APPENDIX C

SOIL DESIGN PARAMETERS

Deviations of the in situ materials from any of these assumptions may affect settlement calculations.

For this study, the coefficient of consolidation is assumed to be constant for each stratum. Soil layers exceeding 3 feet in thickness were divided into sublayers not greater than 3 feet.

The following table lists the soil parameters used in the settlement analyses for the North Marsh Platform and North Containment Levee.

DEPTH BELOW BOTTOM ELEVATION TO TOP OF LAYER (FEET)	DEPTH BELOW BOTTOM ELEVATION TO BOTTOM OF LAYER (FEET)	WET DENSITY (PCF)	COMPRESSION RATIO	UNDRAINED COHESION (PSF)	SWELL INDEX	COEFFICIENT OF CONSOLIDATION (FT^2/DAY)	OCR
0	5	88	0.35	200	0.035	0.07	3
5	10	88	0.21	200	0.021	0.30	3
10	17	118	0.17	400	0.017	0.40	1
17	20	104	0.21	175	0.025	0.09	1
20	40	116	0.28	325	0.028	0.10	1
40	60	116	0.25	450	0.025	0.30	1
60	70	116	0.25	600	0.025	0.10	1

The following is a table of properties used in the settlement analyses of the South Marsh Platform and South Containment Levee.

DEPTH BELOW BOTTOM ELEVATION TO TOP OF LAYER (FEET)	DEPTH BELOW BOTTOM ELEVATION TO BOTTOM OF LAYER (FEET)	WET DENSITY (PCF)	COMPRESSION RATIO	UNDRAINED COHESION (PSF)	SWELL INDEX	COEFFICIENT OF CONSOLIDATION (FT^2/DAY)	OCR
0	10	118	0.17	250	0.12	0.04	3
10	25	102	0.48	125	0.08	0.04	1
25	50	103	0.25	325	0.06	0.04	1
50	70	102	0.33	600	0.06	0.04	1

The following soil parameters were used to calculate settlements and slope stability for the terraces.

DEPTH BELOW BOTTOM ELEVATION TO TOP OF LAYER (FEET)	DEPTH BELOW BOTTOM ELEVATION TO BOTTOM OF LAYER (FEET)	WET DENSITY (PCF)	COMPRESSION RATIO	UNDRAINED COHESION (PSF)	SWELL INDEX	COEFFICIENT OF CONSOLIDATION (FT^2/DAY)	OCR
0	5	118	0.18	425	0.018	0.60	4
5	9	118	0.10	250	0.018	0.80	4
9	13	112	0.13	250	0.020	2.00	1
13	20	76	0.35	100	0.035	0.04	1
20	30	101	0.27	275	0.027	0.02	1
30	40	105	0.23	350	0.023	0.09	1
40	50	115	0.21	550	0.021	0.12	1
50	60	103	0.22	675	0.022	0.10	1

Included in this Appendix are plots of the soil parameters as a function of depth. We have also included representative calculations for settlement of the marsh platform and the containment levee, and slope stability analyses.

Terraces
** STABLPro V3.0**

Upgraded from
FHWA-PCSTABLE

1

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date:
Time of Run:
Run By:
Input Data Filename:
Output Filename:
Plotted Output Filename:

PROBLEM DESCRIPTION 19666 Lake Hermitage -- Slope stability analyses for the Terraces

BOUNDARY COORDINATES

11 Top Boundaries
18 Total Boundaries

Boundary No.	X-Left ft.	Y-Left ft.	X-Right ft.	Y-Right ft.	Soil Type Below Bnd
1	0.00	98.60	20.00	98.60	2
2	20.00	98.60	35.00	93.60	2
3	35.00	93.60	50.00	88.60	3
4	50.00	88.60	70.00	88.60	3
5	70.00	88.60	85.00	93.60	3
6	85.00	93.60	100.00	98.60	2
7	100.00	98.60	125.00	98.60	2
8	125.00	98.60	140.00	103.60	1
9	140.00	103.60	160.00	103.60	1
10	160.00	103.60	175.00	98.60	1
11	175.00	98.60	200.00	98.90	2
12	125.00	98.60	175.00	98.90	2
13	0.00	93.60	35.00	93.60	3
14	85.00	93.60	200.00	93.60	3
15	0.00	85.60	200.00	85.60	4
16	0.00	78.60	200.00	78.60	5
17	0.00	68.60	200.00	68.60	6
18	0.00	58.60	200.00	58.60	7

1

ISOTROPIC SOIL PARAMETERS

7 Type(s) of Soil

Soil Type No.	Total Unit Wt. pcf	Saturated Unit Wt. pcf	Cohesion Intercept psf	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant psf	Piez. Surface No.
1	100.0	100.0	150.0	0.0	0.00	0.0	1
2	118.0	118.0	425.0	0.0	0.00	0.0	1
3	122.0	122.0	250.0	0.0	0.00	0.0	1
4	104.0	104.0	100.0	0.0	0.00	0.0	1
5	102.0	102.0	275.0	0.0	0.00	0.0	1
6	105.0	105.0	350.0	0.0	0.00	0.0	1
7	115.0	115.0	550.0	0.0	0.00	0.0	1

1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40 pcf

Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water ft.	Y-Water ft.
1	0.00	99.68
2	200.00	99.68

1

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced Along The Ground Surface Between X = 10.00 ft.
and X = 125.00 ft.

Each Surface Terminates Between X = 130.00 ft.
and X = 170.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00 ft.

5.00 ft. Line Segments Define Each Trial Failure Surface.

Terraces

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By Spencer`s Method * *

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	61.11	88.60
2	65.59	86.37
3	70.20	84.44
4	74.92	82.80
5	79.74	81.46
6	84.63	80.44
7	89.58	79.73
8	94.57	79.33
9	99.57	79.25
10	104.56	79.49
11	109.53	80.05
12	114.45	80.92
13	119.31	82.11
14	124.08	83.60
15	128.75	85.39
16	133.29	87.48
17	137.70	89.85
18	141.94	92.50
19	146.00	95.41
20	149.88	98.57
21	153.54	101.98
22	155.08	103.60

Circle Center At X = 98.3 ; Y = 157.7 and Radius, 78.5

*** FOS = 1.557 Spencer`s Theta = 3.70 ***

Individual data on the 31 slices

Slice No.	Width Ft	Weight Lbs	Water Force Top Lbs	Water Force Bot Lbs	Tie Force Norm Lbs	Tie Force Tan Lbs	Earthquake Force Hor Lbs	Earthquake Force Ver Lbs	Surcharge Load Lbs
1	4.5	0.61E+03	0.31E+04	0.38E+04	0.00E+00	0.0	0.0	0.0	0.0
2	1.8	0.59E+03	0.13E+04	0.17E+04	0.00E+00	0.0	0.0	0.0	0.0
3	2.6	0.11E+04	0.18E+04	0.25E+04	0.00E+00	0.0	0.0	0.0	0.0
4	0.2	0.97E+02	0.14E+03	0.20E+03	0.00E+00	0.0	0.0	0.0	0.0
5	4.7	0.32E+04	0.32E+04	0.50E+04	0.00E+00	0.0	0.0	0.0	0.0
6	4.8	0.49E+04	0.27E+04	0.55E+04	0.00E+00	0.0	0.0	0.0	0.0
7	4.9	0.66E+04	0.23E+04	0.58E+04	0.00E+00	0.0	0.0	0.0	0.0

Terraces

8	0.4	0.55E+03	0.15E+03	0.44E+03	0.00E+00	0.0	0.0	0.0	0.0
9	4.6	0.75E+04	0.16E+04	0.57E+04	0.00E+00	0.0	0.0	0.0	0.0
10	5.0	0.94E+04	0.12E+04	0.63E+04	0.00E+00	0.0	0.0	0.0	0.0
11	5.0	0.11E+05	0.68E+03	0.64E+04	0.00E+00	0.0	0.0	0.0	0.0
12	0.4	0.96E+03	0.33E+02	0.55E+03	0.00E+00	0.0	0.0	0.0	0.0
13	4.6	0.10E+05	0.31E+03	0.58E+04	0.00E+00	0.0	0.0	0.0	0.0
14	5.0	0.11E+05	0.33E+03	0.62E+04	0.00E+00	0.0	0.0	0.0	0.0
15	4.9	0.10E+05	0.33E+03	0.60E+04	0.00E+00	0.0	0.0	0.0	0.0
16	4.9	0.97E+04	0.33E+03	0.57E+04	0.00E+00	0.0	0.0	0.0	0.0
17	4.8	0.88E+04	0.32E+03	0.52E+04	0.00E+00	0.0	0.0	0.0	0.0
18	0.9	0.16E+04	0.62E+02	0.97E+03	0.00E+00	0.0	0.0	0.0	0.0
19	3.8	0.65E+04	0.11E+03	0.38E+04	0.00E+00	0.0	0.0	0.0	0.0
20	0.4	0.77E+03	0.00E+00	0.44E+03	0.00E+00	0.0	0.0	0.0	0.0
21	4.1	0.68E+04	0.00E+00	0.37E+04	0.00E+00	0.0	0.0	0.0	0.0
22	4.4	0.68E+04	0.00E+00	0.34E+04	0.00E+00	0.0	0.0	0.0	0.0
23	2.3	0.33E+04	0.00E+00	0.15E+04	0.00E+00	0.0	0.0	0.0	0.0
24	1.9	0.25E+04	0.00E+00	0.11E+04	0.00E+00	0.0	0.0	0.0	0.0
25	1.5	0.18E+04	0.00E+00	0.78E+03	0.00E+00	0.0	0.0	0.0	0.0
26	2.5	0.25E+04	0.00E+00	0.10E+04	0.00E+00	0.0	0.0	0.0	0.0
27	3.9	0.27E+04	0.00E+00	0.84E+03	0.00E+00	0.0	0.0	0.0	0.0
28	0.0	0.15E+02	0.00E+00	0.28E+01	0.00E+00	0.0	0.0	0.0	0.0
29	1.2	0.52E+03	0.00E+00	0.53E+02	0.00E+00	0.0	0.0	0.0	0.0
30	2.5	0.68E+03	0.00E+00	0.00E+00	0.00E+00	0.0	0.0	0.0	0.0
31	1.5	0.12E+03	0.00E+00	0.00E+00	0.00E+00	0.0	0.0	0.0	0.0

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	73.89	89.90
2	78.11	87.22
3	82.56	84.93
4	87.19	83.06
5	91.98	81.61
6	96.88	80.60
7	101.85	80.04
8	106.84	79.93
9	111.83	80.27
10	116.77	81.06
11	121.62	82.29
12	126.33	83.96
13	130.87	86.04
14	135.21	88.53
15	139.31	91.40
16	143.12	94.63
17	146.64	98.19
18	149.81	102.05
19	150.87	103.60

Circle Center At X = 105.6 ; Y = 135.2 and Radius, 55.3

*** FOS = 1.797 Spencer`s Theta = 3.37 ***

1

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	61.11	88.60
2	64.75	85.17
3	68.66	82.06
4	72.82	79.28
5	77.20	76.86
6	81.76	74.82
7	86.48	73.16
8	91.32	71.91
9	96.24	71.06
10	101.23	70.63
11	106.23	70.61
12	111.21	71.02
13	116.14	71.84
14	120.99	73.07
15	125.72	74.70
16	130.29	76.72
17	134.68	79.11
18	138.85	81.86
19	142.78	84.96
20	146.44	88.37
21	149.80	92.07
22	152.83	96.04
23	155.53	100.25
24	157.29	103.60

Circle Center At X = 103.9 ; Y = 130.3 and Radius, 59.8

*** FOS = 1.906 Spencer`s Theta = 3.99 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	61.11	88.60
2	65.26	85.81
3	69.61	83.35
4	74.15	81.24
5	78.83	79.49
6	83.63	78.10
7	88.53	77.10
8	93.49	76.47
9	98.49	76.24
10	103.48	76.40
11	108.46	76.94
12	113.37	77.87
13	118.19	79.18
14	122.90	80.86

		Terraces
15	127.47	82.90
16	131.86	85.29
17	136.05	88.01
18	140.02	91.06
19	143.74	94.40
20	147.19	98.02
21	150.34	101.90
22	151.52	103.60

Circle Center At X = 99.0 ; Y = 140.5 and Radius, 64.2

*** FOS = 1.926 Spencer`s Theta = 4.60 ***

1

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	61.11	88.60
2	65.45	86.11
3	69.92	83.87
4	74.51	81.88
5	79.20	80.15
6	83.98	78.69
7	88.83	77.49
8	93.75	76.57
9	98.70	75.92
10	103.69	75.55
11	108.69	75.45
12	113.69	75.64
13	118.66	76.10
14	123.61	76.84
15	128.51	77.86
16	133.34	79.14
17	138.09	80.70
18	142.75	82.51
19	147.30	84.59
20	151.73	86.91
21	156.02	89.48
22	160.16	92.28
23	164.14	95.31
24	167.94	98.55
25	169.81	100.33

Circle Center At X = 107.9 ; Y = 165.1 and Radius, 89.7

*** FOS = 1.938 Spencer`s Theta = 3.27 ***

Failure Surface Specified By 20 Coordinate Points

Terraces

Point No.	X-Surf ft.	Y-Surf ft.
1	61.11	88.60
2	65.67	86.55
3	70.36	84.81
4	75.16	83.40
5	80.04	82.32
6	84.98	81.57
7	89.97	81.17
8	94.97	81.10
9	99.96	81.38
10	104.92	82.00
11	109.83	82.95
12	114.66	84.24
13	119.39	85.85
14	124.00	87.79
15	128.47	90.03
16	132.78	92.57
17	136.90	95.40
18	140.82	98.51
19	144.51	101.88
20	146.16	103.60

Circle Center At X = 93.4 ; Y = 154.3 and Radius, 73.2

*** FOS = 1.964 Spencer`s Theta = 4.43 ***

1

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	48.33	89.16
2	52.64	86.61
3	57.09	84.33
4	61.67	82.33
5	66.37	80.61
6	71.16	79.19
7	76.03	78.06
8	80.96	77.23
9	85.93	76.70
10	90.93	76.48
11	95.93	76.57
12	100.91	76.96
13	105.86	77.65
14	110.76	78.65
15	115.59	79.95
16	120.33	81.54
17	124.97	83.41
18	129.48	85.57
19	133.85	88.00
20	138.06	90.69
21	142.10	93.63

Terraces

22	145.95	96.82
23	149.60	100.24
24	152.78	103.60

Circle Center At X = 92.0 ; Y = 158.1 and Radius, 81.6

*** FOS = 1.980 Spencer`s Theta = 4.48 ***

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	48.33	89.16
2	51.88	85.63
3	55.65	82.35
4	59.64	79.34
5	63.83	76.60
6	68.20	74.17
7	72.72	72.03
8	77.38	70.22
9	82.15	68.72
10	87.01	67.56
11	91.94	66.73
12	96.92	66.25
13	101.92	66.10
14	106.91	66.30
15	111.88	66.84
16	116.80	67.72
17	121.65	68.94
18	126.41	70.48
19	131.05	72.35
20	135.55	74.53
21	139.89	77.02
22	144.04	79.79
23	148.00	82.85
24	151.74	86.17
25	155.24	89.73
26	158.49	93.53
27	161.48	97.55
28	164.18	101.76
29	164.39	102.14

Circle Center At X = 101.5 ; Y = 139.0 and Radius, 72.9

*** FOS = 1.980 Spencer`s Theta = 4.48 ***

1

Failure Surface Specified By 23 Coordinate Points

Point	X-Surf	Y-Surf

No.	ft.	Terraces ft.
1	48.33	89.16
2	52.90	87.11
3	57.57	85.32
4	62.33	83.81
5	67.17	82.56
6	72.08	81.59
7	77.03	80.89
8	82.01	80.48
9	87.01	80.35
10	92.01	80.50
11	96.99	80.94
12	101.94	81.65
13	106.84	82.64
14	111.67	83.91
15	116.43	85.45
16	121.09	87.26
17	125.65	89.32
18	130.08	91.64
19	134.37	94.21
20	138.51	97.01
21	142.48	100.04
22	146.28	103.30
23	146.59	103.60

Circle Center At X = 86.8 ; Y = 168.9 and Radius, 88.5

*** FOS = 2.020 Spencer`s Theta = 4.05 ***

Failure Surface Specified By 29 Coordinate Points

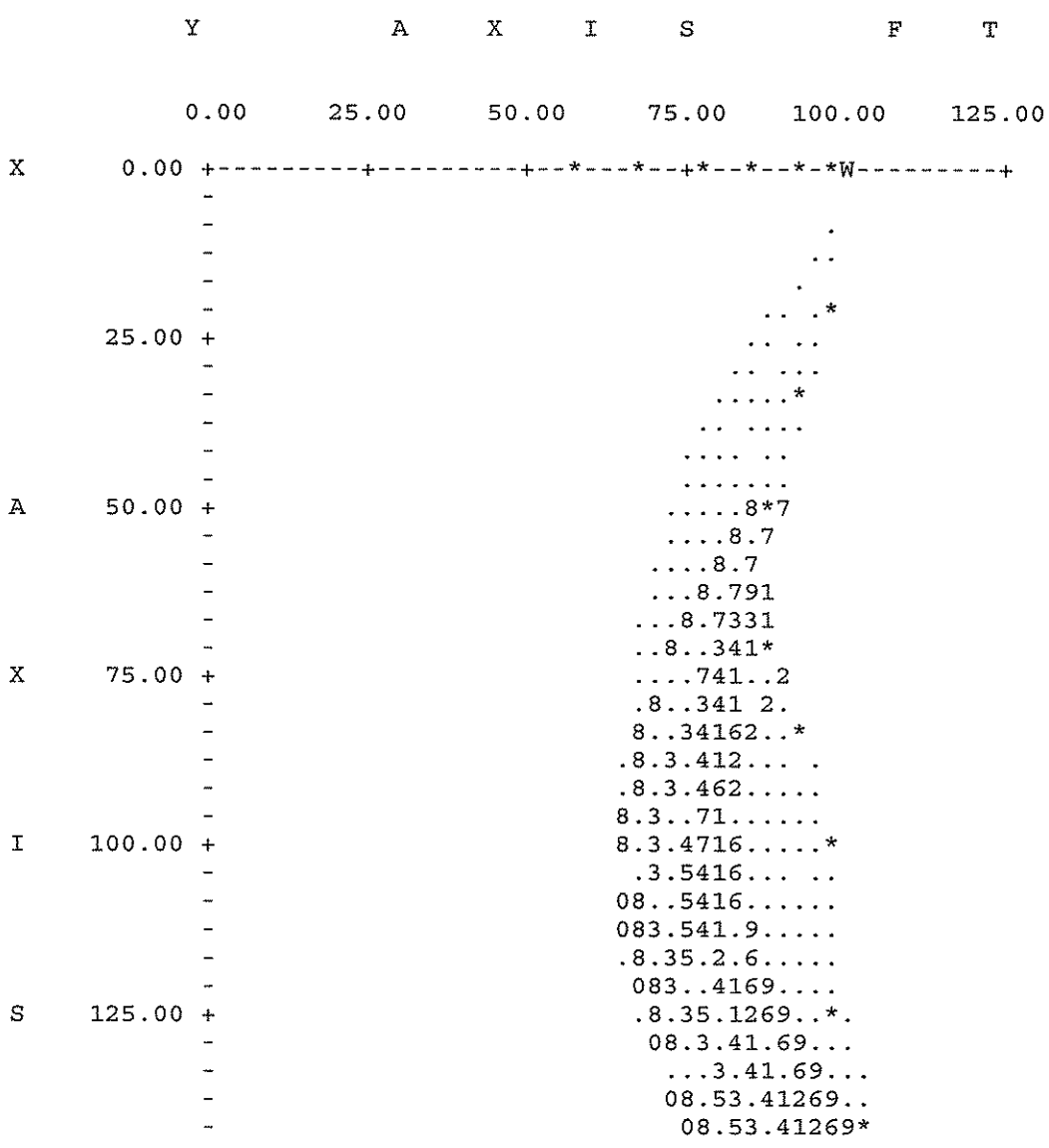
Point No.	X-Surf ft.	Y-Surf ft.
1	48.33	89.16
2	51.90	85.65
3	55.69	82.39
4	59.69	79.39
5	63.87	76.65
6	68.22	74.19
7	72.73	72.01
8	77.36	70.14
9	82.11	68.57
10	86.95	67.32
11	91.86	66.38
12	96.82	65.76
13	101.82	65.47
14	106.82	65.51
15	111.80	65.87
16	116.75	66.56
17	121.65	67.57
18	126.47	68.89
19	131.20	70.53
20	135.81	72.47

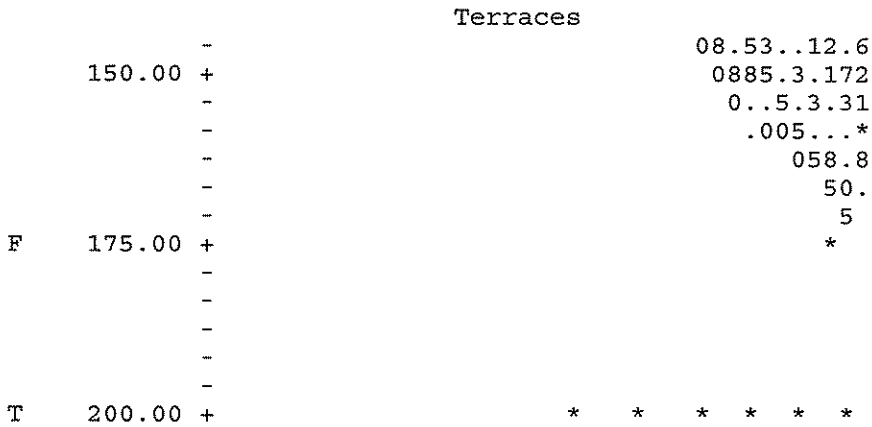
		Terraces
21	140.28	74.71
22	144.59	77.23
23	148.74	80.03
24	152.69	83.10
25	156.43	86.41
26	159.95	89.96
27	163.23	93.74
28	166.25	97.72
29	168.31	100.83

Circle Center At X = 103.8 ; Y = 142.1 and Radius, 76.7

*** FOS = 2.020 Spencer`s Theta = 4.05 ***

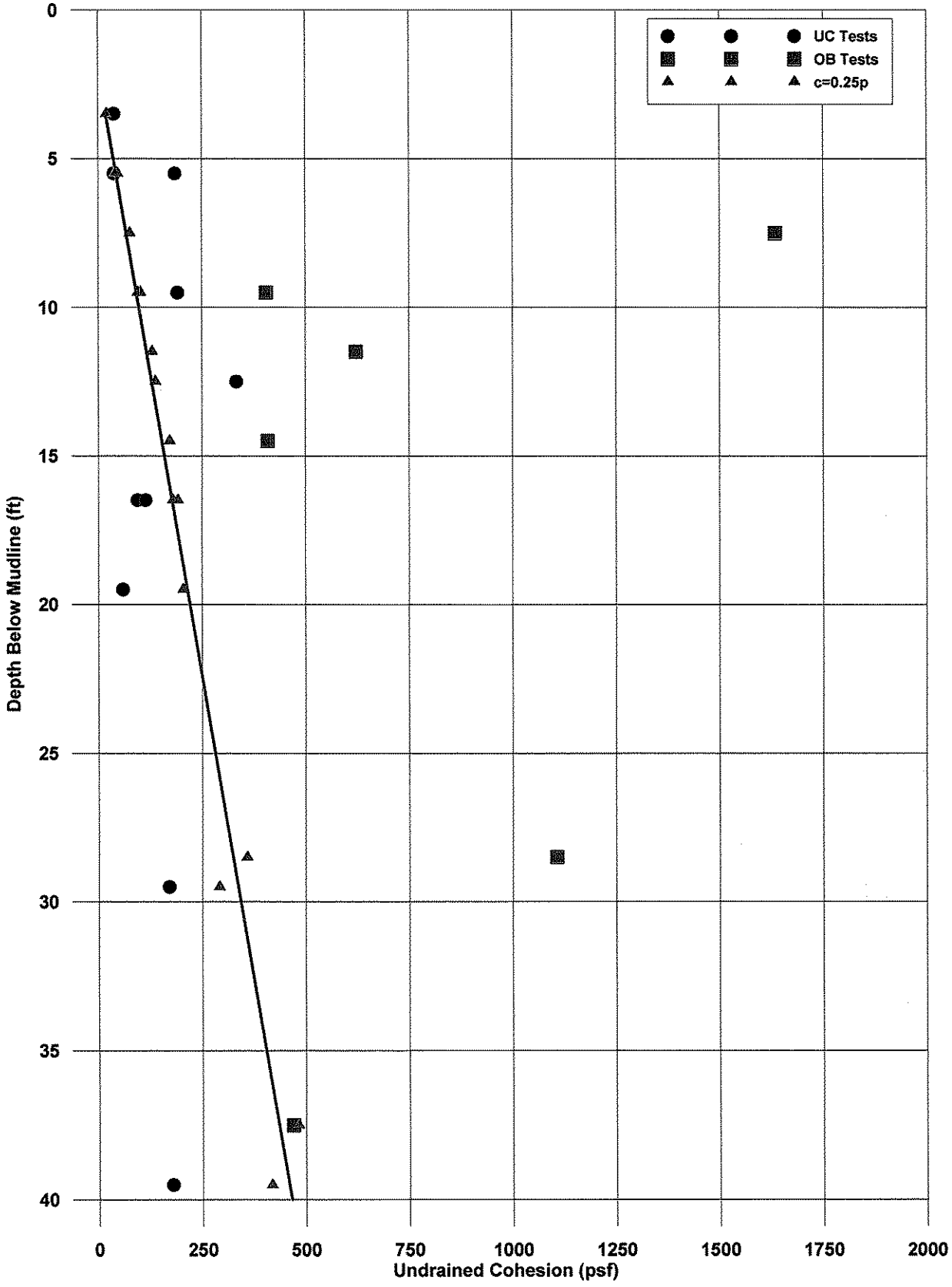
1



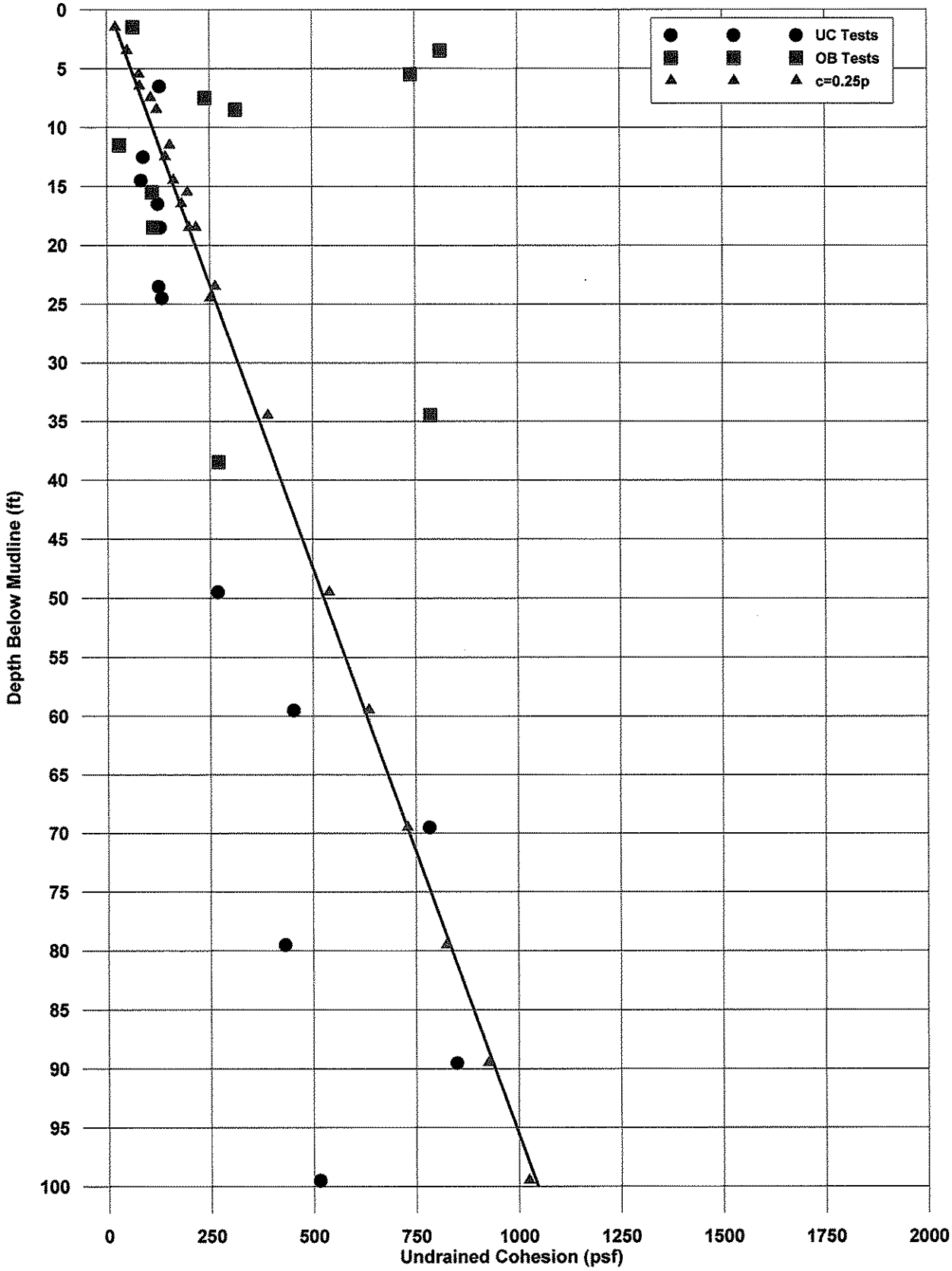


****
****** EXECUTION OF STABL ABORTED ******
****

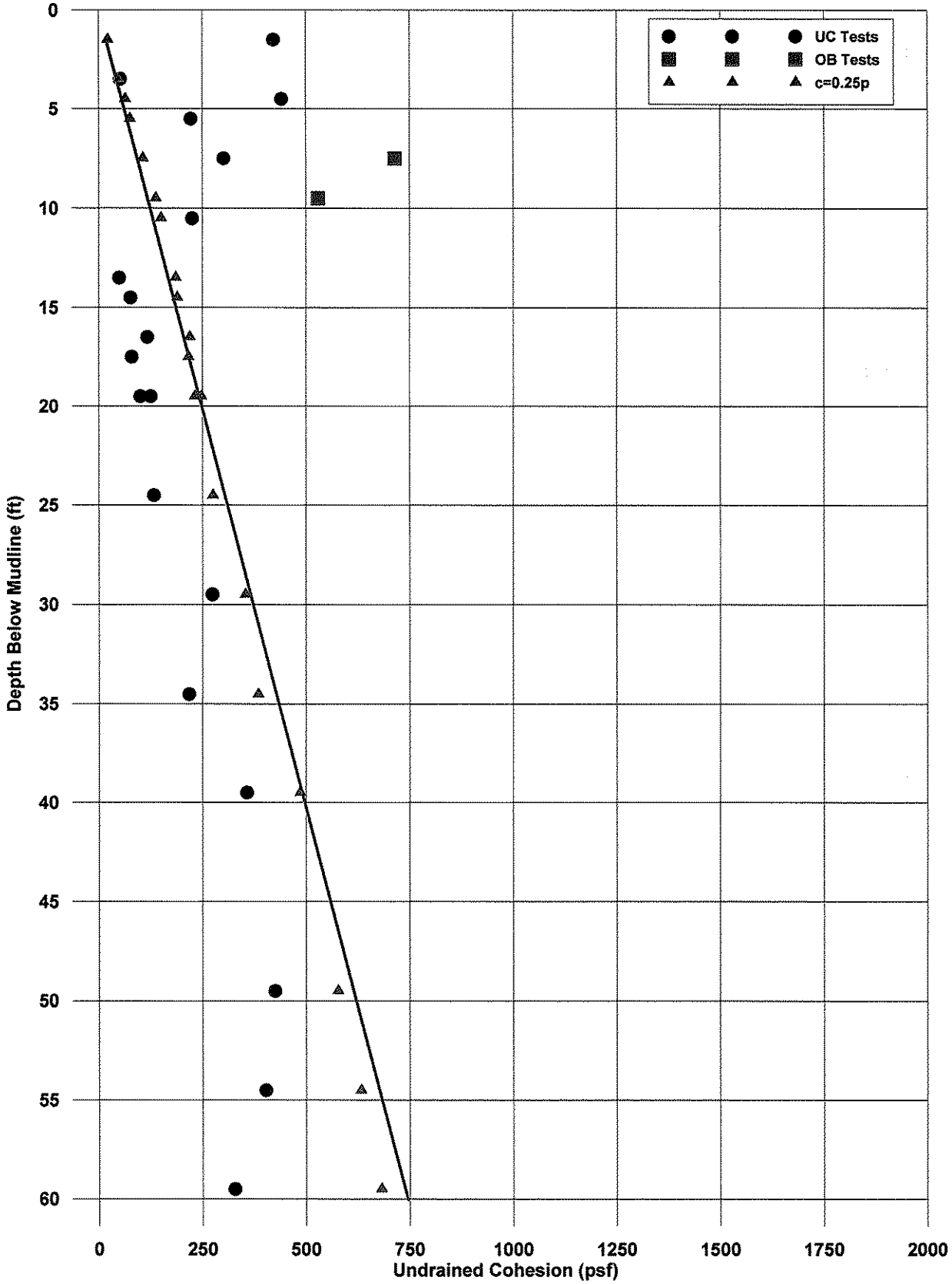
EE 19666 - Depth vs. Undrained Cohesion North Marsh Platform



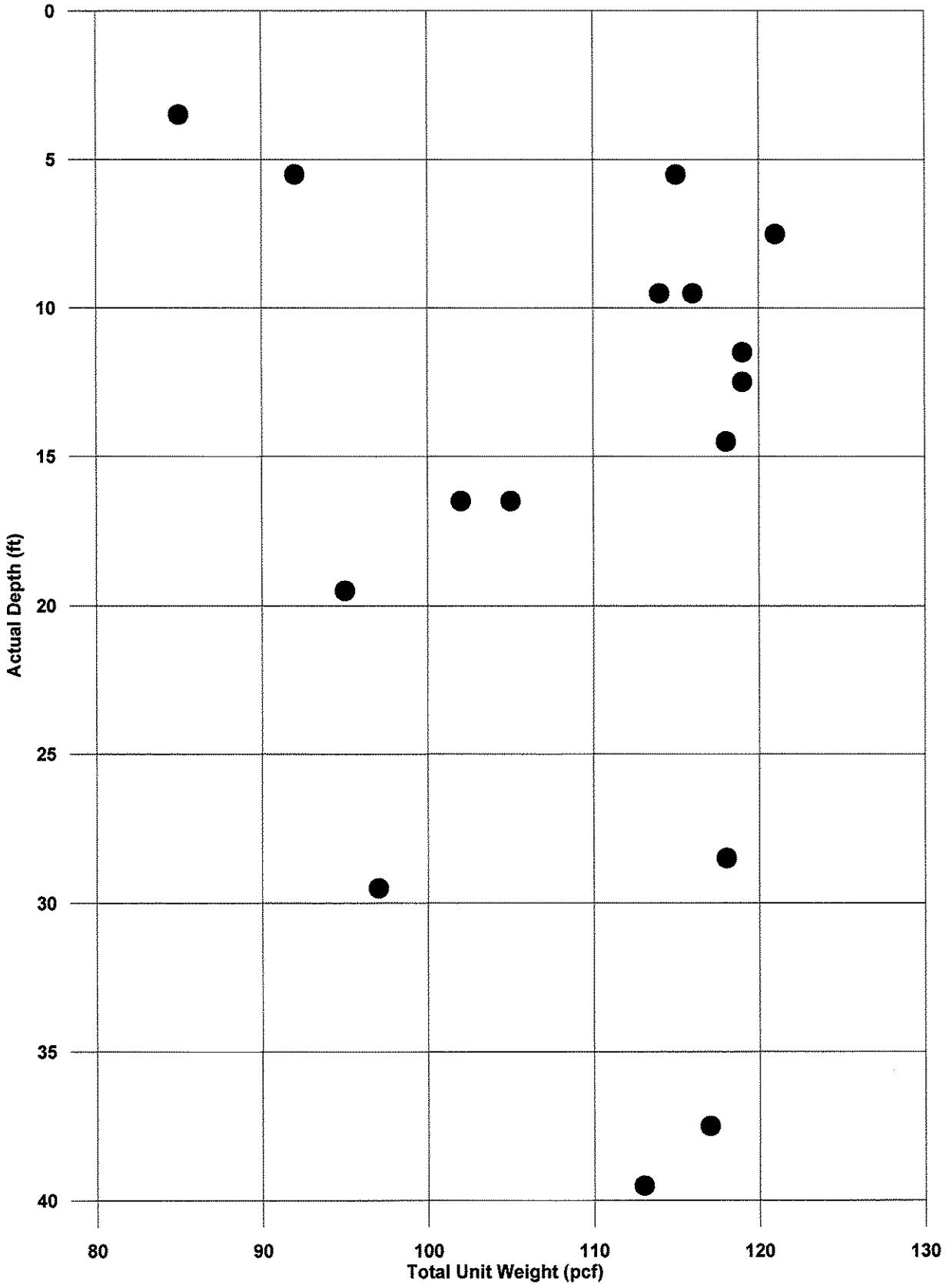
EE 19666 - Depth vs. Undrained Cohesion South Marsh Platform



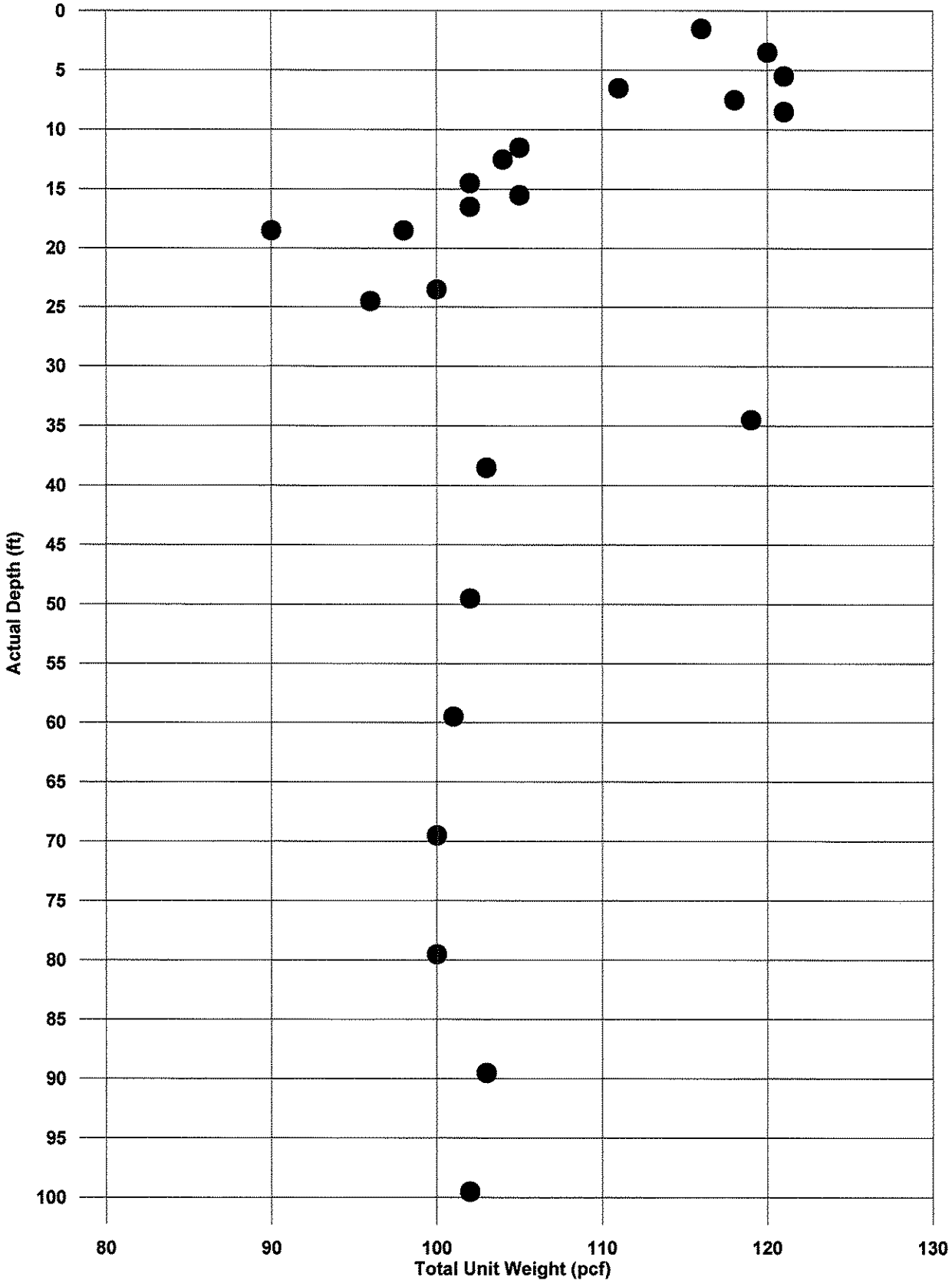
EE 19666 - Depth vs. Undrained Cohesion the Terraces

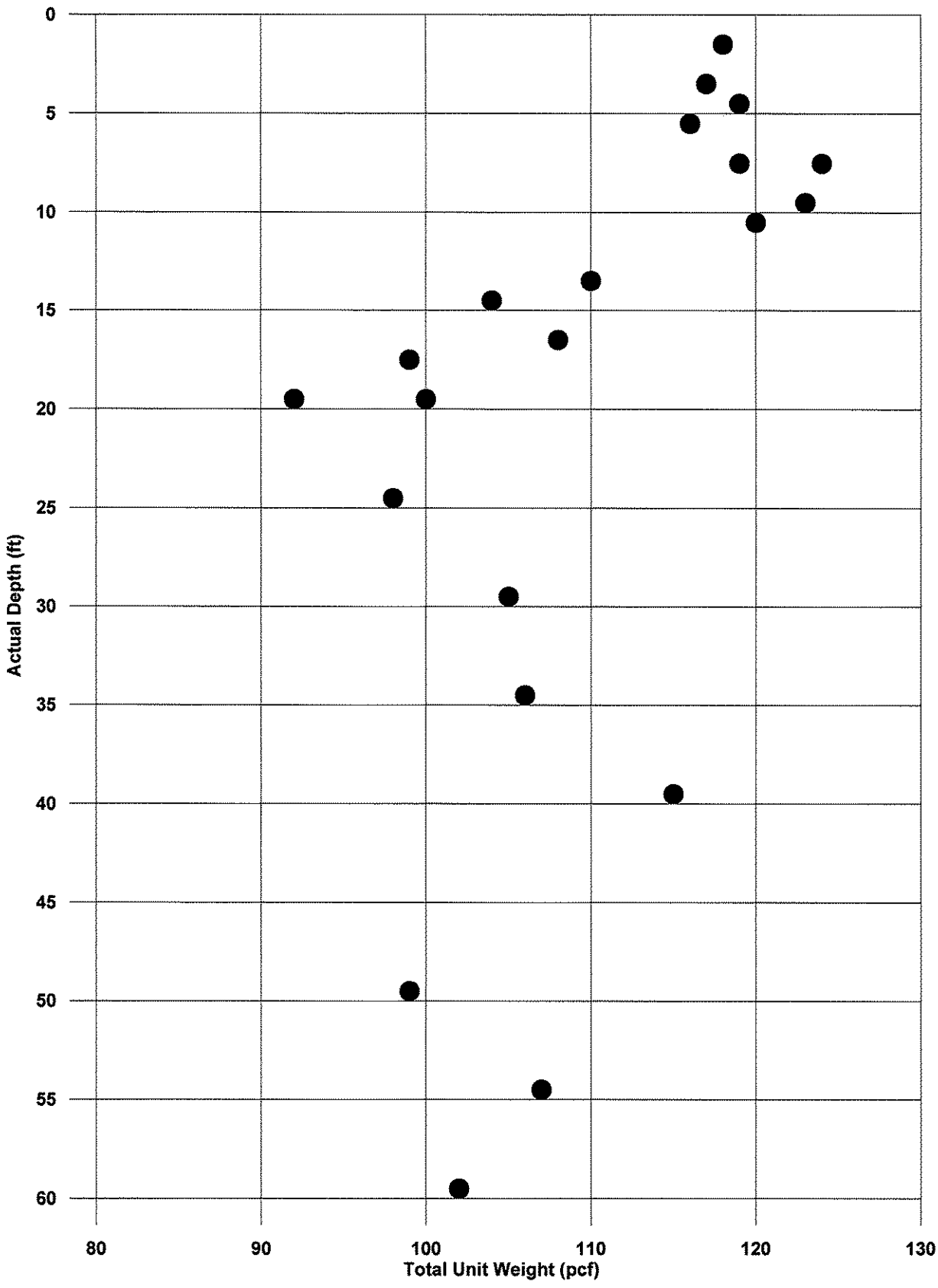


EE 19666 - Depth vs. Total Unit Weight North Marsh Platform

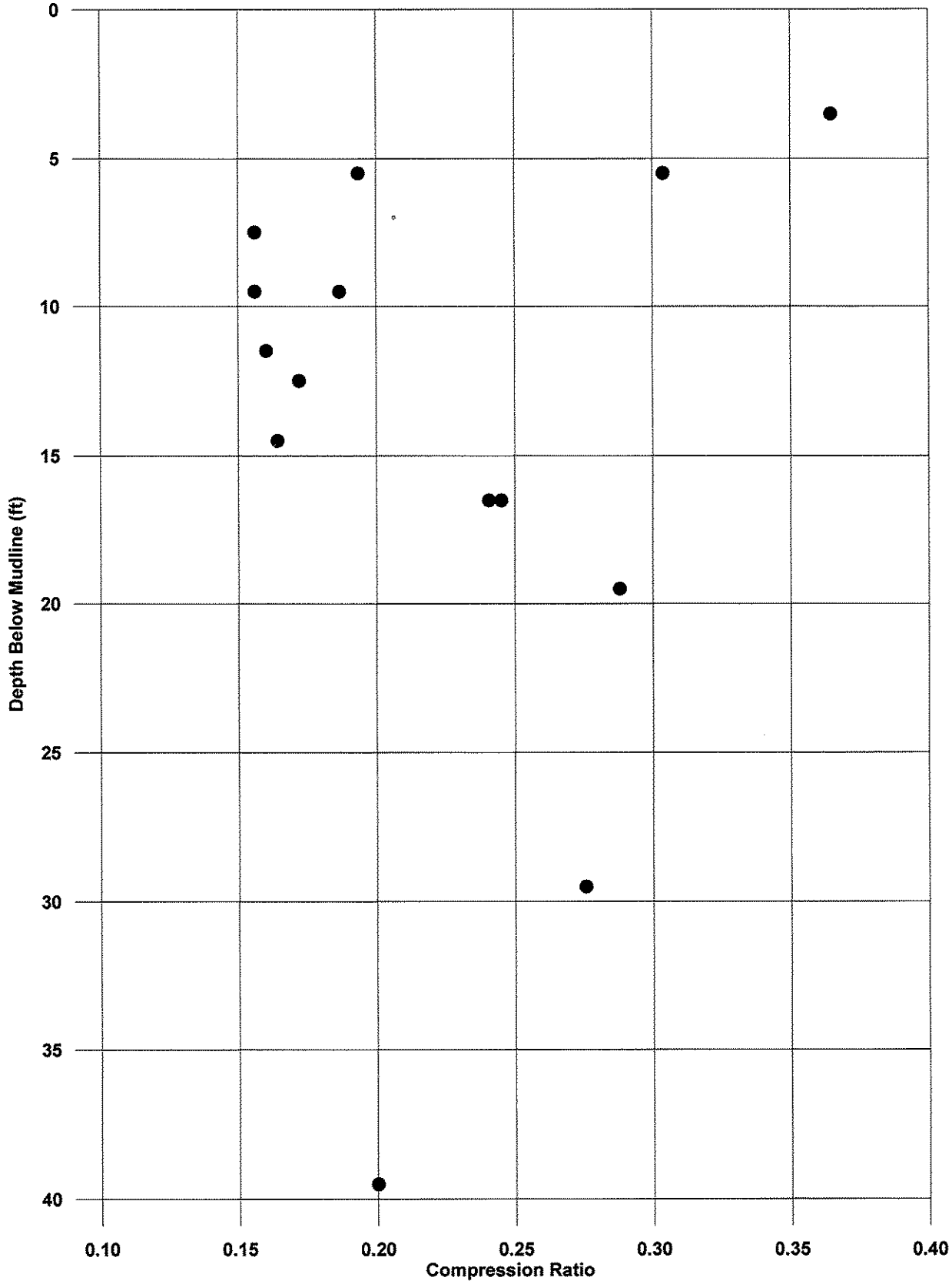


EE 19666 - Depth vs. Total Unit Weight South Marsh Platform

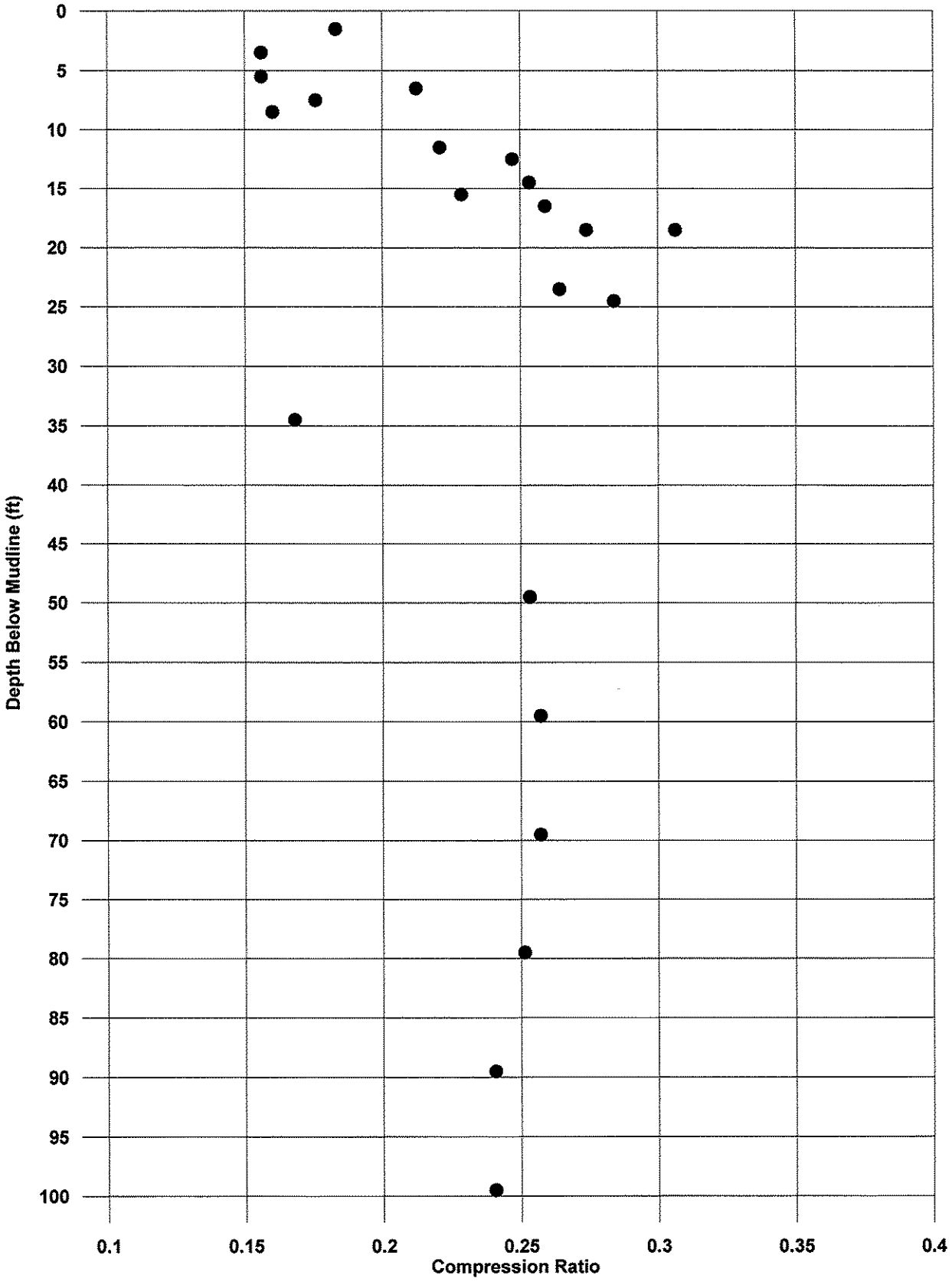



EE 19666 - Depth vs. Total Unit Weight the Terraces
Actual Depth (ft)
0
5
10
15
20
25
30
35
40
45
50
55
60
80
90
100
110
120
130
Total Unit Weight (pcf)

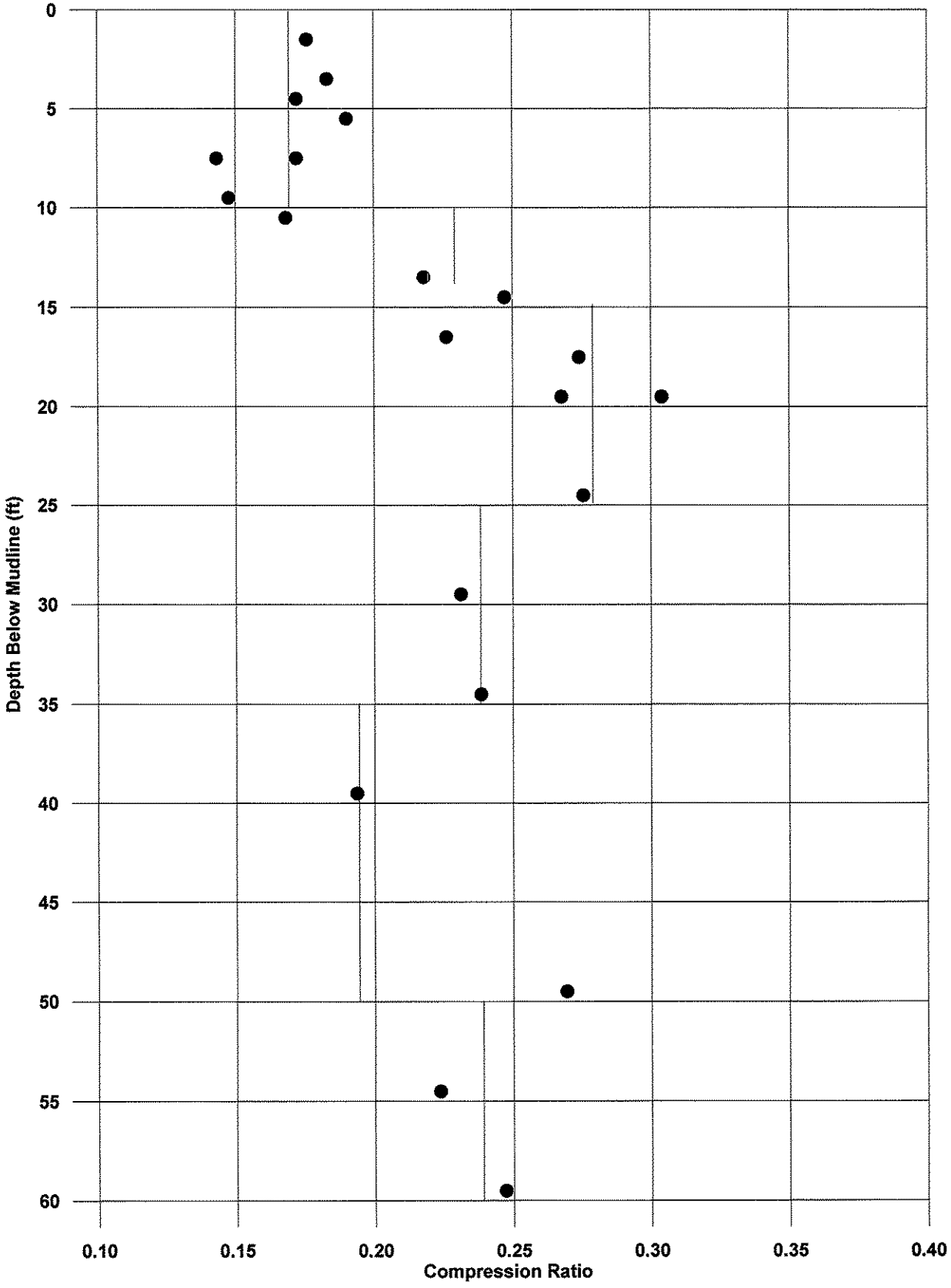
EE 19666 - Depth vs. Compression Ratio North Marsh Platform



EE 19666 - Depth vs. Compression Ratio for South Marsh Platform



EE 19666 - Depth vs. Compression Ratio the Terraces B-7 & B-8



MPN-A

LAKE HERMITAGE FOR SD3, TWO-DIMENSIONAL FLOW, LARGE STRAINS, LOG S-LOG P CURVES, EFFECTIVE-STRESS DEPENDENT PROPERTIES, MARSH PLATFORM NORTH COMBINATION OF CORRELATIONS WITH CR AND ACTUAL CONSOLIDATION TEST RESULTS high water level 2.5'

TABLE 1 P R O B L E M G E O M E T R Y

LAYER NO.	NUMBER OF DEPTH NODES	NUMBER OF RADIAL NODES
1	5	3
2	3	3
3	2	3
4	5	3
5	2	3
6	5	3
7	2	3

STATIC PORE WATER PRESSURES ABOVE THE WATERTABLE ARE ZERO

BOTH HORIZONTAL BOUNDARIES ARE FREELY DRAINING

TABLE 2 S A N D D R A I N I N F O R M A T I O N

DAY OF INSTALLATION	WELL RADIUS (FEET)	CENTER-TO-CENTER SPACING (FEET)	PATTERN OF INSTALLATION
15000.0	0.11	10.00	SQUARE

LAYER NO.	PENETRATED BY DRAINS
1	Y
2	Y
3	Y
4	Y
5	Y
6	Y
7	Y

TABLE 3 L O A D H I S T O R Y

THE DEPTH FROM THE ORIGINAL GROUND SURFACE TO THE INITIAL GROUND WATER TABLE (FT) -1.3

THE DEPTH FROM THE ORIGINAL GROUND SURFACE TO THE FINAL GROUND WATER TABLE (FT) = -1.3

ELEV. OF ORIGINAL GROUND SURFACE= -0.46FT.

FILL LAYER NUMBER	TOTAL UNIT WEIGHT (PCF)	TIME FILL CONSTRUCTION BEGINS (DAYS)	TIME FILL CONSTRUCTION ENDS (DAYS)
1	115.0	30.0	30.0
2	115.0	90.0	150.0
3	115.0	1000.0	1000.0

TIME (DAYS)	EMBANKMENT ELEVATION (FT)
0.	-0.46
365.	2.04
1000.	2.04
1000.	2.04
40000.	2.04

TABLE 4 T I M E S F O R O U T P U T

0.0	DAYS
365.0	DAYS
400.0	DAYS
500.0	DAYS
600.0	DAYS
700.0	DAYS
800.0	DAYS
1000.0	DAYS
2000.0	DAYS
3000.0	DAYS
4000.0	DAYS
5000.0	DAYS
6000.0	DAYS

MPN-A
7300.0 DAYS
9125.0 DAYS
10000.0 DAYS

TABLE 5 S T R A I N - E F F E C T I V E S T R E S S C U R V E S

LAYER	EFFECTIVE STRESS (PSF)	VERTICAL STRAIN (PERCENT)
1	0.0	0.00
	139.0	0.00
	417.0	1.70
	5000.0	37.80
2	0.0	0.00
	417.0	0.00
	1251.0	1.00
	5000.0	12.60
3	0.0	0.00
	703.0	0.00
	5000.0	17.90
4	0.0	0.00
	850.0	0.00
	5000.0	21.50
5	0.0	0.00
	1351.0	0.00
	10000.0	21.70
6	0.0	0.00
	2173.0	0.00
	10000.0	16.60
7	0.0	0.00
	2777.0	0.00
	10000.0	13.90

LAYER	SLOPE OF REBOUND CURVE
1	0.4E-01
2	0.2E-01
3	0.2E-01
4	0.3E-01
5	0.3E-01

MPN-A

6	0.3E-01
7	0.3E-01

TABLE 6 C O E F F I C I E N T S O F C O N S O L I D A T I O N A N D P E R M E A B I L I T Y

LAYER NO.	EFFECTIVE STRESS PSF	COEFFICIENTS OF CONSOLIDATION CV SQ.FT/DAY	CR SQ.FT/DAY	PERMEABILITY PK FT/DAY
1	ALL VALUES	0.70E-01	0.10E+00	0.10E+01
2	ALL VALUES	0.30E+00	0.10E+00	0.10E+01
3	ALL VALUES	0.40E+00	0.10E+00	0.10E+01
4	ALL VALUES	0.90E-01	0.10E+00	0.10E+01
5	ALL VALUES	0.10E+00	0.10E+00	0.10E+01
6	ALL VALUES	0.30E+00	0.10E+00	0.10E+01
7	ALL VALUES	0.10E+00	0.10E+00	0.10E+01

TABLE 7 I N I T I A L C O N D I T I O N S

L	HO FT	GS	HS FT	HREF FT	ZAVE FT	GAM PCF	EO	CORR FT
1	5.0	1.41	5.00	5.00	2.50	88.0	0.000	0.000
2	5.0	1.41	5.00	5.00	7.50	88.0	0.000	0.000
3	7.0	1.89	7.00	7.00	13.50	118.0	0.000	0.000
4	13.0	1.67	12.88	13.00	23.50	104.0	0.009	0.117
5	10.0	1.87	9.92	10.00	35.00	116.0	0.008	0.080
6	20.0	1.68	20.00	20.00	50.00	105.0	0.000	0.000
7	10.0	1.68	10.00	10.00	65.00	105.0	0.000	0.004

L	SIGNSO PSF	PAVE PSF	PPAVE PSF	CV SQFT/DAY	CR SQFT/DAY	PK FT/DAY
1	220.00	64.00	0.00	0.70E-01	0.10E+00	0.10E+01
2	660.00	192.00	0.00	0.30E+00	0.10E+00	0.10E+01
3	1293.00	450.60	0.00	0.40E+00	0.10E+00	0.10E+01
4	2382.00	915.60	0.00	0.90E-01	0.10E+00	0.10E+01
5	3638.00	1454.00	0.00	0.10E+00	0.10E+00	0.10E+01
6	5268.00	2148.00	0.00	0.30E+00	0.10E+00	0.10E+01
7	6843.00	2787.00	0.00	0.10E+00	0.10E+00	0.10E+01

1

TABLE 9 S U M M A R Y O F T I M E - S E T T L E M E N T D A T A

TIME (DAYS)	SETTLEMENT (FEET)	MPN-A PERCENTAGE SETTLEMENT	FILL ELEVATION (FEET)	SETTLEMENT (INCHES)
0.0	0.000	0.00	-0.460	0.000
365.0	0.034	5.09	2.040	0.407
400.0	0.042	6.27	2.032	0.502
500.0	0.059	8.87	2.015	0.710
600.0	0.074	11.11	2.000	0.889
700.0	0.090	13.53	1.984	1.083
800.0	0.108	16.12	1.966	1.291
1000.0	0.139	20.91	1.934	1.674
2000.0	0.279	41.78	1.901	3.344
3000.0	0.376	56.31	1.804	4.507
4000.0	0.447	66.99	1.733	5.362
5000.0	0.500	74.97	1.679	6.000
6000.0	0.540	80.91	1.640	6.476
7300.0	0.577	86.52	1.602	6.925
9125.0	0.611	91.62	1.568	7.333
10000.0	0.622	93.28	1.557	7.466
INFINITY	0.667	100.00	1.512	8.004

Terraces
** STABLPro V3.0**

Upgraded from
FHWA-PCSTABLE

1

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date:
Time of Run:
Run By:
Input Data Filename:
Output Filename:
Plotted Output Filename:

PROBLEM DESCRIPTION 19666 Lake Hermitage -- Slope stability analyses for the Terraces

BOUNDARY COORDINATES

11 Top Boundaries
18 Total Boundaries

Boundary No.	X-Left ft.	Y-Left ft.	X-Right ft.	Y-Right ft.	Soil Type Below Bnd
1	0.00	98.60	20.00	98.60	2
2	20.00	98.60	35.00	93.60	2
3	35.00	93.60	50.00	88.60	3
4	50.00	88.60	70.00	88.60	3
5	70.00	88.60	85.00	93.60	3
6	85.00	93.60	100.00	98.60	2
7	100.00	98.60	125.00	98.60	2
8	125.00	98.60	140.00	103.60	1
9	140.00	103.60	160.00	103.60	1
10	160.00	103.60	175.00	98.60	1
11	175.00	98.60	200.00	98.90	2
12	125.00	98.60	175.00	98.90	2
13	0.00	93.60	35.00	93.60	3
14	85.00	93.60	200.00	93.60	3
15	0.00	85.60	200.00	85.60	4
16	0.00	78.60	200.00	78.60	5
17	0.00	68.60	200.00	68.60	6
18	0.00	58.60	200.00	58.60	7

1

ISOTROPIC SOIL PARAMETERS

7 Type(s) of Soil

Soil Type No.	Total Unit Wt. pcf	Saturated Unit Wt. pcf	Cohesion Intercept psf	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant psf	Piez. Surface No.
1	100.0	100.0	150.0	0.0	0.00	0.0	1
2	118.0	118.0	425.0	0.0	0.00	0.0	1
3	122.0	122.0	250.0	0.0	0.00	0.0	1
4	104.0	104.0	100.0	0.0	0.00	0.0	1
5	102.0	102.0	275.0	0.0	0.00	0.0	1
6	105.0	105.0	350.0	0.0	0.00	0.0	1
7	115.0	115.0	550.0	0.0	0.00	0.0	1

1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40 pcf

Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water ft.	Y-Water ft.
1	0.00	99.68
2	200.00	99.68

1

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced Along The Ground Surface Between X = 10.00 ft.
and X = 125.00 ft.

Each Surface Terminates Between X = 130.00 ft.
and X = 170.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00 ft.

5.00 ft. Line Segments Define Each Trial Failure Surface.

Terraces

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By Spencer`s Method * *

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	61.11	88.60
2	65.59	86.37
3	70.20	84.44
4	74.92	82.80
5	79.74	81.46
6	84.63	80.44
7	89.58	79.73
8	94.57	79.33
9	99.57	79.25
10	104.56	79.49
11	109.53	80.05
12	114.45	80.92
13	119.31	82.11
14	124.08	83.60
15	128.75	85.39
16	133.29	87.48
17	137.70	89.85
18	141.94	92.50
19	146.00	95.41
20	149.88	98.57
21	153.54	101.98
22	155.08	103.60

Circle Center At X = 98.3 ; Y = 157.7 and Radius, 78.5

*** FOS = 1.557 Spencer`s Theta = 3.70 ***

Individual data on the 31 slices

Slice No.	Width Ft	Weight Lbs	Water Force Top Lbs	Water Force Bot Lbs	Tie Force Norm Lbs	Tie Force Tan Lbs	Earthquake Force Hor Lbs	Earthquake Force Ver Lbs	Surcharge Load Lbs
1	4.5	0.61E+03	0.31E+04	0.38E+04	0.00E+00	0.0	0.0	0.0	0.0
2	1.8	0.59E+03	0.13E+04	0.17E+04	0.00E+00	0.0	0.0	0.0	0.0
3	2.6	0.11E+04	0.18E+04	0.25E+04	0.00E+00	0.0	0.0	0.0	0.0
4	0.2	0.97E+02	0.14E+03	0.20E+03	0.00E+00	0.0	0.0	0.0	0.0
5	4.7	0.32E+04	0.32E+04	0.50E+04	0.00E+00	0.0	0.0	0.0	0.0
6	4.8	0.49E+04	0.27E+04	0.55E+04	0.00E+00	0.0	0.0	0.0	0.0
7	4.9	0.66E+04	0.23E+04	0.58E+04	0.00E+00	0.0	0.0	0.0	0.0

Terraces

8	0.4	0.55E+03	0.15E+03	0.44E+03	0.00E+00	0.0	0.0	0.0	0.0
9	4.6	0.75E+04	0.16E+04	0.57E+04	0.00E+00	0.0	0.0	0.0	0.0
10	5.0	0.94E+04	0.12E+04	0.63E+04	0.00E+00	0.0	0.0	0.0	0.0
11	5.0	0.11E+05	0.68E+03	0.64E+04	0.00E+00	0.0	0.0	0.0	0.0
12	0.4	0.96E+03	0.33E+02	0.55E+03	0.00E+00	0.0	0.0	0.0	0.0
13	4.6	0.10E+05	0.31E+03	0.58E+04	0.00E+00	0.0	0.0	0.0	0.0
14	5.0	0.11E+05	0.33E+03	0.62E+04	0.00E+00	0.0	0.0	0.0	0.0
15	4.9	0.10E+05	0.33E+03	0.60E+04	0.00E+00	0.0	0.0	0.0	0.0
16	4.9	0.97E+04	0.33E+03	0.57E+04	0.00E+00	0.0	0.0	0.0	0.0
17	4.8	0.88E+04	0.32E+03	0.52E+04	0.00E+00	0.0	0.0	0.0	0.0
18	0.9	0.16E+04	0.62E+02	0.97E+03	0.00E+00	0.0	0.0	0.0	0.0
19	3.8	0.65E+04	0.11E+03	0.38E+04	0.00E+00	0.0	0.0	0.0	0.0
20	0.4	0.77E+03	0.00E+00	0.44E+03	0.00E+00	0.0	0.0	0.0	0.0
21	4.1	0.68E+04	0.00E+00	0.37E+04	0.00E+00	0.0	0.0	0.0	0.0
22	4.4	0.68E+04	0.00E+00	0.34E+04	0.00E+00	0.0	0.0	0.0	0.0
23	2.3	0.33E+04	0.00E+00	0.15E+04	0.00E+00	0.0	0.0	0.0	0.0
24	1.9	0.25E+04	0.00E+00	0.11E+04	0.00E+00	0.0	0.0	0.0	0.0
25	1.5	0.18E+04	0.00E+00	0.78E+03	0.00E+00	0.0	0.0	0.0	0.0
26	2.5	0.25E+04	0.00E+00	0.10E+04	0.00E+00	0.0	0.0	0.0	0.0
27	3.9	0.27E+04	0.00E+00	0.84E+03	0.00E+00	0.0	0.0	0.0	0.0
28	0.0	0.15E+02	0.00E+00	0.28E+01	0.00E+00	0.0	0.0	0.0	0.0
29	1.2	0.52E+03	0.00E+00	0.53E+02	0.00E+00	0.0	0.0	0.0	0.0
30	2.5	0.68E+03	0.00E+00	0.00E+00	0.00E+00	0.0	0.0	0.0	0.0
31	1.5	0.12E+03	0.00E+00	0.00E+00	0.00E+00	0.0	0.0	0.0	0.0

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	73.89	89.90
2	78.11	87.22
3	82.56	84.93
4	87.19	83.06
5	91.98	81.61
6	96.88	80.60
7	101.85	80.04
8	106.84	79.93
9	111.83	80.27
10	116.77	81.06
11	121.62	82.29
12	126.33	83.96
13	130.87	86.04
14	135.21	88.53
15	139.31	91.40
16	143.12	94.63
17	146.64	98.19
18	149.81	102.05
19	150.87	103.60

Circle Center At X = 105.6 ; Y = 135.2 and Radius, 55.3

*** FOS = 1.797 Spencer`s Theta = 3.37 ***

1

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	61.11	88.60
2	64.75	85.17
3	68.66	82.06
4	72.82	79.28
5	77.20	76.86
6	81.76	74.82
7	86.48	73.16
8	91.32	71.91
9	96.24	71.06
10	101.23	70.63
11	106.23	70.61
12	111.21	71.02
13	116.14	71.84
14	120.99	73.07
15	125.72	74.70
16	130.29	76.72
17	134.68	79.11
18	138.85	81.86
19	142.78	84.96
20	146.44	88.37
21	149.80	92.07
22	152.83	96.04
23	155.53	100.25
24	157.29	103.60

Circle Center At X = 103.9 ; Y = 130.3 and Radius, 59.8

*** FOS = 1.906 Spencer`s Theta = 3.99 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	61.11	88.60
2	65.26	85.81
3	69.61	83.35
4	74.15	81.24
5	78.83	79.49
6	83.63	78.10
7	88.53	77.10
8	93.49	76.47
9	98.49	76.24
10	103.48	76.40
11	108.46	76.94
12	113.37	77.87
13	118.19	79.18
14	122.90	80.86

Terraces

15	127.47	82.90
16	131.86	85.29
17	136.05	88.01
18	140.02	91.06
19	143.74	94.40
20	147.19	98.02
21	150.34	101.90
22	151.52	103.60

Circle Center At X = 99.0 ; Y = 140.5 and Radius, 64.2

*** FOS = 1.926 Spencer`s Theta = 4.60 ***

1

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	61.11	88.60
2	65.45	86.11
3	69.92	83.87
4	74.51	81.88
5	79.20	80.15
6	83.98	78.69
7	88.83	77.49
8	93.75	76.57
9	98.70	75.92
10	103.69	75.55
11	108.69	75.45
12	113.69	75.64
13	118.66	76.10
14	123.61	76.84
15	128.51	77.86
16	133.34	79.14
17	138.09	80.70
18	142.75	82.51
19	147.30	84.59
20	151.73	86.91
21	156.02	89.48
22	160.16	92.28
23	164.14	95.31
24	167.94	98.55
25	169.81	100.33

Circle Center At X = 107.9 ; Y = 165.1 and Radius, 89.7

*** FOS = 1.938 Spencer`s Theta = 3.27 ***

Failure Surface Specified By 20 Coordinate Points

Terraces

Point No.	X-Surf ft.	Y-Surf ft.
1	61.11	88.60
2	65.67	86.55
3	70.36	84.81
4	75.16	83.40
5	80.04	82.32
6	84.98	81.57
7	89.97	81.17
8	94.97	81.10
9	99.96	81.38
10	104.92	82.00
11	109.83	82.95
12	114.66	84.24
13	119.39	85.85
14	124.00	87.79
15	128.47	90.03
16	132.78	92.57
17	136.90	95.40
18	140.82	98.51
19	144.51	101.88
20	146.16	103.60

Circle Center At X = 93.4 ; Y = 154.3 and Radius, 73.2

*** FOS = 1.964 Spencer`s Theta = 4.43 ***

1

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	48.33	89.16
2	52.64	86.61
3	57.09	84.33
4	61.67	82.33
5	66.37	80.61
6	71.16	79.19
7	76.03	78.06
8	80.96	77.23
9	85.93	76.70
10	90.93	76.48
11	95.93	76.57
12	100.91	76.96
13	105.86	77.65
14	110.76	78.65
15	115.59	79.95
16	120.33	81.54
17	124.97	83.41
18	129.48	85.57
19	133.85	88.00
20	138.06	90.69
21	142.10	93.63

		Terraces
22	145.95	96.82
23	149.60	100.24
24	152.78	103.60

Circle Center At X = 92.0 ; Y = 158.1 and Radius, 81.6

*** FOS = 1.980 Spencer`s Theta = 4.48 ***

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	48.33	89.16
2	51.88	85.63
3	55.65	82.35
4	59.64	79.34
5	63.83	76.60
6	68.20	74.17
7	72.72	72.03
8	77.38	70.22
9	82.15	68.72
10	87.01	67.56
11	91.94	66.73
12	96.92	66.25
13	101.92	66.10
14	106.91	66.30
15	111.88	66.84
16	116.80	67.72
17	121.65	68.94
18	126.41	70.48
19	131.05	72.35
20	135.55	74.53
21	139.89	77.02
22	144.04	79.79
23	148.00	82.85
24	151.74	86.17
25	155.24	89.73
26	158.49	93.53
27	161.48	97.55
28	164.18	101.76
29	164.39	102.14

Circle Center At X = 101.5 ; Y = 139.0 and Radius, 72.9

*** FOS = 1.980 Spencer`s Theta = 4.48 ***

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Failure Surface Specified By 23 Coordinate Points

Point	X-Surf	Y-Surf

No.	ft.	Terraces ft.
1	48.33	89.16
2	52.90	87.11
3	57.57	85.32
4	62.33	83.81
5	67.17	82.56
6	72.08	81.59
7	77.03	80.89
8	82.01	80.48
9	87.01	80.35
10	92.01	80.50
11	96.99	80.94
12	101.94	81.65
13	106.84	82.64
14	111.67	83.91
15	116.43	85.45
16	121.09	87.26
17	125.65	89.32
18	130.08	91.64
19	134.37	94.21
20	138.51	97.01
21	142.48	100.04
22	146.28	103.30
23	146.59	103.60

Circle Center At X = 86.8 ; Y = 168.9 and Radius, 88.5

*** FOS = 2.020 Spencer`s Theta = 4.05 ***

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	48.33	89.16
2	51.90	85.65
3	55.69	82.39
4	59.69	79.39
5	63.87	76.65
6	68.22	74.19
7	72.73	72.01
8	77.36	70.14
9	82.11	68.57
10	86.95	67.32
11	91.86	66.38
12	96.82	65.76
13	101.82	65.47
14	106.82	65.51
15	111.80	65.87
16	116.75	66.56
17	121.65	67.57
18	126.47	68.89
19	131.20	70.53
20	135.81	72.47

Terraces

21	140.28	74.71
22	144.59	77.23
23	148.74	80.03
24	152.69	83.10
25	156.43	86.41
26	159.95	89.96
27	163.23	93.74
28	166.25	97.72
29	168.31	100.83

Circle Center At X = 103.8 ; Y = 142.1 and Radius, 76.7

*** FOS = 2.020 Spencer`s Theta = 4.05 ***