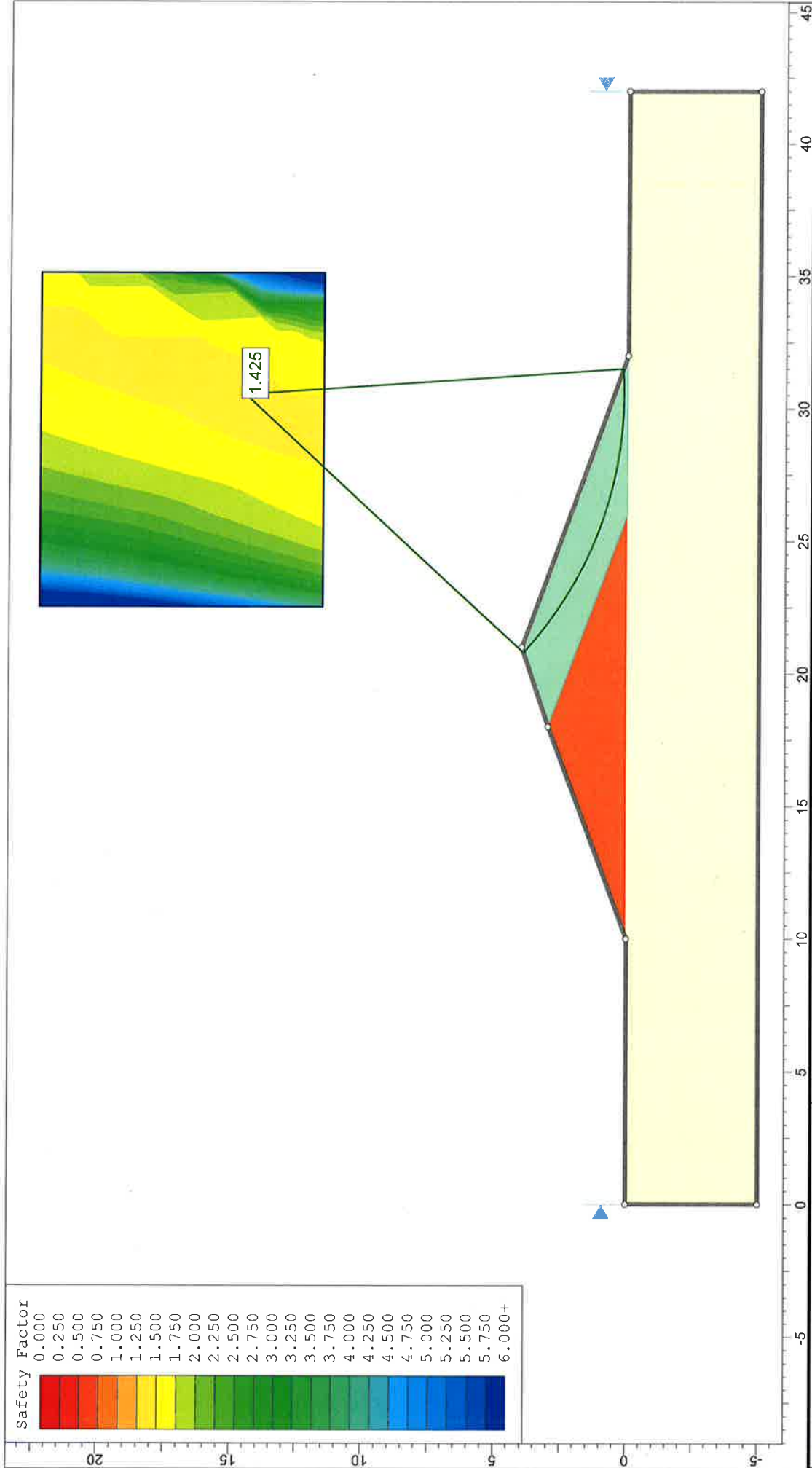


**SPECTATOR BANKS
PEMBREY RACETRACK
CARMARTHENSHIRE**

Waste Recovery Plan

Appendix 4
Stability Modelling Output
Report Number 1223r1v4d0715



Project			
Pembrey Racetrack Spectator Bunds			
Analysis Description			
Effective Stress Long Term Analysis			
Drawn By	Ewan Thomas	Scale	1:200
Date	20/06/2014, 12:24:14	Company	Geotechnology Ltd
		File Name	SRA1.slim

Slide Analysis Information

Pembrey Racetrack Spectator Bunds

Project Summary

File Name: SRA1
Slide Modeler Version: 6.029
Project Title: Pembrey Racetrack Spectator Bunds
Analysis: Effective Stress Long Term Analysis
Author: Ewan Thomas
Company: Geotechnology Ltd
Date Created: 20/06/2014, 12:24:14
Comments:

A model to examine the stability implications of increasing bund height from 3m to 4m with geometry specified in planning consent. First Run to examine stability of proposed increased bund with effective stress parameters

General Settings

Units of Measurement: Metric Units
Time Units: days
Permeability Units: meters/second
Failure Direction: Left to Right
Data Output: Standard
Maximum Material Properties: 20

		Project	Pembrey Racetrack Spectator Bunds	
		Analysis Description	Effective Stress Long Term Analysis	
		Drawn By	Ewan Thomas	Company Geotechnology Ltd
		Date	20/06/2014, 12:24:14	File Name SRA1.slim

Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Bishop simplified

Number of slices: 25

Tolerance: 0.005

Maximum number of iterations: 50

Check malpha < 0.2: Yes

Initial trial value of FS: 1

Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Ru Coefficient

Pore Fluid Unit Weight: 9.81 kN/m3

Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116

Random Number Generation Method: Park and Miller v.3

Surface Options

		Project: Pembrey Racetrack Spectator Bunds	
Analysis Description		Effective Stress Long Term Analysis	
Drawn By	Ewan Thomas	Scale	Company: Geotechnology Ltd
Date	20/06/2014, 12:24:14		File Name: SRA1.slim

Surface Type: Circular
 Search Method: Grid Search
 Radius Increment: 10
 Composite Surfaces: Disabled
 Reverse Curvature: Create Tension Crack
 Minimum Elevation: Not Defined
 Minimum Depth: Not Defined

Material Properties

Property	Natural Ground	Existing Bund Fill	New Fill
Color			
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [kN/m3]	20	20	20
Cohesion [kPa]	1	1	1
Friction Angle [deg]	35	30	25
Ru Value	0	0.1	0.1

Global Minimums

Method: bishop simplified

FS: 1.424930
 Center: 30.527, 14.523
 Radius: 14.379
 Left Slip Surface Endpoint: 20.801, 3.934
 Right Slip Surface Endpoint: 31.511, 0.178
 Resisting Moment=1273.43 kN-m
 Driving Moment=893.683 kN-m

		Project	Pembrey Racetrack Spectator Bunds	
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Total Slice Area=9.62091 m2

Valid / Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 4386
Number of Invalid Surfaces: 421

Error Codes:

Error Code -103 reported for 405 surfaces
Error Code -108 reported for 16 surfaces

Error Codes

The following errors were encountered during the computation:

- 103 = Two surface / slope intersections, but one or more surface / nonslope external polygon intersections lie between them. This usually occurs when the slip surface extends past the bottom of the soil region, but may also occur on a benched slope model with two sets of Slope Limits.
- 108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.42493

Slice Number	Width [m]	Weight [kN]	Base Material	Base Cohesion [kPa]	Base Friction Angle [degrees]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]
1	0.428404	1.86617	New Fill	1	25	1.54054	2.19516	2.99865	0.43561	2.56304
2	0.428404	3.92472	New Fill	1	25	2.68482	3.82568	6.9758	0.916126	6.05968

		Project	Pembrey Racetrack Spectator Bunds		
Analysis Description		Drawn By	Effective Stress Long Term Analysis		
Date		Ewan Thomas	Scale	Company	Geotechnology Ltd
SLIDEINTERPRET 6.029		20/06/2014, 12:24:14	File Name		
			SRA1.slim		

3	0.428404	5.47024	New Fill	1	25	3.58039	5.1018	10.0732	1.27689	8.79633
4	0.428404	6.80025	New Fill	1	25	4.37854	6.23912	12.8227	1.58735	11.2353
5	0.428404	7.93143	New Fill	1	25	5.08228	7.24189	15.2372	1.85139	13.3858
6	0.428404	8.87772	New Fill	1	25	5.69422	8.11386	17.328	2.07228	15.2557
7	0.428404	9.65089	New Fill	1	25	6.21666	8.8583	19.1049	2.25276	16.8522
8	0.428404	10.2609	New Fill	1	25	6.65156	9.47801	20.5763	2.39515	18.1811
9	0.428404	10.7164	New Fill	1	25	7.00059	9.97535	21.7491	2.50146	19.2477
10	0.428404	11.0245	New Fill	1	25	7.26511	10.3523	22.6295	2.5734	20.0561
11	0.428404	11.1918	New Fill	1	25	7.44623	10.6104	23.222	2.61244	20.6096
12	0.428404	11.2236	New Fill	1	25	7.54479	10.7508	23.5304	2.61987	20.9106
13	0.428404	11.1248	New Fill	1	25	7.56139	10.7745	23.5582	2.59679	20.9614
14	0.428404	10.8993	New Fill	1	25	7.49637	10.6818	23.3068	2.54416	20.7626
15	0.428404	10.5507	New Fill	1	25	7.34984	10.473	22.7778	2.46279	20.315
16	0.428404	10.0821	New Fill	1	25	7.12169	10.1479	21.9712	2.35341	19.6178
17	0.428404	9.49603	New Fill	1	25	6.81155	9.70598	20.8866	2.21661	18.67
18	0.428404	8.79466	New Fill	1	25	6.41881	9.14636	19.5228	2.05289	17.4699
19	0.428404	7.97979	New Fill	1	25	5.94264	8.46784	17.8775	1.86268	16.0148
20	0.428404	7.05286	New Fill	1	25	5.38189	7.66882	15.9476	1.64631	14.3013
21	0.428404	6.015	New Fill	1	25	4.73519	6.74732	13.7292	1.40405	12.3252
22	0.428404	4.86699	New Fill	1	25	4.00086	5.70094	11.2173	1.13608	10.0812
23	0.428404	3.60935	New Fill	1	25	3.17686	4.5268	8.40577	0.842512	7.56325
24	0.428404	2.24228	New Fill	1	25	2.26085	3.22156	5.28754	0.523404	4.76414
25	0.428404	0.7657	New Fill	1	25	1.25008	1.78128	1.85419	0.178733	1.67546

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.42493

		Project	Pembrey Racetrack Spectator Bunds	
		Analysis Description	Effective Stress Long Term Analysis	
Drawn By		Ewan Thomas	Scale	Company
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Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [degrees]
1	20.8005	3.93351	0	0	0
2	21.2289	3.55543	0.474815	0	0
3	21.6574	3.20615	1.76291	0	0
4	22.0858	2.8831	3.4857	0	0
5	22.5142	2.58413	5.44642	0	0
6	22.9426	2.30749	7.48787	0	0
7	23.371	2.05168	9.48498	0	0
8	23.7994	1.81544	11.3392	0	0
9	24.2278	1.59772	12.9742	0	0
10	24.6562	1.39757	14.3328	0	0
11	25.0846	1.21421	15.3746	0	0
12	25.513	1.04696	16.0736	0	0
13	25.9414	0.895216	16.4171	0	0
14	26.3698	0.758472	16.4043	0	0
15	26.7982	0.636283	16.0457	0	0
16	27.2266	0.528268	15.3623	0	0
17	27.655	0.434101	14.3851	0	0
18	28.0834	0.353505	13.155	0	0
19	28.5118	0.286251	11.7225	0	0
20	28.9402	0.232149	10.1479	0	0
21	29.3686	0.191052	8.50131	0	0
22	29.797	0.162847	6.86317	0	0
23	30.2254	0.147458	5.32452	0	0
24	30.6538	0.144844	3.98765	0	0
25	31.0822	0.154999	2.96693	0	0
26	31.5106	0.177949	0	0	0

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List Of Coordinates

External Boundary

X	Y
0	-5
42	-5
42	0
32	0
21	4
18	3
10	0
0	0

Material Boundary

X	Y
10	0
26	0
32	0

Material Boundary

X	Y
18	3
26	0



SLIDEINTERPRET 6.029

Project

Pembrey Racetrack Spectator Bunds

Analysis Description

Effective Stress Long Term Analysis

Drawn By

Ewan Thomas

Scale

Company

Geotechnology Ltd

Date

20/06/2014, 12:24:14

File Name

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