Temporary Works Design Report

Saggart Reservoir

Slope Stability Check for Filling of Hinchs Field

Contractor	Coffey Construction
Project No.	2965
Design Report No:	NK-2965-REP- 008

Rev.	Date	Description	Designed by	Checked By
1	13/09/21	first issue	dg	nk
2	10/02/22	clarification on slope angle added	dg	nk
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Introduction

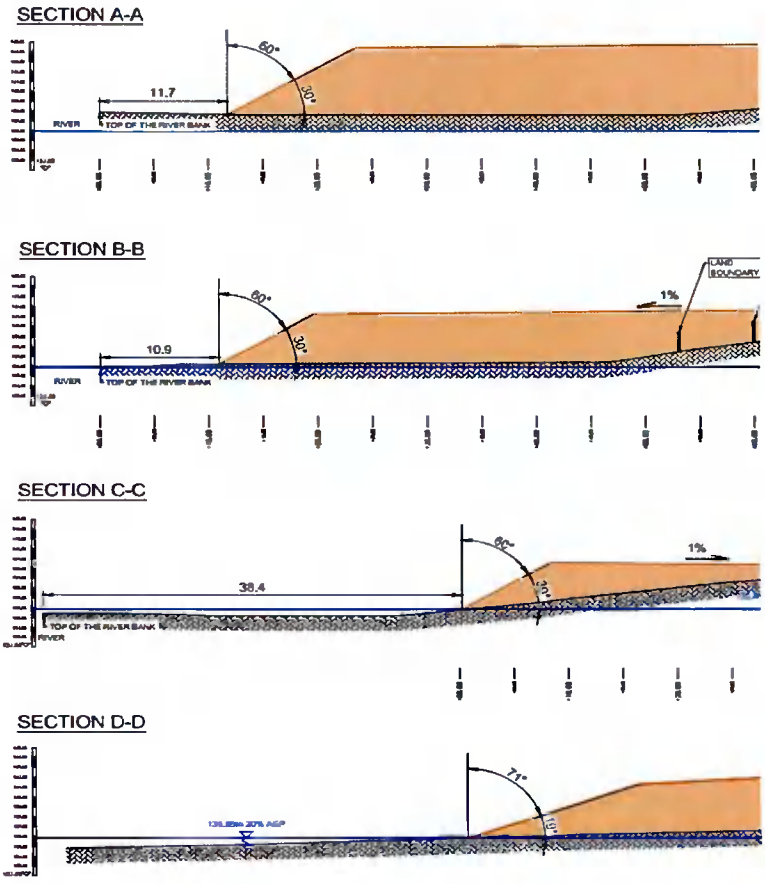
NK Engineering have been appointed by Coffey Construction to assess the slope stability of the proposed filling of the area adjacent to the reservoir site known as Hinchs Field.
The field shall be filled and compacted with surplus arisings from the reservoir site works.

Design Basis

The excavation slope stability shall utilise GEO5 Slope Stability Analysis software to calculate the circular slip surface with the lowest stability rating.

Results Summary

- Slope stability analysis confirms infill area side slopes up to 40 degrees are stable. Maximum proposed slope as per planning submission drawings is 30 degrees, therefore proposed slopes are stable.
- Long term surcharge loading to top of embankment not to exceed 5kPa



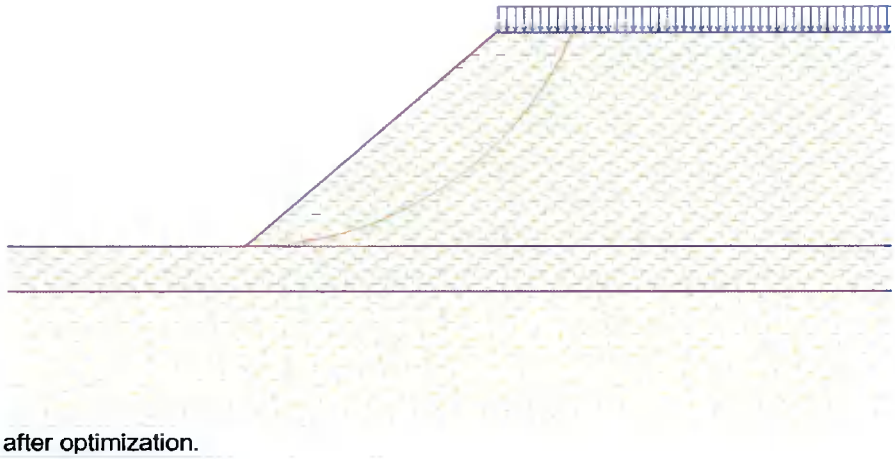
Extract from Planning submission drawing J1387-LH-001 rev 8 showing maximum proposed slopes of infill area

Slope Stability

The stability of the excavated slope is assessed using GEO5 Slope Stability Analysis software to verify that a minimum factor of safety of 1.5 is achieved for all slip surfaces using the Bishop method of analysis.

The critical slip surface is shown below with the full analysis report contained in Appendix A and verified the stability of the excavation.

Name : Hinchs Field – 7m Maximum Height | **Stage - analysis : 1 - 1**



The slip surface after optimization.

Slope stability verification (Bishop)

Sum of active forces : F_a = 250.70 kN/m
Sum of passive forces : F_p = 390.95 kN/m

Sliding moment : M_a = 2958.30 kNm/m
Resisting moment : M_p = 4613.25 kNm/m
Factor of safety = 1.56 > 1.50
Slope stability ACCEPTABLE

Appendix A - Slope Stability Analysys

Slope stability analysis

Input data

Project

Task : Slope Stability - Liam Hinch Field
Description : Hinchs Field
Customer : Coffey Construction
Author : D Nolan
Date : 12/09/2021
Project ID : 2965

Settings

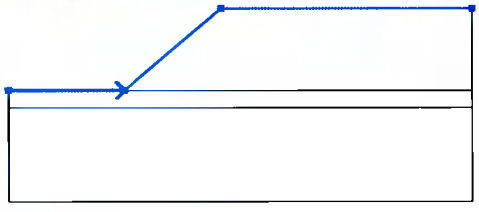
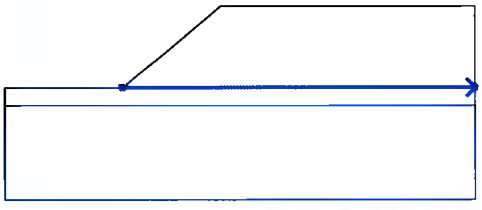
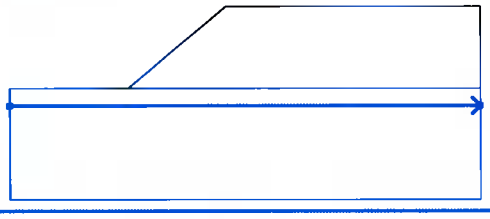
Standard - safety factors

Stability analysis

Earthquake analysis : Standard
Verification methodology : Safety factors (ASD)

Safety factors		
Permanent design situation		
Safety factor :	SF_s =	1.50 [–]

Interface

No.	Interface location	Coordinates of interface points [m]					
		x	z	x	z	x	z
1		0.00	0.00	10.00	0.00	18.34	7.00
		40.00	7.00				
2		10.00	0.00	40.00	0.00		
3		0.00	-1.50	40.00	-1.50		

Soil parameters - effective stress state

No.	Name	Pattern	φ_{ef} [°]	c_{ef} [kPa]	γ [kN/m^3]
1	Sandy clay (CS), firm consistency		24.50	14.00	18.50

No.	Name	Pattern	φ_{ef} [°]	c_{ef} [kPa]	γ [kN/m^3]
2	Sandy clay (CS), stiff consistency, Sr < 0.8		24.50	33.00	18.50
3	Sandy clay (CS), very stiff consistency, Sr > 0.8		24.50	40.00	18.00

Soil parameters - uplift

No.	Name	Pattern	γ_{sat} [kN/m^3]	γ_s [kN/m^3]	n [–]
1	Sandy clay (CS), firm consistency		18.50		
2	Sandy clay (CS), stiff consistency, Sr < 0.8		18.50		
3	Sandy clay (CS), very stiff consistency, Sr > 0.8		18.00		

Soil parameters

Sandy clay (CS), firm consistency

Unit weight : γ = 18.50 kN/m^3
Stress-state : effective
Angle of internal friction : φ_{ef} = 24.50 °
Cohesion of soil : c_{ef} = 14.00 kPa
Saturated unit weight : γ_{sat} = 18.50 kN/m^3

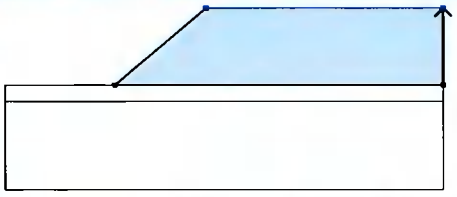
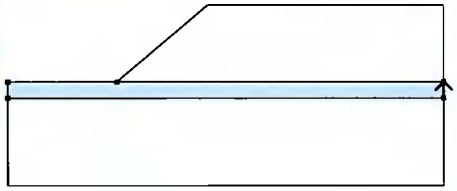
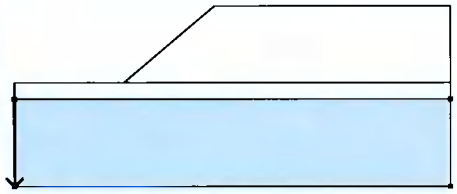
Sandy clay (CS), stiff consistency, Sr < 0.8

Unit weight : γ = 18.50 kN/m^3
Stress-state : effective
Angle of internal friction : φ_{ef} = 24.50 °
Cohesion of soil : c_{ef} = 33.00 kPa
Saturated unit weight : γ_{sat} = 18.50 kN/m^3

Sandy clay (CS), very stiff consistency, Sr > 0.8

Unit weight : γ = 18.00 kN/m^3
Stress-state : effective
Angle of internal friction : φ_{ef} = 24.50 °
Cohesion of soil : c_{ef} = 40.00 kPa
Saturated unit weight : γ_{sat} = 18.00 kN/m^3

Assigning and surfaces

No.	Surface position	Coordinates of surface points [m] x	z	x	z	Assigned soil
1		40.00 18.34	0.00 7.00	40.00 10.00	7.00 0.00	Sandy clay (CS), firm consistency
2		40.00 10.00 0.00	-1.50 0.00 -1.50	40.00 0.00	0.00 0.00	Sandy clay (CS), firm consistency
3		0.00 40.00	-1.50 -9.50	0.00 40.00	-9.50 -1.50	Sandy clay (CS), stiff consistency, Sr < 0.8

Surcharge

No.	Type	Type of action	Location z [m]	Origin x [m]	Length l [m]	Width b [m]	Slope α [°]	Magnitude q, q_1, f, F, x	Magnitude q_2, z	unit
1	strip	variable	on terrain	x = 18.40	l = 21.00		0.00	5.00		kN/m²

Surcharges

No.	Name
1	Non Vehciular Surcharge Loading

Water

Water type : No water

Tensile crack

Tensile crack not input.

Earthquake

Earthquake not included.

Settings of the stage of construction

Design situation : permanent

Results (Stage of construction 1)

Analysis 1

Circular slip surface

Slip surface parameters					
Center :	x =	10.11 [m]	Angles :	α_1 =	-0.53 [°]
	z =	11.80 [m]		α_2 =	66.00 [°]
Radius :	R =	11.80 [m]			
The slip surface after optimization.					

Slope stability verification (Bishop)

Sum of active forces : F_a = 250.70 kN/m

Sum of passive forces : F_p = 390.95 kN/m

Sliding moment : M_a = 2958.30 kNm/m

Resisting moment : M_p = 4613.25 kNm/m

Factor of safety = 1.56 > 1.50

Slope stability ACCEPTABLE

Optimization of circular slip surface (Bishop)

No.	Center		Radius	FS	Verification
	x [m]	z [m]	R [m]		
1	10.11	11.80	11.80	1.56	ACCEPTABLE
2	10.11	11.80	11.80	1.56	ACCEPTABLE
3	10.11	11.80	11.80	1.56	ACCEPTABLE
4	-91.45	411.67	422.16	3.64	ACCEPTABLE
5	11.69	17.83	20.25	2.60	ACCEPTABLE
6	14.31	7.83	14.52	3.68	ACCEPTABLE
7	4.50	45.28	45.34	2.17	ACCEPTABLE
8	10.11	11.80	11.80	1.56	ACCEPTABLE
9	-15.26	97.58	99.60	2.68	ACCEPTABLE
10	11.54	15.46	16.90	1.97	ACCEPTABLE
11	20.42	7.02	5.75	10.20	ACCEPTABLE
12	13.90	8.23	12.33	2.97	ACCEPTABLE
13	-0.43	24.17	25.23	140.99	ACCEPTABLE
14	3.35	18.12	18.17	111.08	ACCEPTABLE
15	6.47	30.99	31.04	1.89	ACCEPTABLE
16	10.11	11.80	11.80	1.56	ACCEPTABLE
17	-15.33	97.30	98.65	3.11	ACCEPTABLE
18	-1.83	47.74	48.46	2.07	ACCEPTABLE
19	11.36	13.96	14.79	1.81	ACCEPTABLE
20	17.96	7.68	6.48	3.51	ACCEPTABLE
21	13.42	8.69	11.12	2.44	ACCEPTABLE
22	6.32	12.97	12.97	3.33	ACCEPTABLE
23	7.75	23.20	23.23	1.73	ACCEPTABLE
24	10.11	11.80	11.80	1.56	ACCEPTABLE
25	8.37	24.88	23.25	2.09	ACCEPTABLE
26	3.46	30.19	30.48	1.83	ACCEPTABLE
27	11.16	13.03	13.49	1.72	ACCEPTABLE
28	15.95	8.48	7.44	2.35	ACCEPTABLE
29	12.89	9.19	10.58	1.86	ACCEPTABLE
30	8.31	13.27	12.00	2.96	ACCEPTABLE
31	7.76	11.80	11.80	2.05	ACCEPTABLE
32	10.39	7.71	8.18	1.90	ACCEPTABLE
33	8.58	18.78	18.80	1.65	ACCEPTABLE

No.	Center x [m]	Center z [m]	Radius R [m]	FS	Verification
34	15.60	9.23	7.95	2.23	ACCEPTABLE
35	10.11	11.80	11.80	1.56	ACCEPTABLE
36	12.90	12.02	10.79	1.80	ACCEPTABLE
37	12.63	8.00	6.77	1.80	ACCEPTABLE
38	-7.59	49.62	52.15	2.04	ACCEPTABLE
39	9.88	17.82	16.59	1.82	ACCEPTABLE
40	6.11	22.19	22.31	1.69	ACCEPTABLE
41	10.96	12.48	12.73	1.66	ACCEPTABLE
42	14.34	9.26	8.42	1.93	ACCEPTABLE
43	12.35	9.70	10.46	1.73	ACCEPTABLE
44	12.83	7.73	6.54	1.81	ACCEPTABLE
45	6.36	15.21	15.35	1.93	ACCEPTABLE
46	9.49	12.28	11.16	1.94	ACCEPTABLE
47	8.54	11.80	11.80	1.71	ACCEPTABLE
48	10.45	8.84	9.06	1.72	ACCEPTABLE
49	9.11	16.18	16.19	1.60	ACCEPTABLE
50	13.60	10.69	9.59	1.84	ACCEPTABLE
51	10.11	11.80	11.80	1.56	ACCEPTABLE
52	11.28	13.19	12.32	1.69	ACCEPTABLE
53	11.73	9.28	8.43	1.69	ACCEPTABLE
54	3.36	25.89	26.49	1.76	ACCEPTABLE
55	10.17	15.17	14.32	1.70	ACCEPTABLE
56	7.61	18.03	18.08	1.63	ACCEPTABLE
57	14.31	7.82	7.67	1.95	ACCEPTABLE
58	10.77	12.16	12.30	1.63	ACCEPTABLE
59	13.12	9.93	9.29	1.75	ACCEPTABLE
60	11.84	10.18	10.58	1.66	ACCEPTABLE
61	11.75	9.25	8.40	1.69	ACCEPTABLE
62	7.56	14.14	14.20	1.70	ACCEPTABLE
63	9.84	12.00	11.19	1.73	ACCEPTABLE
64	9.07	11.80	11.80	1.61	ACCEPTABLE
65	12.43	7.01	7.42	1.72	ACCEPTABLE
66	11.46	8.07	8.45	1.68	ACCEPTABLE
67	11.94	7.32	7.91	1.72	ACCEPTABLE
68	10.42	9.69	9.80	1.65	ACCEPTABLE
69	12.62	8.00	7.30	1.73	ACCEPTABLE
70	9.46	14.60	14.61	1.64	ACCEPTABLE
71	12.31	11.36	10.56	1.70	ACCEPTABLE
72	10.11	11.80	11.80	1.56	ACCEPTABLE
73	10.65	13.12	12.53	1.64	ACCEPTABLE
74	11.16	10.13	9.56	1.63	ACCEPTABLE
75	6.57	19.06	19.26	1.65	ACCEPTABLE
76	10.22	13.84	13.27	1.64	ACCEPTABLE
77	8.51	15.67	15.69	1.59	ACCEPTABLE
78	13.08	8.99	8.74	1.73	ACCEPTABLE
79	10.61	11.99	12.06	1.60	ACCEPTABLE

No.	Center		Radius	FS	Verification
	x [m]	z [m]	R [m]		
80	12.21	10.47	10.00	1.66	ACCEPTABLE
81	11.40	10.59	10.80	1.62	ACCEPTABLE
82	11.15	10.15	9.57	1.63	ACCEPTABLE
83	8.40	13.38	13.41	1.62	ACCEPTABLE
84	9.97	11.90	11.33	1.65	ACCEPTABLE
85	9.41	11.80	11.80	1.58	ACCEPTABLE
86	11.88	8.18	8.39	1.63	ACCEPTABLE
87	13.08	7.30	7.12	1.77	ACCEPTABLE
88	11.14	9.11	9.30	1.62	ACCEPTABLE
89	12.50	8.15	7.78	1.69	ACCEPTABLE
90	11.61	8.38	8.69	1.65	ACCEPTABLE
91	10.36	10.32	10.38	1.62	ACCEPTABLE
92	11.89	9.06	8.56	1.65	ACCEPTABLE
93	9.68	13.61	13.62	1.62	ACCEPTABLE
94	11.51	11.65	11.09	1.64	ACCEPTABLE
95	10.11	11.80	11.80	1.56	ACCEPTABLE
96	10.38	12.81	12.42	1.61	ACCEPTABLE
97	10.80	10.69	10.31	1.60	ACCEPTABLE
98	8.04	16.00	16.07	1.60	ACCEPTABLE
99	10.21	13.08	12.70	1.61	ACCEPTABLE
100	9.07	14.26	14.27	1.57	ACCEPTABLE
101	12.17	9.85	9.61	1.64	ACCEPTABLE
102	10.47	11.90	11.94	1.59	ACCEPTABLE
103	11.55	10.87	10.53	1.62	ACCEPTABLE
104	11.05	10.93	11.03	1.59	ACCEPTABLE
105	10.79	10.72	10.33	1.61	ACCEPTABLE
106	8.96	12.87	12.88	1.59	ACCEPTABLE
107	10.03	11.85	11.47	1.61	ACCEPTABLE
108	9.65	11.80	11.80	1.57	ACCEPTABLE
109	11.42	9.15	9.26	1.59	ACCEPTABLE
110	12.29	8.45	8.26	1.66	ACCEPTABLE
111	10.87	9.90	9.98	1.59	ACCEPTABLE
112	11.84	9.13	8.85	1.63	ACCEPTABLE
113	11.27	9.27	9.43	1.61	ACCEPTABLE
114	10.30	10.78	10.81	1.60	ACCEPTABLE
115	11.35	9.87	9.52	1.61	ACCEPTABLE
116	9.83	12.98	12.99	1.61	ACCEPTABLE
117	11.01	11.76	11.38	1.61	ACCEPTABLE
118	10.11	11.80	11.80	1.56	ACCEPTABLE
119	10.25	12.52	12.26	1.59	ACCEPTABLE
120	10.56	11.07	10.81	1.59	ACCEPTABLE
121	8.83	14.38	14.40	1.58	ACCEPTABLE
122	10.19	12.63	12.37	1.59	ACCEPTABLE
123	9.43	13.39	13.40	1.64	ACCEPTABLE
124	11.52	10.47	10.28	1.60	ACCEPTABLE
125	10.36	11.85	11.87	1.58	ACCEPTABLE

No.	Center		Radius	FS	Verification
	x [m]	z [m]	R [m]		
126	11.09	11.16	10.93	1.59	ACCEPTABLE
127	10.77	11.18	11.23	1.58	ACCEPTABLE
128	10.55	11.08	10.83	1.59	ACCEPTABLE
129	9.34	12.51	12.52	1.57	ACCEPTABLE
130	10.07	11.83	11.57	1.59	ACCEPTABLE
131	9.80	11.80	11.80	1.56	ACCEPTABLE
132	11.05	9.91	9.96	1.57	ACCEPTABLE
133	11.67	9.38	9.22	1.61	ACCEPTABLE
134	10.65	10.47	10.51	1.58	ACCEPTABLE
135	11.33	9.90	9.70	1.60	ACCEPTABLE
136	10.98	9.97	10.05	1.59	ACCEPTABLE
137	10.25	11.10	11.12	1.59	ACCEPTABLE
138	10.96	10.46	10.22	1.59	ACCEPTABLE
139	9.92	12.58	12.58	1.56	ACCEPTABLE
140	10.70	11.80	11.55	1.59	ACCEPTABLE
141	10.11	11.80	11.80	1.56	ACCEPTABLE
142	10.19	12.30	12.13	1.58	ACCEPTABLE
143	10.41	11.31	11.14	1.58	ACCEPTABLE
144	9.29	13.43	13.44	1.57	ACCEPTABLE
145	10.16	12.34	12.17	1.58	ACCEPTABLE
146	9.66	12.84	12.84	1.56	ACCEPTABLE
147	11.07	10.89	10.76	1.58	ACCEPTABLE
148	10.29	11.83	11.84	1.57	ACCEPTABLE
149	10.78	11.36	11.20	1.58	ACCEPTABLE
150	10.57	11.37	11.40	1.58	ACCEPTABLE
151	10.40	11.33	11.15	1.58	ACCEPTABLE
152	9.60	12.28	12.28	1.56	ACCEPTABLE
153	10.08	11.82	11.64	1.58	ACCEPTABLE
154	9.90	11.80	11.80	1.56	ACCEPTABLE
155	10.77	10.48	10.50	1.57	ACCEPTABLE
156	11.21	10.09	9.97	1.59	ACCEPTABLE
157	10.49	10.88	10.91	1.58	ACCEPTABLE
158	10.96	10.48	10.33	1.58	ACCEPTABLE
159	10.73	10.51	10.55	1.58	ACCEPTABLE
160	10.21	11.33	11.33	1.56	ACCEPTABLE
161	10.69	10.89	10.72	1.58	ACCEPTABLE
162	9.98	12.31	12.32	1.59	ACCEPTABLE
163	10.49	11.81	11.64	1.58	ACCEPTABLE
164	10.11	11.80	11.80	1.56	ACCEPTABLE
165	10.16	12.14	12.02	1.57	ACCEPTABLE
166	10.31	11.48	11.36	1.57	ACCEPTABLE
167	9.58	12.85	12.86	1.62	ACCEPTABLE
168	10.15	12.15	12.04	1.57	ACCEPTABLE
169	9.81	12.49	12.49	1.56	ACCEPTABLE
170	10.76	11.19	11.09	1.57	ACCEPTABLE
171	10.23	11.82	11.82	1.56	ACCEPTABLE

No.	Center		Radius	FS	Verification
	x [m]	z [m]	R [m]		
172	10.56	11.50	11.40	1.57	ACCEPTABLE
173	10.43	11.51	11.52	1.56	ACCEPTABLE
174	10.30	11.49	11.37	1.57	ACCEPTABLE
175	9.77	12.12	12.12	1.56	ACCEPTABLE
176	10.09	11.81	11.69	1.57	ACCEPTABLE
177	9.97	11.80	11.80	1.56	ACCEPTABLE
178	10.57	10.89	10.90	1.56	ACCEPTABLE
179	10.87	10.61	10.52	1.58	ACCEPTABLE
180	10.37	11.18	11.19	1.57	ACCEPTABLE
181	10.69	10.89	10.79	1.57	ACCEPTABLE
182	10.55	10.90	10.93	1.58	ACCEPTABLE
183	10.18	11.48	11.48	1.56	ACCEPTABLE
184	10.50	11.18	11.07	1.57	ACCEPTABLE
185	10.03	12.14	12.14	1.56	ACCEPTABLE
186	10.36	11.81	11.70	1.57	ACCEPTABLE
187	10.11	11.80	11.80	1.56	ACCEPTABLE
188	10.14	12.03	11.95	1.57	ACCEPTABLE
189	10.24	11.58	11.51	1.57	ACCEPTABLE
190	9.76	12.49	12.49	1.56	ACCEPTABLE
191	10.14	12.03	11.96	1.57	ACCEPTABLE
192	9.91	12.25	12.25	1.56	ACCEPTABLE
193	10.55	11.39	11.32	1.57	ACCEPTABLE
194	10.19	11.81	11.81	1.56	ACCEPTABLE
195	10.41	11.60	11.53	1.57	ACCEPTABLE
196	10.32	11.60	11.61	1.57	ACCEPTABLE
197	10.24	11.59	11.51	1.57	ACCEPTABLE
198	9.88	12.01	12.01	1.56	ACCEPTABLE
199	10.10	11.81	11.73	1.57	ACCEPTABLE
200	10.02	11.80	11.80	1.56	ACCEPTABLE
201	10.42	11.18	11.18	1.56	ACCEPTABLE
202	10.63	10.99	10.92	1.57	ACCEPTABLE
203	10.29	11.38	11.38	1.56	ACCEPTABLE
204	10.50	11.18	11.11	1.57	ACCEPTABLE
205	10.41	11.19	11.20	1.56	ACCEPTABLE
206	10.16	11.59	11.59	1.56	ACCEPTABLE
207	10.37	11.38	11.31	1.57	ACCEPTABLE
208	10.05	12.03	12.03	1.56	ACCEPTABLE
209	10.28	11.81	11.74	1.57	ACCEPTABLE
210	10.11	11.80	11.80	1.56	ACCEPTABLE
211	10.13	11.95	11.90	1.56	ACCEPTABLE
212	10.20	11.66	11.61	1.56	ACCEPTABLE
213	9.88	12.25	12.25	1.56	ACCEPTABLE
214	10.13	11.95	11.90	1.56	ACCEPTABLE
215	9.98	12.10	12.10	1.56	ACCEPTABLE
216	10.40	11.52	11.48	1.56	ACCEPTABLE
217	10.16	11.81	11.81	1.56	ACCEPTABLE

No.	Center x [m]	Center z [m]	Radius R [m]	FS	Verification
218	10.31	11.67	11.62	1.56	ACCEPTABLE
219	10.25	11.67	11.67	1.56	ACCEPTABLE
220	10.20	11.66	11.61	1.56	ACCEPTABLE
221	9.96	11.94	11.94	1.56	ACCEPTABLE
222	10.10	11.80	11.75	1.56	ACCEPTABLE
223	10.05	11.80	11.80	1.56	ACCEPTABLE
224	10.32	11.38	11.38	1.56	ACCEPTABLE
225	10.46	11.25	11.20	1.57	ACCEPTABLE
226	10.23	11.52	11.52	1.56	ACCEPTABLE
227	10.38	11.38	11.33	1.57	ACCEPTABLE
228	10.32	11.38	11.39	1.57	ACCEPTABLE
229	10.14	11.66	11.66	1.56	ACCEPTABLE
230	10.29	11.52	11.47	1.56	ACCEPTABLE
231	10.07	11.95	11.95	1.56	ACCEPTABLE
232	10.22	11.81	11.76	1.56	ACCEPTABLE
233	10.11	11.80	11.80	1.56	ACCEPTABLE
234	10.12	11.90	11.87	1.56	ACCEPTABLE
235	10.17	11.70	11.67	1.56	ACCEPTABLE
236	9.96	12.10	12.10	1.56	ACCEPTABLE
237	10.12	11.90	11.87	1.56	ACCEPTABLE
238	10.02	12.00	12.00	1.56	ACCEPTABLE
239	10.31	11.62	11.58	1.56	ACCEPTABLE
240	10.15	11.80	11.81	1.58	ACCEPTABLE
241	10.25	11.71	11.68	1.56	ACCEPTABLE
242	10.21	11.71	11.71	1.56	ACCEPTABLE
243	10.17	11.71	11.67	1.56	ACCEPTABLE
244	10.01	11.90	11.90	1.56	ACCEPTABLE
245	10.11	11.80	11.77	1.56	ACCEPTABLE
246	10.07	11.80	11.80	1.56	ACCEPTABLE
247	10.25	11.52	11.52	1.56	ACCEPTABLE
248	10.35	11.43	11.40	1.56	ACCEPTABLE
249	10.19	11.61	11.61	1.56	ACCEPTABLE
250	10.29	11.52	11.49	1.56	ACCEPTABLE
251	10.25	11.52	11.52	1.56	ACCEPTABLE
252	10.13	11.70	11.71	1.58	ACCEPTABLE
253	10.23	11.61	11.58	1.56	ACCEPTABLE
254	10.08	11.90	11.90	1.56	ACCEPTABLE
255	10.18	11.81	11.77	1.56	ACCEPTABLE
256	10.11	11.80	11.80	1.56	ACCEPTABLE
257	10.12	11.87	11.85	1.56	ACCEPTABLE
258	10.15	11.74	11.71	1.56	ACCEPTABLE
259	10.01	12.00	12.00	1.56	ACCEPTABLE
260	10.12	11.87	11.85	1.56	ACCEPTABLE
261	10.05	11.93	11.93	1.56	ACCEPTABLE
262	10.24	11.68	11.66	1.56	ACCEPTABLE
263	10.13	11.80	11.80	1.56	ACCEPTABLE

No.	Center		Radius	FS	Verification
	x [m]	z [m]	R [m]		
264	10.20	11.74	11.72	1.56	ACCEPTABLE
265	10.17	11.74	11.74	1.56	ACCEPTABLE
266	10.15	11.74	11.72	1.56	ACCEPTABLE
267	10.04	11.86	11.86	1.56	ACCEPTABLE
268	10.11	11.80	11.78	1.56	ACCEPTABLE
269	10.08	11.80	11.80	1.56	ACCEPTABLE
270	10.21	11.61	11.61	1.56	ACCEPTABLE
271	10.27	11.55	11.53	1.56	ACCEPTABLE
272	10.16	11.67	11.67	1.56	ACCEPTABLE
273	10.23	11.61	11.59	1.56	ACCEPTABLE
274	10.20	11.61	11.61	1.56	ACCEPTABLE
275	10.12	11.74	11.74	1.56	ACCEPTABLE
276	10.19	11.67	11.65	1.56	ACCEPTABLE
277	10.09	11.87	11.87	1.56	ACCEPTABLE
278	10.16	11.80	11.78	1.56	ACCEPTABLE
279	-91.45	411.67	422.16	3.64	ACCEPTABLE
280	28.92	19.49	14.72	63880636.39	ACCEPTABLE
281	17.41	19.66	23.10	3.48	ACCEPTABLE
282	-3.46	189.61	187.66	5.58	ACCEPTABLE
283	25.42	11.49	15.06	12.25	ACCEPTABLE
284	18.86	9.96	21.15	5.23	ACCEPTABLE
285	-89.55	405.00	415.23	3.64	ACCEPTABLE
286	11.20	17.01	20.26	2.81	ACCEPTABLE
287	14.65	23.42	27.52	3.41	ACCEPTABLE
288	19.12	17.01	20.26	3.95	ACCEPTABLE
289	17.60	8.01	19.16	5.17	ACCEPTABLE
290	8.52	9.50	12.63	3.05	ACCEPTABLE
291	9.21	7.45	11.69	3.38	ACCEPTABLE
292	19.40	15.87	19.47	4.08	ACCEPTABLE
293	11.20	17.01	20.25	2.81	ACCEPTABLE
294	17.79	11.65	16.94	3.77	ACCEPTABLE
295	10.66	13.42	14.38	1.81	ACCEPTABLE
296	6.48	36.29	36.83	2.43	ACCEPTABLE
297	16.76	12.42	13.21	2.60	ACCEPTABLE
298	12.76	10.65	16.46	3.32	ACCEPTABLE
299	-29.06	55.69	67.94	10.92	ACCEPTABLE
300	7.60	7.70	10.67	4.09	ACCEPTABLE
301	16.46	13.27	13.85	2.52	ACCEPTABLE
302	-210.72	745.66	774.91	4.76	ACCEPTABLE
303	-205.44	745.66	774.91	3.17	ACCEPTABLE
304	10.66	13.42	14.38	1.81	ACCEPTABLE
305	13.43	15.36	15.98	1.99	ACCEPTABLE
306	10.93	9.13	9.33	1.64	ACCEPTABLE
307	2.90	38.70	37.82	2.27	ACCEPTABLE
308	5.85	25.83	25.83	1.77	ACCEPTABLE
309	11.29	11.81	13.16	1.84	ACCEPTABLE

No.	Center x [m]	Center z [m]	Radius R [m]	FS	Verification
310	16.94	7.01	6.59	2.95	ACCEPTABLE
311	12.98	7.45	10.56	2.66	ACCEPTABLE
312	7.31	10.15	10.31	2.93	ACCEPTABLE
313	9.01	17.69	18.04	1.85	ACCEPTABLE
314	-143.76	328.00	360.36	4.48	ACCEPTABLE
315	10.93	9.13	9.33	1.64	ACCEPTABLE
316	-11.13	61.00	63.54	2.32	ACCEPTABLE
317	8.60	19.56	18.63	1.80	ACCEPTABLE
318	7.68	18.83	18.86	1.64	ACCEPTABLE
319	13.89	16.33	14.30	2.21	ACCEPTABLE
320	13.47	8.85	6.81	1.87	ACCEPTABLE
321	-32.89	132.96	138.50	2.73	ACCEPTABLE
322	-15.76	80.84	84.21	2.19	ACCEPTABLE
323	9.80	19.11	19.21	1.81	ACCEPTABLE
324	15.67	11.89	10.29	2.33	ACCEPTABLE
325	12.51	12.58	13.42	1.83	ACCEPTABLE
326	13.53	8.75	6.73	1.87	ACCEPTABLE
327	-22.61	64.22	71.35	2.97	ACCEPTABLE
328	4.64	19.69	19.94	1.95	ACCEPTABLE
329	9.64	10.95	11.11	1.73	ACCEPTABLE
330	14.48	7.29	5.55	2.00	ACCEPTABLE
331	4.73	31.36	31.51	1.85	ACCEPTABLE
332	14.61	14.54	12.61	2.23	ACCEPTABLE
333	7.68	18.83	18.86	1.64	ACCEPTABLE
334	8.77	24.13	22.88	1.98	ACCEPTABLE
335	11.33	12.29	10.85	1.75	ACCEPTABLE
336	1.53	40.05	39.93	2.10	ACCEPTABLE
337	-3.98	47.85	49.48	1.95	ACCEPTABLE
338	15.70	8.90	8.45	2.27	ACCEPTABLE
339	9.30	18.77	18.78	1.68	ACCEPTABLE
340	13.65	13.41	12.12	1.96	ACCEPTABLE
341	11.60	13.72	14.05	1.73	ACCEPTABLE
342	11.02	12.80	11.37	1.76	ACCEPTABLE
343	2.54	26.67	26.84	2.07	ACCEPTABLE
344	5.42	19.69	19.94	1.75	ACCEPTABLE
345	12.80	7.72	8.04	1.72	ACCEPTABLE
346	11.39	9.27	9.68	1.65	ACCEPTABLE
347	14.21	7.58	6.62	1.92	ACCEPTABLE
348	11.93	8.33	8.97	1.70	ACCEPTABLE
349	9.24	13.02	13.03	1.57	ACCEPTABLE
350	11.46	14.64	13.32	1.79	ACCEPTABLE
351	12.21	8.47	7.18	1.80	ACCEPTABLE
352	-23.17	80.15	86.16	2.22	ACCEPTABLE
353	8.02	21.18	20.17	1.86	ACCEPTABLE
354	3.74	26.69	27.10	1.77	ACCEPTABLE
355	10.43	13.39	13.54	1.66	ACCEPTABLE

No.	Center x [m]	Center z [m]	Radius R [m]	FS	Verification
356	13.94	9.93	8.92	1.87	ACCEPTABLE
357	11.96	10.34	10.92	1.70	ACCEPTABLE
358	12.02	8.73	7.42	1.80	ACCEPTABLE
359	4.93	17.22	17.58	2.13	ACCEPTABLE
360	7.84	14.36	13.56	2.13	ACCEPTABLE
361	7.63	13.06	13.09	1.81	ACCEPTABLE
362	10.02	9.39	9.52	1.75	ACCEPTABLE
363	13.17	7.18	6.06	1.86	ACCEPTABLE
364	8.11	17.99	18.00	1.62	ACCEPTABLE
365	12.91	11.89	10.64	1.80	ACCEPTABLE
366	9.24	13.02	13.03	1.57	ACCEPTABLE
367	9.88	15.52	14.68	1.70	ACCEPTABLE
368	11.16	9.99	9.10	1.69	ACCEPTABLE
369	-0.28	32.32	33.62	1.86	ACCEPTABLE
370	8.83	17.38	16.64	1.73	ACCEPTABLE
371	5.88	21.00	21.23	1.68	ACCEPTABLE
372	13.92	8.40	8.04	1.86	ACCEPTABLE
373	10.16	13.14	13.19	1.62	ACCEPTABLE
374	12.60	10.73	9.96	1.71	ACCEPTABLE
375	11.36	10.93	11.19	1.64	ACCEPTABLE
376	10.91	10.34	9.46	1.70	ACCEPTABLE
377	6.34	15.86	16.08	1.80	ACCEPTABLE
378	8.59	13.64	12.99	1.81	ACCEPTABLE
379	8.15	13.06	13.09	1.67	ACCEPTABLE
380	12.06	7.44	7.70	1.67	ACCEPTABLE
381	11.12	8.50	8.76	1.66	ACCEPTABLE
382	13.01	7.35	6.75	1.78	ACCEPTABLE
383	11.61	7.74	8.18	1.69	ACCEPTABLE
384	9.88	10.40	10.44	1.67	ACCEPTABLE
385	12.12	8.62	7.80	1.70	ACCEPTABLE
386	8.49	16.21	16.22	1.60	ACCEPTABLE
387	11.52	12.65	11.77	1.69	ACCEPTABLE
388	9.24	13.02	13.03	1.57	ACCEPTABLE
389	9.40	15.07	14.54	1.65	ACCEPTABLE
390	10.49	11.01	10.42	1.64	ACCEPTABLE
391	4.55	22.37	22.87	1.71	ACCEPTABLE
392	9.09	15.60	15.09	1.66	ACCEPTABLE
393	7.11	17.92	18.06	1.63	ACCEPTABLE
394	12.58	9.73	9.32	1.68	ACCEPTABLE
395	9.92	13.03	13.05	1.61	ACCEPTABLE
396	11.60	11.38	10.82	1.64	ACCEPTABLE
397	10.83	11.46	11.56	1.60	ACCEPTABLE
398	10.30	11.29	10.70	1.65	ACCEPTABLE
399	7.29	14.94	15.07	1.68	ACCEPTABLE
400	8.89	13.36	12.89	1.70	ACCEPTABLE
401	8.50	13.06	13.09	1.62	ACCEPTABLE

No.	Center		Radius	FS	Verification
	x [m]	z [m]	R [m]		
402	11.43	8.75	8.85	1.60	ACCEPTABLE
403	12.68	7.79	7.46	1.71	ACCEPTABLE
404	10.68	9.71	9.80	1.61	ACCEPTABLE
405	12.07	8.69	8.21	1.66	ACCEPTABLE
406	11.18	8.94	9.13	1.63	ACCEPTABLE
407	9.73	11.17	11.18	1.63	ACCEPTABLE
408	11.30	9.82	9.24	1.64	ACCEPTABLE
409	8.73	15.10	15.11	1.58	ACCEPTABLE
410	10.67	12.94	12.35	1.63	ACCEPTABLE
411	9.24	13.02	13.03	1.57	ACCEPTABLE
412	9.26	14.51	14.16	1.62	ACCEPTABLE
413	10.06	11.69	11.30	1.62	ACCEPTABLE
414	6.55	18.31	18.55	1.64	ACCEPTABLE
415	9.18	14.62	14.28	1.62	ACCEPTABLE
416	7.86	16.13	16.21	1.60	ACCEPTABLE
417	11.57	10.72	10.37	1.62	ACCEPTABLE
418	9.73	13.00	13.00	1.56	ACCEPTABLE
419	9.91	14.24	13.85	1.62	ACCEPTABLE
420	10.47	11.77	11.38	1.60	ACCEPTABLE
421	7.34	17.94	18.07	1.62	ACCEPTABLE
422	9.74	14.53	14.15	1.62	ACCEPTABLE
423	8.54	15.84	15.87	1.59	ACCEPTABLE
424	11.95	10.76	10.47	1.64	ACCEPTABLE
425	10.15	13.04	13.06	1.60	ACCEPTABLE
426	11.28	11.91	11.54	1.62	ACCEPTABLE
427	10.79	11.92	11.99	1.60	ACCEPTABLE
428	10.44	11.82	11.43	1.60	ACCEPTABLE
429	8.47	14.28	14.32	1.59	ACCEPTABLE
430	9.59	13.15	12.79	1.61	ACCEPTABLE
431	9.26	13.01	13.01	1.57	ACCEPTABLE
432	11.22	9.96	10.03	1.58	ACCEPTABLE
433	12.12	9.18	8.94	1.64	ACCEPTABLE
434	10.64	10.79	10.84	1.58	ACCEPTABLE
435	11.63	9.95	9.63	1.62	ACCEPTABLE
436	11.08	10.07	10.19	1.60	ACCEPTABLE
437	10.00	11.81	11.82	1.59	ACCEPTABLE
438	11.08	10.81	10.44	1.60	ACCEPTABLE
439	9.42	14.31	14.31	1.57	ACCEPTABLE
440	10.66	12.97	12.58	1.62	ACCEPTABLE
441	9.73	13.00	13.00	1.56	ACCEPTABLE
442	9.81	13.87	13.62	1.60	ACCEPTABLE
443	10.22	12.19	11.92	1.59	ACCEPTABLE
444	8.26	16.01	16.07	1.59	ACCEPTABLE
445	9.75	13.98	13.73	1.60	ACCEPTABLE
446	8.95	14.84	14.85	1.58	ACCEPTABLE
447	11.26	11.46	11.23	1.60	ACCEPTABLE

No.	Center		Radius	FS	Verification
	x [m]	z [m]	R [m]		
448	10.03	13.01	13.02	1.59	ACCEPTABLE
449	10.79	12.25	11.99	1.60	ACCEPTABLE
450	10.48	12.24	12.26	1.58	ACCEPTABLE
451	10.20	12.22	11.96	1.59	ACCEPTABLE
452	8.89	13.85	13.88	1.57	ACCEPTABLE
453	9.64	13.09	12.84	1.60	ACCEPTABLE
454	9.41	13.01	13.01	1.57	ACCEPTABLE
455	10.80	10.82	10.85	1.57	ACCEPTABLE
456	11.45	10.23	10.03	1.60	ACCEPTABLE
457	10.38	11.45	11.47	1.58	ACCEPTABLE
458	11.08	10.82	10.59	1.59	ACCEPTABLE
459	10.74	10.88	10.93	1.58	ACCEPTABLE
460	9.92	12.18	12.19	1.60	ACCEPTABLE
461	10.66	11.48	11.23	1.59	ACCEPTABLE
462	9.52	13.87	13.87	1.57	ACCEPTABLE
463	10.33	13.01	12.75	1.60	ACCEPTABLE
464	9.73	13.00	13.00	1.56	ACCEPTABLE
465	9.77	13.60	13.43	1.59	ACCEPTABLE
466	10.05	12.46	12.29	1.58	ACCEPTABLE
467	8.80	14.90	14.93	1.58	ACCEPTABLE
468	9.75	13.64	13.47	1.59	ACCEPTABLE
469	9.21	14.20	14.21	1.57	ACCEPTABLE
470	10.77	11.95	11.79	1.59	ACCEPTABLE
471	9.93	13.00	13.00	1.56	ACCEPTABLE
472	10.45	12.49	12.31	1.58	ACCEPTABLE
473	10.25	12.47	12.48	1.58	ACCEPTABLE
474	10.04	12.48	12.31	1.58	ACCEPTABLE
475	9.17	13.57	13.59	1.68	ACCEPTABLE
476	9.68	13.06	12.89	1.58	ACCEPTABLE
477	9.52	13.01	13.01	1.56	ACCEPTABLE
478	10.49	11.47	11.48	1.56	ACCEPTABLE
479	10.61	11.90	11.73	1.58	ACCEPTABLE
480	10.77	11.02	10.86	1.58	ACCEPTABLE
481	9.74	13.00	13.00	1.56	ACCEPTABLE
482	10.56	11.97	11.81	1.58	ACCEPTABLE
483	10.08	12.44	12.44	1.56	ACCEPTABLE
484	11.40	10.61	10.51	1.60	ACCEPTABLE
485	10.64	11.53	11.56	1.58	ACCEPTABLE
486	11.12	11.07	10.93	1.59	ACCEPTABLE
487	10.91	11.08	11.14	1.58	ACCEPTABLE
488	10.78	11.00	10.84	1.58	ACCEPTABLE
489	9.99	11.93	11.93	1.56	ACCEPTABLE
490	10.06	12.45	12.28	1.58	ACCEPTABLE
491	10.30	11.43	11.26	1.58	ACCEPTABLE
492	9.15	13.60	13.61	1.57	ACCEPTABLE
493	10.04	12.48	12.31	1.58	ACCEPTABLE

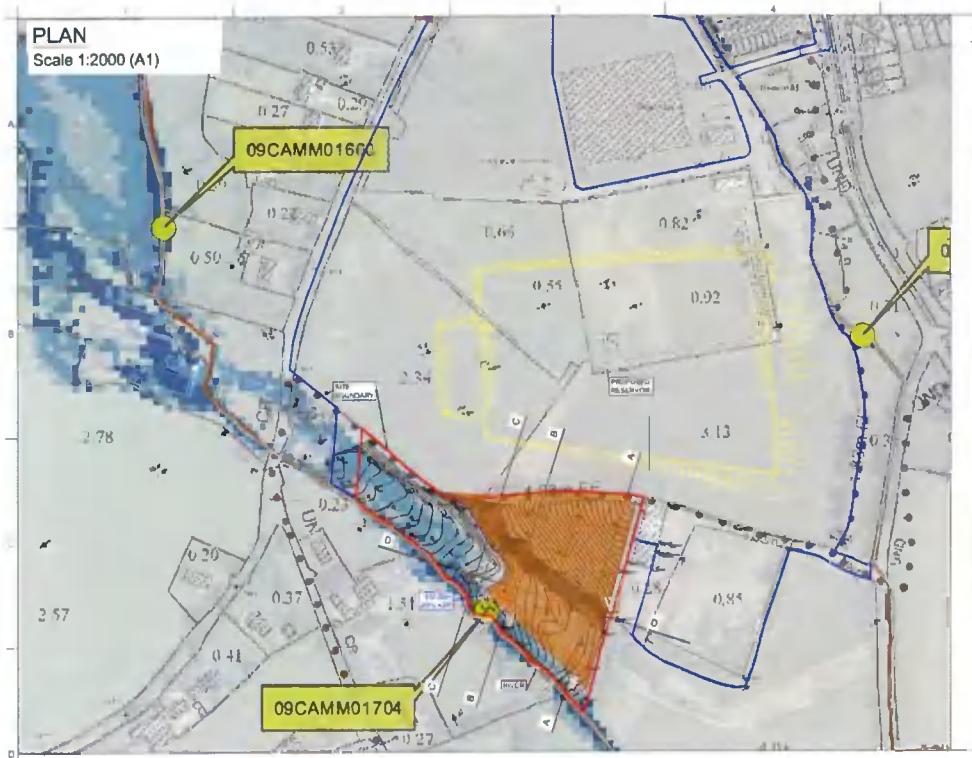
No.	Center		Radius	FS	Verification
	x [m]	z [m]	R [m]		
494	9.53	13.00	13.00	1.56	ACCEPTABLE
495	10.97	11.01	10.86	1.58	ACCEPTABLE
496	10.18	11.95	11.95	1.56	ACCEPTABLE
497	10.67	11.48	11.32	1.58	ACCEPTABLE
498	10.47	11.48	11.50	1.57	ACCEPTABLE
499	10.28	11.45	11.28	1.58	ACCEPTABLE
500	9.47	12.41	12.42	1.64	ACCEPTABLE
501	9.96	11.95	11.78	1.58	ACCEPTABLE
502	9.78	11.93	11.93	1.56	ACCEPTABLE
503	10.67	10.57	10.60	1.57	ACCEPTABLE
504	11.11	10.19	10.05	1.59	ACCEPTABLE
505	10.39	10.98	11.00	1.58	ACCEPTABLE
506	10.86	10.58	10.42	1.58	ACCEPTABLE
507	10.64	10.60	10.64	1.58	ACCEPTABLE
508	10.10	11.44	11.44	1.56	ACCEPTABLE
509	10.58	11.00	10.83	1.58	ACCEPTABLE
510	9.87	12.45	12.45	1.56	ACCEPTABLE
511	10.37	11.95	11.78	1.58	ACCEPTABLE
512	9.99	11.93	11.93	1.56	ACCEPTABLE
513	10.03	12.29	12.17	1.57	ACCEPTABLE
514	10.19	11.60	11.48	1.57	ACCEPTABLE
515	9.45	13.00	13.01	1.64	ACCEPTABLE
516	10.02	12.29	12.18	1.57	ACCEPTABLE
517	9.68	12.63	12.63	1.56	ACCEPTABLE
518	10.65	11.31	11.20	1.57	ACCEPTABLE
519	10.12	11.94	11.94	1.56	ACCEPTABLE
520	10.17	12.28	12.17	1.57	ACCEPTABLE
521	10.32	11.62	11.50	1.57	ACCEPTABLE
522	9.59	13.01	13.01	1.56	ACCEPTABLE
523	10.16	12.30	12.18	1.57	ACCEPTABLE
524	9.82	12.63	12.63	1.56	ACCEPTABLE
525	10.77	11.32	11.22	1.58	ACCEPTABLE
526	10.24	11.96	11.96	1.56	ACCEPTABLE
527	10.57	11.64	11.53	1.57	ACCEPTABLE
528	10.44	11.64	11.65	1.56	ACCEPTABLE
529	10.32	11.62	11.51	1.57	ACCEPTABLE
530	9.77	12.27	12.27	1.56	ACCEPTABLE
531	10.10	11.95	11.84	1.57	ACCEPTABLE
532	9.98	11.94	11.94	1.56	ACCEPTABLE
533	10.58	11.01	11.03	1.57	ACCEPTABLE
534	10.88	10.74	10.65	1.58	ACCEPTABLE
535	10.38	11.31	11.32	1.57	ACCEPTABLE
536	10.70	11.02	10.92	1.57	ACCEPTABLE
537	10.56	11.03	11.06	1.58	ACCEPTABLE
538	10.19	11.62	11.62	1.56	ACCEPTABLE
539	10.51	11.31	11.20	1.57	ACCEPTABLE

No.	Center		Radius	FS	Verification
	x [m]	z [m]	R [m]		
540	10.04	12.29	12.29	1.56	ACCEPTABLE
541	10.37	11.95	11.84	1.57	ACCEPTABLE
542	10.12	11.94	11.94	1.56	ACCEPTABLE
543	10.15	12.17	12.09	1.57	ACCEPTABLE
544	10.25	11.72	11.65	1.57	ACCEPTABLE
545	9.77	12.64	12.64	1.56	ACCEPTABLE
546	10.15	12.18	12.10	1.57	ACCEPTABLE
547	9.92	12.40	12.40	1.56	ACCEPTABLE
548	10.56	11.52	11.45	1.57	ACCEPTABLE
549	10.20	11.95	11.95	1.56	ACCEPTABLE
550	10.42	11.74	11.66	1.57	ACCEPTABLE
551	10.33	11.74	11.74	1.56	ACCEPTABLE
552	10.25	11.73	11.65	1.57	ACCEPTABLE
553	9.89	12.16	12.16	1.56	ACCEPTABLE
554	10.11	11.95	11.87	1.57	ACCEPTABLE
555	10.03	11.94	11.94	1.56	ACCEPTABLE
556	10.43	11.31	11.32	1.56	ACCEPTABLE
557	10.64	11.12	11.05	1.57	ACCEPTABLE
558	10.30	11.51	11.52	1.57	ACCEPTABLE
559	10.51	11.31	11.24	1.57	ACCEPTABLE
560	10.42	11.32	11.33	1.56	ACCEPTABLE
561	10.17	11.72	11.73	1.58	ACCEPTABLE
562	10.38	11.52	11.44	1.57	ACCEPTABLE
563	10.06	12.17	12.17	1.56	ACCEPTABLE
564	10.29	11.95	11.87	1.57	ACCEPTABLE
565	10.12	11.94	11.94	1.56	ACCEPTABLE
566	10.14	12.10	12.04	1.57	ACCEPTABLE
567	10.21	11.80	11.75	1.56	ACCEPTABLE
568	9.89	12.40	12.40	1.56	ACCEPTABLE
569	10.14	12.10	12.05	1.57	ACCEPTABLE
570	9.99	12.24	12.24	1.56	ACCEPTABLE
571	10.41	11.66	11.61	1.57	ACCEPTABLE
572	10.17	11.95	11.95	1.56	ACCEPTABLE
573	10.32	11.80	11.76	1.56	ACCEPTABLE
574	10.26	11.80	11.81	1.57	ACCEPTABLE
575	10.21	11.80	11.75	1.56	ACCEPTABLE
576	9.96	12.09	12.09	1.56	ACCEPTABLE
577	10.11	11.94	11.89	1.56	ACCEPTABLE
578	10.06	11.94	11.94	1.56	ACCEPTABLE
579	10.08	12.10	12.05	1.56	ACCEPTABLE
580	10.15	11.79	11.74	1.56	ACCEPTABLE
581	9.83	12.40	12.40	1.56	ACCEPTABLE
582	10.08	12.10	12.05	1.56	ACCEPTABLE
583	9.93	12.24	12.24	1.56	ACCEPTABLE
584	10.36	11.66	11.61	1.57	ACCEPTABLE
585	10.12	11.94	11.94	1.56	ACCEPTABLE

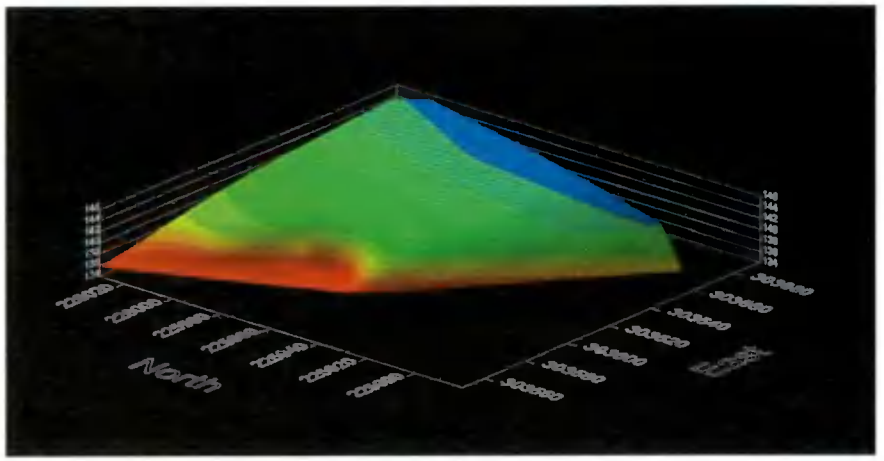
No.	Center		Radius	FS	Verification
	x [m]	z [m]	R [m]		
586	10.26	11.80	11.75	1.56	ACCEPTABLE
587	10.21	11.80	11.80	1.56	ACCEPTABLE
588	10.15	11.80	11.75	1.56	ACCEPTABLE
589	9.91	12.09	12.09	1.56	ACCEPTABLE
590	10.05	11.95	11.89	1.57	ACCEPTABLE
591	10.00	11.94	11.94	1.56	ACCEPTABLE
592	10.28	11.51	11.51	1.56	ACCEPTABLE
593	10.42	11.38	11.33	1.57	ACCEPTABLE
594	10.19	11.65	11.65	1.56	ACCEPTABLE
595	10.33	11.51	11.47	1.56	ACCEPTABLE
596	10.27	11.51	11.52	1.57	ACCEPTABLE
597	10.09	11.79	11.79	1.56	ACCEPTABLE
598	10.24	11.65	11.60	1.56	ACCEPTABLE
599	10.02	12.09	12.09	1.56	ACCEPTABLE
600	10.17	11.95	11.90	1.56	ACCEPTABLE
601	10.06	11.94	11.94	1.56	ACCEPTABLE
602	10.07	12.05	12.01	1.56	ACCEPTABLE
603	10.12	11.84	11.81	1.56	ACCEPTABLE
604	9.91	12.24	12.24	1.56	ACCEPTABLE
605	10.07	12.04	12.01	1.56	ACCEPTABLE
606	9.97	12.14	12.14	1.56	ACCEPTABLE
607	10.26	11.75	11.72	1.56	ACCEPTABLE
608	10.10	11.94	11.94	1.56	ACCEPTABLE
609	10.20	11.85	11.82	1.56	ACCEPTABLE
610	10.16	11.85	11.85	1.56	ACCEPTABLE
611	10.12	11.85	11.81	1.56	ACCEPTABLE
612	9.96	12.04	12.04	1.56	ACCEPTABLE
613	10.05	11.94	11.91	1.56	ACCEPTABLE
614	10.02	11.94	11.94	1.56	ACCEPTABLE
615	10.21	11.65	11.65	1.56	ACCEPTABLE
616	10.30	11.56	11.53	1.56	ACCEPTABLE
617	10.14	11.74	11.75	1.58	ACCEPTABLE
618	10.24	11.65	11.62	1.56	ACCEPTABLE
619	10.20	11.65	11.65	1.56	ACCEPTABLE
620	10.08	11.84	11.84	1.56	ACCEPTABLE
621	10.18	11.75	11.72	1.56	ACCEPTABLE
622	10.04	12.04	12.04	1.56	ACCEPTABLE
623	10.13	11.95	11.91	1.56	ACCEPTABLE
624	10.06	11.94	11.94	1.56	ACCEPTABLE
625	10.07	12.01	11.99	1.56	ACCEPTABLE
626	10.10	11.88	11.85	1.56	ACCEPTABLE
627	9.96	12.14	12.14	1.56	ACCEPTABLE
628	10.07	12.01	11.99	1.56	ACCEPTABLE
629	10.00	12.07	12.07	1.56	ACCEPTABLE
630	10.19	11.81	11.79	1.56	ACCEPTABLE
631	10.09	11.94	11.94	1.56	ACCEPTABLE

No.	Center		Radius	FS	Verification
	x [m]	z [m]	R [m]		
632	10.15	11.88	11.86	1.56	ACCEPTABLE
633	10.13	11.88	11.88	1.56	ACCEPTABLE
634	10.10	11.88	11.85	1.56	ACCEPTABLE
635	9.99	12.00	12.00	1.56	ACCEPTABLE
636	10.06	11.94	11.92	1.56	ACCEPTABLE
637	10.03	11.94	11.94	1.56	ACCEPTABLE
638	10.16	11.75	11.75	1.56	ACCEPTABLE
639	10.22	11.68	11.66	1.56	ACCEPTABLE
640	10.12	11.81	11.81	1.56	ACCEPTABLE
641	10.13	11.88	11.86	1.56	ACCEPTABLE
642	10.16	11.75	11.72	1.56	ACCEPTABLE
643	10.02	12.01	12.01	1.56	ACCEPTABLE
644	10.13	11.88	11.86	1.56	ACCEPTABLE
645	10.06	11.94	11.94	1.56	ACCEPTABLE
646	10.25	11.69	11.67	1.56	ACCEPTABLE
647	10.14	11.81	11.81	1.56	ACCEPTABLE
648	10.15	11.88	11.86	1.56	ACCEPTABLE
649	10.18	11.75	11.72	1.56	ACCEPTABLE
650	10.04	12.01	12.01	1.56	ACCEPTABLE
651	10.15	11.88	11.86	1.56	ACCEPTABLE
652	10.08	11.94	11.94	1.56	ACCEPTABLE
653	10.27	11.69	11.67	1.56	ACCEPTABLE
654	10.16	11.81	11.82	1.58	ACCEPTABLE
655	10.23	11.75	11.73	1.56	ACCEPTABLE
656	10.20	11.75	11.75	1.56	ACCEPTABLE
657	10.18	11.75	11.73	1.56	ACCEPTABLE
658	10.07	11.88	11.88	1.56	ACCEPTABLE
659	10.14	11.81	11.79	1.56	ACCEPTABLE
660	10.11	11.81	11.81	1.56	ACCEPTABLE
661	10.24	11.62	11.62	1.56	ACCEPTABLE
662	10.30	11.56	11.54	1.56	ACCEPTABLE
663	10.19	11.68	11.69	1.58	ACCEPTABLE
664	10.26	11.62	11.60	1.56	ACCEPTABLE
665	10.23	11.62	11.63	1.57	ACCEPTABLE
666	10.15	11.75	11.75	1.56	ACCEPTABLE
667	10.22	11.68	11.66	1.56	ACCEPTABLE
668	10.12	11.88	11.88	1.56	ACCEPTABLE
669	10.19	11.81	11.79	1.56	ACCEPTABLE
670	10.11	11.80	11.80	1.56	ACCEPTABLE

PLAN
Scale 1:2000 (A1)

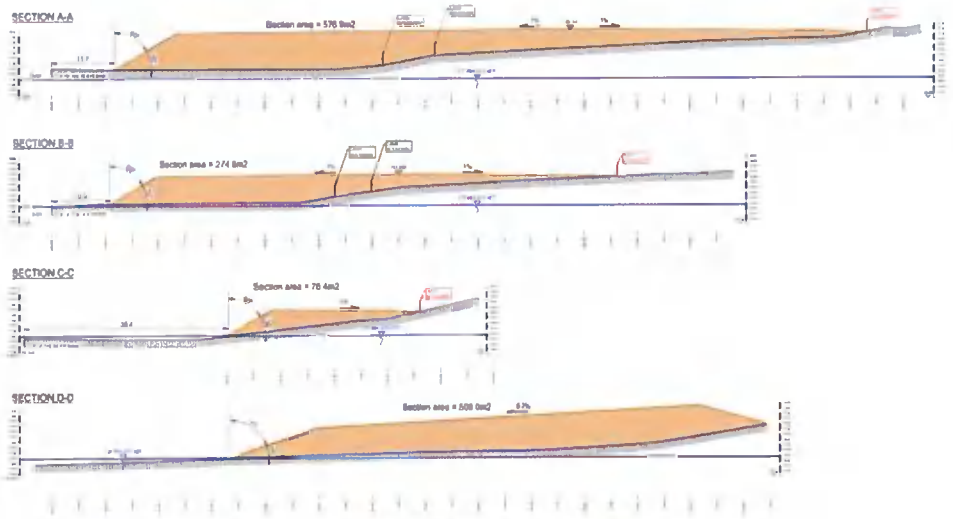


CUT / FILL MODEL



APPROX. FILL VOLUME: 36,588.49 m3
FILL SURFACE AREA: 11,333.00 m2

SECTIONS
Scale 1:500 (A1)



CUT / FILL VOLUMES

SURFACE TO SURFACE VOLUME REPORT

Trimble
5475 Kellenburger Road
Dayton, Ohio 45424-1098, USA
1-937-233-8921

Project: C:\Users\Dell\Desktop\Liam Hinch Field\Liam Hinch field 141221.prc
Report Generated: 14 grudnia 2021 08:58:32

Where the second surface is above the first the volume is reported as fill.
Where the second surface is below the first the volume is reported as excavation.

Shrinkage/swell factors: Excavation 1.0000 fill 1.0000

First Surface Layer Name	Number of Points	Second Surface Layer Name	Number of Points
OL	54	1_FILL	65

Excavation Volume (Cu. m.)	Fill Volume (Cu. m.)
1.12	36,588.49

Net Difference: 36,587.37 Cu. m. Borrow

KEY / SYMBOLS

- SITE BOUNDARY / FENCE
- L. HINCH FILE D BOUNDARY
- INFILL BOUNDARY
- FILL AREA

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ALL LEVELS ARE IN METRES AND RELATE TO THE ORDNANCE SURVEY DATUM MALIN HEAD UNLESS NOTED OTHERWISE
3. ENSURE THIS DRAWING IS THE RELEVANT REVISION AND READ IN CONJUNCTION WITH ALL RELEVANT DOCUMENTS
4. TO BE VIEWED ON A1 PAPER SIZE

REV.	DESCRIPTION	DATE	BY	CHECK
08	AS PER REVIEW	14/12/21	PW	AC
07	AEP UPDATE	10/12/21	PW	AC
06	SITE BOUNDARY COLOUR	29/11/21	PW	AC
05	PARKING SPACES ADDED	15/09/21	PW	AC
04	FLOOD RISK INCLUDED	29/03/21	PW	AC
03	SITE BOUNDARIES ADDED	12/03/21	PW	AC
02	REVISED LEVELS	14/02/21	PW	AC
01	FOR INFORMATION	12/02/21	PW	AC

APPROVED AC
CHECKED PS
DRAWN PW
DESIGNED
DATE

CONFIDENTIALITY NOTE

IRISH WATER
COLVIL HOUSE
24-26 TALBOT STREET
MOUNTJOY
DUBLIN 1 D01 NP86

rps

coffey

SAGGART RESERVOIR
DESIGN AND BUILT CONTRACT

J1387

LIAM HINCH FIELD
SECTIONS

FOR PLANNING APPLICATION

J1387-LH-001

08

Appendix 6 – Slope Stability Report