

1.20

RESULTS	
C, ksf	0.23
ϕ , deg	8.5
TAN ϕ	0.15

PEAK STRESS, ksf

0.80

0.40

0

0.40

0.80

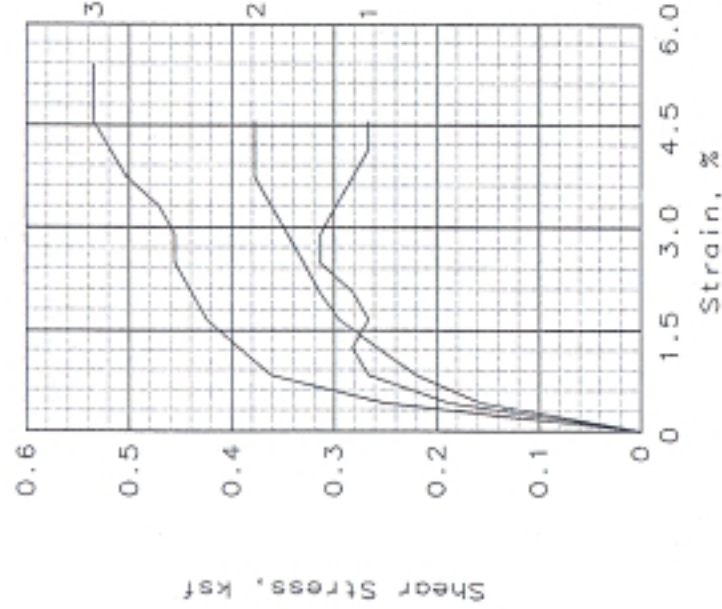
1.20

1.60

2.00

2.40

Normal Stress, ksf



SAMPLE NO.:

1

2

3

WATER CONTENT, %	124.1	125.5	123.5
DRY DENSITY, pcf	38.2	37.8	38.6
SATURATION, %	97.1	98.1	99.0
VOID RATIO	3.580	3.454	3.368
DIAMETER, in	2.42	2.42	2.42
HEIGHT, in	1.00	1.00	1.00
WATER CONTENT, %	85.9	79.6	69.2
DRY DENSITY, pcf	51.2	53.3	58.5
SATURATION, %	99.7	99.3	99.2
VOID RATIO	2.412	2.163	1.883
DIAMETER, in	2.42	2.42	2.42
HEIGHT, in	0.75	0.71	0.66

NORMAL STRESS, ksf

PEAK STRESS, ksf

STRAIN, %

Ultimate Stress, ksf

STRAIN, %

Strain rate, %/min

0.50	1.00	2.00
0.31	0.38	0.53
2.5	3.7	4.6
1.00	1.00	1.00
1.00	1.00	1.00

SAMPLE TYPE: Undisturbed

DESCRIPTION: black & gray CLAY
(Bay Mud)

ASSUMED SPECIFIC GRAVITY= 2.8

REMARKS: **DS-CU**

An undrained condition cannot
be completely accomplished.

CLIENT: PWA

PROJECT: 1546.01 / Napa Sonoma Marsh

SAMPLE LOCATION: Sonoma Bayland / Mudflat

PROJ. NO.: 345-017

DATE: 01/17/02

DIRECT SHEAR TEST REPORT

Fig. No.:

COOPER TESTING LABORATORY

1.20

RESULTS

C, ksf 0.07

 ϕ , deg 14.2TAN ϕ 0.25

PEAK STRESS, ksf

0.80

0.40

0

Normal Stress, ksf

0.40

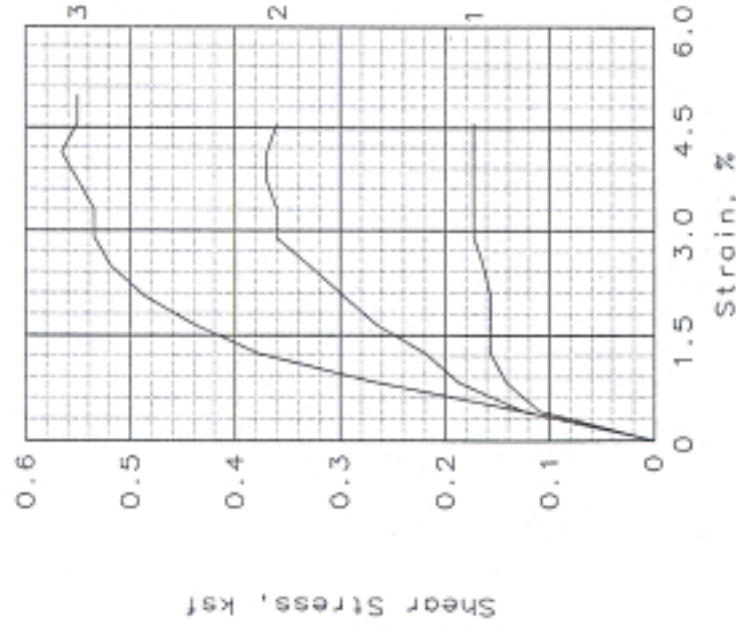
0.80

1.20

1.60

2.00

2.40



Normal Stress, ksf

0.6

0.5

0.4

0.3

0.2

0.1

0

Strain, %

0 1.5 3.0 4.5 6.0

0.6

0.5

0.4

0.3

0.2

0.1

0

3

2

1

SAMPLE NO.:

1 2 3

WATER CONTENT, % 130.0 127.8 119.2

DRY DENSITY, pcf 37.7 38.1 40.3

SATURATION, % 100.0 99.8 99.9

VOID RATIO 3.640 3.588 3.342

DIAMETER, in 2.42 2.42 2.42

HEIGHT, in 1.00 1.00 1.00

WATER CONTENT, % 95.1 77.2 64.3

DRY DENSITY, pcf 47.7 55.3 62.4

SATURATION, % 100.0 100.0 99.9

VOID RATIO 2.665 2.161 1.801

DIAMETER, in 2.42 2.42 2.42

HEIGHT, in 0.79 0.69 0.65

NORMAL STRESS, ksf 0.50 1.00 2.00

PEAK STRESS, ksf 0.17 0.37 0.57

STRAIN, % 2.9 3.7 4.1

Residual CU, ksf

STRAIN, %

Strain rate, %/min 1.00 1.00 1.00

SAMPLE TYPE: Undisturbed
 DESCRIPTION: gray CLAY (Boy MUD)

CLIENT: PWA

PROJECT: 1546.01 / Napa Sonoma Marsh

ASSUMED SPECIFIC GRAVITY= 2.8

REMARKS: **DS-CU**

An undrained condition cannot
 be completely accomplished.

SAMPLE LOCATION: Baylands/ In-Channel

PROJ. NO.: 345-017B

DATE: 01/18/02

DIRECT SHEAR TEST REPORT

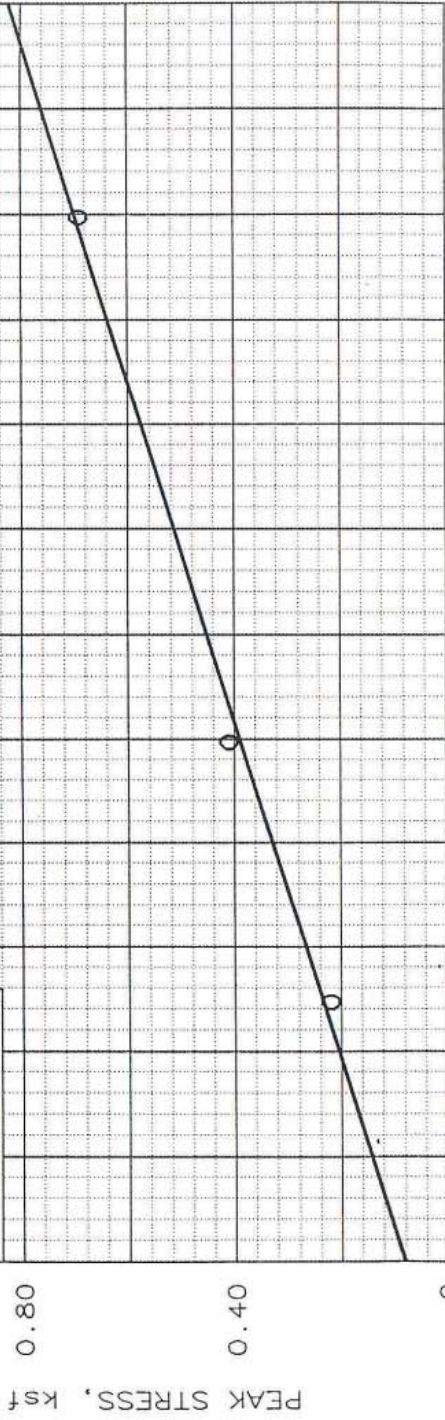
Fig. No.:

COOPER TESTING LABORATORY

1.20

RESULTS	
C, ksf	0.08
ϕ , deg	17.2
TAN ϕ	0.31

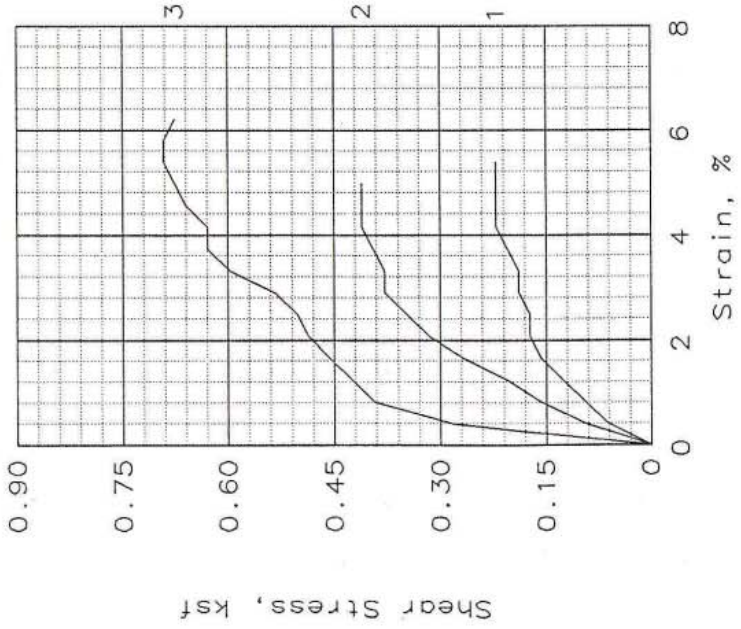
0.80



0.40

Normal Stress, ksf

0.90



Shear Stress, ksf

Strain, %

SAMPLE NO.:

	1	2	3
WATER CONTENT, %	169.4	166.2	160.2
DRY DENSITY, pcf	29.4	29.9	31.4
SATURATION, %	96.5	96.8	98.1
VOID RATIO	4.741	4.638	4.575
DIAMETER, in	2.42	2.41	2.42
HEIGHT, in	1.00	1.00	1.00
WATER CONTENT, %	137.7	126.5	107.2
DRY DENSITY, pcf	35.7	38.3	43.5
SATURATION, %	100.0	100.3	99.6
VOID RATIO	3.718	3.406	3.014
DIAMETER, in	2.42	2.41	2.42
HEIGHT, in	0.82	0.78	0.72

NORMAL STRESS, ksf

PEAK STRESS, ksf

STRAIN, %

Ultimate Stress, ksf

STRAIN, %

Strain rate, %/min

SAMPLE TYPE: Undisturbed

DESCRIPTION: blk. CLAY & MUCK

(Bay Mud) with organics

ASSUMED SPECIFIC GRAVITY= 2.7

REMARKS: **DS-CU**

An undrained condition cannot be completely accomplished.

CLIENT: PWA

PROJECT: 1546.01 / Napa Sonoma Marsh

SAMPLE LOCATION: Cooley Marsh

PROJ. NO.: 345-017A DATE: 01/17/02

DIRECT SHEAR TEST REPORT

COOPER TESTING LABORATORY

Fig. No.:

1.20

RESULTS	
C, ksf	0.15
ϕ , deg	11.1
TAN ϕ	0.20

0.80

PEAK STRESS, ksf

0.40

0

0

0

0.40

0.80

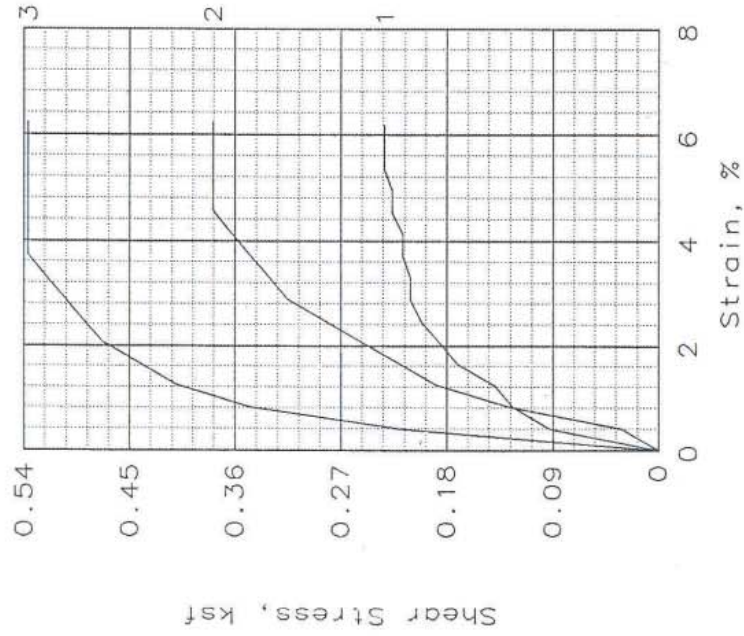
1.20

1.60

2.00

2.40

Normal Stress, ksf



0.54

0.45

Shear Stress, ksf

0.36

0.27

0.18

0.09

Strain, %

0

2

4

6

8

SAMPLE NO.:

3

2

1

1

2

3

WATER CONTENT, %

108.7

95.3

89.3

DRY DENSITY, pcf

42.5

46.2

48.5

SATURATION, %

98.9

97.1

97.5

VOID RATIO

2.968

2.650

2.474

DIAMETER, in

2.43

2.41

2.41

HEIGHT, in

1.03

1.00

1.00

WATER CONTENT, %

96.0

74.7

64.5

DRY DENSITY, pcf

46.8

55.3

61.2

SATURATION, %

99.7

98.5

99.4

VOID RATIO

2.600

2.047

1.753

DIAMETER, in

2.43

2.41

2.41

HEIGHT, in

0.93

0.83

0.79

NORMAL STRESS, ksf

0.50

1.00

2.00

PEAK STRESS, ksf

0.23

0.38

0.54

STRAIN, %

5.3

4.6

3.7

Ultimate Stress, ksf
STRAIN, %

Strain rate, %/min

1.00

1.00

1.00

SAMPLE TYPE: undisturbed

DESCRIPTION: balck & gray CLAY
w/organics & salt, (bay mud)

ASSUMED SPECIFIC GRAVITY= 2.7

REMARKS: **DS-CU**

An undrained condition cannot
be completely accomplished

CLIENT: PWA

Napa Marsh Restoration

PROJECT:

SAMPLE LOCATION: 3C

PROJ. NO.: 345-016

DATE: 12/6/01

DIRECT SHEAR TEST REPORT

COOPER TESTING LABORATORY



Specific Gravity by Pycnometer

ASTM D 854

Job#: 345-017 Date: 01/21/02
 Client: PWA By: DC
 Project: 1546.01

Boring: Sample: Depth, ft.:	Mudflat	In Channel	Cooley Marsh	Napa Slough			
Soil Description (visual)	see sieve						
Hydroscopic MC	0.06	0.04	0.04	0.04			
Wet Weight, gm	54.97	61.33	31.36	58.34			
Dry Wt., gm	53.22	60	31.02	57.13			
Dish, gm	21.82	26.06	22.22	26.76			
Wb, gm	352.73	350.27	292.74	306.93			
T °C	16	15	16	15			
Wa, gm	316.35	316.39	274.72	274.74			
Wo, gm	60	55.3	30	53.16			
Wo Corrected	56.83	53.21	28.88	51.12			
K	1.0008	1.0008	1.0008	1.0008			
$G_s = \frac{K W_o}{W_o + W_a - W_b}$ Specific Gravity (20 ^o c)	2.78	2.76	2.66	2.70			

Wb = Weight of Pycnometer, Soil & Water T = Temperature Wo = Weight of Air-Dried Soil
 Wa = Weight of Pycnometer & Water K = Temperature Correction Factor MC = Moisture Content

Note: The temperature correction factor will be shown as 1 if the weight of pycnometer and water was taken from the temperature correction curve in the laboratory or if the temp was 20c.

**Specific Gravity by Pycnometer
ASTM D 854
Cooper Testing Labs, Inc.**

Job#: 345-016 Date: 12/06/01
 Client: PWA By: DC
 Project: 1546.01

Boring: Sample: Depth, ft.:	1A-A	1B-C	2A-A	2D-G	3A	3C	3D
Soil Description (visual)	see sieve						
Wb	299.95	331.95	345.09	346.46	339.05	328.53	304.82
T °C	20	20	18	20	17	18	18
Wa	274.57	302.27	316.27	316.19	316.31	302.36	274.65
Wo	41.43	47.66	48.58	48.12	38.28	41.71	47.59
K	1	1	1.0004	1	1.0006	1.0004	1.0004
$G_s = \frac{K W_o}{W_o + W_a - W_b}$ Specific Gravity (20°C)	2.58	2.65	2.46	2.70	2.47	2.69	2.73

Wb = Weight of Pycnometer, Soil & Water

T = Temperature

Wo = Weight of Air-Dried Soil

Wa = Weight of Pycnometer & Water

K = Temperature Correction Factor

Note

The temperature correction factor will be shown as 1 if the weight of pycnometer, and water was taken from the temperature correction curve in the laboratory or if the temp was 20c.

**Specific Gravity by Pycnometer
ASTM D 854
Cooper Testing Labs, Inc.**

Job#:	345-016a	Date:	12/06/01
Client:	PWA	By:	DC
Project:	1546.01		

Boring: Sample: Depth, ft.:		4B	4C	5B	6A	7A-B	8B
Soil Description (visual)							
Wb		336.65	301	303.12	302.46	344.12	329.07
T °C		16	17	16	16	16	16
Wa		316.35	274.69	274.72	274.72	316.35	302.44
Wo		32.68	42.33	45.96	43.29	45.33	41.95
K		1.0008	1.0006	1.0008	1.0008	1.0008	1.0008
Gs = $\frac{K \cdot Wo}{Wo + Wa - Wb}$ Specific Gravity (20°C)		2.64	2.65	2.62	2.79	2.59	2.74

Wb = Weight of Pycnometer, Soil & Water T = Temperature Wo = Weight of Air-Dried Soil
 Wa = Weight of Pycnometer & Water K = Temperature Correction Factor

Note The temperature correction factor will be shown as 1 if the weight of pycnometer and water was taken from the temperature correction curve in the laboratory or if the temp was 20c.



**Percent Organic Content Test
ASTM D 2974**

JOB NO.: 345-017
CLIENT : PWA **DATE:** 1/21/2002
PROJECT: 1546.01 Sonoma Marsh **BY:** DC

Boring : Sample : Depth :	Mudflat	Baylands	Cooley Marsh	Napa Slough		
Visual Description:	see sieve					
Soil, Org & Dish, gm	113.71	112.46	98.28	108.03		
Soil & Dish, gm	112.07	110.79	96.24	106.12		
Dish, gm	76.09	75.76	74.8	75.15		
Soil, gm	35.98	35.03	21.44	30.97	0	0
Soil & Organics, gm	37.62	36.7	23.48	32.88	0	0
Organic Content: %	4.4	4.6	8.7	5.8	#DIV/0!	#DIV/0!

Remarks:



**Percent Organic Content Test
ASTM D 2974**

JOB NO.: 345-016
CLIENT : PWA **DATE:** 12/7/2001
PROJECT: 1546.01 **BY:** DC

Boring :						
Sample :	1A-A	1B-C	2A-A	2D-G	3A	3C
Depth :						
Visual Description:	see sieve report					
Soil, Org & Dish, gm	91.49	107.75	94.6	110.92	92.15	102.14
Soil & Dish, gm	89.39	105.6	92.46	108.9	88.76	100.45
Dish, gm	72.98	76.07	75.78	74.34	74.92	75.15
Soil, gm	16.41	29.53	16.68	34.56	13.84	25.3
Soil & Organics, gm	18.51	31.68	18.82	36.58	17.23	26.99
Organic Content: %	11.3	6.8	11.4	5.5	19.7	6.3

Remarks: