48.840m,47.661m)
Radius 8.0000m
Iterations: 10
Horiz acceleration [%g]: 0.0
Net vertical force [kN/m]: 0.21227
Slip weight [kN/m] 94.752
Net horiz force [kN/m]: 0.44444
Disturbing moment [kN/m]: 323.90
Restoring moment [kNm/m]: 368.24
Reinf.Rest.Moment [kNm/m]: 0.0
Over-Design Factor: 1.1369

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 Point	x [m]	y [m]	Pore Pressure L [kN/m²]	R [kN/m²]	Interslice forces [kN/m] T	E	E(u)
1	48.745	39.661	-	0.0	0.0	0.0	0.0
2	48.840	39.661	0.0	0.0	0.0	0.14977	0.0
3	49.061	39.664	0.0	0.0	0.012689	0.61171	0.0
4	49.282	39.673	0.0	0.0	0.056138	1.2060	0.0
5	49.502	39.688	0.0	0.0	0.13519	1.8987	0.0
6	49.723	39.709	0.0	0.0	0.25207	2.6578	0.0
7	49.944	39.737	0.0	0.0	0.41099	3.4430	0.0
8	50.164	39.771	0.0	0.0	0.60467	4.2348	0.0
9	50.385	39.811	0.0	0.0	0.82885	5.0086	0.0
10	50.633	39.864	0.0	0.0	1.1116	5.8134	0.0
11	50.880	39.925	0.0	0.0	1.4149	6.5328	0.0
12	51.128	39.995	0.0	0.0	1.7262	7.1273	0.0
13	51.375	40.073	0.0	0.0	2.0317	7.5955	0.0
14	51.623	40.160	0.0	0.0	2.3155	7.9078	0.0
15	51.870	40.257	0.0	0.0	2.5584	8.0399	0.0
16	52.118	40.363	0.0	0.0	2.7508	8.0085	0.0
17	52.366	40.479	0.0	0.0	2.8752	7.8013	0.0
18	52.613	40.606	0.0	0.0	2.9145	7.4147	0.0
19	52.861	40.744	0.0	0.0	2.8623	6.8676	0.0
20	53.108	40.894	0.0	0.0	2.7085	6.1712	0.0
21	53.356	41.057	0.0	0.0	2.4487	5.3459	0.0
22	53.603	41.233	0.0	0.0	2.0952	4.4302	0.0

Slip surface coordinates		Pore Pressure		Interslice forces [kN/m]		
Point	x [m]	y [m]	L [kN/m²]	R [kN/m²]	T	E	E(u)
23	53.851	41.424	0.0	0.0	1.6518	3.4508	0.0
24	54.098	41.631	0.0	0.0	1.1432	2.4526	0.0
25	54.346	41.856	0.0	0.0	0.60016	1.4813	0.0
26	54.577	42.085	0.0	0.0	0.10435	0.64672	0.0
27	54.809	42.334	0.0	0.0	-0.31706	-0.061606	0.0
28	54.851	42.381	0.0	0.0	-0.37624	-0.17044	0.0
29	55.011	42.569	0.0	0.0	-0.45423	-0.44163	0.0
30	55.170	42.768	0.0	-	-0.21227	-0.44444	0.0

Slice No.	Strength Parameters		Average Pore Pressure	Slice Weight	Forces on base [kN/m]		
	c' [kN/m²]	Tan phi	[kN/m²]	[kN/m]	Normal	Shear (capacity)	Shear (mobilised)
1	1.6000	0.39019	0.0	0.046113	0.046113	0.17027	0.14977
2	1.6000	0.39019	0.0	0.45285	0.45922	0.53232	0.46822
3	1.6000	0.39019	0.0	0.92038	0.93882	0.71971	0.63305
4	1.6000	0.39019	0.0	1.3628	1.3915	0.89687	0.78888
5	1.6000	0.39019	0.0	1.7800	1.8164	1.0634	0.93539
6	1.6000	0.39019	0.0	2.1699	2.2115	1.2188	1.0721
7	1.6000	0.39019	0.0	2.5326	2.5740	1.3616	1.1977
8	1.6000	0.39019	0.0	2.8702	2.9067	1.4930	1.3133
9	1.6000	0.39019	0.0	3.5866	3.6151	1.8156	1.5970
10	1.6000	0.39019	0.0	3.9393	3.9473	1.9481	1.7136
11	1.6000	0.39019	0.0	4.2521	4.2295	2.0619	1.8137
12	1.6000	0.39019	0.0	4.5226	4.4642	2.1572	1.8974
13	1.6000	0.39019	0.0	4.7531	4.6484	2.2336	1.9647
14	1.6000	0.39019	0.0	4.9412	4.7787	2.2900	2.0143
15	1.6000	0.39019	0.0	5.0847	4.8635	2.3285	2.0482
16	1.6000	0.39019	0.0	5.1835	4.8943	2.3471	2.0645
17	1.6000	0.39019	0.0	5.2305	4.8653	2.3435	2.0614
18	1.6000	0.39019	0.0	5.2258	4.7853	2.3206	2.0412
19	1.6000	0.39019	0.0	5.1694	4.6505	2.2777	2.0034
20	1.6000	0.39019	0.0	5.0541	4.4581	2.2137	1.9472
21	1.6000	0.39019	0.0	4.8777	4.2180	2.1318	1.8751
22	1.6000	0.39019	0.0	4.6331	3.9155	2.0280	1.7839
23	1.6000	0.39019	0.0	4.3156	3.5609	1.9057	1.6763
24	1.6000	0.39019	0.0	3.9205	3.1527	1.7654	1.5528
25	1.6000	0.39019	0.0	3.2241	2.5265	1.5068	1.3254
26	1.6000	0.39019	0.0	2.7051	2.0737	1.3531	1.1902
27	1.6000	0.39019	0.0	0.42494	0.32487	0.22761	0.20020
28	1.6000	0.39019	0.0	1.1758	0.91704	0.75229	0.66171
29	1.6000	0.39019	0.0	0.39700	0.40180	0.56483	0.49682

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	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

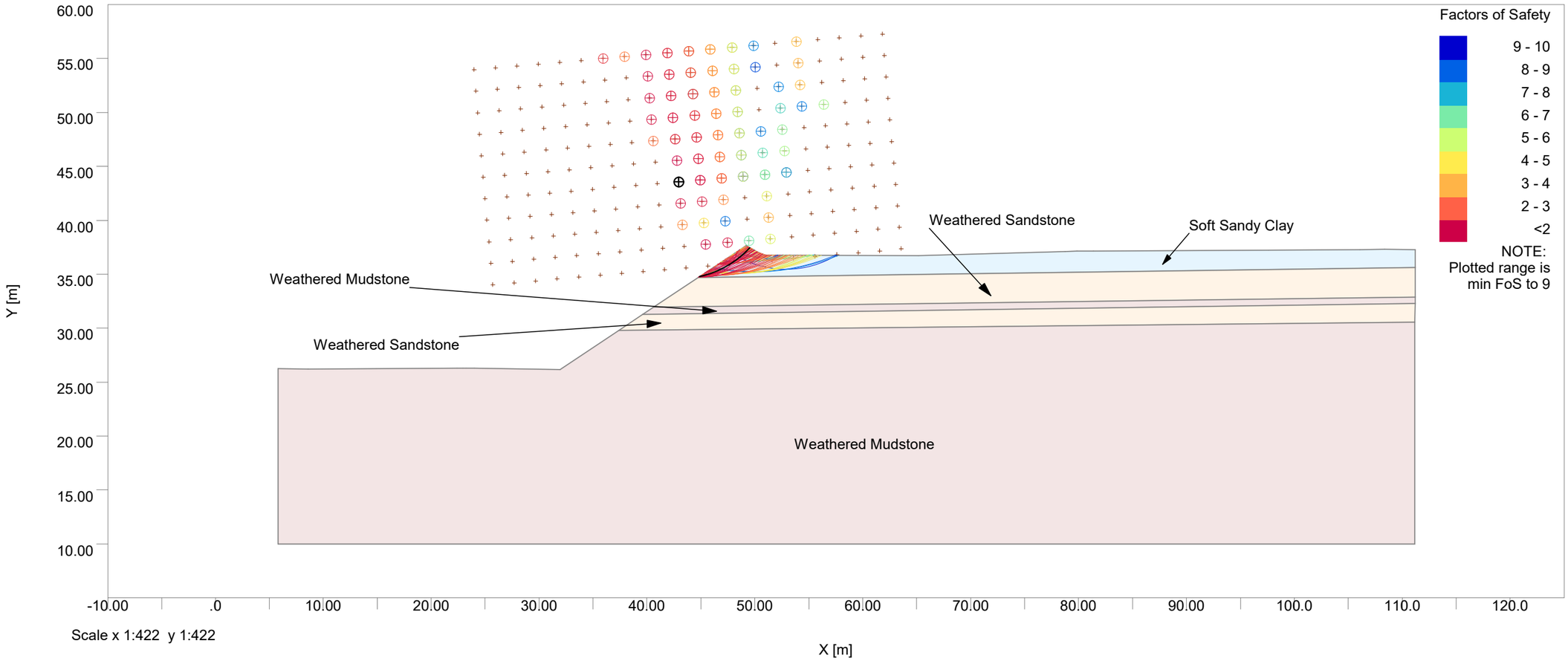
Slice No.	Surface Load [kN/m_hor/m] Vert	Surface Load [kN/m_hor/m] Horiz	Point Load [kN/m] Vert	Point Load [kN/m] Horiz	Water Pressure on ground surface [kN/m_hor/m] Vert	Water Pressure on ground surface [kN/m_hor/m] Horiz
27	*0.0*	*0.0*	0.0	0.0	0.0	0.0
28	*0.0*	*0.0*	0.0	0.0	0.0	0.0
29	*0.0*	*0.0*	0.0	0.0	0.0	0.0

Oasys

Peace Wood Quarry, Huddersfield
Section 3

Job No.	Sheet No.	Rev.
16-571		
Drg. Ref.		
Made by CB	Date	Checked / Date

More than one slip surface shown, minimum factor of 1.049



Scale x 1:422 y 1:422

Specification

Slip Type: CIRCULAR
Direction of slip: Downhill
Minimum slip weight [kN/m] :0.00000
Type of analysis: STATIC
Partial factor analysis
Minimum number of slices 25
Method: Bishop(Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NONE

Material Properties

No	Description	Unit Weight Above GWL [kN/m3]	Unit Weight Below GWL [kN/m3]	Shear Strength Parameters Condition	Phi or Phi0 [°]	c or c0' [kN/m²]
1	Soft Sandy Clay	19.000	19.000	Drained	26.000	2.0000
2	Weathered Sandstone	33.000	33.000	Drained	45.000	10000.
3	Weathered Mudstone	33.000	33.000	Drained	45.000	10000.

Slip Surface Specification

Circle centre specification:
Bottom left of grid: x = 25.00000 m y = 42.00000 m
Inclination of grid: 5.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 20 in x direction at 2.00000m spacing
                  7 in y direction at 2.00000m 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 (42.932m,43.569m) Radius 9.0000m
Iterations: 5 Horiz acceleration [%g]: 0.0
Net vertical force [kN/m]: 0.028242 *Slip weight [kN/m] 44.869*
Net horiz force [kN/m]: 0.049266 Disturbing moment [kN/m]: 205.91
Restoring moment [kNm/m]: 215.92
Reinf.Rest.Moment [kNm/m]: 0.0
Over-Design Factor: 1.0486

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 Point	x [m]	y [m]	Pore Pressure L [kN/m²]	R [kN/m²]	Interslice forces [kN/m] T	E	E(u)
1	44.897	34.786	-	0.0	0.0	0.0	0.0
2	45.076	34.828	0.0	0.0	0.092346	0.29348	0.0
3	45.255	34.874	0.0	0.0	0.19969	0.61154	0.0
4	45.434	34.924	0.0	0.0	0.31961	0.94170	0.0
5	45.613	34.978	0.0	0.0	0.44919	1.2726	0.0
6	45.793	35.036	0.0	0.0	0.58523	1.5943	0.0
7	45.972	35.098	0.0	0.0	0.72424	1.8981	0.0
8	46.151	35.164	0.0	0.0	0.86256	2.1762	0.0
9	46.330	35.235	0.0	0.0	0.99522	2.4144	0.0
10	46.509	35.310	0.0	0.0	1.1193	2.6149	0.0
11	46.688	35.390	0.0	0.0	1.2289	2.7652	0.0
12	46.867	35.475	0.0	0.0	1.3197	2.8623	0.0
13	47.047	35.565	0.0	0.0	1.3880	2.9050	0.0
14	47.226	35.659	0.0	0.0	1.4349	2.9016	0.0
15	47.405	35.759	0.0	0.0	1.4491	2.8355	0.0
16	47.584	35.865	0.0	0.0	1.4287	2.7106	0.0
17	47.763	35.976	0.0	0.0	1.3779	2.5390	0.0
18	47.942	36.093	0.0	0.0	1.2914	2.3182	0.0
19	48.121	36.216	0.0	0.0	1.1710	2.0556	0.0
20	48.300	36.346	0.0	0.0	1.0141	1.7535	0.0
21	48.479	36.482	0.0	0.0	0.83112	1.4276	0.0

Slip surface coordinates		Pore Pressure		Interslice forces [kN/m]		
Point	x [m]	y [m]	L [kN/m²]	R [kN/m²]	T	E	E(u)
22	48.659	36.626	0.0	0.0	0.61752	1.0786	0.0
23	48.838	36.778	0.0	0.0	0.38378	0.72127	0.0
24	49.017	36.938	0.0	0.0	0.14230	0.37052	0.0
25	49.196	37.107	0.0	0.0	-0.096583	0.038553	0.0
26	49.368	37.279	0.0	0.0	-0.20215	-0.14156	0.0
27	49.541	37.461	0.0	-	-0.028242	-0.049267	0.0

Slice No.	Strength Parameters		Average Pore Pressure	Slice Weight	Forces on base [kN/m]		
	c' [kN/m²]	Tan phi	[kN/m²]	[kN/m]	Normal	Shear (capacity)	Shear (mobilised)
1	1.6000	0.39019	0.0	0.13103	0.15048	0.35309	0.33672
2	1.6000	0.39019	0.0	0.38798	0.40065	0.45223	0.43127
3	1.6000	0.39019	0.0	0.63133	0.63482	0.54525	0.51998
4	1.6000	0.39019	0.0	0.85935	0.85134	0.63152	0.60225
5	1.6000	0.39019	0.0	1.0755	1.0535	0.71230	0.67929
6	1.6000	0.39019	0.0	1.2780	1.2397	0.78699	0.75051
7	1.6000	0.39019	0.0	1.4652	1.4084	0.85499	0.81536
8	1.6000	0.39019	0.0	1.6370	1.5574	0.91597	0.87351
9	1.6000	0.39019	0.0	1.7953	1.6930	0.97130	0.92628
10	1.6000	0.39019	0.0	1.9382	1.8085	1.0195	0.97228
11	1.6000	0.39019	0.0	2.0624	1.9037	1.0600	1.0109
12	1.6000	0.39019	0.0	2.1697	1.9806	1.0935	1.0429
13	1.6000	0.39019	0.0	2.2632	2.0471	1.1224	1.0704
14	1.6000	0.39019	0.0	2.3398	2.0876	1.1428	1.0898
15	1.6000	0.39019	0.0	2.3943	2.1066	1.1550	1.1015
16	1.6000	0.39019	0.0	2.4317	2.1142	1.1621	1.1082
17	1.6000	0.39019	0.0	2.4504	2.0999	1.1617	1.1078
18	1.6000	0.39019	0.0	2.4470	2.0666	1.1540	1.1005
19	1.6000	0.39019	0.0	2.4215	2.0103	1.1385	1.0857
20	1.6000	0.39019	0.0	2.3756	1.9433	1.1181	1.0663
21	1.6000	0.39019	0.0	2.3058	1.8493	1.0893	1.0388
22	1.6000	0.39019	0.0	2.2071	1.7358	1.0532	1.0044
23	1.6000	0.39019	0.0	2.0812	1.6057	1.0108	0.96395
24	1.6000	0.39019	0.0	1.9280	1.4564	0.96230	0.91770
25	1.6000	0.39019	0.0	1.3405	1.0017	0.78060	0.74442
26	1.6000	0.39019	0.0	0.45230	0.36378	0.54316	0.51798

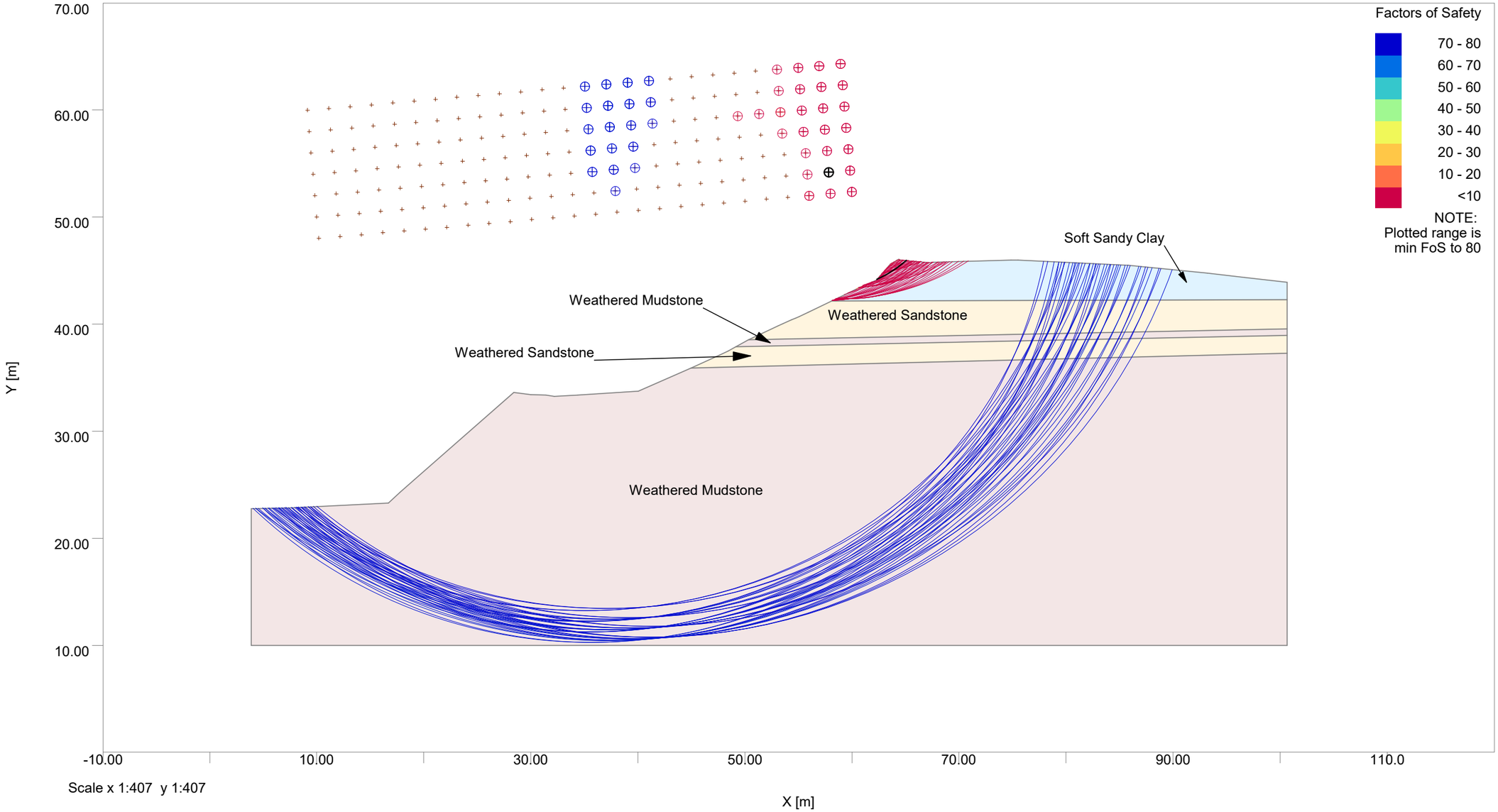
Slice No.	Surface Load [kN/m_hor/m]		Point Load [kN/m]		Water Pressure on ground surface [kN/m_hor/m]	
	Vert	Horiz	Vert	Horiz	Vert	Horiz
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	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

Oasys

Peace Wood Quarry, Huddersfield
Section 4

Job No.	Sheet No.	Rev.
16-571		
Drg. Ref.		
Made by CB	Date	Checked / Date

More than one slip surface shown, minimum factor of 0.987



Specification

Slip Type: CIRCULAR
Direction of slip: Downhill
Minimum slip weight [kN/m] :0.00000
Type of analysis: STATIC
Partial factor analysis
Minimum number of slices 25
Method: Bishop(Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NONE

Material Properties

No	Description	Unit Weight Above GWL [kN/m3]	Unit Weight Below GWL [kN/m3]	Shear Strength Parameters Condition	Phi or Phi0 [°]	c or c0' [kN/m²]
1	Soft Sandy Clay	19.000	19.000	Drained	26.000	2.0000
2	Weathered Sandstone	33.000	33.000	Drained	45.000	10000.
3	Weathered Mudstone	33.000	33.000	Drained	45.000	10000.

Slip Surface Specification

Circle centre specification:
Bottom left of grid: x = 10.00000 m y = 50.00000 m
Inclination of grid: 5.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 25 in x direction at 2.00000m spacing
                  6 in y direction at 2.00000m 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 (57.817m,54.183m) Radius 11.000m
Iterations: 5 Horiz acceleration [%g]: 0.0
Net vertical force [kN/m]: 0.0052011 *Slip weight [kN/m] 25.757*
Net horiz force [kN/m]: 0.0080658 Disturbing moment [kN/m]: 153.63
Restoring moment [kNm/m]: 151.59
Reinf.Rest.Moment [kNm/m]: 0.0
Over-Design Factor: 0.98670

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 Point	x [m]	y [m]	Pore Pressure L [kN/m²]	R [kN/m²]	Interslice forces [kN/m] T	E	E(u)
1	62.326	44.150	-	0.0	0.0	0.0	0.0
2	62.435	44.199	0.0	0.0	0.081906	0.17189	0.0
3	62.543	44.251	0.0	0.0	0.16256	0.33080	0.0
4	62.648	44.301	0.0	0.0	0.23606	0.47660	0.0
5	62.754	44.353	0.0	0.0	0.30441	0.60607	0.0
6	62.859	44.407	0.0	0.0	0.36536	0.71602	0.0
7	62.965	44.462	0.0	0.0	0.41840	0.80869	0.0
8	63.070	44.519	0.0	0.0	0.46013	0.87692	0.0
9	63.175	44.577	0.0	0.0	0.49137	0.92480	0.0
10	63.281	44.636	0.0	0.0	0.51100	0.95101	0.0
11	63.386	44.697	0.0	0.0	0.51371	0.94689	0.0
12	63.492	44.760	0.0	0.0	0.49736	0.91079	0.0
13	63.597	44.825	0.0	0.0	0.46000	0.84154	0.0
14	63.689	44.882	0.0	0.0	0.42197	0.77240	0.0
15	63.782	44.941	0.0	0.0	0.37199	0.68672	0.0
16	63.874	45.001	0.0	0.0	0.31642	0.59378	0.0
17	63.966	45.063	0.0	0.0	0.24935	0.48657	0.0
18	64.067	45.131	0.0	0.0	0.17717	0.37122	0.0
19	64.168	45.202	0.0	0.0	0.090427	0.23978	0.0
20	64.269	45.274	0.0	0.0	0.0021351	0.10792	0.0
21	64.370	45.348	0.0	0.0	-0.092809	-0.029607	0.0

Slip surface coordinates		Pore Pressure		Interslice forces [kN/m]		
Point	x [m]	y [m]	L [kN/m²]	R [kN/m²]	T	E	E(u)
22	64.430	45.393	0.0	0.0	-0.14662	-0.10604	0.0
23	64.490	45.439	0.0	0.0	-0.19109	-0.16870	0.0
24	64.593	45.518	0.0	0.0	-0.24029	-0.24059	0.0
25	64.695	45.599	0.0	0.0	-0.26367	-0.27812	0.0
26	64.798	45.682	0.0	0.0	-0.25676	-0.27740	0.0
27	64.901	45.768	0.0	0.0	-0.21542	-0.23579	0.0
28	65.003	45.855	0.0	0.0	-0.13319	-0.14646	0.0
29	65.106	45.945	0.0	-	-0.0052011	-0.0080658	0.0

Slice No.	Strength Parameters		Average Pore Pressure	Slice Weight	Forces on base [kN/m]		
	c' [kN/m²]	Tan phi	[kN/m²]	[kN/m]	Normal	Shear (capacity)	Shear (mobilised)
1	1.6000	0.39019	0.0	0.082460	0.079049	0.22133	0.22431
2	1.6000	0.39019	0.0	0.24532	0.22528	0.28041	0.28419
3	1.6000	0.39019	0.0	0.38550	0.35221	0.32408	0.32845
4	1.6000	0.39019	0.0	0.52168	0.47185	0.37216	0.37717
5	1.6000	0.39019	0.0	0.65385	0.58603	0.41815	0.42378
6	1.6000	0.39019	0.0	0.78302	0.69834	0.46270	0.46894
7	1.6000	0.39019	0.0	0.90818	0.80309	0.50508	0.51188
8	1.6000	0.39019	0.0	1.0303	0.90698	0.54638	0.55374
9	1.6000	0.39019	0.0	1.1515	1.0091	0.58701	0.59491
10	1.6000	0.39019	0.0	1.2696	1.1033	0.62534	0.63376
11	1.6000	0.39019	0.0	1.3838	1.1923	0.66168	0.67059
12	1.6000	0.39019	0.0	1.4929	1.2753	0.69573	0.70510
13	1.6000	0.39019	0.0	1.3540	1.1558	0.62450	0.63291
14	1.6000	0.39019	0.0	1.3531	1.1440	0.62157	0.62995
15	1.6000	0.39019	0.0	1.3487	1.1347	0.61883	0.62716
16	1.6000	0.39019	0.0	1.3426	1.1185	0.61425	0.62253
17	1.6000	0.39019	0.0	1.4546	1.2112	0.66739	0.67638
18	1.6000	0.39019	0.0	1.4287	1.1734	0.65539	0.66422
19	1.6000	0.39019	0.0	1.3990	1.1438	0.64475	0.65343
20	1.6000	0.39019	0.0	1.3673	1.1076	0.63251	0.64104
21	1.6000	0.39019	0.0	0.76209	0.61248	0.35898	0.36382
22	1.6000	0.39019	0.0	0.68058	0.54294	0.33282	0.33730
23	1.6000	0.39019	0.0	1.0085	0.80411	0.52102	0.52804
24	1.6000	0.39019	0.0	0.83489	0.66034	0.46689	0.47318
25	1.6000	0.39019	0.0	0.65737	0.51613	0.41262	0.41818
26	1.6000	0.39019	0.0	0.47401	0.36834	0.35800	0.36283
27	1.6000	0.39019	0.0	0.28675	0.22375	0.30262	0.30669
28	1.6000	0.39019	0.0	0.096558	0.077627	0.24874	0.25209

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	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

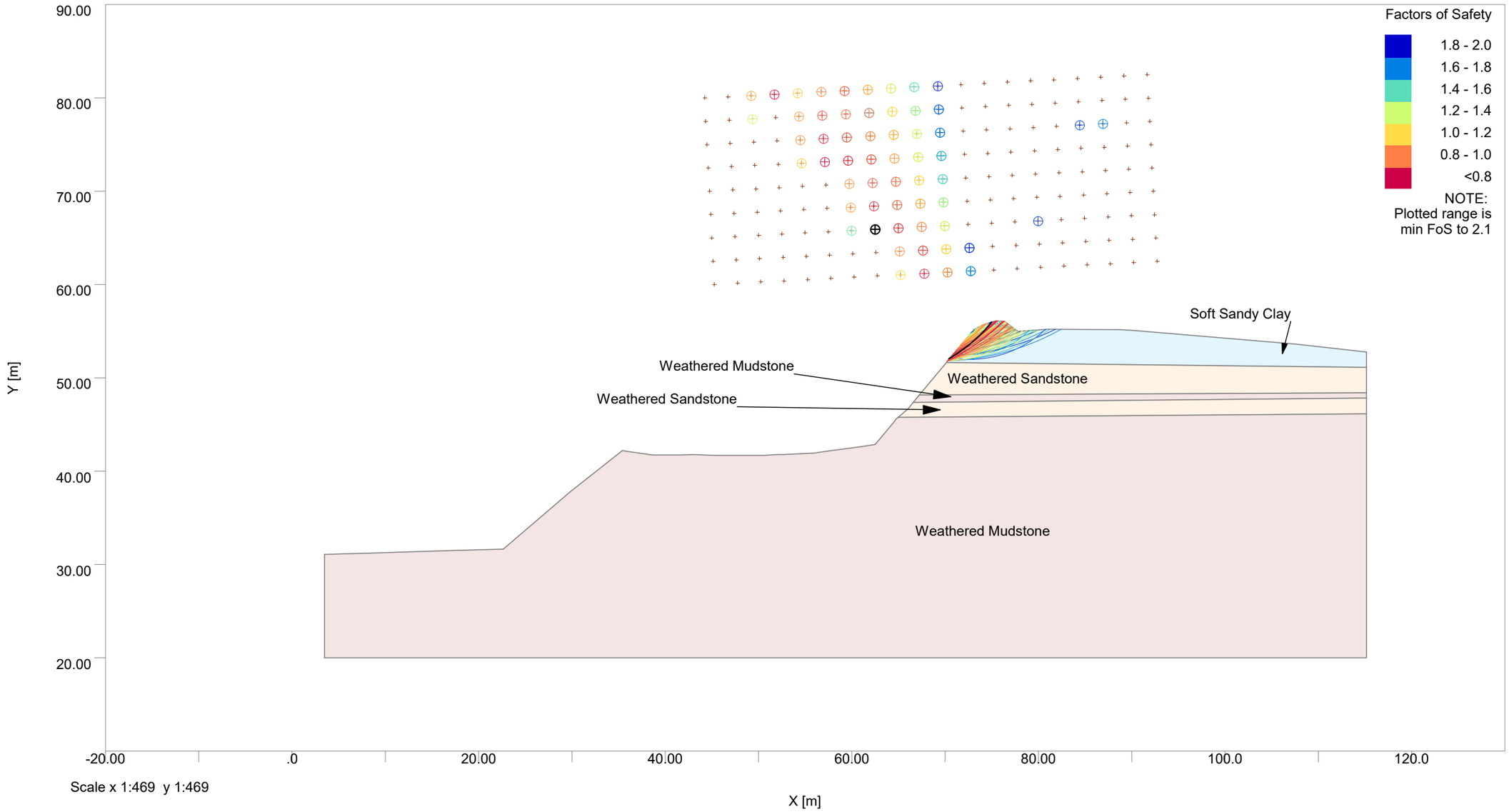
Slice No.	Surface Load [kN/m_hor/m] Vert	Surface Load [kN/m_hor/m] Horiz	Point Load [kN/m] Vert	Point Load [kN/m] Horiz	Water Pressure on ground surface [kN/m_hor/m] Vert	Water Pressure on ground surface [kN/m_hor/m] Horiz
28	*0.0*	*0.0*	0.0	0.0	0.0	0.0

Oasys

Peace Wood Quarry, Huddersfield
Section 5

Job No.	Sheet No.	Rev.
16-571		
Drg. Ref.		
Made by CB	Date	Checked / Date

More than one slip surface shown, minimum factor of 0.701



Scale x 1:469 y 1:469

Specification

Slip Type: CIRCULAR
Direction of slip: Downhill
Minimum slip weight [kN/m] :0.00000
Type of analysis: STATIC
Partial factor analysis
Minimum number of slices 25
Method: Bishop(Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NONE

Material Properties

No	Description	Unit Weight Above GWL [kN/m3]	Unit Weight Below GWL [kN/m3]	Shear Strength Parameters Condition	Phi or Phi0 [°]	c or c0' [kN/m²]
1	Soft Sandy Clay	19.000	19.000	Drained	26.000	2.0000
2	Weathered Sandstone	33.000	33.000	Drained	45.000	10000.
3	Weathered Mudstone	33.000	33.000	Drained	45.000	10000.

Slip Surface Specification

Circle centre specification:
Bottom left of grid: x = 45.00000 m y = 65.00000 m
Inclination of grid: 3.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 20 in x direction at 2.50000m spacing
                  7 in y direction at 2.50000m 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 (62.476m,65.916m)
Iterations: 5
Net vertical force [kN/m]: 0.024012
Net horiz force [kN/m]: 0.028041

Radius 16.000m
Horiz acceleration [%g]: 0.0
Slip weight [kN/m] 61.798
Disturbing moment [kN/m]: 642.31
Restoring moment [kNm/m]: 450.38
Reinf.Rest.Moment [kNm/m]: 0.0
Over-Design Factor: 0.70119

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 Point	x [m]	y [m]	Pore Pressure L [kN/m²]	Pore Pressure R [kN/m²]	Interslice forces [kN/m] T	E	E(u)
1	70.419	52.026	-	0.0	0.0	0.0	0.0
2	70.523	52.087	0.0	0.0	0.14888	0.23561	0.0
3	70.627	52.148	0.0	0.0	0.29607	0.46833	0.0
4	70.807	52.256	0.0	0.0	0.54923	0.85935	0.0
5	70.987	52.368	0.0	0.0	0.79549	1.2244	0.0
6	71.168	52.483	0.0	0.0	1.0290	1.5593	0.0
7	71.348	52.601	0.0	0.0	1.2447	1.8580	0.0
8	71.528	52.723	0.0	0.0	1.4351	2.1085	0.0
9	71.708	52.848	0.0	0.0	1.5974	2.3122	0.0
10	71.889	52.977	0.0	0.0	1.7229	2.4573	0.0
11	72.069	53.110	0.0	0.0	1.8059	2.5398	0.0
12	72.249	53.247	0.0	0.0	1.8413	2.5566	0.0
13	72.407	53.371	0.0	0.0	1.8213	2.5055	0.0
14	72.564	53.497	0.0	0.0	1.7622	2.4059	0.0
15	72.722	53.627	0.0	0.0	1.6452	2.2387	0.0
16	72.879	53.760	0.0	0.0	1.4757	2.0126	0.0
17	73.037	53.896	0.0	0.0	1.2510	1.7272	0.0
18	73.068	53.924	0.0	0.0	1.1920	1.6570	0.0
19	73.112	53.963	0.0	0.0	1.1178	1.5664	0.0
20	73.267	54.103	0.0	0.0	0.85346	1.2488	0.0
21	73.423	54.247	0.0	0.0	0.58137	0.93114	0.0

Slip surface coordinates		Pore Pressure		Interslice forces [kN/m]		
Point	x [m]	y [m]	L [kN/m²]	R [kN/m²]	T	E	E(u)
22	73.578	54.394	0.0	0.0	0.31606	0.62684	0.0
23	73.733	54.546	0.0	0.0	0.048503	0.32976	0.0
24	73.889	54.702	0.0	0.0	-0.20506	0.053841	0.0
25	74.044	54.862	0.0	0.0	-0.43606	-0.19366	0.0
26	74.205	55.033	0.0	0.0	-0.62941	-0.39927	0.0
27	74.366	55.209	0.0	0.0	-0.74137	-0.52509	0.0
28	74.526	55.390	0.0	0.0	-0.75545	-0.56084	0.0
29	74.687	55.577	0.0	0.0	-0.65488	-0.49729	0.0
30	74.848	55.770	0.0	0.0	-0.41884	-0.32324	0.0
31	75.009	55.970	0.0	-	-0.024012	-0.028041	0.0

Slice No.	Strength Parameters		Average Pore Pressure	Slice Weight	Forces on base [kN/m]		
	c' [kN/m²]	Tan phi	[kN/m²]	[kN/m]	Normal	Shear (capacity)	Shear (mobilised)
1	1.6000	0.39019	0.0	0.065208	0.065465	0.21845	0.31155
2	1.6000	0.39019	0.0	0.19464	0.17711	0.26202	0.37367
3	1.6000	0.39019	0.0	0.62321	0.55073	0.55106	0.78589
4	1.6000	0.39019	0.0	0.96563	0.83663	0.66594	0.94973
5	1.6000	0.39019	0.0	1.2961	1.1093	0.77488	1.1051
6	1.6000	0.39019	0.0	1.6162	1.3691	0.87886	1.2534
7	1.6000	0.39019	0.0	1.9244	1.6108	0.97671	1.3929
8	1.6000	0.39019	0.0	2.2206	1.8420	1.0697	1.5255
9	1.6000	0.39019	0.0	2.5048	2.0544	1.1562	1.6489
10	1.6000	0.39019	0.0	2.7753	2.2509	1.2366	1.7636
11	1.6000	0.39019	0.0	3.0321	2.4319	1.3111	1.8698
12	1.6000	0.39019	0.0	2.8671	2.2692	1.2063	1.7203
13	1.6000	0.39019	0.0	3.0767	2.4191	1.2668	1.8066
14	1.6000	0.39019	0.0	3.2774	2.5444	1.3197	1.8820
15	1.6000	0.39019	0.0	3.4675	2.6662	1.3703	1.9542
16	1.6000	0.39019	0.0	3.6502	2.7798	1.4177	2.0219
17	1.6000	0.39019	0.0	0.73360	0.54766	0.28053	0.40007
18	1.6000	0.39019	0.0	1.0274	0.77348	0.39588	0.56458
19	1.6000	0.39019	0.0	3.5106	2.6240	1.3584	1.9373
20	1.6000	0.39019	0.0	3.3498	2.4730	1.3038	1.8594
21	1.6000	0.39019	0.0	3.1801	2.3262	1.2498	1.7824
22	1.6000	0.39019	0.0	2.9986	2.1597	1.1904	1.6977
23	1.6000	0.39019	0.0	2.8038	1.9949	1.1306	1.6124
24	1.6000	0.39019	0.0	2.5957	1.8247	1.0688	1.5242
25	1.6000	0.39019	0.0	2.3820	1.6493	1.0191	1.4534
26	1.6000	0.39019	0.0	1.9878	1.3583	0.91146	1.2999
27	1.6000	0.39019	0.0	1.5783	1.0658	0.80326	1.1456
28	1.6000	0.39019	0.0	1.1505	0.76762	0.69415	0.98997
29	1.6000	0.39019	0.0	0.70437	0.46832	0.58470	0.83387
30	1.6000	0.39019	0.0	0.23836	0.16676	0.47570	0.67842

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	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

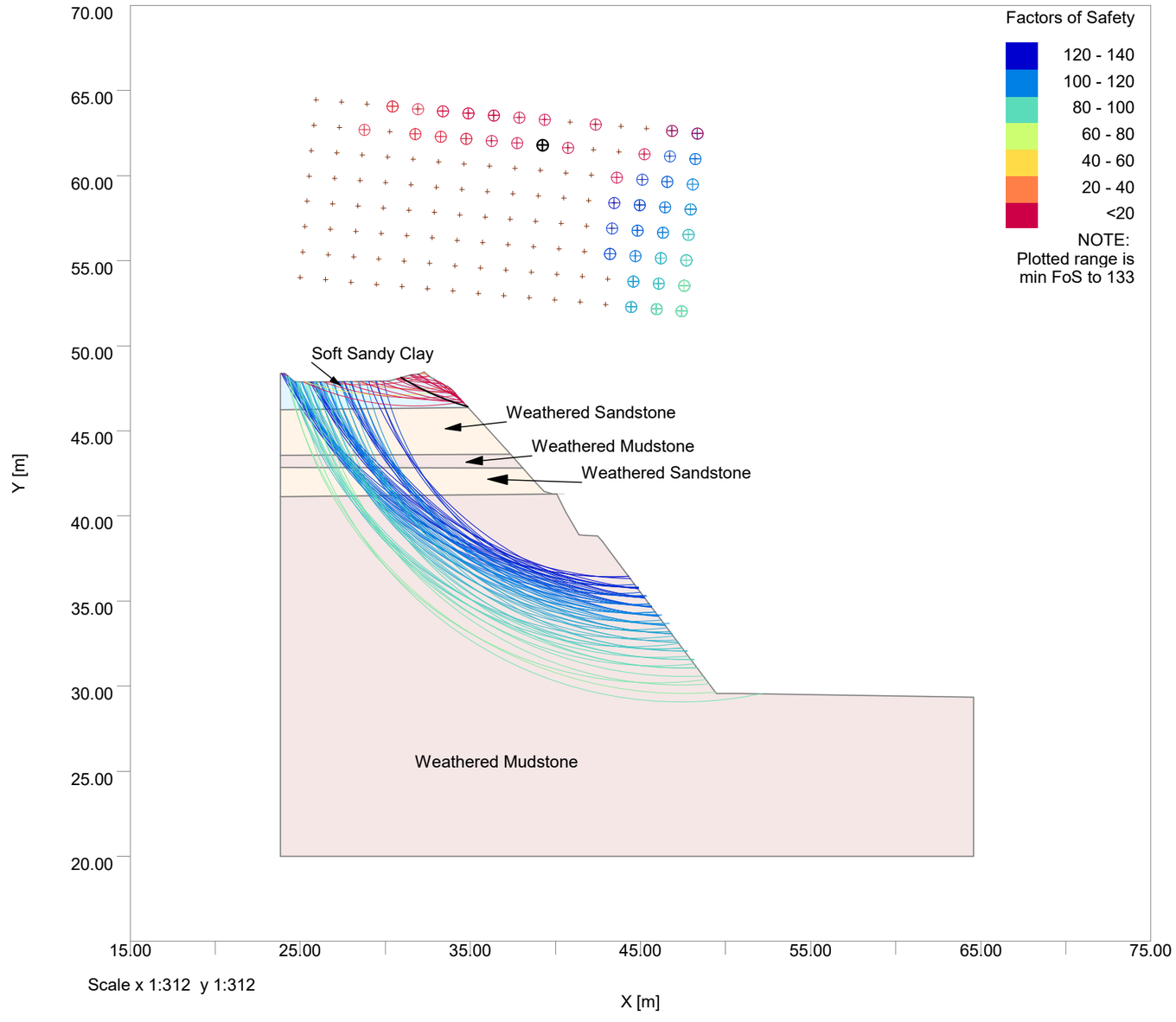
Slice No.	Surface Load [kN/m_hor/m] Vert	Surface Load [kN/m_hor/m] Horiz	Point Load [kN/m] Vert	Point Load [kN/m] Horiz	Water Pressure on ground surface [kN/m_hor/m] Vert	Water Pressure on ground surface [kN/m_hor/m] Horiz
24	*0.0*	*0.0*	0.0	0.0	0.0	0.0
25	*0.0*	*0.0*	0.0	0.0	0.0	0.0
26	*0.0*	*0.0*	0.0	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

Oasys

Peace Wood Quarry, Huddersfield
Section 6

Job No.	Sheet No.	Rev.
16-571		
Drg. Ref.		
Made by CB	Date	Checked / Date

More than one slip surface shown, minimum factor of 1.251



Specification

Slip Type: CIRCULAR
Direction of slip: Downhill
Minimum slip weight [kN/m] :0.00000
Type of analysis: STATIC
Partial factor analysis
Minimum number of slices 25
Method: Bishop(Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NONE

Material Properties

No	Description	Unit Weight Above GWL [kN/m3]	Unit Weight Below GWL [kN/m3]	Shear Strength Parameters Condition	Phi or Phi0 [°]	c or c0' [kN/m²]
1	Soft Sandy Clay	19.000	19.000	Drained	26.000	2.0000
2	Weathered Sandstone	33.000	33.000	Drained	45.000	10000.
3	Weathered Mudstone	33.000	33.000	Drained	45.000	10000.

Slip Surface Specification

Circle centre specification:
Bottom left of grid: x = 25.00000 m y = 54.00000 m
Inclination of grid: -5.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 16 in x direction at 1.50000m spacing
                  6 in y direction at 1.50000m 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 (39.233m,61.789m) Radius 16.000m
Iterations: 5 Horiz acceleration [%g]: 0.0
Net vertical force [kN/m]: 0.0035414 *Slip weight [kN/m] 48.669*
Net horiz force [kN/m]: 0.0080930 Disturbing moment [kN/m]: 310.87
Restoring moment [kNm/m]: 388.95
Reinf.Rest.Moment [kNm/m]: 0.0
Over-Design Factor: 1.2511

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 Point	x [m]	y [m]	Pore Pressure L [kN/m²]	R [kN/m²]	Interslice forces [kN/m] T	E	E(u)
1	30.915	48.122	-	0.0	0.0	0.0	0.0
2	31.069	48.029	0.0	0.0	-0.10175	-0.15187	0.0
3	31.222	47.939	0.0	0.0	-0.15500	-0.22650	0.0
4	31.375	47.851	0.0	0.0	-0.16659	-0.23045	0.0
5	31.529	47.766	0.0	0.0	-0.14576	-0.17644	0.0
6	31.665	47.692	0.0	0.0	-0.10394	-0.085003	0.0
7	31.801	47.620	0.0	0.0	-0.049548	0.032409	0.0
8	31.937	47.549	0.0	0.0	0.019536	0.17944	0.0
9	31.949	47.543	0.0	0.0	0.024984	0.19165	0.0
10	31.972	47.532	0.0	0.0	0.032783	0.21048	0.0
11	32.080	47.477	0.0	0.0	0.099016	0.35183	0.0
12	32.187	47.424	0.0	0.0	0.16441	0.49643	0.0
13	32.295	47.372	0.0	0.0	0.23399	0.65231	0.0
14	32.408	47.318	0.0	0.0	0.30553	0.81443	0.0
15	32.521	47.265	0.0	0.0	0.36400	0.95155	0.0
16	32.634	47.213	0.0	0.0	0.41004	1.0641	0.0
17	32.784	47.146	0.0	0.0	0.45250	1.1759	0.0
18	32.934	47.081	0.0	0.0	0.47978	1.2557	0.0
19	33.084	47.018	0.0	0.0	0.49258	1.3030	0.0
20	33.235	46.956	0.0	0.0	0.49746	1.3317	0.0
21	33.385	46.896	0.0	0.0	0.48938	1.3284	0.0

Slip surface coordinates		Pore Pressure		Interslice forces [kN/m]		
Point	x [m]	y [m]	L [kN/m²]	R [kN/m²]	T	E	E(u)
22	33.535	46.838	0.0	0.0	0.46937	1.2936	0.0
23	33.685	46.782	0.0	0.0	0.43853	1.2280	0.0
24	33.835	46.727	0.0	0.0	0.40200	1.1454	0.0
25	33.978	46.677	0.0	0.0	0.35592	1.0301	0.0
26	34.121	46.628	0.0	0.0	0.30378	0.89446	0.0
27	34.264	46.580	0.0	0.0	0.24703	0.74197	0.0
28	34.406	46.535	0.0	0.0	0.18526	0.56239	0.0
29	34.549	46.490	0.0	0.0	0.12322	0.38194	0.0
30	34.692	46.447	0.0	0.0	0.061815	0.19451	0.0
31	34.835	46.406	0.0	-	0.0035414	0.0080930	0.0

Slice No.	Strength Parameters		Average Pore Pressure	Slice Weight	Forces on base [kN/m]		
	c' [kN/m²]	Tan phi	[kN/m²]	[kN/m]	Normal	Shear (capacity)	Shear (mobilised)
1	1.6000	0.39019	0.0	0.19686	0.17670	0.35610	0.28462
2	1.6000	0.39019	0.0	0.58622	0.51389	0.48522	0.38782
3	1.6000	0.39019	0.0	0.96828	0.84812	0.61402	0.49077
4	1.6000	0.39019	0.0	1.3430	1.1829	0.74228	0.59328
5	1.6000	0.39019	0.0	1.4729	1.3007	0.75525	0.60365
6	1.6000	0.39019	0.0	1.7067	1.5153	0.83744	0.66934
7	1.6000	0.39019	0.0	1.9354	1.7225	0.91756	0.73338
8	1.6000	0.39019	0.0	0.18240	0.16373	0.085351	0.068218
9	1.6000	0.39019	0.0	0.35506	0.32140	0.16620	0.13284
10	1.6000	0.39019	0.0	1.7623	1.5747	0.80788	0.64572
11	1.6000	0.39019	0.0	1.9383	1.7442	0.87257	0.69741
12	1.6000	0.39019	0.0	2.1101	1.9052	0.93470	0.74708
13	1.6000	0.39019	0.0	2.2629	2.0471	0.99915	0.79859
14	1.6000	0.39019	0.0	2.1803	1.9792	0.97197	0.77686
15	1.6000	0.39019	0.0	2.0944	1.9078	0.94344	0.75406
16	1.6000	0.39019	0.0	2.7026	2.4748	1.2287	0.98203
17	1.6000	0.39019	0.0	2.6570	2.4449	1.2157	0.97168
18	1.6000	0.39019	0.0	2.6042	2.4079	1.2000	0.95913
19	1.6000	0.39019	0.0	2.5472	2.3607	1.1810	0.94394
20	1.6000	0.39019	0.0	2.4858	2.3146	1.1618	0.92859
21	1.6000	0.39019	0.0	2.4188	2.2624	1.1403	0.91138
22	1.6000	0.39019	0.0	2.3475	2.2054	1.1169	0.89270
23	1.6000	0.39019	0.0	2.2705	2.1378	1.0900	0.87117
24	1.6000	0.39019	0.0	1.9774	1.8717	0.97250	0.77729
25	1.6000	0.39019	0.0	1.6842	1.5984	0.86533	0.69163
26	1.6000	0.39019	0.0	1.3870	1.3200	0.75617	0.60439
27	1.6000	0.39019	0.0	1.0844	1.0392	0.64513	0.51563
28	1.6000	0.39019	0.0	0.77900	0.74797	0.53149	0.42480
29	1.6000	0.39019	0.0	0.47093	0.45572	0.41652	0.33291
30	1.6000	0.39019	0.0	0.15743	0.15591	0.29863	0.23869

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	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

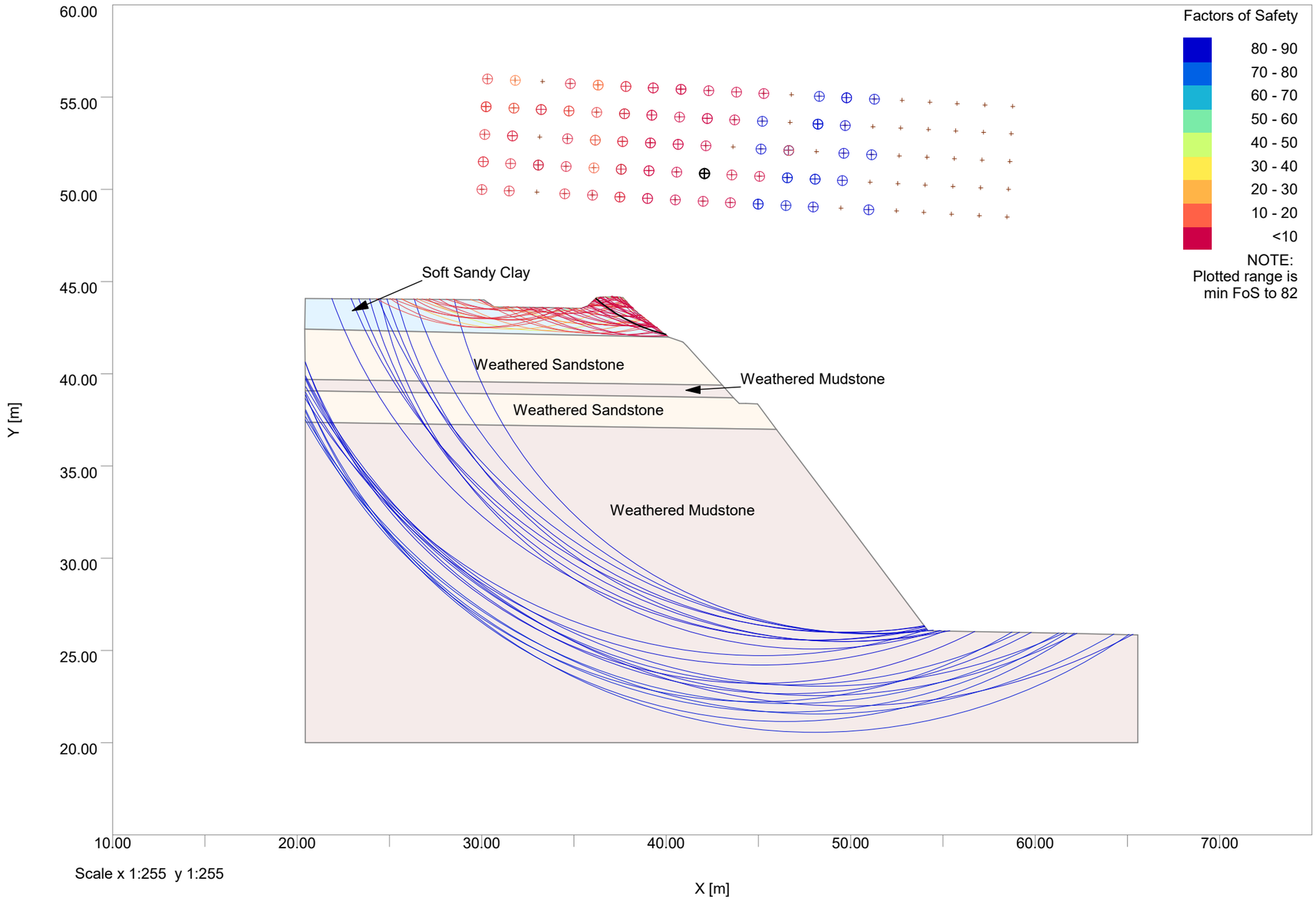
Slice No.	Surface Load [kN/m_hor/m] Vert	Surface Load [kN/m_hor/m] Horiz	Point Load [kN/m] Vert	Point Load [kN/m] Horiz	Water Pressure on ground surface [kN/m_hor/m] Vert	Water Pressure on ground surface [kN/m_hor/m] Horiz
24	*0.0*	*0.0*	0.0	0.0	0.0	0.0
25	*0.0*	*0.0*	0.0	0.0	0.0	0.0
26	*0.0*	*0.0*	0.0	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

Oasys

Peace Wood Quarry, Huddersfield
Section 7

Job No.	Sheet No.	Rev.
16-571		
Drg. Ref.		
Made by CB	Date	Checked / Date

More than one slip surface shown, minimum factor of 1.095



Specification

Slip Type: CIRCULAR
Direction of slip: Downhill
Minimum slip weight [kN/m] :0.00000
Type of analysis: STATIC
Partial factor analysis
Minimum number of slices 25
Method: Bishop(Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NONE

Material Properties

No	Description	Unit Weight Above GWL [kN/m3]	Unit Weight Below GWL [kN/m3]	Shear Strength Parameters Condition	Phi or Phi0 [°]	c or c0' [kN/m²]
1	Soft Sandy Clay	19.000	19.000	Drained	26.000	2.0000
2	Weathered Sandstone	33.000	33.000	Drained	45.000	10000.
3	Weathered Mudstone	33.000	33.000	Drained	45.000	10000.

Slip Surface Specification

Circle centre specification:
Bottom left of grid: x = 30.00000 m y = 50.00000 m
Inclination of grid: -3.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 20 in x direction at 1.50000m spacing
                  5 in y direction at 1.50000m 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 (42.062m,50.870m) Radius 9.0000m
Iterations: 5 Horiz acceleration [%g]: 0.0
Net vertical force [kN/m]: 0.016337 *Slip weight [kN/m] 43.099*
Net horiz force [kN/m]: 0.031927 Disturbing moment [kN/m]: 180.20
Restoring moment [kNm/m]: 197.31
Reinf.Rest.Moment [kNm/m]: 0.0
Over-Design Factor: 1.0950

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 Point	x [m]	y [m]	Pore Pressure L [kN/m²]	R [kN/m²]	Interslice forces [kN/m] T	E	E(u)
1	36.170	44.067	-	0.0	0.0	0.0	0.0
2	36.235	44.011	0.0	0.0	-0.076230	-0.069455	0.0
3	36.246	44.002	0.0	0.0	-0.085686	-0.077731	0.0
4	36.261	43.989	0.0	0.0	-0.097802	-0.087330	0.0
5	36.290	43.965	0.0	0.0	-0.11839	-0.10359	0.0
6	36.370	43.898	0.0	0.0	-0.15669	-0.12575	0.0
7	36.451	43.833	0.0	0.0	-0.17091	-0.11924	0.0
8	36.584	43.729	0.0	0.0	-0.15183	-0.054754	0.0
9	36.716	43.630	0.0	0.0	-0.096308	0.060444	0.0
10	36.849	43.533	0.0	0.0	-0.0027428	0.22947	0.0
11	36.971	43.449	0.0	0.0	0.097693	0.41296	0.0
12	37.092	43.367	0.0	0.0	0.22205	0.63572	0.0
13	37.233	43.275	0.0	0.0	0.37808	0.91992	0.0
14	37.374	43.187	0.0	0.0	0.52848	1.2065	0.0
15	37.515	43.103	0.0	0.0	0.66683	1.4848	0.0
16	37.656	43.022	0.0	0.0	0.79676	1.7575	0.0
17	37.773	42.958	0.0	0.0	0.87775	1.9441	0.0
18	37.889	42.896	0.0	0.0	0.93179	2.0849	0.0
19	38.006	42.836	0.0	0.0	0.96132	2.1818	0.0
20	38.123	42.778	0.0	0.0	0.96892	2.2367	0.0
21	38.240	42.722	0.0	0.0	0.95622	2.2501	0.0

Slip surface coordinates		Pore Pressure		Interslice forces [kN/m]		
Point	x [m]	y [m]	L [kN/m²]	R [kN/m²]	T	E	E(u)
22	38.358	42.668	0.0	0.0	0.92792	2.2290	0.0
23	38.475	42.616	0.0	0.0	0.88626	2.1755	0.0
24	38.598	42.563	0.0	0.0	0.83242	2.0929	0.0
25	38.722	42.513	0.0	0.0	0.76696	1.9744	0.0
26	38.846	42.464	0.0	0.0	0.69727	1.8421	0.0
27	38.969	42.418	0.0	0.0	0.62048	1.6795	0.0
28	39.113	42.367	0.0	0.0	0.52666	1.4653	0.0
29	39.258	42.318	0.0	0.0	0.43179	1.2374	0.0
30	39.402	42.272	0.0	0.0	0.33779	0.99428	0.0
31	39.546	42.229	0.0	0.0	0.24744	0.74312	0.0
32	39.690	42.188	0.0	0.0	0.16226	0.49550	0.0
33	39.835	42.150	0.0	0.0	0.085138	0.25511	0.0
34	39.979	42.114	0.0	-	0.016337	0.031927	0.0

Slice No.	Strength Parameters		Average Pore Pressure	Slice Weight	Forces on base [kN/m]		
	c' [kN/m²]	Tan phi	[kN/m²]	[kN/m]	Normal	Shear (capacity)	Shear (mobilised)
1	1.6000	0.39019	0.0	0.071630	0.066687	0.16329	0.14913
2	1.6000	0.39019	0.0	0.025498	0.021812	0.031251	0.028540
3	1.6000	0.39019	0.0	0.038475	0.031944	0.044223	0.040387
4	1.6000	0.39019	0.0	0.086231	0.071924	0.088293	0.080634
5	1.6000	0.39019	0.0	0.31967	0.26096	0.26940	0.24603
6	1.6000	0.39019	0.0	0.43514	0.35371	0.30356	0.27722
7	1.6000	0.39019	0.0	0.94399	0.76769	0.56926	0.51988
8	1.6000	0.39019	0.0	1.2036	0.98903	0.65076	0.59431
9	1.6000	0.39019	0.0	1.4557	1.1993	0.73091	0.66751
10	1.6000	0.39019	0.0	1.5663	1.3101	0.74753	0.68268
11	1.6000	0.39019	0.0	1.8029	1.5160	0.82604	0.75438
12	1.6000	0.39019	0.0	2.3307	1.9766	1.0406	0.95035
13	1.6000	0.39019	0.0	2.5276	2.1684	1.1120	1.0156
14	1.6000	0.39019	0.0	2.7138	2.3550	1.1815	1.0790
15	1.6000	0.39019	0.0	2.8920	2.5308	1.2477	1.1394
16	1.6000	0.39019	0.0	2.4001	2.1233	1.0415	0.95118
17	1.6000	0.39019	0.0	2.2648	2.0186	0.99914	0.91247
18	1.6000	0.39019	0.0	2.1251	1.9081	0.95453	0.87173
19	1.6000	0.39019	0.0	1.9820	1.7927	0.90805	0.82928
20	1.6000	0.39019	0.0	1.8581	1.6942	0.86907	0.79369
21	1.6000	0.39019	0.0	1.7344	1.5924	0.82800	0.75618
22	1.6000	0.39019	0.0	1.6073	1.4859	0.78513	0.71703
23	1.6000	0.39019	0.0	1.5733	1.4627	0.78576	0.71760
24	1.6000	0.39019	0.0	1.4689	1.3778	0.75076	0.68564
25	1.6000	0.39019	0.0	1.3610	1.2810	0.71242	0.65062
26	1.6000	0.39019	0.0	1.2483	1.1851	0.67325	0.61485
27	1.6000	0.39019	0.0	1.3008	1.2435	0.73006	0.66673
28	1.6000	0.39019	0.0	1.1199	1.0769	0.66401	0.60641
29	1.6000	0.39019	0.0	0.93209	0.90376	0.59494	0.54333
30	1.6000	0.39019	0.0	0.73744	0.72158	0.52244	0.47712
31	1.6000	0.39019	0.0	0.53595	0.52980	0.44672	0.40797
32	1.6000	0.39019	0.0	0.32623	0.32882	0.36703	0.33519
33	1.6000	0.39019	0.0	0.10966	0.11912	0.28441	0.25974

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	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

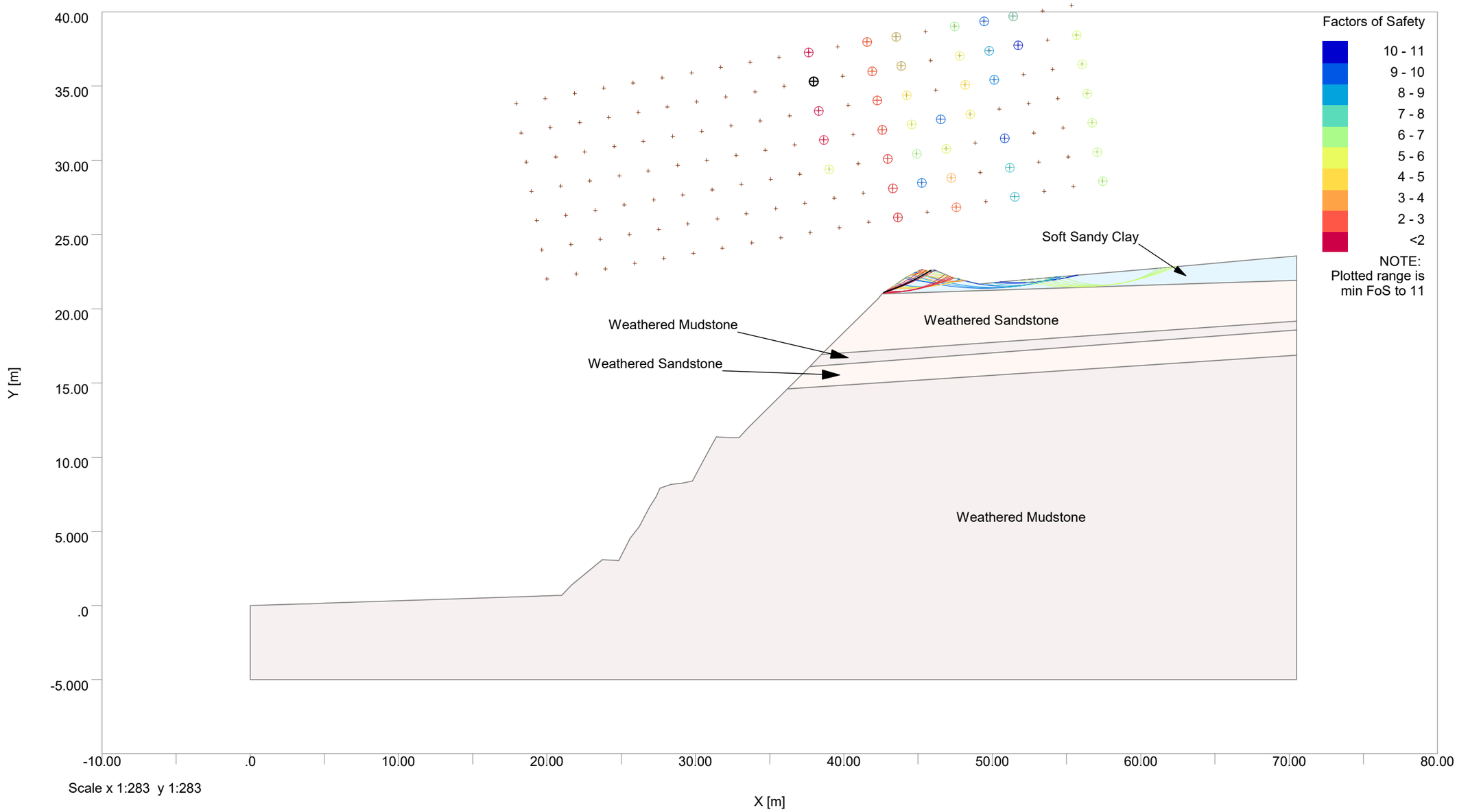
Slice No.	Surface Load [kN/m_hor/m]		Point Load [kN/m]		Water Pressure on ground surface [kN/m_hor/m]	
	Vert	Horiz	Vert	Horiz	Vert	Horiz
18	*0.0*	*0.0*	0.0	0.0	0.0	0.0
19	*0.0*	*0.0*	0.0	0.0	0.0	0.0
20	*0.0*	*0.0*	0.0	0.0	0.0	0.0
21	*0.0*	*0.0*	0.0	0.0	0.0	0.0
22	*0.0*	*0.0*	0.0	0.0	0.0	0.0
23	*0.0*	*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

Oasys

Peace Wood Quarry
Section 8

Job No.	Sheet No.	Rev.
16-571		
Drg. Ref.		
Made by CB	Date	Checked / Date

More than one slip surface shown, minimum factor of 1.530



Scale x 1:283 y 1:283

Specification

Slip Type: CIRCULAR
Direction of slip: Downhill
Minimum slip weight [kN/m] :0.00000
Type of analysis: STATIC
Partial factor analysis
Minimum number of slices 25
Method: Bishop(Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NONE

Method Partial Factors

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 UNIT WEIGHT: 1.00000
Factor on DRAINED COHESION: 1.25000
Factor on UNDRAINED COHESION: 1.40000
Factor on TAN PHI': 1.25000
Factor on REINFORCEMENT PULLOUT: 1.50000
Factor on ECONOMIC FAILURE: 1.00000
Factor on SLIDING ALONG REINFORCEMENT: 1.50000

Material Properties

No	Description	Unit Weight Above GWL [kN/m3]	Unit Weight Below GWL [kN/m3]	Shear Strength Parameters Condition	Phi or Phi0 [°]	c or c0' [kN/m²]
1	Soft Sandy Clay	19.000	19.000	Drained	26.000	2.0000
2	Weathered Sandstone	33.000	33.000	Drained	45.000	10000.
3	Weathered Mudstone	33.000	33.000	Drained	45.000	10000.

Slip Surface Specification

Circle centre specification:
Bottom left of grid: x = 20.00000 m y = 22.00000 m
Inclination of grid: 10.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 20 in x direction at 2.00000m spacing
                  7 in y direction at 2.00000m 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 (37.960m,35.321m) Radius 15.000m
Iterations: 5 Horiz acceleration [%g]: 0.0
Net vertical force [kN/m]: 0.0016188 *Slip weight [kN/m] 18.241*
Net horiz force [kN/m]: 0.0034511 Disturbing moment [kN/m]: 118.24
Restoring moment [kNm/m]: 180.96
Reinf.Rest.Moment [kNm/m]: 0.0
Over-Design Factor: 1.5305

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 Point	x [m]	y [m]	Pore Pressure L [kN/m²]	Pore Pressure R [kN/m²]	Interslice forces [kN/m] T	E	E(u)
1	42.703	21.091	-	0.0	0.0	0.0	0.0
2	42.827	21.133	0.0	0.0	0.045201	0.12534	0.0
3	42.950	21.176	0.0	0.0	0.088507	0.24215	0.0
4	43.074	21.220	0.0	0.0	0.12934	0.34921	0.0
5	43.198	21.265	0.0	0.0	0.16717	0.44545	0.0
6	43.321	21.312	0.0	0.0	0.20118	0.52728	0.0

Slip surface coordinates		Pore Pressure		Interslice forces [kN/m]		
Point	x [m]	y [m]	L [kN/m²]	R [kN/m²]	T	E	E(u)
7	43.445	21.360	0.0	0.0	0.23092	0.59625	0.0
8	43.569	21.409	0.0	0.0	0.25580	0.65143	0.0
9	43.692	21.460	0.0	0.0	0.27400	0.68796	0.0
10	43.816	21.511	0.0	0.0	0.28776	0.71375	0.0
11	43.940	21.565	0.0	0.0	0.29123	0.71416	0.0
12	44.063	21.619	0.0	0.0	0.28992	0.70363	0.0
13	44.187	21.675	0.0	0.0	0.27848	0.67088	0.0
14	44.300	21.727	0.0	0.0	0.26258	0.62947	0.0
15	44.413	21.780	0.0	0.0	0.24199	0.57870	0.0
16	44.526	21.835	0.0	0.0	0.21334	0.51300	0.0
17	44.639	21.890	0.0	0.0	0.18322	0.44429	0.0
18	44.753	21.947	0.0	0.0	0.14490	0.36152	0.0
19	44.866	22.005	0.0	0.0	0.10198	0.27111	0.0
20	44.979	22.065	0.0	0.0	0.050795	0.16795	0.0
21	45.092	22.125	0.0	0.0	-999.66E-6	0.063646	0.0
22	45.205	22.187	0.0	0.0	-0.060747	-0.051977	0.0
23	45.318	22.250	0.0	0.0	-0.11174	-0.15002	0.0
24	45.431	22.314	0.0	0.0	-0.13923	-0.20514	0.0
25	45.544	22.380	0.0	0.0	-0.14221	-0.21677	0.0
26	45.657	22.447	0.0	0.0	-0.11584	-0.17879	0.0
27	45.768	22.513	0.0	0.0	-0.067350	-0.10396	0.0
28	45.878	22.581	0.0	-	-0.0016188	-0.0034511	0.0

Slice No.	Strength Parameters		Average Pore Pressure	Slice Weight	Forces on base [kN/m]		
	c' [kN/m²]	Tan phi	[kN/m²]	[kN/m]	Normal	Shear (capacity)	Shear (mobilised)
1	*1.6000*	*0.39019*	0.0	*0.049343*	0.049215	0.22817	0.14908
2	*1.6000*	*0.39019*	0.0	*0.14803*	0.14236	0.26503	0.17317
3	*1.6000*	*0.39019*	0.0	*0.24554*	0.23392	0.30129	0.19686
4	*1.6000*	*0.39019*	0.0	*0.34070*	0.32280	0.33651	0.21987
5	*1.6000*	*0.39019*	0.0	*0.43116*	0.40576	0.37000	0.24175
6	*1.6000*	*0.39019*	0.0	*0.51810*	0.48576	0.40179	0.26252
7	*1.6000*	*0.39019*	0.0	*0.60386*	0.56421	0.43298	0.28291
8	*1.6000*	*0.39019*	0.0	*0.68610*	0.63718	0.46265	0.30229
9	*1.6000*	*0.39019*	0.0	*0.76599*	0.71103	0.49147	0.32112
10	*1.6000*	*0.39019*	0.0	*0.84118*	0.77391	0.51787	0.33838
11	*1.6000*	*0.39019*	0.0	*0.91285*	0.83958	0.54350	0.35512
12	*1.6000*	*0.39019*	0.0	*0.98334*	0.89886	0.56793	0.37108
13	*1.6000*	*0.39019*	0.0	*0.94131*	0.85812	0.53401	0.34892
14	*1.6000*	*0.39019*	0.0	*0.96173*	0.87376	0.54079	0.35335
15	*1.6000*	*0.39019*	0.0	*0.97999*	0.88429	0.54628	0.35693
16	*1.6000*	*0.39019*	0.0	*0.99611*	0.89879	0.55193	0.36063
17	*1.6000*	*0.39019*	0.0	*1.0090*	0.90409	0.55542	0.36291
18	*1.6000*	*0.39019*	0.0	*1.0187*	0.90952	0.55826	0.36477
19	*1.6000*	*0.39019*	0.0	*1.0262*	0.90968	0.55981	0.36577
20	*1.6000*	*0.39019*	0.0	*1.0316*	0.91442	0.56166	0.36698
21	*1.6000*	*0.39019*	0.0	*1.0337*	0.90966	0.56132	0.36676
22	*1.6000*	*0.39019*	0.0	*0.93287*	0.81801	0.52618	0.34380
23	*1.6000*	*0.39019*	0.0	*0.73105*	0.63935	0.45725	0.29876
24	*1.6000*	*0.39019*	0.0	*0.52494*	0.45658	0.38753	0.25321
25	*1.6000*	*0.39019*	0.0	*0.31668*	0.27572	0.31777	0.20763
26	*1.6000*	*0.39019*	0.0	*0.15746*	0.13844	0.25995	0.16985
27	*1.6000*	*0.39019*	0.0	*0.053537*	0.048899	0.22667	0.14811

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	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

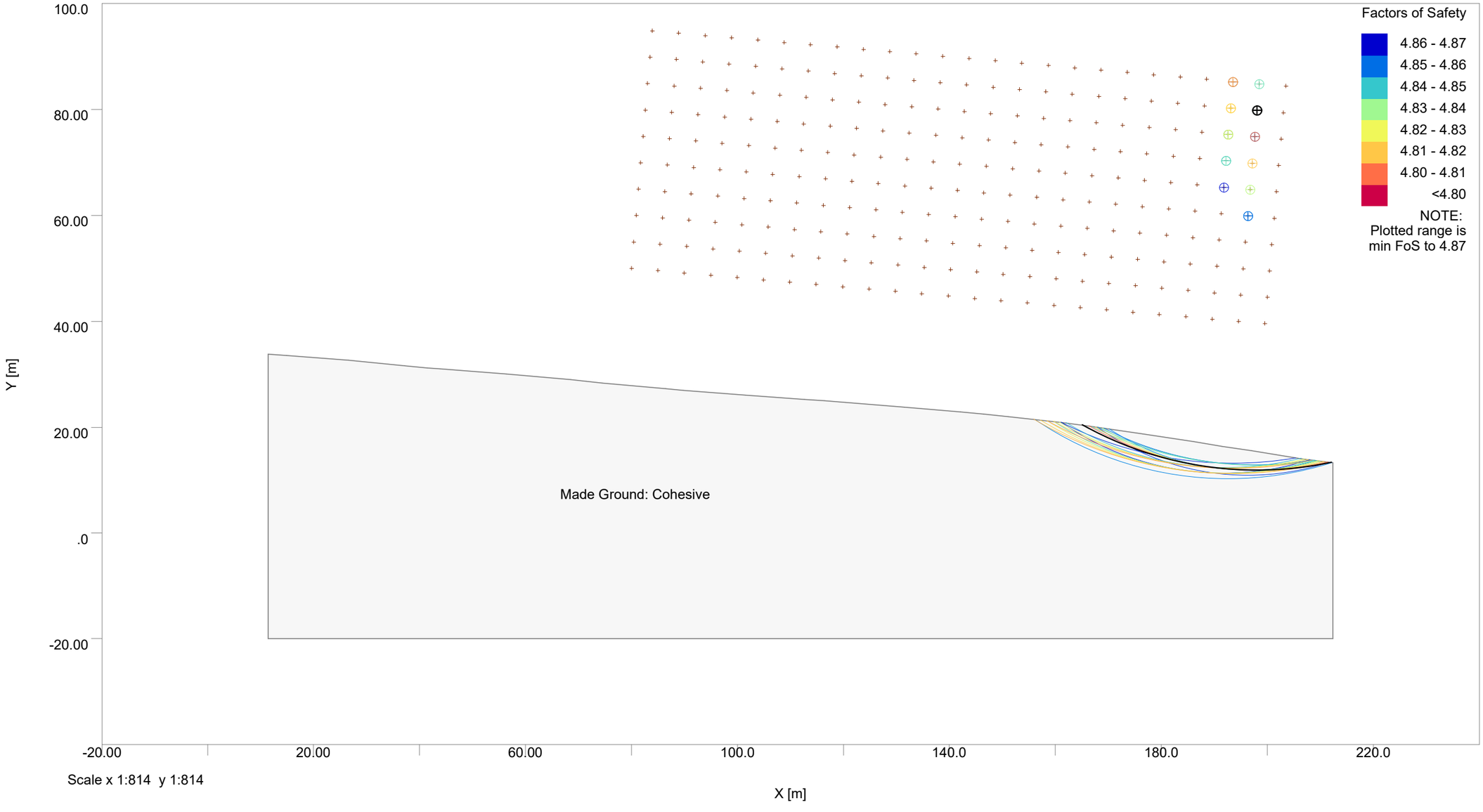
Slice No.	Surface Load [kN/m_hor/m] Vert	Surface Load [kN/m_hor/m] Horiz	Point Load [kN/m] Vert	Point Load [kN/m] Horiz	Water Pressure on ground surface [kN/m_hor/m] Vert	Water Pressure on ground surface [kN/m_hor/m] Horiz
16	*0.0*	*0.0*	0.0	0.0	0.0	0.0
17	*0.0*	*0.0*	0.0	0.0	0.0	0.0
18	*0.0*	*0.0*	0.0	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

Oasys

Peacewood Quarry
Section 1 - Final Levels

Job No.	Sheet No.	Rev.
16-574		
Drg. Ref.		
Made by CB	Date	Checked / Date

More than one slip surface shown, minimum factor of 4.794



Specification

Slip Type: CIRCULAR
Direction of slip: Downhill
Minimum slip weight [kN/m] :0.00000
Type of analysis: STATIC
Partial factor analysis
Minimum number of slices 25
Method: Bishop(Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NONE

Material Properties

No	Description	Unit Weight Above GWL [kN/m3]	Unit Weight Below GWL [kN/m3]	Shear Strength Parameters Condition	Phi or Phi0 [°]	c or c0' [kN/m²]
1	Made Ground: Cohesive	20.000	20.000	Drained	38.000	5.0000

Slip Surface Specification

Circle centre specification:
Bottom left of grid: x = 80.00000 m y = 50.00000 m
Inclination of grid: -5.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 20 in x direction at 5.00000m spacing
                  6 in y direction at 5.00000m 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 (198.05m,79.825m)
Iterations: 6
Net vertical force [kN/m]: 1.0650
Net horiz force [kN/m]: 7.0290

Radius 68.000m
Horiz acceleration [%g]: 0.0
Slip weight [kN/m] 2762.1
Disturbing moment [kN/m]: 27295.
Restoring moment [kNm/m]: 130860.
Reinf.Rest.Moment [kNm/m]: 0.0
Over-Design Factor: 4.7942

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 Point	x [m]	y [m]	Pore Pressure L [kN/m²]	R [kN/m²]	Interslice forces [kN/m] T	E	E(u)
1	165.03	20.379	-	0.0	0.0	0.0	0.0
2	166.40	19.638	0.0	0.0	-3.4121	2.7967	0.0
3	168.08	18.784	0.0	0.0	-4.6319	11.722	0.0
4	169.76	17.988	0.0	0.0	-3.6093	25.371	0.0
5	171.44	17.247	0.0	0.0	-1.2125	42.447	0.0
6	173.12	16.559	0.0	0.0	1.8671	61.749	0.0
7	174.80	15.922	0.0	0.0	5.1018	82.193	0.0
8	176.48	15.336	0.0	0.0	8.0582	102.70	0.0
9	178.09	14.819	0.0	0.0	10.396	121.65	0.0
10	179.71	14.346	0.0	0.0	12.072	139.12	0.0
11	181.32	13.915	0.0	0.0	13.048	154.61	0.0
12	182.93	13.527	0.0	0.0	13.286	167.51	0.0
13	184.54	13.179	0.0	0.0	12.882	177.62	0.0
14	186.16	12.873	0.0	0.0	11.893	184.45	0.0
15	187.93	12.582	0.0	0.0	10.310	188.12	0.0
16	189.71	12.338	0.0	0.0	8.4155	187.72	0.0
17	191.48	12.142	0.0	0.0	6.4325	183.19	0.0
18	193.33	11.988	0.0	0.0	4.5250	174.30	0.0
19	195.19	11.885	0.0	0.0	3.0299	161.50	0.0
20	197.04	11.832	0.0	0.0	2.1646	145.36	0.0
21	198.05	11.825	0.0	0.0	2.0418	135.31	0.0
22	199.74	11.846	0.0	0.0	2.0898	117.24	0.0
23	201.42	11.909	0.0	0.0	2.2768	98.023	0.0
24	203.11	12.014	0.0	0.0	2.6103	78.470	0.0
25	204.80	12.161	0.0	0.0	3.0293	59.493	0.0

Slip surface coordinates		Pore Pressure		Interslice forces [kN/m]		
Point	x [m]	y [m]	L [kN/m²]	R [kN/m²]	T	E	E(u)
26	206.49	12.351	0.0	0.0	3.4001	42.066	0.0
27	207.90	12.543	0.0	0.0	3.5271	29.308	0.0
28	209.32	12.765	0.0	0.0	3.3331	18.756	0.0
29	210.73	13.018	0.0	0.0	2.6042	11.087	0.0
30	212.15	13.303	0.0	-	1.0650	7.0290	0.0

Slice No.	Strength Parameters		Average Pore Pressure	Slice Weight	Forces on base [kN/m]		
	c' [kN/m²]	Tan phi	[kN/m²]	[kN/m]	Normal	Shear (capacity)	Shear (mobilised)
1	4.0000	0.62503	0.0	7.4802	10.911	13.050	2.7221
2	4.0000	0.62503	0.0	28.627	30.651	26.696	5.5685
3	4.0000	0.62503	0.0	48.216	48.492	37.745	7.8731
4	4.0000	0.62503	0.0	65.906	65.000	47.971	10.006
5	4.0000	0.62503	0.0	81.782	80.147	57.356	11.964
6	4.0000	0.62503	0.0	95.911	93.904	65.880	13.742
7	4.0000	0.62503	0.0	108.33	106.25	73.524	15.336
8	4.0000	0.62503	0.0	113.89	112.01	76.784	16.016
9	4.0000	0.62503	0.0	121.92	120.30	81.912	17.086
10	4.0000	0.62503	0.0	128.56	127.26	86.218	17.984
11	4.0000	0.62503	0.0	133.84	132.91	89.707	18.712
12	4.0000	0.62503	0.0	137.77	137.20	92.352	19.263
13	4.0000	0.62503	0.0	140.37	140.15	94.165	19.641
14	4.0000	0.62503	0.0	155.79	155.90	104.64	21.826
15	4.0000	0.62503	0.0	155.24	155.62	104.44	21.784
16	4.0000	0.62503	0.0	152.98	153.53	103.11	21.507
17	4.0000	0.62503	0.0	155.62	156.25	105.09	21.920
18	4.0000	0.62503	0.0	150.33	150.88	101.72	21.217
19	4.0000	0.62503	0.0	143.15	143.49	97.093	20.252
20	4.0000	0.62503	0.0	74.508	74.560	50.652	10.565
21	4.0000	0.62503	0.0	116.52	116.69	79.683	16.621
22	4.0000	0.62503	0.0	105.82	106.27	73.180	15.264
23	4.0000	0.62503	0.0	93.700	94.400	65.767	13.718
24	4.0000	0.62503	0.0	80.165	81.092	57.461	11.986
25	4.0000	0.62503	0.0	65.178	66.350	48.264	10.067
26	4.0000	0.62503	0.0	42.720	43.921	33.166	6.9179
27	4.0000	0.62503	0.0	31.580	33.025	26.373	5.5010
28	4.0000	0.62503	0.0	19.562	21.324	19.080	3.9798
29	4.0000	0.62503	0.0	6.6670	8.8456	11.304	2.3579

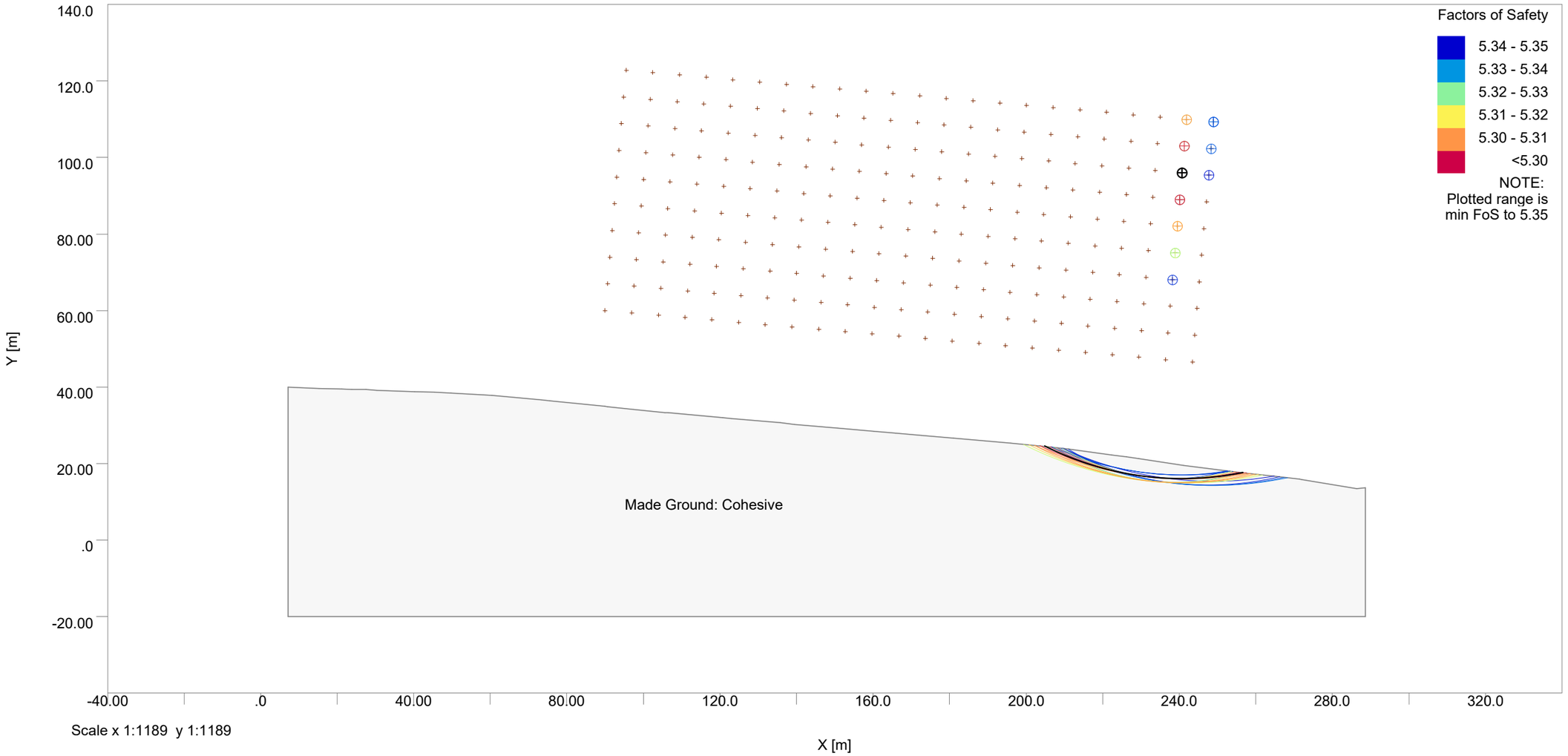
Slice No.	Surface Load [kN/m_hor/m]		Point Load [kN/m]		Water Pressure on ground surface [kN/m_hor/m]	
	Vert	Horiz	Vert	Horiz	Vert	Horiz
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	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

Oasys

Peacewood Quarry
Section 2 - Final Levels

Job No.	Sheet No.	Rev.
16-571		
Drg. Ref.		
Made by CB	Date	Checked / Date

More than one slip surface shown, minimum factor of 5.296



Specification

Slip Type: CIRCULAR
Direction of slip: Downhill
Minimum slip weight [kN/m] :0.00000
Type of analysis: STATIC
Partial factor analysis
Minimum number of slices 25
Method: Bishop(Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NONE

Material Properties

No	Description	Unit Weight Above GWL [kN/m3]	Unit Weight Below GWL [kN/m3]	Shear Strength Parameters Condition	Phi or Phi0 [°]	c or c0' [kN/m²]
1	Made Ground: Cohesive	20.000	20.000	Drained	38.000	5.0000

Slip Surface Specification

Circle centre specification:
Bottom left of grid: x = 90.00000 m y = 60.00000 m
Inclination of grid: -5.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 20 in x direction at 7.00000m spacing
                  6 in y direction at 7.00000m 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 (240.71m,96.002m)
Iterations: 5
Net vertical force [kN/m]: 0.87933
Net horiz force [kN/m]: 6.5477

Radius 80.000m
Horiz acceleration [%g]: 0.0
Slip weight [kN/m] 3123.3
Disturbing moment [kN/m]: 32774.
Restoring moment [kNm/m]: 173580.
Reinf.Rest.Moment [kNm/m]: 0.0
Over-Design Factor: 5.2963

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 Point	x [m]	y [m]	Pore Pressure L [kN/m²]	R [kN/m²]	Interslice forces [kN/m] T	E	E(u)
1	204.82	24.506	-	0.0	0.0	0.0	0.0
2	205.75	24.044	0.0	0.0	-2.4251	1.2557	0.0
3	207.53	23.206	0.0	0.0	-4.5677	8.5429	0.0
4	209.31	22.421	0.0	0.0	-4.3584	20.993	0.0
5	211.09	21.687	0.0	0.0	-2.6105	37.335	0.0
6	212.96	20.969	0.0	0.0	0.13670	57.310	0.0
7	214.83	20.305	0.0	0.0	3.1679	78.790	0.0
8	216.70	19.692	0.0	0.0	6.0805	100.73	0.0
9	218.56	19.129	0.0	0.0	8.5607	122.13	0.0
10	220.43	18.615	0.0	0.0	10.409	142.11	0.0
11	222.30	18.150	0.0	0.0	11.501	159.85	0.0
12	224.23	17.719	0.0	0.0	11.839	175.22	0.0
13	226.15	17.338	0.0	0.0	11.406	186.96	0.0
14	227.76	17.057	0.0	0.0	10.553	193.76	0.0
15	229.37	16.809	0.0	0.0	9.3575	197.74	0.0
16	231.26	16.562	0.0	0.0	7.6467	198.46	0.0
17	233.15	16.360	0.0	0.0	5.8130	195.16	0.0
18	235.04	16.203	0.0	0.0	4.0618	187.97	0.0
19	236.93	16.091	0.0	0.0	2.5967	177.16	0.0
20	238.82	16.024	0.0	0.0	1.6057	163.13	0.0
21	240.71	16.002	0.0	0.0	1.2492	146.44	0.0
22	241.21	16.003	0.0	0.0	1.2508	141.70	0.0
23	243.24	16.042	0.0	0.0	1.3448	121.02	0.0
24	245.26	16.131	0.0	0.0	1.6183	99.006	0.0
25	247.29	16.272	0.0	0.0	2.0813	76.591	0.0

Slip surface coordinates Point	x [m]	y [m]	Pore Pressure L [kN/m²]	R [kN/m²]	Interslice forces [kN/m] T	E	E(u)
26	249.31	16.465	0.0	0.0	2.6390	55.005	0.0
27	251.34	16.711	0.0	0.0	3.0907	35.596	0.0
28	253.36	17.008	0.0	0.0	3.0929	19.941	0.0
29	255.39	17.359	0.0	0.0	2.1871	9.5888	0.0
30	256.27	17.530	0.0	0.0	1.3464	7.1582	0.0
31	256.66	17.607	0.0	-	0.87933	6.5477	0.0

Slice No.	Strength Parameters c' [kN/m²]	Tan phi	Average Pore Pressure [kN/m²]	Slice Weight [kN/m]	Forces on base Normal	Shear (capacity)	Shear (mobilised)
1	4.0000	0.62503	0.0	3.4538	5.8275	7.8176	1.4761
2	4.0000	0.62503	0.0	24.310	27.037	24.767	4.6763
3	4.0000	0.62503	0.0	45.720	46.664	36.947	6.9760
4	4.0000	0.62503	0.0	65.296	64.978	48.314	9.1222
5	4.0000	0.62503	0.0	87.201	85.997	61.755	11.660
6	4.0000	0.62503	0.0	103.95	102.29	71.862	13.568
7	4.0000	0.62503	0.0	118.76	116.92	80.939	15.282
8	4.0000	0.62503	0.0	131.67	129.87	88.974	16.799
9	4.0000	0.62503	0.0	142.73	141.13	95.959	18.118
10	4.0000	0.62503	0.0	151.97	150.70	101.89	19.238
11	4.0000	0.62503	0.0	164.14	163.21	109.91	20.752
12	4.0000	0.62503	0.0	169.27	168.76	113.33	21.399
13	4.0000	0.62503	0.0	144.16	144.02	96.556	18.231
14	4.0000	0.62503	0.0	145.62	145.71	97.591	18.426
15	4.0000	0.62503	0.0	170.86	171.21	114.64	21.645
16	4.0000	0.62503	0.0	168.77	169.28	113.41	21.413
17	4.0000	0.62503	0.0	164.97	165.55	111.06	20.969
18	4.0000	0.62503	0.0	159.47	160.01	107.58	20.313
19	4.0000	0.62503	0.0	152.27	152.67	102.98	19.445
20	4.0000	0.62503	0.0	143.37	143.52	97.263	18.364
21	4.0000	0.62503	0.0	36.391	36.399	24.757	4.6745
22	4.0000	0.62503	0.0	139.24	139.52	95.304	17.994
23	4.0000	0.62503	0.0	126.02	126.59	87.229	16.470
24	4.0000	0.62503	0.0	110.75	111.57	77.857	14.700
25	4.0000	0.62503	0.0	93.373	94.444	67.167	12.682
26	4.0000	0.62503	0.0	73.852	75.205	55.165	10.416
27	4.0000	0.62503	0.0	52.225	53.942	41.902	7.9115
28	4.0000	0.62503	0.0	28.492	30.734	27.430	5.1791
29	4.0000	0.62503	0.0	4.5614	5.7654	7.2051	1.3604
30	4.0000	0.62503	0.0	0.45696	1.0260	2.2079	0.41687

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

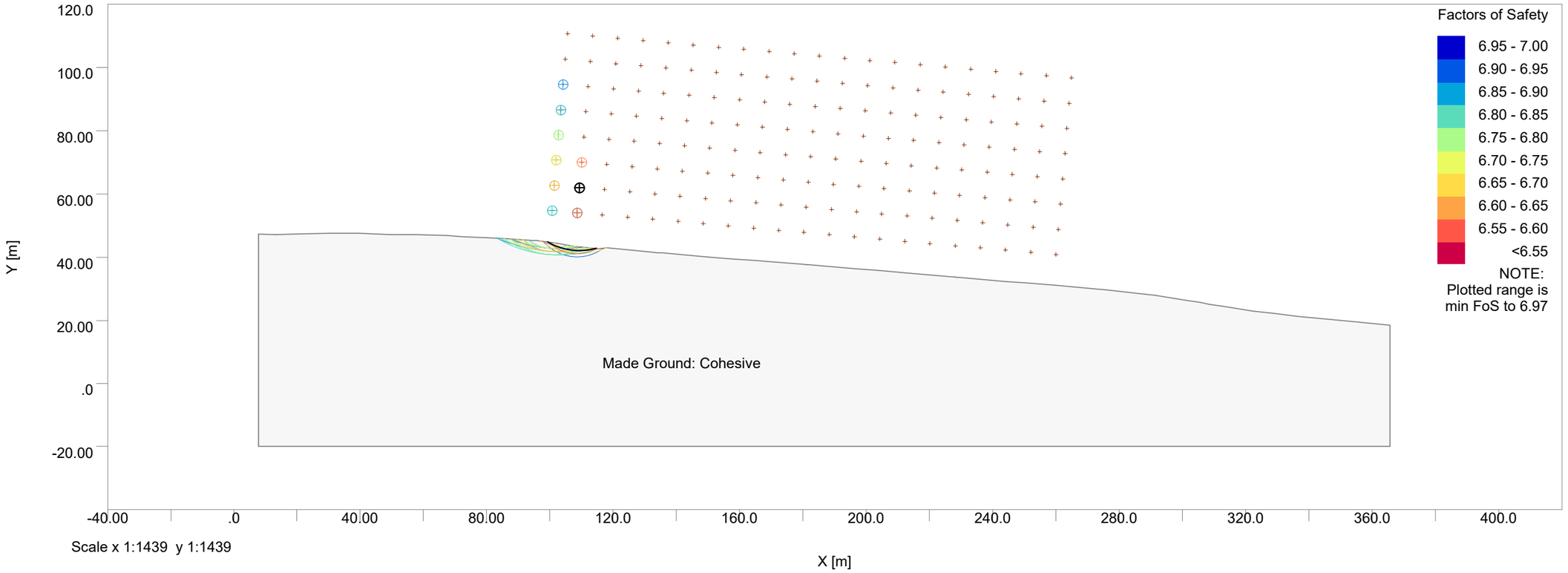
Slice No.	Surface Load [kN/m_hor/m] Vert	Surface Load [kN/m_hor/m] Horiz	Point Load [kN/m] Vert	Point Load [kN/m] Horiz	Water Pressure on ground surface [kN/m_hor/m] Vert	Water Pressure on ground surface [kN/m_hor/m] Horiz
28	*0.0*	*0.0*	0.0	0.0	0.0	0.0
29	*0.0*	*0.0*	0.0	0.0	0.0	0.0
30	*0.0*	*0.0*	0.0	0.0	0.0	0.0

Oasys

Peacewood Quarry
Section 3 - Final Levels

Job No.	Sheet No.	Rev.
16-571		
Drg. Ref.		
Made by CB	Date	Checked / Date

More than one slip surface shown, minimum factor of 6.513



Scale x 1:1439 y 1:1439

Specification
Slip Type: CIRCULAR
Direction of slip: Downhill
Minimum slip weight [kN/m] :0.00000
Type of analysis: STATIC
Partial factor analysis
Minimum number of slices 25
Method: Bishop(Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NONE

Method Partial Factors
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 UNIT WEIGHT: 1.00000
Factor on DRAINED COHESION: 1.25000
Factor on UNDRAINED COHESION: 1.40000
Factor on TAN PHI': 1.25000
Factor on REINFORCEMENT PULLOUT: 1.50000
Factor on ECONOMIC FAILURE: 1.00000
Factor on SLIDING ALONG REINFORCEMENT: 1.50000

Material Properties

No	Description	Unit Weight Above GWL [kN/m3]	Unit Weight Below GWL [kN/m3]	Shear Strength Parameters Condition	Phi or Phi0 [°]	c or c0' [kN/m²]
1	Made Ground: Cohesive	20.000	20.000	Drained	38.000	5.0000

Slip Surface Specification
Circle centre specification:
Bottom left of grid: x = 110.00000 m y = 70.00000 m
Inclination of grid: -5.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 20 in x direction at 8.00000m spacing
                  6 in y direction at 8.00000m 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 (109.30m,62.030m)
Iterations: 7
Net vertical force [kN/m]: 0.11692
Net horiz force [kN/m]: 0.88561

Radius 20.000m
Horiz acceleration [%g]: 0.0
Slip weight [kN/m] 304.63
Disturbing moment [kN/m]: 785.35
Restoring moment [kNm/m]: 5114.9
Reinf.Rest.Moment [kNm/m]: 0.0
Over-Design Factor: 6.5130

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 Point	x [m]	y [m]	Pore Pressure L [kN/m²]	R [kN/m²]	Interslice forces [kN/m] T	E	E(u)
1	99.206	44.766	-	0.0	0.0	0.0	0.0
2	99.723	44.474	0.0	0.0	-0.56903	0.37120	0.0
3	100.24	44.202	0.0	0.0	-0.74571	1.4382	0.0
4	100.76	43.949	0.0	0.0	-0.65340	3.0523	0.0
5	101.27	43.713	0.0	0.0	-0.38499	5.0852	0.0
6	101.79	43.495	0.0	0.0	-0.031132	7.3894	0.0
7	102.31	43.294	0.0	0.0	0.34704	9.8453	0.0
8	102.91	43.079	0.0	0.0	0.74870	12.743	0.0
9	103.52	42.885	0.0	0.0	1.0626	15.509	0.0
10	104.13	42.712	0.0	0.0	1.2611	18.008	0.0

Slip surface coordinates Point	x [m]	y [m]	Pore Pressure L [kN/m²]	R [kN/m²]	Interslice forces [kN/m] T	E	E(u)
11	104.73	42.559	0.0	0.0	1.3427	20.151	0.0
12	105.34	42.427	0.0	0.0	1.3066	21.819	0.0
13	105.95	42.314	0.0	0.0	1.1826	22.999	0.0
14	106.55	42.220	0.0	0.0	0.99585	23.650	0.0
15	107.16	42.146	0.0	0.0	0.77761	23.726	0.0
16	107.77	42.090	0.0	0.0	0.56473	23.291	0.0
17	108.28	42.057	0.0	0.0	0.41410	22.538	0.0
18	108.79	42.037	0.0	0.0	0.30949	21.445	0.0
19	109.30	42.030	0.0	0.0	0.26859	20.041	0.0
20	109.89	42.039	0.0	0.0	0.26670	18.055	0.0
21	110.48	42.065	0.0	0.0	0.27435	15.773	0.0
22	111.07	42.109	0.0	0.0	0.30457	13.262	0.0
23	111.66	42.170	0.0	0.0	0.35707	10.654	0.0
24	112.25	42.249	0.0	0.0	0.42468	8.0563	0.0
25	112.84	42.347	0.0	0.0	0.48616	5.6023	0.0
26	113.44	42.462	0.0	0.0	0.49539	3.4810	0.0
27	114.03	42.596	0.0	0.0	0.39881	1.8452	0.0
28	114.62	42.749	0.0	-	0.11692	0.88561	0.0

Slice No.	Strength Parameters c' [kN/m²]	Tan phi	Average Pore Pressure [kN/m²]	Slice Weight [kN/m]	Forces on base [kN/m] Normal	Shear (capacity)	Shear (mobilised)
1	4.0000	0.62503	0.0	1.1573	1.6856	3.4274	0.52625
2	4.0000	0.62503	0.0	3.3687	3.6342	4.6071	0.70737
3	4.0000	0.62503	0.0	5.3837	5.4620	5.7150	0.87749
4	4.0000	0.62503	0.0	7.2127	7.1611	6.7480	1.0361
5	4.0000	0.62503	0.0	8.8557	8.7288	7.6989	1.1821
6	4.0000	0.62503	0.0	10.318	10.154	8.5640	1.3149
7	4.0000	0.62503	0.0	13.622	13.429	10.969	1.6841
8	4.0000	0.62503	0.0	14.890	14.726	11.753	1.8045
9	4.0000	0.62503	0.0	15.904	15.788	12.392	1.9027
10	4.0000	0.62503	0.0	16.668	16.607	12.883	1.9780
11	4.0000	0.62503	0.0	17.184	17.181	13.223	2.0302
12	4.0000	0.62503	0.0	17.457	17.500	13.407	2.0585
13	4.0000	0.62503	0.0	17.493	17.571	13.439	2.0634
14	4.0000	0.62503	0.0	17.293	17.392	13.315	2.0445
15	4.0000	0.62503	0.0	16.868	16.969	13.044	2.0027
16	4.0000	0.62503	0.0	13.904	13.977	10.788	1.6564
17	4.0000	0.62503	0.0	13.632	13.684	10.602	1.6278
18	4.0000	0.62503	0.0	13.228	13.248	10.329	1.5858
19	4.0000	0.62503	0.0	14.570	14.601	11.487	1.7638
20	4.0000	0.62503	0.0	13.643	13.723	10.941	1.6799
21	4.0000	0.62503	0.0	12.510	12.632	10.263	1.5758
22	4.0000	0.62503	0.0	11.170	11.326	9.4533	1.4515
23	4.0000	0.62503	0.0	9.6229	9.8154	8.5174	1.3078
24	4.0000	0.62503	0.0	7.8577	8.0928	7.4520	1.1442
25	4.0000	0.62503	0.0	5.8741	6.1622	6.2574	0.96076
26	4.0000	0.62503	0.0	3.6779	4.0430	4.9485	0.75979
27	4.0000	0.62503	0.0	1.2634	1.7366	3.5249	0.54121

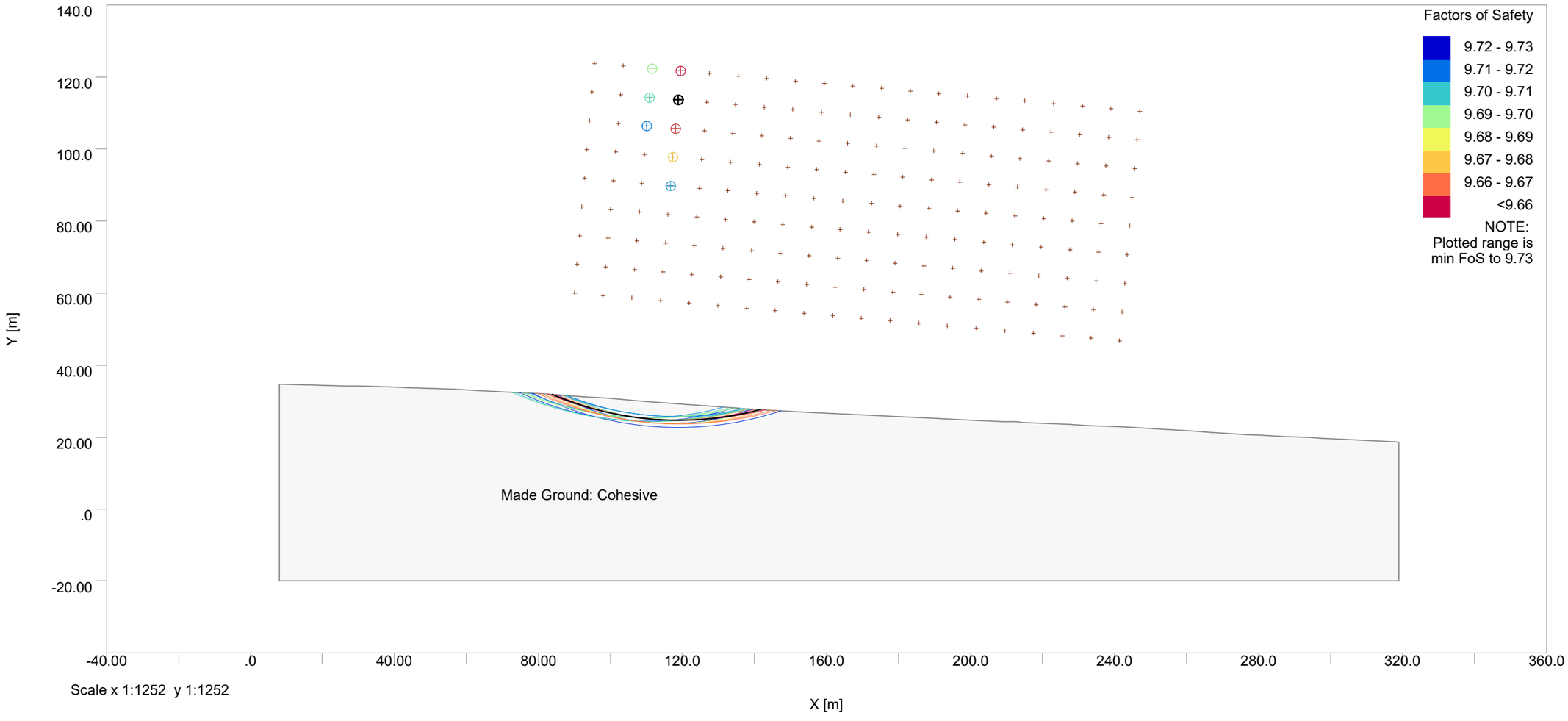
Slice No.	Surface Load [kN/m_hor/m] Vert	Horiz	Point Load [kN/m] Vert	Horiz	Water Pressure on ground surface [kN/m_hor/m] Vert	Horiz
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	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

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

Oasys

Job No.	Sheet No.	Rev.
Drg. Ref.		
Made by Date	Checked Date	

More than one slip surface shown, minimum factor of 9.657



Scale x 1:1252 y 1:1252

Specification

Slip Type: CIRCULAR
Direction of slip: Downhill
Minimum slip weight [kN/m] :0.00000
Type of analysis: STATIC
Partial factor analysis
Minimum number of slices 25
Method: Bishop(Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NONE

Material Properties

No	Description	Unit Weight		Shear Strength Parameters		
		Above GWL	Below GWL	Condition	Phi or Phi0	c or c0'
		[kN/m3]	[kN/m3]		[°]	[kN/m²]
1	Made Ground: Cohesive	20.000	20.000	Drained	38.000	5.0000

Slip Surface Specification

Circle centre specification:
Bottom left of grid: x = 90.00000 m y = 60.00000 m
Inclination of grid: -5.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 20 in x direction at 8.00000m spacing
                  6 in y direction at 8.00000m 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 (118.79m,113.70m)
Radius 89.000m
Iterations: 5
Horiz acceleration [%g]: 0.0
Net vertical force [kN/m]: 0.35341
Slip weight [kN/m] 3756.5
Net horiz force [kN/m]: 4.8078
Disturbing moment [kN/m]: 24006.
Restoring moment [kNm/m]: 231820.
Reinf.Rest.Moment [kNm/m]: 0.0
Over-Design Factor: 9.6567

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 [kN/m²]	R [kN/m²]	T	E	E(u)
1	83.730	31.892	-	0.0	0.0	0.0	0.0
2	85.956	30.973	0.0	0.0	-4.6760	6.2859	0.0
3	88.182	30.124	0.0	0.0	-5.8990	20.885	0.0
4	90.407	29.342	0.0	0.0	-4.9202	41.654	0.0
5	92.633	28.626	0.0	0.0	-2.7444	66.566	0.0
6	94.894	27.963	0.0	0.0	-0.055571	94.326	0.0
7	97.156	27.365	0.0	0.0	2.5150	122.78	0.0
8	99.417	26.829	0.0	0.0	4.6144	150.49	0.0
9	101.37	26.417	0.0	0.0	5.8270	172.58	0.0
10	103.32	26.050	0.0	0.0	6.4347	192.24	0.0
11	105.27	25.728	0.0	0.0	6.4540	208.86	0.0
12	107.22	25.450	0.0	0.0	5.9706	222.02	0.0
13	109.17	25.217	0.0	0.0	5.0918	231.26	0.0
14	110.84	25.051	0.0	0.0	4.1537	236.08	0.0
15	112.52	24.916	0.0	0.0	3.1514	237.95	0.0
16	114.19	24.814	0.0	0.0	2.1994	236.65	0.0
17	115.93	24.741	0.0	0.0	1.3846	232.13	0.0
18	117.67	24.702	0.0	0.0	0.87816	224.45	0.0
19	118.79	24.695	0.0	0.0	0.77724	217.92	0.0
20	120.88	24.720	0.0	0.0	0.73873	202.59	0.0
21	122.96	24.793	0.0	0.0	0.74930	183.75	0.0
22	125.05	24.916	0.0	0.0	0.94597	161.90	0.0
23	127.14	25.088	0.0	0.0	1.3975	137.94	0.0
24	129.22	25.309	0.0	0.0	2.1045	112.82	0.0
25	131.31	25.580	0.0	0.0	2.9942	87.573	0.0

Slip surface coordinates Point	x [m]	y [m]	Pore Pressure L [kN/m²]	R [kN/m²]	Interslice forces [kN/m] T	E	E(u)
26	133.40	25.902	0.0	0.0	3.8951	63.402	0.0
27	135.49	26.275	0.0	0.0	4.5109	41.694	0.0
28	135.75	26.326	0.0	0.0	4.5527	39.193	0.0
29	135.93	26.361	0.0	0.0	4.5690	37.520	0.0
30	137.85	26.760	0.0	0.0	4.3878	21.668	0.0
31	139.77	27.204	0.0	0.0	3.1634	10.323	0.0
32	141.69	27.693	0.0	-	0.35341	4.8078	0.0

Slice No.	Strength Parameters c' [kN/m²]	Tan phi	Average Pore Pressure [kN/m²]	Slice Weight [kN/m]	Forces on base [kN/m] Normal	Shear (capacity)	Shear (mobilised)
1	4.0000	0.62503	0.0	16.960	22.398	23.631	2.4471
2	4.0000	0.62503	0.0	49.345	52.451	42.312	4.3816
3	4.0000	0.62503	0.0	78.703	80.214	59.572	6.1690
4	4.0000	0.62503	0.0	105.10	105.61	75.360	7.8040
5	4.0000	0.62503	0.0	130.95	130.89	91.239	9.4482
6	4.0000	0.62503	0.0	152.48	152.20	104.49	10.820
7	4.0000	0.62503	0.0	171.14	170.87	116.10	12.022
8	4.0000	0.62503	0.0	159.87	159.80	107.85	11.169
9	4.0000	0.62503	0.0	168.61	168.74	113.41	11.744
10	4.0000	0.62503	0.0	175.59	175.93	117.87	12.206
11	4.0000	0.62503	0.0	180.84	181.37	121.24	12.555
12	4.0000	0.62503	0.0	184.35	185.02	123.50	12.789
13	4.0000	0.62503	0.0	159.99	160.62	107.12	11.092
14	4.0000	0.62503	0.0	160.91	161.54	107.68	11.151
15	4.0000	0.62503	0.0	160.76	161.33	107.54	11.137
16	4.0000	0.62503	0.0	166.26	166.74	111.19	11.514
17	4.0000	0.62503	0.0	164.31	164.60	109.85	11.376
18	4.0000	0.62503	0.0	103.66	103.71	69.290	7.1754
19	4.0000	0.62503	0.0	188.39	188.60	126.23	13.072
20	4.0000	0.62503	0.0	179.83	180.37	121.09	12.539
21	4.0000	0.62503	0.0	169.21	170.01	114.62	11.870
22	4.0000	0.62503	0.0	156.52	157.51	106.82	11.062
23	4.0000	0.62503	0.0	141.81	142.96	97.750	10.123
24	4.0000	0.62503	0.0	125.03	126.36	87.395	9.0502
25	4.0000	0.62503	0.0	106.12	107.68	75.747	7.8440
26	4.0000	0.62503	0.0	85.085	86.971	62.839	6.5073
27	4.0000	0.62503	0.0	9.1281	9.3967	6.9409	0.71877
28	4.0000	0.62503	0.0	6.1425	6.3320	4.6990	0.48661
29	4.0000	0.62503	0.0	54.182	56.450	43.132	4.4666
30	4.0000	0.62503	0.0	33.719	36.601	30.765	3.1858
31	4.0000	0.62503	0.0	11.528	15.255	17.465	1.8086

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

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