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STABILITY ANALYSIS USING HYDRODYNAMIC APPROACH

Refer to Figure 8 for Geometric Depiction

CELLS OF THIS BACKGROUND COLOUR REQUIRE USER INPUT DATA

	rad to deg	57.296							
	SG solids	2.65			tailwater	**DS**	35	ft > datum	
	moist S%	5							
	cohesion # / sq ft	friction degrees	radians	void ratio nd	unit wgt dry # / cu ft	unit wgt moist # / cu ft	unit wgt saturated # / cu ft	unit wgt buoyant # / cu ft	**Ko** nd
water	0	0	0	0	62.4	62.4	62.4	62.4	1.000
Soil 1	0	30	0.524	0.22	135.5	136.1	146.8	84.4	0.500
Soil 2	3375	0	0	0.50	110.2	111.3	131.0	68.6	1.000

boundary line	full height feet	water feet **A**	moist S 1 feet **B**	buoy S 1 feet **C**	moist S 2 feet	buoy S 2 feet **D**	Ground Elevation	piezo elev **PE**	slice width	Friction = F Cohesion = blank	slice #
a	5.00	5.00	0.00	0.00	0.00	0.00	120.00	120.00			
b	21.32	0.00	0.00	21.32	0.00	0.00	120.00	120.00	5.00	F	1
c	42.64	0.00	6.97	35.67	0.00	0.00	125.00	118.03	5.00	F	2
d	73.44	0.00	11.91	61.53	0.00	0.00	125.00	113.09	12.50	F	3
e	85.00	0.00	16.84	58.16	0.00	10.00	125.00	108.16	12.50		4
f	77.50	0.00	14.74	52.76	0.00	10.00	115.00	100.26	20.00		5
g	70.00	0.00	12.63	47.37	0.00	10.00	105.00	92.37	20.00		6
h	62.50	0.00	10.53	41.97	0.00	10.00	95.00	84.47	20.00		7
i	55.00	0.00	8.42	36.58	0.00	10.00	85.00	76.58	20.00		8
j	47.50	0.00	6.32	31.18	0.00	10.00	75.00	68.68	20.00		9
k	40.00	0.00	4.21	25.79	0.00	10.00	65.00	60.79	20.00		10
l	32.50	0.00	2.11	20.39	0.00	10.00	55.00	52.89	20.00		11
m	25.00	0.00	0.00	15.00	0.00	10.00	45.00	45.00	20.00		12
n	17.50	0.00	0.00	7.50	0.00	10.00	35.00	35.00	20.00		13
o	10.00	10.00	0.00	0.00	0.00	0.00	35.00	35.00	20.00		14

HORIZONTAL COMPONENTS OF FORCES

SHEAR RESISTANCE	723,992
SEEPAGE FORCE	198,810
EFFECTIVE SOIL WEIGHT	171,120
HYDROSTATIC END FORCES	-2,340

FACTOR OF SAFETY = **1.970**

NO DRAIN - cohesion & friction

boundary line	slice #	average PE	average PE - DS	bottom Elevation **BE**	ave bottom elevation **BE**	ave PE - BE	ave Seepage Height	active seepage volume	head loss across slice	gradient across slice	active Seepage Force	top angle rad	effective angle rad at depth	effective sin verticle	effective cos horizontal	Horizontal component **SFh**	Verticle component **SFv**	effective angle degee mid-height	slice #	**tan φ**	**sin β**	**cos β**
a				115.00																		
b	1	120.00	85.00	98.68	106.84	13.16	13.16	66	0.00	0.000	0	0.000	0.000	0.000	1.000	0	0	0.00	1	0.577	0.956	0.293
c	2	119.02	84.02	82.36	90.52	28.50	28.50	142	1.97	0.394	3,503	0.375	0.312	0.307	0.952	3,334	1,074	17.86	2	0.577	0.956	0.293
d	3	115.56	80.56	51.56	66.96	48.60	48.60	608	4.94	0.395	14,981	0.376	0.263	0.260	0.966	14,467	3,892	15.06	3	0.577	0.927	0.376
e	4	110.63	75.63	40.00	45.78	64.85	64.85	811	4.93	0.394	19,948	0.376	0.215	0.213	0.977	19,491	4,248	12.30	4	0.000	0.679	0.734
f	5	104.21	69.21	37.50	38.75	65.46	65.46	1309	7.90	0.395	32,269	0.376	0.198	0.197	0.980	31,637	6,357	11.36	5	0.000	0.124	0.992
g	6	96.32	61.32	35.00	36.25	60.07	60.07	1201	7.89	0.395	29,572	0.376	0.192	0.191	0.982	29,030	5,635	10.98	6	0.000	0.124	0.992
h	7	88.42	53.42	32.50	33.75	54.67	53.42	1068	7.90	0.395	26,334	0.376	0.188	0.187	0.982	25,869	4,924	10.78	7	0.000	0.124	0.992
i	8	80.53	45.53	30.00	31.25	49.28	45.53	911	7.89	0.395	22,414	0.376	0.188	0.187	0.982	22,019	4,186	10.76	8	0.000	0.124	0.992
j	9	72.63	37.63	27.50	28.75	43.88	37.63	753	7.90	0.395	18,550	0.376	0.188	0.187	0.982	18,223	3,469	10.78	9	0.000	0.124	0.992
k	10	64.74	29.74	25.00	26.25	38.49	29.74	595	7.89	0.395	14,640	0.376	0.188	0.187	0.982	14,382	2,734	10.76	10	0.000	0.124	0.992
l	11	56.84	21.84	22.50	23.75	33.09	21.84	437	7.90	0.395	10,766	0.376	0.188	0.187	0.982	10,576	2,013	10.78	11	0.000	0.124	0.992
m	12	48.95	13.95	20.00	21.25	27.70	13.95	279	7.89	0.395	6,866	0.376	0.188	0.187	0.982	6,745	1,282	10.76	12	0.000	0.124	0.992
n	13	40.00	5.00	17.50	18.75	21.25	5.00	100	10.00	0.500	3,120	0.464	0.232	0.230	0.973	3,037	717	13.28	13	0.000	0.124	0.992
o	14	35.00	0.00	25.00	21.25	13.75	0.00	0	0.00	0.000	0	0.000	0.000	0.000	1.000	0	0	0.00	14	0.000	-0.351	0.936
																198,810	40,532					

boundary line	slice #	area water	area moist S 1	area buoy S 1	area moist S 2	area buoy S 2	weight water	weight moist S 1	weight buoy S 1	weight moist S 2	weight buoy S 2	weight soil ONLY **EW**	Elevation Loss	base angle radians **β**	degrees **β**	Horizontal Friction **soil**	Horizontal Friction **seepage**	Horizontal Cohesion **CH**	Soil-wise Resistance **SH**	Horizontal EW comp **WH**	End slice Hydrostatic Forces	slice #
a																						
b	1	12.5	0.0	53.3	0.0	0.0	780	0	4,498	0	0	4,498	16.32	1.274	72.97	223	0	0	223	1,260	780	1
c	2	0.0	17.4	142.5	0.0	0.0	0	2,372	12,024	0	0	14,396	16.32	1.274	72.97	713	53	0	766	4,032		2
d	3	0.0	118.0	607.5	0.0	0.0	0	16,060	51,269	0	0	67,329	30.80	1.185	67.91	5,497	318	0	5,815	23,461		3
e	4	0.0	179.7	748.1	0.0	62.5	0	24,456	63,132	0	4,290	91,878	11.56	0.746	42.76	0	0	42,188	42,188	45,799		4
f	5	0.0	315.8	1109.2	0.0	200.0	0	42,982	93,609	0	13,728	150,319	2.50	0.124	7.13	0	0	67,500	67,500	18,501		5
g	6	0.0	273.7	1001.3	0.0	200.0	0	37,252	84,503	0	13,728	135,483	2.50	0.124	7.13	0	0	67,500	67,500	16,675		6
h	7	0.0	231.6	893.4	0.0	200.0	0	31,522	75,397	0	13,728	120,647	2.50	0.124	7.13	0	0	67,500	67,500	14,849		7
i	8	0.0	189.5	785.5	0.0	200.0	0	25,792	66,291	0	13,728	105,811	2.50	0.124	7.13	0	0	67,500	67,500	13,023		8
j	9	0.0	147.4	677.6	0.0	200.0	0	20,062	57,185	0	13,728	90,975	2.50	0.124	7.13	0	0	67,500	67,500	11,197		9
k	10	0.0	105.3	569.7	0.0	200.0	0	14,332	48,079	0	13,728	76,139	2.50	0.124	7.13	0	0	67,500	67,500	9,371		10
l	11	0.0	63.2	461.8	0.0	200.0	0	8,602	38,973	0	13,728	61,303	2.50	0.124	7.13	0	0	67,500	67,500	7,545		11
m	12	0.0	21.1	353.9	0.0	200.0	0	2,872	29,867	0	13,728	46,467	2.50	0.124	7.13	0	0	67,500	67,500	5,719		12
n	13	0.0	0.0	225.0	0.0	200.0	0	0	18,989	0	13,728	32,717	2.50	0.124	7.13	0	0	67,500	67,500	4,027		13
o	14	100.0	0.0	75.0	0.0	100.0	6,240	0	6,330	0	6,864	13,194	-7.50	-0.359	-20.56	0	0	67,500	67,500	-4,338	-3120	14
												1,011,152							723,992	171,120	-2340	