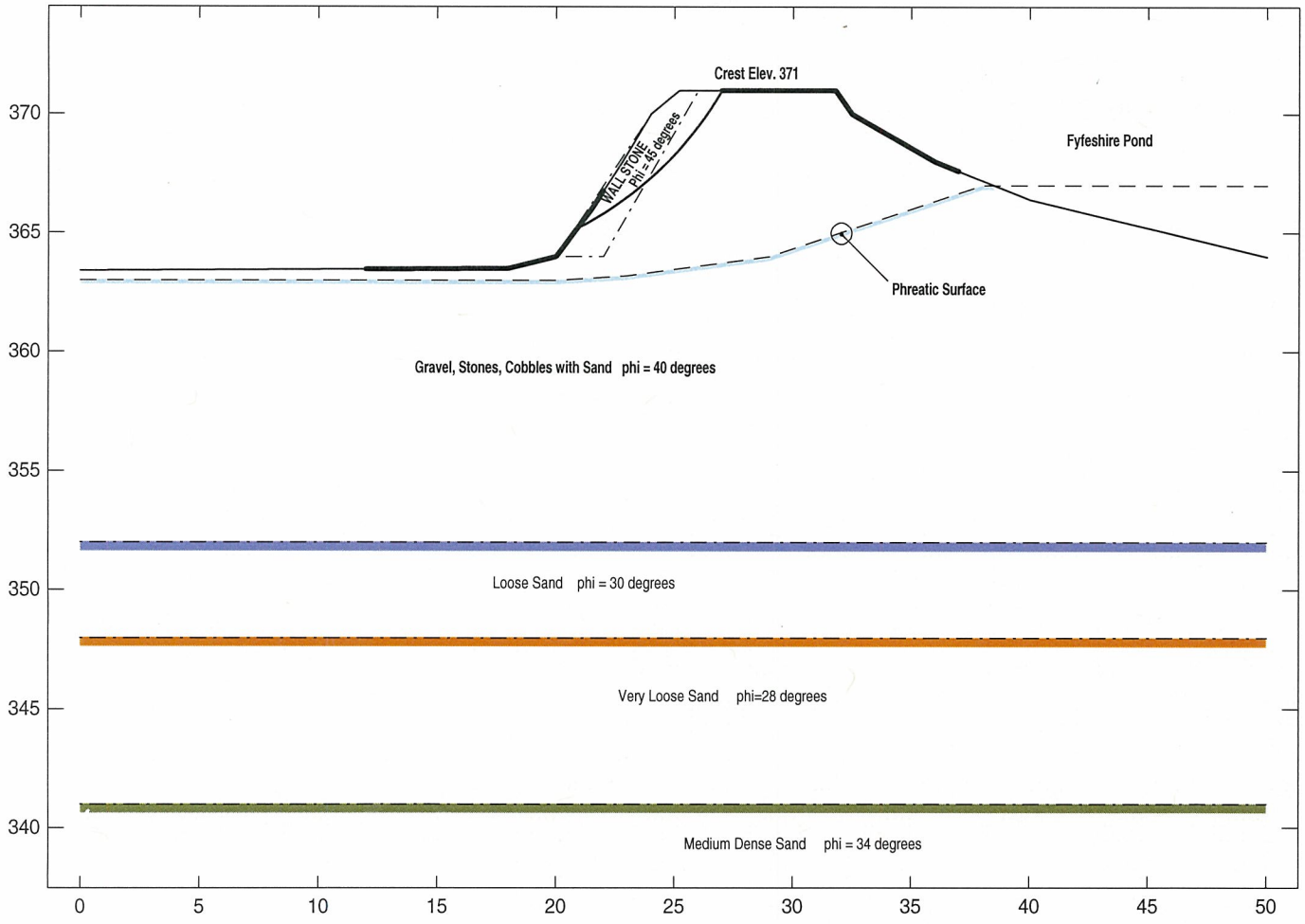


GALENA Version 4.02

Analysis: 1

Multiple Stability Analysis

Method: Bishop Simplified

Surface: Circular

Results

Critical (minimum)
Factor of Safety: 1.00

Project: Fyfeshire Dam
Fyfeshire Existing Conditions Pond Normal

File: C:\Galena Model Files\Fyfeshire.gmf

Fuss & O'Neill, Inc.

Project: Fyfeshire Dam
File: C:\Galena Model Files\Fyfeshire.gmf Processed: 17:57:18 21 Oct 2009

DATA: Analysis 1 - Fyfeshire Existing Conditions Pond Full

Material and Water Properties (5 materials)

Material: 1 (Mohr-Coulomb Isotropic) - Embankment Fill

Cohesion	Phi	UnitWeight	Ru
0.00	40.0	140.00	1.10

Material: 2 (Mohr-Coulomb Isotropic) - Loose Sand

Cohesion	Phi	UnitWeight	Ru
0.00	30.0	105.00	1.10

Material: 3 (Mohr-Coulomb Isotropic) - Very Loose Sand

Cohesion	Phi	UnitWeight	Ru
0.00	28.0	100.00	1.10

Material: 4 (Mohr-Coulomb Isotropic) - Medium Dense Sand

Cohesion	Phi	UnitWeight	Ru
0.00	34.0	115.00	1.10

Material: 5 (Mohr-Coulomb Isotropic) - Downstream Wall Stone

Cohesion	Phi	UnitWeight	Ru
0.00	45.0	145.00	1.10

Unit weight of water: 62.400 Unit weight of water/medium above ground: 0.000

Material Profiles (5 profiles)

Profile: 1 (2 points) Material beneath: 1 - Embankment Fill

0.00	371.00	50.00	371.00

Profile: 2 (2 points) Material beneath: 2 - Loose Sand

0.00	352.00	50.00	352.00

Profile: 3 (2 points) Material beneath: 3 - Very Loose Sand

0.00	348.00	50.00	348.00

Profile: 4 (2 points) Material beneath: 4 - Medium Dense Sand

0.00	341.00	50.00	341.00

Profile: 5 (6 points) Material within: 5 - Downstream Wall Stone

20.00	364.00	22.00	364.00	26.00	371.00	25.00	371.00	24.00	370.00
20.00	364.00								

Slope Surface (12 points)

0.00	363.40	18.00	363.50	20.00	364.00	21.50	366.00	22.80	368.00
24.00	370.00	25.20	371.00	31.80	371.00	32.50	370.00	36.00	368.00
40.00	366.40	50.00	364.00						

Phreatic Surface (10 points)

0.00	363.00	18.00	363.00	20.00	364.00	22.00	366.00	25.00	368.00
27.00	369.00	29.00	370.00	31.00	371.00	32.00	371.00	50.00	371.00

Failure Surface

Initial circular surface for critical search defined by: XL,XR,R
Circle centre: XC: 17.34 YC: 373.58 Circle radius: R: 10.00
Intersections: XL: 18.67 YL: 363.67 XR: 27.00 YR: 371.00
Generated failure surface (20 points)

18.67	363.67	19.28	363.77	19.88	363.91	20.47	364.08	21.06	364.30
21.62	364.54	22.18	364.83	22.71	365.14	23.22	365.49	23.71	365.87
24.17	366.28	24.61	366.72	25.02	367.18	25.40	367.67	25.75	368.18
26.07	368.71	26.36	369.26	26.61	369.83	26.82	370.41	27.00	371.00

Variable Restraints

Parameter descriptor:	XL	XR	R
Range of variation:	10.00	10.00	10.00
Trial positions within range:	10	10	5

RESULTS: Analysis 1 - Fyfeshire Existing Conditions Pond Full

Bishop Simplified Method of Analysis - Circular Failure Surface

Critical Failure Circle Search using Multiple Circle Generation Techniques

Factor of Safety for initial failure circle approximation: 1.43
There were: 292 successful analyses from a total of 501 trial circles
209 analyses aborted due to unacceptable geometry

Critical (minimum) Factor of Safety: 0.79

Circle and Results Summary (Lowest 99 Factor of Safety circles)

Circle	X-Centre	Y-Centre	X-Left	Y-Left	X-Right	Y-Right	Radius	FoS
1	17.34	373.58	18.67	363.67	27.00	371.00	10.00	0.786
2	17.31	373.45	16.44	363.49	27.00	371.00	10.00	0.790
3	17.27	373.30	15.33	363.49	27.00	371.00	10.00	0.834

4	19.50	371.12	18.67	363.67	27.00	371.00	7.50	0.850
5	16.66	376.00	18.67	363.67	28.11	371.00	12.50	0.864
6	18.42	373.46	17.56	363.50	28.11	371.00	10.00	0.867
7	16.62	375.92	15.33	363.49	28.11	371.00	12.50	0.874
8	18.38	373.30	16.44	363.49	28.11	371.00	10.00	0.877
9	19.51	371.44	19.78	363.94	27.00	371.00	7.50	0.877
10	18.47	373.66	18.67	363.67	28.11	371.00	10.00	0.880
11	19.50	370.74	17.56	363.50	27.00	371.00	7.50	0.882
12	18.53	373.87	19.78	363.94	28.11	371.00	10.00	0.903
13	16.55	375.76	14.22	363.48	28.11	371.00	12.50	0.920
14	17.73	375.92	16.44	363.49	29.22	371.00	12.50	0.932
15	17.21	373.02	14.22	363.48	27.00	371.00	10.00	0.932
16	18.32	373.03	15.33	363.49	28.11	371.00	10.00	0.934
17	16.21	378.46	18.67	363.67	29.22	371.00	15.00	0.943
18	17.67	375.77	15.33	363.49	29.22	371.00	12.50	0.946
19	17.83	376.14	18.67	363.67	29.22	371.00	12.50	0.946
20	16.15	378.35	14.22	363.48	29.22	371.00	15.00	0.965
21	15.83	376.62	20.89	365.19	27.00	371.00	12.50	0.965
22	14.02	378.52	20.89	365.19	27.00	371.00	15.00	0.968
23	17.90	376.30	19.78	363.94	29.22	371.00	12.50	0.968
24	19.53	370.33	16.44	363.49	27.00	371.00	7.50	0.969
25	17.69	374.66	20.89	365.19	27.00	371.00	10.00	0.970
26	19.49	373.31	17.56	363.50	29.22	371.00	10.00	0.981
27	19.57	373.63	18.67	363.67	29.22	371.00	10.00	0.982
28	17.57	375.52	14.22	363.48	29.22	371.00	12.50	0.998
29	17.32	378.47	16.44	363.49	30.33	371.00	15.00	0.998
30	17.26	378.36	15.33	363.49	30.33	371.00	15.00	1.002
31	16.46	375.52	13.11	363.47	28.11	371.00	12.50	1.005
32	19.43	373.03	16.44	363.49	29.22	371.00	10.00	1.005
33	18.85	375.93	17.56	363.50	30.33	371.00	12.50	1.009
34	17.41	378.61	18.67	363.67	30.33	371.00	15.00	1.013
35	16.05	378.18	13.11	363.47	29.22	371.00	15.00	1.014
36	19.67	372.59	20.89	365.19	27.00	371.00	7.50	1.015
37	18.78	375.77	16.44	363.49	30.33	371.00	12.50	1.015
38	17.17	378.19	14.22	363.48	30.33	371.00	15.00	1.023
39	20.62	371.40	19.78	363.94	28.11	371.00	7.50	1.023
40	18.95	376.16	18.67	363.67	30.33	371.00	12.50	1.025
41	19.67	373.94	19.78	363.94	29.22	371.00	10.00	1.025
42	18.25	372.63	14.22	363.48	28.11	371.00	10.00	1.027
43	20.61	370.91	18.67	363.67	28.11	371.00	7.50	1.027
44	17.50	378.77	19.78	363.94	30.33	371.00	15.00	1.037
45	18.68	375.53	15.33	363.49	30.33	371.00	12.50	1.042
46	17.13	372.63	13.11	363.47	27.00	371.00	10.00	1.051
47	18.38	378.37	16.44	363.49	31.44	371.00	15.00	1.061
48	18.44	378.47	17.56	363.50	31.44	371.00	15.00	1.061
49	17.45	375.20	13.11	363.47	29.22	371.00	12.50	1.067
50	15.55	379.20	20.89	365.19	28.11	371.00	15.00	1.068
51	19.36	372.64	15.33	363.49	29.22	371.00	10.00	1.069
52	17.22	377.13	20.89	365.19	28.11	371.00	12.50	1.070
53	19.07	376.42	19.78	363.94	30.33	371.00	12.50	1.072
54	18.28	378.19	15.33	363.49	31.44	371.00	15.00	1.073
55	17.04	377.95	13.11	363.47	30.33	371.00	15.00	1.076
56	18.55	378.67	18.67	363.67	31.44	371.00	15.00	1.082
57	20.64	370.33	17.56	363.50	28.11	371.00	7.50	1.088
58	15.34	375.51	12.00	363.47	27.00	371.00	12.50	1.089
59	18.94	374.99	20.89	365.19	28.11	371.00	10.00	1.091
60	15.93	377.94	12.00	363.47	29.22	371.00	15.00	1.091
61	18.56	375.20	14.22	363.48	30.33	371.00	12.50	1.092
62	16.33	375.19	12.00	363.47	28.11	371.00	12.50	1.094
63	18.15	377.95	14.22	363.48	31.44	371.00	15.00	1.105
64	19.89	375.78	17.56	363.50	31.44	371.00	12.50	1.114
65	20.64	373.47	18.67	363.67	30.33	371.00	10.00	1.120
66	19.80	375.53	16.44	363.49	31.44	371.00	12.50	1.121
67	20.54	373.04	17.56	363.50	30.33	371.00	10.00	1.122
68	18.70	378.91	19.78	363.94	31.44	371.00	15.00	1.128
69	15.04	380.06	22.00	366.77	27.00	371.00	15.00	1.130
70	20.03	376.09	18.67	363.67	31.44	371.00	12.50	1.130
71	16.89	377.65	12.00	363.47	30.33	371.00	15.00	1.135
72	16.71	378.09	22.00	366.77	27.00	371.00	12.50	1.145
73	18.00	377.65	13.11	363.47	31.44	371.00	15.00	1.148
74	20.76	373.90	19.78	363.94	30.33	371.00	10.00	1.149
75	19.67	375.21	15.33	363.49	31.44	371.00	12.50	1.151
76	19.63	369.64	15.33	363.49	27.00	371.00	7.50	1.152
77	20.47	372.65	16.44	363.49	30.33	371.00	10.00	1.158
78	18.17	372.10	13.11	363.47	28.11	371.00	10.00	1.158
79	17.31	374.78	12.00	363.47	29.22	371.00	12.50	1.159
80	18.42	374.79	13.11	363.47	30.33	371.00	12.50	1.162
81	19.28	372.10	14.22	363.48	29.22	371.00	10.00	1.172
82	16.98	379.67	20.89	365.19	29.22	371.00	15.00	1.175
83	18.40	376.10	22.00	366.77	27.00	371.00	10.00	1.176
84	20.19	376.44	19.78	363.94	31.44	371.00	12.50	1.178
85	20.80	372.68	20.89	365.19	28.11	371.00	7.50	1.181
86	18.52	377.46	20.89	365.19	29.22	371.00	12.50	1.187
87	19.53	374.79	14.22	363.48	31.44	371.00	12.50	1.203
88	17.83	377.29	12.00	363.47	31.44	371.00	15.00	1.206
89	17.06	372.09	12.00	363.47	27.00	371.00	10.00	1.218
90	20.13	375.16	20.89	365.19	29.22	371.00	10.00	1.230
91	20.73	369.64	16.44	363.49	28.11	371.00	7.50	1.233
92	20.40	372.11	15.33	363.49	30.33	371.00	10.00	1.236
93	21.72	371.19	19.78	363.94	29.22	371.00	7.50	1.238

94	19.94	378.08	16.44	363.49	32.56	369.97	15.00	1.240
95	20.07	378.28	17.56	363.50	32.56	369.97	15.00	1.246
96	19.77	377.81	15.33	363.49	32.56	369.97	15.00	1.250
97	20.14	374.04	22.00	366.77	27.00	371.00	7.50	1.250
98	18.27	374.28	12.00	363.47	30.33	371.00	12.50	1.260
99	21.74	370.51	18.67	363.67	29.22	371.00	7.50	1.267

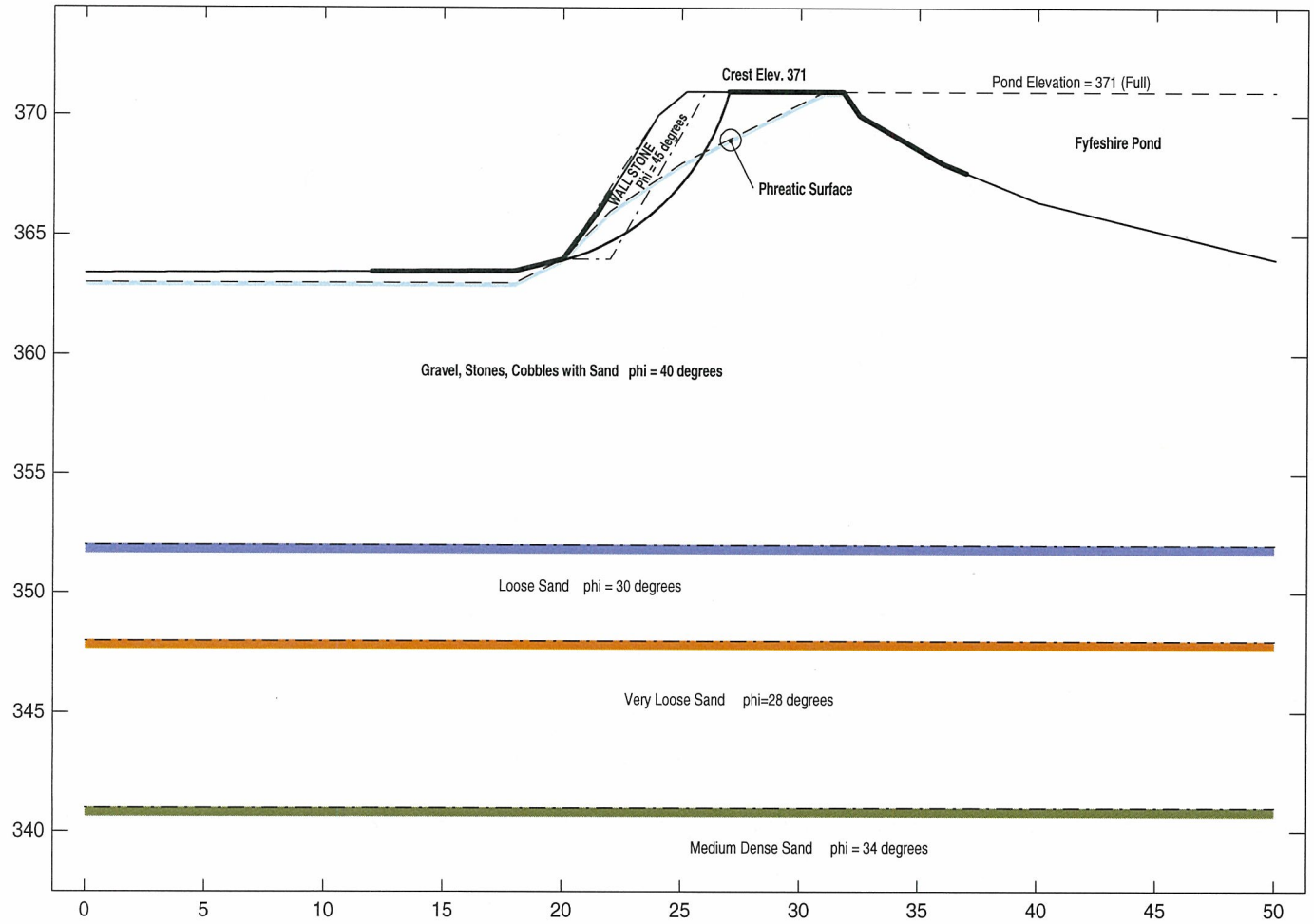
Critical Failure Circle

Circle centre: XC: 17.34 YC: 373.58 Circle radius: R: 10.00
Intersections: XL: 18.67 YL: 363.67 XR: 27.00 YR: 371.00
Generated failure surface: (20 points)

18.67	363.67	19.28	363.77	19.88	363.91	20.47	364.08	21.06	364.30
21.62	364.54	22.18	364.83	22.71	365.14	23.22	365.49	23.71	365.87
24.17	366.28	24.61	366.72	25.02	367.18	25.40	367.67	25.75	368.18
26.07	368.71	26.36	369.26	26.61	369.83	26.82	370.41	27.00	371.00

Slice Geometry and Properties (46 slices)

Slice	X-Left	Width	Y-Top	Y-Base	Base Angle	Base Matl	Base Cohesion	Total Weight	PoreWater Force	Normal Stress	Test Factor
1	18.67	0.20	363.69	363.68	9.4	1	0.00	0.24	0.00	1.02	0.86
2	18.87	0.20	363.74	363.72	9.4	1	0.00	0.73	0.00	3.06	0.86
3	19.07	0.20	363.79	363.75	9.4	1	0.00	1.22	0.00	5.10	0.86
4	19.28	0.24	363.85	363.80	13.0	1	0.00	1.80	0.00	6.05	0.82
5	19.52	0.24	363.91	363.85	13.0	1	0.00	1.96	0.00	6.59	0.82
6	19.76	0.13	363.95	363.89	13.0	1	0.00	1.09	0.14	7.21	0.82
7	19.88	0.12	363.99	363.92	16.5	1	0.00	1.01	0.36	7.15	0.79
8	20.00	0.20	364.13	363.97	16.5	1	0.00	4.49	1.62	19.35	0.79
9	20.20	0.14	364.35	364.02	16.5	5	0.00	6.74	2.22	39.28	0.76
10	20.34	0.14	364.54	364.06	16.5	5	0.00	9.68	3.12	56.20	0.76
11	20.47	0.19	364.76	364.12	20.1	5	0.00	18.11	5.84	72.77	0.73
12	20.67	0.19	365.02	364.19	20.1	5	0.00	23.39	7.43	93.81	0.73
13	20.86	0.19	365.28	364.26	20.1	5	0.00	28.67	9.02	114.83	0.73
14	21.06	0.22	365.56	364.34	23.6	5	0.00	39.00	12.44	131.43	0.70
15	21.28	0.22	365.85	364.44	23.6	5	0.00	45.39	14.32	152.74	0.70
16	21.50	0.12	366.10	364.52	23.6	5	0.00	28.40	8.83	170.53	0.70
17	21.62	0.19	366.34	364.59	27.2	5	0.00	47.54	14.86	180.82	0.68
18	21.81	0.19	366.62	364.69	27.1	5	0.00	52.80	16.06	200.01	0.68
19	22.00	0.18	366.90	364.78	27.2	5	0.00	53.88	15.68	217.79	0.68
20	22.18	0.22	367.21	364.89	30.7	5	0.00	75.52	21.18	226.47	0.66
21	22.40	0.22	367.56	365.03	30.7	5	0.00	82.43	21.44	244.44	0.66
22	22.62	0.08	367.79	365.12	30.7	1	0.00	32.30	8.02	269.55	0.71
23	22.71	0.09	367.93	365.17	34.3	1	0.00	36.89	9.28	265.90	0.70
24	22.80	0.21	368.17	365.28	34.3	1	0.00	87.81	21.01	277.38	0.70
25	23.01	0.21	368.52	365.42	34.2	1	0.00	93.85	20.96	294.03	0.70
26	23.22	0.24	368.90	365.59	37.8	1	0.00	116.76	25.29	298.13	0.69
27	23.46	0.24	369.31	365.78	37.8	1	0.00	124.20	24.78	314.01	0.69
28	23.71	0.15	369.64	365.93	41.3	1	0.00	77.32	15.18	311.67	0.69
29	23.85	0.15	369.88	366.06	41.3	1	0.00	79.65	14.80	318.97	0.69
30	24.00	0.17	370.07	366.20	41.3	1	0.00	96.14	17.15	321.59	0.69
31	24.17	0.22	370.24	366.39	44.9	1	0.00	120.61	21.91	302.99	0.68
32	24.39	0.22	370.42	366.61	44.9	1	0.00	119.29	20.51	297.76	0.68
33	24.61	0.19	370.59	366.83	48.4	1	0.00	104.00	17.89	276.85	0.68
34	24.81	0.19	370.75	367.04	48.4	1	0.00	102.27	16.25	269.78	0.68
35	25.00	0.20	370.92	367.28	51.6	1	0.00	103.37	15.51	247.90	0.69
36	25.20	0.20	371.00	367.54	52.0	1	0.00	100.33	12.72	229.70	0.69
37	25.40	0.18	371.00	367.80	55.5	1	0.00	79.38	8.71	194.48	0.69
38	25.58	0.18	371.00	368.05	55.5	1	0.00	72.85	5.47	173.52	0.69
39	25.75	0.17	371.00	368.32	59.1	1	0.00	64.12	2.06	139.34	0.70
40	25.92	0.08	371.00	368.53	59.1	1	0.00	26.01	0.00	124.67	0.70
41	26.00	0.07	371.00	368.65	59.1	1	0.00	23.97	0.00	118.33	0.70
42	26.07	0.14	371.00	368.85	62.6	1	0.00	42.89	0.00	98.45	0.71
43	26.22	0.14	371.00	369.12	62.6	1	0.00	37.42	0.00	85.88	0.71
44	26.36	0.25	371.00	369.54	66.2	1	0.00	51.01	0.00	59.70	0.72
45	26.61	0.21	371.00	370.12	69.7	1	0.00	26.53	0.00	31.80	0.74
46	26.82	0.18	371.00	370.70	73.3	1	0.00	7.39	0.00	9.12	0.76



GALENA Version 4.02

Analysis: 1
Multiple Stability Analysis
Method: Bishop Simplified
Surface: Circular

Results
Critical (minimum)
Factor of Safety: 0.79

Project: Fyfeshire Dam
Fyfeshire Existing Conditions Pond Full
File: C:\Galena Model Files\Fyfeshire.gmf

Fuss & O'Neill, Inc.

Project: Fyfeshire Dam
File: C:\Galena Model Files\Fyfeshire.gmf Processed: 17:46:38 21 Oct 2009

DATA: Analysis 1 - Fyfeshire Existing Conditions

Material and Water Properties (5 materials)

```
-----------------------------
Material:  1 (Mohr-Coulomb Isotropic) - Embankment Fill
   Cohesion   Phi  UnitWeight   Ru
      0.00   40.0    140.00    1.10
Material:  2 (Mohr-Coulomb Isotropic) - Loose Sand
   Cohesion   Phi  UnitWeight   Ru
      0.00   30.0    105.00    1.10
Material:  3 (Mohr-Coulomb Isotropic) - Very Loose Sand
   Cohesion   Phi  UnitWeight   Ru
      0.00   28.0    100.00    1.10
Material:  4 (Mohr-Coulomb Isotropic) - Medium Dense Sand
   Cohesion   Phi  UnitWeight   Ru
      0.00   34.0    115.00    1.10
Material:  5 (Mohr-Coulomb Isotropic) - Downstream Wall Stone
   Cohesion   Phi  UnitWeight   Ru
      0.00   45.0    145.00    1.10
```

Unit weight of water: 62.400 Unit weight of water/medium above ground: 0.000

Material Profiles (5 profiles)

```
----------------
Profile:  1 (2 points)   Material beneath:  1 - Embankment Fill
      0.00    371.00           50.00    371.00
Profile:  2 (2 points)   Material beneath:  2 - Loose Sand
      0.00    352.00           50.00    352.00
Profile:  3 (2 points)   Material beneath:  3 - Very Loose Sand
      0.00    348.00           50.00    348.00
Profile:  4 (2 points)   Material beneath:  4 - Medium Dense Sand
      0.00    341.00           50.00    341.00
Profile:  5 (6 points)   Material within:   5 - Downstream Wall Stone
     20.00    364.00           22.00    364.00           26.00    371.00           25.00    371.00           24.00    370.00
     20.00    364.00
```

Slope Surface (12 points)

```
-------------
      0.00    363.40           18.00    363.50           20.00    364.00           21.50    366.00           22.80    368.00
     24.00    370.00           25.20    371.00           31.80    371.00           32.50    370.00           36.00    368.00
     40.00    366.40           50.00    364.00
```

Phreatic Surface (8 points)

```
----------------
      0.00    363.00           20.00    363.10           23.00    363.50           25.00    365.00           27.00    367.50
     30.00    369.80           32.00    371.00           50.00    371.00
```

Failure Surface

```
---------------
Initial circular surface for critical search defined by: XL,XR,R
Circle centre:  XC:      14.02   YC:     378.52      Circle radius:  R:      15.00
Intersections:  XL:      20.89   YL:     365.19    XR:      27.00   YR:     371.00
Generated failure surface (20 points)
     20.89    365.19           21.29    365.40           21.68    365.62           22.06    365.86           22.44    366.10
```

22.80	366.36	23.17	366.63	23.52	366.91	23.86	367.20	24.20	367.50
24.52	367.81	24.84	368.13	25.15	368.46	25.44	368.80	25.73	369.14
26.01	369.50	26.27	369.86	26.53	370.24	26.77	370.61	27.00	371.00

Variable Restraints

Parameter descriptor:	XL	XR	R
Range of variation:	10.00	10.00	10.00
Trial positions within range:	10	10	5

RESULTS: Analysis 1 - Fyfeshire Existing Conditions

Bishop Simplified Method of Analysis - Circular Failure Surface
---
Critical Failure Circle Search using Multiple Circle Generation Techniques

Factor of Safety for initial failure circle approximation: 1.80
There were: 292 successful analyses from a total of 501 trial circles
209 analyses aborted due to unacceptable geometry

Critical (minimum) Factor of Safety: 1.00

Circle and Results Summary (Lowest 99 Factor of Safety circles)

Circle	X-Centre	Y-Centre	X-Left	Y-Left	X-Right	Y-Right	Radius	FoS
1	14.02	378.52	20.89	365.19	27.00	371.00	15.00	0.995
2	15.83	376.62	20.89	365.19	27.00	371.00	12.50	1.015
3	17.34	373.58	18.67	363.67	27.00	371.00	10.00	1.060
4	17.69	374.66	20.89	365.19	27.00	371.00	10.00	1.065
5	17.31	373.45	16.44	363.49	27.00	371.00	10.00	1.079
6	15.04	380.06	22.00	366.77	27.00	371.00	15.00	1.130
7	17.27	373.30	15.33	363.49	27.00	371.00	10.00	1.137
8	16.71	378.09	22.00	366.77	27.00	371.00	12.50	1.145
9	16.66	376.00	18.67	363.67	28.11	371.00	12.50	1.152
10	16.62	375.92	15.33	363.49	28.11	371.00	12.50	1.168
11	15.55	379.20	20.89	365.19	28.11	371.00	15.00	1.172
12	18.40	376.10	22.00	366.77	27.00	371.00	10.00	1.176
13	19.67	372.59	20.89	365.19	27.00	371.00	7.50	1.192
14	17.22	377.13	20.89	365.19	28.11	371.00	12.50	1.209
15	16.55	375.76	14.22	363.48	28.11	371.00	12.50	1.227
16	19.51	371.44	19.78	363.94	27.00	371.00	7.50	1.247
17	18.47	373.66	18.67	363.67	28.11	371.00	10.00	1.249
18	20.14	374.04	22.00	366.77	27.00	371.00	7.50	1.250
19	18.53	373.87	19.78	363.94	28.11	371.00	10.00	1.251
20	18.42	373.46	17.56	363.50	28.11	371.00	10.00	1.256
21	19.50	371.12	18.67	363.67	27.00	371.00	7.50	1.257
22	17.21	373.02	14.22	363.48	27.00	371.00	10.00	1.257
23	16.21	378.46	18.67	363.67	29.22	371.00	15.00	1.274
24	18.38	373.30	16.44	363.49	28.11	371.00	10.00	1.278
25	15.34	375.51	12.00	363.47	27.00	371.00	12.50	1.283
26	18.94	374.99	20.89	365.19	28.11	371.00	10.00	1.285
27	16.15	378.35	14.22	363.48	29.22	371.00	15.00	1.303
28	16.46	375.52	13.11	363.47	28.11	371.00	12.50	1.326
29	17.83	376.14	18.67	363.67	29.22	371.00	12.50	1.334
30	17.73	375.92	16.44	363.49	29.22	371.00	12.50	1.335
31	19.50	370.74	17.56	363.50	27.00	371.00	7.50	1.342
32	17.90	376.30	19.78	363.94	29.22	371.00	12.50	1.342
33	17.67	375.77	15.33	363.49	29.22	371.00	12.50	1.358

34	18.32	373.03	15.33	363.49	28.11	371.00	10.00	1.361
35	16.05	378.18	13.11	363.47	29.22	371.00	15.00	1.362
36	16.78	380.83	22.00	366.77	28.11	371.00	15.00	1.372
37	16.98	379.67	20.89	365.19	29.22	371.00	15.00	1.376
38	17.13	372.63	13.11	363.47	27.00	371.00	10.00	1.393
39	18.26	378.70	22.00	366.77	28.11	371.00	12.50	1.401
40	17.57	375.52	14.22	363.48	29.22	371.00	12.50	1.421
41	17.32	378.47	16.44	363.49	30.33	371.00	15.00	1.421
42	17.26	378.36	15.33	363.49	30.33	371.00	15.00	1.427
43	16.33	375.19	12.00	363.47	28.11	371.00	12.50	1.427
44	18.52	377.46	20.89	365.19	29.22	371.00	12.50	1.430
45	19.57	373.63	18.67	363.67	29.22	371.00	10.00	1.430
46	17.41	378.61	18.67	363.67	30.33	371.00	15.00	1.433
47	15.93	377.94	12.00	363.47	29.22	371.00	15.00	1.443
48	19.49	373.31	17.56	363.50	29.22	371.00	10.00	1.445
49	17.17	378.19	14.22	363.48	30.33	371.00	15.00	1.448
50	17.50	378.77	19.78	363.94	30.33	371.00	15.00	1.451
51	18.85	375.93	17.56	363.50	30.33	371.00	12.50	1.453
52	19.53	370.33	16.44	363.49	27.00	371.00	7.50	1.455
53	19.77	376.52	22.00	366.77	28.11	371.00	10.00	1.456
54	18.25	372.63	14.22	363.48	28.11	371.00	10.00	1.459
55	18.78	375.77	16.44	363.49	30.33	371.00	12.50	1.463
56	18.95	376.16	18.67	363.67	30.33	371.00	12.50	1.463
57	19.67	373.94	19.78	363.94	29.22	371.00	10.00	1.465
58	19.43	373.03	16.44	363.49	29.22	371.00	10.00	1.475
59	20.80	372.68	20.89	365.19	28.11	371.00	7.50	1.475
60	17.45	375.20	13.11	363.47	29.22	371.00	12.50	1.490
61	18.68	375.53	15.33	363.49	30.33	371.00	12.50	1.491
62	18.44	378.47	17.56	363.50	31.44	371.00	15.00	1.491
63	20.62	371.40	19.78	363.94	28.11	371.00	7.50	1.492
64	18.38	378.37	16.44	363.49	31.44	371.00	15.00	1.493
65	19.36	372.64	15.33	363.49	29.22	371.00	10.00	1.499
66	17.04	377.95	13.11	363.47	30.33	371.00	15.00	1.501
67	18.28	378.19	15.33	363.49	31.44	371.00	15.00	1.506
68	19.07	376.42	19.78	363.94	30.33	371.00	12.50	1.508
69	18.56	375.20	14.22	363.48	30.33	371.00	12.50	1.511
70	18.55	378.67	18.67	363.67	31.44	371.00	15.00	1.512
71	22.06	371.77	22.00	366.77	27.00	371.00	5.00	1.520
72	20.61	370.91	18.67	363.67	28.11	371.00	7.50	1.528
73	18.15	377.95	14.22	363.48	31.44	371.00	15.00	1.531
74	20.13	375.16	20.89	365.19	29.22	371.00	10.00	1.540
75	18.42	374.79	13.11	363.47	30.33	371.00	12.50	1.544
76	19.67	375.21	15.33	363.49	31.44	371.00	12.50	1.547
77	19.80	375.53	16.44	363.49	31.44	371.00	12.50	1.548
78	18.00	377.65	13.11	363.47	31.44	371.00	15.00	1.548
79	19.89	375.78	17.56	363.50	31.44	371.00	12.50	1.549
80	16.89	377.65	12.00	363.47	30.33	371.00	15.00	1.553
81	19.28	372.10	14.22	363.48	29.22	371.00	10.00	1.555
82	18.70	378.91	19.78	363.94	31.44	371.00	15.00	1.559
83	18.17	372.10	13.11	363.47	28.11	371.00	10.00	1.563
84	20.03	376.09	18.67	363.67	31.44	371.00	12.50	1.564
85	19.53	374.79	14.22	363.48	31.44	371.00	12.50	1.565
86	17.31	374.78	12.00	363.47	29.22	371.00	12.50	1.566
87	20.54	373.04	17.56	363.50	30.33	371.00	10.00	1.568
88	20.64	370.33	17.56	363.50	28.11	371.00	7.50	1.571
89	20.47	372.65	16.44	363.49	30.33	371.00	10.00	1.571
90	17.83	377.29	12.00	363.47	31.44	371.00	15.00	1.575
91	17.06	372.09	12.00	363.47	27.00	371.00	10.00	1.575
92	20.64	373.47	18.67	363.67	30.33	371.00	10.00	1.576
93	21.35	374.24	22.00	366.77	28.11	371.00	7.50	1.583

94	19.63	369.64	15.33	363.49	27.00	371.00	7.50	1.588
95	20.76	373.90	19.78	363.94	30.33	371.00	10.00	1.600
96	18.30	379.96	20.89	365.19	30.33	371.00	15.00	1.600
97	18.27	374.28	12.00	363.47	30.33	371.00	12.50	1.606
98	20.40	372.11	15.33	363.49	30.33	371.00	10.00	1.607
99	19.38	374.29	13.11	363.47	31.44	371.00	12.50	1.610

Critical Failure Circle

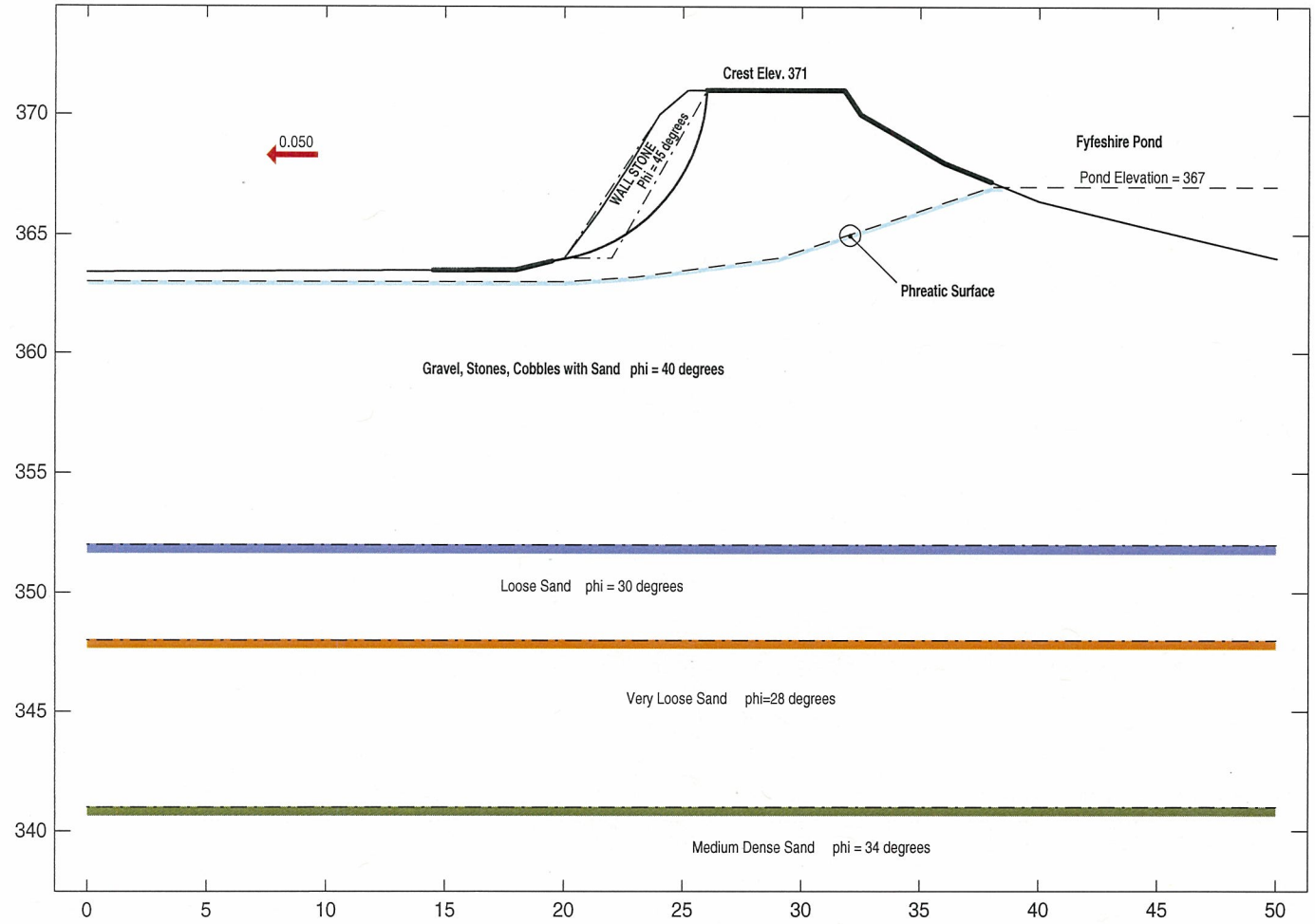
Circle centre: XC: 14.02 YC: 378.52 Circle radius: R: 15.00
Intersections: XL: 20.89 YL: 365.19 XR: 27.00 YR: 371.00
Generated failure surface: (20 points)

20.89	365.19	21.29	365.40	21.68	365.62	22.06	365.86	22.44	366.10
22.80	366.36	23.17	366.63	23.52	366.91	23.86	367.20	24.20	367.50
24.52	367.81	24.84	368.13	25.15	368.46	25.44	368.80	25.73	369.14
26.01	369.50	26.27	369.86	26.53	370.24	26.77	370.61	27.00	371.00

Slice Geometry and Properties (41 slices)

Slice	X-Left	Width	Y-Top	Y-Base	Base Angle	Base Matl	Base Cohesion	Total Weight	PoreWater Force	Normal Stress	Test Factor
1	20.89	0.20	365.32	365.24	28.1	5	0.00	2.28	0.00	7.48	0.74
2	21.09	0.20	365.58	365.34	28.1	5	0.00	6.85	0.00	22.46	0.74
3	21.29	0.11	365.79	365.43	29.8	5	0.00	5.56	0.00	32.93	0.73
4	21.39	0.11	365.93	365.49	29.8	5	0.00	6.82	0.00	40.43	0.73
5	21.50	0.18	366.14	365.57	29.8	5	0.00	14.44	0.00	51.99	0.73
6	21.68	0.19	366.42	365.68	31.5	5	0.00	20.54	0.00	66.26	0.73
7	21.87	0.19	366.71	365.80	31.5	5	0.00	25.47	0.00	82.16	0.73
8	22.06	0.19	367.01	365.92	33.3	5	0.00	29.68	0.00	95.07	0.72
9	22.25	0.19	367.30	366.04	33.3	5	0.00	34.21	0.00	109.58	0.72
10	22.44	0.18	367.58	366.17	35.0	5	0.00	37.28	0.00	120.32	0.72
11	22.62	0.18	367.86	366.29	35.0	5	0.00	41.31	0.00	133.32	0.72
12	22.80	0.18	368.15	366.43	36.7	5	0.00	45.77	0.00	143.23	0.71
13	22.98	0.18	368.46	366.56	36.7	5	0.00	50.23	0.00	157.10	0.71
14	23.17	0.18	368.76	366.70	38.4	5	0.00	52.56	0.00	165.91	0.71
15	23.34	0.18	369.05	366.84	38.4	5	0.00	56.50	0.00	178.36	0.71
16	23.52	0.14	369.31	366.97	40.1	5	0.00	47.42	0.00	184.05	0.71
17	23.66	0.14	369.55	367.09	40.1	5	0.00	49.75	0.00	193.04	0.71
18	23.80	0.07	369.72	367.17	40.1	1	0.00	23.98	0.00	215.49	0.76
19	23.86	0.14	369.89	367.26	41.9	1	0.00	52.31	0.00	216.36	0.76
20	24.00	0.20	370.08	367.41	41.9	1	0.00	76.20	0.00	219.84	0.76
21	24.20	0.16	370.23	367.58	43.6	1	0.00	62.41	0.00	212.45	0.77
22	24.36	0.16	370.37	367.73	43.6	1	0.00	61.85	0.00	210.52	0.77
23	24.52	0.16	370.50	367.89	45.3	1	0.00	59.42	0.00	202.69	0.77
24	24.68	0.16	370.63	368.05	45.3	1	0.00	58.68	0.00	200.20	0.77
25	24.84	0.15	370.76	368.21	47.0	1	0.00	56.07	0.00	191.90	0.77
26	24.99	0.15	370.89	368.38	47.0	1	0.00	55.17	0.00	188.82	0.77
27	25.15	0.05	370.98	368.49	48.7	1	0.00	18.89	0.00	181.28	0.77
28	25.20	0.12	371.00	368.59	48.7	1	0.00	41.90	0.00	175.40	0.77
29	25.32	0.12	371.00	368.73	48.7	1	0.00	39.41	0.00	164.94	0.77
30	25.44	0.14	371.00	368.88	50.5	1	0.00	43.04	0.00	148.64	0.78
31	25.59	0.14	371.00	369.06	50.5	1	0.00	39.38	0.00	135.99	0.78
32	25.73	0.13	371.00	369.23	52.2	1	0.00	33.63	0.00	119.53	0.78
33	25.87	0.13	371.00	369.41	52.2	1	0.00	30.19	0.00	107.31	0.78
34	26.00	0.14	371.00	369.58	53.8	1	0.00	26.89	0.00	92.04	0.79
35	26.14	0.14	371.00	369.77	53.9	1	0.00	23.35	0.00	79.83	0.79
36	26.27	0.13	371.00	369.96	55.6	1	0.00	18.56	0.00	65.44	0.79
37	26.40	0.13	371.00	370.14	55.6	1	0.00	15.26	0.00	53.79	0.79
38	26.53	0.12	371.00	370.33	57.3	1	0.00	11.39	0.00	40.52	0.80
39	26.65	0.12	371.00	370.52	57.3	1	0.00	8.17	0.00	29.07	0.80

40	26.77	0.12	371.00	370.71	59.0	1	0.00	4.69	0.00	16.84	0.81
41	26.88	0.12	371.00	370.90	59.0	1	0.00	1.56	0.00	5.61	0.81



GALENA Version 4.02

Analysis: 1
Multiple Stability Analysis
Method: Bishop Simplified
Surface: Circular

Results
Critical (minimum)
Factor of Safety: 0.99

Project: Fyfeshire Dam Seismic
Fyfeshire Existing Conditions Pond Normal Seismic
File: C:\Galena Model Files\Fyfeshire- Seismic.gmf

Fuss & O'Neill, Inc.

Project: Fyfeshire Dam Seismic
File: C:\Galena Model Files\Fyfeshire- Seismic.gmf Processed: 12:08:56 13 Nov 2009

DATA: Analysis 1 - Fyfeshire Existing Conditions Pond Normal Seismic

Material and Water Properties (5 materials)

Material: 1 (Mohr-Coulomb Isotropic) - Embankment Fill

Cohesion	Phi	UnitWeight	Ru
0.00	40.0	140.00	1.10

Material: 2 (Mohr-Coulomb Isotropic) - Loose Sand

Cohesion	Phi	UnitWeight	Ru
0.00	30.0	105.00	1.10

Material: 3 (Mohr-Coulomb Isotropic) - Very Loose Sand

Cohesion	Phi	UnitWeight	Ru
0.00	28.0	100.00	1.10

Material: 4 (Mohr-Coulomb Isotropic) - Medium Dense Sand

Cohesion	Phi	UnitWeight	Ru
0.00	34.0	115.00	1.10

Material: 5 (Mohr-Coulomb Isotropic) - Downstream Wall Stone

Cohesion	Phi	UnitWeight	Ru
0.00	45.0	145.00	1.10

Unit weight of water: 62.400 Unit weight of water/medium above ground: 0.000

Material Profiles (5 profiles)

Profile: 1 (2 points) Material beneath: 1 - Embankment Fill

0.00	371.00	50.00	371.00

Profile: 2 (2 points) Material beneath: 2 - Loose Sand

0.00	352.00	50.00	352.00

Profile: 3 (2 points) Material beneath: 3 - Very Loose Sand

0.00	348.00	50.00	348.00

Profile: 4 (2 points) Material beneath: 4 - Medium Dense Sand

0.00	341.00	50.00	341.00

Profile: 5 (6 points) Material within: 5 - Downstream Wall Stone

20.00	364.00	22.00	364.00	26.00	371.00	25.00	371.00	24.00	370.00
20.00	364.00								

Slope Surface (12 points)

0.00	363.40	18.00	363.50	20.00	364.00	21.50	366.00	22.80	368.00
24.00	370.00	25.20	371.00	31.80	371.00	32.50	370.00	36.00	368.00
40.00	366.40	50.00	364.00						

Phreatic Surface (6 points)

0.00	363.00	20.00	363.00	23.00	363.20	29.00	364.00	38.00	367.00
50.00	367.00								

Earthquake Force

Pseudo-static earthquake (seismic) coefficient: 0.050

Failure Surface

Initial circular surface for critical search defined by: XL,XR,R

Circle centre: XC: 18.51 YC: 371.31 Circle radius: R: 7.50
Intersections: XL: 19.50 YL: 363.88 XR: 26.00 YR: 371.00
Generated failure surface (20 points)

19.50	363.88	20.04	363.97	20.58	364.10	21.10	364.27	21.61	364.48
22.10	364.73	22.58	365.01	23.03	365.33	23.46	365.68	23.86	366.05
24.23	366.46	24.57	366.89	24.88	367.35	25.15	367.83	25.39	368.33
25.59	368.84	25.75	369.37	25.87	369.91	25.96	370.45	26.00	371.00

Variable Restraints

Parameter descriptor:	XL	XR	R
Range of variation:	5.00	12.00	10.00
Trial positions within range:	10	10	5

RESULTS: Analysis 1 - Fyfeshire Existing Conditions Pond Normal Seismic

Bishop Simplified Method of Analysis - Circular Failure Surface
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Critical Failure Circle Search using Multiple Circle Generation Techniques

Factor of Safety for initial failure circle approximation: 2.05
There were: 254 successful analyses from a total of 501 trial circles
247 analyses aborted due to unacceptable geometry

Critical (minimum) Factor of Safety: 0.99

Circle and Results Summary (Lowest 99 Factor of Safety circles)

Circle	X-Centre	Y-Centre	X-Left	Y-Left	X-Right	Y-Right	Radius	FoS
1	18.51	371.31	19.50	363.88	26.00	371.00	7.50	0.989
2	18.50	371.22	18.94	363.74	26.00	371.00	7.50	0.999
3	18.50	371.10	18.39	363.60	26.00	371.00	7.50	1.014
4	17.71	373.71	19.50	363.88	27.33	371.00	10.00	1.029
5	17.69	373.66	18.94	363.74	27.33	371.00	10.00	1.031
6	18.50	370.97	17.83	363.50	26.00	371.00	7.50	1.036
7	17.67	373.57	18.39	363.60	27.33	371.00	10.00	1.036
8	17.65	373.49	17.28	363.50	27.33	371.00	10.00	1.043
9	17.64	373.45	16.72	363.49	27.33	371.00	10.00	1.050
10	18.50	370.90	17.28	363.50	26.00	371.00	7.50	1.055
11	17.62	373.38	16.17	363.49	27.33	371.00	10.00	1.067
12	18.50	370.78	16.72	363.49	26.00	371.00	7.50	1.090
13	17.60	373.29	15.61	363.49	27.33	371.00	10.00	1.095
14	17.57	373.16	15.06	363.48	27.33	371.00	10.00	1.135
15	17.26	376.12	18.94	363.74	28.67	371.00	12.50	1.143
16	17.23	376.04	18.39	363.60	28.67	371.00	12.50	1.143
17	17.29	376.18	19.50	363.88	28.67	371.00	12.50	1.143
18	18.51	370.61	16.17	363.49	26.00	371.00	7.50	1.148
19	17.19	375.95	16.17	363.49	28.67	371.00	12.50	1.148
20	17.16	375.89	15.61	363.49	28.67	371.00	12.50	1.159
21	17.13	375.81	15.06	363.48	28.67	371.00	12.50	1.176
22	17.54	373.01	14.50	363.48	27.33	371.00	10.00	1.190
23	17.09	375.71	14.50	363.48	28.67	371.00	12.50	1.202
24	19.84	371.37	19.50	363.88	27.33	371.00	7.50	1.232
25	19.84	371.18	18.94	363.74	27.33	371.00	7.50	1.233
26	19.00	373.58	18.39	363.60	28.67	371.00	10.00	1.244
27	18.52	370.40	15.61	363.49	26.00	371.00	7.50	1.244
28	19.05	373.74	18.94	363.74	28.67	371.00	10.00	1.248
29	19.09	373.87	19.50	363.88	28.67	371.00	10.00	1.254

30	18.97	373.43	17.83	363.50	28.67	371.00	10.00	1.254
31	18.95	373.36	17.28	363.50	28.67	371.00	10.00	1.266
32	17.03	378.54	18.39	363.60	30.00	371.00	15.00	1.275
33	19.83	370.96	18.39	363.60	27.33	371.00	7.50	1.275
34	16.97	378.43	15.61	363.49	30.00	371.00	15.00	1.278
35	17.08	378.62	18.94	363.74	30.00	371.00	15.00	1.279
36	17.12	378.68	19.50	363.88	30.00	371.00	15.00	1.283
37	16.93	378.37	15.06	363.48	30.00	371.00	15.00	1.286
38	18.92	373.25	16.72	363.49	28.67	371.00	10.00	1.286
39	16.89	378.29	14.50	363.48	30.00	371.00	15.00	1.297
40	18.89	373.11	16.17	363.49	28.67	371.00	10.00	1.317
41	19.84	370.73	17.83	363.50	27.33	371.00	7.50	1.327
42	18.53	375.98	17.83	363.50	30.00	371.00	12.50	1.333
43	18.52	375.93	17.28	363.50	30.00	371.00	12.50	1.336
44	18.59	376.10	18.39	363.60	30.00	371.00	12.50	1.337
45	18.55	370.12	15.06	363.48	26.00	371.00	7.50	1.343
46	18.49	375.87	16.72	363.49	30.00	371.00	12.50	1.343
47	18.65	376.23	18.94	363.74	30.00	371.00	12.50	1.347
48	18.45	375.78	16.17	363.49	30.00	371.00	12.50	1.356
49	18.70	376.35	19.50	363.88	30.00	371.00	12.50	1.358
50	18.86	372.95	15.61	363.49	28.67	371.00	10.00	1.359
51	18.41	375.67	15.61	363.49	30.00	371.00	12.50	1.375
52	19.85	370.54	17.28	363.50	27.33	371.00	7.50	1.377
53	18.82	372.75	15.06	363.48	28.67	371.00	10.00	1.399
54	18.35	375.54	15.06	363.48	30.00	371.00	12.50	1.402
55	18.30	375.39	14.50	363.48	30.00	371.00	12.50	1.432
56	19.87	370.30	16.72	363.49	27.33	371.00	7.50	1.439
57	18.78	372.52	14.50	363.48	28.67	371.00	10.00	1.444
58	18.34	378.49	17.83	363.50	31.33	371.00	15.00	1.454
59	18.32	378.46	17.28	363.50	31.33	371.00	15.00	1.454
60	18.29	378.41	16.72	363.49	31.33	371.00	15.00	1.457
61	18.40	378.60	18.39	363.60	31.33	371.00	15.00	1.459
62	18.60	369.76	14.50	363.48	26.00	371.00	7.50	1.460
63	18.25	378.34	16.17	363.49	31.33	371.00	15.00	1.462
64	18.21	378.26	15.61	363.49	31.33	371.00	15.00	1.471
65	18.48	378.73	18.94	363.74	31.33	371.00	15.00	1.475
66	18.15	378.16	15.06	363.48	31.33	371.00	15.00	1.485
67	18.55	378.84	19.50	363.88	31.33	371.00	15.00	1.491
68	20.41	373.83	19.50	363.88	30.00	371.00	10.00	1.499
69	20.35	373.64	18.94	363.74	30.00	371.00	10.00	1.505
70	18.09	378.04	14.50	363.48	31.33	371.00	15.00	1.505
71	19.90	369.99	16.17	363.49	27.33	371.00	7.50	1.512
72	20.30	373.41	18.39	363.60	30.00	371.00	10.00	1.518
73	20.25	373.20	17.83	363.50	30.00	371.00	10.00	1.538
74	20.21	373.06	17.28	363.50	30.00	371.00	10.00	1.558
75	21.17	371.19	19.50	363.88	28.67	371.00	7.50	1.564
76	19.88	376.01	18.39	363.60	31.33	371.00	12.50	1.571
77	19.96	376.19	18.94	363.74	31.33	371.00	12.50	1.572
78	19.81	375.84	17.83	363.50	31.33	371.00	12.50	1.574
79	19.77	375.75	17.28	363.50	31.33	371.00	12.50	1.579
80	20.18	372.88	16.72	363.49	30.00	371.00	10.00	1.580
81	20.04	376.36	19.50	363.88	31.33	371.00	12.50	1.581
82	19.72	375.63	16.72	363.49	31.33	371.00	12.50	1.590
83	20.14	372.67	16.17	363.49	30.00	371.00	10.00	1.603
84	19.67	375.49	16.17	363.49	31.33	371.00	12.50	1.606
85	19.97	369.59	15.61	363.49	27.33	371.00	7.50	1.608
86	21.17	370.90	18.94	363.74	28.67	371.00	7.50	1.609
87	19.61	375.33	15.61	363.49	31.33	371.00	12.50	1.620
88	20.10	372.42	15.61	363.49	30.00	371.00	10.00	1.630
89	19.54	375.15	15.06	363.48	31.33	371.00	12.50	1.633

90	19.47	374.95	14.50	363.48	31.33	371.00	12.50	1.650
91	20.07	372.14	15.06	363.48	30.00	371.00	10.00	1.667
92	21.18	370.56	18.39	363.60	28.67	371.00	7.50	1.676
93	20.03	371.81	14.50	363.48	30.00	371.00	10.00	1.714
94	21.21	370.20	17.83	363.50	28.67	371.00	7.50	1.737
95	20.09	369.04	15.06	363.48	27.33	371.00	7.50	1.755
96	21.25	369.85	17.28	363.50	28.67	371.00	7.50	1.797
97	21.77	368.33	19.50	363.88	26.00	371.00	5.00	1.819
98	19.75	377.53	14.50	363.48	32.67	369.90	15.00	1.820
99	20.11	378.11	16.72	363.49	32.67	369.90	15.00	1.820

Critical Failure Circle

Circle centre: XC: 18.51 YC: 371.31 Circle radius: R: 7.50
Intersections: XL: 19.50 YL: 363.88 XR: 26.00 YR: 371.00
Generated failure surface: (20 points)

19.50	363.88	20.04	363.97	20.58	364.10	21.10	364.27	21.61	364.48
22.10	364.73	22.58	365.01	23.03	365.33	23.46	365.68	23.86	366.05
24.23	366.46	24.57	366.89	24.88	367.35	25.15	367.83	25.39	368.33
25.59	368.84	25.75	369.37	25.87	369.91	25.96	370.45	26.00	371.00

Slice Geometry and Properties (43 slices)

Slice	X-Left	Width	Y-Top	Y-Base	Base Angle	Base Matl	Base Cohesion	Total Weight	PoreWater Force	Normal Stress	Test Factor
1	19.50	0.17	363.90	363.89	9.7	1	0.00	0.15	0.00	0.80	0.89
2	19.67	0.17	363.94	363.92	9.7	1	0.00	0.46	0.00	2.41	0.89
3	19.83	0.17	363.98	363.95	9.7	1	0.00	0.76	0.00	4.01	0.89
4	20.00	0.04	364.03	363.96	9.7	1	0.00	0.40	0.00	8.01	0.89
5	20.04	0.13	364.14	363.98	13.9	1	0.00	2.97	0.00	19.04	0.85
6	20.17	0.20	364.36	364.03	13.9	5	0.00	10.00	0.00	39.37	0.82
7	20.38	0.20	364.64	364.08	13.9	5	0.00	16.50	0.00	64.93	0.82
8	20.58	0.17	364.89	364.13	18.1	5	0.00	19.19	0.00	82.57	0.79
9	20.75	0.17	365.12	364.19	18.1	5	0.00	23.64	0.00	101.70	0.79
10	20.93	0.17	365.35	364.24	18.1	5	0.00	28.08	0.00	120.82	0.79
11	21.10	0.20	365.60	364.31	22.4	5	0.00	37.18	0.00	132.00	0.76
12	21.30	0.20	365.87	364.40	22.3	5	0.00	42.47	0.00	150.81	0.76
13	21.50	0.11	366.09	364.46	22.4	5	0.00	26.40	0.00	166.65	0.76
14	21.61	0.16	366.30	364.52	26.6	5	0.00	42.31	0.00	171.00	0.74
15	21.78	0.16	366.55	364.61	26.6	5	0.00	46.37	0.00	187.43	0.74
16	21.94	0.16	366.80	364.69	26.6	5	0.00	50.44	0.00	203.87	0.74
17	22.10	0.16	367.05	364.78	30.8	5	0.00	51.94	0.00	206.03	0.73
18	22.26	0.16	367.29	364.87	30.8	5	0.00	55.32	0.00	219.46	0.73
19	22.42	0.16	367.54	364.96	30.8	5	0.00	58.71	0.00	232.89	0.73
20	22.58	0.11	367.74	365.05	34.9	1	0.00	43.52	0.00	245.12	0.77
21	22.69	0.11	367.91	365.13	35.0	1	0.00	44.97	0.00	253.05	0.77
22	22.80	0.12	368.10	365.21	35.0	1	0.00	48.03	0.00	262.03	0.77
23	22.92	0.12	368.29	365.29	35.0	1	0.00	49.82	0.00	271.73	0.77
24	23.03	0.21	368.56	365.41	39.2	1	0.00	96.86	0.00	268.07	0.76
25	23.24	0.21	368.92	365.59	39.2	1	0.00	102.28	0.00	283.06	0.76
26	23.46	0.20	369.26	365.77	43.4	1	0.00	100.42	0.00	278.29	0.76
27	23.66	0.20	369.60	365.96	43.4	1	0.00	104.45	0.00	289.44	0.76
28	23.86	0.14	369.88	366.13	47.6	1	0.00	76.52	0.00	278.50	0.77
29	24.00	0.11	370.05	366.27	47.6	1	0.00	61.95	0.00	280.21	0.77
30	24.11	0.11	370.14	366.40	47.6	1	0.00	61.40	0.00	277.75	0.77
31	24.23	0.17	370.26	366.57	51.8	1	0.00	89.91	0.00	253.92	0.78
32	24.40	0.17	370.40	366.79	51.8	1	0.00	88.00	0.00	248.51	0.78
33	24.57	0.15	370.54	367.01	56.0	1	0.00	77.53	0.00	222.91	0.79
34	24.72	0.15	370.67	367.24	56.1	1	0.00	75.26	0.00	216.37	0.79
35	24.88	0.14	370.79	367.47	60.3	1	0.00	64.60	0.00	190.16	0.81

36	25.01	0.14	370.90	367.71	60.3	1	0.00	62.11	0.00	182.86	0.81
37	25.15	0.05	370.98	367.88	64.5	1	0.00	21.62	0.00	158.77	0.84
38	25.20	0.19	371.00	368.13	64.5	1	0.00	76.88	0.00	146.94	0.84
39	25.39	0.20	371.00	368.58	68.7	1	0.00	68.65	0.00	107.95	0.87
40	25.59	0.16	371.00	369.10	72.9	1	0.00	43.48	0.00	71.40	0.91
41	25.75	0.12	371.00	369.64	77.1	1	0.00	23.67	0.00	40.90	0.95
42	25.87	0.08	371.00	370.18	81.3	1	0.00	9.63	0.00	17.66	1.01
43	25.96	0.04	371.00	370.73	85.5	1	0.00	1.66	0.00	3.26	1.08