



Golder Associates

CONSULTING GEOTECHNICAL AND MINING ENGINEERS

Report To
GULF CANADA RESOURCES INC.
LABORATORY INVESTIGATION OF
FOUNDATION CLAYS
AMAULIGAK A-23 AND F-65 SITES
KUGMALLIT CHANNEL, BEAUFORT SEA
VOLUME I: REPORT TEXT AND FIGURES

Submitted by Golder Associates

Distribution: 6 Copies - Gulf Canada Resources Inc.
Calgary, Alberta
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852-2007

September, 1985

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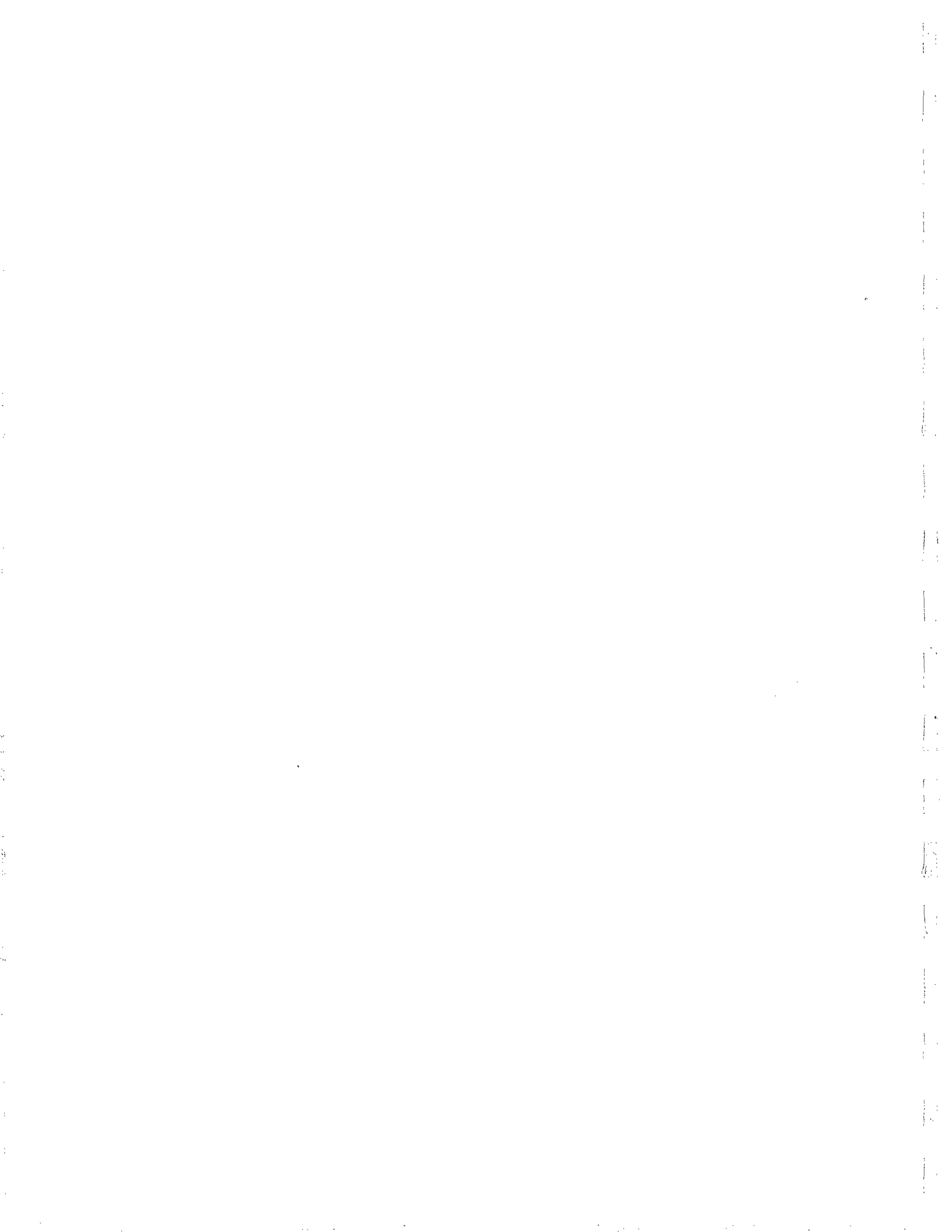
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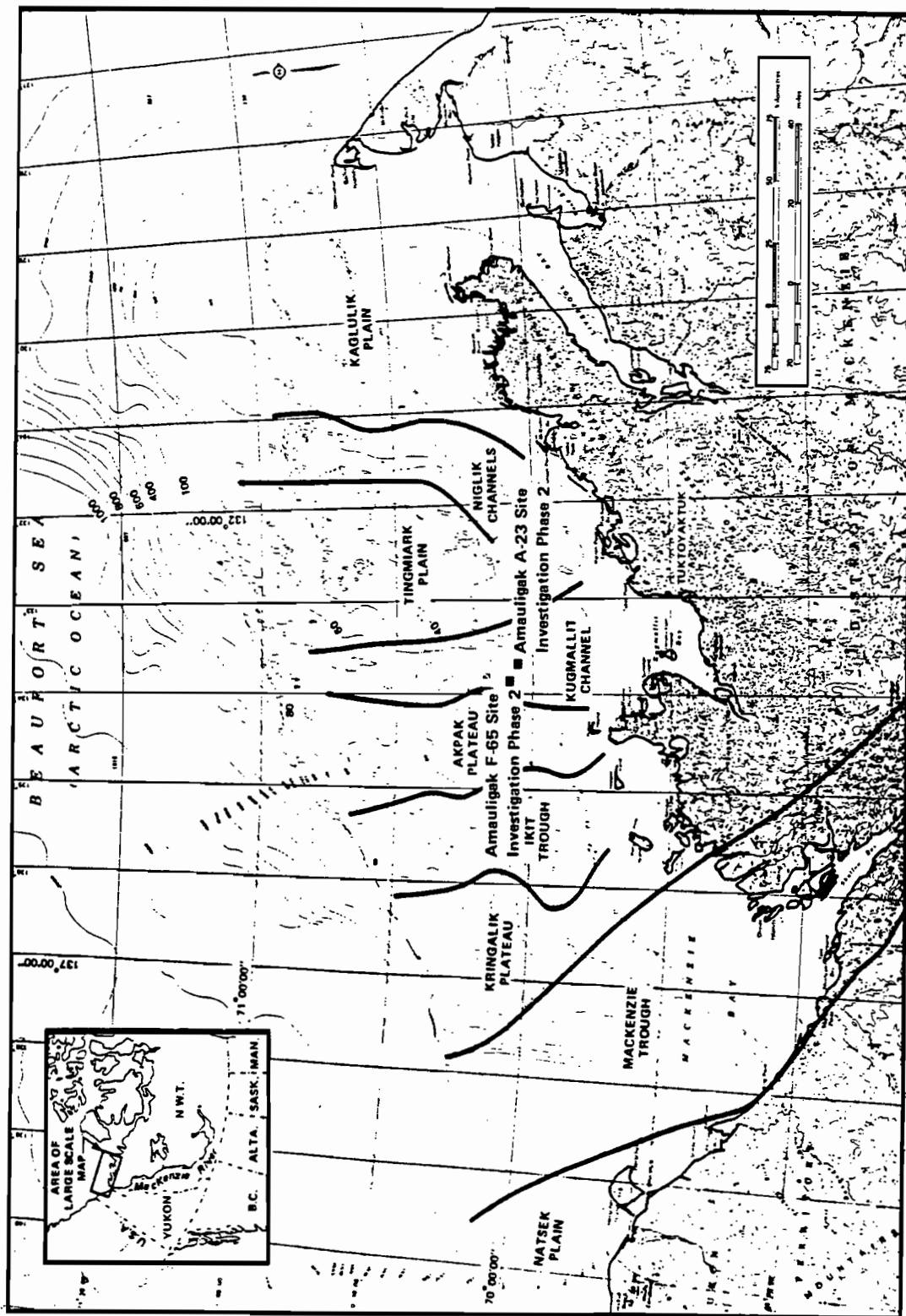
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PHYSIOGRAPHIC REGIONS OF THE BEAUFORT SEA

Figure 1



Project No. 852-2007 Drawn RK Reviewed *DA* Date JUNE '85



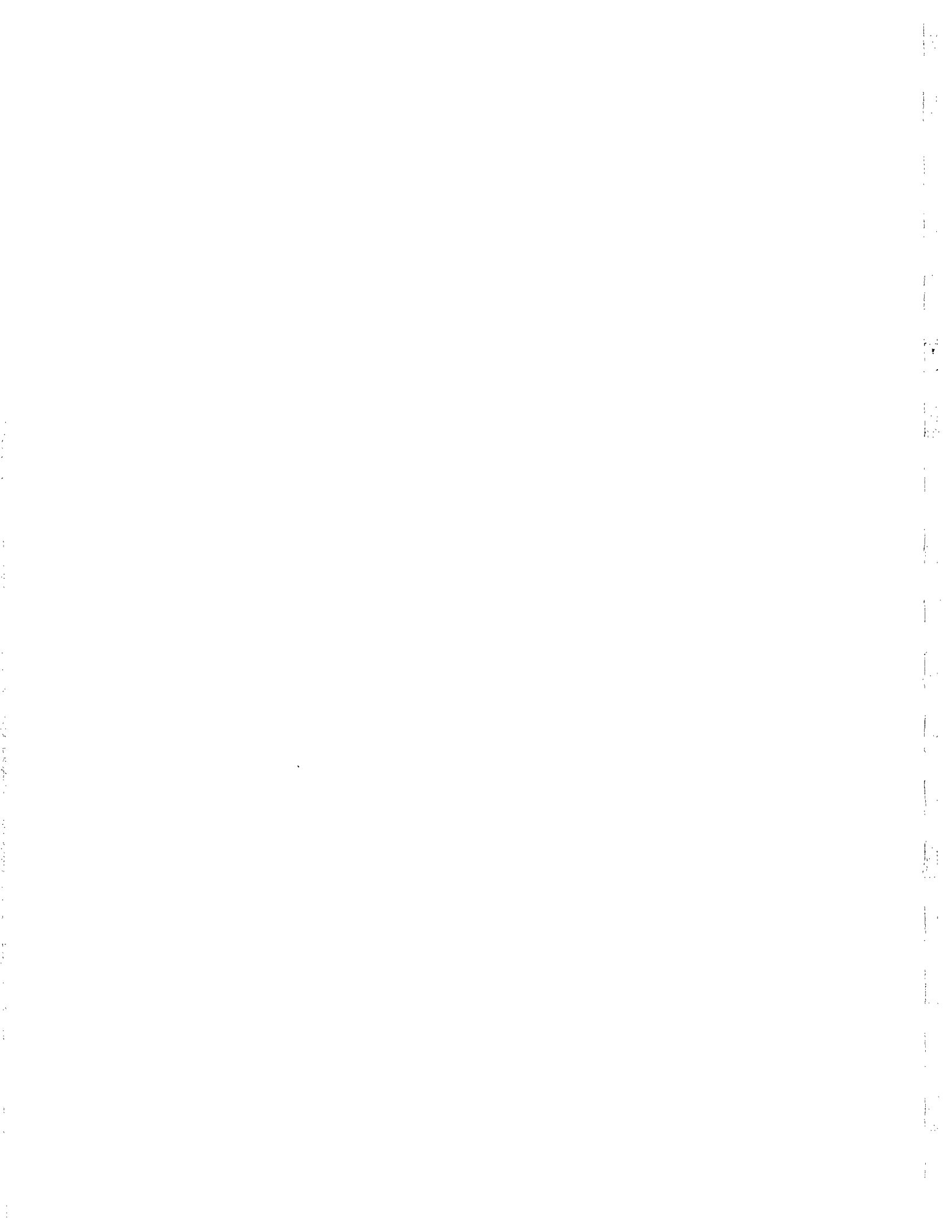
TABLE 1

2.1 General Stratigraphy

The stratigraphy of the Amauligak sites, based on the field investigation*, is characterized by the following sequence:

		AMAULIGAK A-23 (BH AE84SI01)	AMAULIGAK F-65 (BH AW84SI01)
	<u>LITHOSTRATIGRAPHIC UNIT</u>	<u>DEPTH (m)</u>	<u>DEPTH (m)</u>
UNIT I	Very soft silty CLAY	0.0 to 4.0	0.0 to 3.0
- Subunit	highly plastic, homogeneous		
I _a	[Remoulded deltaic sediments]		
UNIT I	Very soft to firm silty CLAY,	4.0 to 13.5	3.0 to 13.5
- Subunit	medium to highly plastic,		
I _b	thinly laminated [Deltaic sediments deposited during Late Wisconsin]		
UNIT II	SAND fine-grained, uniform	13.5 to 31.0	13.5 to 48.5 ⁺
	[Deltaic sediments deposited during Late Wisconsin]		
UNIT III	Stiff silty CLAY	31.0 to 51.0 ⁺	NOT ENCOUNTERED
	low to medium plasticity, [Deltaic sediments deposited during Late Wisconsin age]		

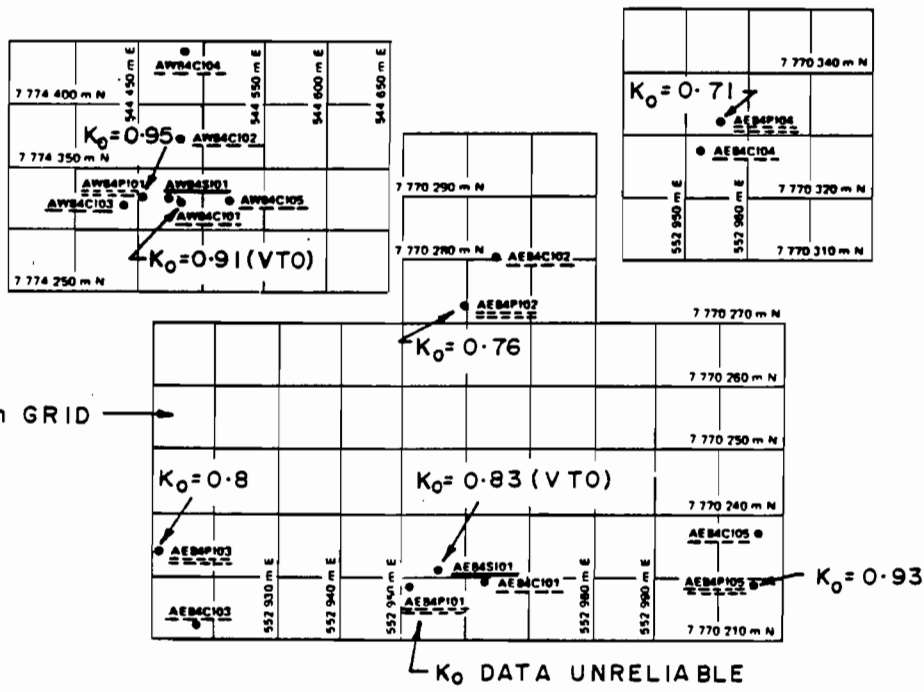
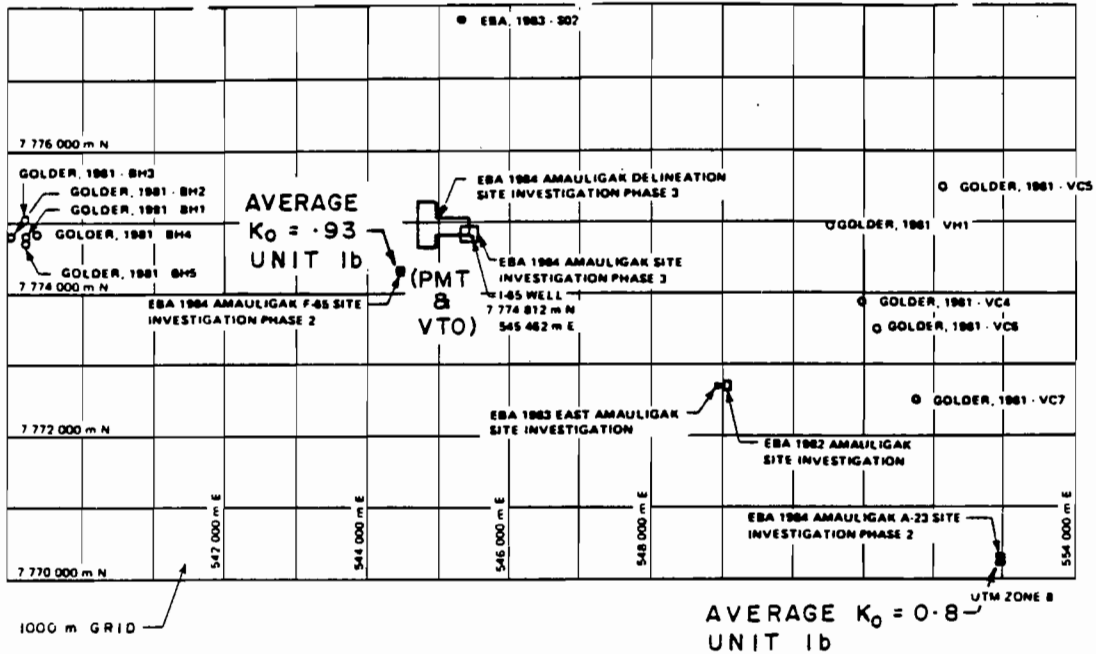
*After EBA (1985)



BOREHOLE AND PROBEHOLE LOCATION MAP

Figure

2



NOTE: K_0 values for clay unit 1b only

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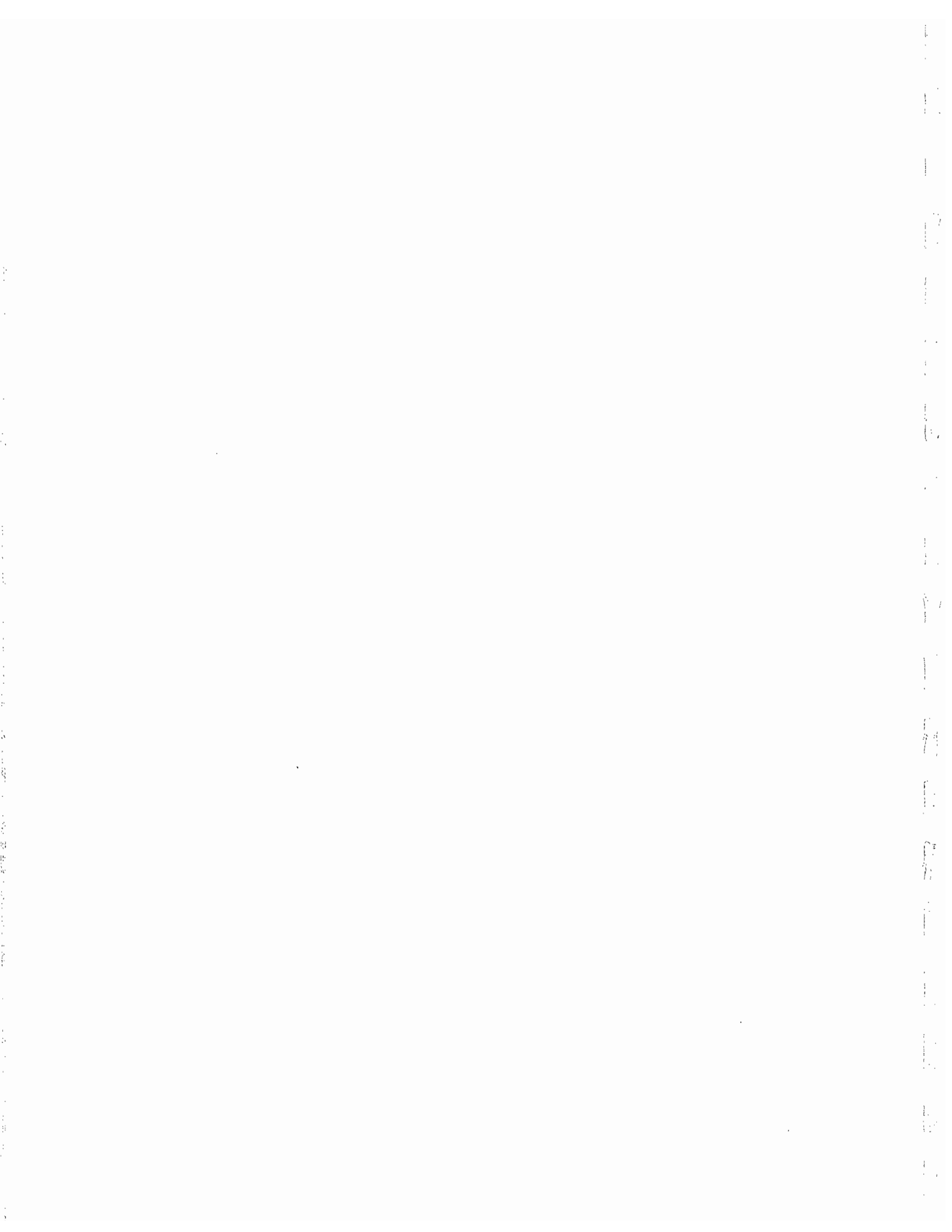
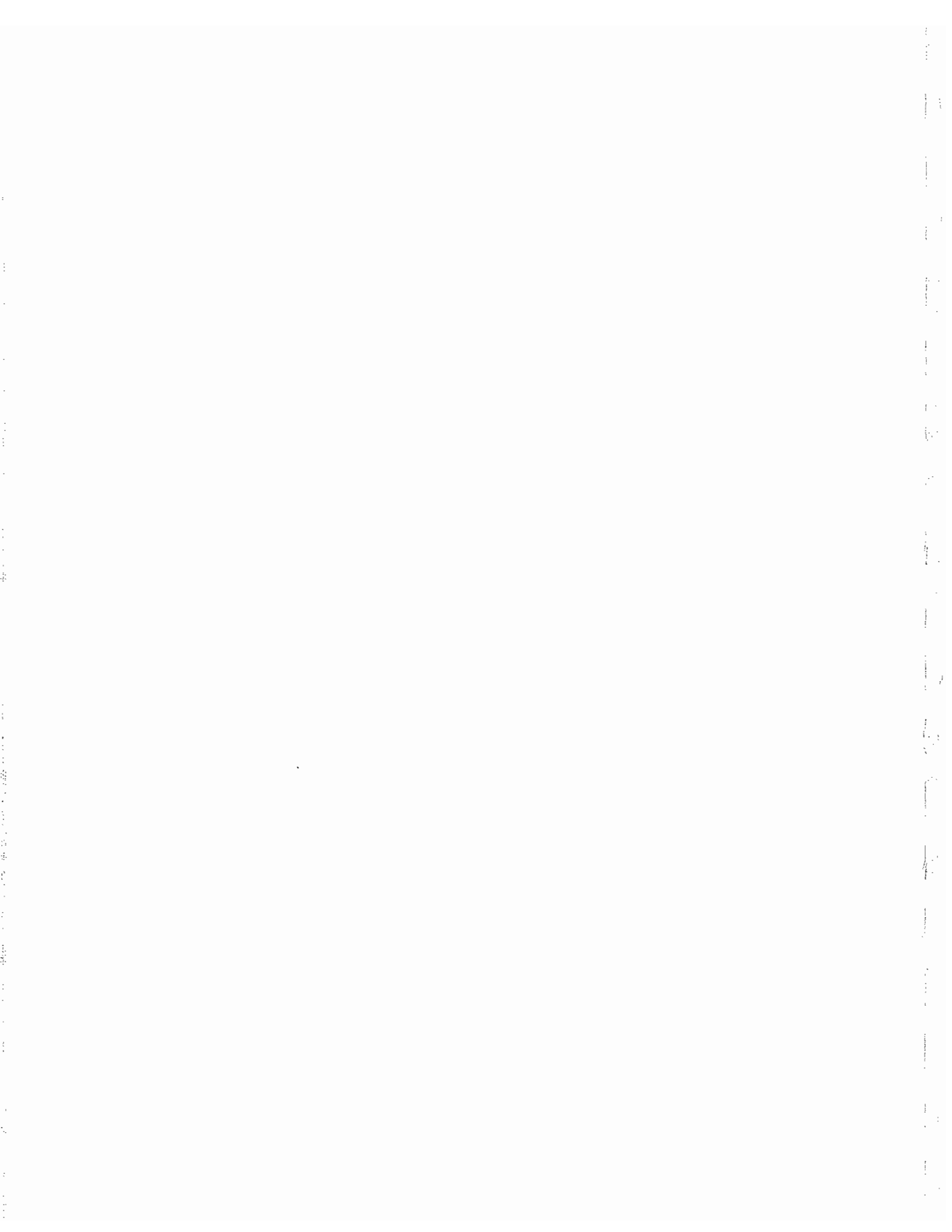


TABLE 2

Borehole No.	Testhole No.	Relative Distance (m)
AW 84SI01	AW 84CI01	2(E)
	AW 84CI02	11(N)
	AW 84CI03	8(W)
	AW 84CI04	26(N)
AE 84SI01	AE 84CI01	8(E)
	AE 84CI02	54(N)
	AE 84CI03	47(W)
	AE 84CI04	97(N)
	AE 84CI05	53(E)



SUMMARY OF OEDOMETER TESTS
GULF/CLAY/AMALDIGA

Sa#	Depth Z (m)	γ'Z (kPa)	σ _{vo} ' (kPa)	σ _{vy} ' (kPa)	σ _{ho} ' (kPa)	σ _{hy} ' (kPa)	K _o (oed)	γ (kN/m ³)	w (%)	e _o	OCR	CPT q _c (kPa)	$\frac{q_c - I_1}{I_1}$
BH# AEB4SI01; Water Depth = 29.7 m													
3	H 2.00	13	-	70	-	-	-	16.8	51.7	1.406	5.4	200	12.8
	V	-	-	-	-	75	-	16.3	56.2	1.529			
4	H 3.15	21	25	65	-	-	0.96	15.8	62.3	1.695	3.10	270	10.7
	V	-	-	-	24	70	-	16.2	62.1	1.689			
6	H 4.45	29	32	105	-	-	0.94	16.2	56.2	1.529	3.62	300	8.2
	V	-	-	-	30	105	-	16.3	53.9	1.466			
7	H 5.89	36	42	125	-	-	0.95	16.8	50.8	1.382	3.28	400	8.3
	V	-	-	-	40	125	-	17.1	51.1	1.390			
9	H 7.61	52	54	150	-	-	0.96	17.3	45.2	1.229	2.88	470	7.1
	V	-	-	-	50	165	-	17.5	46.1	1.254			
10	H 8.67	58	55	135	-	-	0.96	16.8	55.7	1.515	2.36	450	5.4
	V	-	-	-	55	110	-	16.6	55.1	1.499			
11	H 9.63	62	60	140	-	-	0.92	16.8	49.1	1.336	2.33	540	6.6
	V	-	-	-	55	100	-	16.8	53.6	1.458			
13	H 11.35	75	73	150	-	-	0.85	16.8	49.0	1.332	2.00	450	4.0
	V	-	-	-	64	150	-	17.3	48.5	1.319			
14	H 12.3	81	76	170	-	-	0.81	16.4	54.2	1.474	2.10	500	4.3
	V	-	-	-	65	150	-	16.8	53.5	1.455			
16	H 14.15	92	85	165	-	-	0.80	16.6	53.1	1.444	1.83	550	4.1
	V	-	-	-	70	150	-	16.5	60.2	1.637			
27	H 38.57	312	300	560	-	-	0.80	19.8	30.5	0.824	1.79	-	-
	V	-	-	-	240	465	-	19.1	29.1	0.786			
28	H 41.5	337	300	550	-	-	0.80	19.4	26.3	0.764	1.63	-	-
	V	-	-	-	240	465	-	19.5	26.5	0.716			
29	H 44.7	367	350	600	-	-	0.80	18.5	30.7	0.829	1.67	-	-
	V	-	-	-	290	570	-	18.4	33.5	0.905			
30	H 47.9	390	360	585	-	-	0.81	18.6	31.4	0.848	1.50	-	-
	V	-	-	-	290	465	-	18.2	34.0	0.918			

BH# AW84SI01; Water Depth = 30.7 m													
2	H 2.75	18	-	65	-	-	-	17.4	46.5	1.265	3.60	250	11.4
	V	-	-	-	-	75	-	16.7	50.0	1.360			
3	H 4.16	31	28	140	-	-	1.00	18.0	37.8	1.028	5.00	450	13.6
	V	-	-	-	32	180	-	17.9	38.5	1.047			
4	H 6.03	45	48	150	-	-	1.00	17.8	42.0	1.142	3.33	600	11.0
	V	-	-	-	48	165	-	18.0	41.2	1.121			
5	H 7.33	55	56	165	-	-	1.00	18.1	37.1	1.009	3.00	-	-
	V	-	-	-	55	200	-	18.4	37.4	1.017			
6	H 8.85	66	65	150	-	-	0.92	17.1	45.4	1.235	2.27	410	4.1
	V	-	-	-	60	170	-	17.5	44.2	1.202			
7	H 10.52	76	82	135	-	-	0.92	16.5	46.6	1.268	1.69	450	3.7
	V	-	-	-	74	140	-	17.0	49.3	1.341			
9	H 13.54	97	92	115	-	-	1.00	17.6	48.0	1.306	1.15	500	2.75
	V	-	-	-	95	130	-	16.6	52.5	1.428			

BH# AD84SI05; Water Depth = 31.0 m													
2	H 9.85	74	75	195	-	-	1.00	17.4	43.6	1.186	2.60	700	7.1
	V	-	-	-	75	180	-	17.7	43.2	1.175			

BH# AM84SI05; Water Depth = 31.4 m													
2	H 3.87	29	31	180	-	-	1.00	17.3	44.8	1.219	6.20	420	12.1
	V	-	-	-	30	170	-	18.3	42.4	1.153			

NOTE: $*I_1' = \sigma_{vo}' (1+2K_o)$; $I_1 = I_1' + u$ where $u = 10 Z$

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September, 1985

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TABLE 4
SUMMARY OF TRIAXIAL TESTS - AMAULIGAK

CLAY Unit Ia & Ib ($K_0=1.0$; BH #AE84SI01)

TEST:	CIU-C1	CIU-C1	CIU-C1	CIU-C1	CIU-C1	CIU-C*
Sa #:	6	7	14	4		
Depth (m):	4.42-4.92	5.33-5.93	11.73-12.28	2.59-3.18		
σ'_{vo} (kPa)	29	38	81	21		
u_o (kPa)	344	353	417	326		
W (%)	55.0	51.7	54.4	66.7		
W_L (%):	60	62	54	58		
W_p (%):	28	27	28	33		
I_p :	32	35	26	25		
H_o (mm):	101.50	101.50	101.50	94.00		
Dia (mm):	51.13	50.79	50.40	51.50		
H/D:	1.99	2.00	2.01	1.83		
A_o (cm ²):	20.54	20.26	19.95	20.83		
V_o (cm ³):	208.44	205.67	202.50	195.80		
γ (kN/m ³):	16.50	16.90	17.10	14.40		
e_o (1):	1.526	1.382	1.441	2.055		
G_s (assumed):	2.70	2.70	2.70	2.70		
S_o (%)(2):	97.3	100	100	87.4		
Back Press. (kPa):	345	360	400	330		
B (prior to sat.):	0.93	0.87	0.98	0.97		
B (after sat.):	0.96	0.98	0.99	0.99		
σ'_{ac} (kPa)(3):	30	40	80	25		
σ'_{rc} (kPa)(3):	30	40	80	25		
ϵ_{vc} (%)(4):	3.17	4.42	9.23	7.60		
ϵ_{ac} (%)(4):	0.17	1.66	3.12	1.69		
ϵ_{rc} (%)(4):	1.50	1.38	3.06	2.96		
Load Dura. (hrs.)(5):	1.0	2.9	2.8	1.3		
ϵ_a (%/hr.)(6):	2.0	2.0	2.0	2.0		

* Unit Ia

NOTES:

- (1) e_o calculated on basis of volume, weight, W, G_s (i.e. $e = V_v/V_s$).
- (2) $S_o = W_g/e_o$.
- (3) Consolidation obtained in usually three increments.
- (4) Sign convention: positive indicates decrease in volume, height and radius.
- (5) For increments in CAD stress probes.
- (6) During shear of compression and extension tests.

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852-2007

TABLE 5
SUMMARY OF TRIAXIAL TESTS - AMAULIGAK

September, 1985

CLAY UNIT Ib ($K_0=0.8$; BH #AE84SI01)

TEST:	CAU-C1	CAU-C2	CAU-E	CAD-1	CAD-2	CAD-3
Sa #:	14	16	16	16	13	13
Depth (m):	11.73-12.28	13.56-14.26	13.56-14.26	13.56-14.26	10.82-11.42	10.82-11.42
σ_{vo} (kPa)	81	92	92	92	75	75
u_o (kPa)	417	436	436	436	408	408
W_o (%)	53.3	60.6	48.6	53.5	49.5	53.6
W_L (%)	54	40	40	40	55	55
W_p (%)	28	20	20	20	26	26
I_p :	26	20	20	20	29	29
H_o (mm):	101.50	101.50	101.50	101.50	101.00	101.50
Dia (mm):	50.31	51.02	50.93	51.31	50.80	51.08
H/D:	2.02	1.99	1.99	1.98	1.99	1.99
A_o (cm ²):	19.88	20.45	20.37	20.68	20.27	20.50
V_o (cm ³):	201.77	207.54	206.77	209.88	204.71	208.00
γ (kN/m ³):	16.58	15.90	16.88	16.41	16.99	16.51
e_o (1):	1.445	1.676	1.329	1.476	1.328	1.461
G_s (assumed):	2.70	2.70	2.70	2.70	2.70	2.70
S_o (%) (2):	99.6	97.6	98.7	97.9	100	99.0
Back Press. (kPa):	400	400	400	400	400	400
B (prior to sat.):	0.968	0.892	0.930	0.927	0.950	0.949
B (after sat.):	0.990	0.976	0.973	0.985	0.982	0.983
σ'_{ac} (kPa) (3):	80	165	80	80	80	80
σ'_{rc} (kPa) (3):	64	132	64	64	64	64
ϵ_{vc} (%) (4):	7.78	13.71	6.29	7.77	7.84	8.75
ϵ_{ac} (%) (4):	3.28	6.38	2.50	3.81	2.12	3.19
ϵ_{rc} (%) (4):	2.25	3.67	1.90	1.98	2.86	2.78
Load Dura. (hrs.) (5):	2.0-3.3	1.4-2.7	1.7-2.0	2.4-5.5	1.1-3.3	1.5-3.6
ϵ_a (%/hr.) (6):	2.0	2.0	2.0	Stress Controlled Tests		

NOTES:

- (1) e_o calculated on basis of volume, weight, W , G_s (i.e. $e = V_v/V_s$).
- (2) $S_o = W G_s / e_o$.
- (3) Consolidation obtained in usually three increments.
- (4) Sign convention: positive indicates decrease in volume, height and radius.
- (5) For increments in CAD stress probes.
- (6) During shear of compression and extension tests.

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September, 1985

TABLE 6
SUMMARY OF TRIAXIAL TESTS - AMAULIGAK

852-2007

CLAY UNIT III ($K_o=0.8$; BH #AE84SI01)

TEST:	CAU-C1	CAU-E	CAD-1	CAD-2	CAU-C
Sa #:	30	30	28	27	29
Depth (m):	47.40-47.95	47.40-47.95	41.30-41.60	38.25-38.60	44.35-44.80
σ'_{vo} (kPa)	390	390	390	312	367
u_o (kPa)	773.8	773.8	711.5	681.3	742.8
W (%)	34.9	35.4	29.4	30.1	31.4
W _L (%):	51	51	41	40	47
W _p (%):	27	27	27	24	31
Ip:	24	24	14	16	16
H _p (mm):	101.49	101.49	84.32	101.50	101.50
Dia (mm):	51.09	51.21	51.43	51.54	51.29
H/D:	1.99	1.98	1.64	1.97	1.98
A _o (cm ²):	20.50	20.60	20.77	20.80	20.66
V _o (cm ³):	208.05	209.06	175.13	211.73	209.74
γ (kN/m ³):	17.7	18.2	18.4	18.8	18.1
e _o (1):	1.015	0.972	0.856	0.831	0.917
G _s (assumed):	2.70	2.70	2.70	2.70	2.70
S _o (%) (2):	92.8	98.3	92.7	97.8	92.5
Back Press. (kPa):	747	747	697	700	700
B (prior to sat.):	0.73	0.89	0.90	0.98	0.83
B (after sat.):	0.98	0.99	0.99	0.99	0.99
σ'_{ac} (kPa) (3):	389	390	389	389	361
σ'_{rc} (kPa) (3):	311	312	311	311	289
ϵ_{vc} (%) (4):	9.88	11.72	8.73	9.66	8.21
ϵ_{ac} (%) (4):	5.29	2.25	3.06	2.94	3.26
ϵ_{rc} (%) (4):	2.30	4.74	5.67	3.36	2.48
Load Dura. (hrs.) (5):	0.6-2.2	1.8-3.1	1.0-4.4	1.0-7.6	1.0-4.0
ϵ_a (%/hr.) (6):	2.0	2.0	Stress Controlled Tests		

NOTES:

- (1) e_o calculated on basis of volume, weight, W, G_s (i.e. $e = V_v/V_s$).
- (2) $S_o = W_G/e_o$.
- (3) Consolidation obtained in usually three increments.
- (4) Sign convention: positive indicates decrease in volume, height and radius.
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TABLE 7
SUMMARY OF TRIAXIAL TESTS - AMAULIGAK

September, 1985

CLAY UNIT Ia & Ib ($K_o=1.0$ BH #AW84SI01)

TEST:	CIU-C1	CIU-C2	CIU-E	CAD-1	CAD-2	CIU-C*
Sa #:	5	6	6	4	4	2
Depth (m):	7.00-7.35	8.4-8.9	8.4-8.9	5.5-6.05	5.5-6.05	2.4-2.8
σ_{vo} (kPa)	55	66	66	45	45	18
u_o (kPa)	379	394	394	365	365	333
W (%)	36.8	45.2	43.4	50.3	46.1	71.88
W _L (%)	56	60	60	58	58	58
W _p (%)	31	28	28	33	33	28
I _p :	25	32	32	25	25	30
H _o (mm):	101.50	101.50	101.50	101.50	101.50	86.00
D _{1a} (mm):	50.75	50.60	50.74	50.70	50.90	51.48
H/D:	2.0	2.0	2.0	2.0	1.99	1.67
A _o (cm ²):	20.23	20.11	20.22	20.19	20.35	20.82
V _o (cm ³):	202.63	204.13	205.24	204.94	206.53	179.03
Y (kN/m ³):	18.27	17.40	17.53	16.86	17.16	14.4
e _o (1):	0.982	1.209	1.164	1.357	1.252	2.156
G _s (assumed):	2.70	2.70	2.70	2.70	2.70	2.70
S _o (%) (2):	100	100	100	100	99.4	89.9
Back Press. (kPa):	395	400	400	400	400	340
B (prior to sat.):	0.91	0.91	0.95	0.94	0.95	0.98
B (after sat.):	0.96	0.98	0.98	0.99	1.00	1.00
σ'_{ac} (kPa)(3):	51	150	50	50	50	15
σ'_{rc} (kPa)(3):	51	150	50	50	50	15
ϵ_{vc} (%) (4):	2.86	7.54	5.12	10.64	9.64	5.78
ϵ_{ac} (%) (4):	1.31	2.62	1.32	3.73	3.38	-
ϵ_{rc} (%) (4):	0.775	2.46	3.11	3.46	3.13	-
Load Dura. (hrs.) (5):	1.0	1.0	1.2	1.0-4.5	1.0-4.7	3.75
ϵ_a (%) (6):	2.0	2.0	2.0	Stress Controlled Tests	Stress Controlled Tests	2.0

* Unit Ia

NOTES:

- (1) e_o calculated on basis of volume, weight, W, G_s (i.e. $e = V_v/V_s$).
- (2) $S_o = W G_s / e_o$.
- (3) Consolidation obtained in usually three increments.
- (4) Sign convention: positive indicates decrease in volume, height and radius.
- (5) For increments in CAD stress probes.
- (6) During shear of compression and extension tests.

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September, 1985

TABLE 8

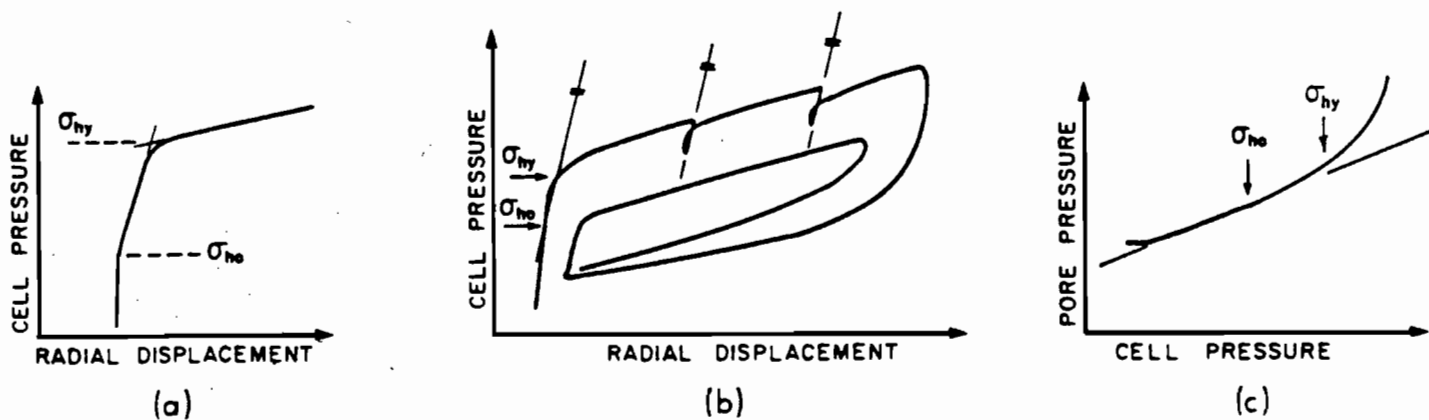
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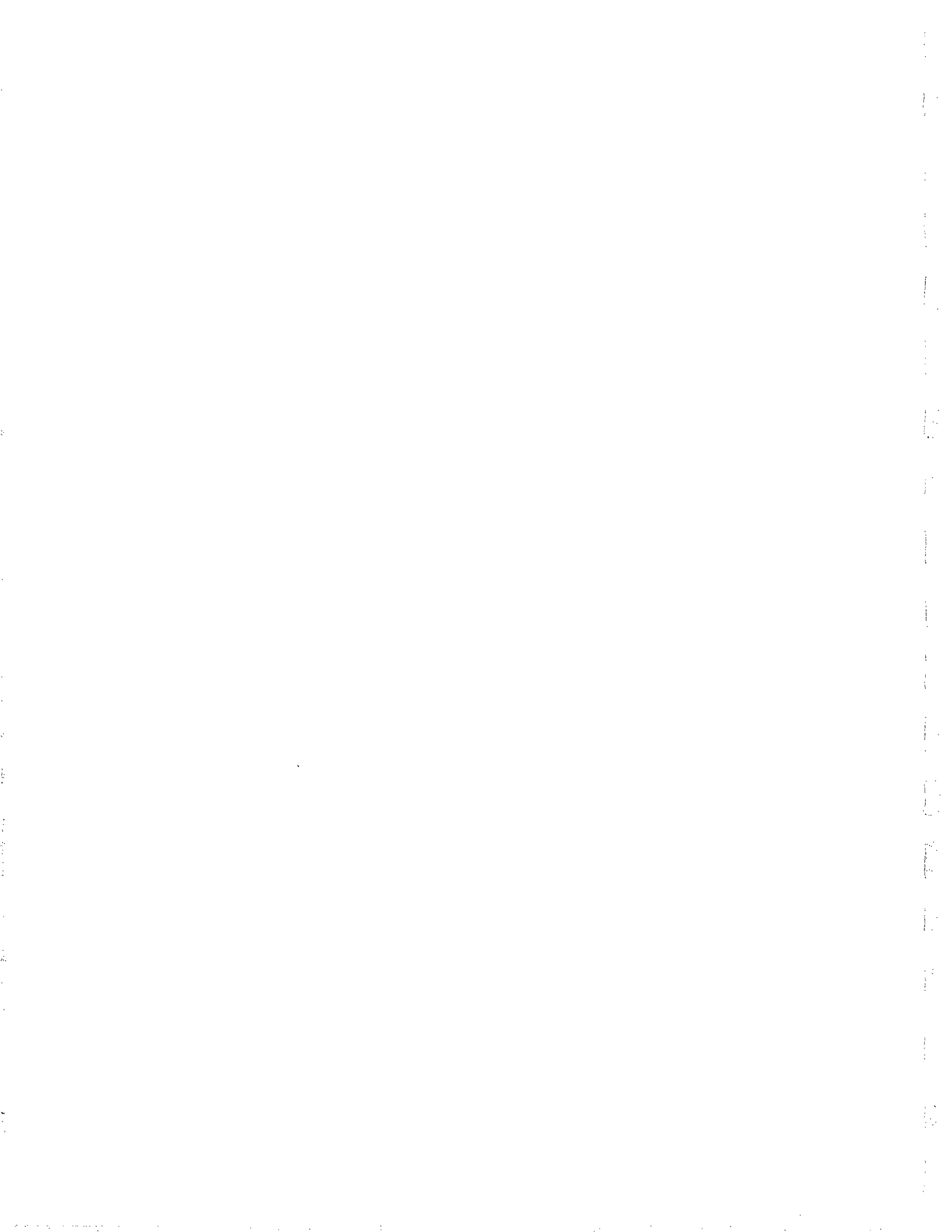
SUMMARY OF SELF-BORING PRESSUREMETER TESTS

AMAULIGAK SITE

BOREHOLE	TEST #	DEPTH (m)	σ_{ho}' (kPa)	σ_{hy}' (kPa)	K_o	CORRELATION BETWEEN (See below)	REMARKS
AE84PI05	1	1.2	-42	33	-	a, b, c	
	2	2.7	-22	38	-	a, b, c	
	3	4.3	-33	62	-	a, b, c	
	4	5.8	27	92	0.7	a, b, c	
	5	7.6	44	89	0.9	a, b	
	6	9.1	64	139	1.1	a, b	
	7	10.7	68	168	1.0	a, b, c	
	8	12.2	68	173	0.9	a, b, c	
	9	13.1	84	195	1.0	a, b, c	
AE84PI04	1	1.2	-42	-7	-	a, b, c	
	2	2.7	-47	18	-	a, b, c	
	3	3.8	-53	27	-	a, b, c	
	4	5.3	22	87	0.6	a, b	
	5	6.9	16	106	0.4	a, b, c	
	6	8.4	36	86	0.7	a, b, c	
	7	9.9	46	76	0.7	a, b, c	
	8	11.4	52	111	0.7	a, b	
	9	13.0	70	146	0.8	a, b, c	
AE84PI03	1	1.5	5	30	-	a, b	
	2	3.0	0	50	-	a, b	
	3	4.6	19	79	0.6	a, b, c	
	4	6.1	43	89	1.1	a, b	
	5	7.6	39	119	0.8	a, b, c	
	6	9.1	53	89	0.9	a, b, c	
	7	11.0	55	125	0.8	a, b, c	
	8	12.5	60	140	0.8	a, b, c	
	9	14.0	55	125	0.7	a, b, c	

NOTE: The reported values of σ_{ho}' and σ_{hy}' reflect a 35 kPa membrane expansion correction.





September, 1985

TABLE 8 (Cont'd)

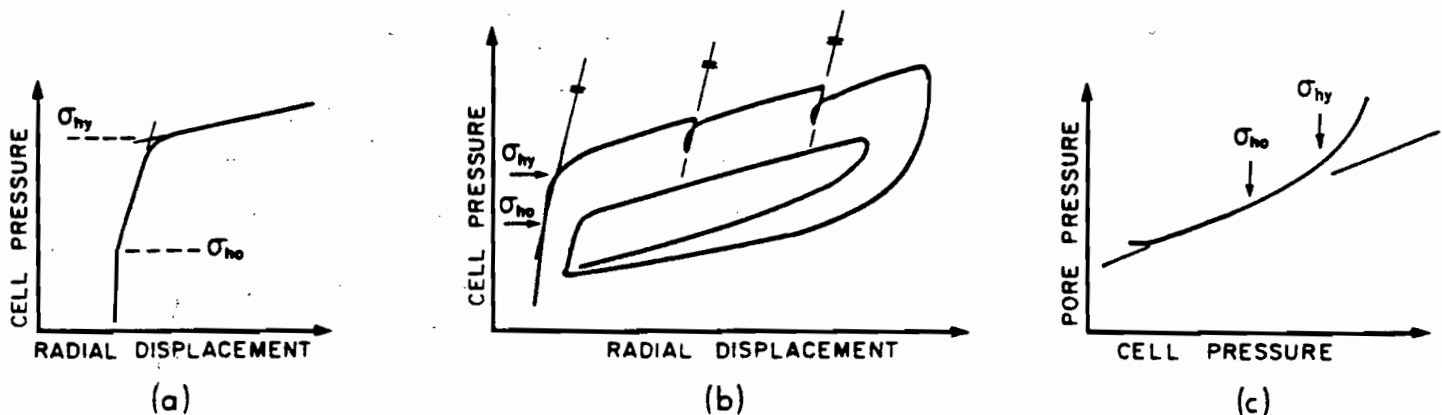
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SUMMARY OF SELF-BORING PRESSUREMETER TESTS

AMAULIGAK SITE

BOREHOLE	TEST #	DEPTH (m)	σ_{ho}' (kPa)	σ_{hy}' (kPa)	K_o	CORRELATION BETWEEN (See below)	REMARKS
AE84PI02	1	1.4	-14	16	-	a,b	
	2	2.9	-24	22	-	a,b,c	
	3	4.4	11	51	0.4	a,b,c	
	4	5.9	31	76	0.8	a,b,c	
	5	7.5	40	120	0.8	a,b,c	
	6	9.0	50	115	0.9	a,b	
	7	10.5	50	110	0.8	a,b	
	8	12.0	60	125	0.8	a,b,c	
	9	13.0	67	147	0.8	a,b,c	
AE84PI01	1	1.5	-40	-5	-		Unreasonable data.
	2	3.4	-35	-5	-		Pressuremeter was acci-
	3	4.9	-34	6	-		dently dropped 1.2 m as
	4	6.4	1	86	-		it was lowered into cas-
	6	9.4	-	-	-		ing when a chain slipped
	7	11.0	-375	-	-		
	8	12.5	-390	-	-		
AW84PI01	1	1.7	3	77	-	a,b	
	2	3.2	43	123	1.7	a,b,c	
	3	4.7	48	173	1.3	a,b,c	
	4	6.3	62	112	1.3	a,b,c	
	5	7.8	67	177	1.2	a,b,c	
	6	9.3	77	142	1.1	a,b,c	
	7	10.8	97	170	1.2	a,b,c	
	8	12.3	72	212	0.8	a,b	
	9	13.9	66	236	0.7	a,b	

NOTE: The reported values of σ_{ho}' and σ_{hy}' reflect a 35 kPa membrane expansion correction.



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changed from soft to very soft. The cone penetration testing reflected an undrained shear strength (based on an N_k factor of 14) ranging from a maximum of about 40 kPa at the 5-6 m depth to minimum value of 17 kPa at the base of the layer.

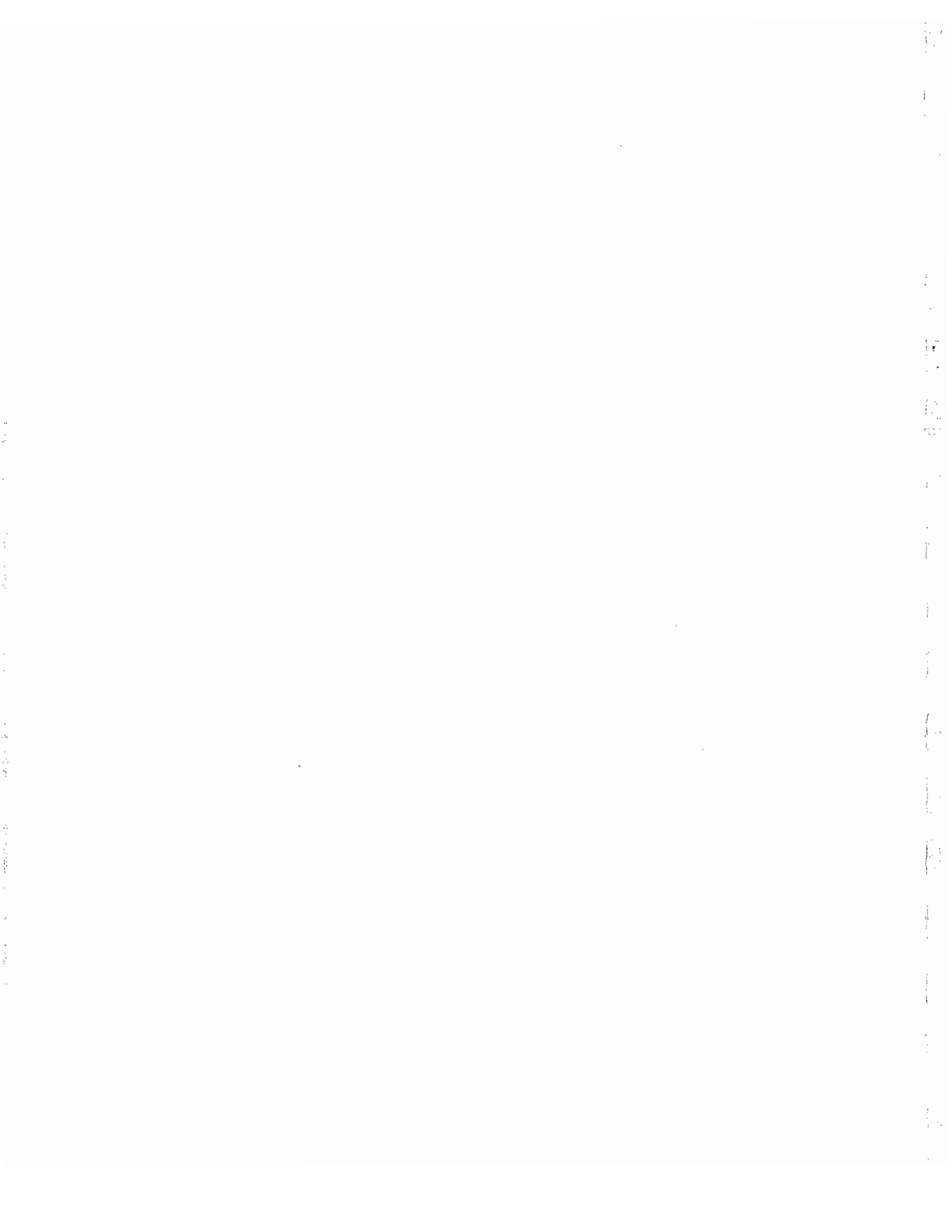
The sand unit (II), consists of a compact to dense uniform, fine-grained sands containing generally less than five percent fines (i.e. particles less than 75 μm). Minor interbeds contain between 10 and 20% fines. Median particle sizes (D_{50}) range from 130 microns to 300 microns. Water contents vary between 20 and 30%.

The underlying stiff to very stiff, silty clay unit (III), encountered at 31.0 m below seabed in Borehole AE84SI01, exhibited water contents between 27 and 34%. This unit, described as being of intermediate plasticity was found to have liquid limits ranging from 40 to 51%. The plasticity index varied from 15 to 29%. Undrained shear strengths, as determined from Pilcon vane tests, ranged from 44 kPa at the surface of the unit to 110 kPa at the bottom of the borehole, generally averaging 77 kPa throughout the unit.

4.0 LABORATORY TESTING PROGRAM AND PROCEDURES

The current laboratory investigation was carried out in two separate stages. The first stage consisted of oedometer tests to delineate in situ effective stress conditions, yield stresses and undrained shear strength profiles based on the yield stresses. The second stage involved triaxial testing under appropriate stress conditions to determine yield/deformation and strength characteristics of the major units within the foundation clays. The triaxial test program concentrated on defining yield envelopes in units associated with different K_0 values.

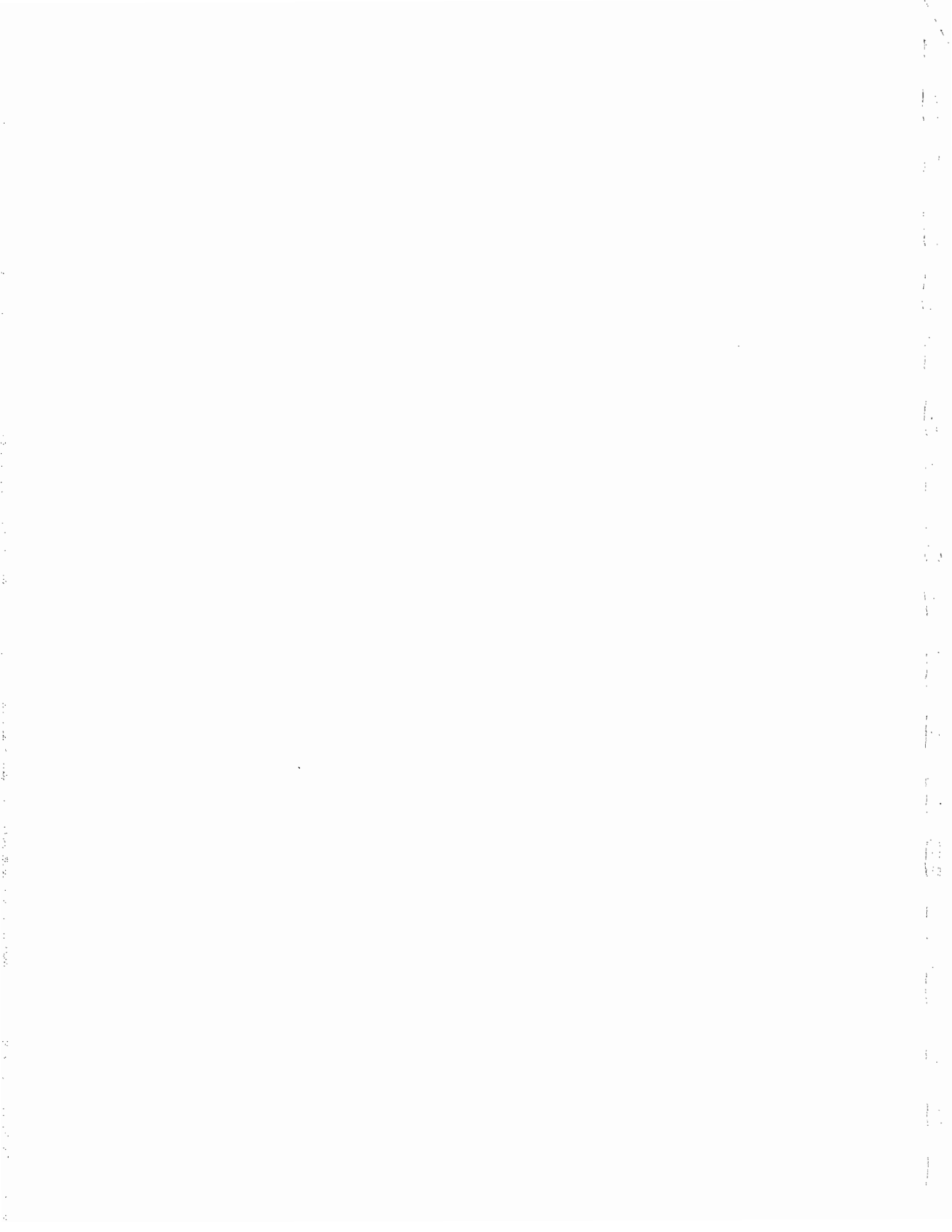
The general stratigraphy consists of three basic soil units denoted as I, II and III and is characterized by a 9 to 16 m thick layer of clay



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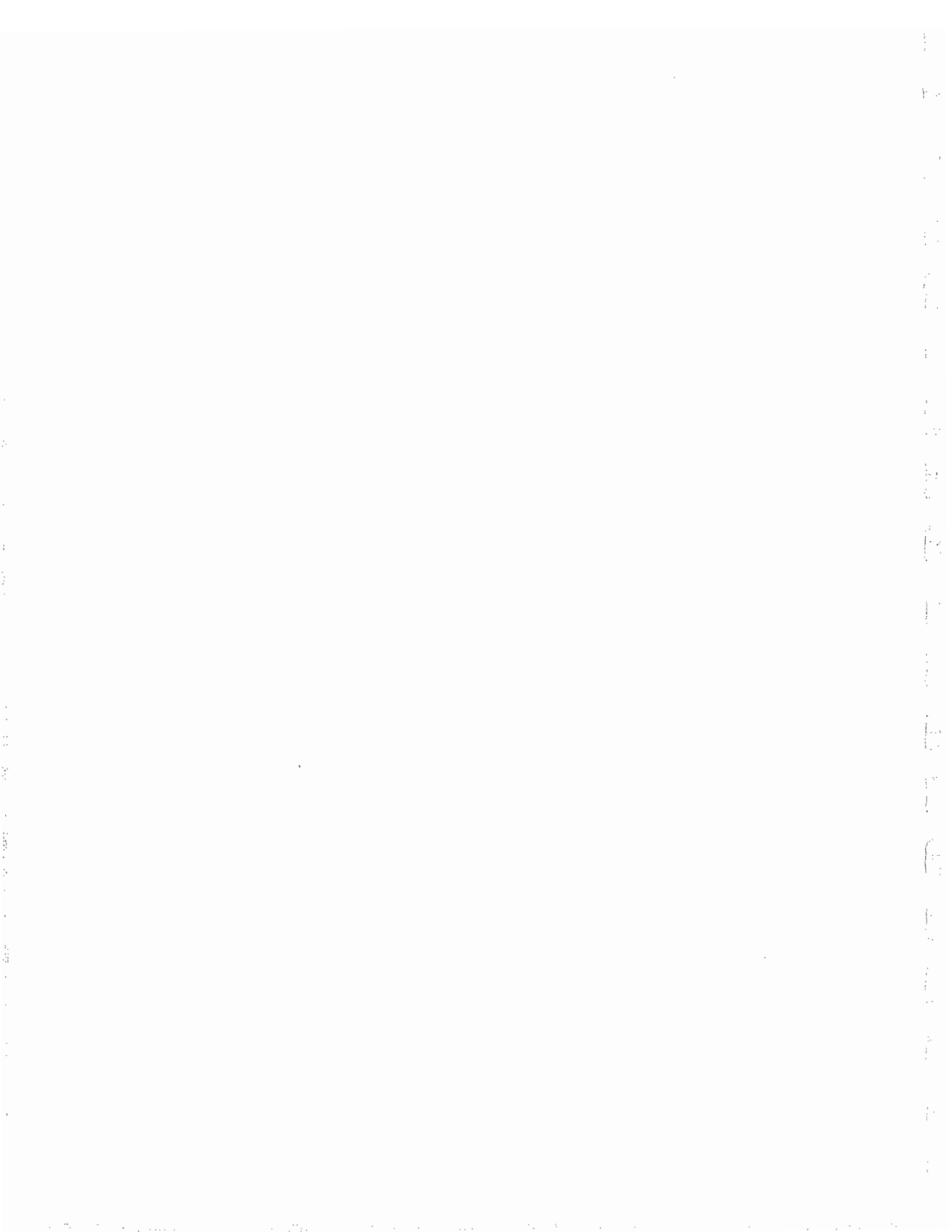


overlying sand. The upper clay layer (unit I) has been sub-divided into two zones I_a (thin surficial zone) and I_b . Each of the basic clay units I and III were investigated, however, emphasis was placed on sub-unit I_b which dominates the clay stratigraphy and governs the foundation design.

In total, 28 samples were forwarded by EBA as instructed by GCRI (BH #AE84SI01 - 17 samples; BH #AW84SI01 - 9 samples; BH #AD 84SI05 - 1 sample from BH AM84SI05). These samples were received in good condition in unopened stainless steel 76 mm diameter Shelby tubes. The tube samples were immediately stored in a humid room until selected for testing. Subsequent to extrusion from the tube, a portion of the sample was immediately used for oedometer testing. The remaining sample was then stored on special PVC tube trays, inserted into long plastic sleeves, sealed and stored in the humid room for further testing. The temperature in the humid room is maintained at approximately 12°C.

4.1 Phase I - Oedometer Tests

The main purpose of the oedometer test program was to define both the in situ current effective and yield stress profiles at the Amauligak site. In addition, the usual suite of consolidation parameters (e.g. c_v , m_v , k and C_c) were determined and the undrained shear strength profiles estimated from correlations between strength and yield stresses. The results of vertically trimmed (VTO) and horizontally trimmed (HTO) oedometer tests (Figure 3), coupled with the results of the self-boring pressuremeter testing, provide a reliable indication of the in situ K_0 profile. As demonstrated in previous studies (Golder Associates, 1984c), the effective current and yield stresses can be reasonably estimated from oedometer test data provided the results are interpreted using the strain energy approach developed by Golder Associates. This allowed representative consolidation conditions to be used in the Phase II triaxial test program. It has been demonstrated in previous studies that it is important to properly account for the in situ stress state in tests which examine strength/deformation behaviour



of the Beaufort Sea clays (Golder Associates, 1984a; Jefferies et al. 1984).

From each 76 mm diameter tube sample, two adjacent oedometer test specimens (typically 12 mm high and 50 mm in diameter) were carefully hand trimmed, but at perpendicular directions (i.e. a HTO and a VTO). The trimming operations were performed using a sharp razor and/or thin wire in a "shaving" manner to produce a circular (in plan) test specimen section with the diameter being only slightly larger than the diameter of the oedometer "ring". Prior to pushing the ring which has a sharp leading edge, onto the test specimen, the inside wall of the oedometer ring was lightly greased to reduce friction between the soil and ring wall interface. To minimize the amount of moisture lost from the sample, trimming and other sample preparation operations were carried out in a controlled temperature humidity room.

The tests were carried out using conventional oedometer equipment with fixed oedometer rings and double drainage. The duration of each load increment was sufficient to permit primary consolidation to take place. To this end, plots of dial reading vs. log time and/or square root time were maintained during testing. In some tests involving small load increment ratios, the resulting dial reading - log time curves were not of the classical "S" shape thereby making the determination of the end of primary consolidation by conventional methods, ambiguous and uncertain. In these cases, the rectangular hyperbola fitting method proposed by Sridharan and Sreepada Rao (1981) was utilized. This fitting method was found to be extremely useful in providing an unambiguous definition of the end of primary consolidation for both small load increment ratios (LIR) and the conventional LIR = 1.0 (Becker et al. 1985). Typically the load duration was approximately 30 minutes but varied between 20 to 100 minutes.

A total of 10 to 12 load increments of varying load increment ratios followed by unloading were used during the test. In the stress range

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corresponding to the anticipated in situ and yield stresses, the number of load increments were increased so that a better definition of the strain energy-stress relationship could be obtained. The in situ current and yield stresses are determined from this relationship according to the procedures developed by Golder Associates (Golder Associates, 1984c; Becker et al. 1985).

The measured in situ temperature of the soil lies in the range of -2 to 0°C. However, oedometer tests are generally performed at room temperature. For this investigation, no precautions were taken by EBA to keep the specimens themselves at their in situ temperature prior to shipping or prior to testing. The results of a previous laboratory investigation on samples of clay from Tarsiut P-45 indicated that the effect of ambient test temperature (i.e. below 0° and 20° C) has little effect on the magnitude of the consolidation parameters (c_v , m_v , k and C_c) and the values of in situ and yield stresses determined using strain energy considerations. Consequently, for this study the oedometer tests were carried out at ambient temperatures of 20°C (room temperature). A total of 46 oedometer tests were tested according to the following schedule.

BH #AE84SI01: Sa# 3, 4, 6, 7, 9, 10, 11, 13, 14, 16, 27, 28, 29, 30
(14 HTO and 14 VTO tests)

BH #AW84SI01: Sa# 2, 3, 4, 5, 6, 7, 9 (7 HTO and 7 VTO tests)

BH #AD84SI05: Sa# 2 (1 HTO and 1 VTO test)

BH #AM84SI05: Sa# 2 (1 HTO and 1 VTO test)

4.2 Phase II: Triaxial Tests

The results of the triaxial testing program provide information on the yield characteristics, stress-strain-strength behaviour and porewater pressure response.



The specimens selected for triaxial testing were carefully hand trimmed from the 76 mm diameter tube samples using conventional soil trimming equipment and a razor and/or thin wire. All specimen preparation operations were carried out in a controlled environment humid room to minimize moisture losses from the sample. The 50 mm diameter cylindrical specimens had a height to diameter ratio of approximately 2.

Both strain-controlled anisotropically consolidated (CAU) triaxial compression and extension tests were carried out with porewater pressure measurements. The term "extension" refers to testing carried out in negative "q" space with the major principal stress, σ'_r (radial) being constant and the minor principal stress, σ'_a (axial) decreasing ($q = (\sigma'_a - \sigma'_r)/2$). The average rate of strain was approximately 2 %/hr. This strain rate was considered to be sufficiently slow to ensure porewater pressure equalization throughout the specimen. The axial load was measured either with an electronic compression load cell or by a calibrated proving ring and the porewater pressure was measured with a pressure transducer. Both the load cell and transducer were connected to a digital multimeter readout unit. Axial deformations were measured with a dial gauge capable of detecting movements of 0.01 mm.

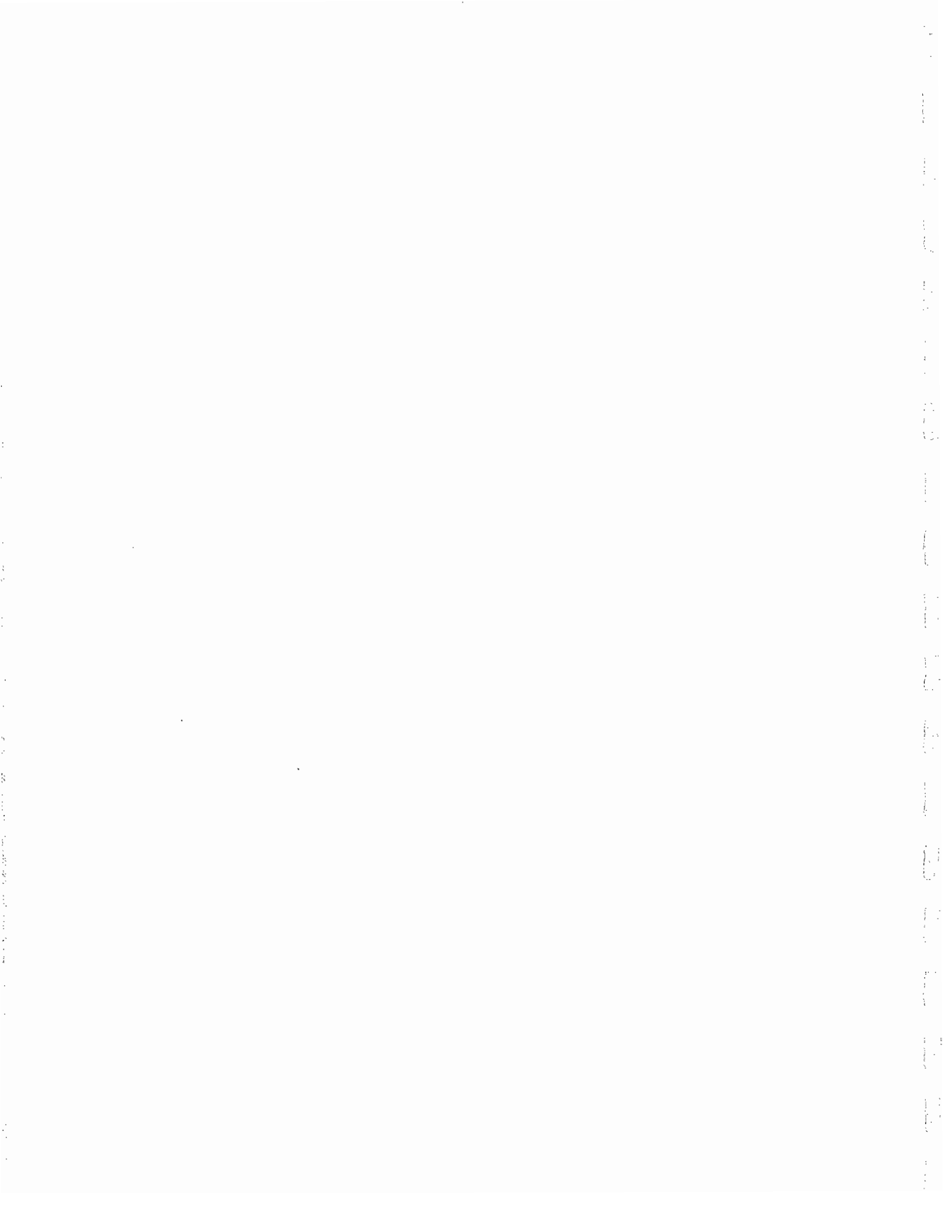
All specimens were enclosed in thin rubber membranes and provided with filter paper drains. Drainage of water from and to the specimen was effected through top and bottom porous stones. A back pressure approximately equal in magnitude to the calculated in situ hydrostatic porewater pressure corresponding to the depth of the sample below sea level was used in all tests to ensure saturation and good quality porewater pressure measurements. The degree of saturation, as indicated by measuring Skempton's B value ($B = \Delta u / \Delta \sigma_3 = 1.0$, if fully saturated) was checked for each sample before and after the saturation stage. In all tests it was observed that $B \geq 0.96$ (typically 0.98 - 0.99) after saturation and prior to shear. Consolidation of the specimen was allowed to continue until primary consolidation was essentially complete as indicated by volume change - square root time relationships.

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At various stages during undrained compression, relaxation tests were performed to monitor the porewater pressure response during relaxation (a form of undrained creep). The relaxation test is implemented by simply stopping the constant deformation (i.e. feed-rate) of the tri-axial ram but continuing to monitor axial load, dial gauge and porewater pressures.

In general, the specimens were anisotropically consolidated (i.e. at a constant stress ratio defined by σ'_r/σ'_a equal to the magnitude of K_o) to its corresponding in situ current effective stress state or to its in situ yield stress state prior to shearing. Zero lateral strain consolidation was not effected as changes in radial (lateral) strains were not prevented. Anisotropic consolidation was implemented through appropriate combinations of axial loads on the piston and of applied cell pressure. The top loading platen and the piston were physically connected with a threaded bolt which enabled the necessary "pulling" or upward force to be applied to the sample to reduce the effective axial stress on the specimen to less than the cell pressure.

In addition to the strain-controlled CAU triaxial tests, stress-controlled anisotropically consolidated drained (CAD) triaxial stress probes were also conducted. In general, the samples were first consolidated to their in situ effective stresses under a constant shear stress ratio equal to K_o . At this point predetermined effective stress paths were followed in drained stress probes which "radiated" from the in situ stress state. The yield point along each effective stress path (ESP) was determined. From these measured discrete yield points, the yield envelope was determined. Yield was also determined from the ESPs associated with the CAU triaxial compression and extension tests. Strain energy was used as the criterion for determining yield in the CAU and CAD stress paths (refer to Beaufort Sea Clay Study, Task #2, Golder Associates, 1984a).



Although the CAD stress probes are idealized as a straight line in $p' - q$ stress space the actual ESP has a "zig-zag" shape. As a specific load increment in terms of both axial load and radial stress is applied, an excess porewater pressure is set-up which causes the ESP to diverge from the straight-line path. After complete dissipation of this excess porewater pressure the ESP once again lies on the desired straight-line drained stress probe. Thus the actual ESP point is only known at the end of each loading increment when excess porewater pressures have dissipated. The duration of each load increment was sufficient to permit primary consolidation to occur. To this end, plots of both observed volume change and axial deformation of the sample against the square root of time were maintained. The next increment was imposed when these relationships indicated a "levelling-off" behaviour. The load duration period varied depending on whether the effective stress state was inside or beyond the yield envelope. Within the yield envelope (i.e. in the overconsolidated range) the time required to dissipate the excess porewater pressures was approximately 30 to 60 minutes. In the normally consolidated state (i.e. beyond the yield envelope) the required load duration was 2 to 3 hours and in some cases even longer periods of time were necessary.

The various CAD ESPs were effected by appropriate combinations of axial loads on the piston and of applied cell pressure. The axial load on the piston which may be either a net downward or net upward force was achieved by a lever arm system in a modified ELE oedometer frame. By adding weights on the appropriate side of the lever arm, the required net upward or downward force could be easily and reliably applied to the piston and hence to the sample. The accuracy of this dead weight system was checked by firstly locking the piston and then applying a cell pressure which acted on the area of the piston thereby producing a net upward thrust onto the piston. The calculated weight required to balance this thrust was applied onto the lever arm and the piston was then unlocked. An appropriately mounted dial gauge indicated that no movement took place thereby indicating that the applied forces from the cell

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pressure acting on the piston and the lever arm weight to counteract it were in equilibrium. The results of this simple exercise provided confidence that the proper applied loads and their direction could be imposed on the piston using the modified oedometer equipment. For cases in which a downward force would always be in effect a simple tray system securely fastened to the top of the piston proved to be adequate and quite effective. This system was also checked by applying a known cell pressure to the piston.

Subsequent to anisotropic consolidation to the desired stress state using the modified oedometer frame, the triaxial cell with the sample inside had to be transferred to the strain-controlled triaxial test frame so that the compression and extension tests could be carried out. Prior to the transfer and dismantling of the cell from the oedometer frame, the piston was locked. After the cell was in the triaxial frame the same force and its direction was again applied to the piston followed by the unlocking of the piston. In all cases, the attached dial gauge indicated that no movement took place. This procedure ensured that the same stress state induced during consolidation was in fact maintained and existed in the sample prior to undrained shearing.

A total of 21 triaxial tests were performed according to the following schedule:

<u>UNIT</u>	<u>K₀</u>	<u>Borehole</u>	<u>CAU/CIU</u>	<u>CAD</u>
I _a	1.0	AW84SI01	Sa# 2 (1 test)	-
	1.0	AE84SI01	Sa# 4 (1 test)	-
I _b	0.8	AE84SI01	Sa# 14, 16	Sa#13, 16
			(3 tests)	(3 tests)
I _b	1.0	AW84SI01	Sa# 5, 6	Sa# 4
			(3 tests)	(2 tests)
I _b	1.0	AE84SI01	Sa# 6, 7, 14	-
			(3 tests)	
III	0.8	AE84SI01	Sa# 29, 30	Sa# 27, 28
			(3 tests)	(2 tests)

All tests were conducted at room temperature.

APPENDIX 2

UNDRAINED SHEAR STRENGTH PROFILES
AND BOREHOLE LOGS

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APPENDIX 4 - Diagnostic Profiles

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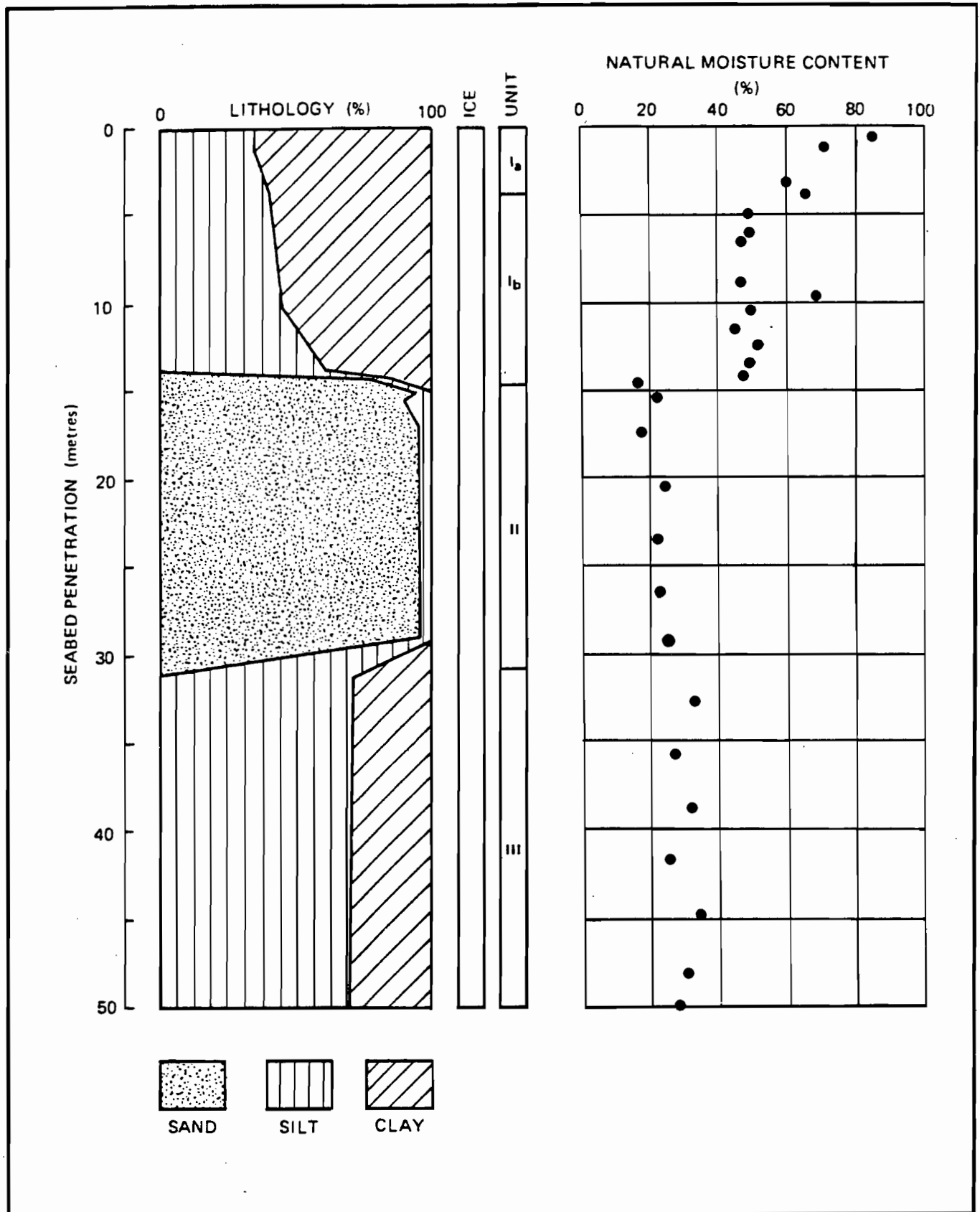


FIGURE C.1 NATURAL MOISTURE CONTENT PROFILE - AMAULIGAK A-23

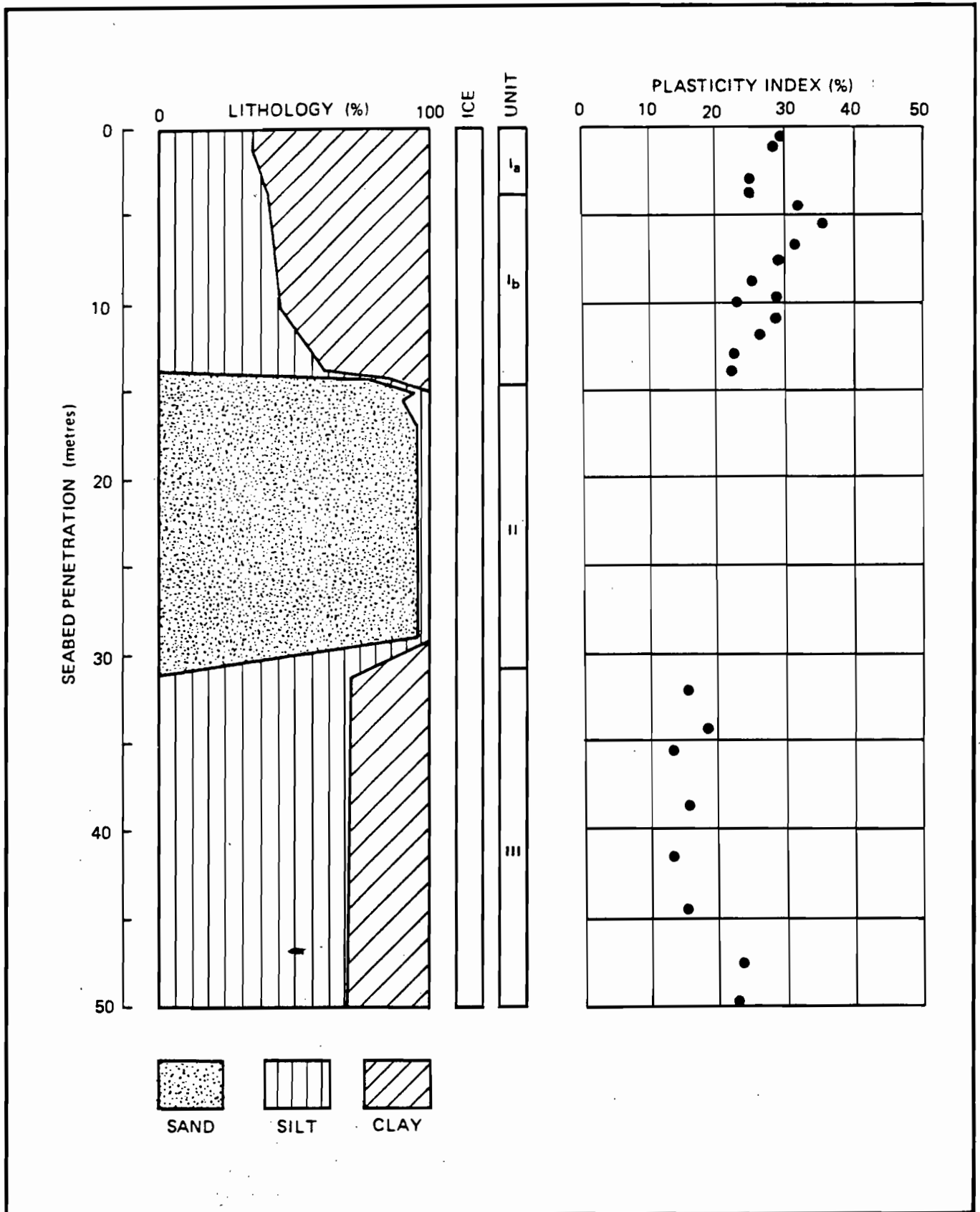


FIGURE C.2 PLASTICITY INDEX PROFILE -
 AMAULIGAK A-23



January, 1985

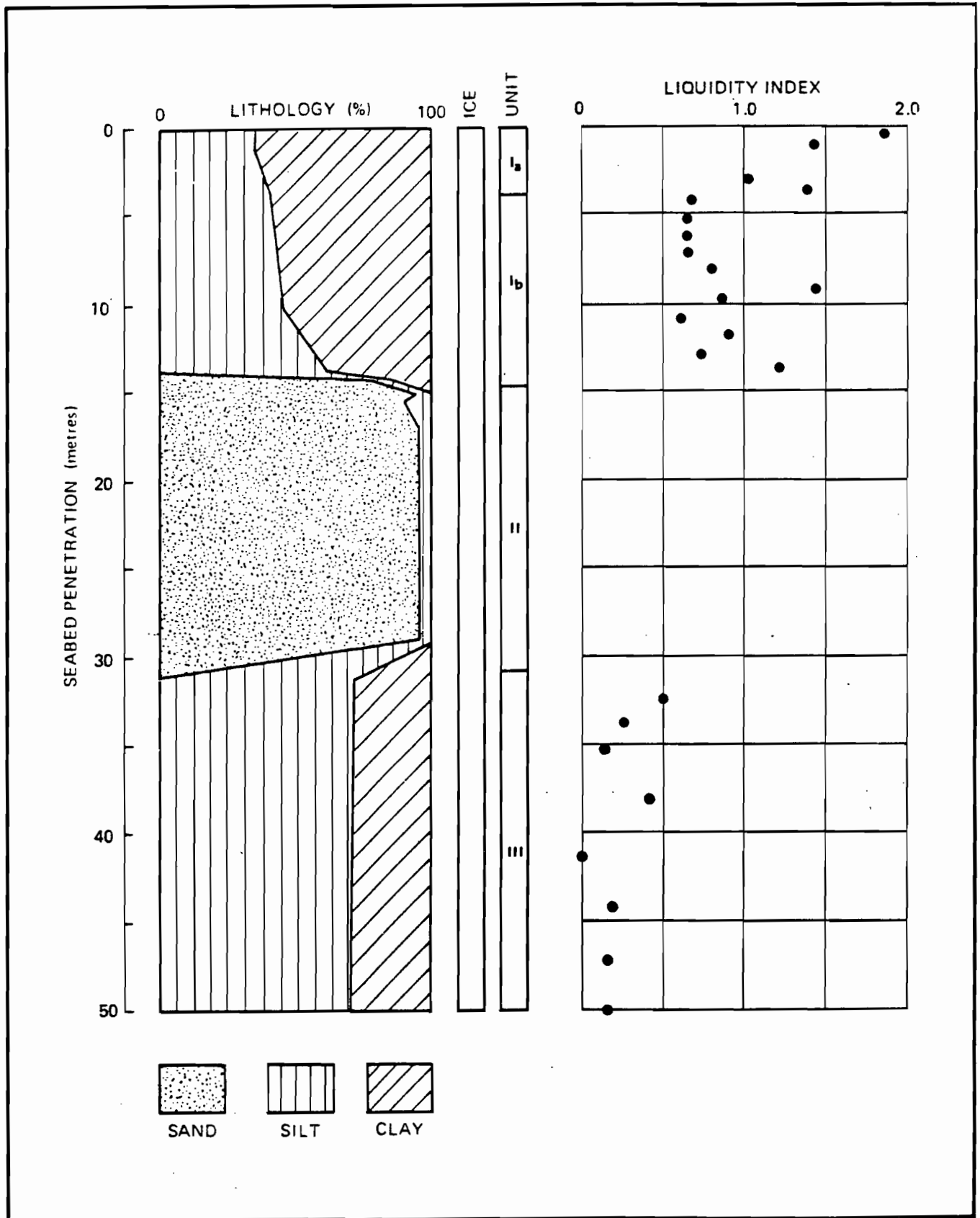


FIGURE C.3 LIQUIDITY INDEX PROFILE - AMAULIGAK A-23

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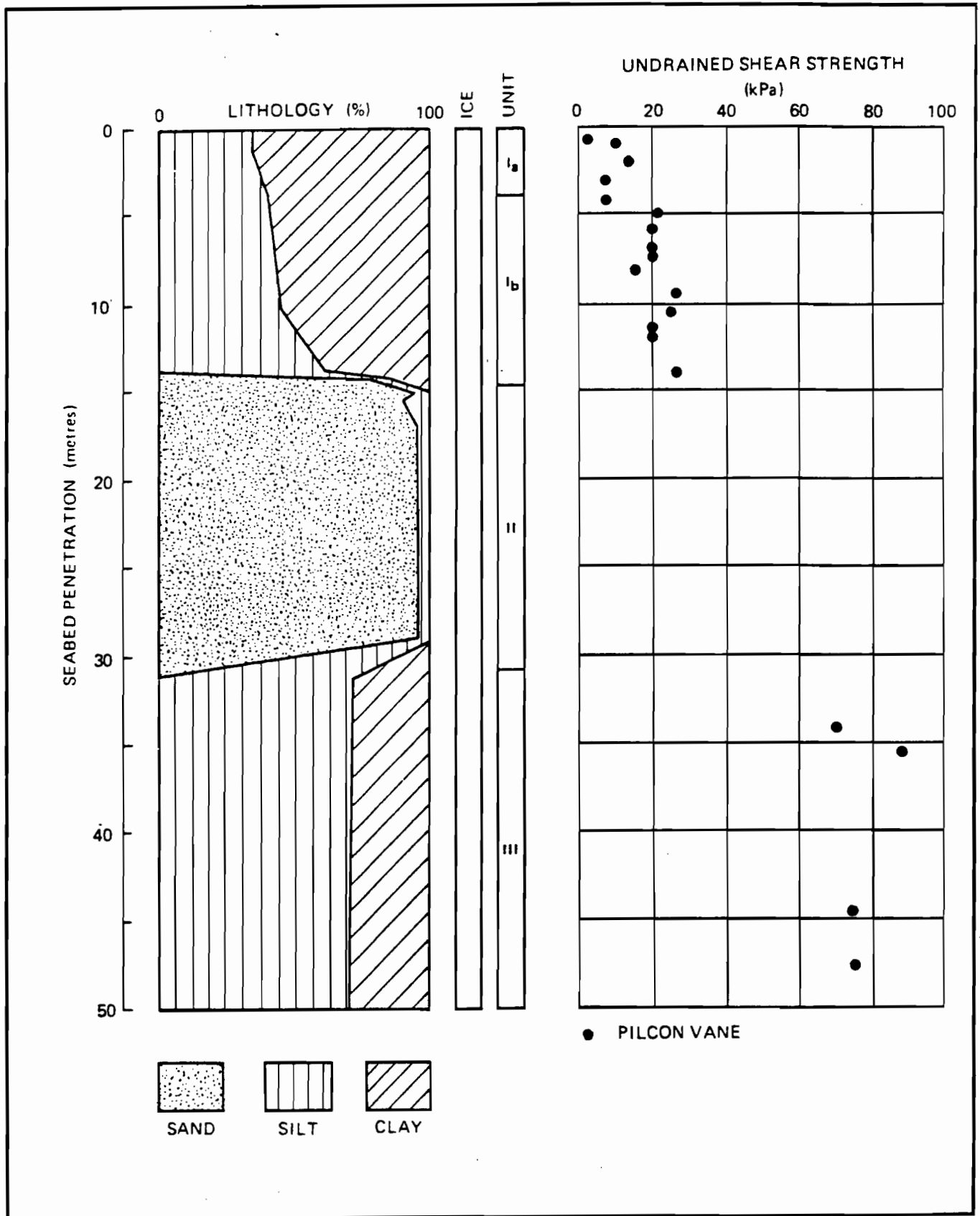


FIGURE C.4 UNDRAINED SHEAR STRENGTH PROFILE -
 AMAULIGAK A-23

January, 1985

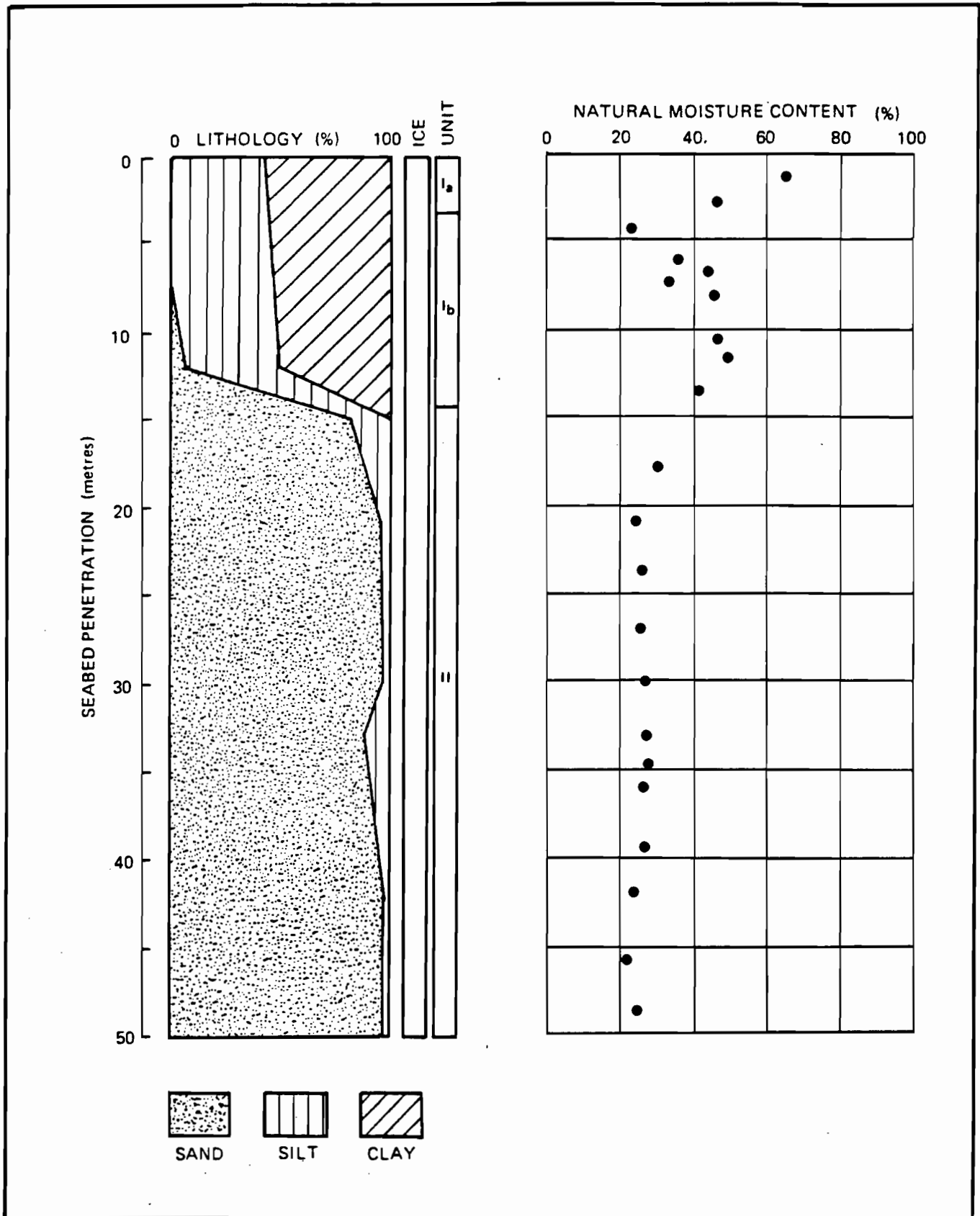


FIGURE C.5 NATURAL MOISTURE CONTENT PROFILE - AMAULIGAK F-65

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January, 1985

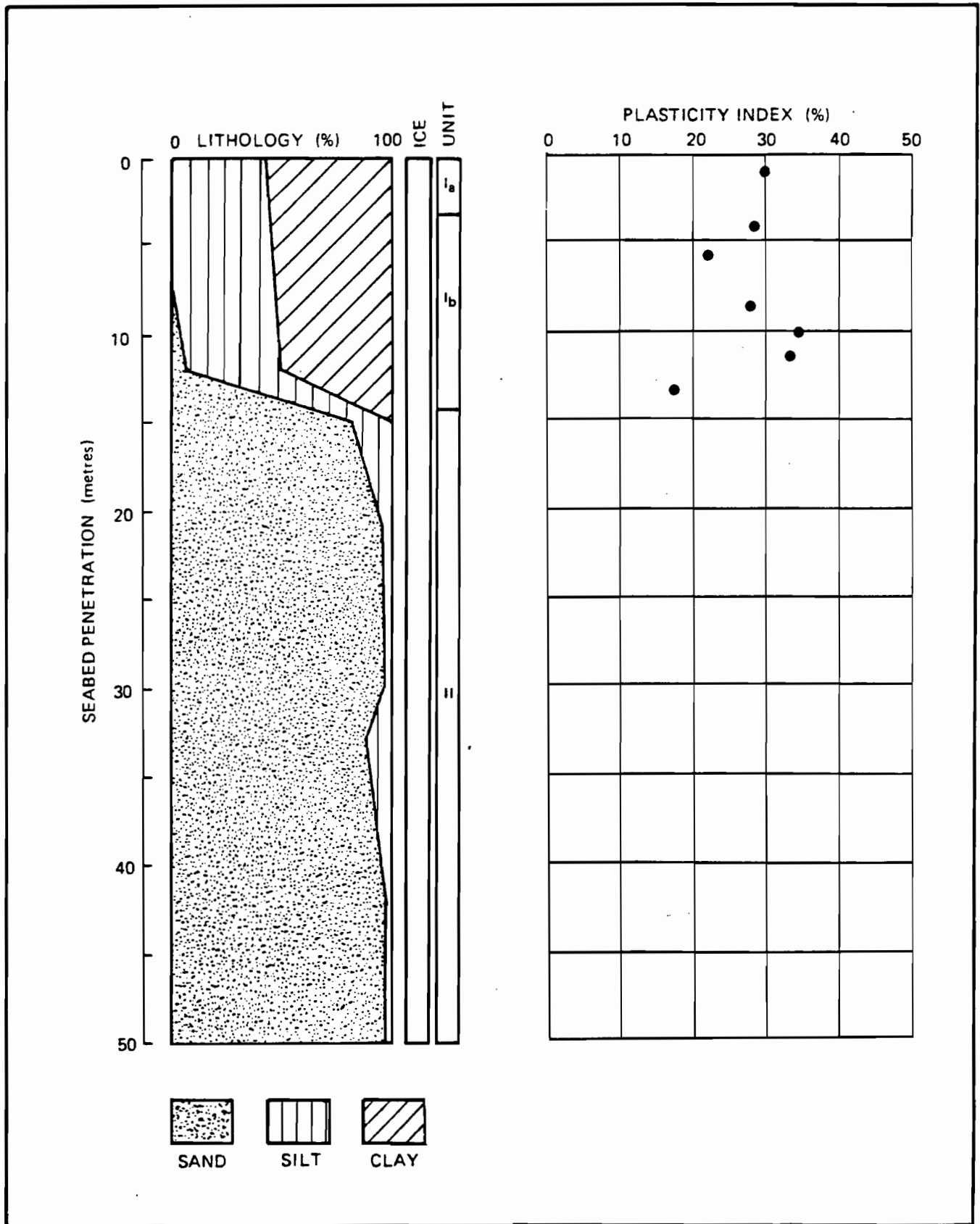
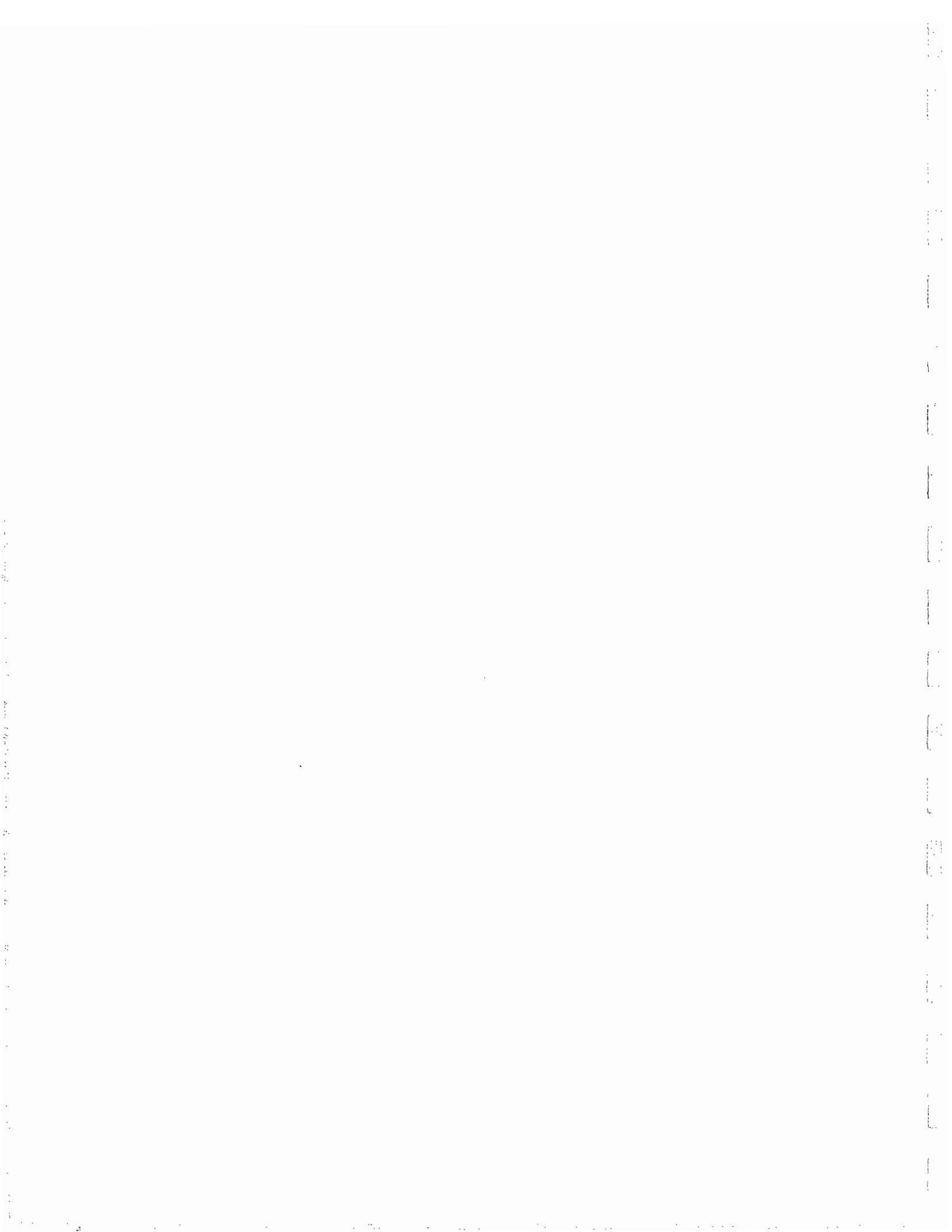


FIGURE C.6 PLASTICITY INDEX PROFILE - AMAULIGAK F-65



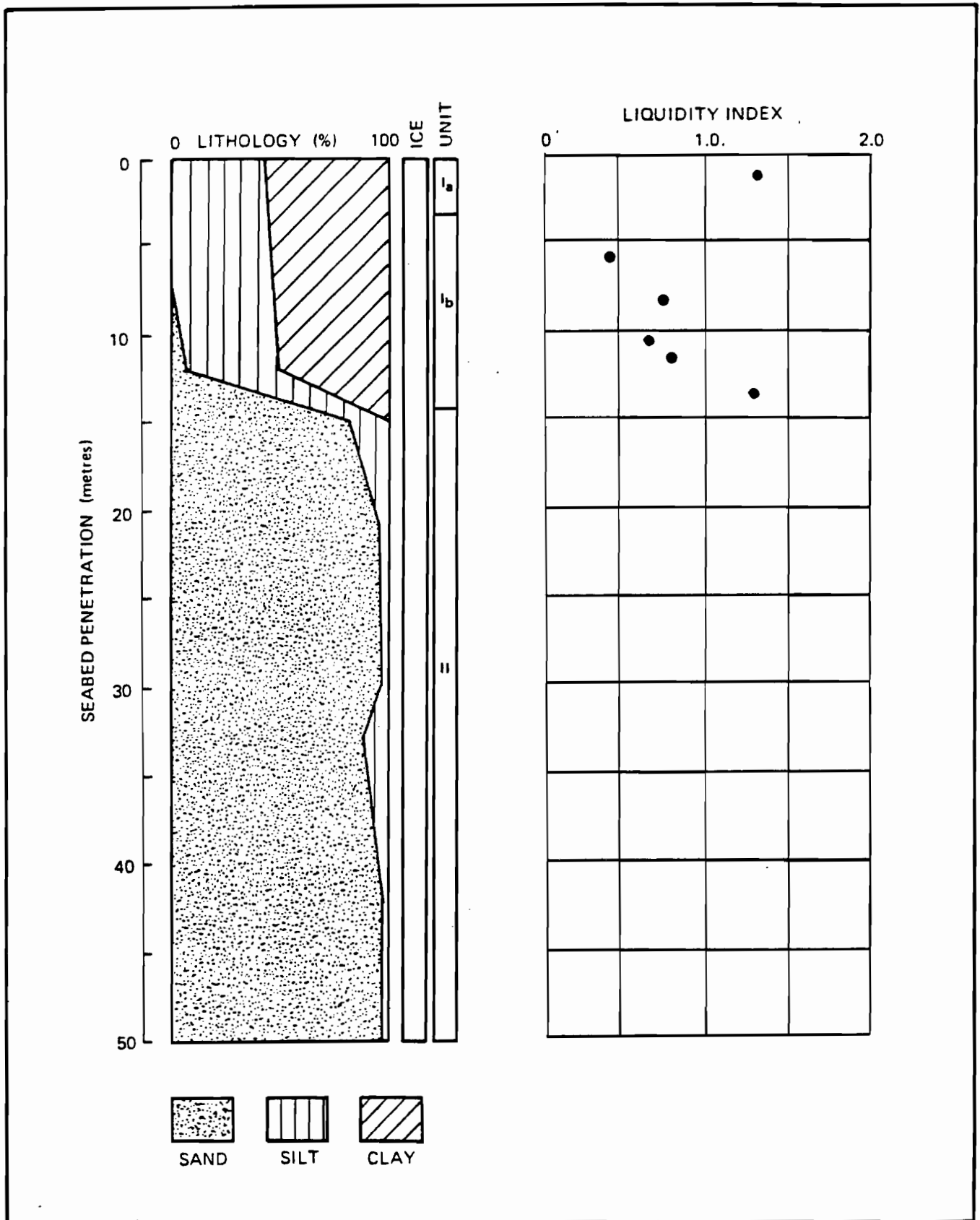


FIGURE C.7 LIQUIDITY INDEX PROFILE -
AMAULIGAK F-65



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January, 1985

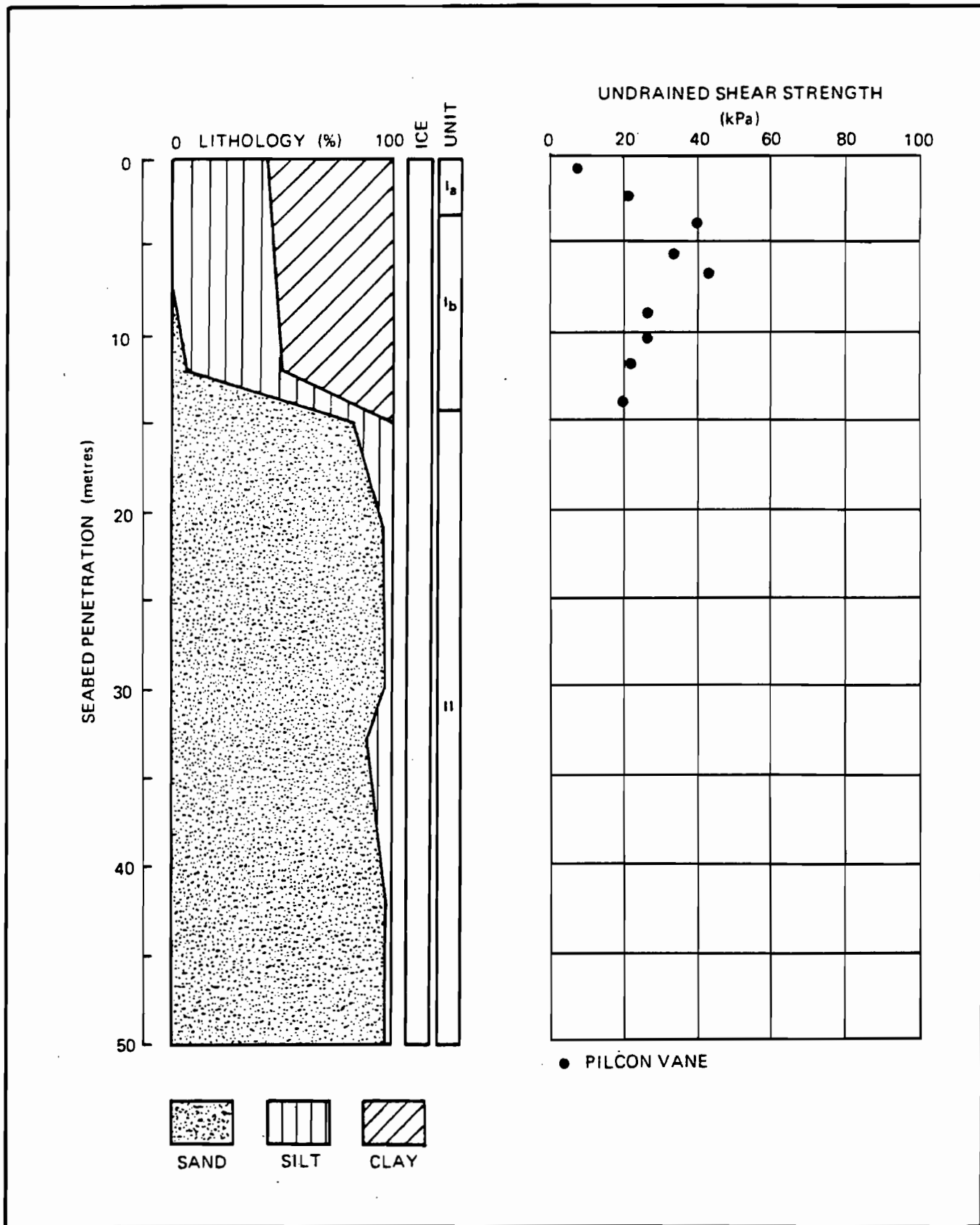


FIGURE C.8 UNDRAINED SHEAR STRENGTH PROFILE - AMAULIGAK F-65

THE UNIVERSITY OF CHICAGO LIBRARY

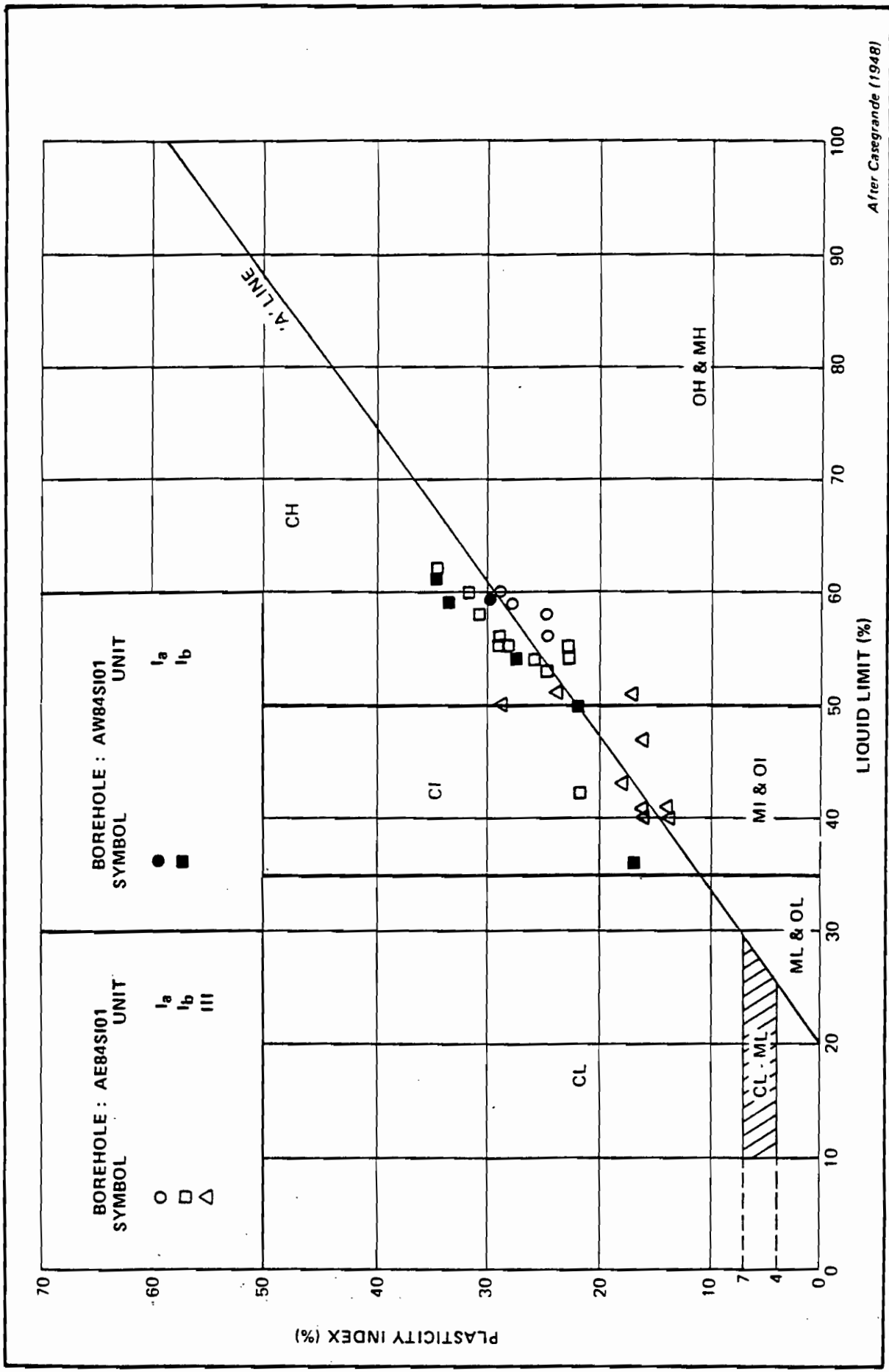


FIGURE 6 PLASTICITY CHART

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APPENDIX 5 - Self-Boring Pressuremeter Data

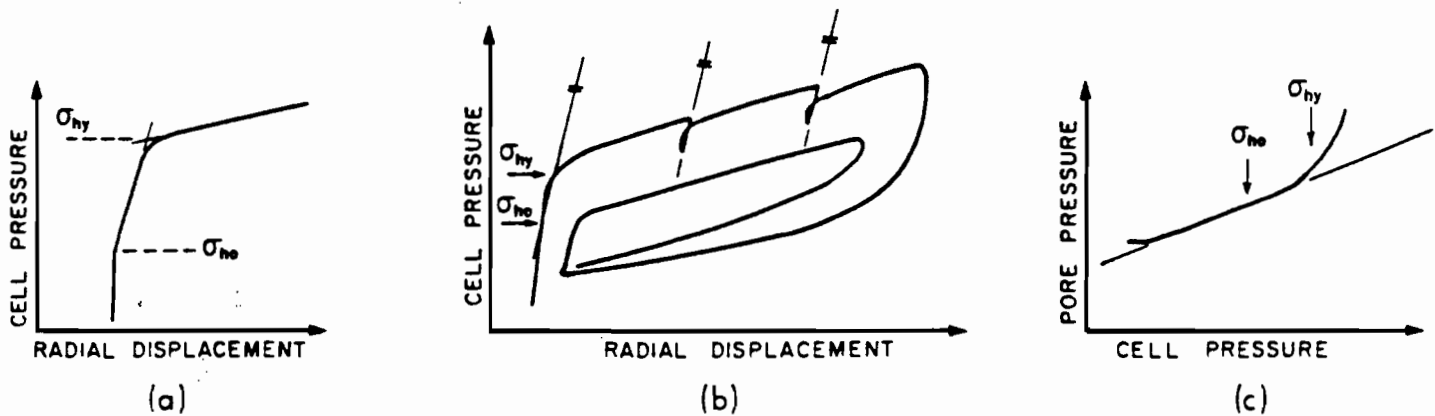


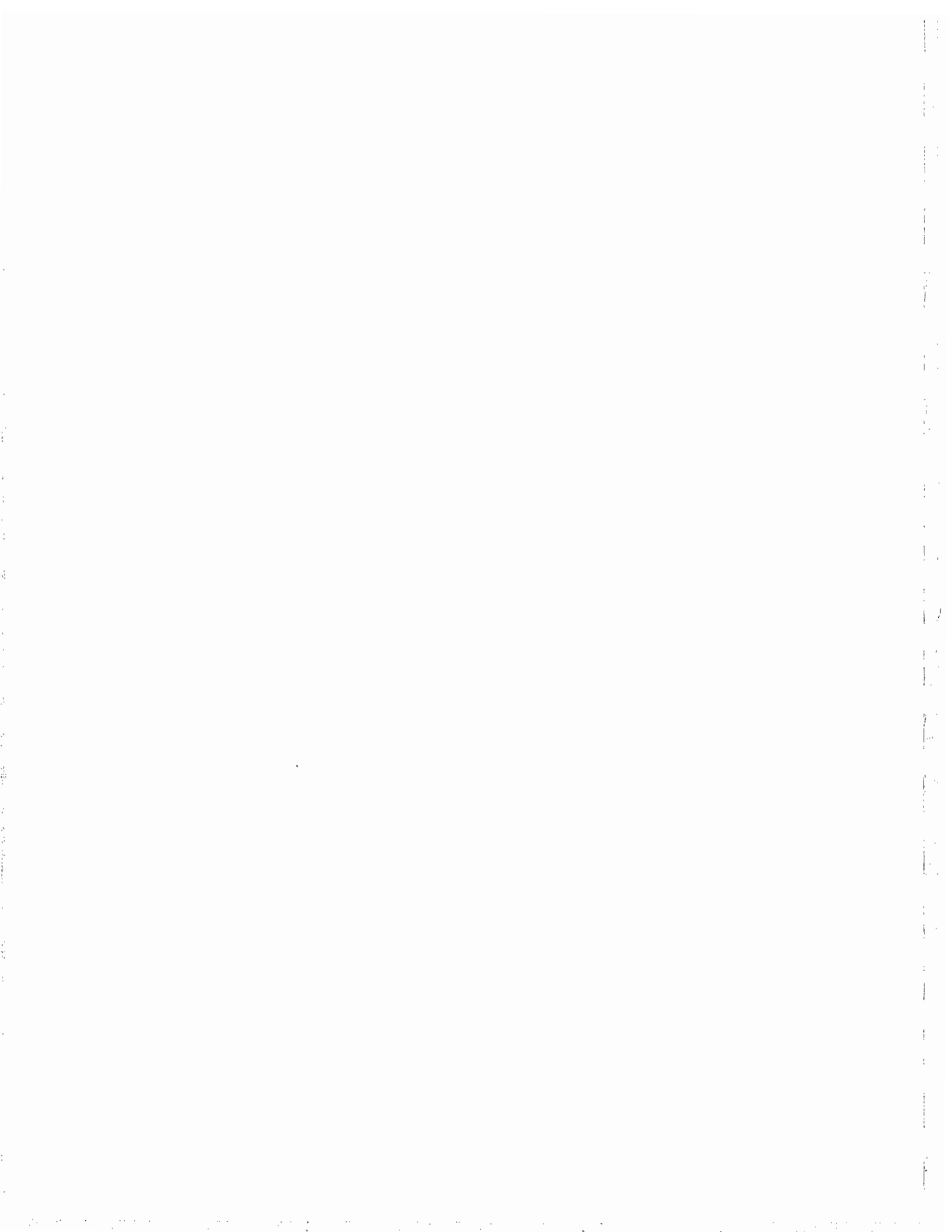
SUMMARY OF SELF-BORING PRESSUREMETER TESTS

AMAILIGAK SITE

BOREHOLE	TEST #	DEPTH (m)	σ_{ho}' (kPa)	σ_{hy}' (kPa)	K_o	CORRELATION BETWEEN (See below)	REMARKS
AE84PI05	1	1.2	-42	33	-	a, b, c	
	2	2.7	-22	38	-	a, b, c	
	3	4.3	-33	62	-	a, b, c	
	4	5.8	27	92	0.7	a, b, c	
	5	7.6	44	89	0.9	a, b	
	6	9.1	64	139	1.1	a, b	
	7	10.7	68	168	1.0	a, b, c	
	8	12.2	68	173	0.9	a, b, c	
	9	13.1	84	195	1.0	a, b, c	
AE84PI04	1	1.2	-42	-7	-	a, b, c	
	2	2.7	-47	18	-	a, b, c	
	3	3.8	-53	27	-	a, b, c	
	4	5.3	22	87	0.6	a, b	
	5	6.9	16	106	0.4	a, b, c	
	6	8.4	36	86	0.7	a, b, c	
	7	9.9	46	76	0.7	a, b, c	
	8	11.4	52	111	0.7	a, b	
	9	13.0	70	146	0.8	a, b, c	
AE84PI03	1	1.5	5	30	-	a, b	
	2	3.0	0	50	-	a, b	
	3	4.6	19	79	0.6	a, b, c	
	4	6.1	43	89	1.1	a, b	
	5	7.6	39	119	0.8	a, b, c	
	6	9.1	53	89	0.9	a, b, c	
	7	11.0	55	125	0.8	a, b, c	
	8	12.5	60	140	0.8	a, b, c	
	9	14.0	55	125	0.7	a, b, c	

NOTE: The reported values of σ_{ho}' and σ_{hy}' reflect a 35 kPa membrane expansion correction.



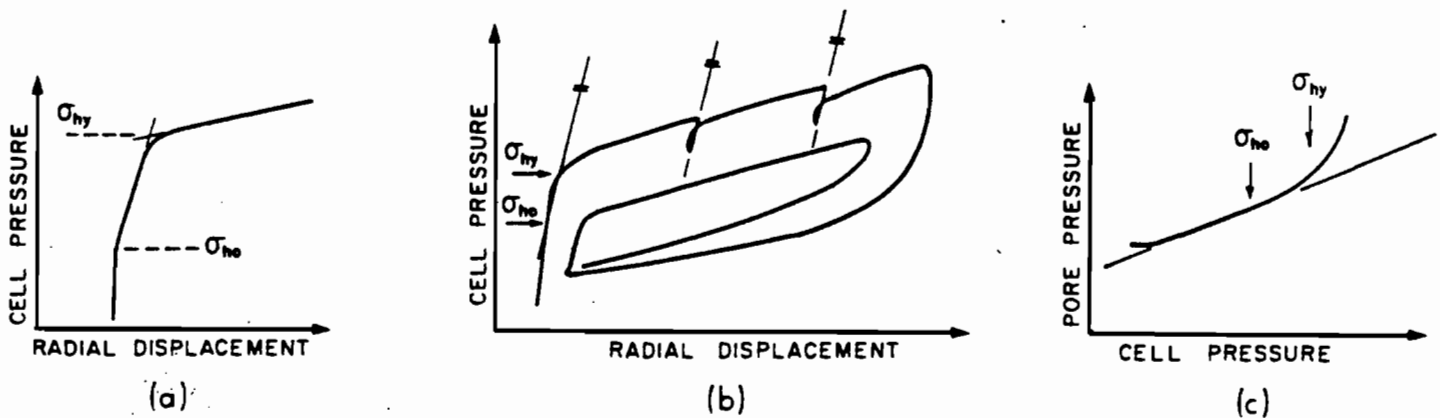


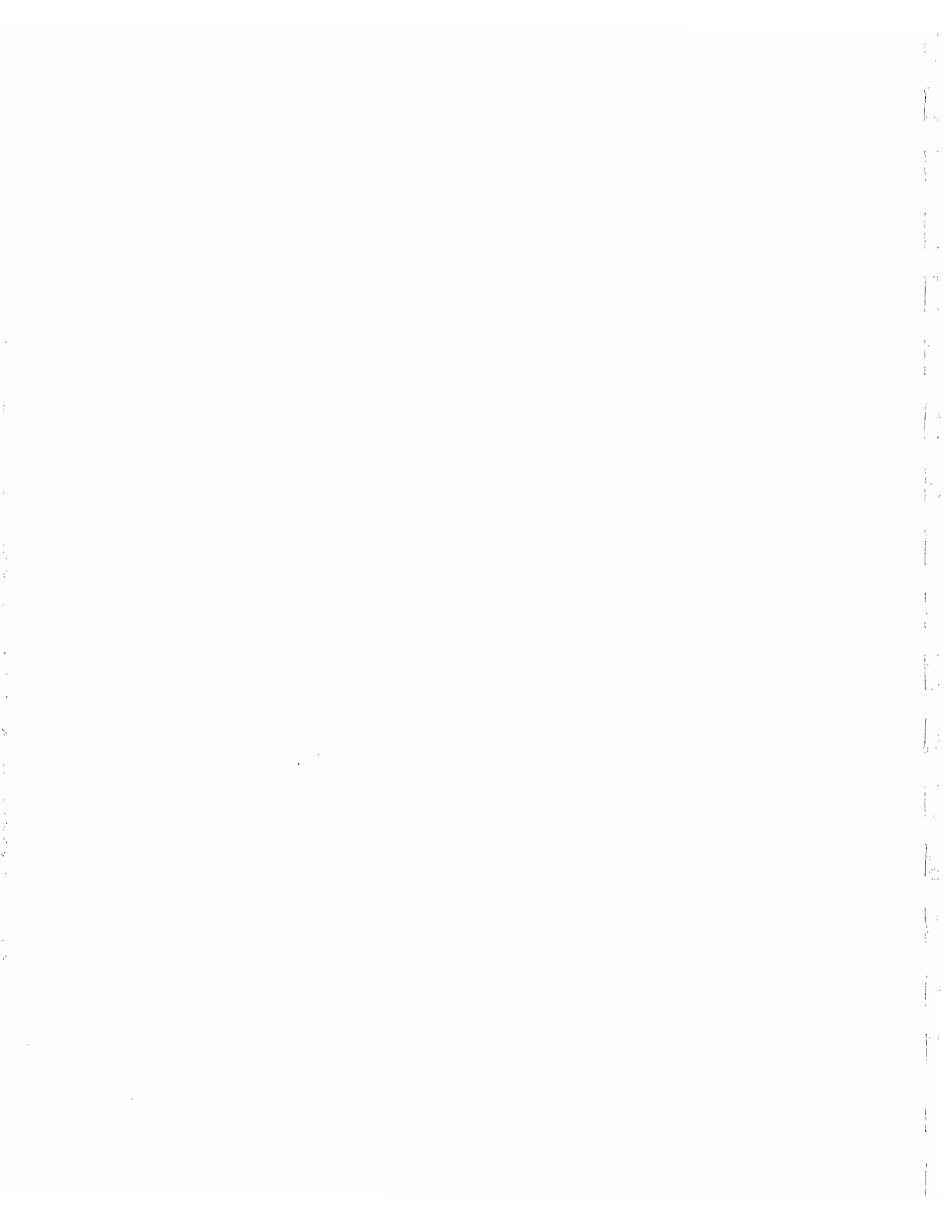
SUMMARY OF SELF-BORING PRESSUREMETER TESTS

AMAILIGAK SITE

BOREHOLE	TEST #	DEPTH (m)	σ_{ho}' (kPa)	σ_{hy}' (kPa)	K_o	CORRELATION BETWEEN (See below)	REMARKS
AE84PI02	1	1.4	-14	16	-	a,b	
	2	2.9	-24	22	-	a,b,c	
	3	4.4	11	51	0.4	a,b,c	
	4	5.9	31	76	0.8	a,b,c	
	5	7.5	40	120	0.8	a,b,c	
	6	9.0	50	115	0.9	a,b	
	7	10.5	50	110	0.8	a,b	
	8	12.0	60	125	0.8	a,b,c	
	9	13.0	67	147	0.8	a,b,c	
AE84PI01	1	1.5	-40	-5	-		Unreasonable data.
	2	3.4	-35	-5	-		Pressuremeter was accidentally dropped 1.2 m as it was lowered into casing when a chain slipped
	3	4.9	-34	6	-		
	4	6.4	1	86	-		
	6	9.4	-	-	-		
	7	11.0	-375	-	-		
	8	12.5	-390	-	-		
AW84PI01	1	1.7	3	77	-	a,b	
	2	3.2	43	123	1.7	a,b,c	
	3	4.7	48	173	1.3	a,b,c	
	4	6.3	62	112	1.3	a,b,c	
	5	7.8	67	177	1.2	a,b,c	
	6	9.3	77	142	1.1	a,b,c	
	7	10.8	97	170	1.2	a,b,c	
	8	12.3	72	212	0.8	a,b	
	9	13.9	66	236	0.7	a,b	

NOTE: The reported values of σ_{ho}' and σ_{hy}' reflect a 35 kPa membrane expansion correction.





Site: AMAULIGAK#1

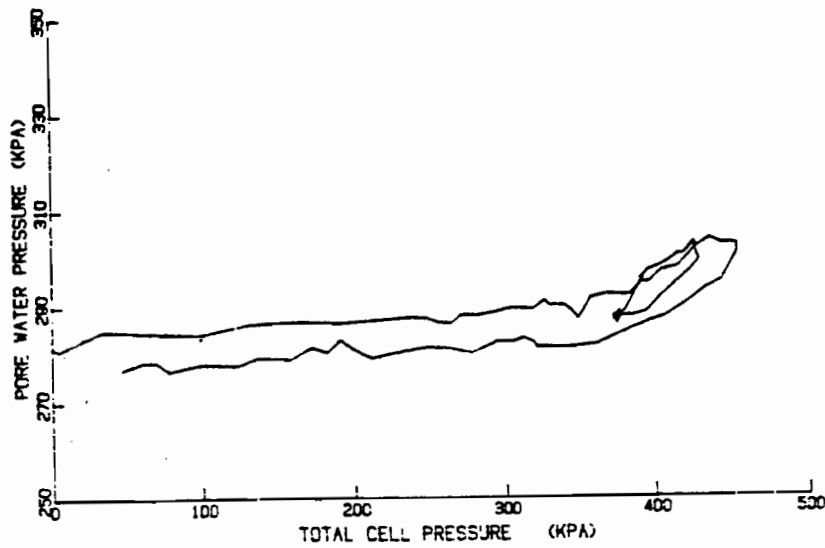
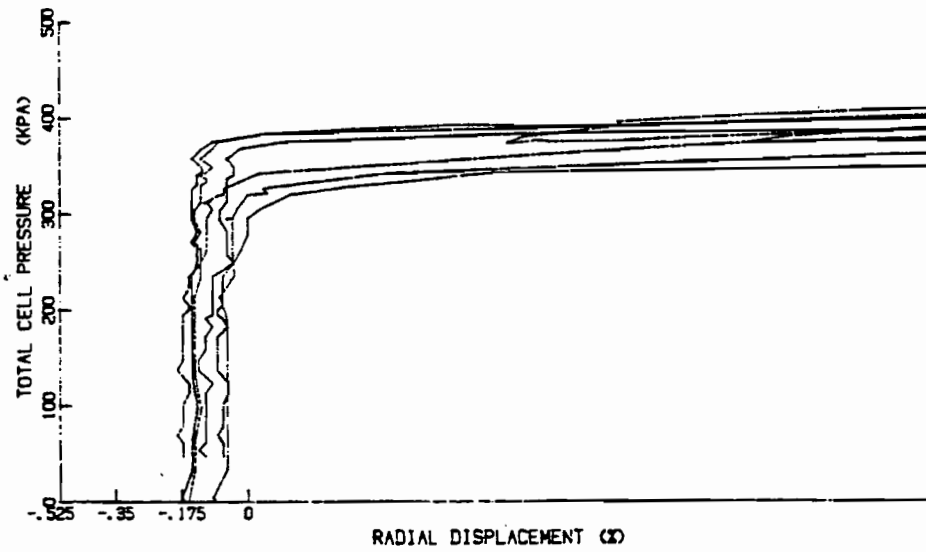
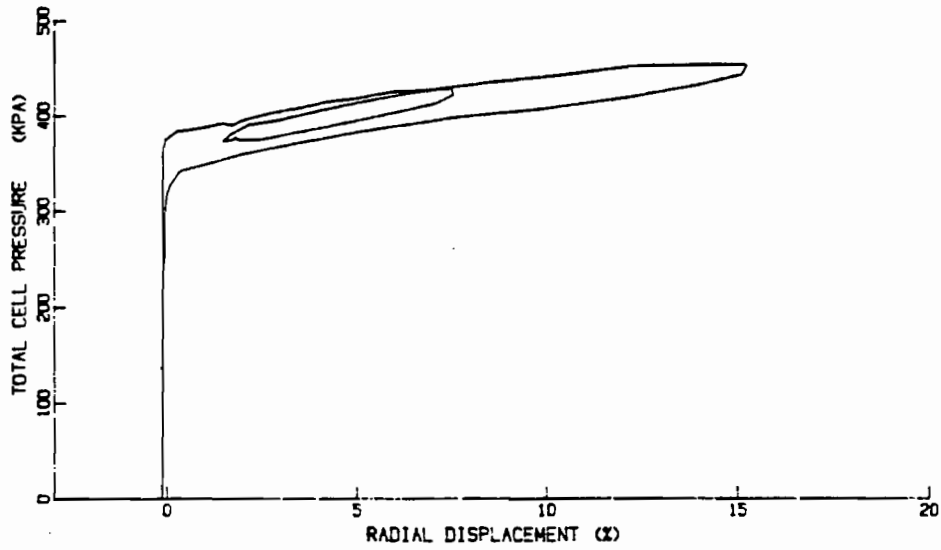
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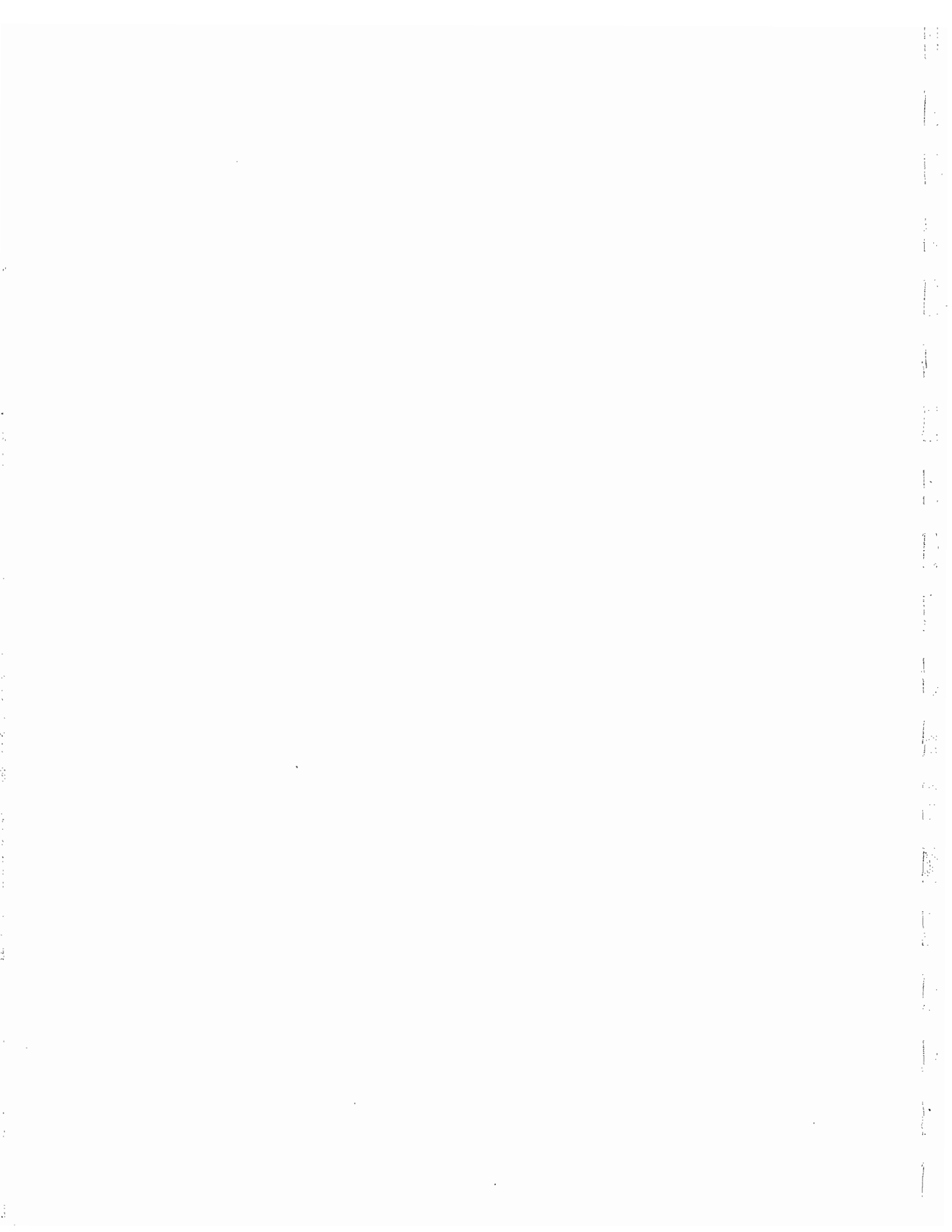
Depth: 4

Average of runs 18283

File : MEMPI25

Date: 08 SEPT 84





Site: AMAULIGAK#1

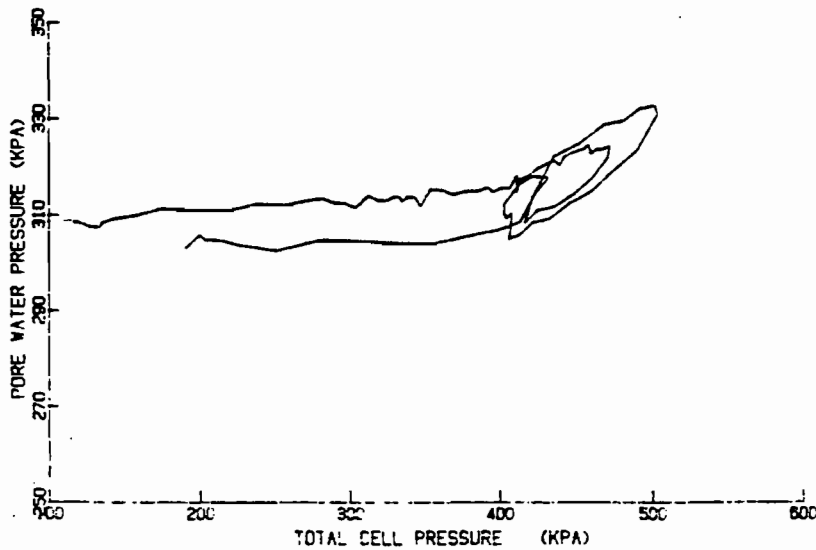
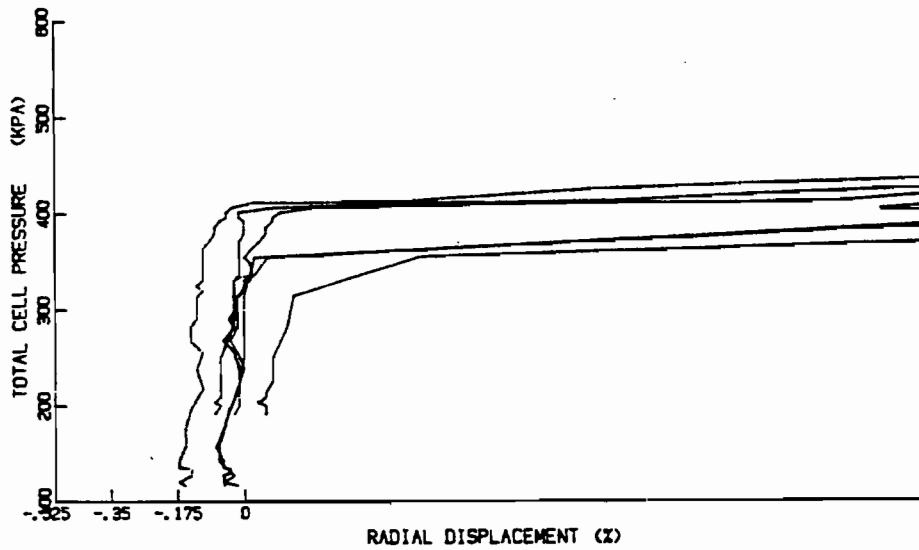
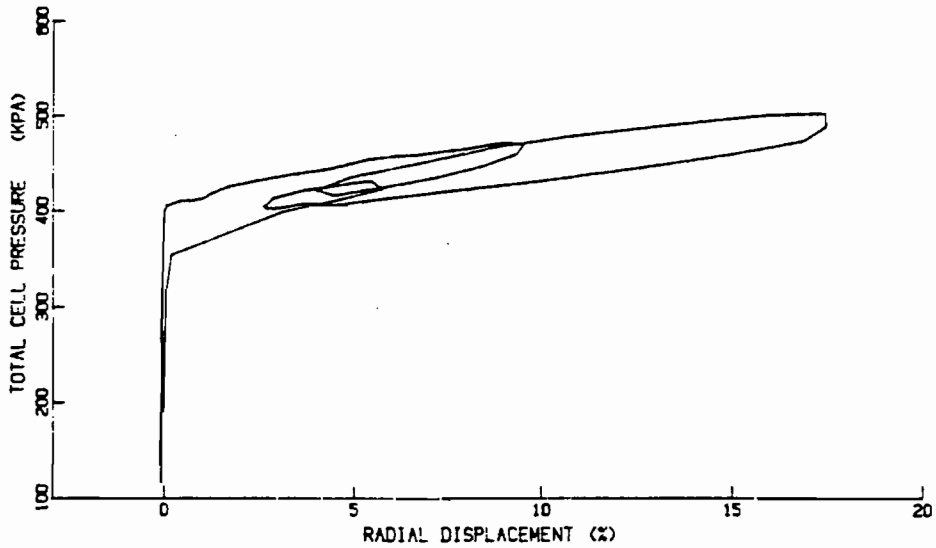
Test : 2

Depth 9

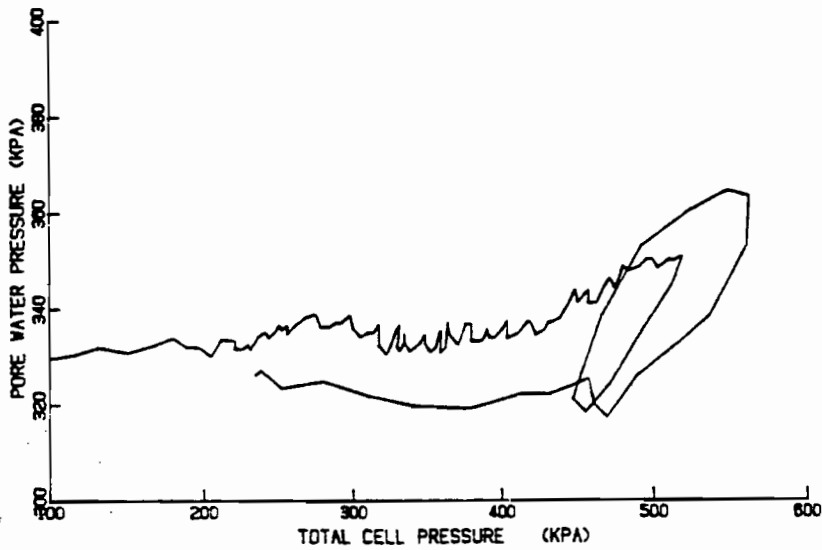
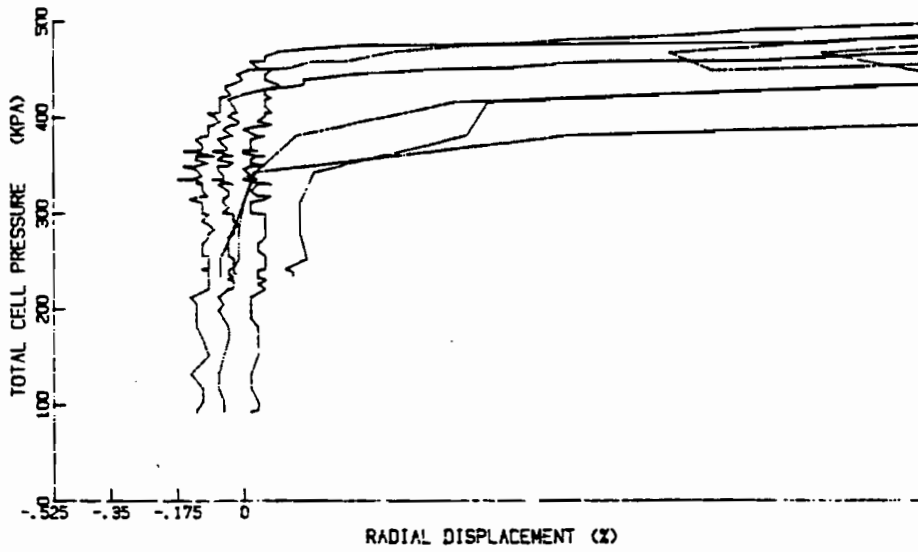
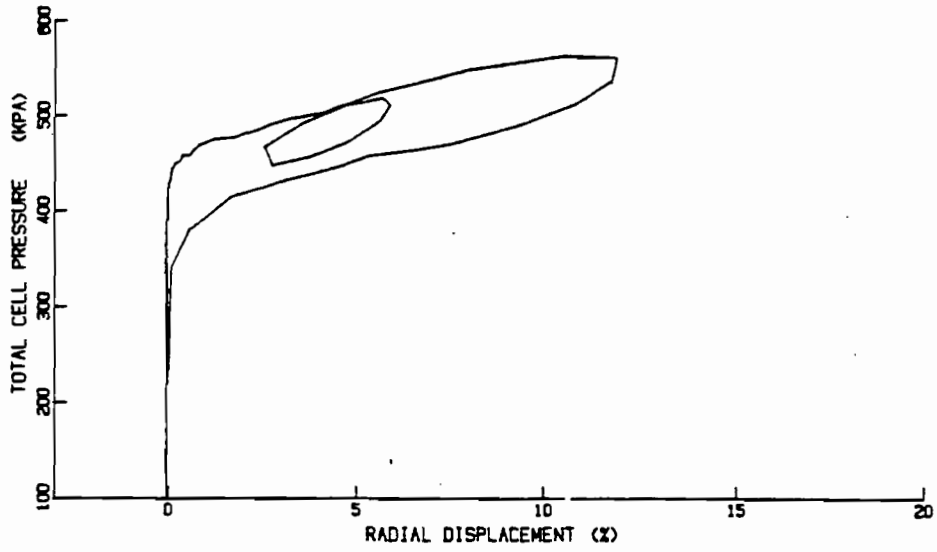
Average of runs 1&2&3

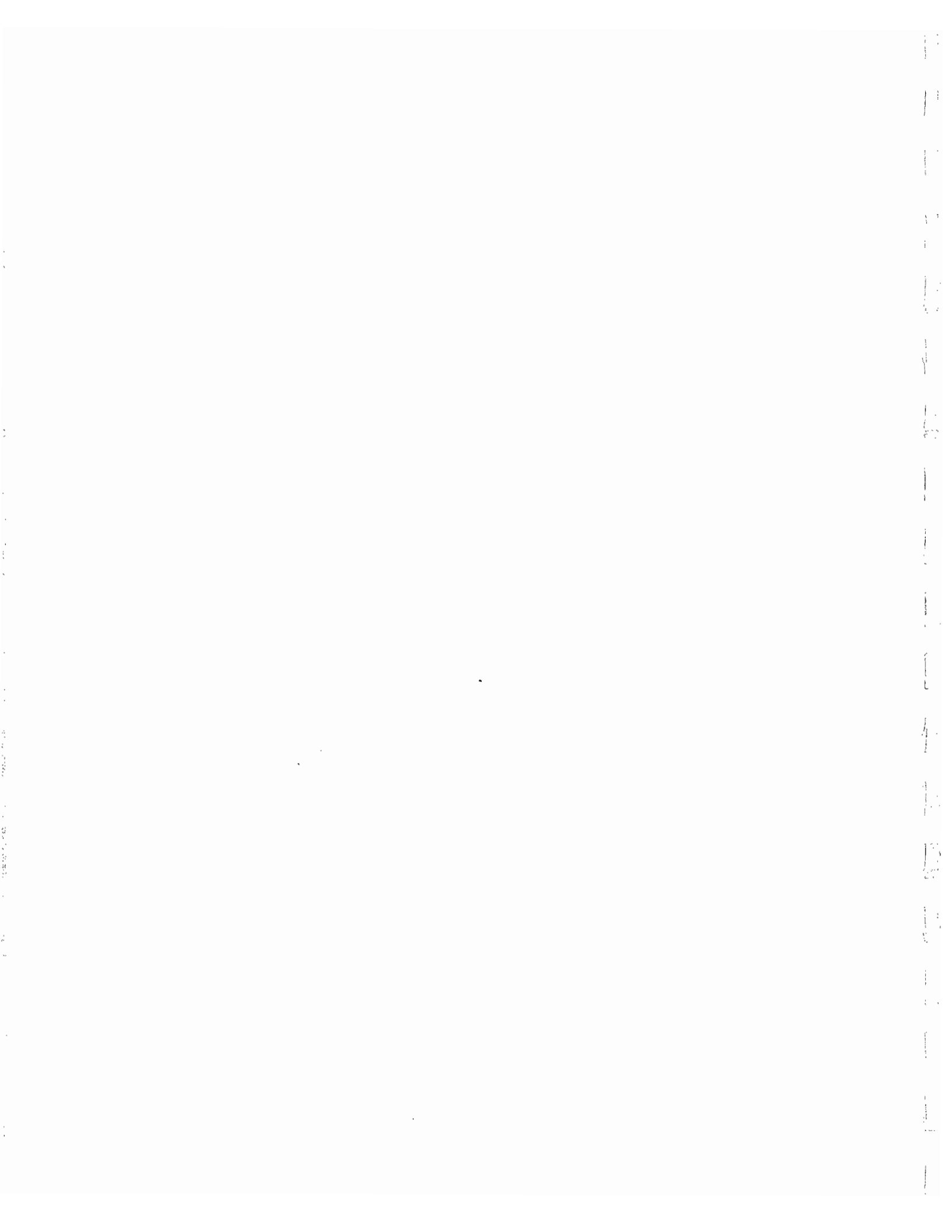
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Date: 09 SEPT 84



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Site: AMAULIGAK#1

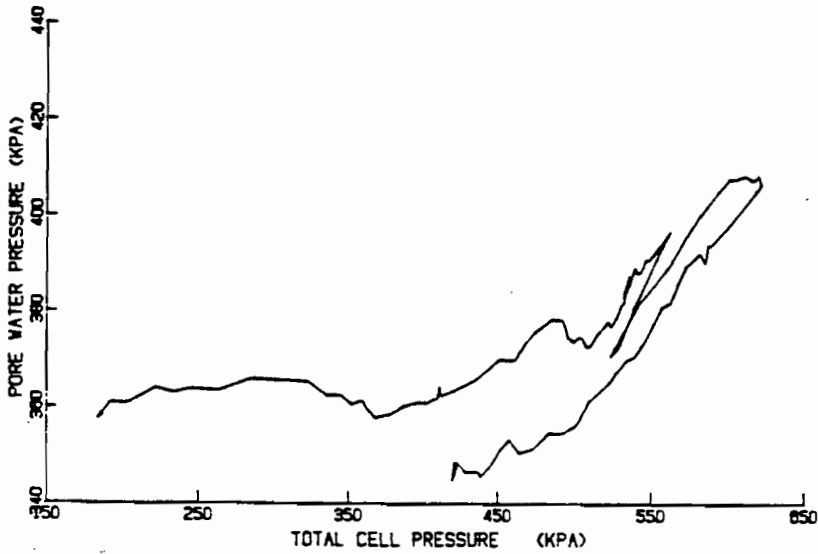
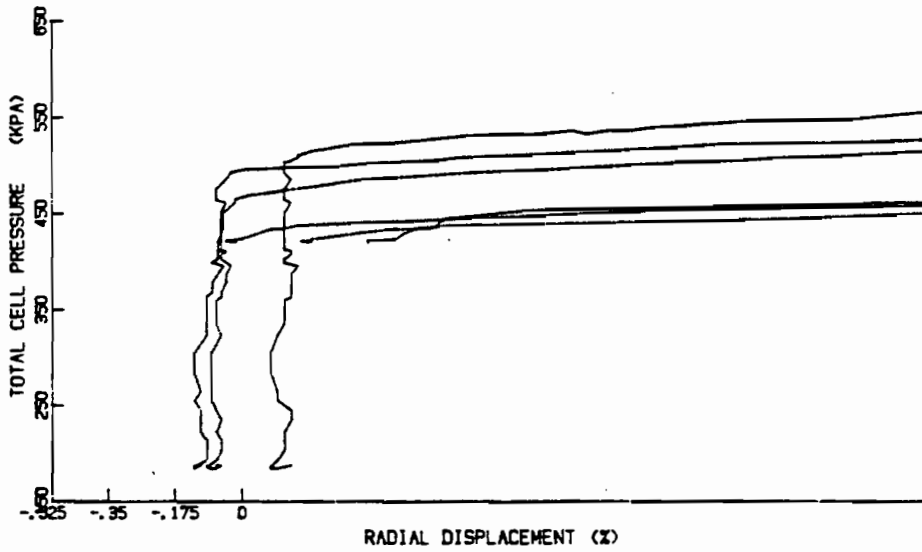
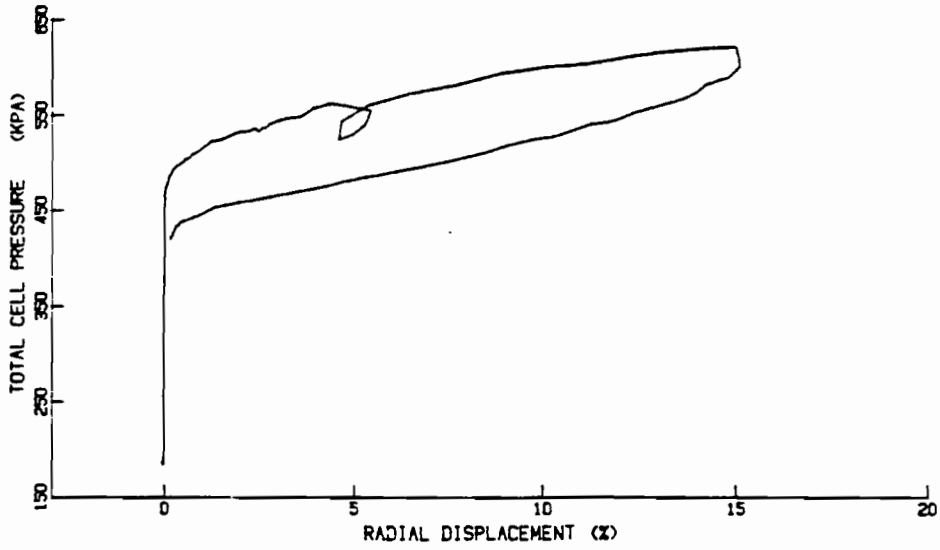
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Depth 19

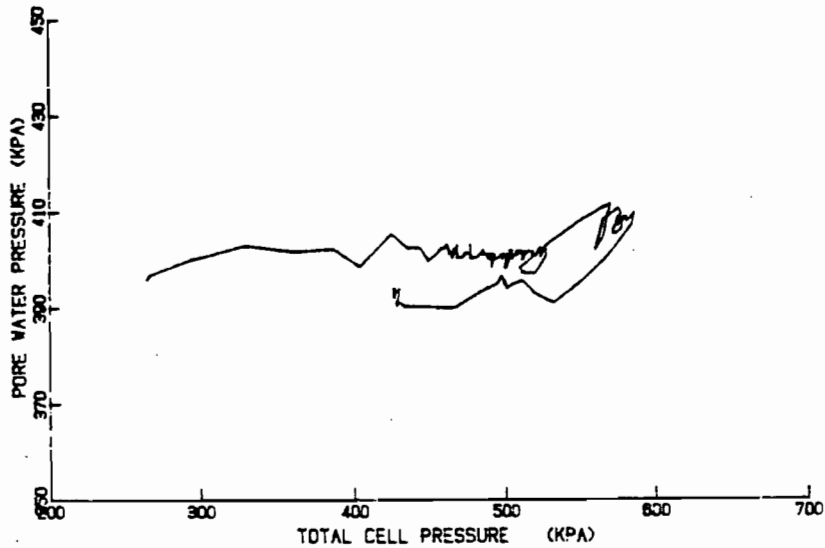
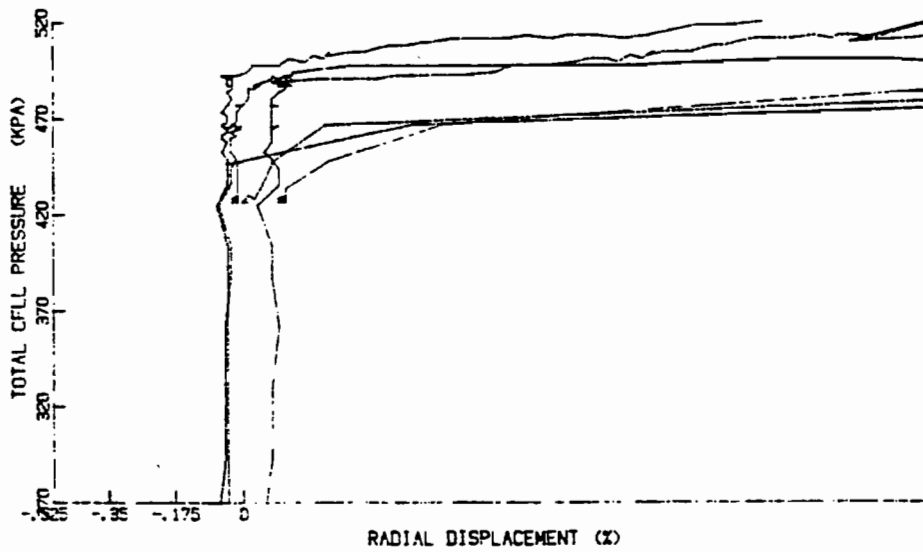
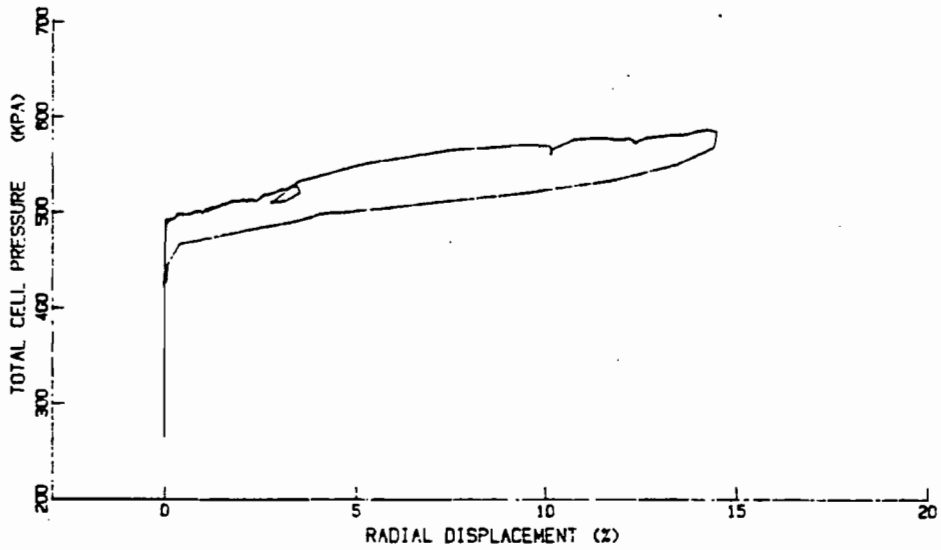
Average of area 18283

File : AEB4P10304

Date: 09 SEPT 84



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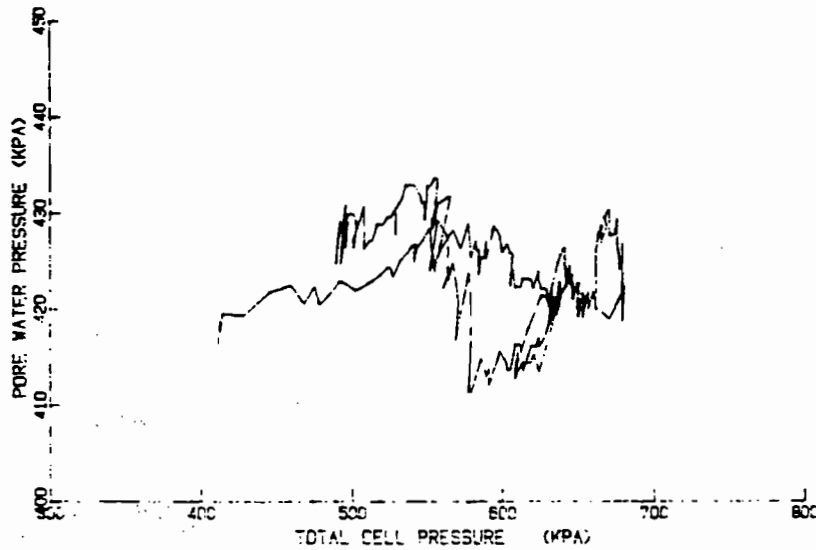
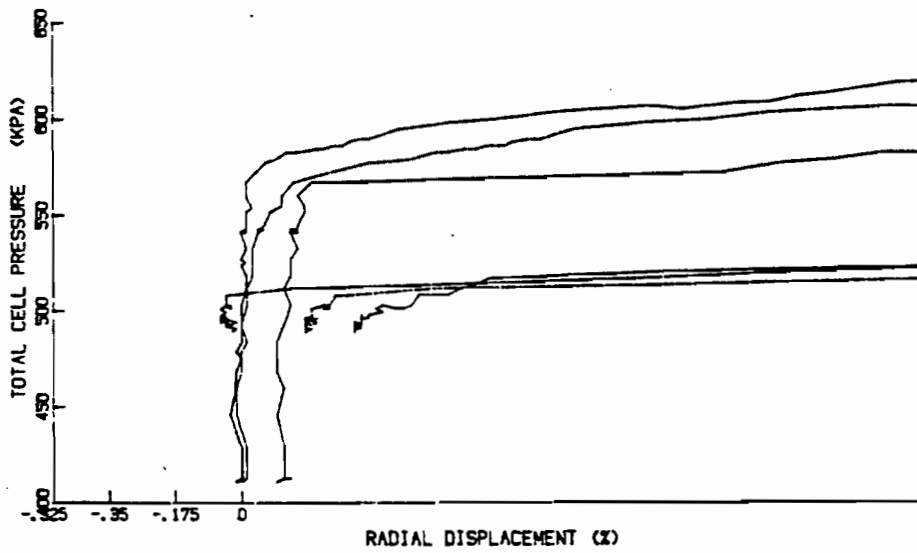
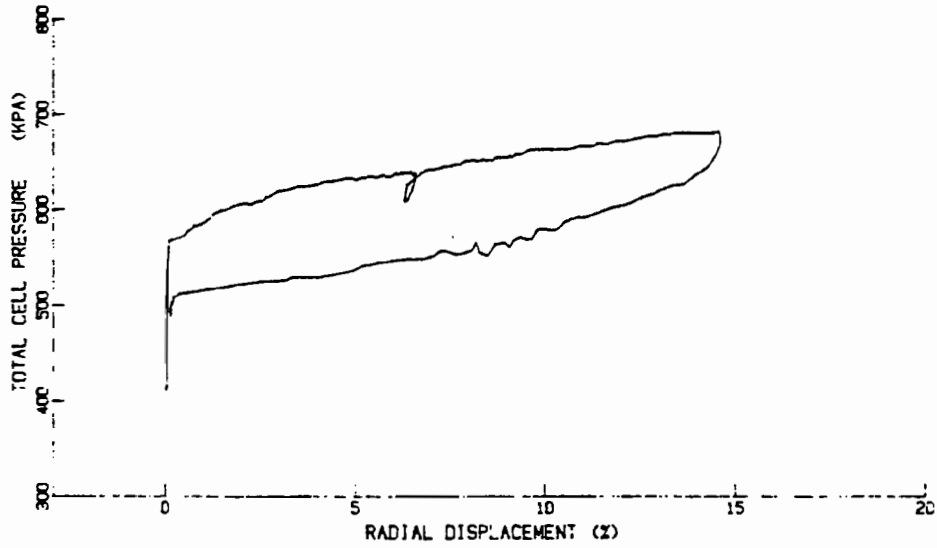
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Average of area 18283

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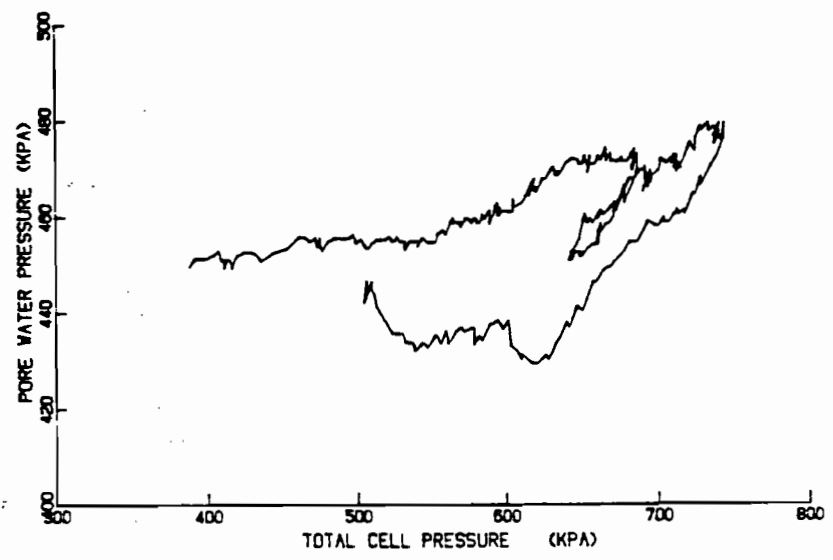
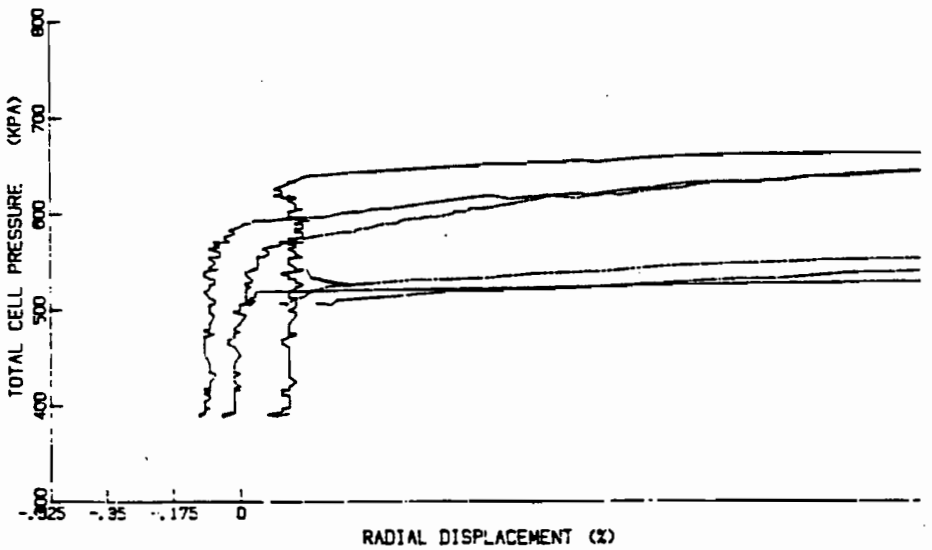
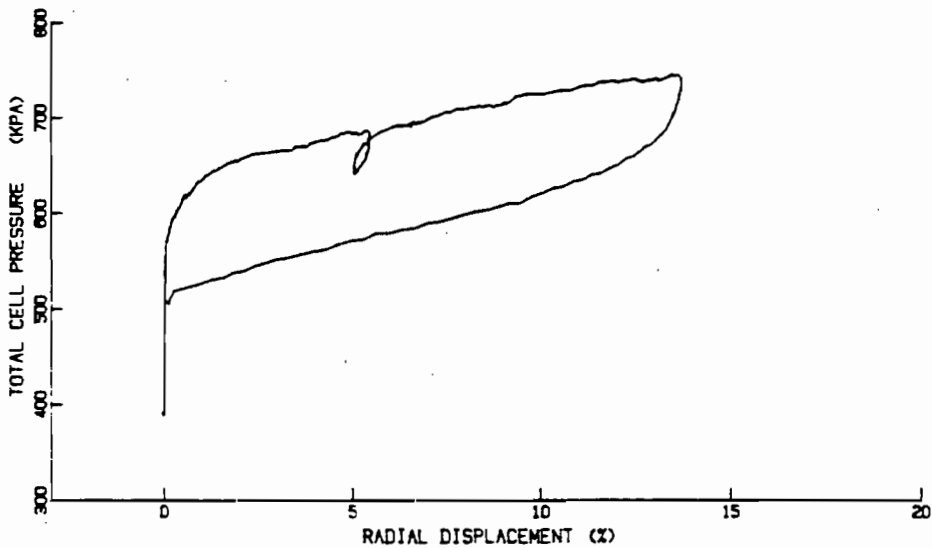
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Depth: 35

Average of runs 18283

File: AEMAP10507

Date: 06 SEP 84



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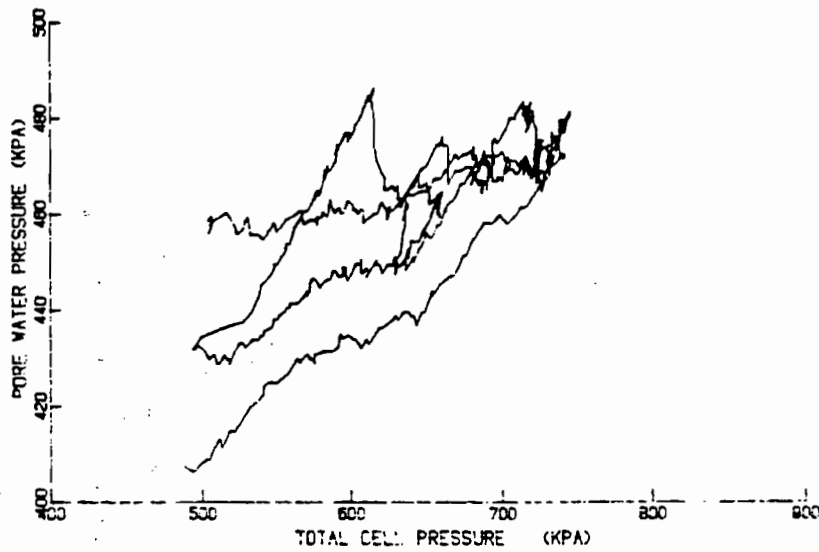
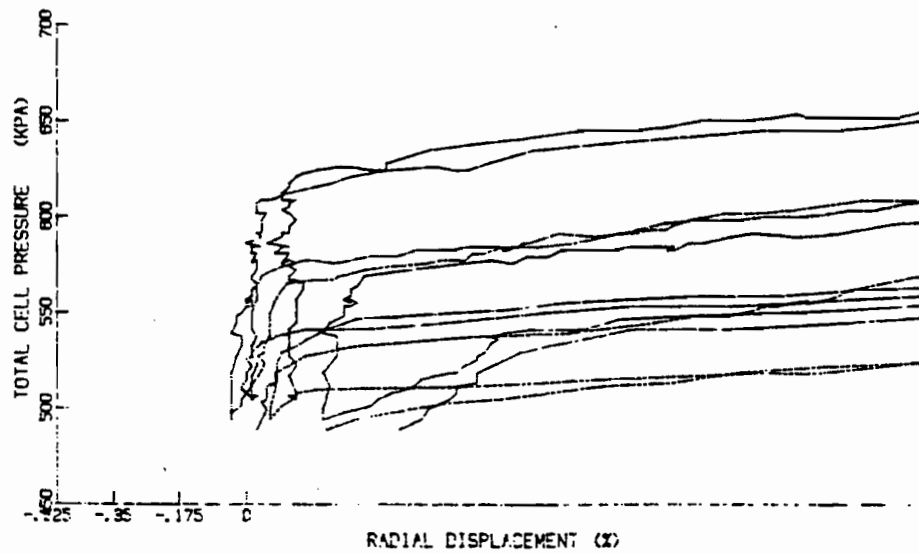
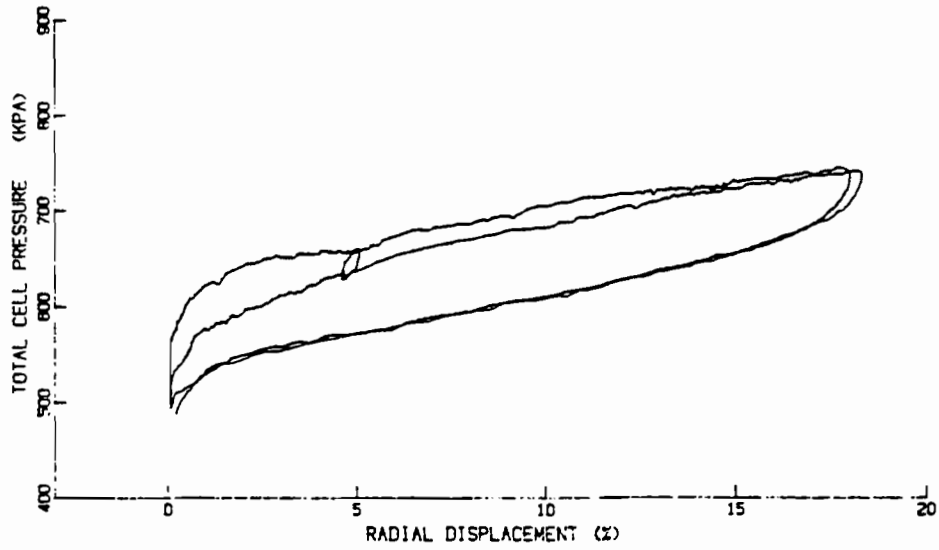
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Depth 40

Average of area 18283

File : AEDAP10800

Date: 09 SEPT 84



Site: AMAULIGAK#1

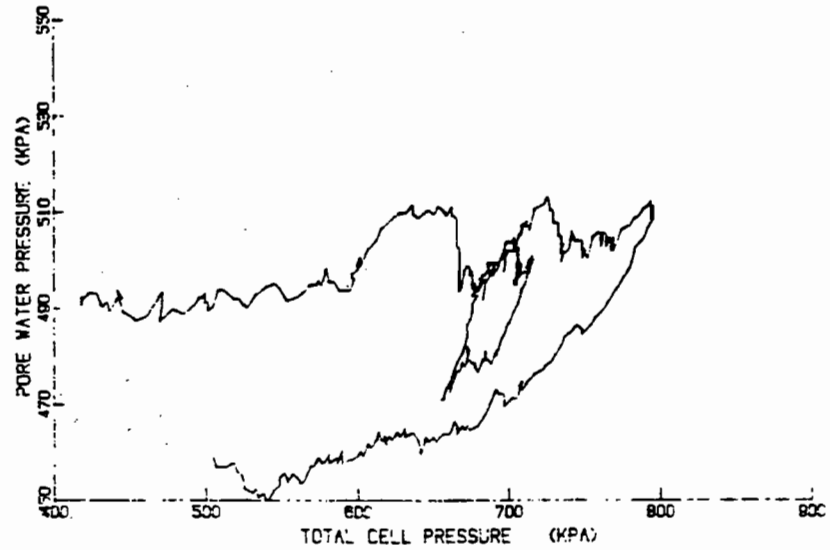
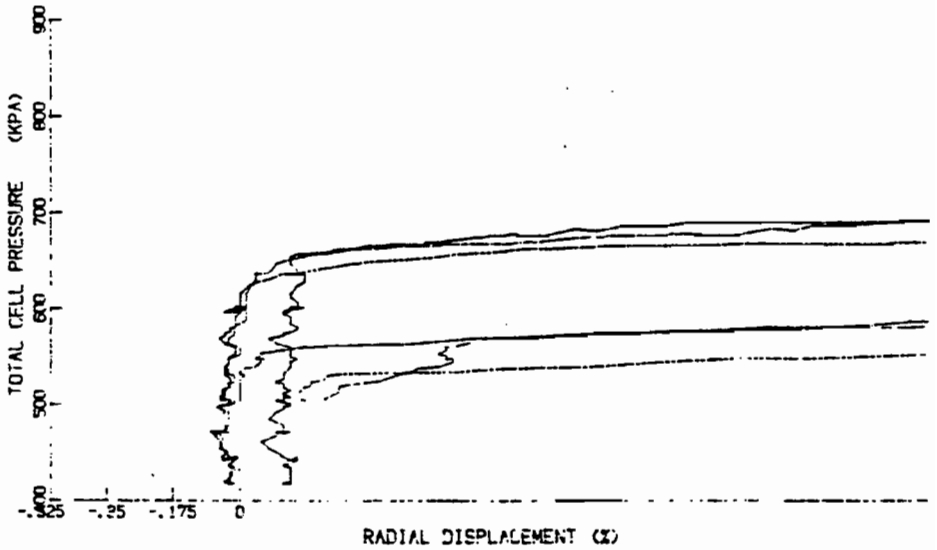
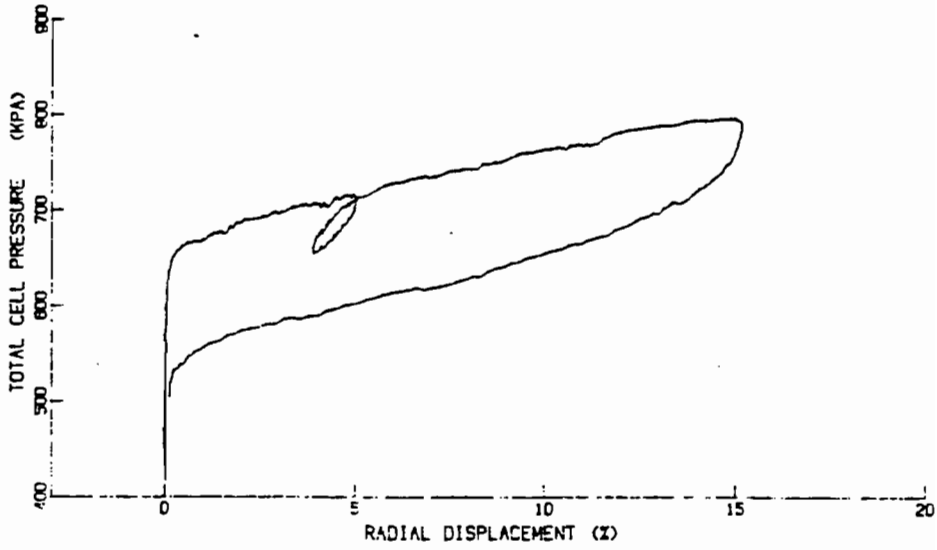
Test : 9

Depth: 43

Average of runs 18283

File : AEB4P10509

Date : 09 SEPT 84



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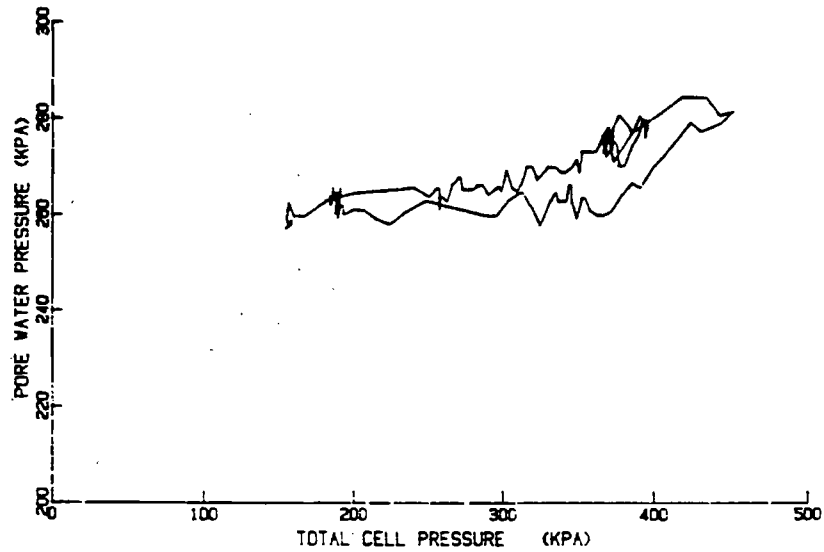
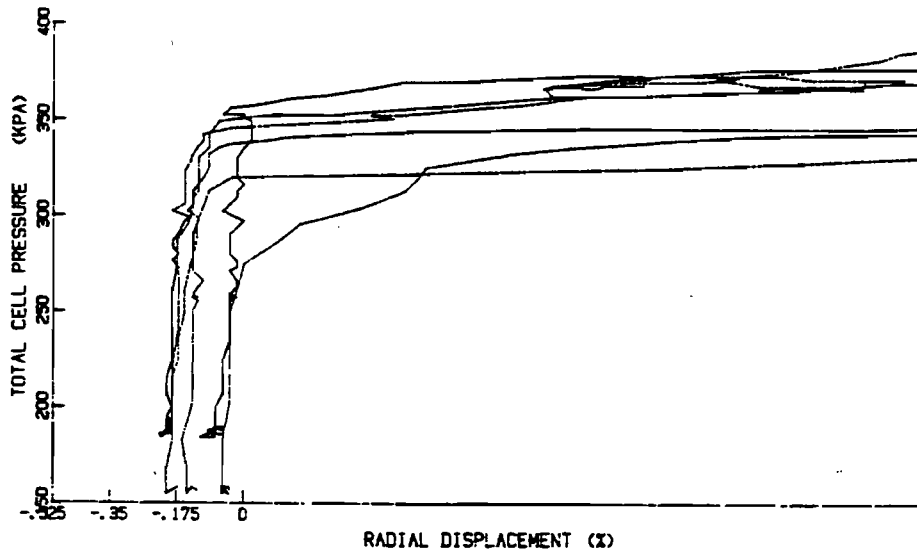
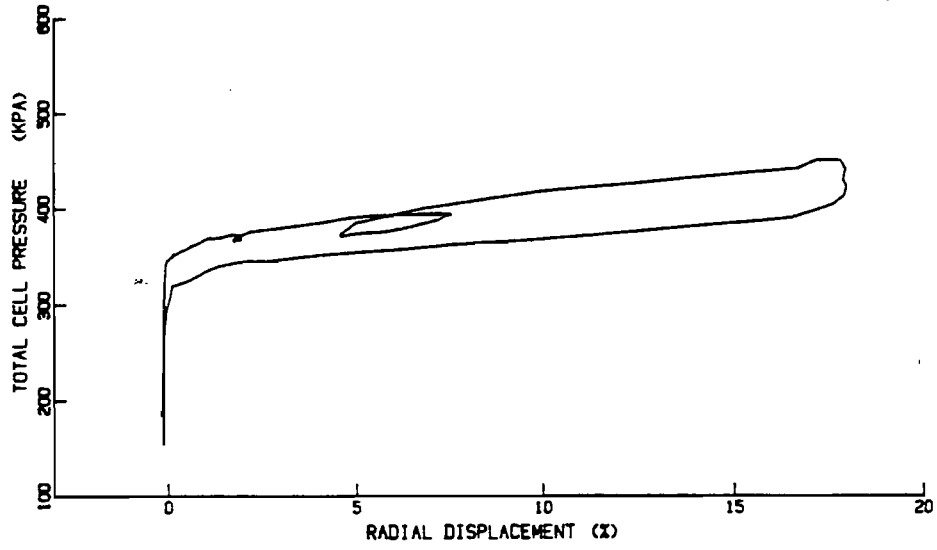
Test : 1

Depth: 4

Average of area 18283

File: AEM4P10401

Date: 10 SEPT 84



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Site: AMAULIGAK#:

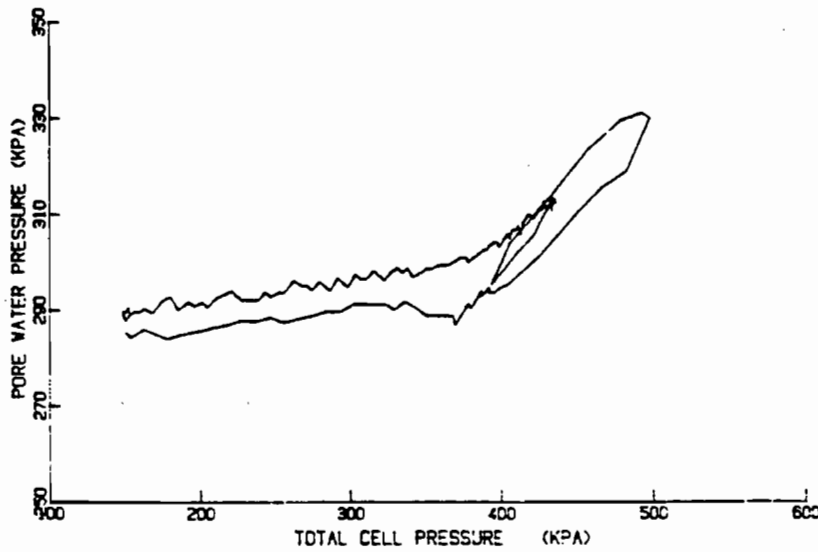
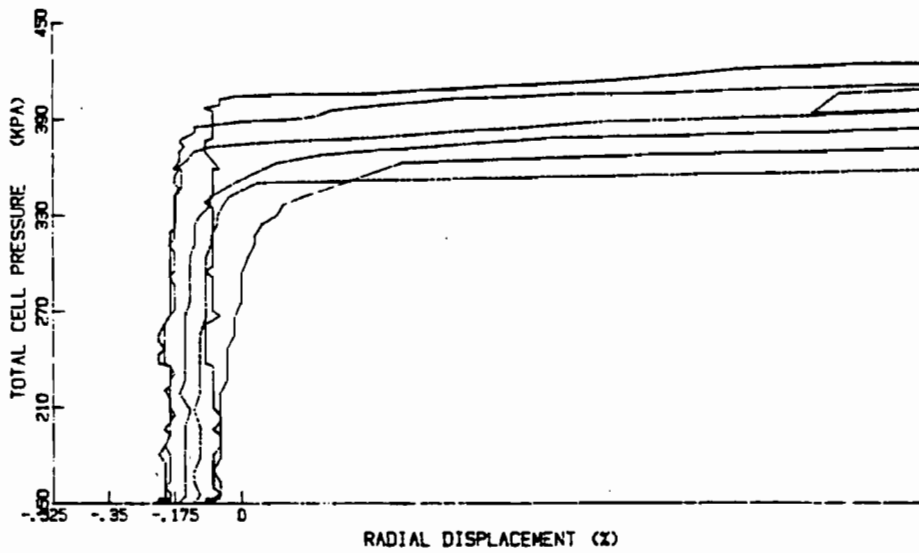
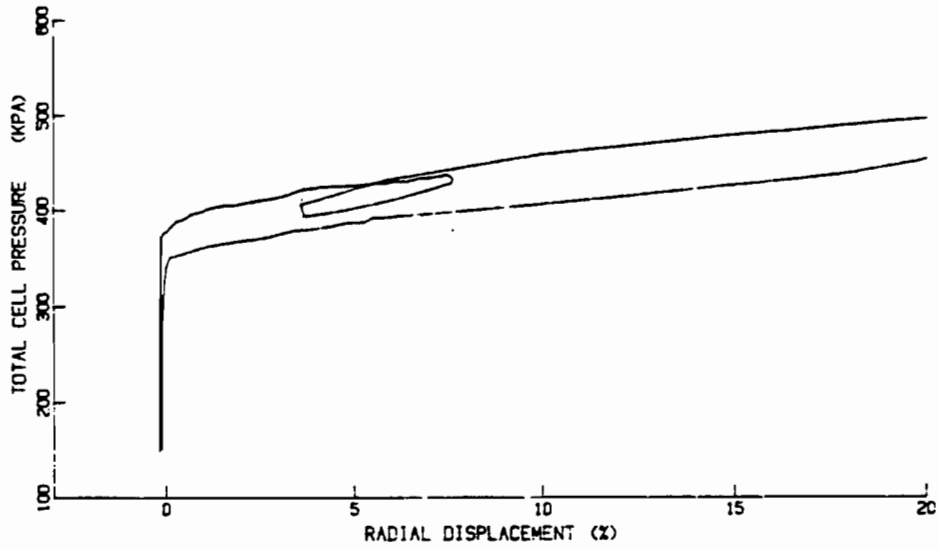
Test : 2

Depth: 9

Average of runs 18283

File: AEM4P104G2

Date: 10 SEPT 84



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Site: AMAULIGAK#1

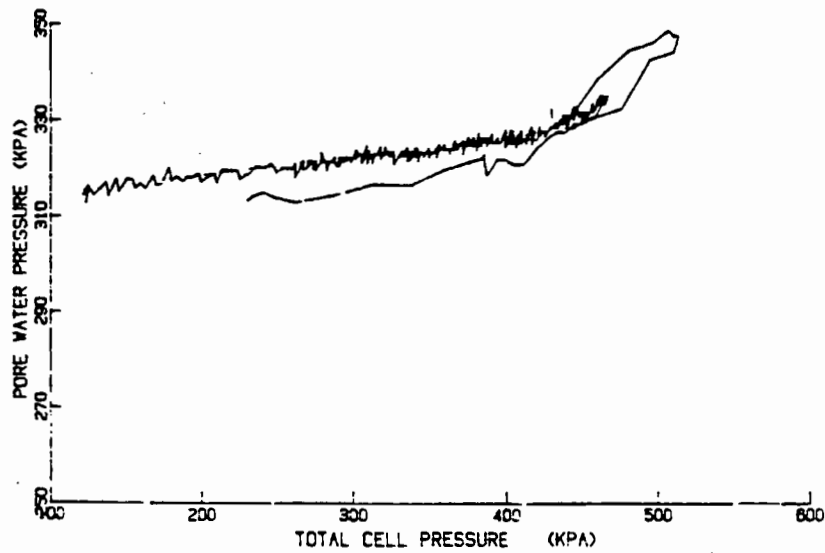
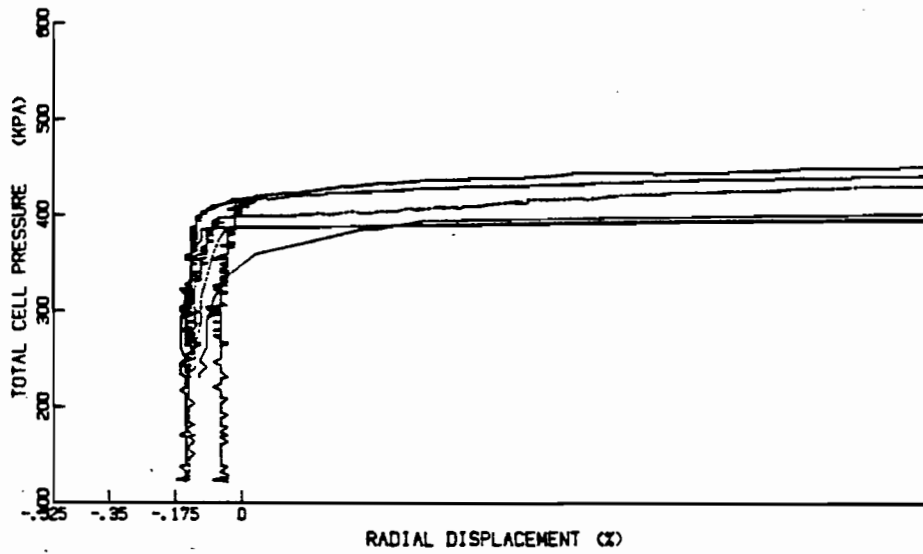
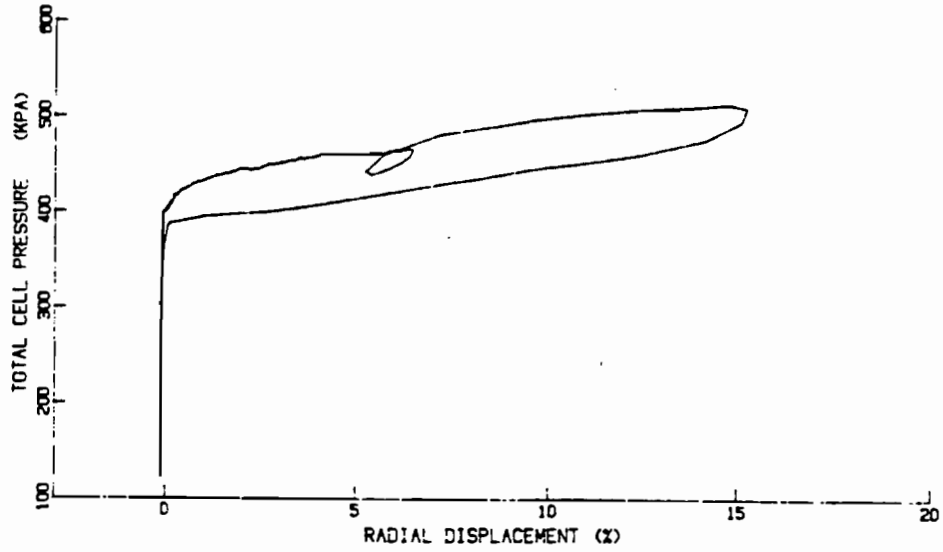
Test : 3

Depth: 12.5

Average of runs 1&2&3

File : AEB4P10408

Date: 10 SEP 84



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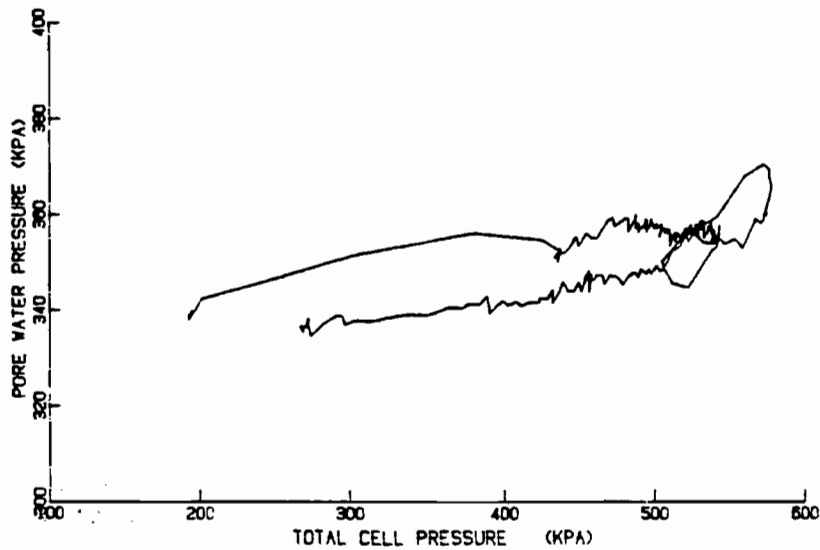
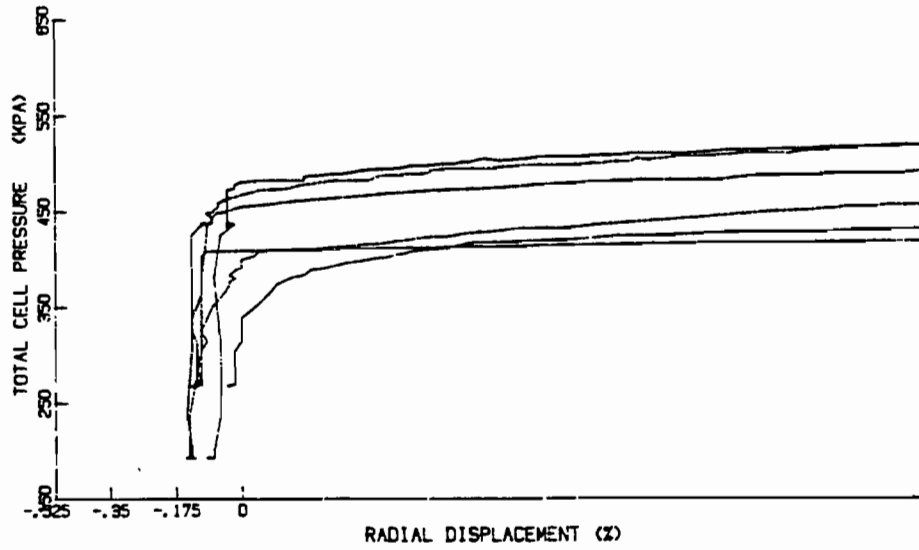
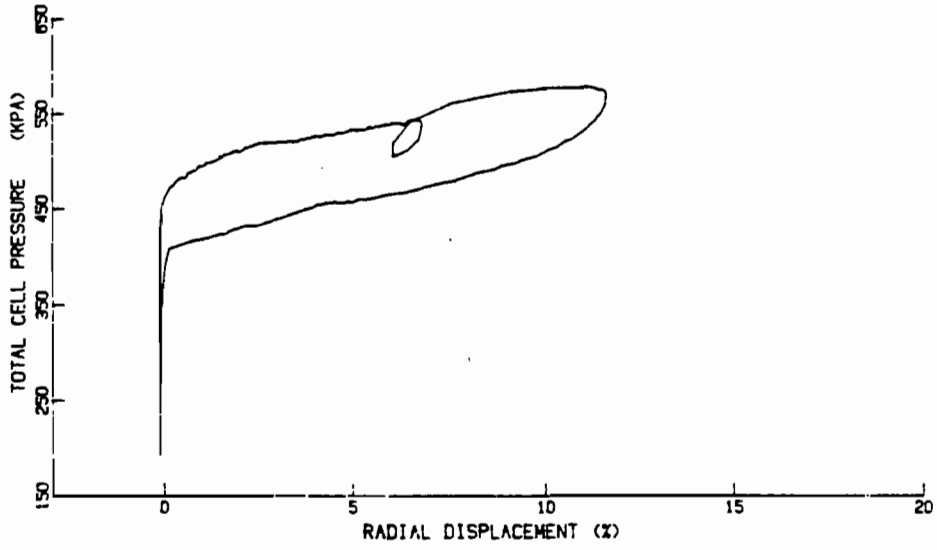
Test : 4

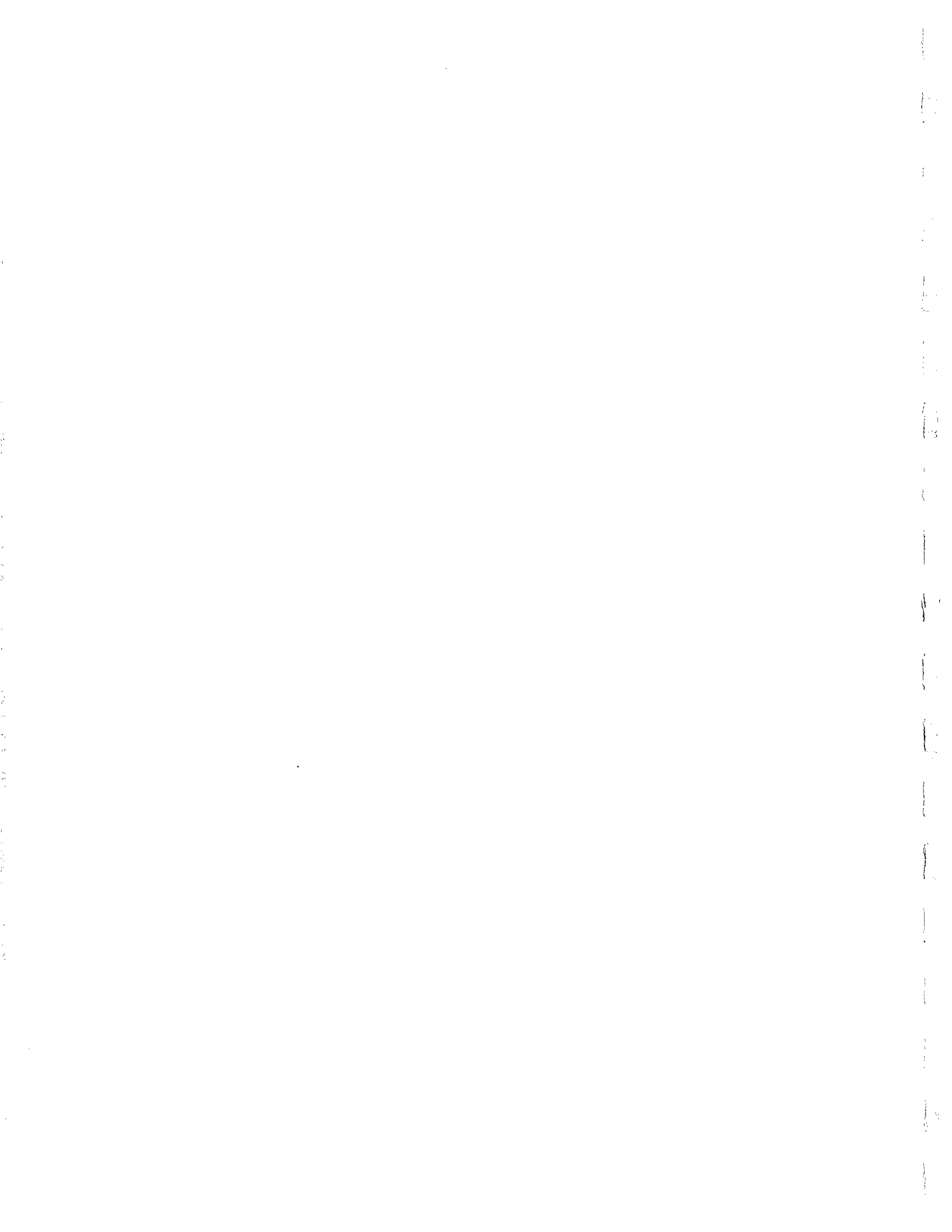
Depth: 17.5

Average of area 18283

File: AEM4P1D404

Date: 10 SEPT 84





Site: AMAULIGAK#1

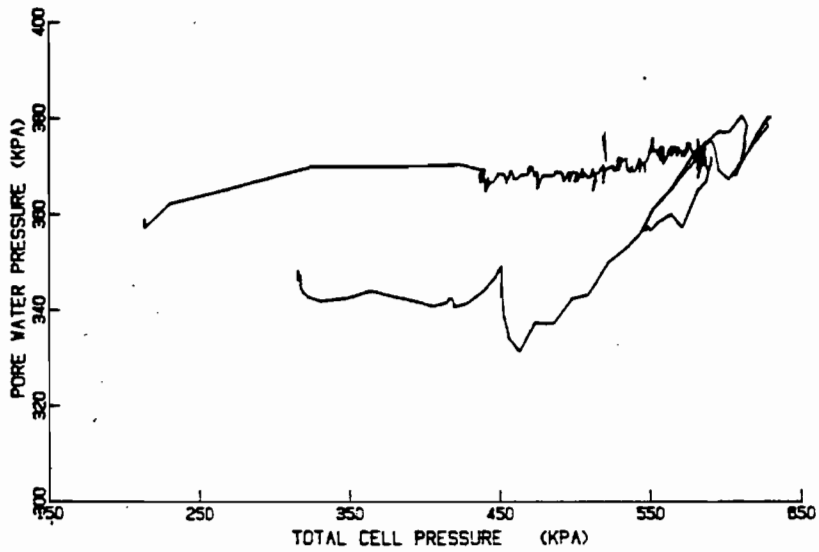
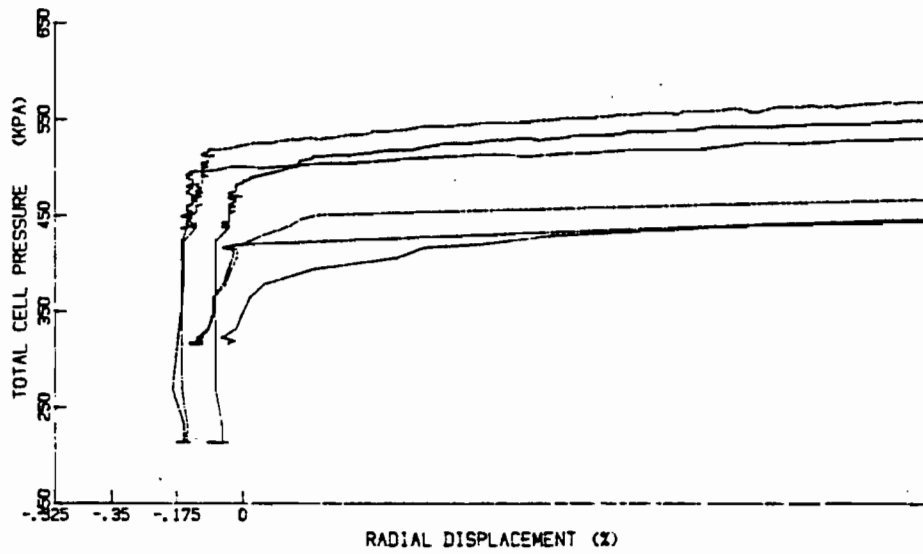
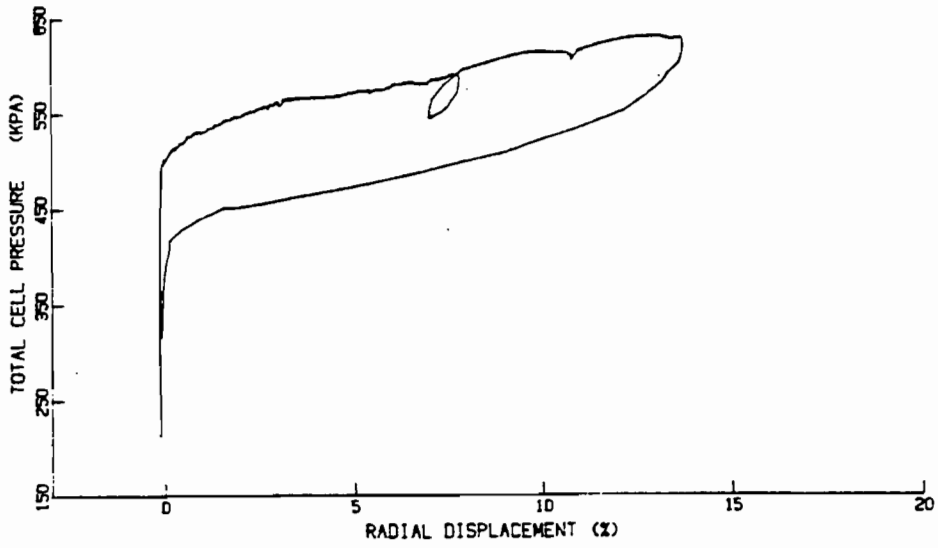
Test : 5

Depth 22.5

Average of area 18283

File : AEM4P10A05

Date: 10 SEPT 84



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Site: AMAULIGAK#1

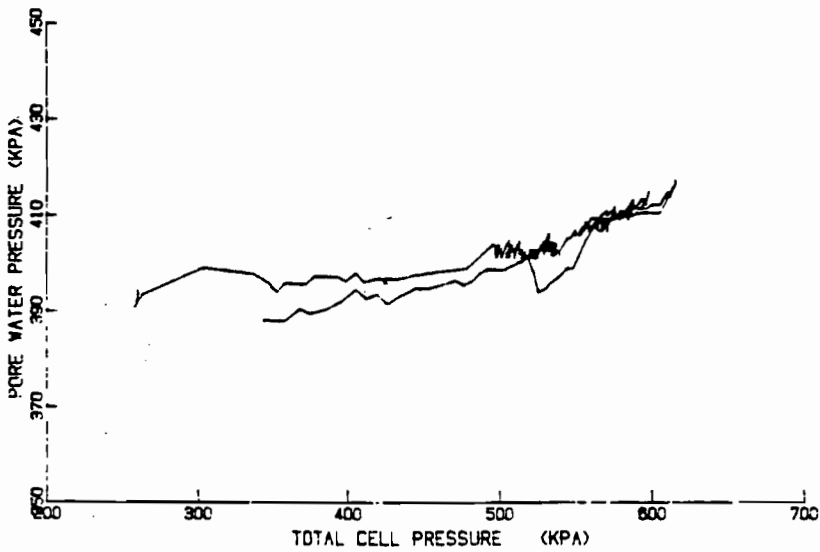
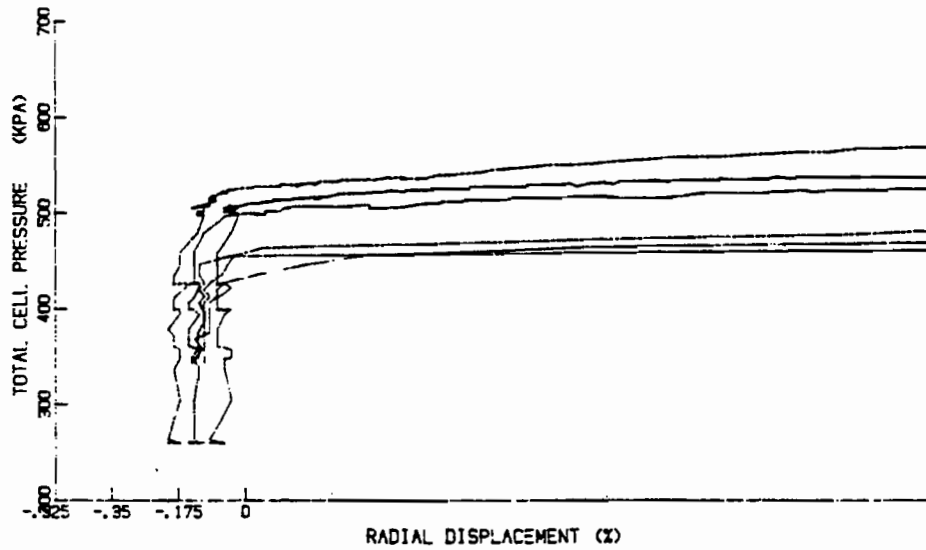
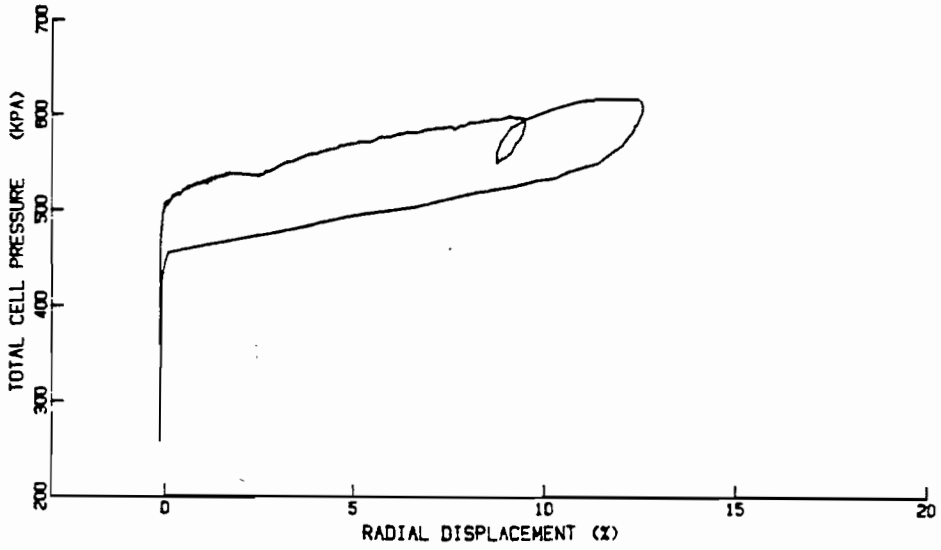
Test : 8

Depth: 27.5

Average of area 18283

File : AEMAP10408

Date: 10 SEPT 84



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Site: AMAULIGAK#1

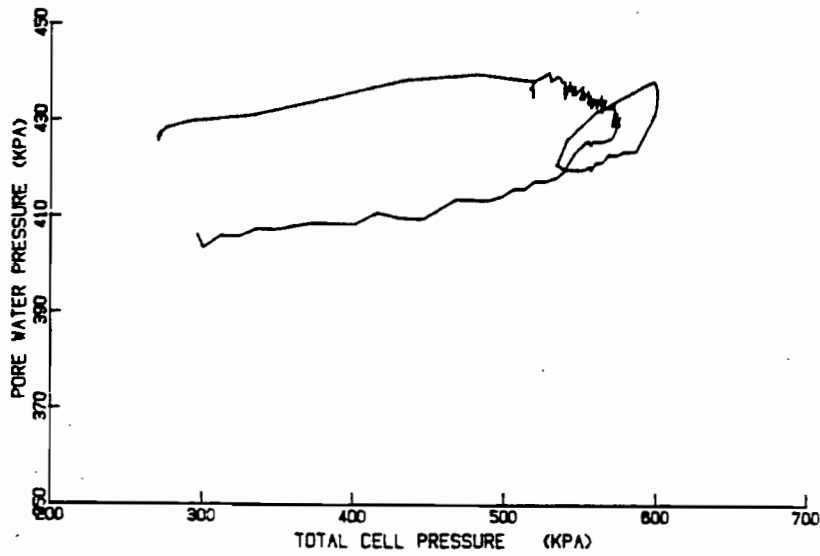
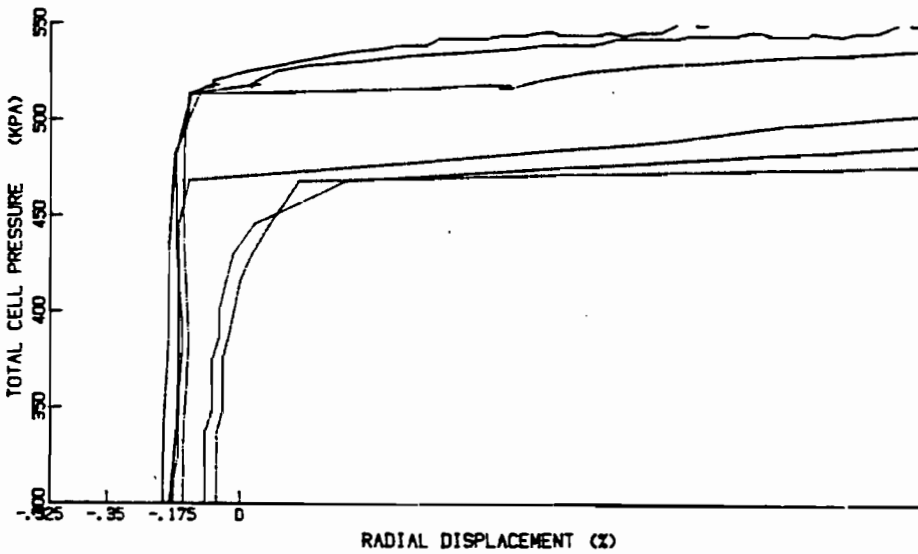
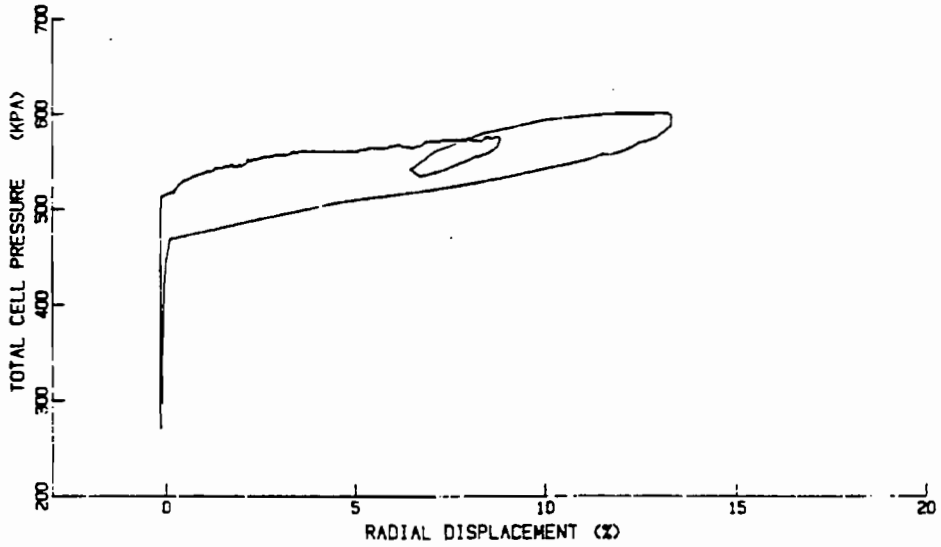
Test : 7

Depth: 32.5

Average of runs 18283

File: AEMAP10407

Date: 10 SEPT 84



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Site: AMAULIGAK#1

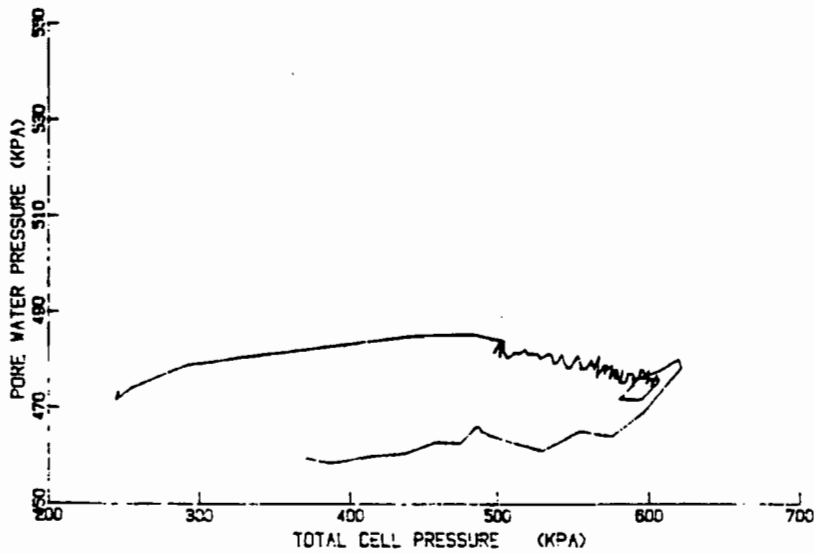
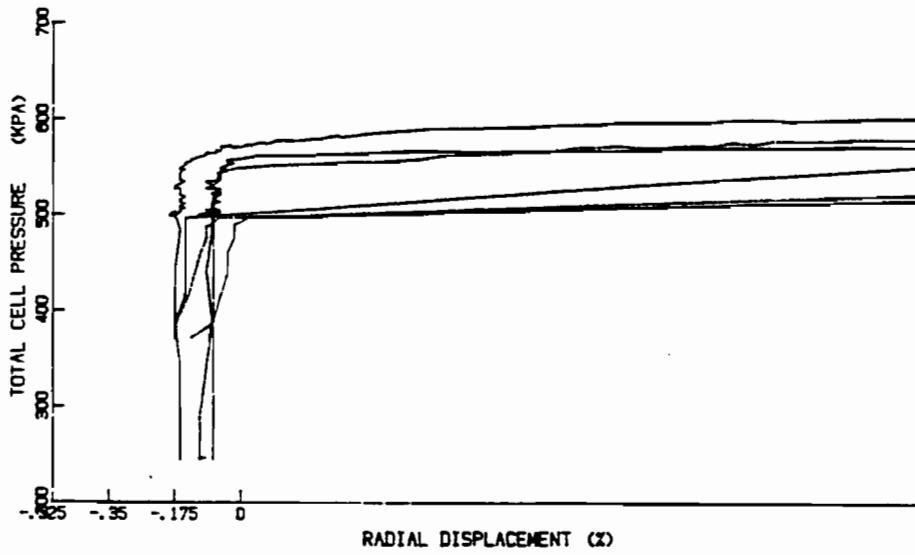
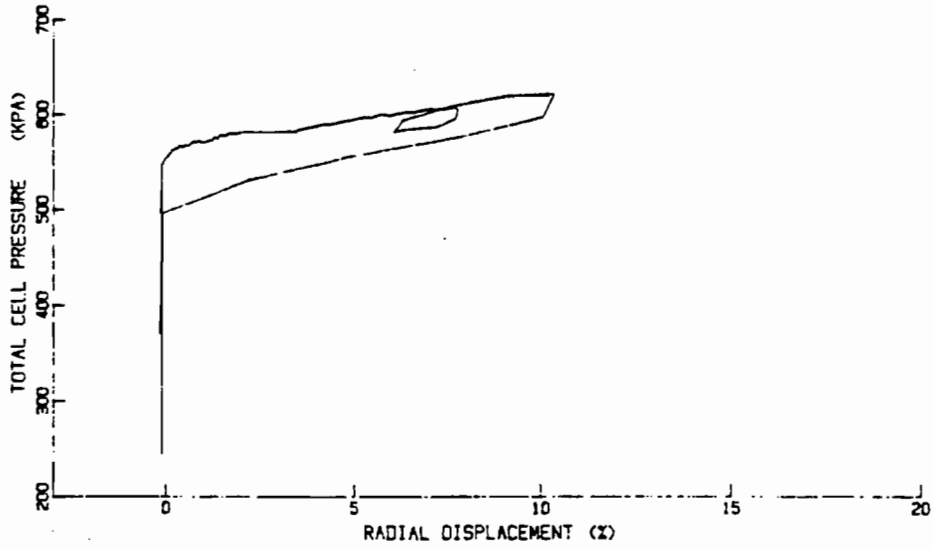
Test: B

Depth: 37.5

Average of runs 18283

File: AEM4P10408

Date: 10 SEPT 84



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Site: AMAULIGAK#1

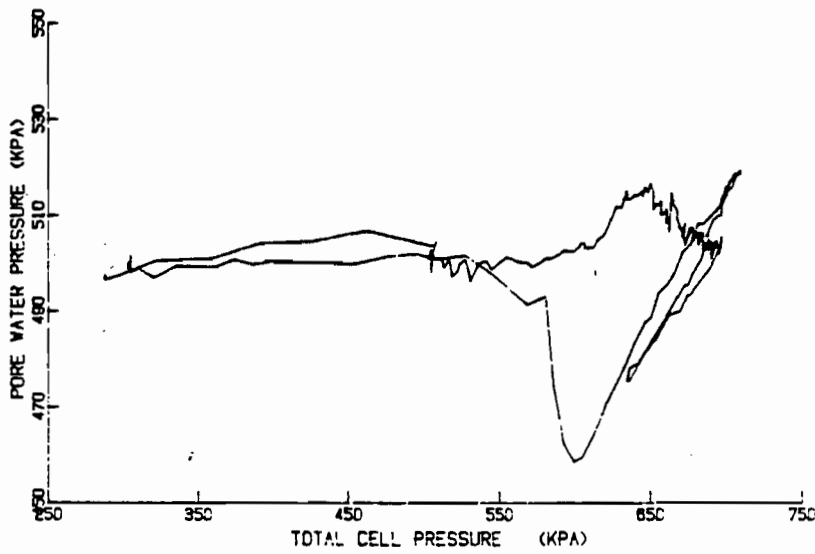
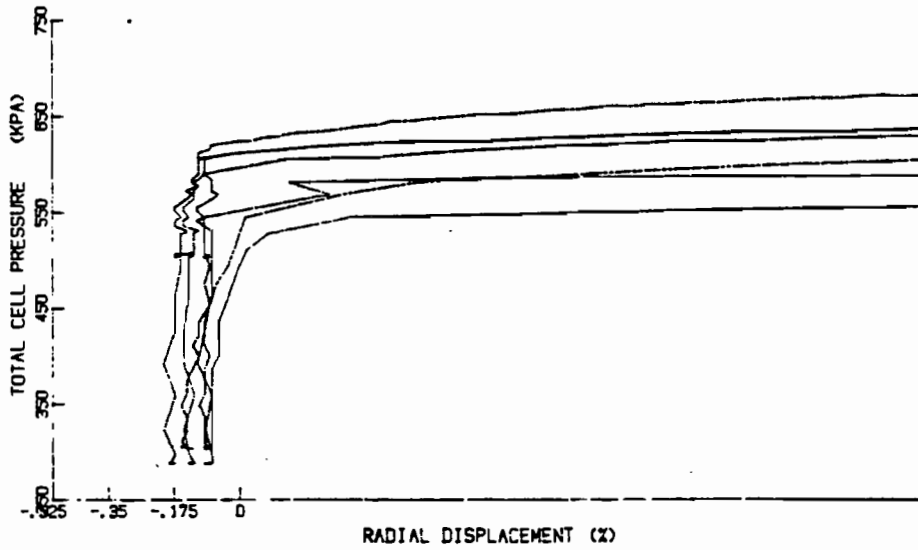
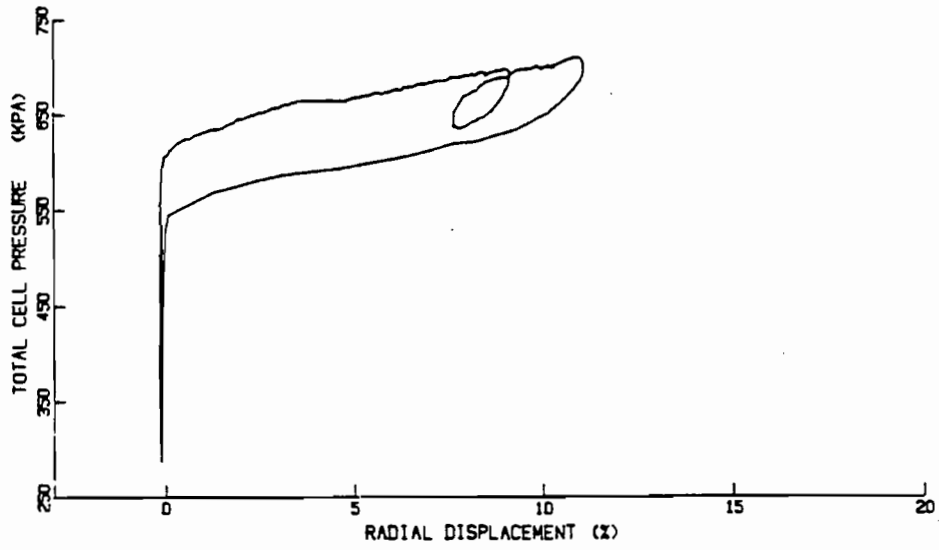
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Depth: 42.5

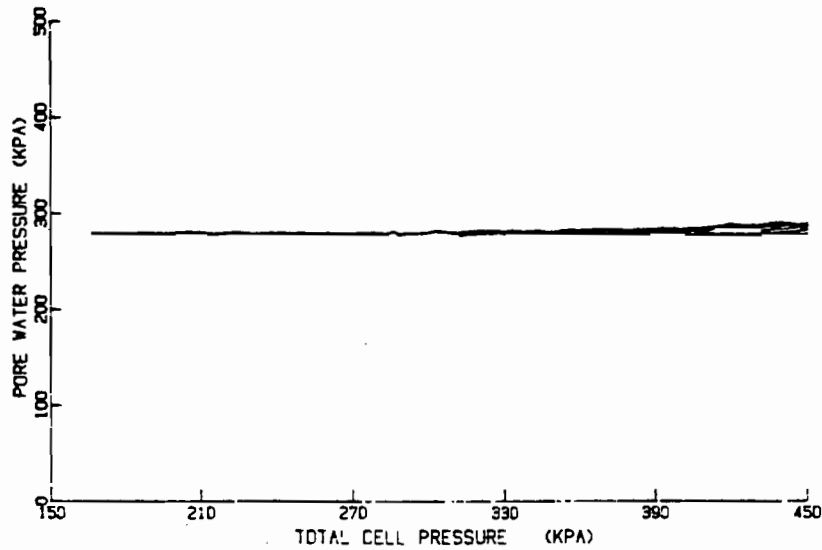
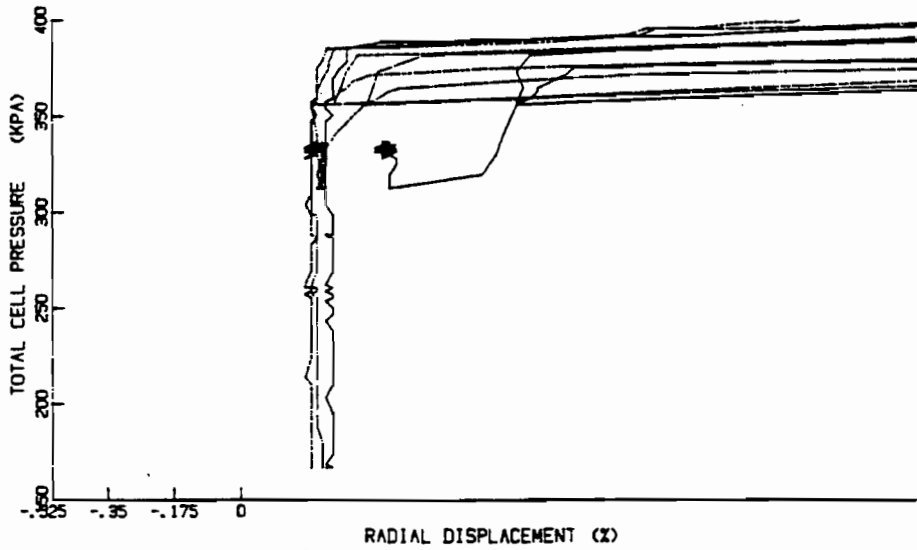
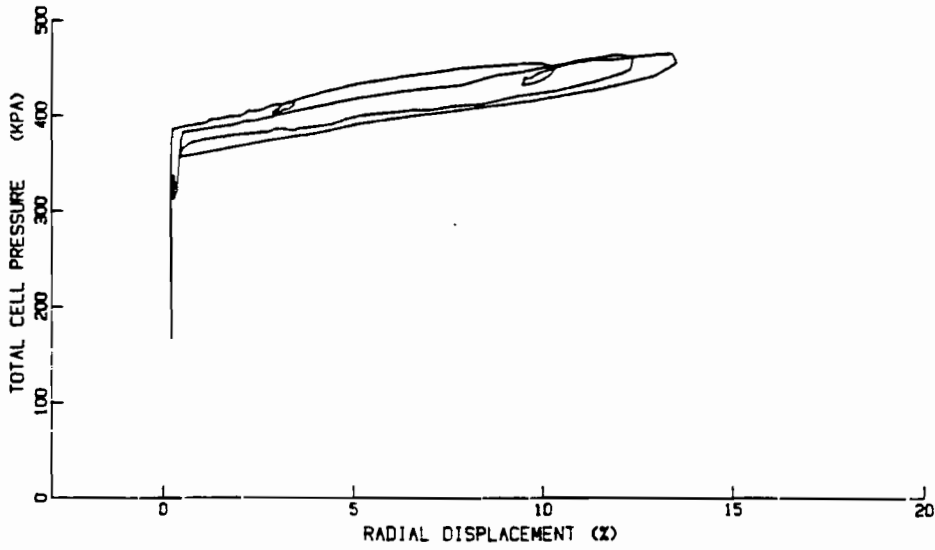
Average of runs 18283

File : AEMF10409

Date: 10 SEPT 84



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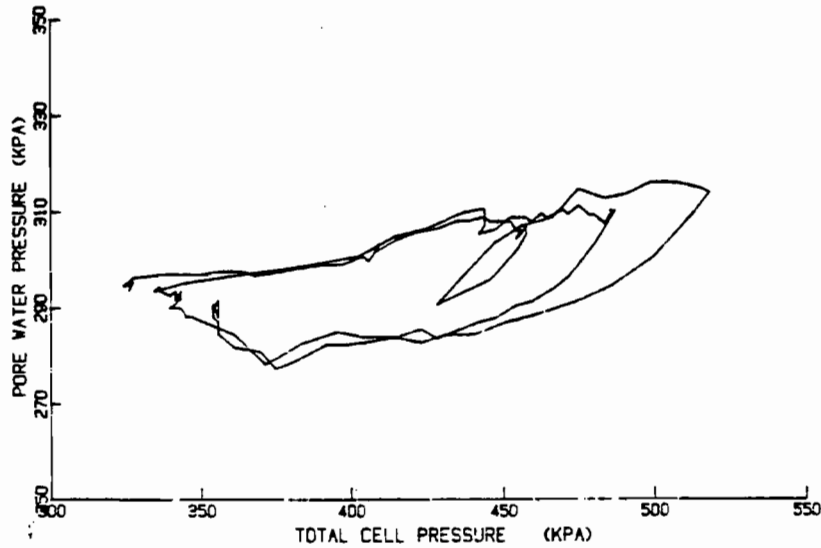
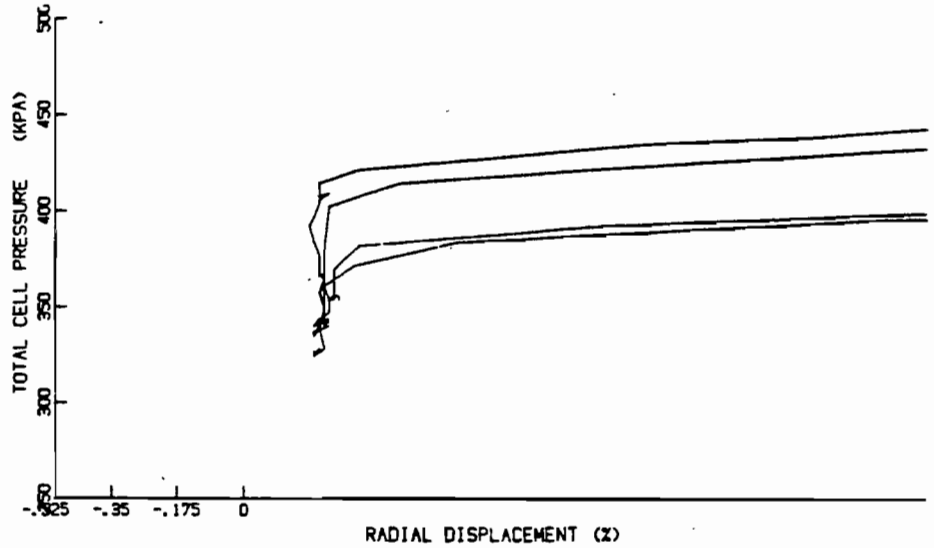
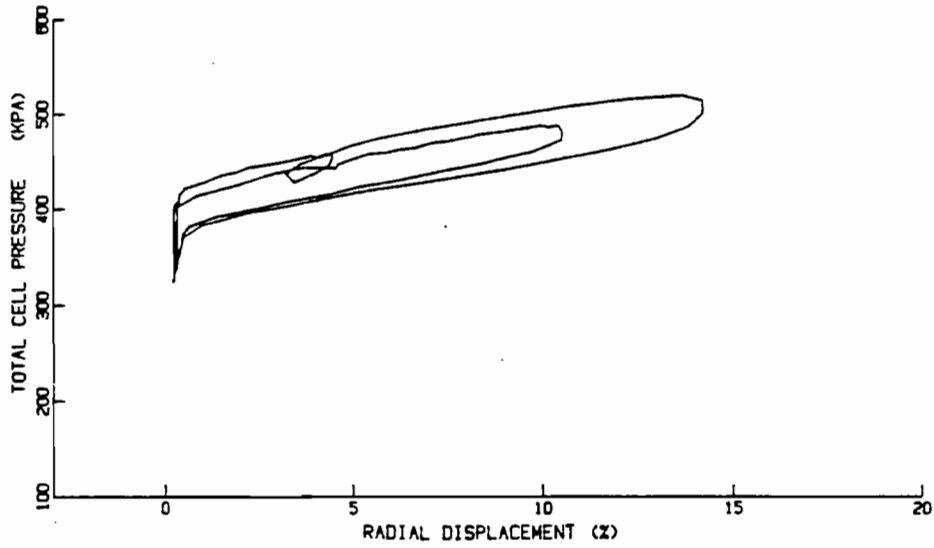
Test: 2

Depth: 10 FT

Average of area 18283

File: AEMPI0302

Date: 09 SEPT 84



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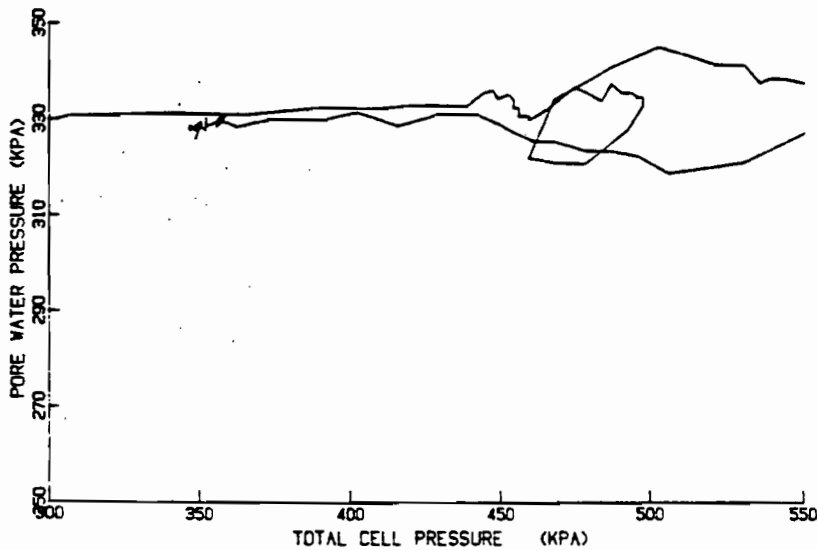
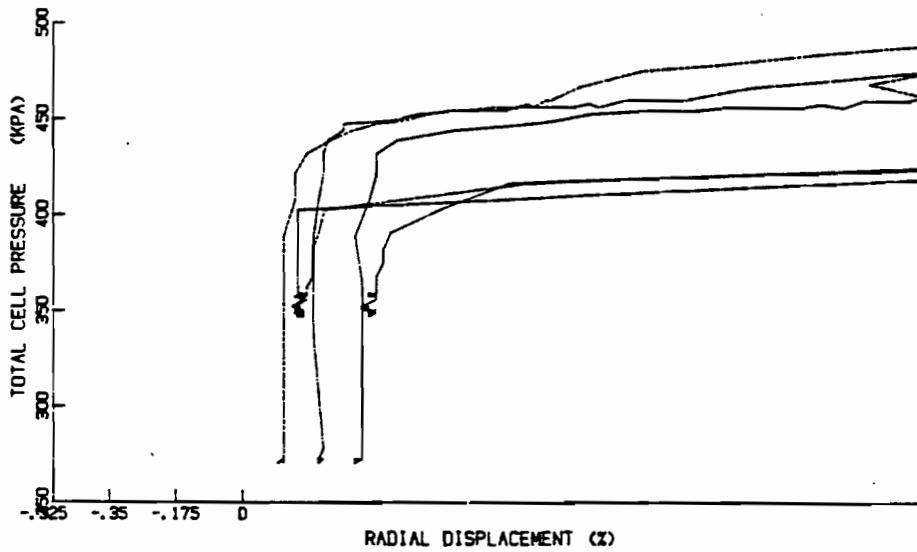
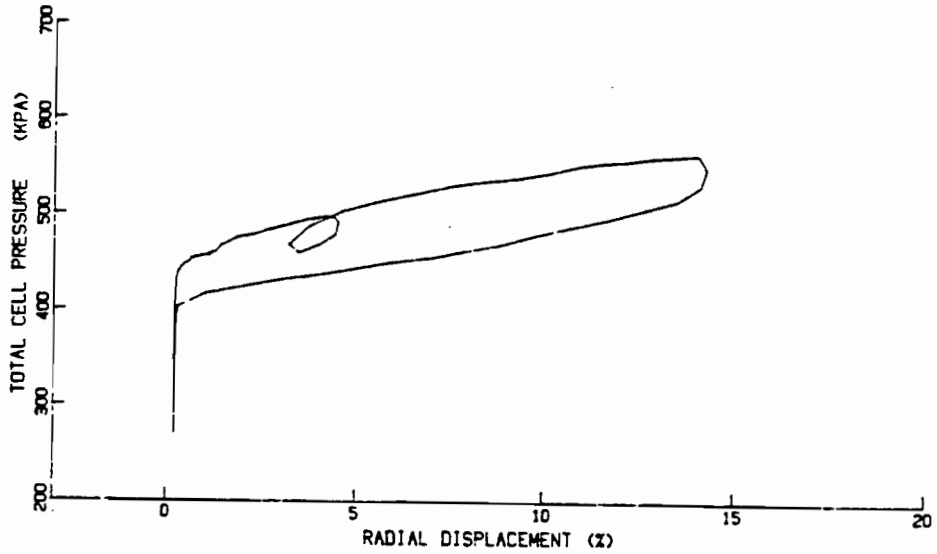
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Average of area 11223

File : AEB4P10303

Date: 09 SEPT 84



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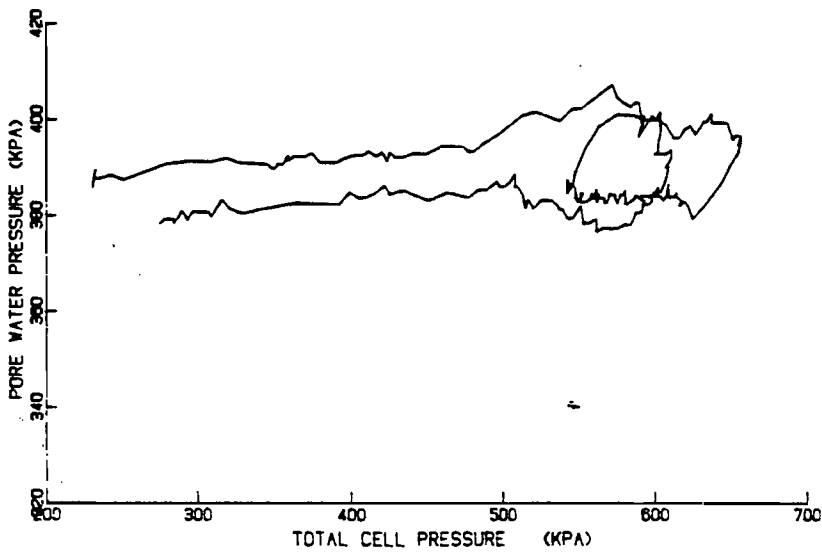
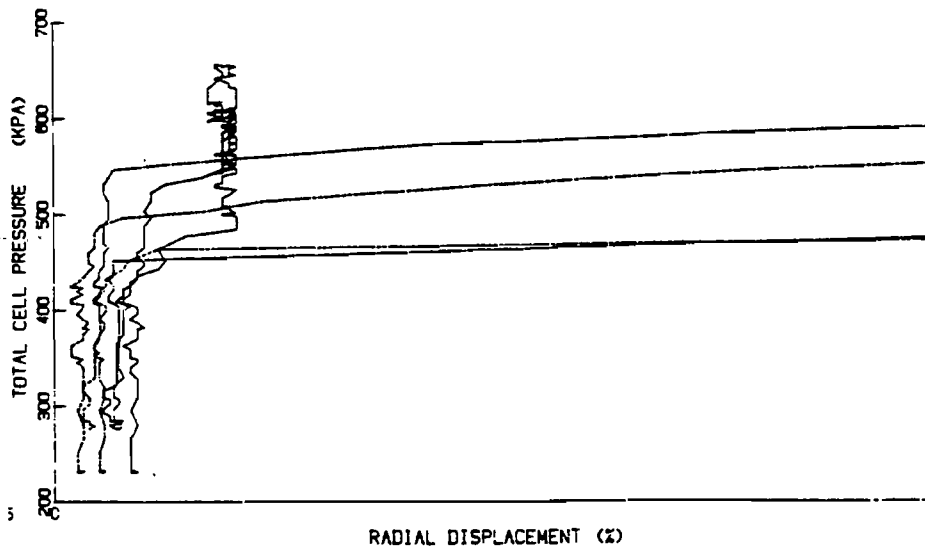
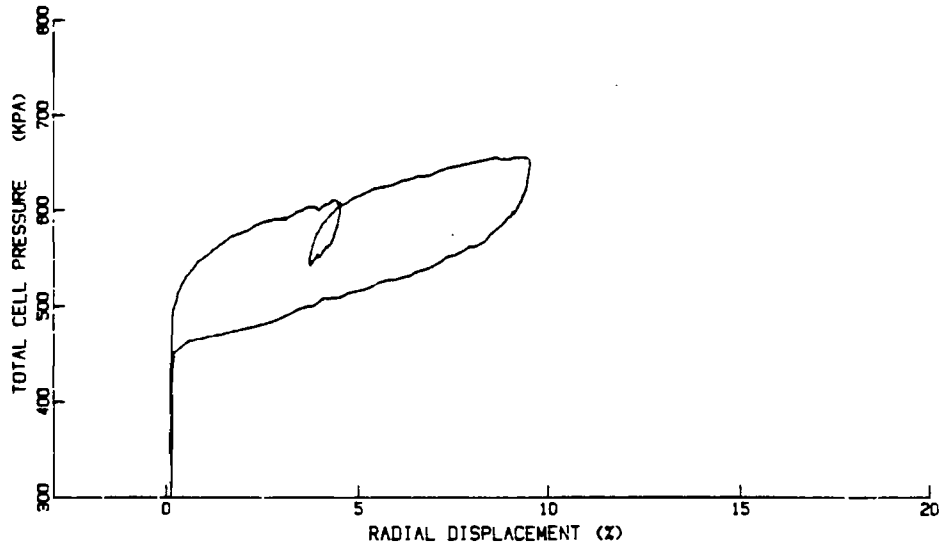
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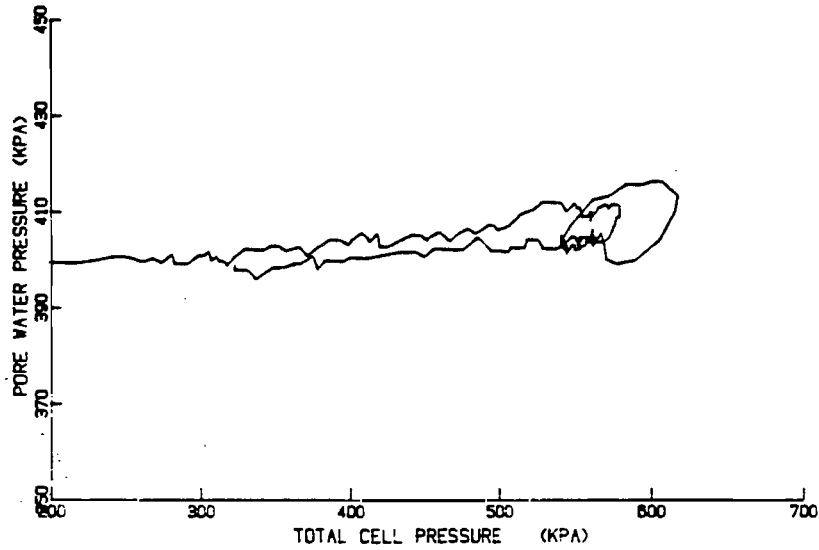
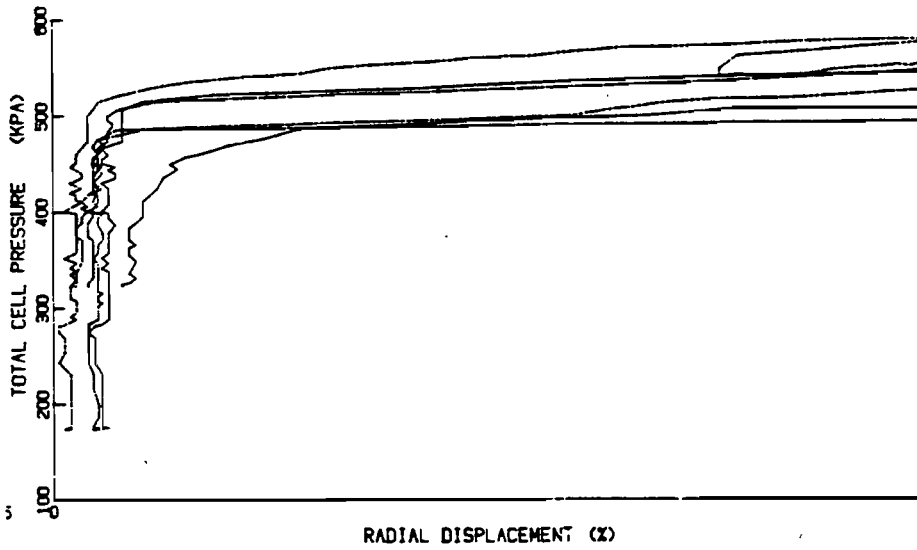
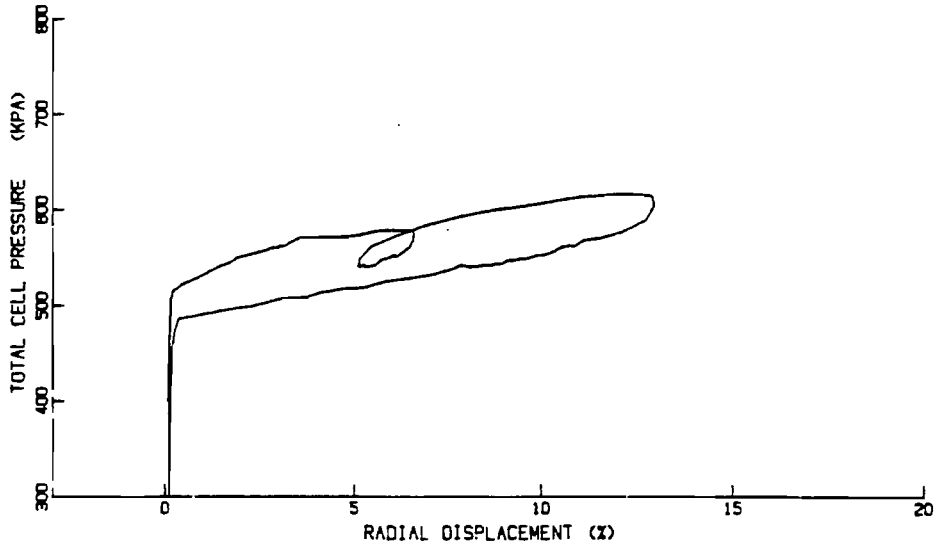
Depth: 25

Average of area 18283

File: AED4P10805
Date: 09 SEPT 84



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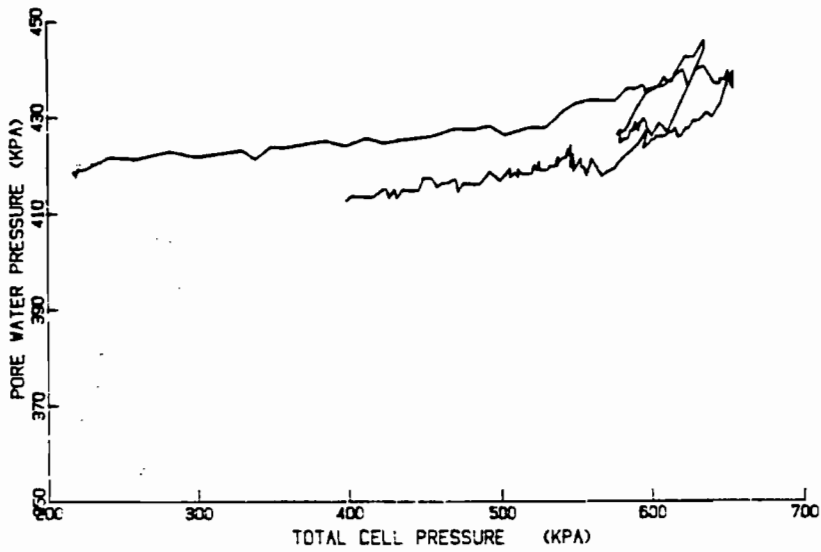
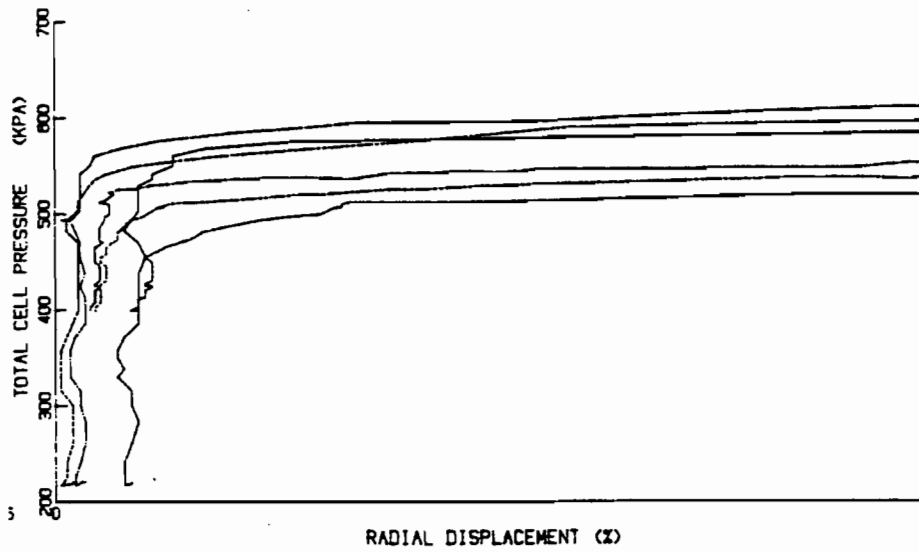
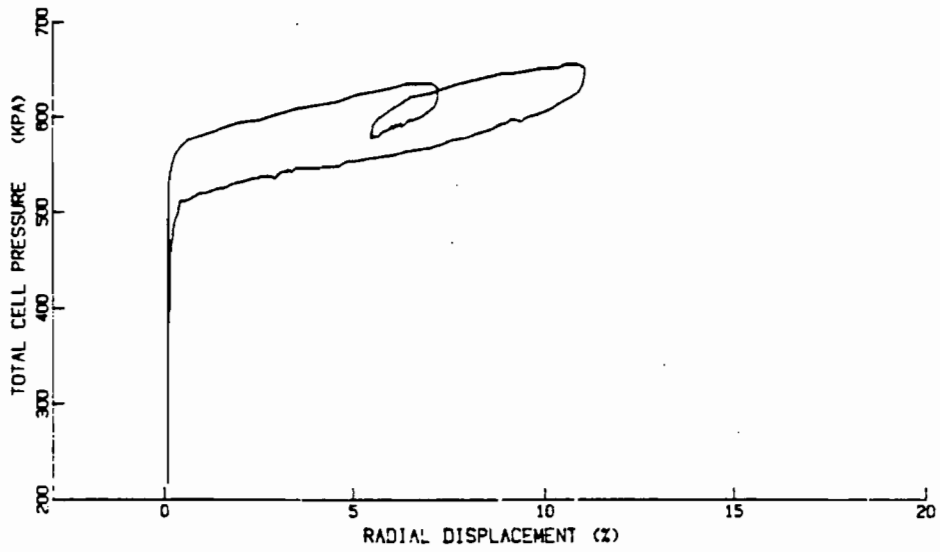
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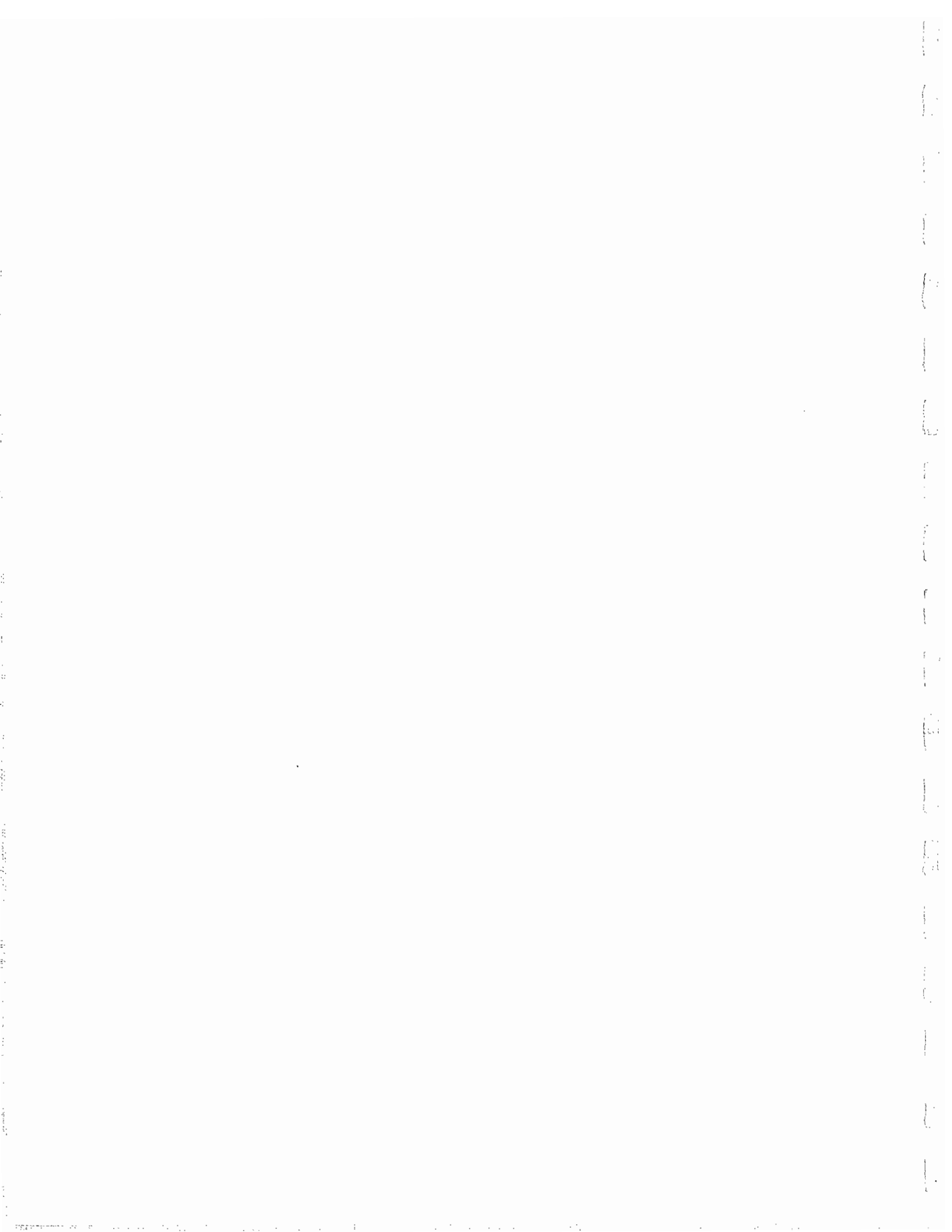
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Average of runs 18283

File : AEMPI0307

Date : 09 SEPT 84





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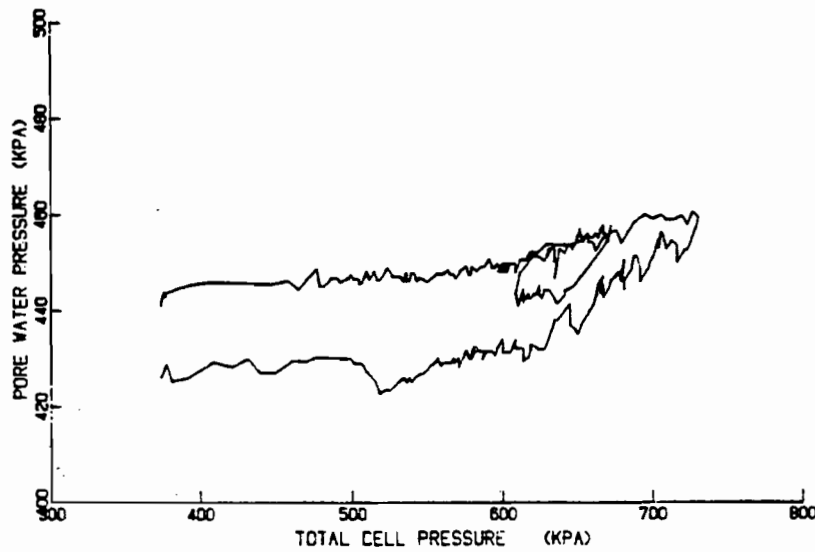
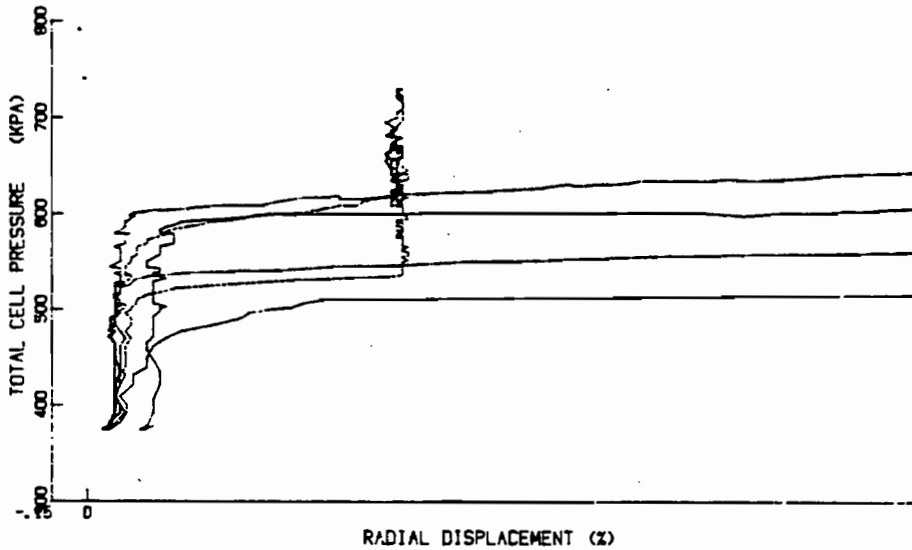
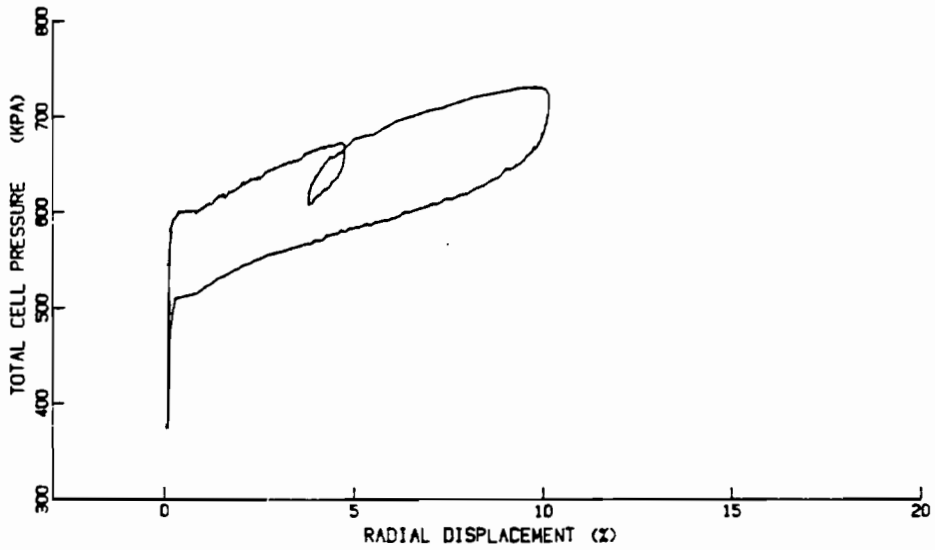
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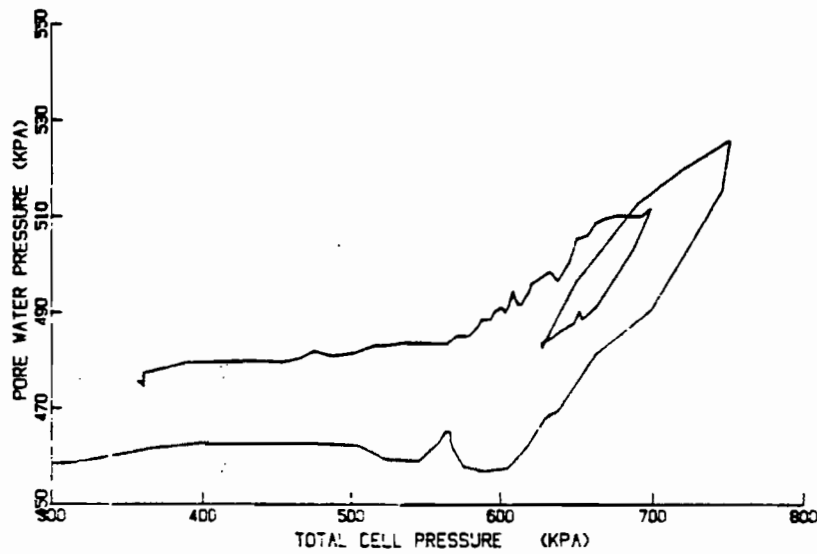
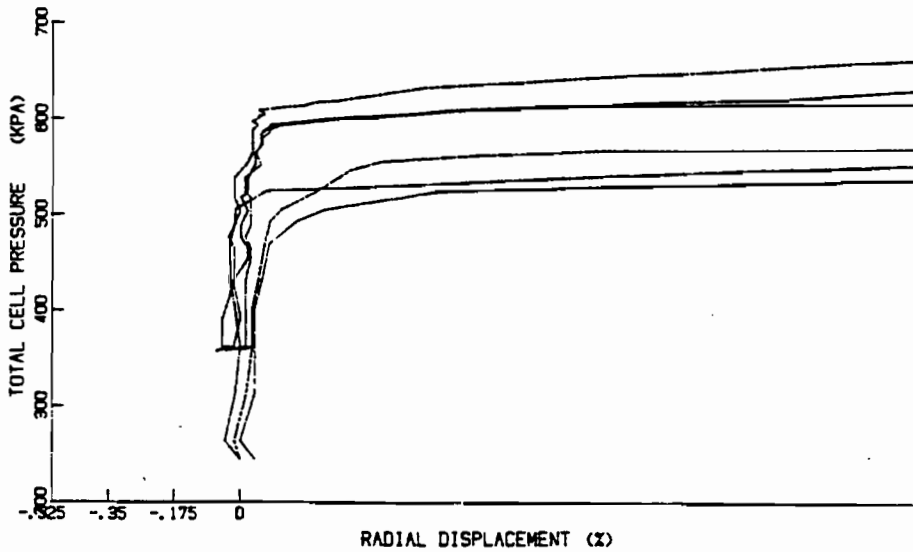
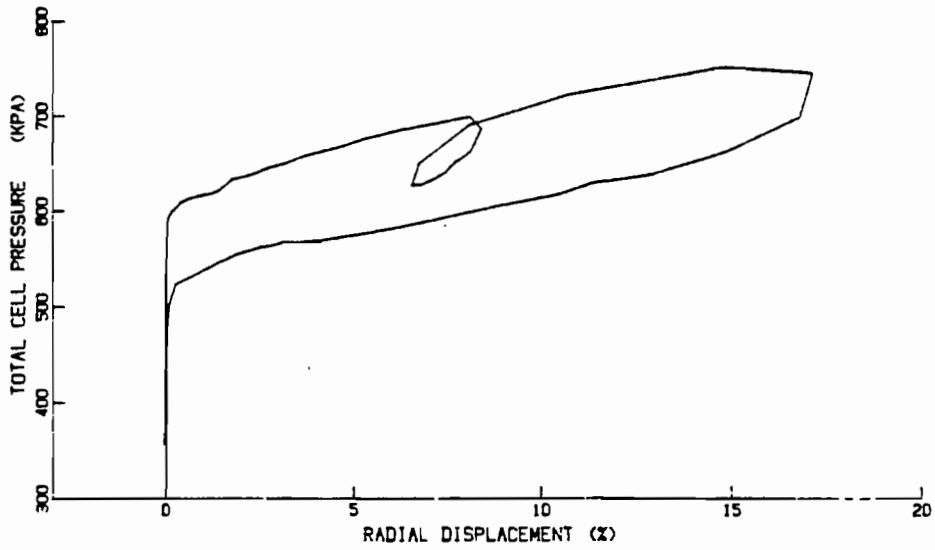
Average of area 18283

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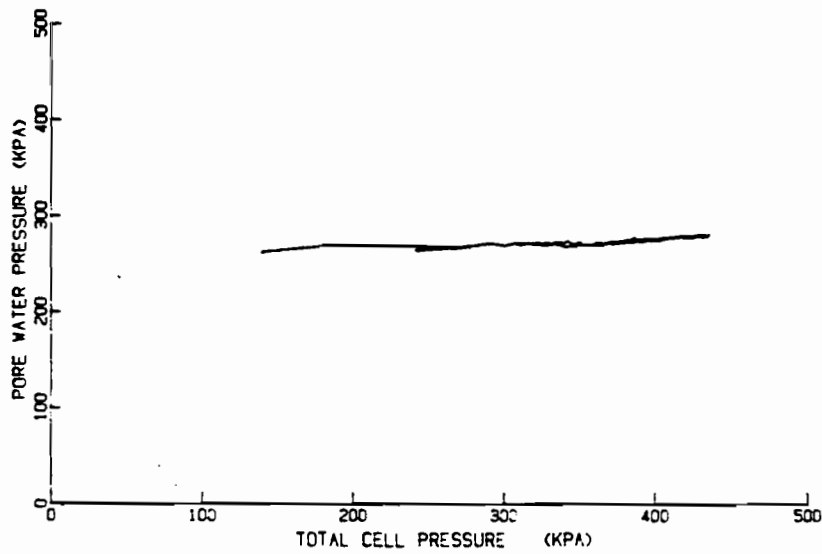
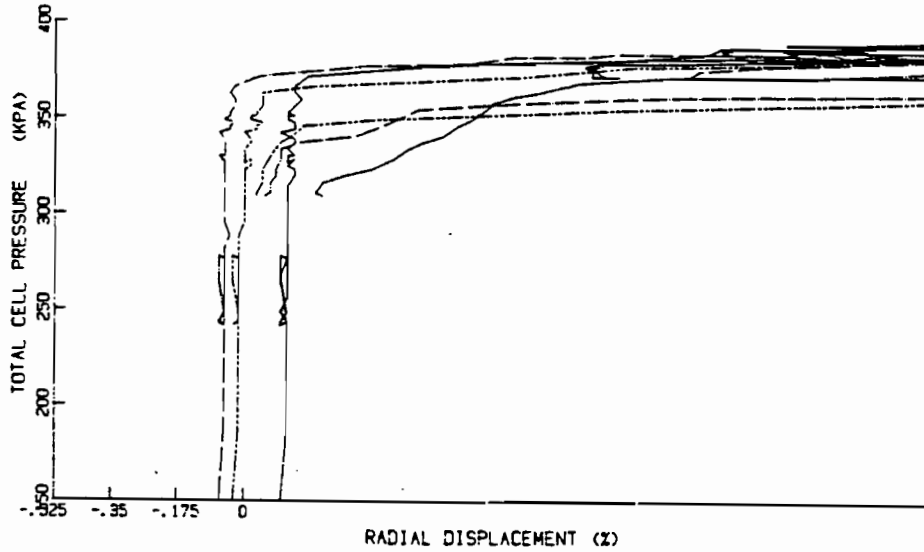
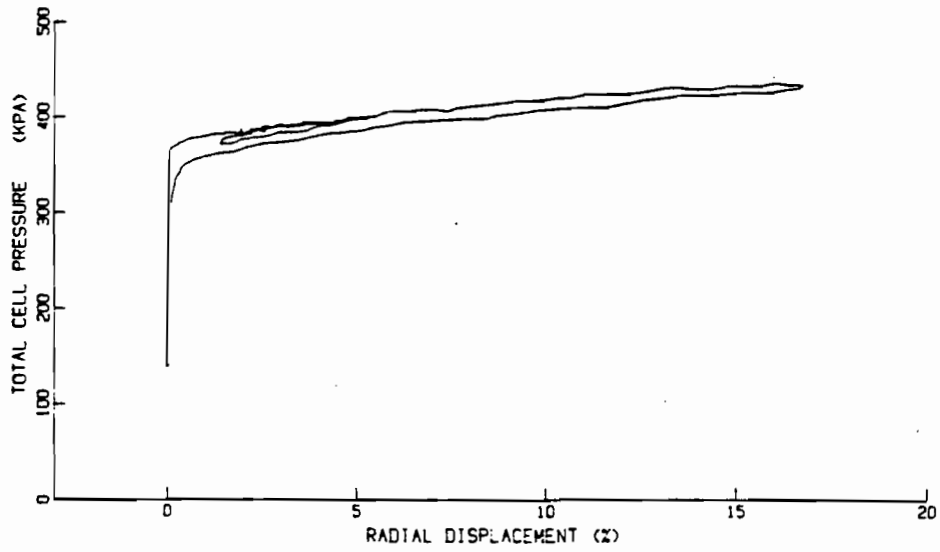
Date: 09 SEPT 84



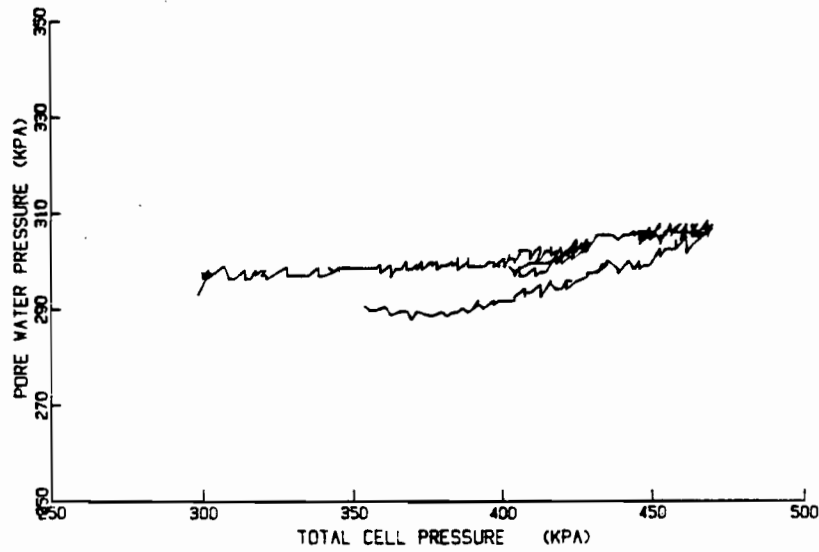
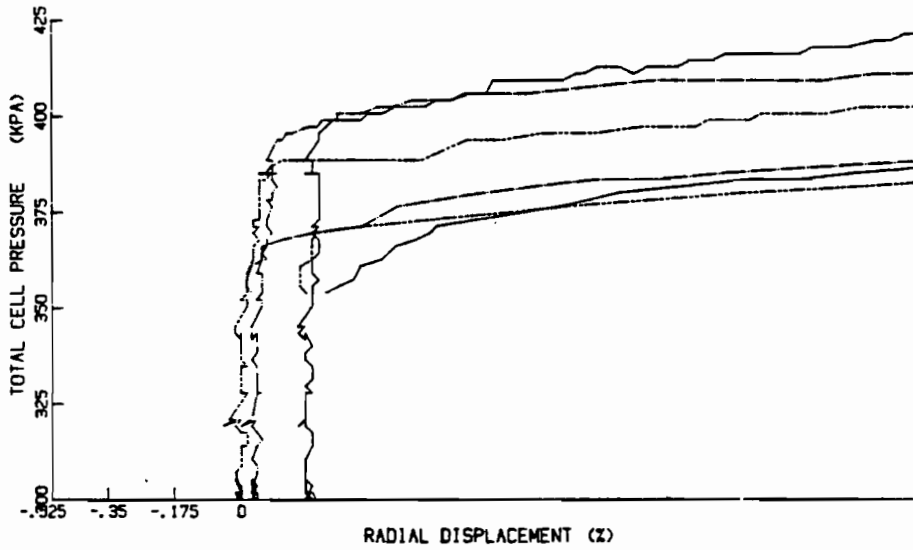
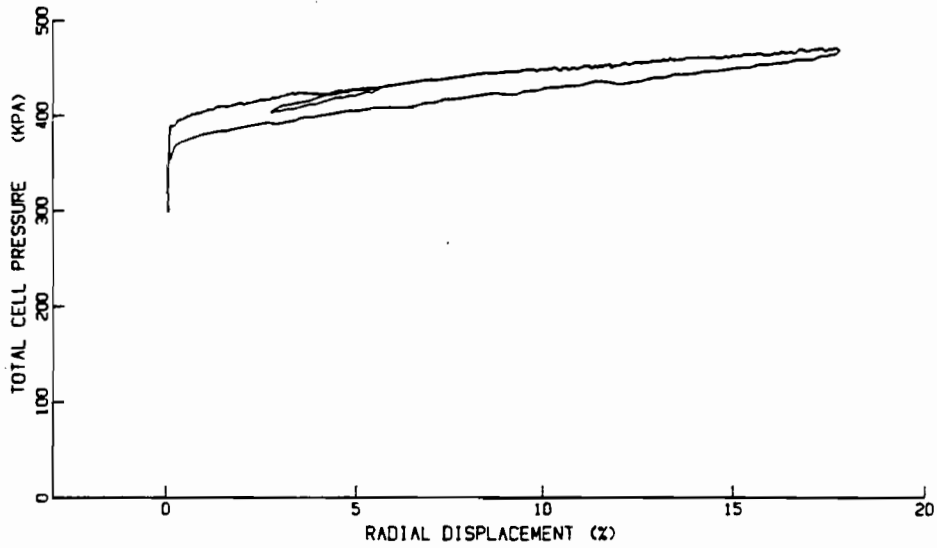
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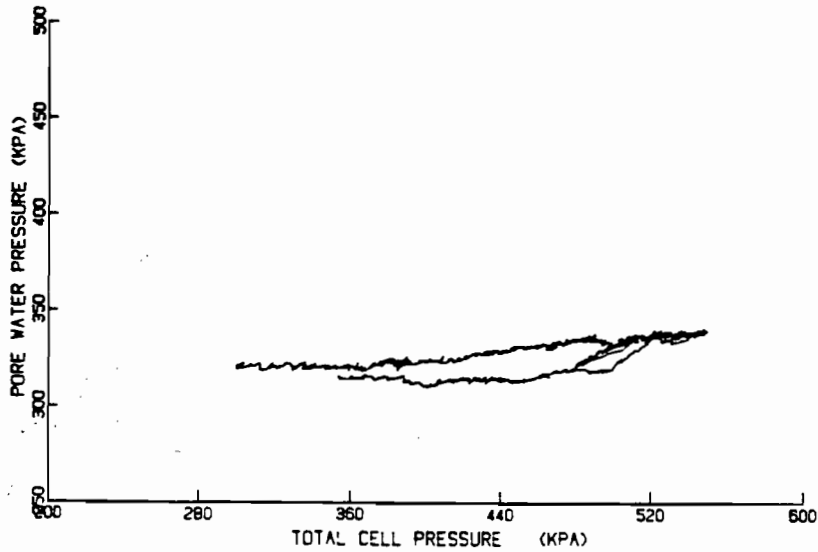
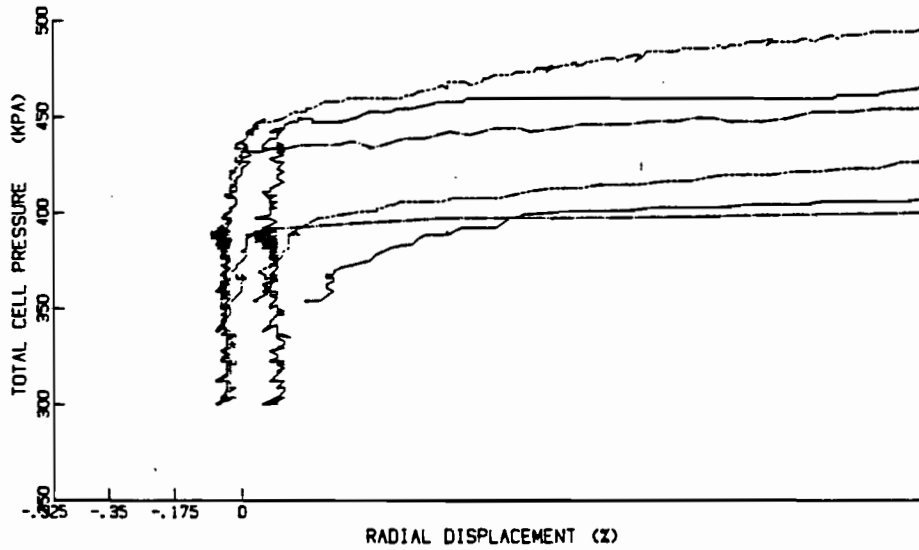
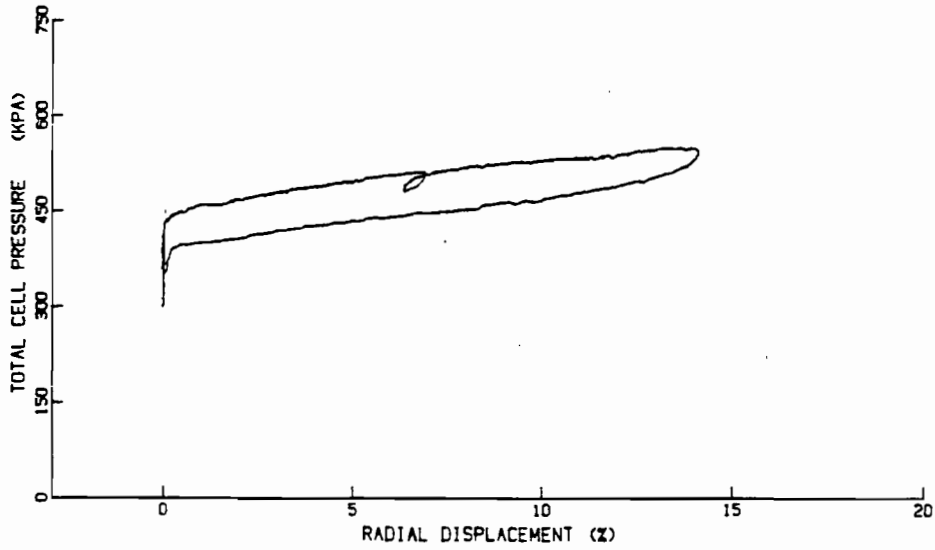
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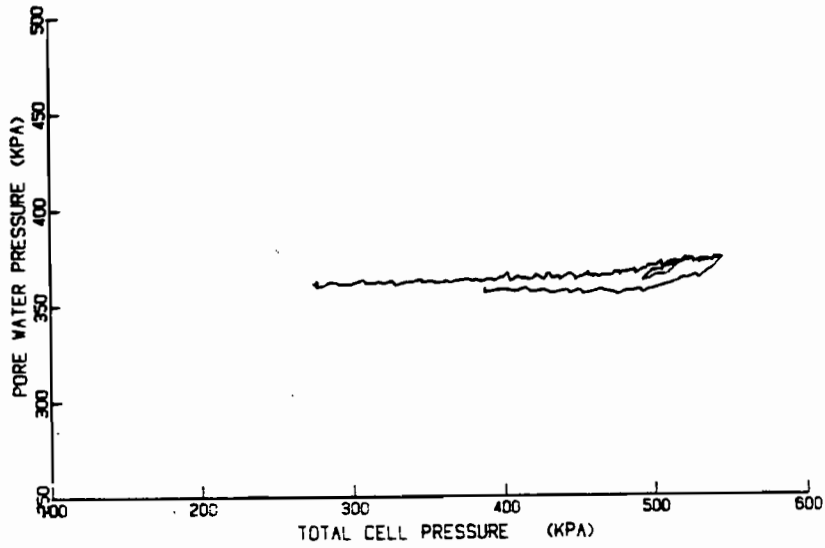
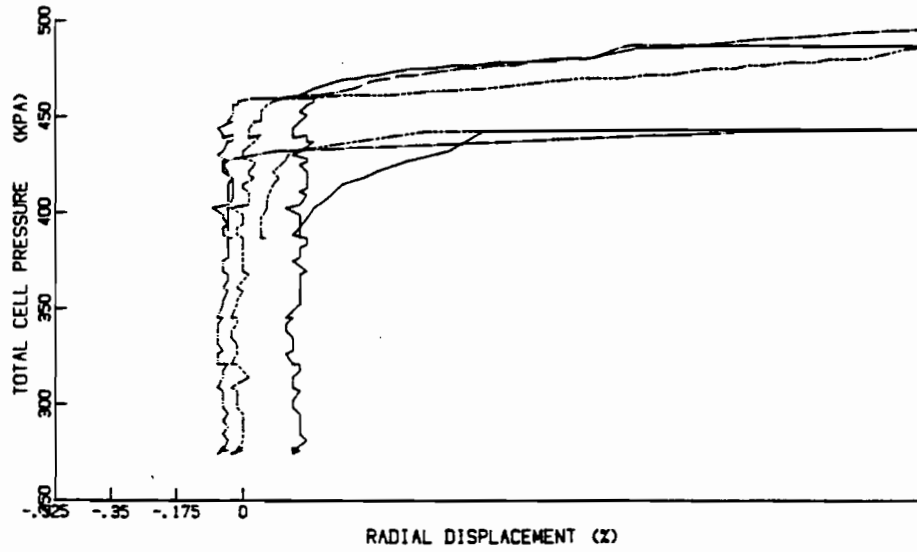
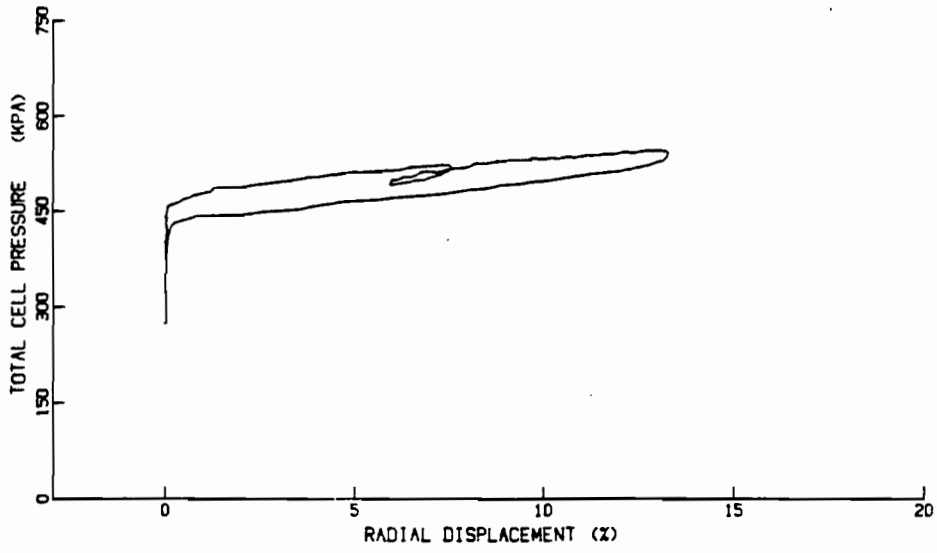
Average of area 18283

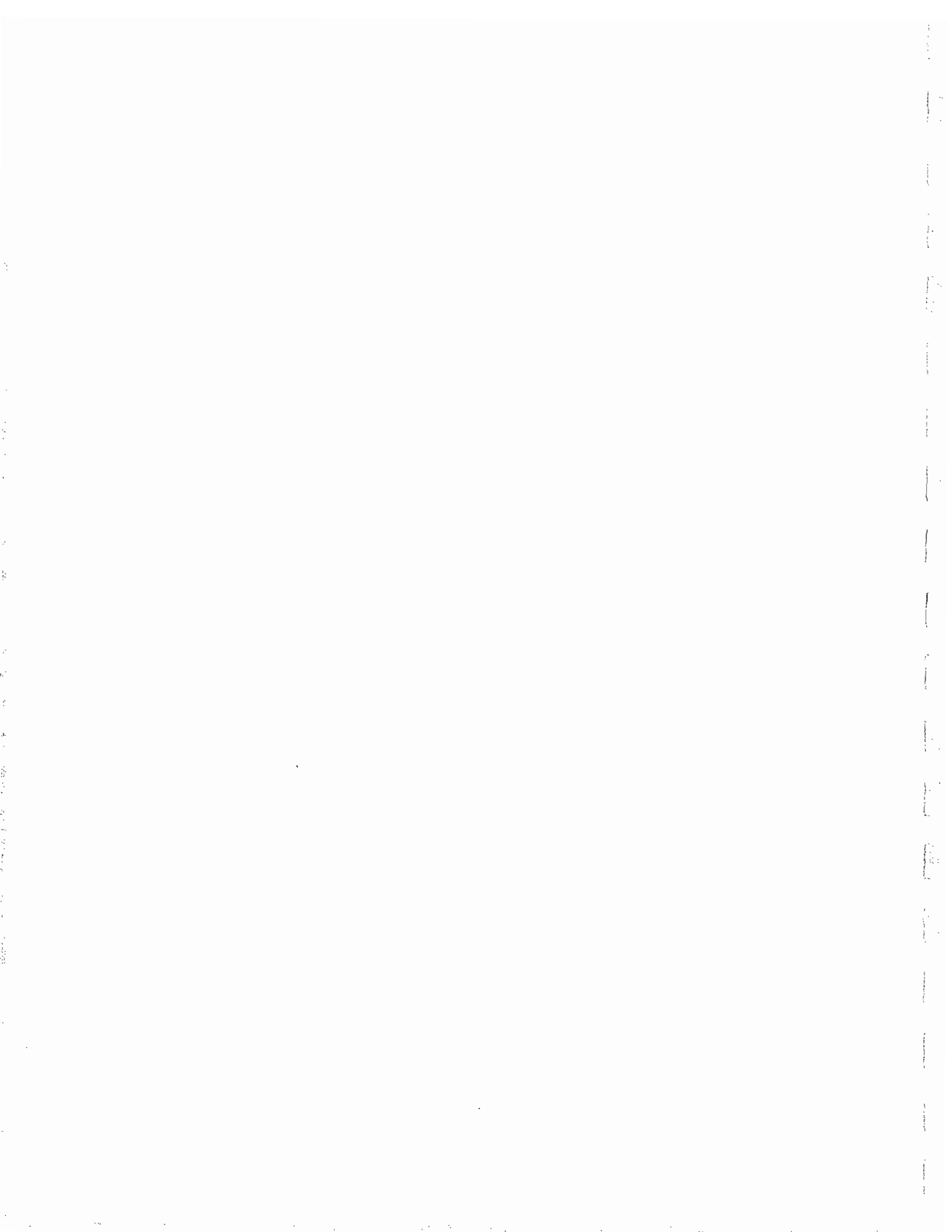
File : AED4P10203

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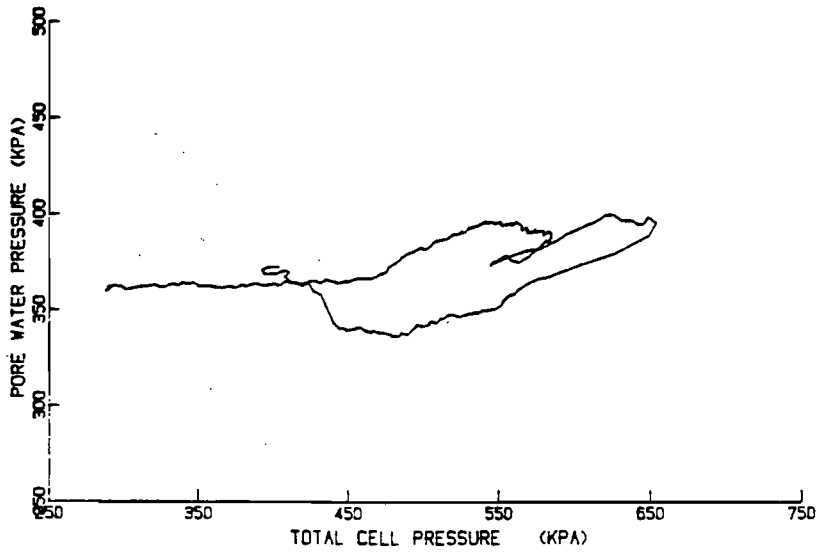
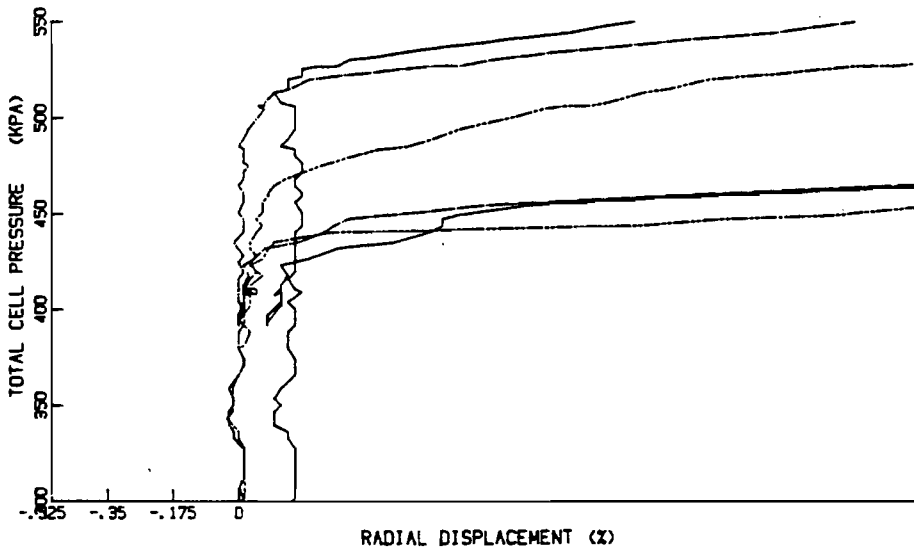
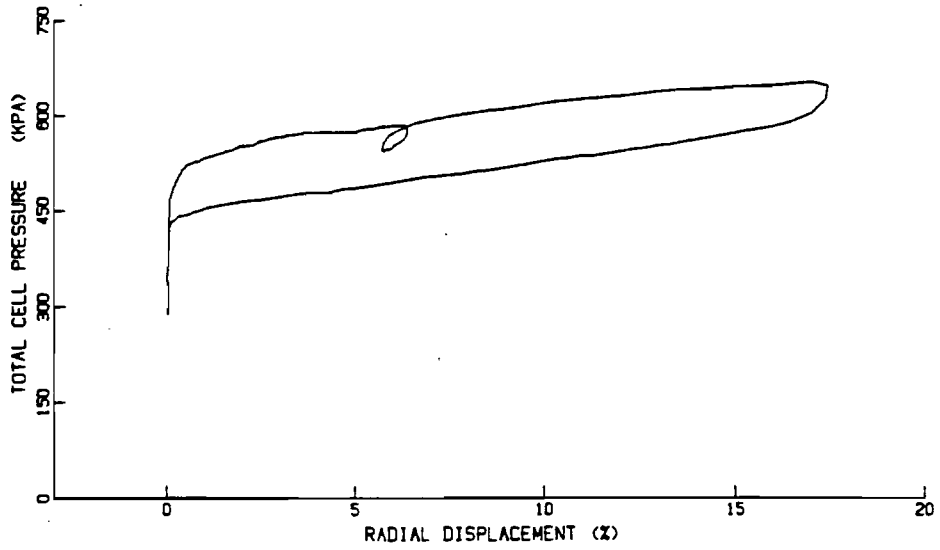
Test : 5

Depth: 24.5

Average of runs 11263

File: AED4P10205

Date: 09 SEPT 84



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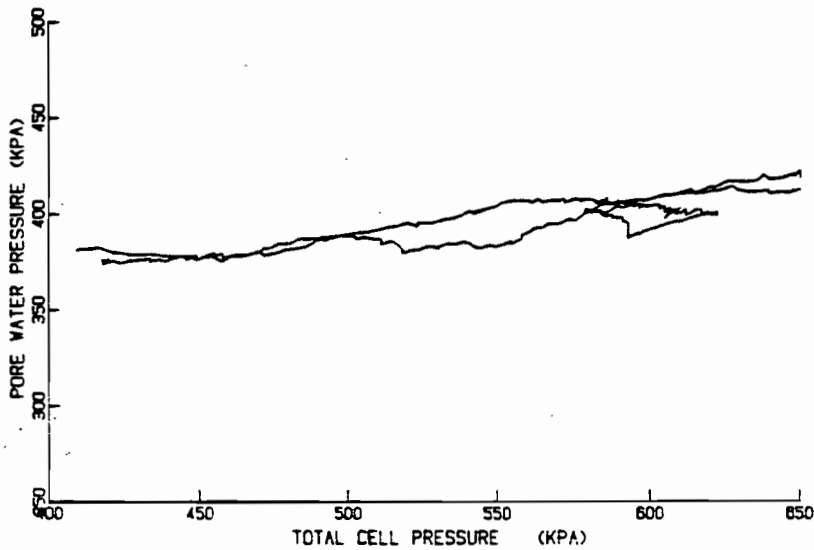
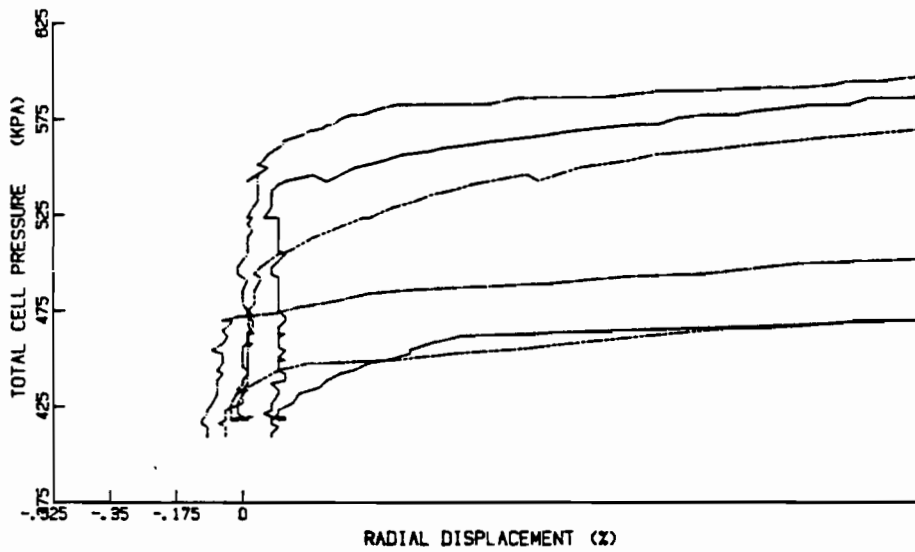
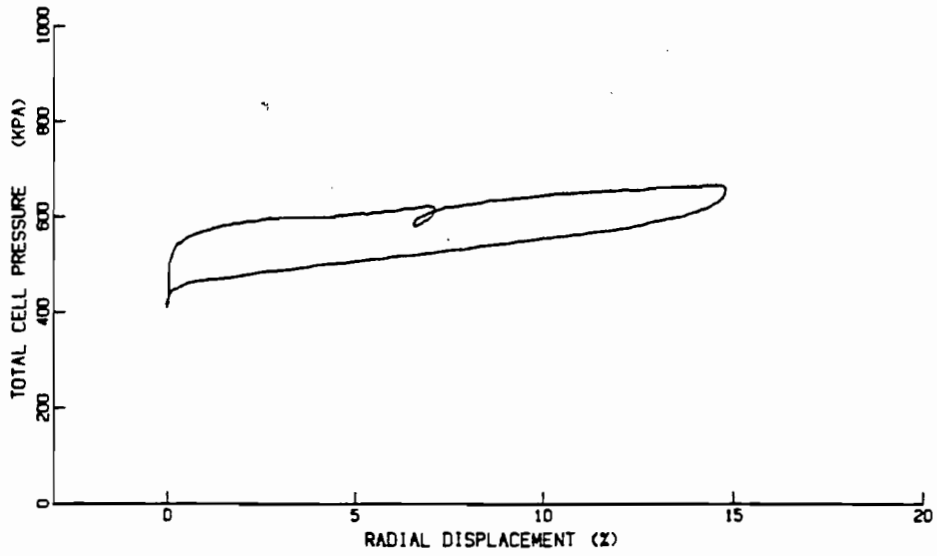
Test : 6

Depth 29.5

Average of area 18283

File : AEMP10206

Date: 09 SEPT 84



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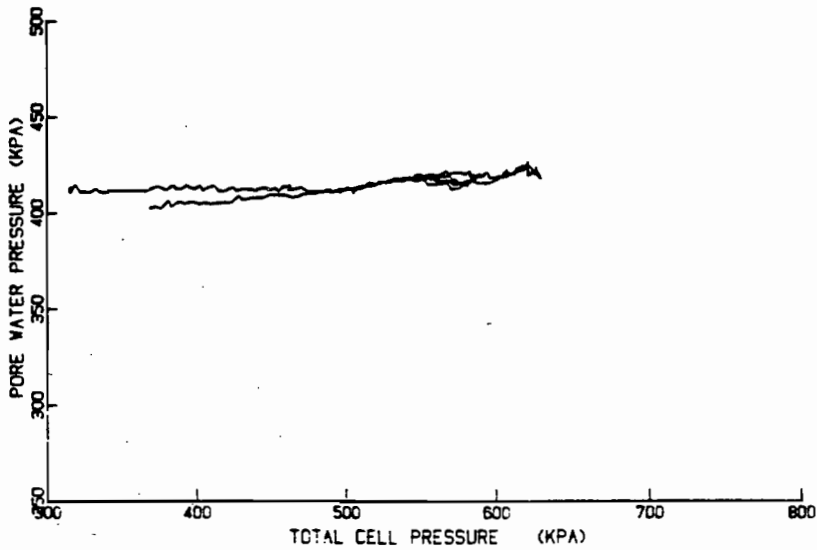
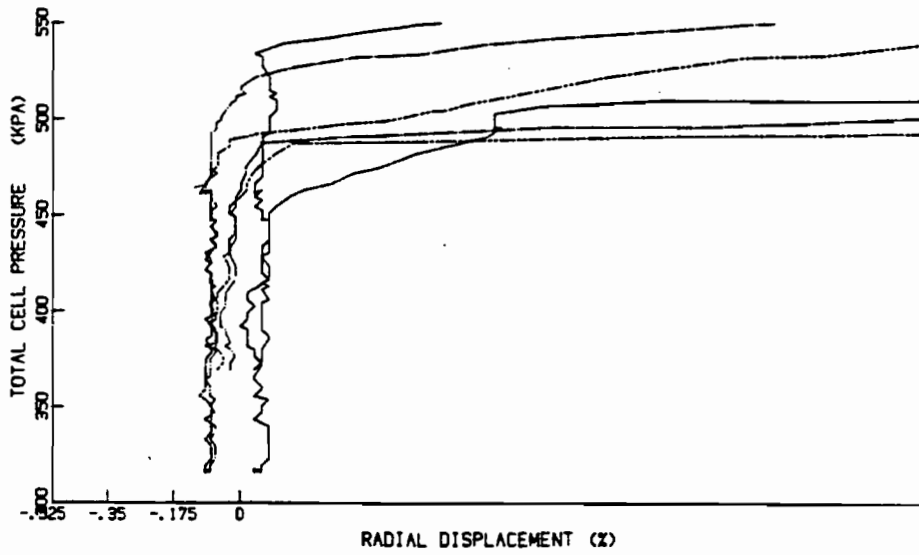
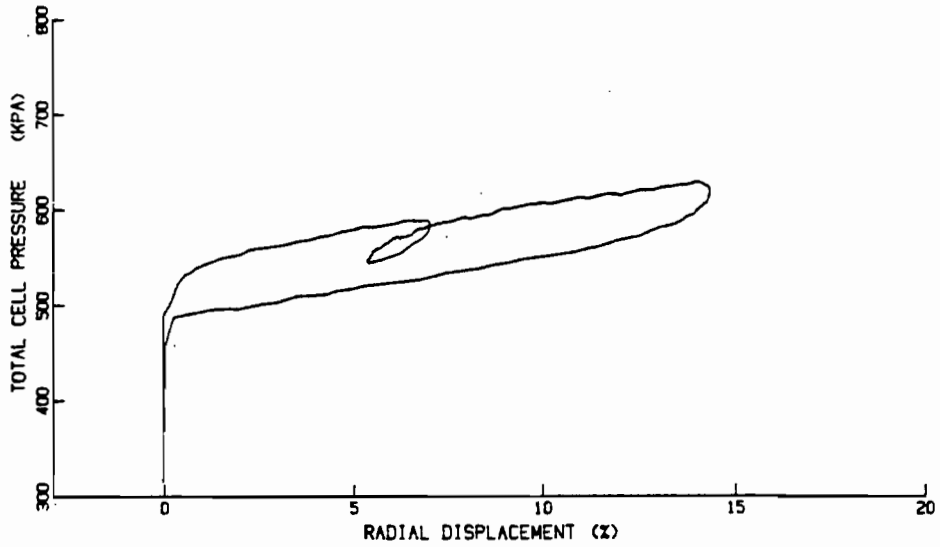
Test : 7

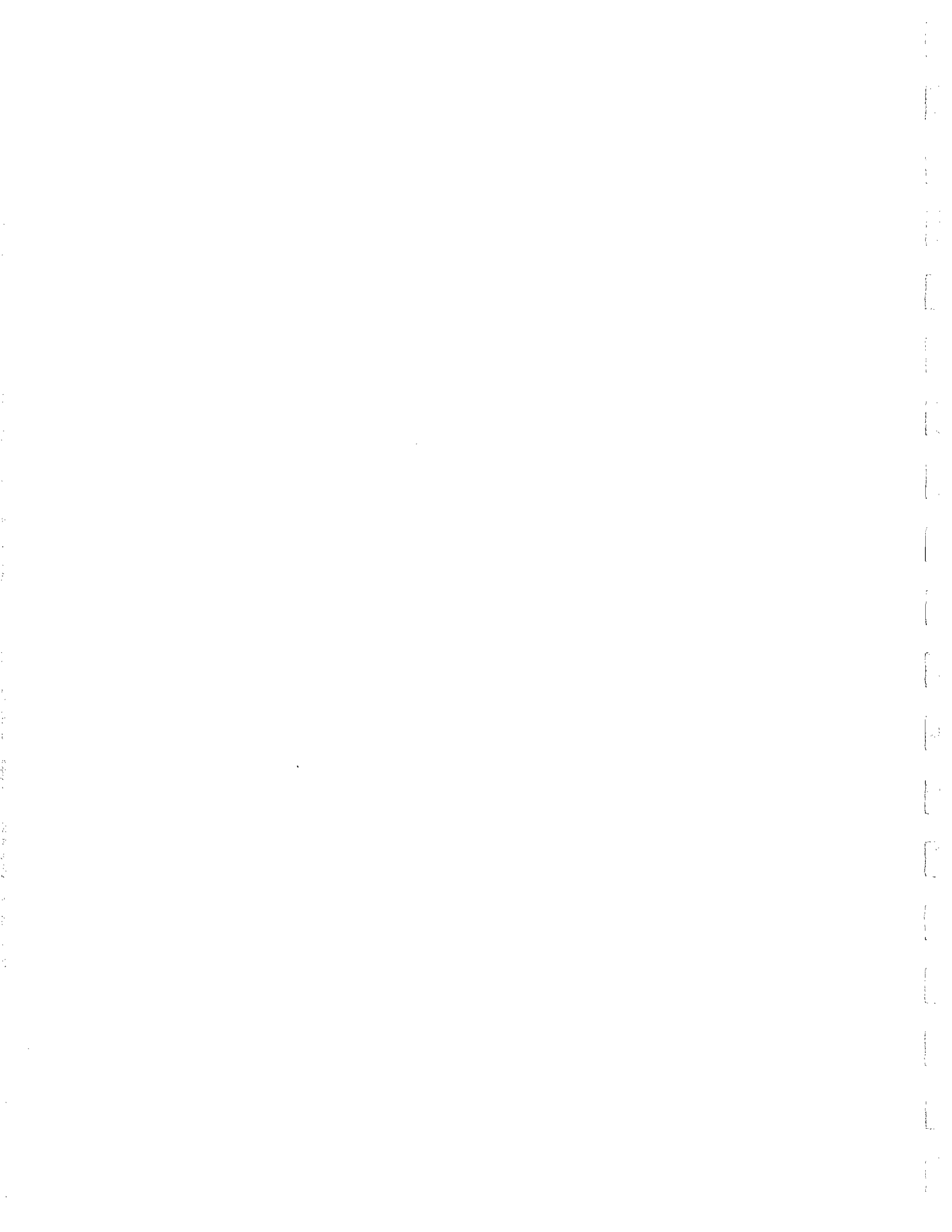
Depth: 34.5

Average of area 18263

File : AEM4P10207

Date: 09 SEPT 84





Site: AMAULIGAK#1

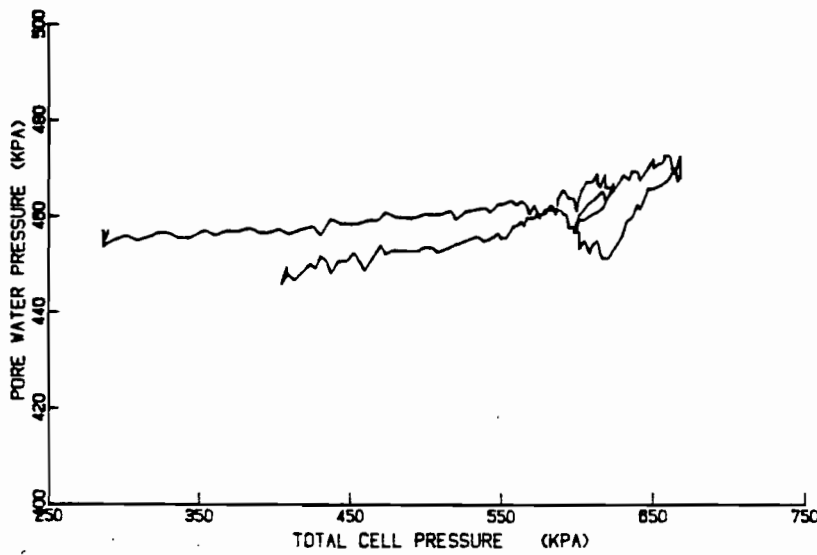
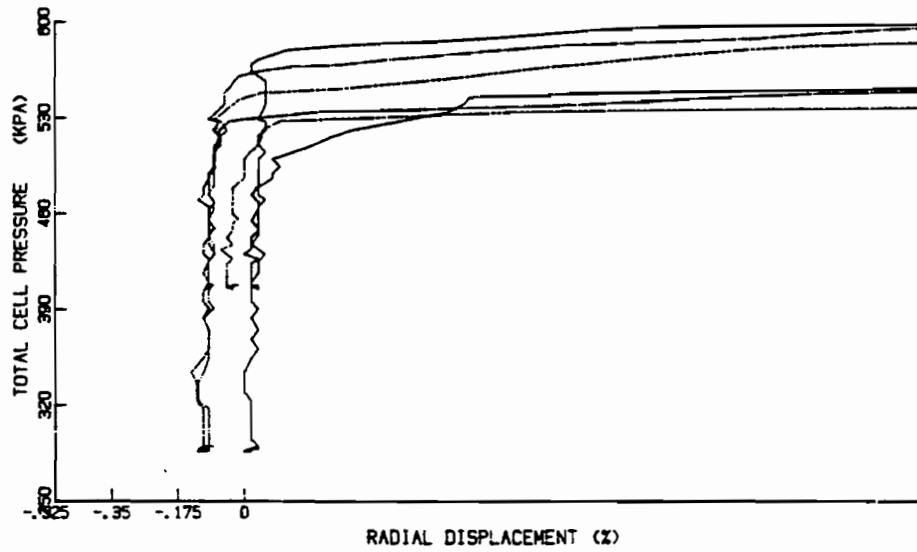
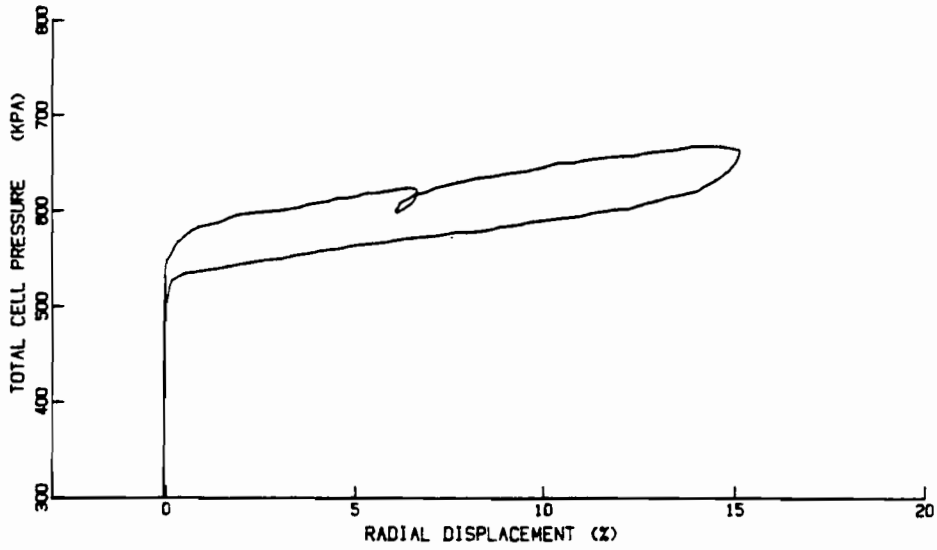
Test : 8

Depth 39.5

Average of area 18283

File : AEMPI0208

Date: 09 SEPT 84





Site: AMAULIGAK#1

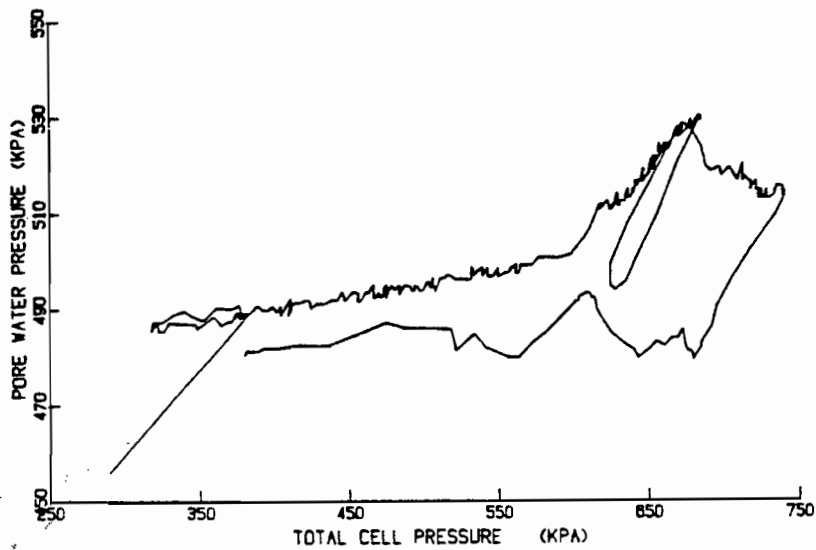
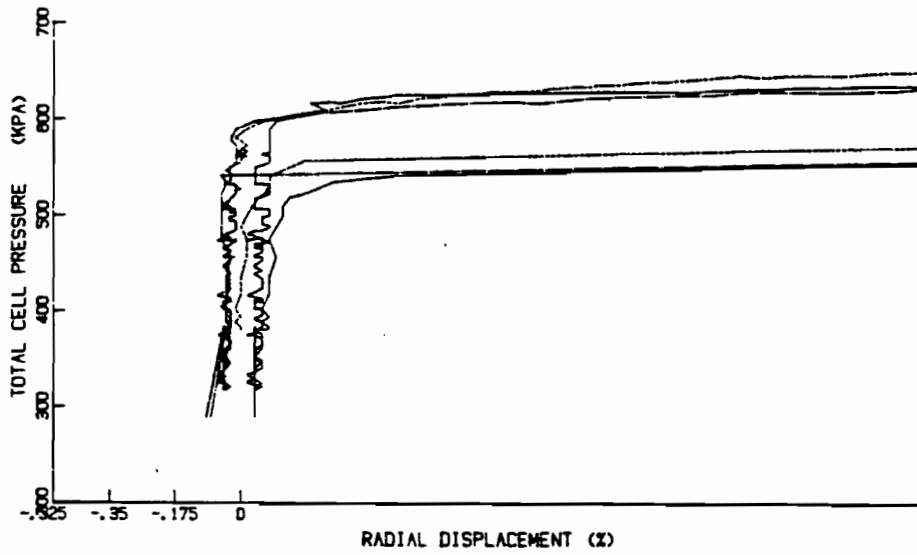
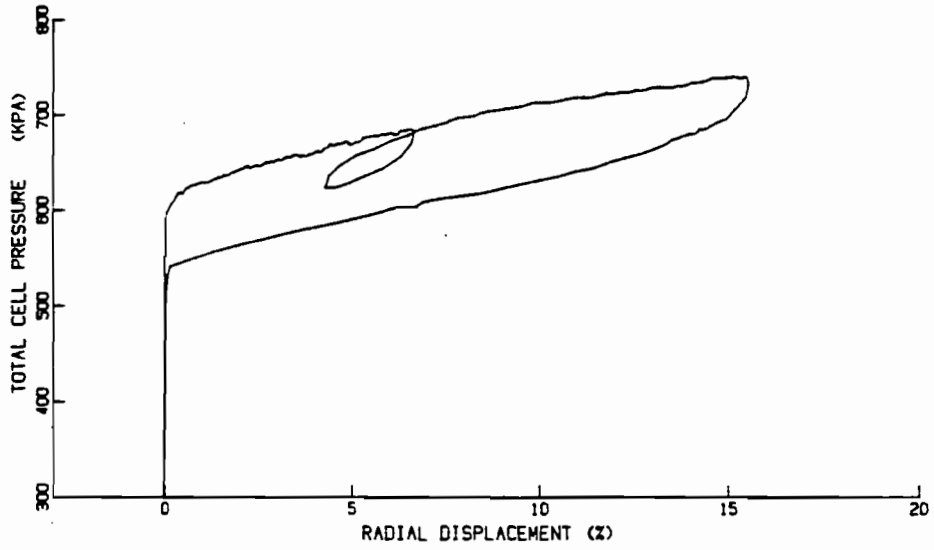
Test : 9

Depth 43.5

Average of area 18283

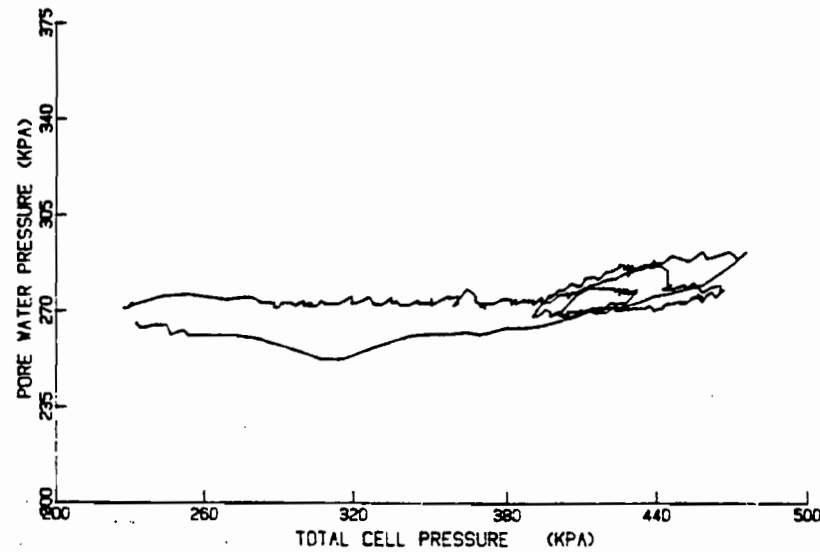
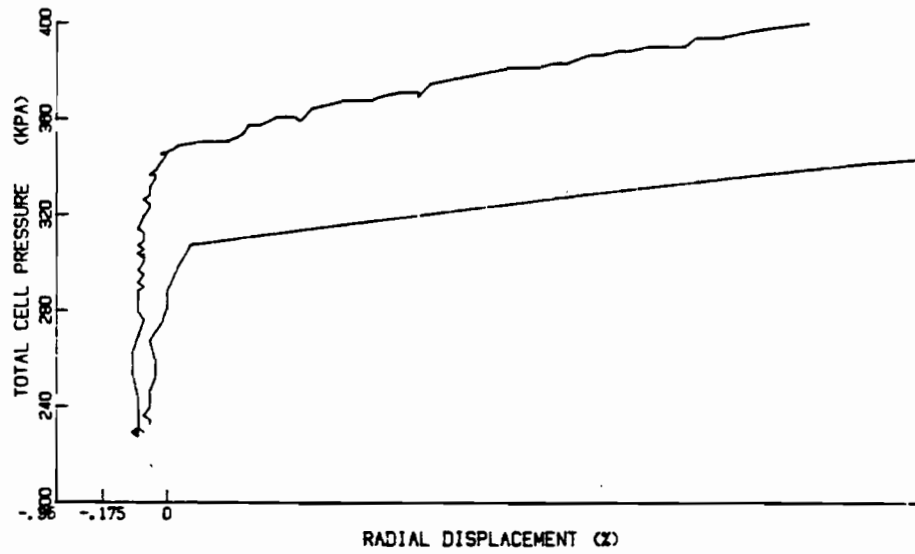
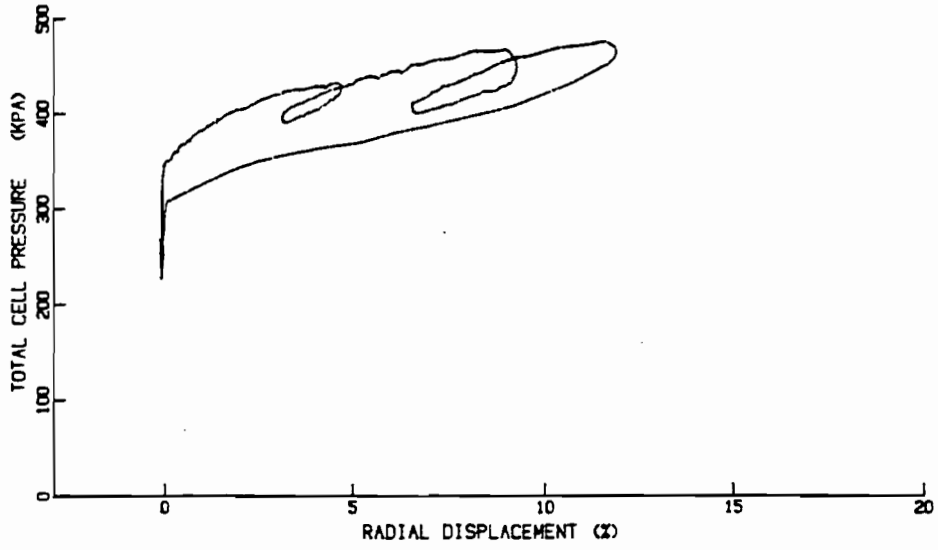
File : AED4P10200

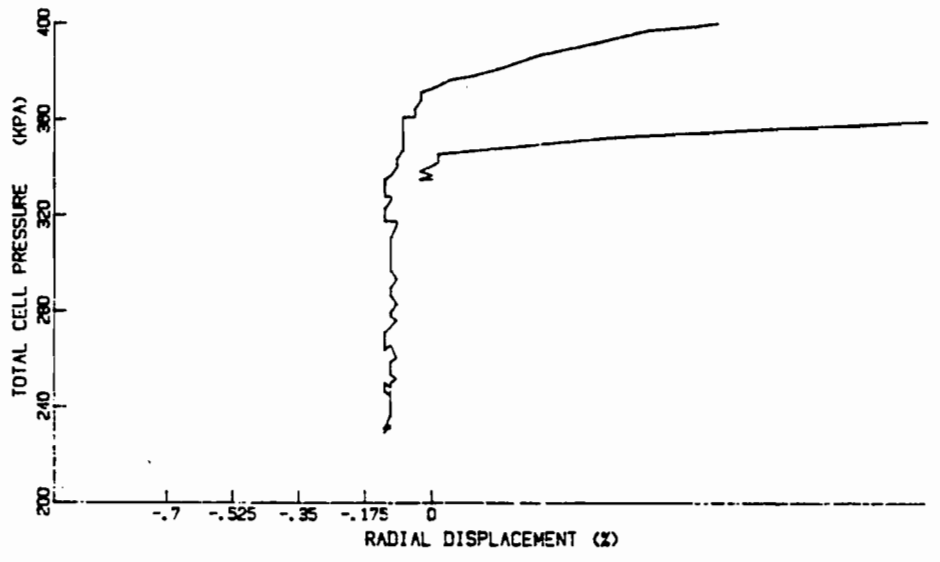
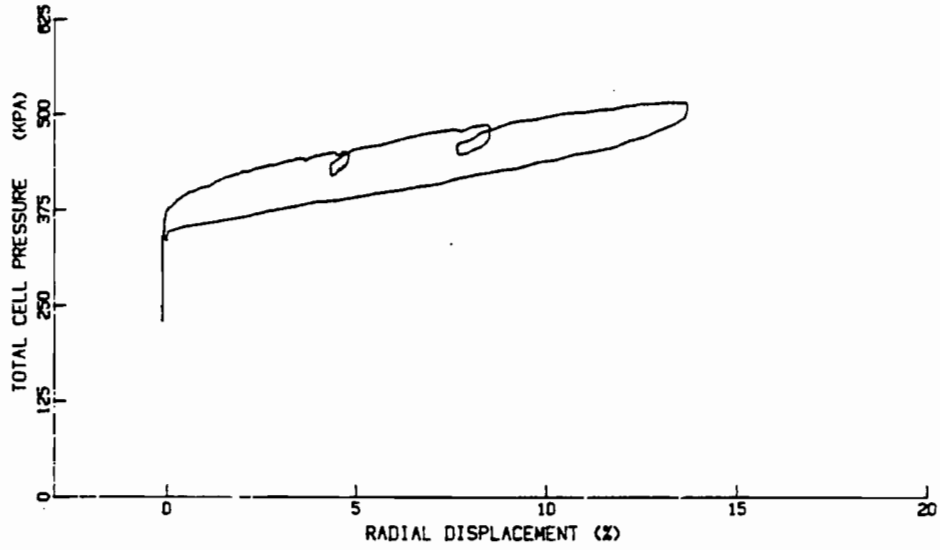
Date: 10 SEPT 84



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Site: AMAULIGAK#1

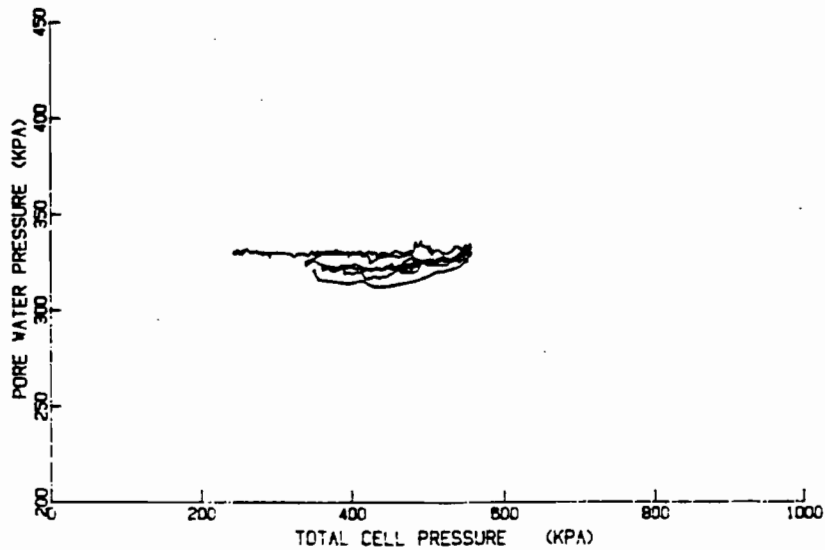
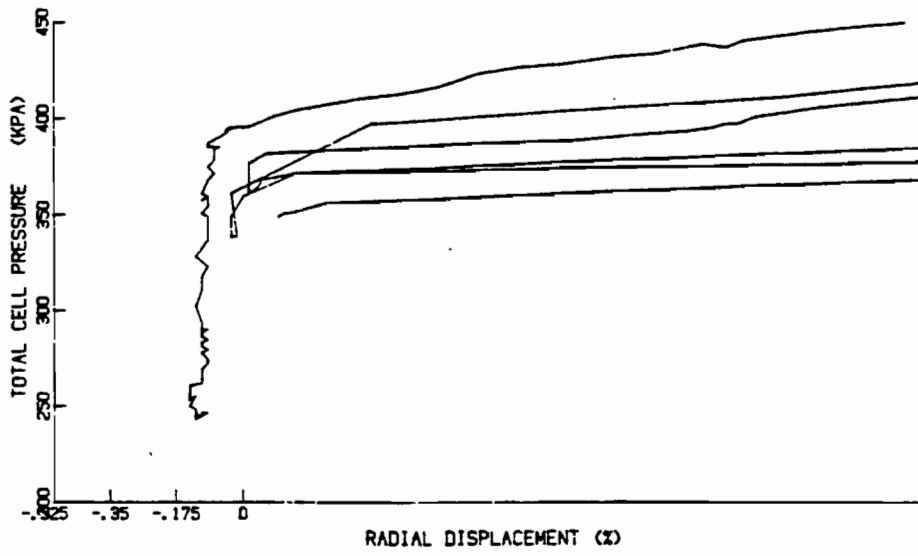
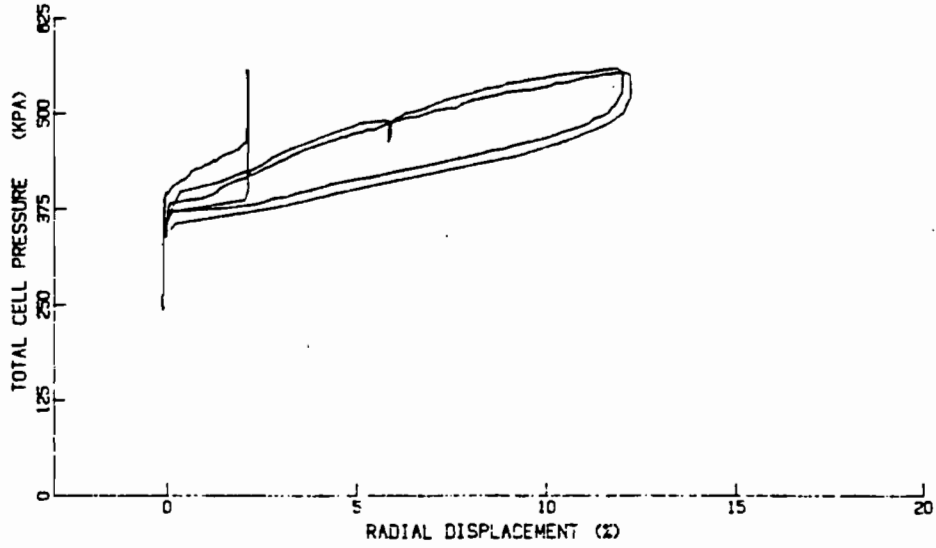
Test: 01 E

Depth: 16

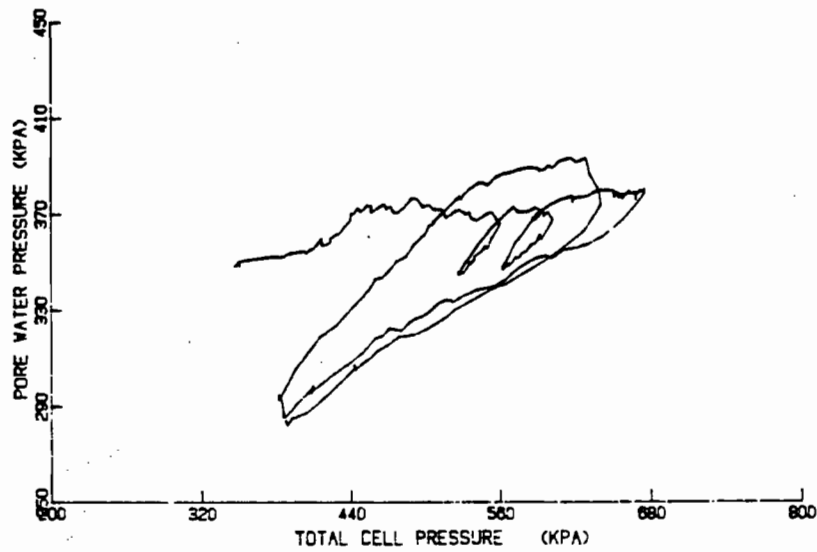
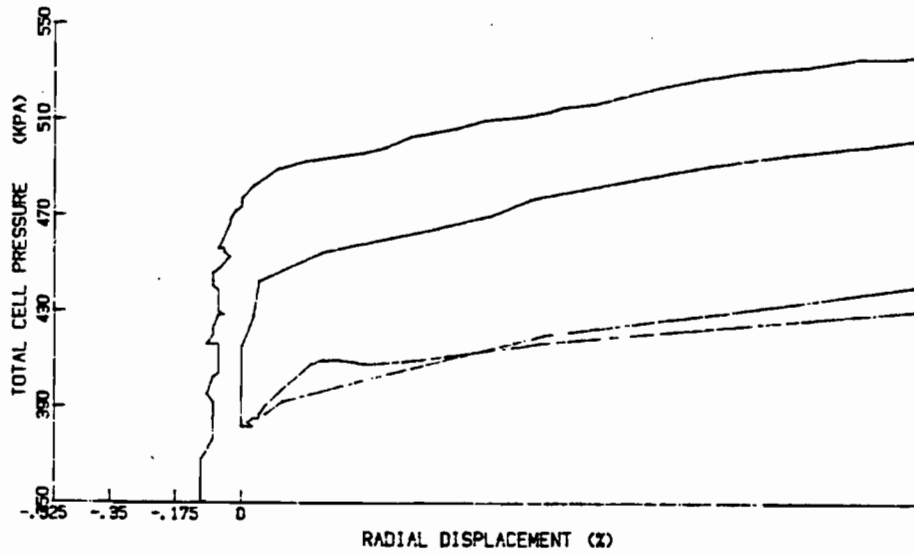
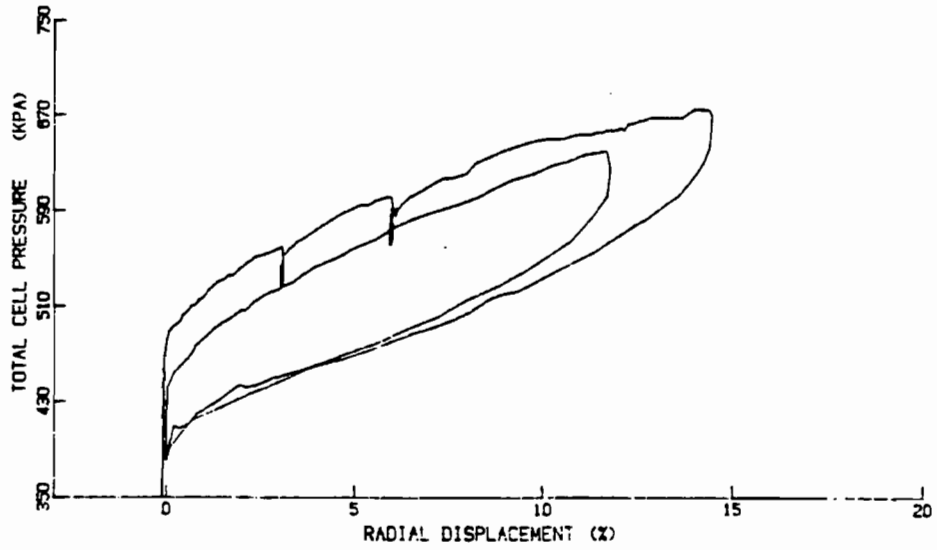
Average of runs: 3

File: AEMAP10103

Date: 08 SEP 84



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Site: AMAULIGAK#1

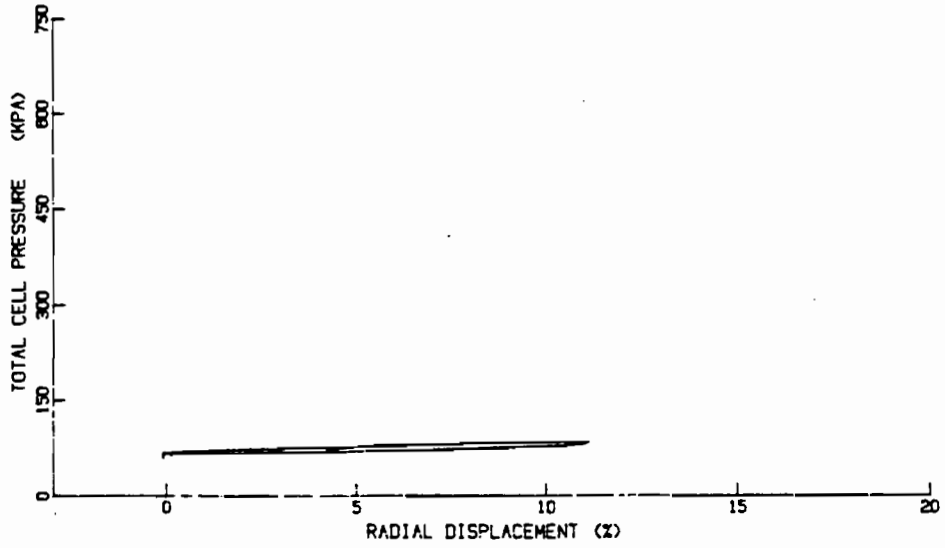
Test : 6

Depth: 31

Average of area 18283

File: ADM4P10108

Date: 08 SEPT 84





GULF CANADA RESOURCES INC

SELF-BORED PRESSUREMETER DATA

Site: AMAULIGAK#1

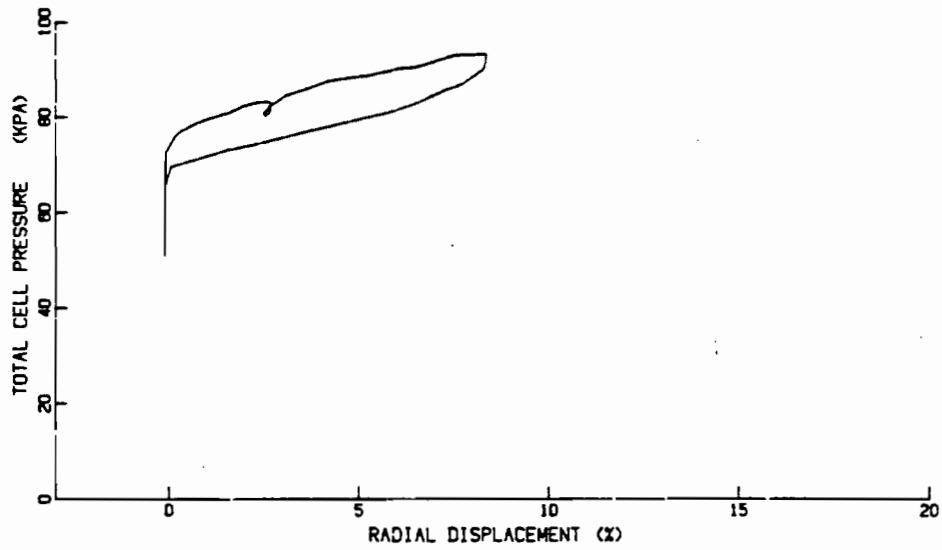
Test : 7

Depth 36

Average of runs 18283

File : AEBAP10107

Date: 08 SEPT 84





Site: AMAULIGAK#1

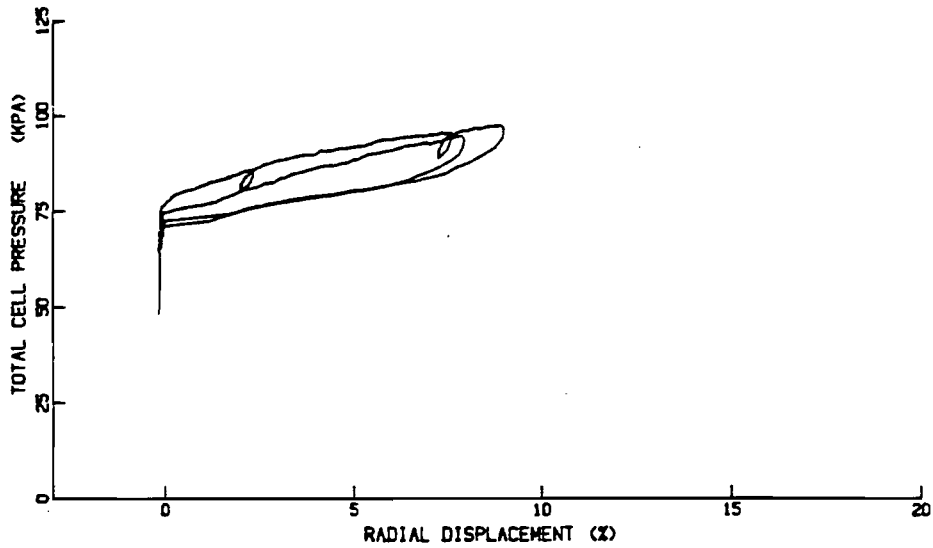
Test : 8

Depth: 41

Average of area 11203

File : AEM4P10108

Date : 08 SEPT 84



RECEIVED

Site: ANAULIGAK (N)

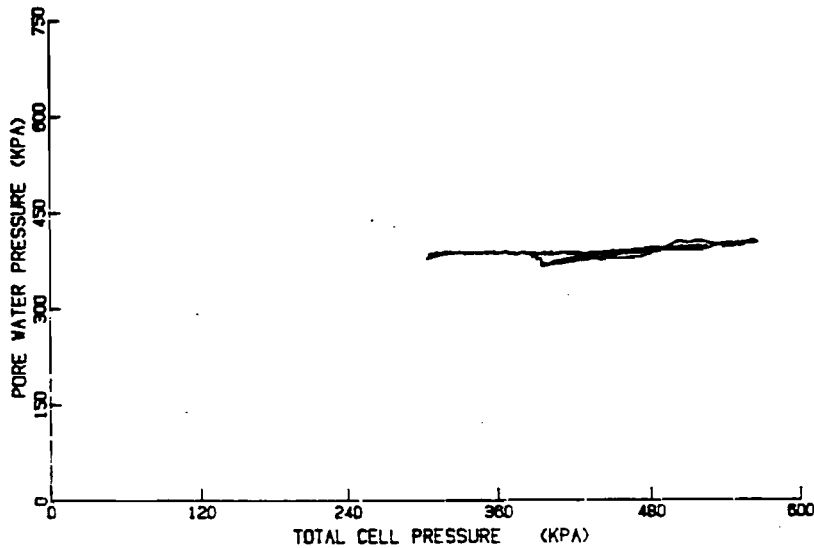
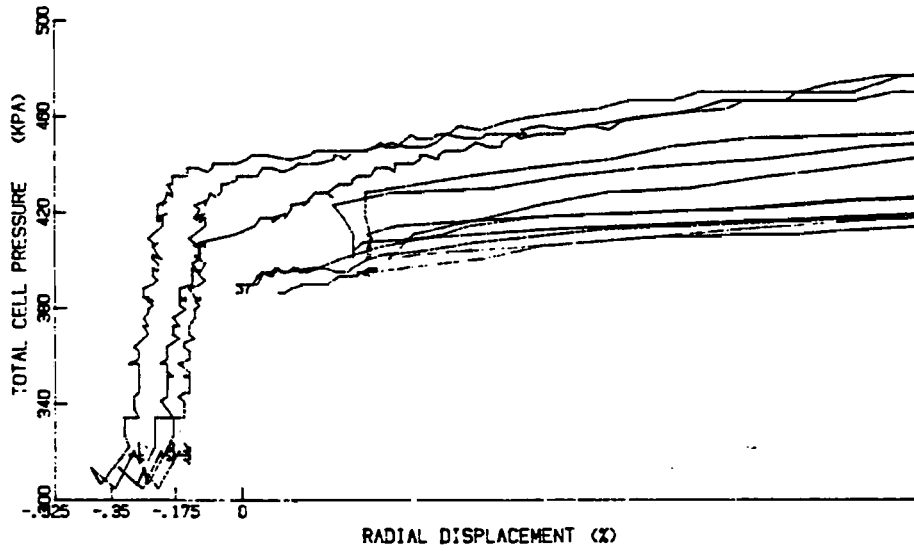
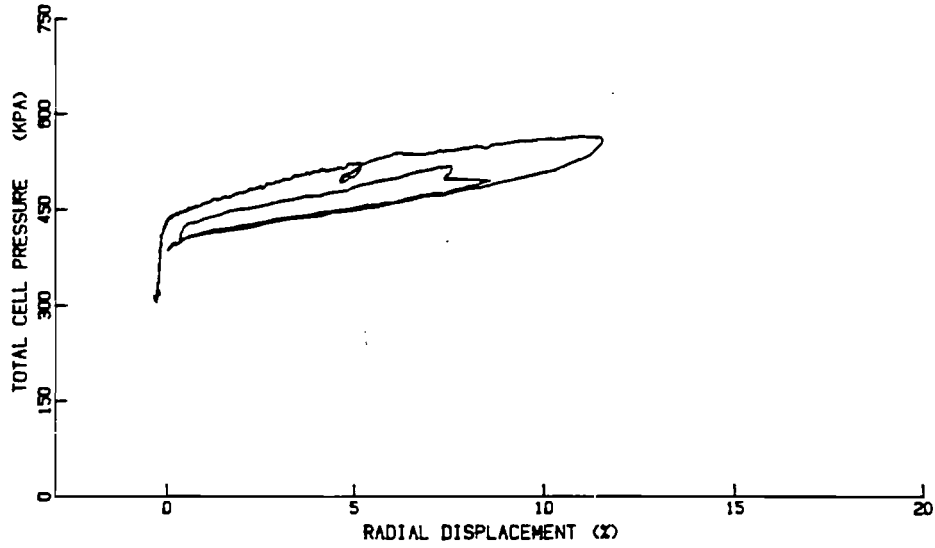
Test : 1

Depth 5.5 FEET

Average of runs 18283

File : ANB4PT0101

Date: 12 SEPT 84





Site: AMAULIGAK (N)

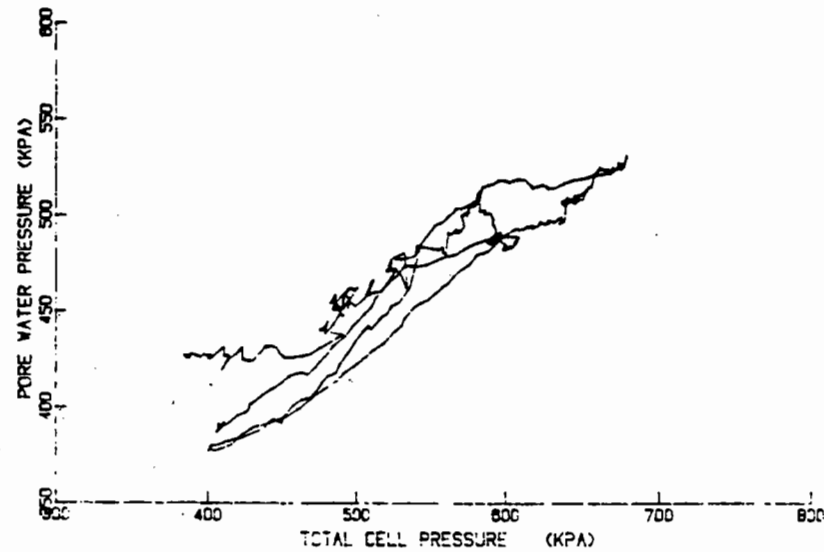
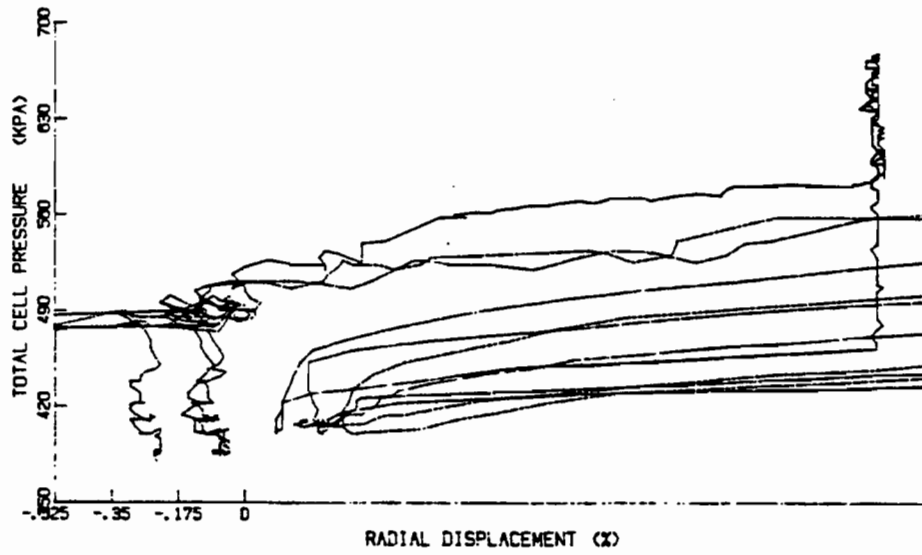
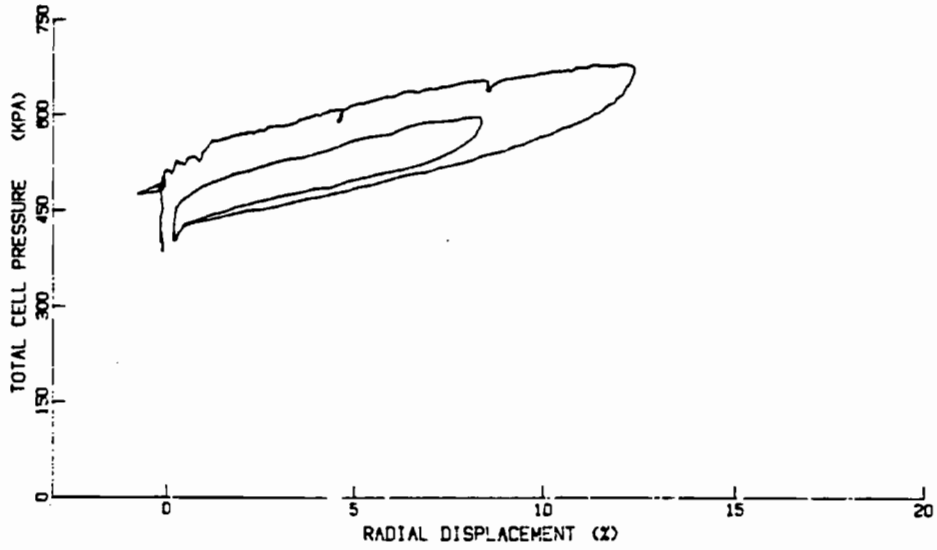
Test : 2

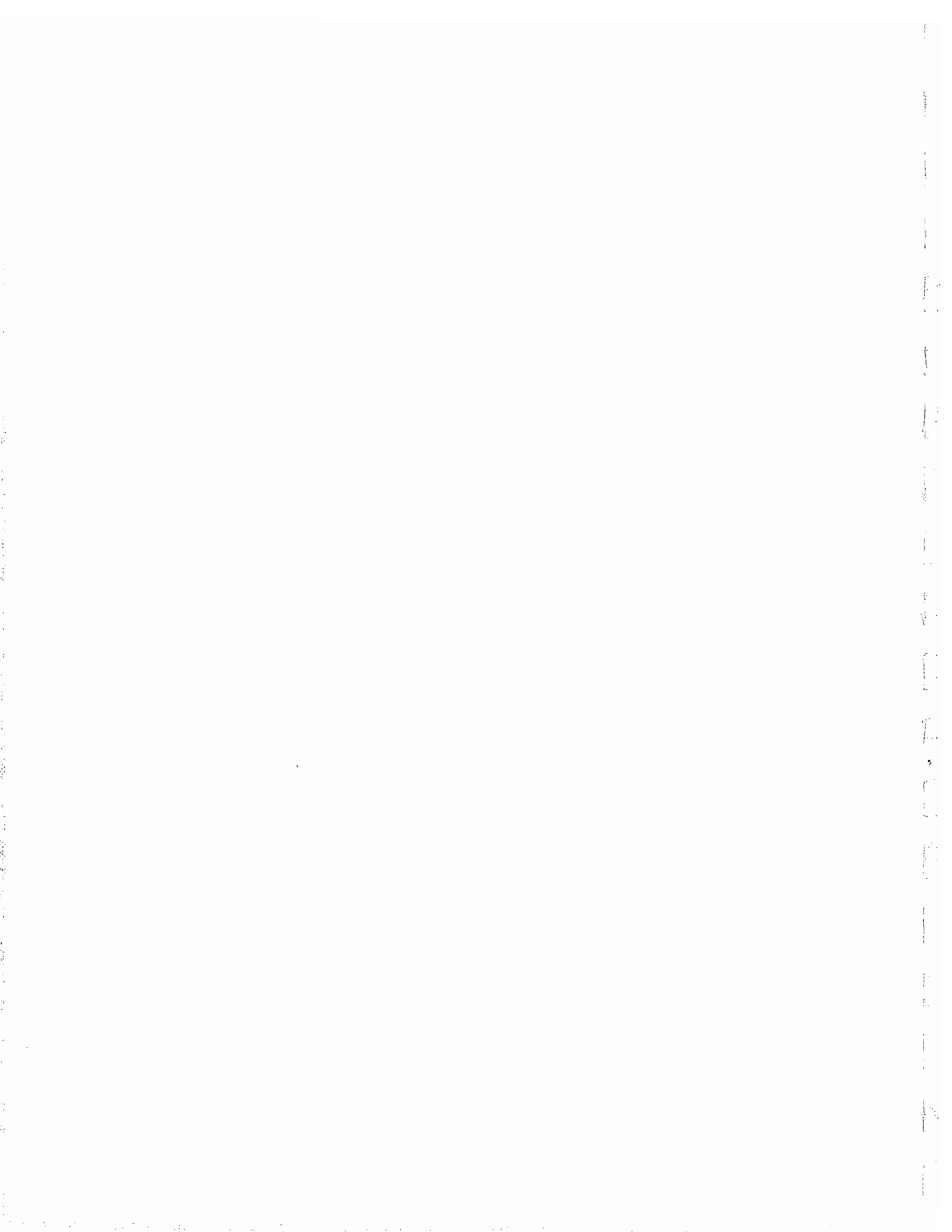
Depth: 10.5 FEET

Average of runs 18293

File : AMB4PID102

Date: 12 SEPT 84





Site: AMAULIGAK (W)

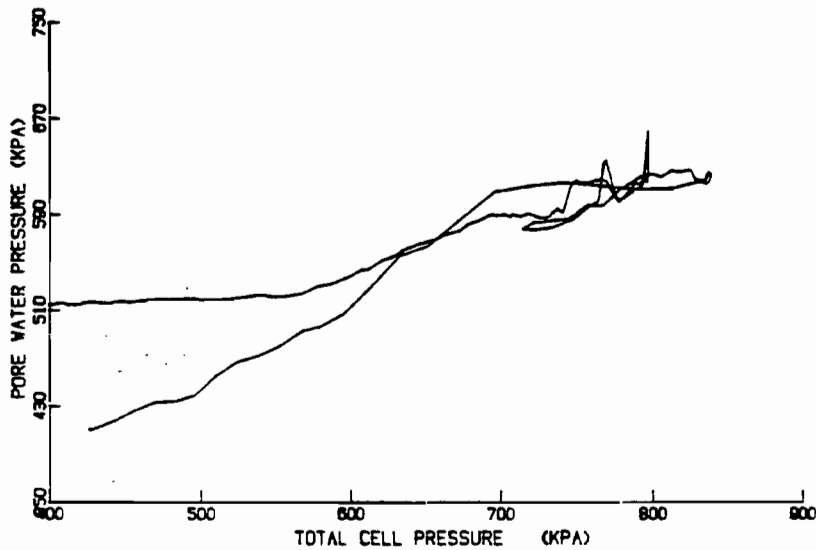
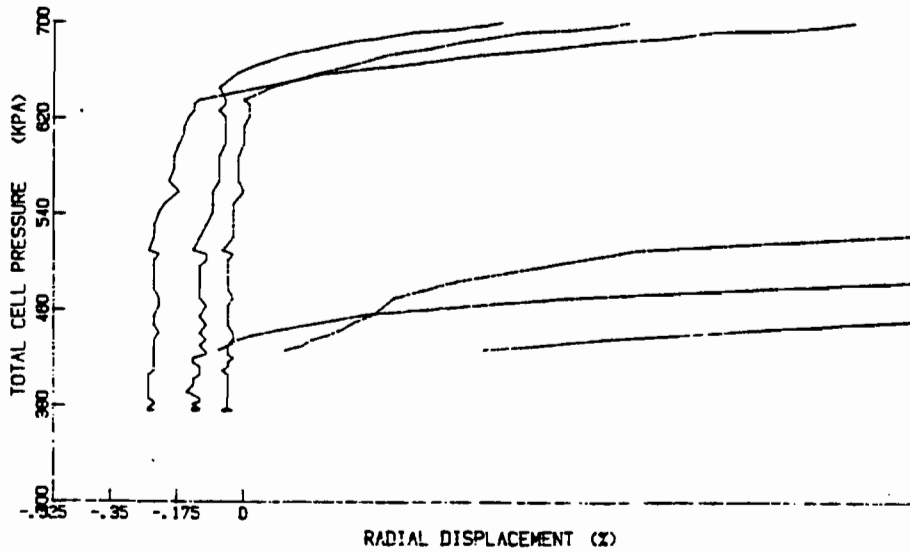
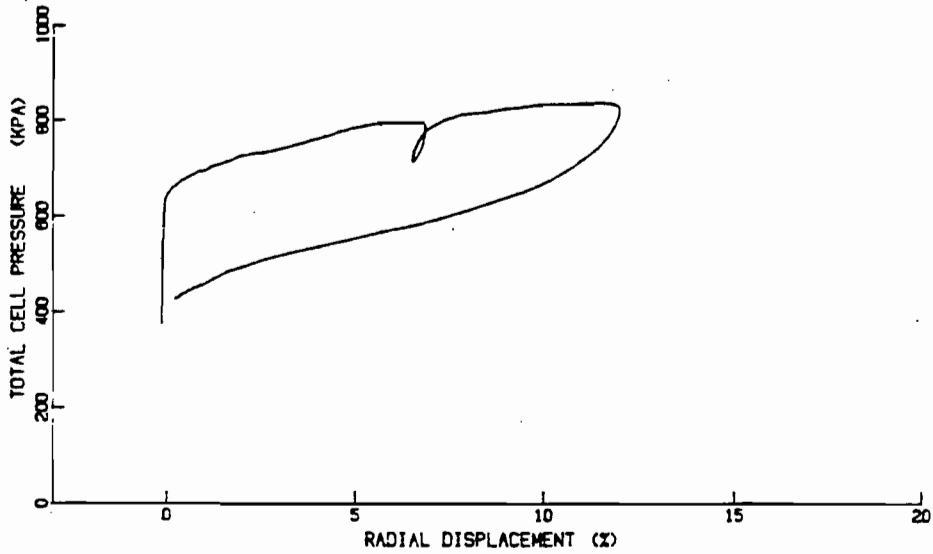
Test : 3

Depth: 15.5 FEET

Average of runs 11213

File : A984P10103

Date: 12 SEPT 84



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Site: AMAULIGAK (W)

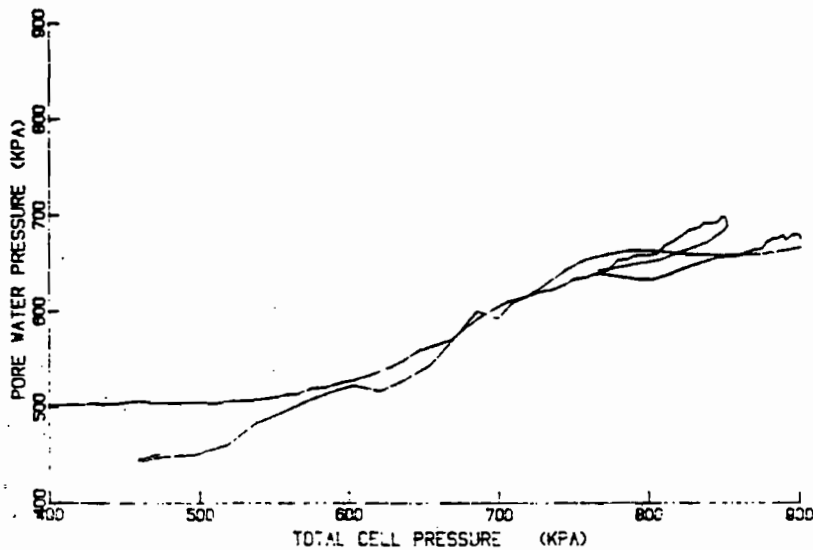
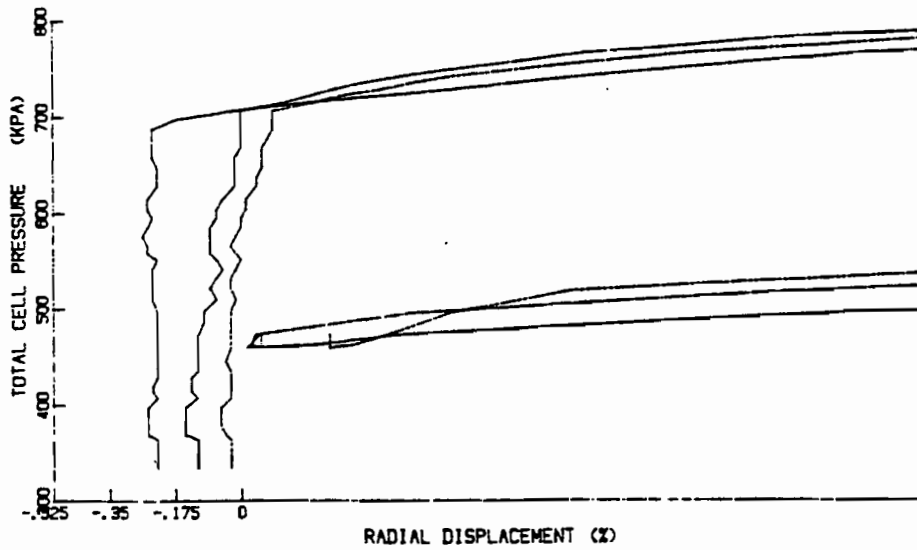
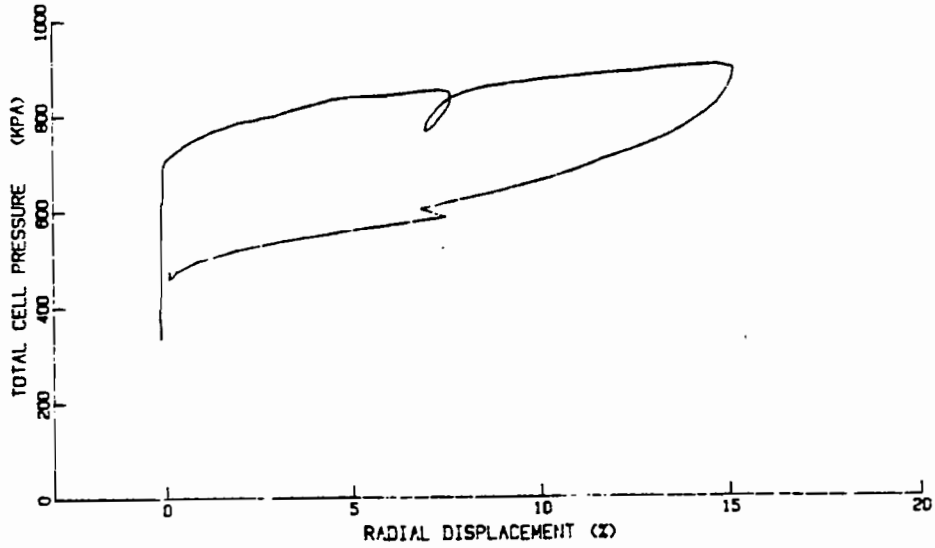
Test : 4

Depth: 20.5 FEET

Average of area 18283

File : AMB4P1D104

Date: 12 SEPT 84



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Site: AMAULIGAK (N)

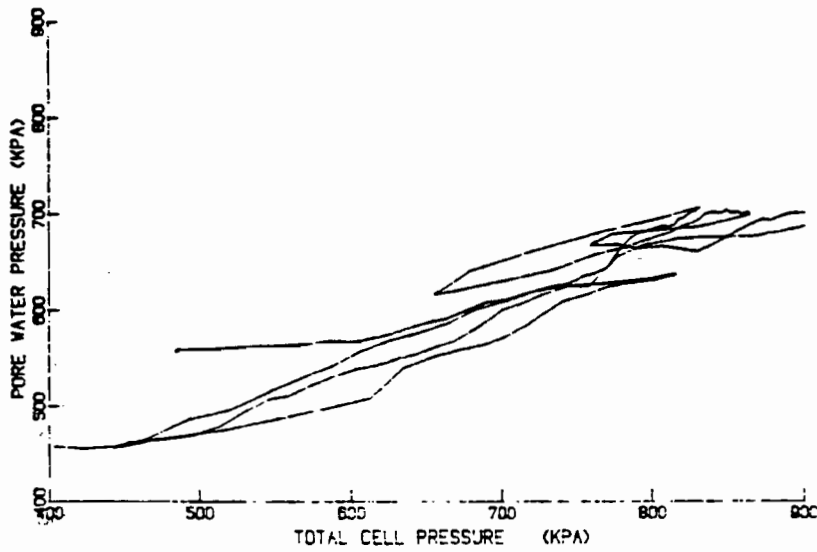
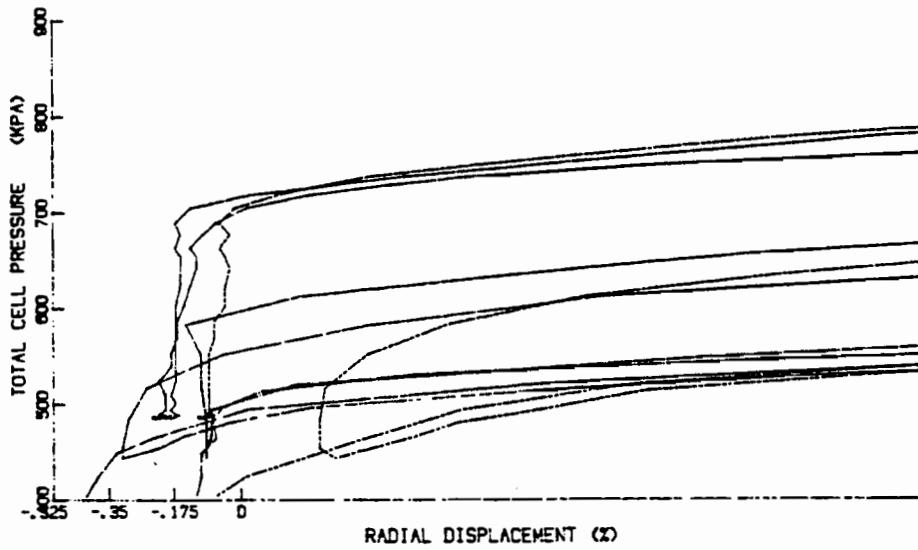
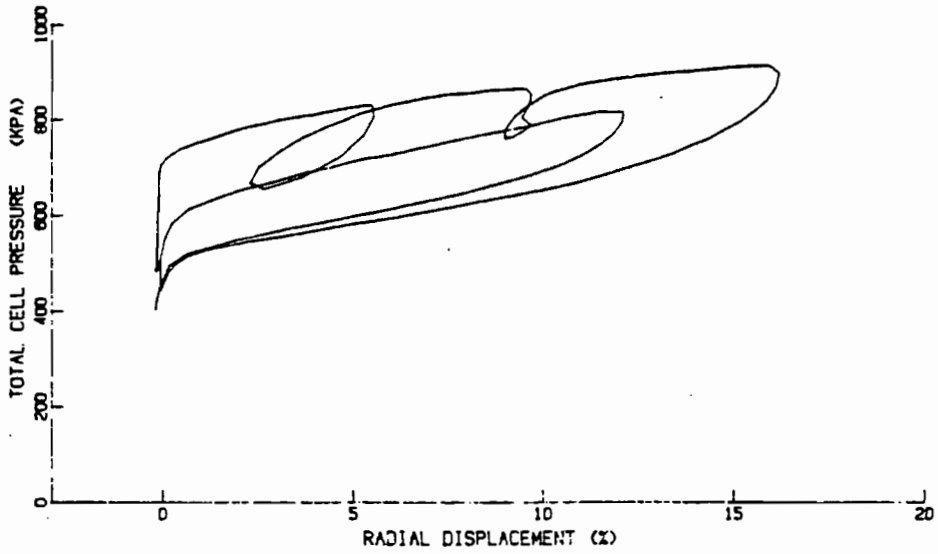
Test : 5

Depth: 25.5 FEET

Average of area 18283

File : AMB4P10105

Date: 12 SEPT 84





Site: AMAULIGAK (W)

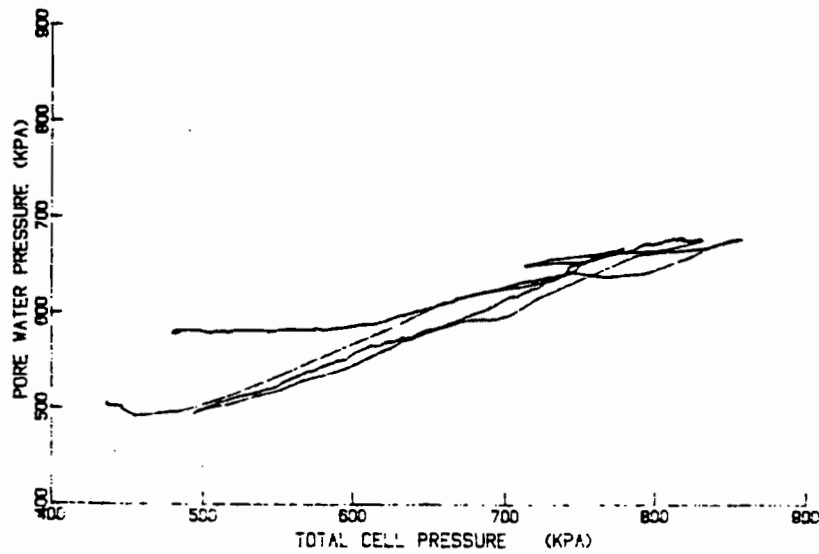
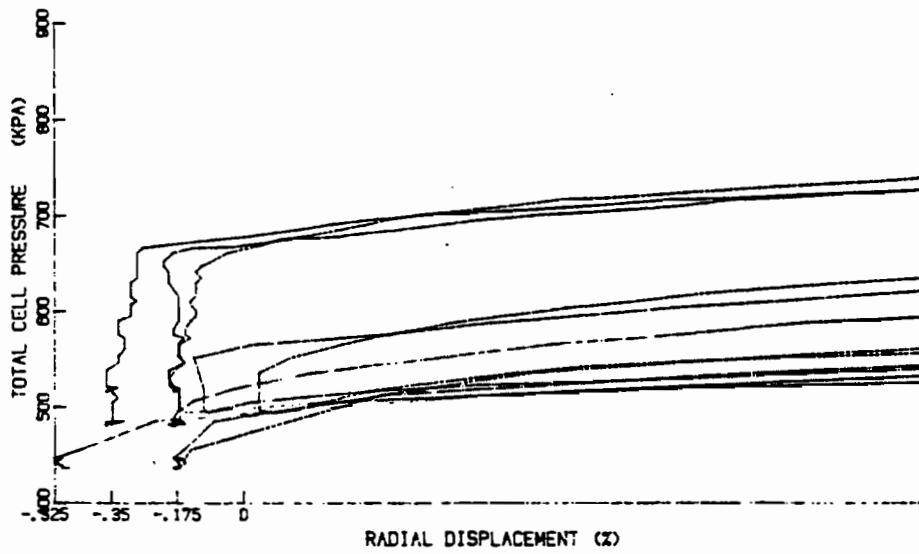
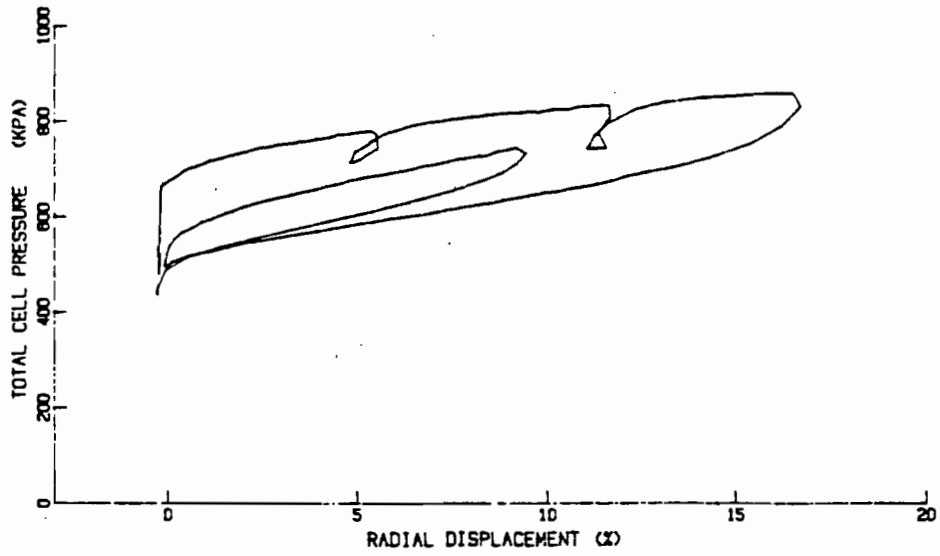
Test : 6

Depth 30.5 FEET

Average of area 18283

File : AMB4P10108

Date: 12 SEPT 84



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Site: AMAULIGAK(N)

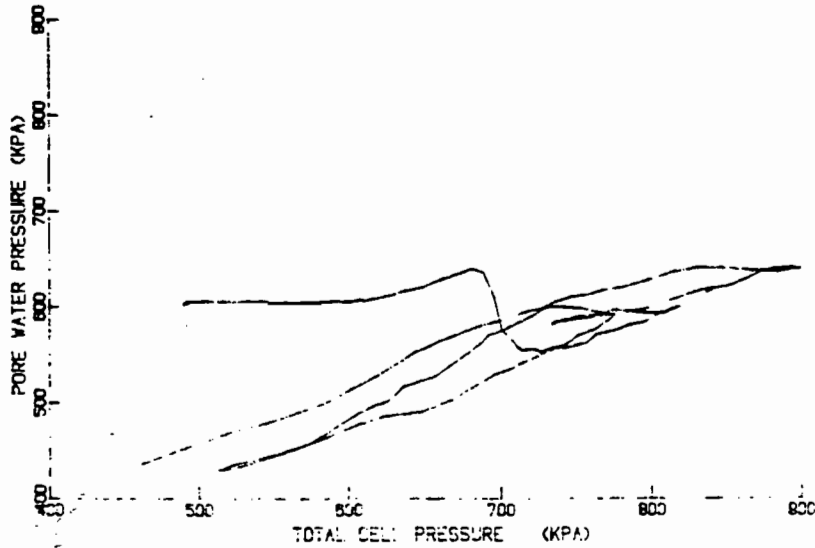
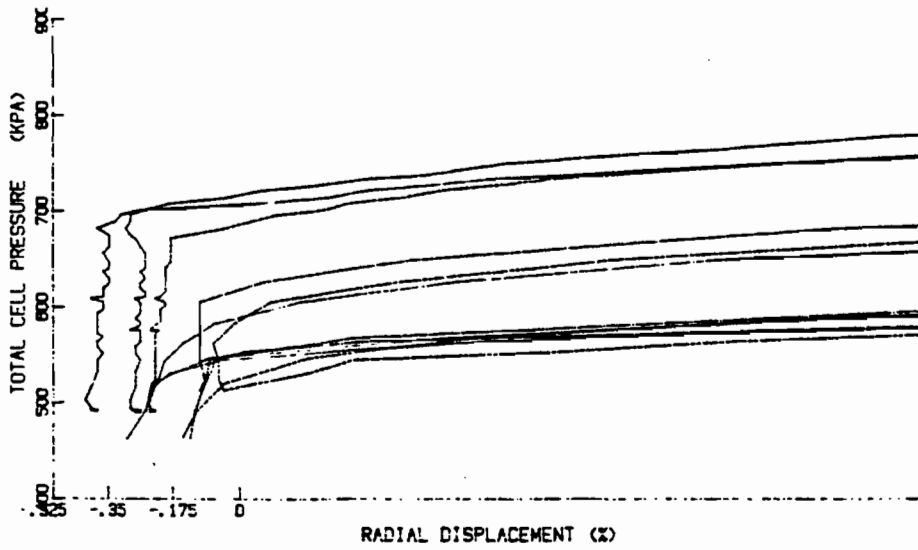
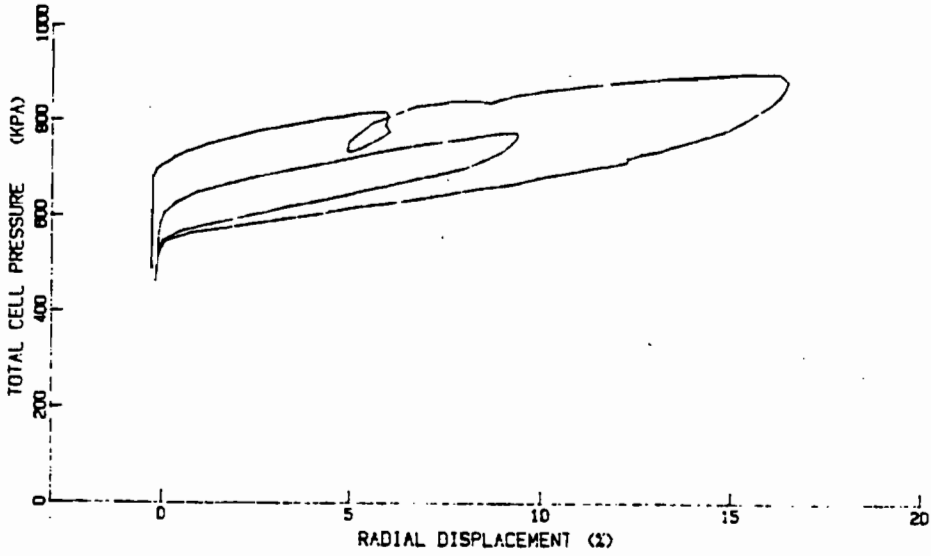
Test : 7

Depth: 35.5 FEET

Average of runs 18283

File: AMB4P10107

Date: 12 SEPT 84



THE UNIVERSITY OF CHICAGO

Site: AMAULIGAK (W)

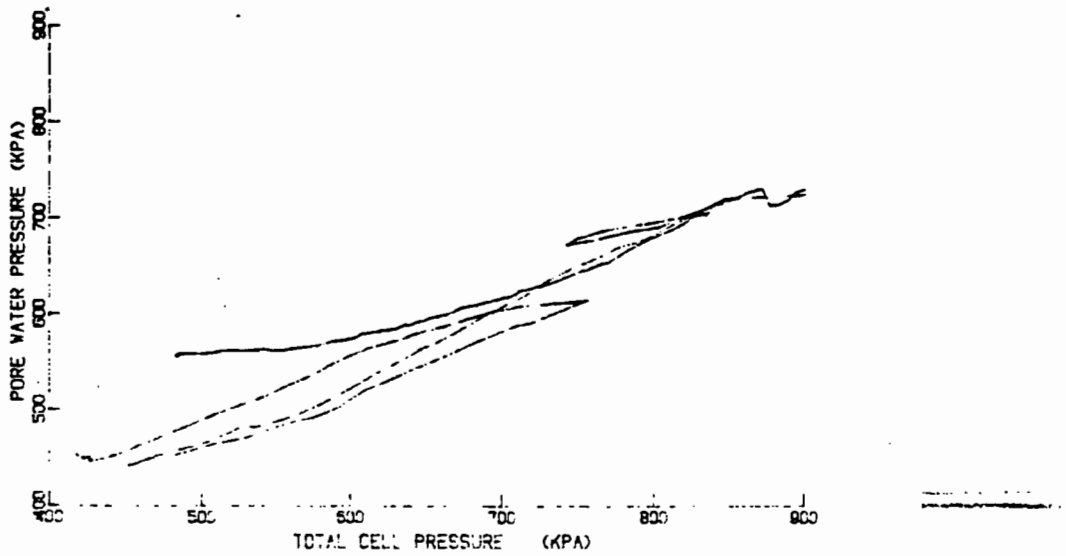
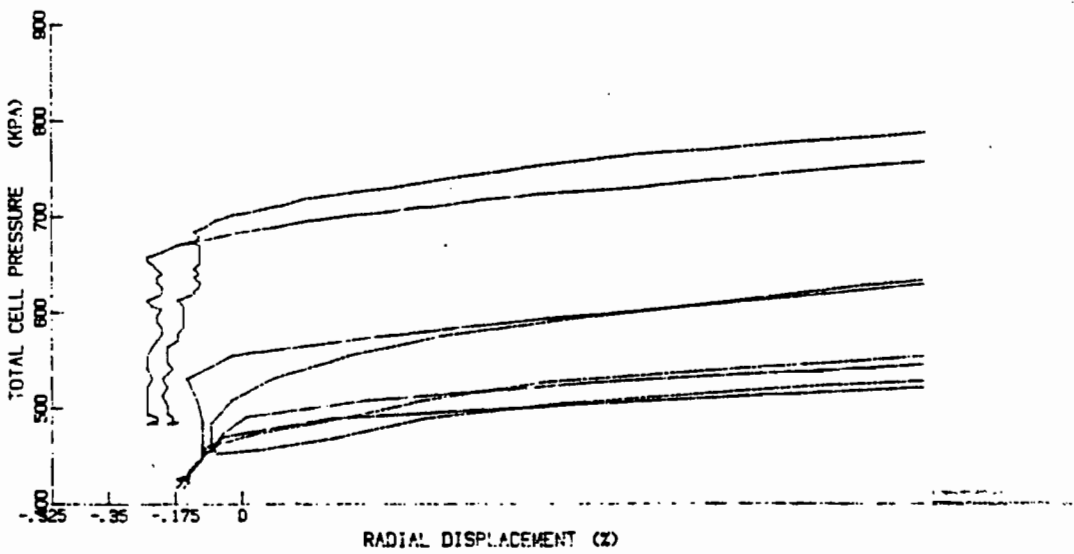
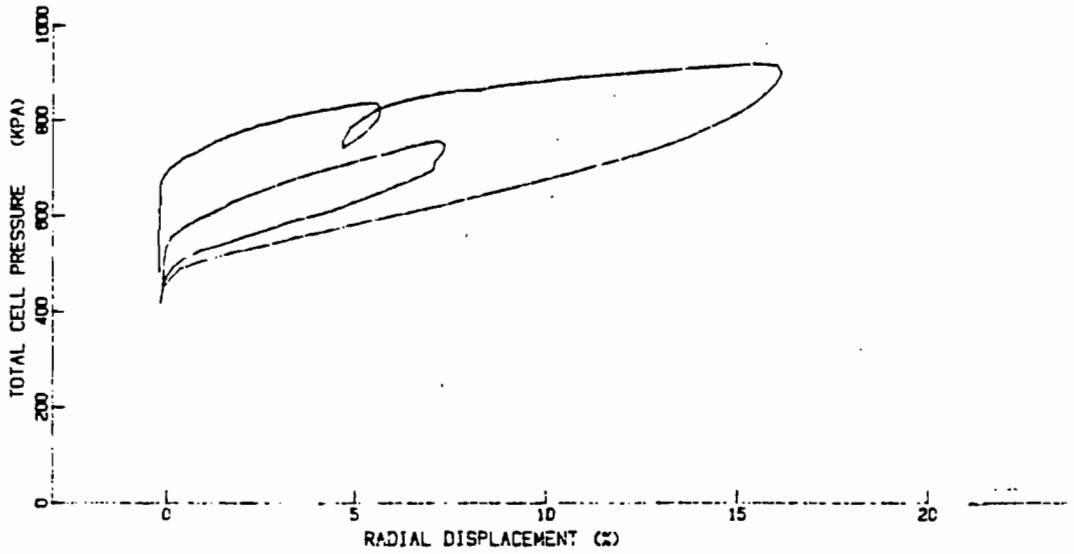
Test: B

Depth: 40.5 FEET

Average of area: 283

File: AMB4P10100

Date: 12 SEP 84





Site: AMAULIGAK (N)

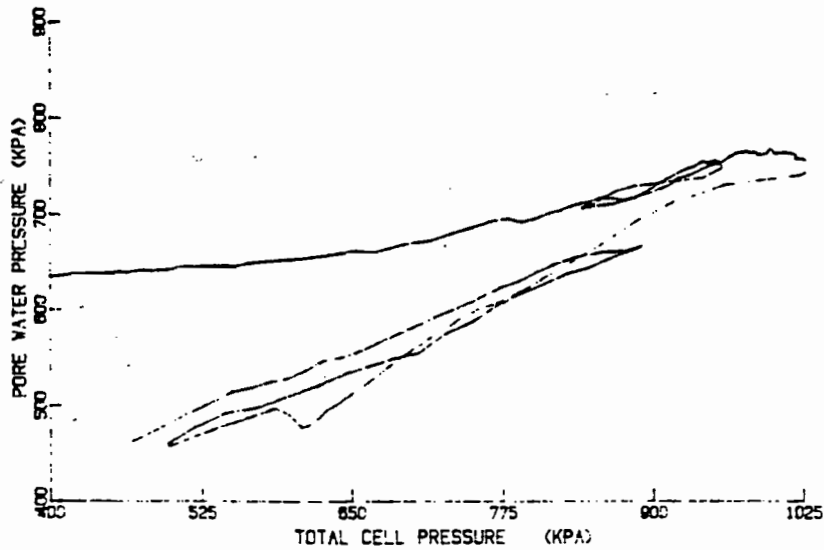
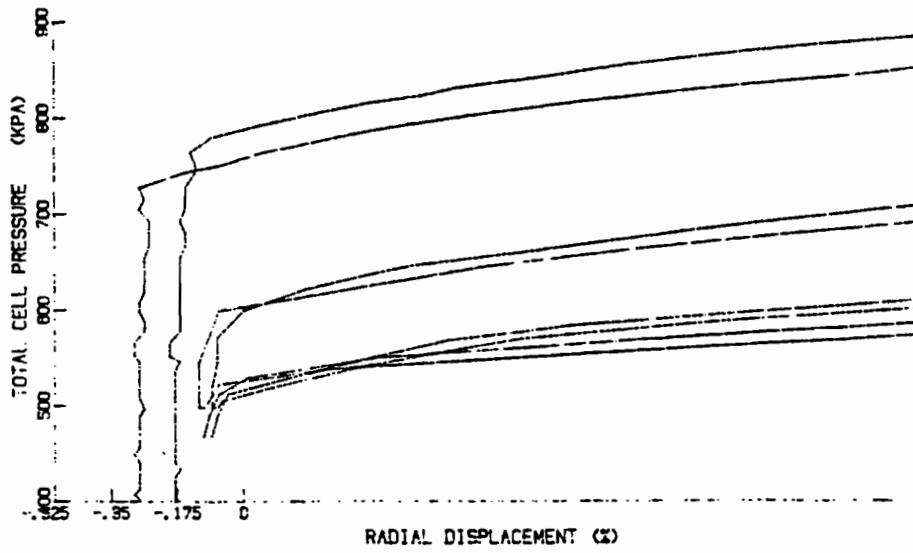
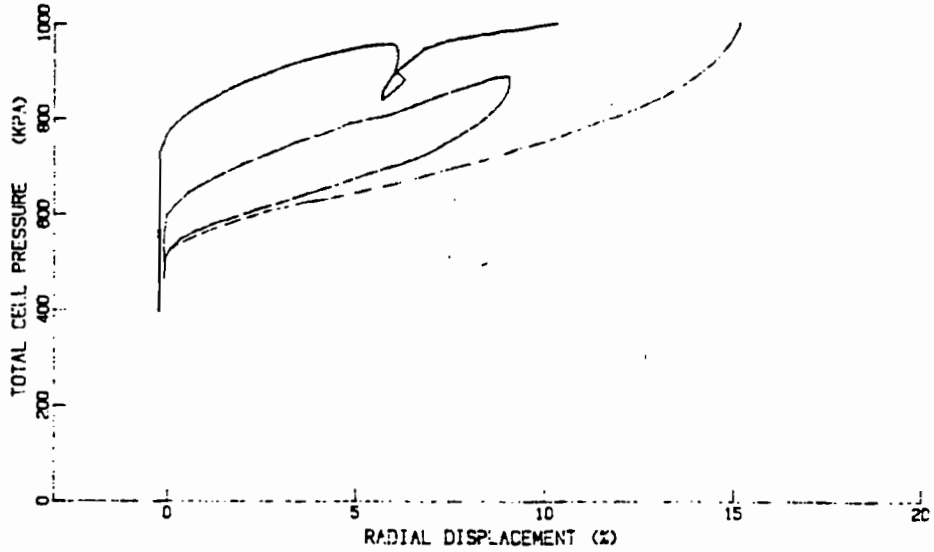
Test : 9

Depth: 45.5 FEET

Average of area: 283

File: AMB4P10109

Date: 12 SEPT 84



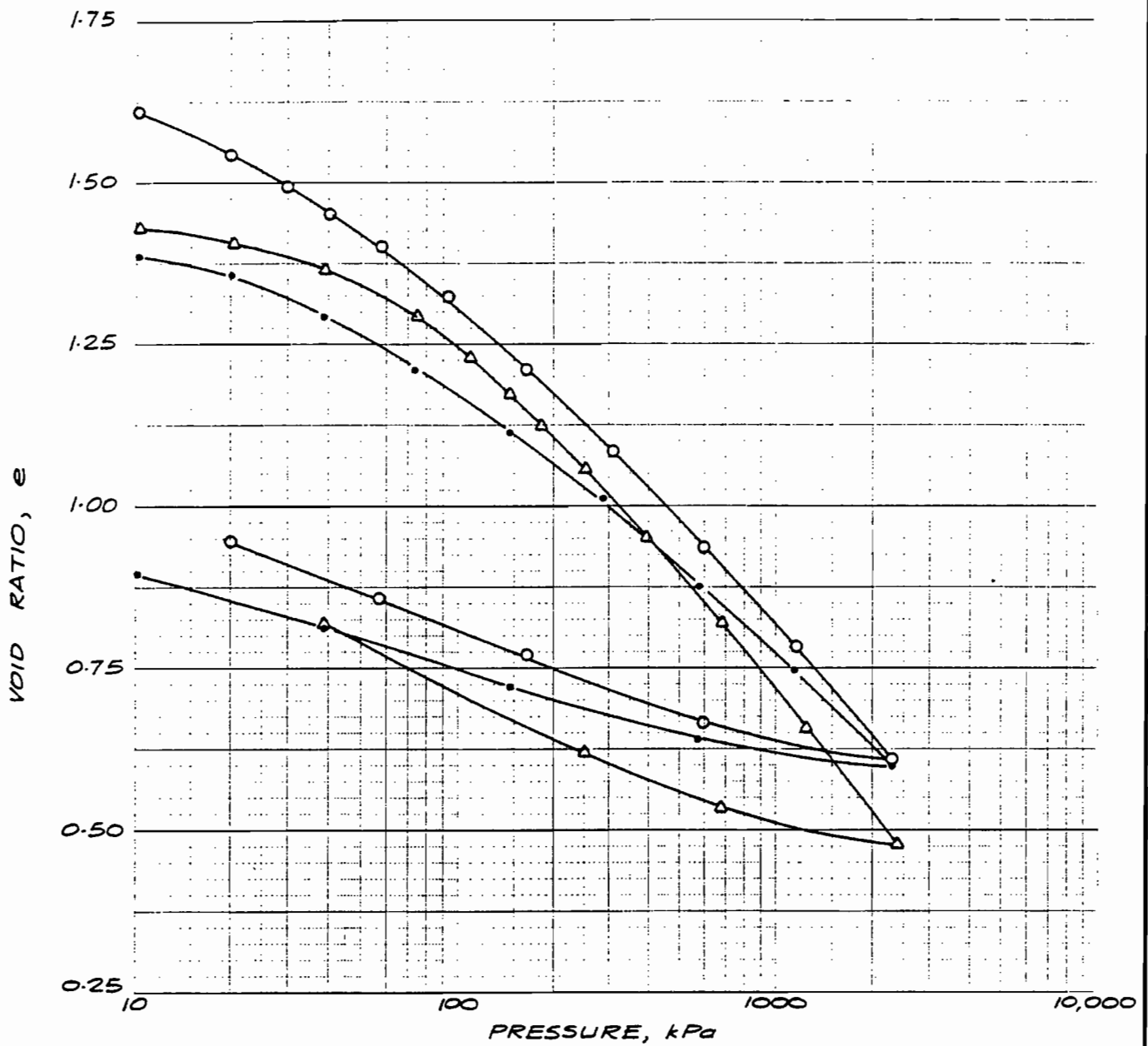
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APPENDIX 6 - Oedometer Test Data

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VOID RATIO - LOG STRESS RELATIONSHIPS

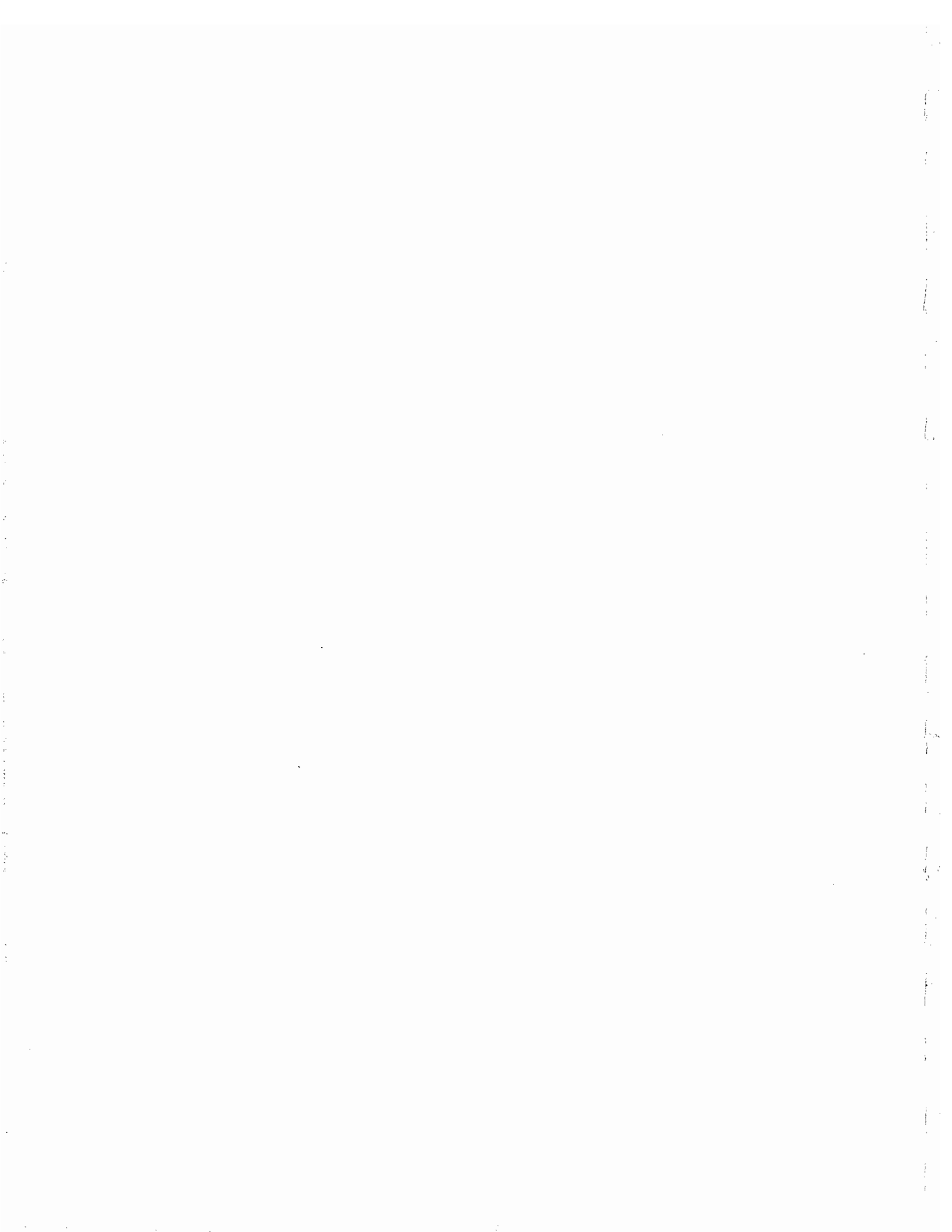
Figure



LEGEND:

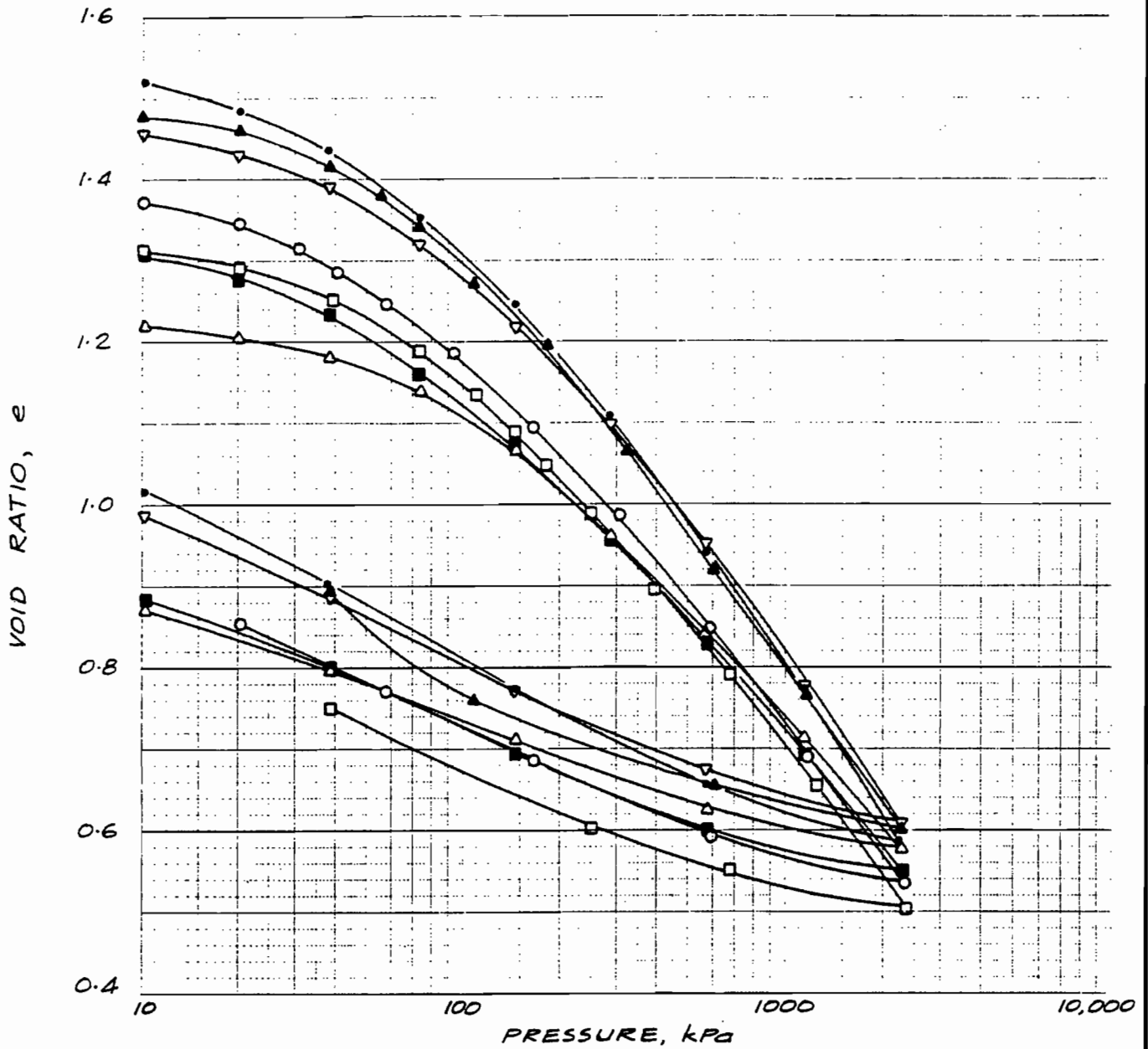
SYMBOL	BOREHOLE	SAMPLE No.	DEPTH (m)	Wn (%)	e ₀	UNIT
●	AE845101	3H	2.13	51.70	1.406	I _a
○	↓	4H	3.15	62.30	1.695	I _a
△	↓	16H	14.24	53.10	1.444	I _b

Project No. 052-2007 Drawn RK Reviewed Date JUNE '85



VOID RATIO - LOG STRESS RELATIONSHIPS

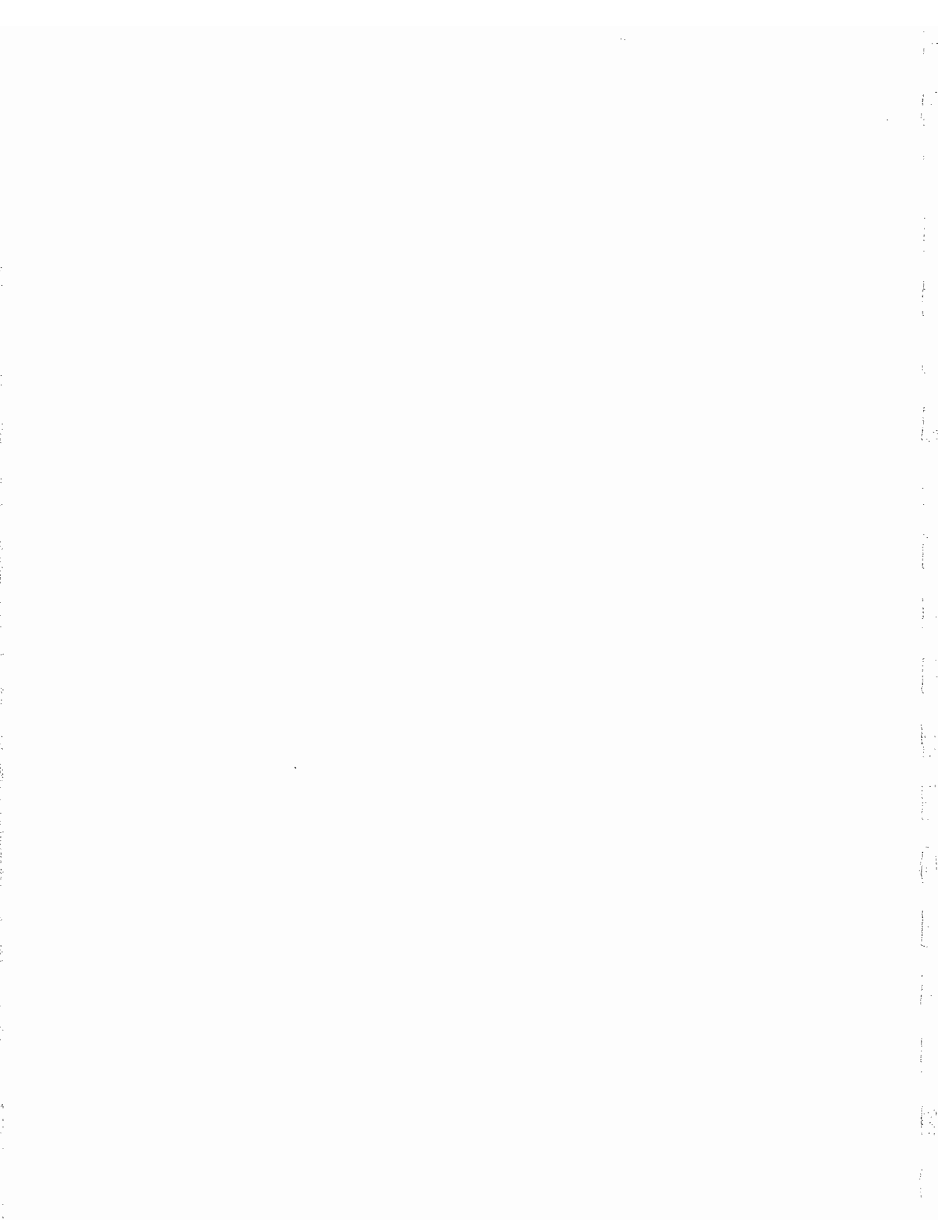
Figure



LEGEND:

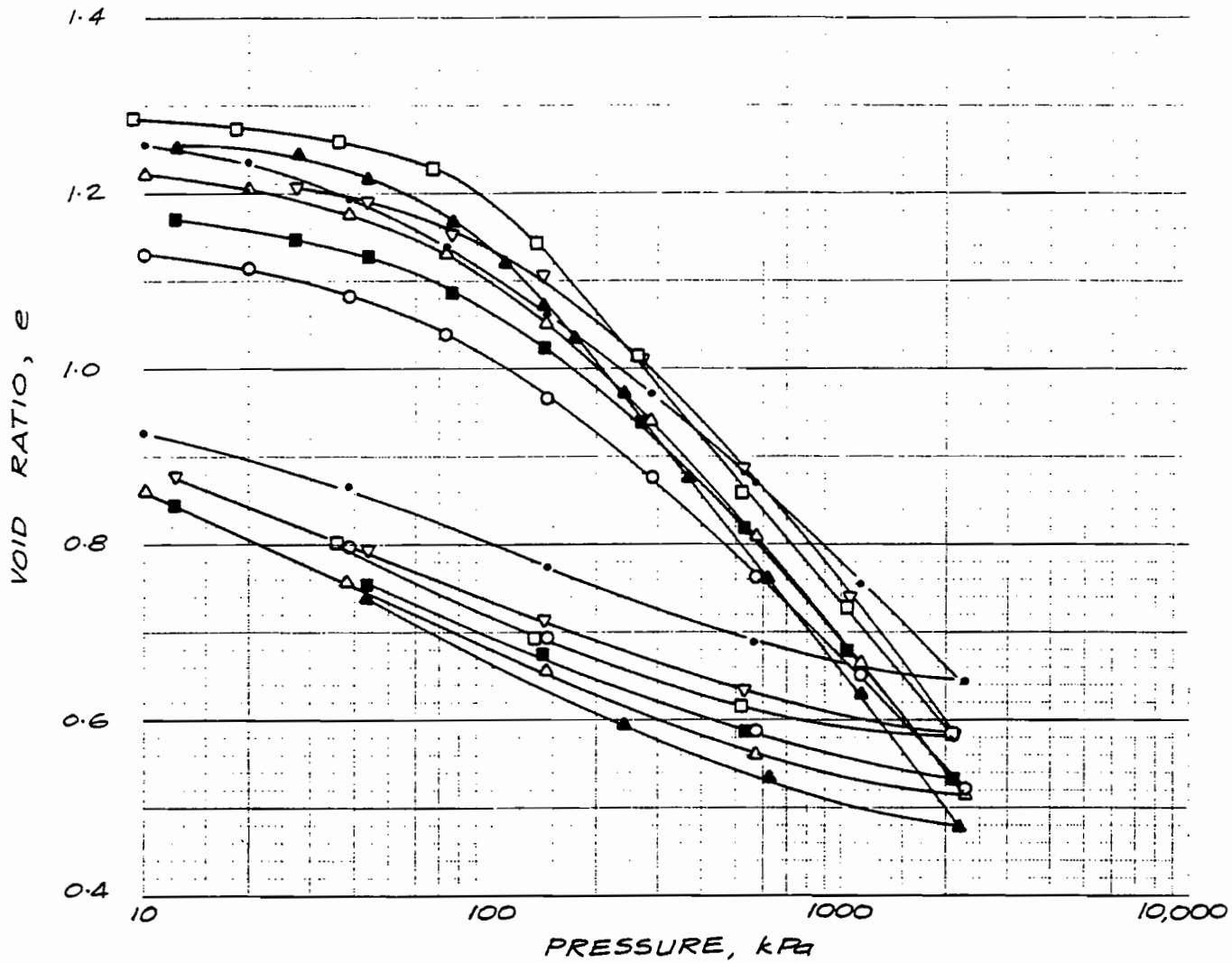
<u>SYMBOL</u>	<u>BOREHOLE</u>	<u>SAMPLE No.</u>	<u>DEPTH (m)</u>	<u>Wn(%)</u>	<u>e₀</u>	<u>UNIT</u>
•	AE845101	6H	4.79	56.20	1.529	lb
○	↓	7H	5.89	50.80	1.382	↓
△		9H	7.61	45.20	1.229	
▲		10H	8.67	55.70	1.515	
□		11H	9.63	49.10	1.336	
■		13H	11.40	48.96	1.332	
▽		14H	12.26	54.20	1.474	

Project No. 852-2007 Drawn RK Reviewed Date JUNE 85



VOID RATIO - LOG STRESS RELATIONSHIPS

Figure



LEGEND:

<u>SYMBOL</u>	<u>BOREHOLE</u>	<u>SAMPLE No.</u>	<u>DEPTH (m)</u>	<u>Wn(%)</u>	<u>e₀</u>	<u>UNIT</u>
•	AW845101	2H	2.78	46.50	1.265	I _a
○		4H	6.03	42.00	1.142	I _b
△		6H	8.85	45.40	1.235	↓
▲		7H	10.52	46.60	1.268	
□		9H	13.54	48.00	1.306	
■	AD845105	2H	9.93 - 9.87	43.60	1.186	↓
▽	AMB45105	2H	3.86 - 3.88	44.80	1.219	

Project No. 852-2007 Drawn RK Reviewed Date JUNE '85

CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: AES01
 SAMPLE: 3V
 DEPTH: 1.95-2.10 M

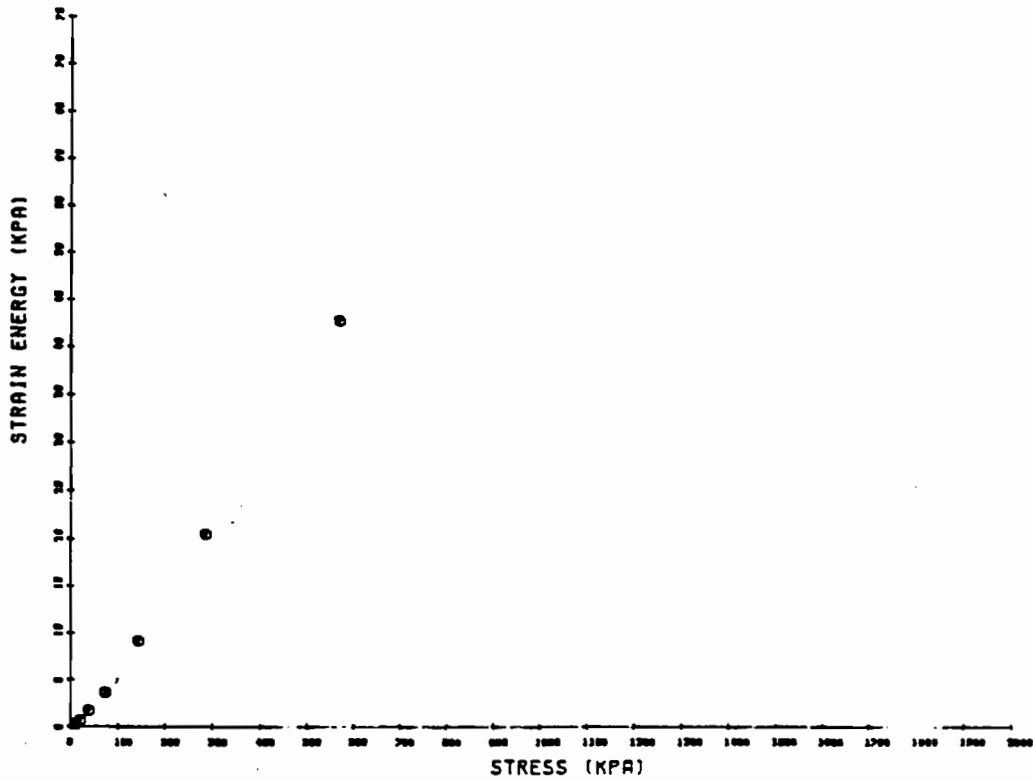
DIAMETER OF SAMPLE = 4.95 CM
 HEIGHT OF SAMPLE = 11.26 MM
 WATER CONTENT = 56.20 %
 WEIGHT OF SOLIDS = 23.01 GMS
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	RI-RO MM
10.0	1.442	3.42E-04	3.43E-03	1.15E-07	0.17	3.43	0.11
20.0	1.371	2.47E-04	2.82E-03	6.85E-08	0.60	6.25	0.01
38.0	1.280	2.43E-04	1.98E-03	4.72E-08	1.63	9.81	0.02
73.0	1.190	4.12E-04	1.02E-03	4.12E-08	3.61	13.38	0.02
144.0	1.061	4.42E-04	7.19E-04	3.12E-08	9.15	18.48	0.03
286.0	0.929	6.26E-04	3.68E-04	2.26E-08	20.39	23.71	0.03
570.0	0.798	7.95E-04	1.83E-04	1.43E-08	42.64	28.91	0.04
1138.0	0.644	6.96E-04	1.07E-04	7.30E-09	94.52	34.99	0.05
2273.0	0.472	7.35E-04	6.01E-05	4.32E-09	%210.77	41.80	0.05
570.0	0.533	1.29E-03	1.42E-05	1.79E-09	%176.33	39.38	-0.09
144.0	0.639	3.51E-04	9.88E-05	3.40E-09	%161.30	35.17	-0.05
38.0	0.751	1.46E-04	4.18E-04	5.99E-09	%157.26	30.74	-0.03
10.0	0.851	5.63E-05	1.40E-03	7.74E-09	%156.32	26.81	-0.01

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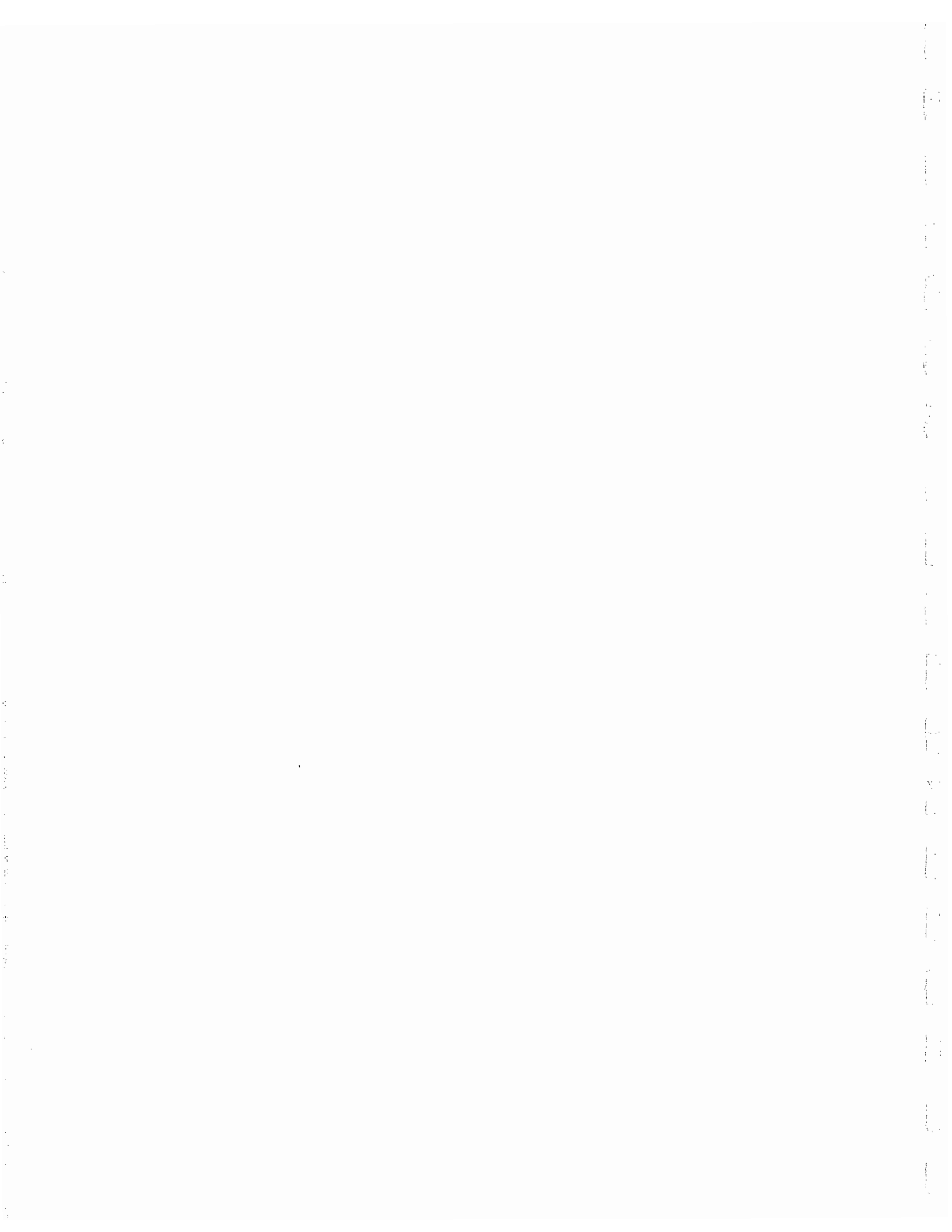
STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BP: RES01 SA: 3V DEPTH: 1.95-2.10 M

Project No. 852-2007 Drawn C9 Reviewed _____ Date JUNE 05



CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: AE845101
 SAMPLE: 3H
 DEPTH: 2.13 M

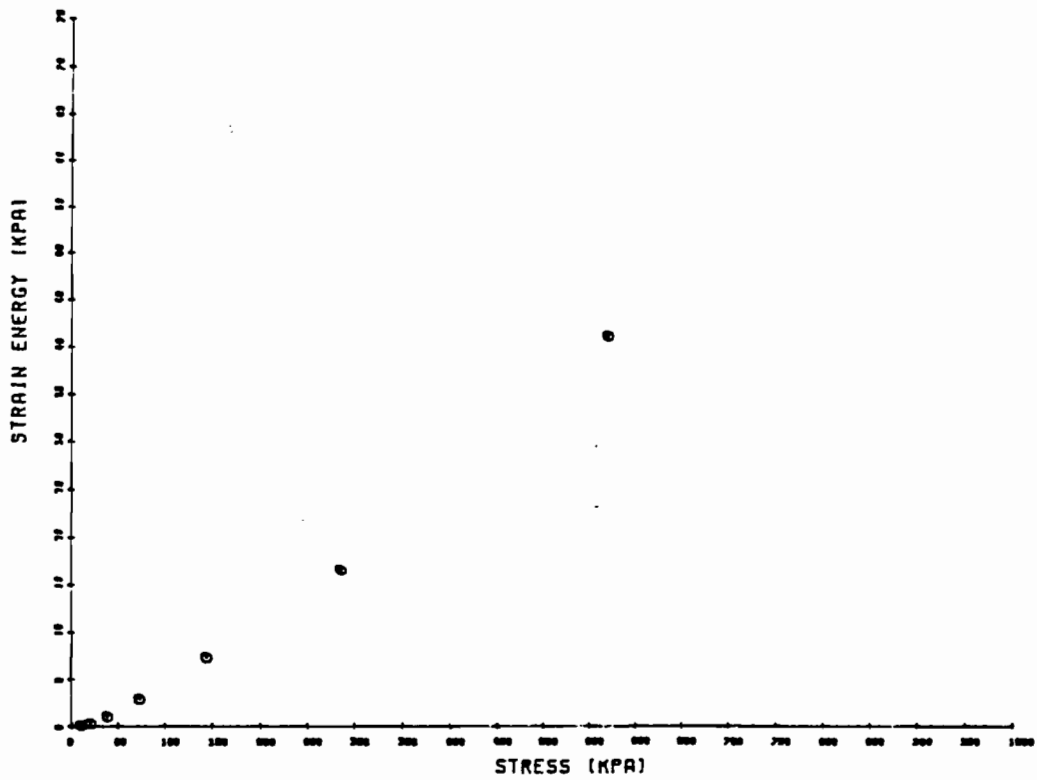
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.92 MM
 WATER CONTENT = 51.70 %
 INITIAL VOID RATIO = 1.406
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	SIRAIN %	R1-R0 MM
10.0	1.391	8.75E-04	6.21E-04	5.33E-08	0.03	0.62	0.04
20.0	1.359	4.26E-04	1.33E-03	5.53E-08	0.23	1.95	0.74
38.0	1.296	4.11E-04	1.46E-03	5.89E-08	0.99	4.58	0.01
73.0	1.215	4.98E-04	9.66E-04	4.72E-08	2.87	7.96	0.02
144.0	1.118	5.38E-04	5.67E-04	2.99E-08	7.24	11.99	0.03
296.0	1.014	8.30E-04	3.04E-04	2.47E-08	16.52	16.30	0.01
570.0	0.876	6.71E-04	2.01E-04	1.32E-08	40.97	22.02	0.04
1138.0	0.748	7.61E-04	9.42E-05	7.02E-09	86.64	27.36	0.04
2273.0	0.601	9.21E-04	5.38E-05	4.86E-09	190.86	33.48	0.04
570.0	0.641	3.35E-04	9.74E-06	3.20E-10	167.29	31.82	-0.12
144.0	0.721	1.44E-04	7.83E-05	1.11E-09	155.38	28.48	-0.06
38.0	0.813	1.10E-04	3.62E-04	3.91E-09	151.89	24.64	-0.03
10.0	0.900	5.23E-05	1.28E-03	6.58E-09	151.03	21.05	-0.01

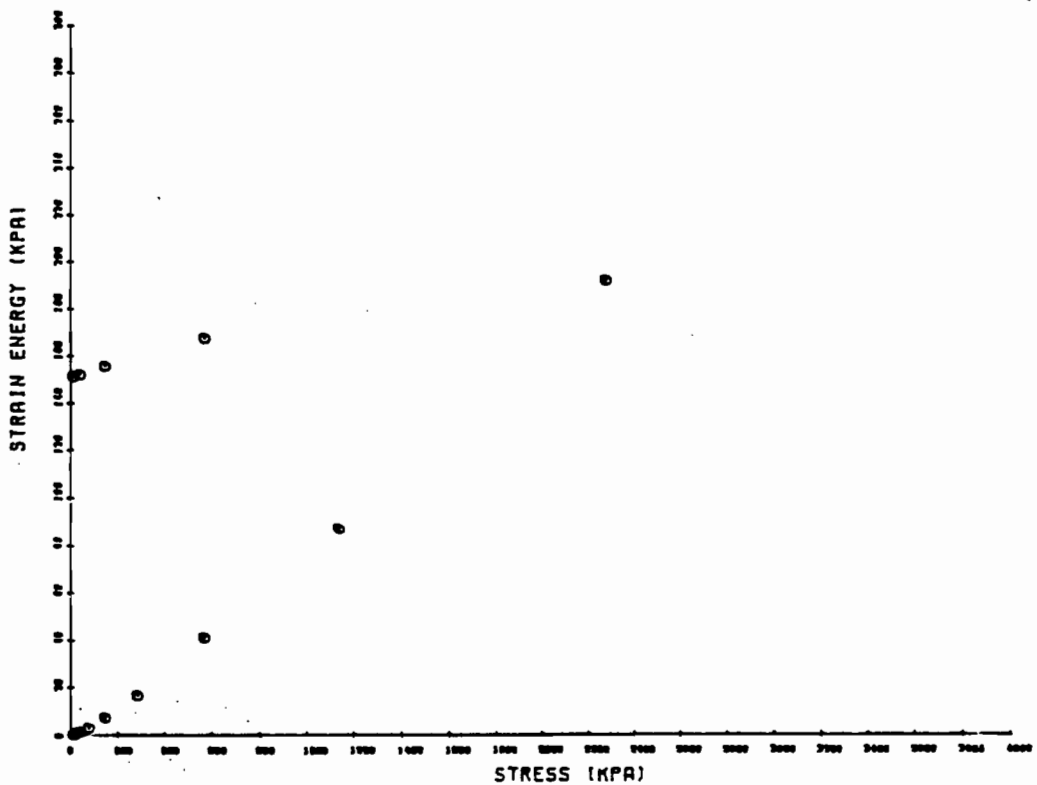
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AE845101 SA: 3H DEPTH: 2.13 M



PROJ: 852-2007 BH: AE845101 SA: 3H DEPTH: 2.13 M

Project No 852-2007 Drawn Cg Revised _____ Date JUNE '85



CONSOLIDATION TEST

PROJECT: B52-2007
 BOREHOLE: AE84S101
 SAMPLE: 4V
 DEPTH: 2.96-3.01M

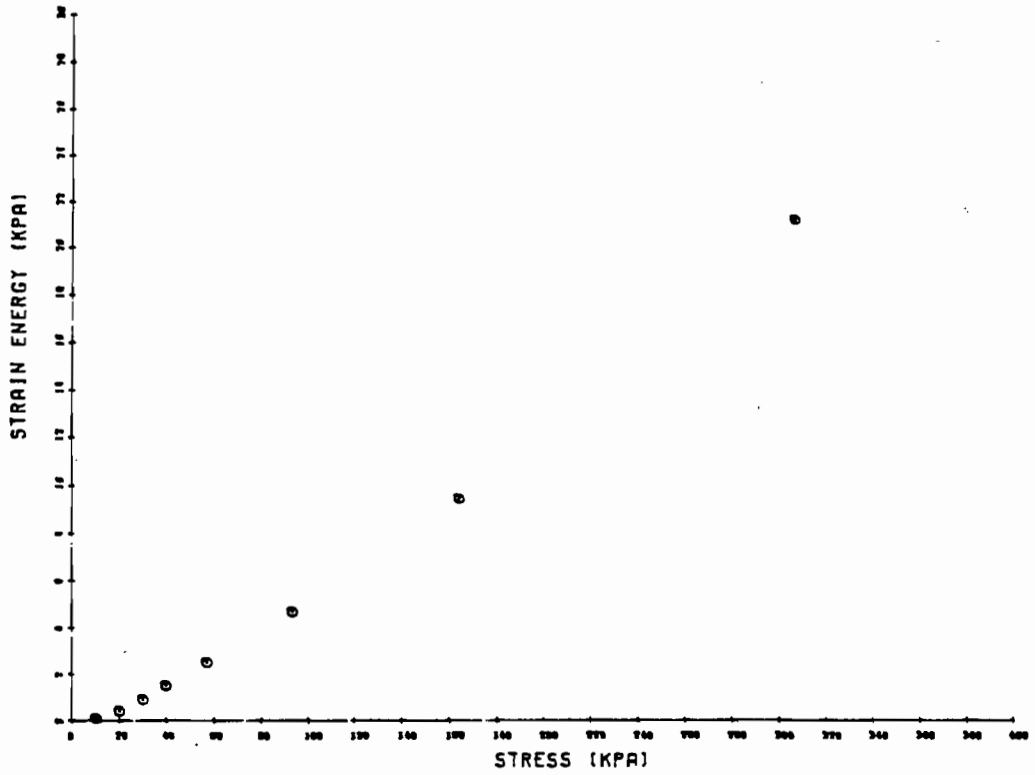
DIAMETER OF SAMPLE = 4.95 CM
 HEIGHT OF SAMPLE = 11.26 MM
 WATER CONTENT = 62.10 %
 INITIAL VOID RATIO = 1.689
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	E CM/SEC	SE KPA	STRAIN %	F1-R0 MM
10.0	1.641	4.84E-04	1.78E-03	8.43E-08	0.09	1.78	0.03
20.0	1.588	3.13E-04	2.00E-03	6.13E-08	0.39	3.78	0.01
30.0	1.534	2.31E-04	1.99E-03	4.51E-08	0.89	5.77	0.01
40.0	1.488	1.85E-04	1.70E-03	3.07E-08	1.48	7.47	0.00
57.0	1.433	2.93E-04	1.20E-03	3.45E-08	2.47	9.51	0.00
93.0	1.355	4.01E-04	8.15E-04	3.20E-08	4.67	12.44	0.02
164.0	1.255	5.90E-04	5.19E-04	3.00E-08	9.41	16.13	0.03
306.0	1.122	6.95E-04	3.50E-04	2.38E-08	21.08	21.09	0.02
590.0	0.966	6.79E-04	2.05E-04	1.36E-08	47.12	26.90	0.05
1158.0	0.802	7.30E-04	1.07E-04	7.68E-09	100.45	33.01	0.05
2293.0	0.634	7.70E-04	5.48E-05	4.14E-09	207.25	39.23	0.05
590.0	0.691	8.98E-04	1.23E-05	1.09E-09	177.53	37.13	-0.07
164.0	0.798	3.13E-04	9.37E-05	2.88E-09	162.48	33.14	-0.05
57.0	0.892	1.77E-04	3.25E-04	5.64E-09	158.64	29.66	-0.02
20.0	0.977	6.44E-05	8.57E-04	5.41E-09	157.42	26.49	-0.02

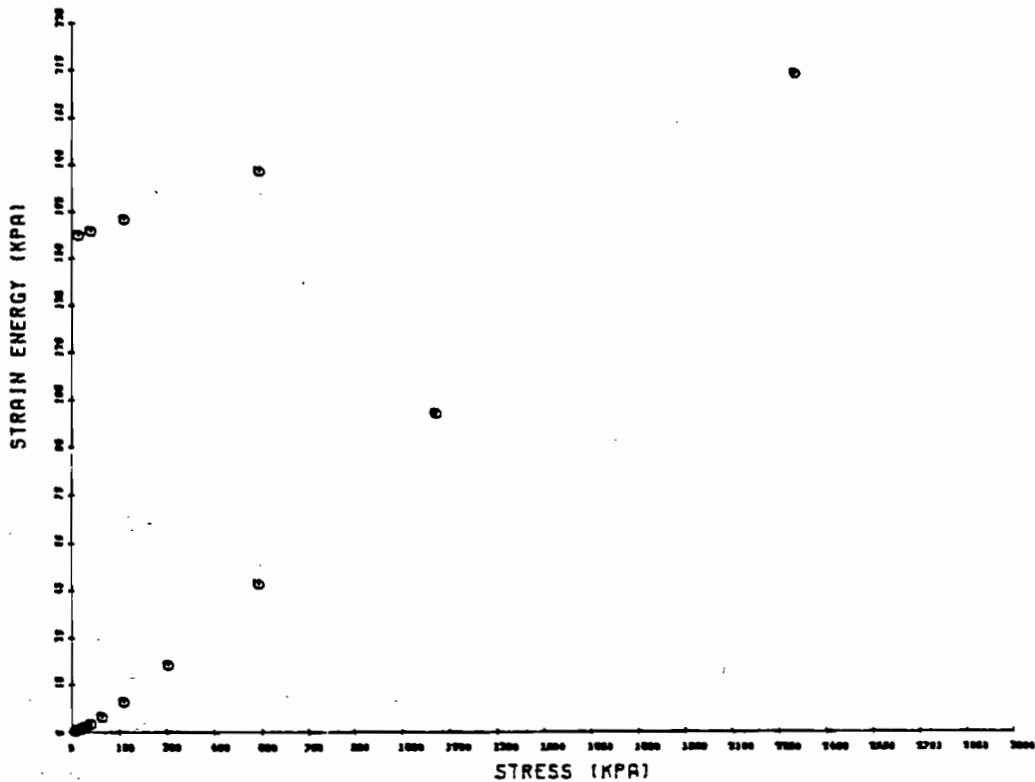


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AE84SI01 SA: 4V DEPTH: 2.96-3.01M



PROJ: 852-2007 BH: AE84SI01 SA: 4V DEPTH: 2.96-3.01M

Project No 852-2007 Drawn Cg Reviewed Date JUNE 05



CONSOLIDATION TEST

PROJECT: SES-2007
 BOREHOLE: A5848101
 SAMPLE: 4 H
 DEPTH: 3.15

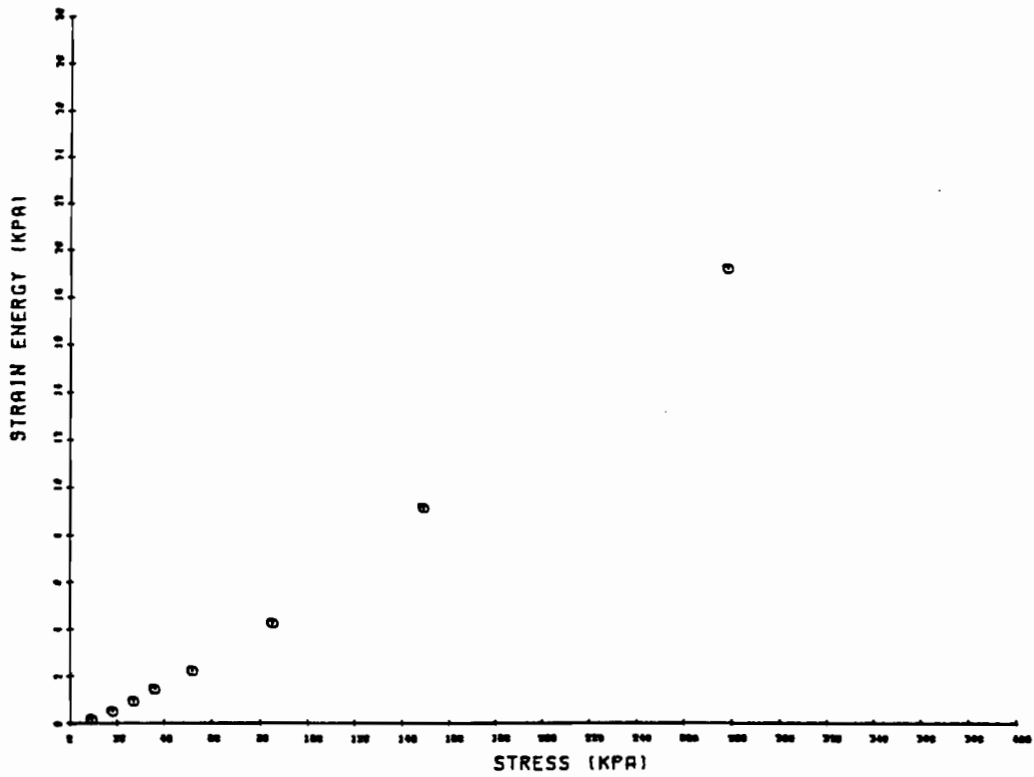
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.92 MM
 WATER CONTENT = 62.30 %
 INITIAL VOID RATIO = 1.695
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	L CM/SEC	SE KPA	STRAIN %	E1-E0 MM
9.0	1.613	2.48E-04	3.36E-03	8.16E-08	0.14	3.02	0.03
18.0	1.546	2.73E-04	2.78E-03	7.43E-08	0.47	5.52	0.02
27.0	1.495	2.47E-04	2.08E-03	5.04E-08	0.90	7.40	0.01
36.0	1.450	1.46E-04	1.85E-03	2.65E-08	1.42	9.06	0.01
52.0	1.404	3.80E-04	1.09E-03	4.02E-08	2.18	10.79	0.00
85.0	1.324	4.10E-04	9.01E-04	3.62E-08	4.22	13.75	0.01
149.0	1.211	4.40E-04	6.52E-04	2.81E-08	9.10	17.94	0.01
278.0	1.085	5.48E-04	3.64E-04	1.95E-08	19.12	22.63	0.02
536.0	0.933	4.82E-04	2.18E-04	1.03E-08	41.99	28.25	0.04
1053.0	0.781	6.46E-04	1.09E-04	6.91E-09	86.78	33.89	0.02
2085.0	0.604	5.54E-04	6.36E-05	3.46E-09	189.83	40.45	0.01
536.0	0.664	2.46E-04	1.42E-05	3.43E-10	160.97	38.25	-0.09
149.0	0.770	1.68E-04	1.02E-04	1.68E-09	147.45	34.30	-0.02
52.0	0.856	1.38E-04	3.29E-04	4.44E-09	144.24	31.11	-0.02
18.0	0.948	6.70E-05	9.97E-04	6.55E-09	143.05	27.72	-0.01

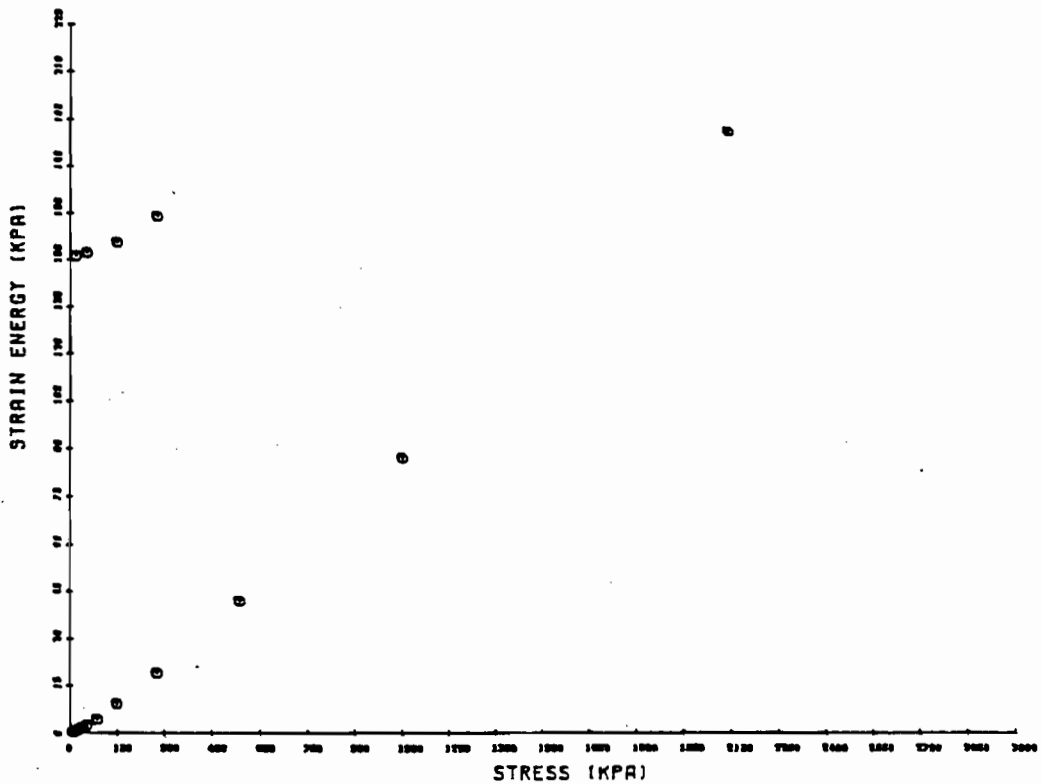
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure

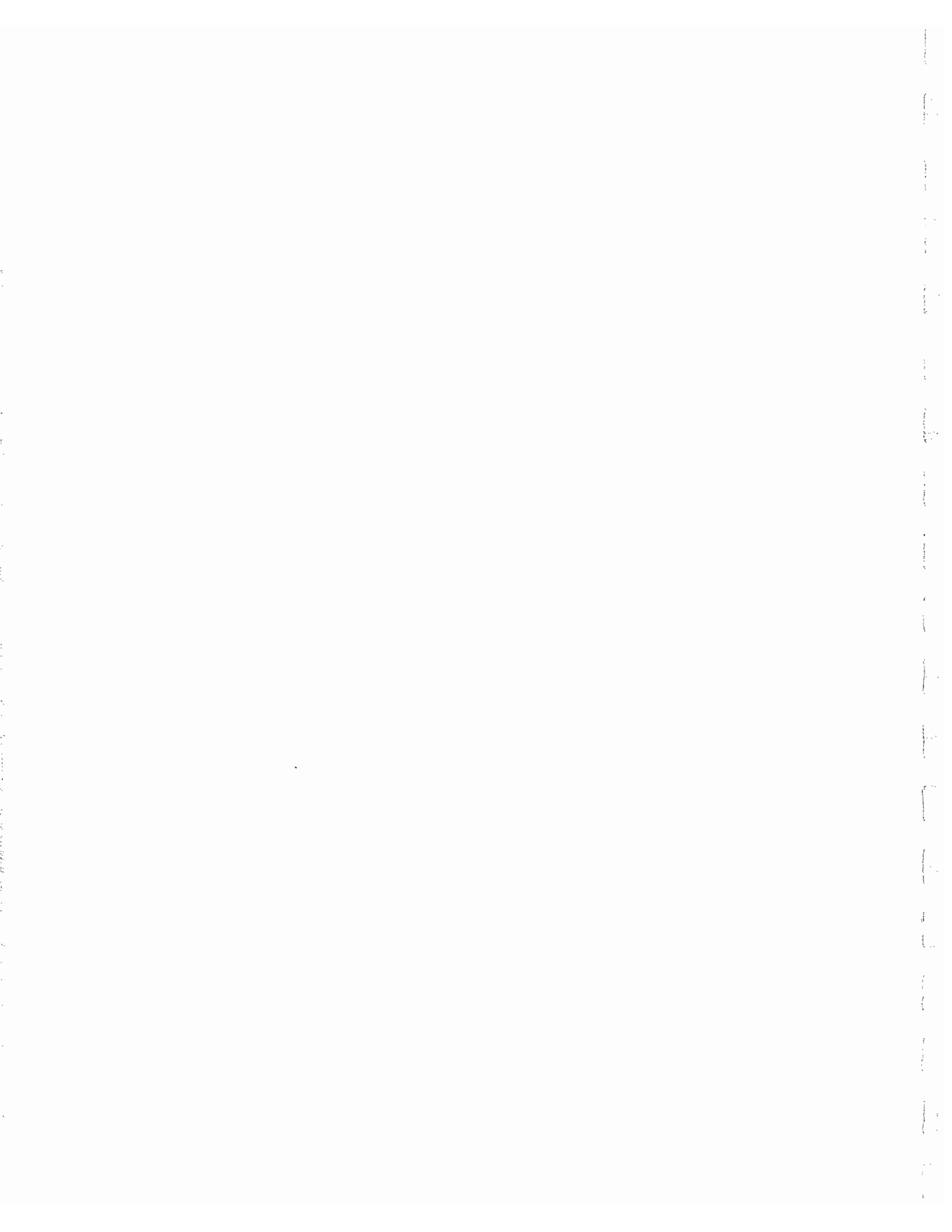


PROJ: 852-2007 BH: AE84S101 SA: 4 H DEPTH: 3.15



PROJ: 852-2007 BH: AE84S101 SA: 4 H DEPTH: 3.15M

Project No 852-2007 Draw C9 Reviewed _____ Date JUNE 05

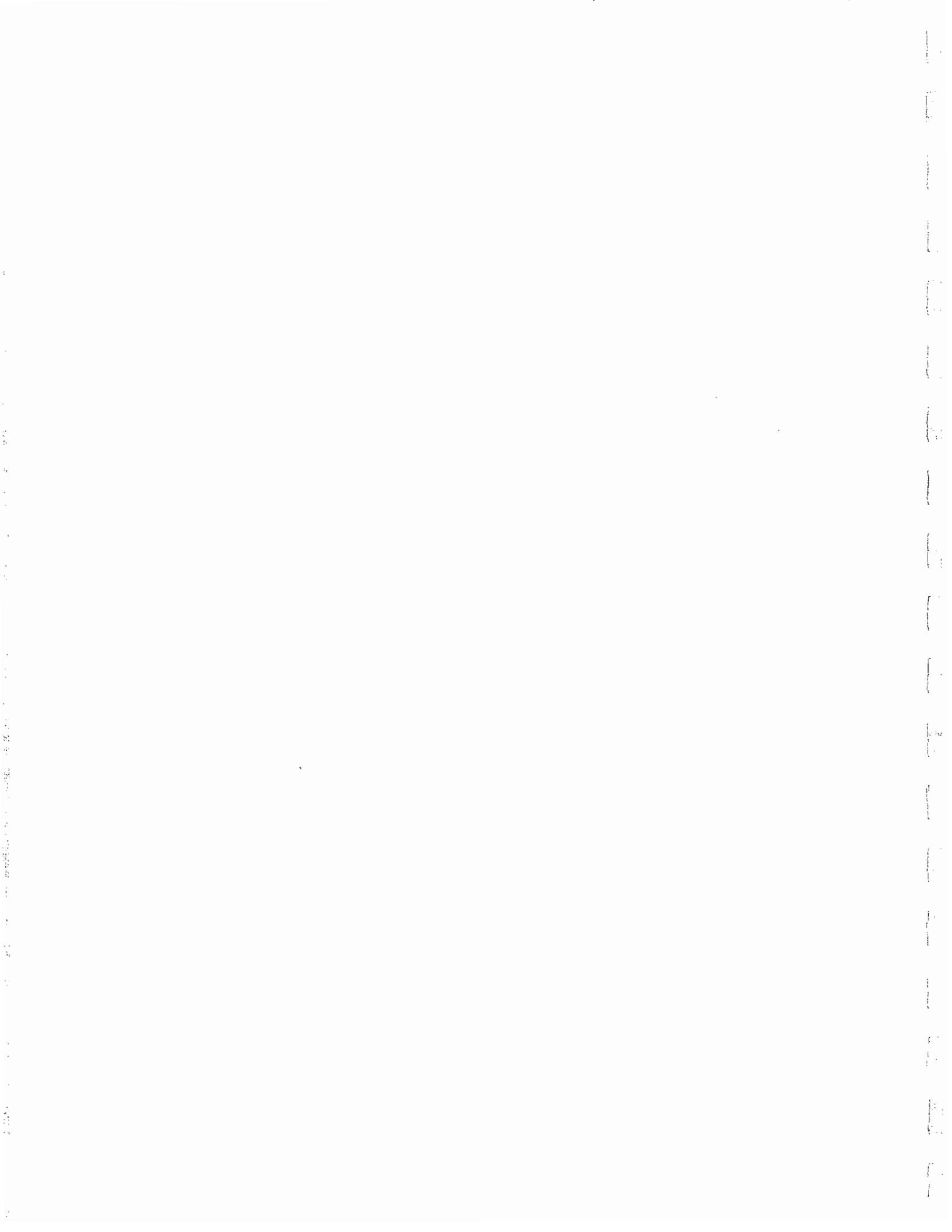


CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: AE84SI01
 SAMPLE: 6V
 DEPTH: 4.42-4.52M

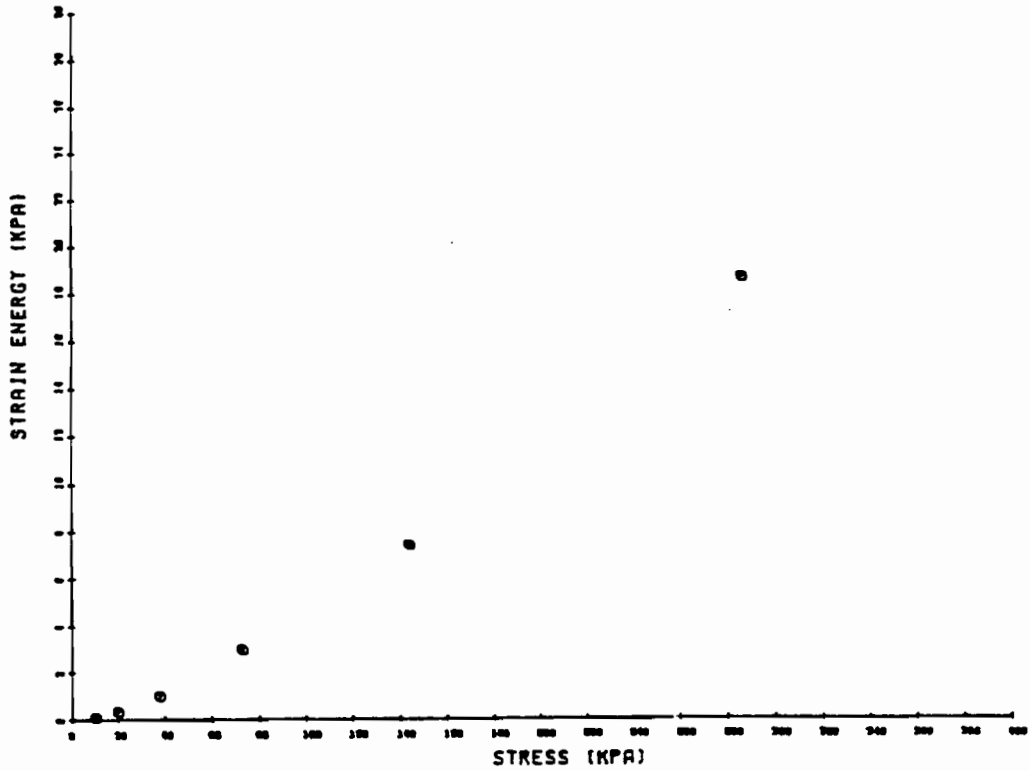
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.92 MM
 WATER CONTENT = 53.90 %
 INITIAL VOID RATIO = 1.466
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	E1-E0 MM
10.0	1.434	5.21E-04	1.31E-03	6.68E-08	0.07	1.31	0.03
20.0	1.396	3.95E-04	1.55E-03	6.02E-08	0.30	2.86	0.01
38.0	1.339	4.07E-04	1.28E-03	5.11E-08	0.97	5.16	0.01
73.0	1.251	5.85E-04	1.02E-03	5.83E-08	2.94	8.72	0.01
144.0	1.150	5.38E-04	5.74E-04	3.02E-08	7.36	12.80	0.01
286.0	1.022	7.47E-04	3.67E-04	2.68E-08	18.56	18.01	0.01
570.0	0.872	6.55E-04	2.14E-04	1.37E-08	44.60	24.09	0.01
1138.0	0.708	6.81E-04	1.17E-04	7.81E-09	101.30	30.73	0.02
2273.0	0.545	7.53E-04	5.82E-05	4.29E-09	213.87	37.33	0.04
570.0	0.597	2.39E-04	1.22E-05	2.86E-10	184.25	35.25	-0.09
144.0	0.695	1.69E-04	9.31E-05	1.55E-09	170.09	31.28	-0.04
38.0	0.811	1.49E-04	4.45E-04	6.50E-09	165.80	26.57	0.02
10.0	0.900	6.43E-05	1.29E-03	8.14E-09	164.93	22.95	-0.00

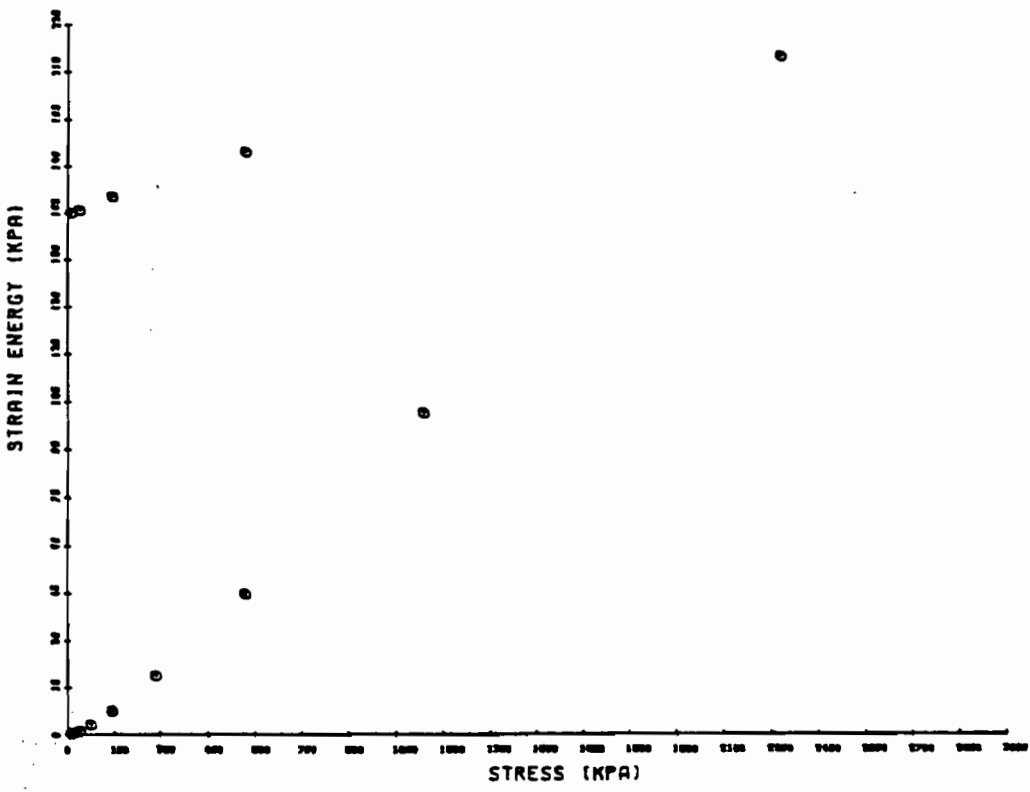


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AE04SI01 SA: 6V DEPTH: 4.42-4.52M



PROJ: 852-2007 BH: AE04SI01 SA: 6V DEPTH: 4.42-4.52M

Project No 852-2007 Drawn C9 Reviewed _____ Date JUNE 05



CONSOLIDATION TEST

PROJECT: 982-2007
 BOREHOLE: ABB46101
 SAMPLE: 6 H
 DEPTH: 4.79

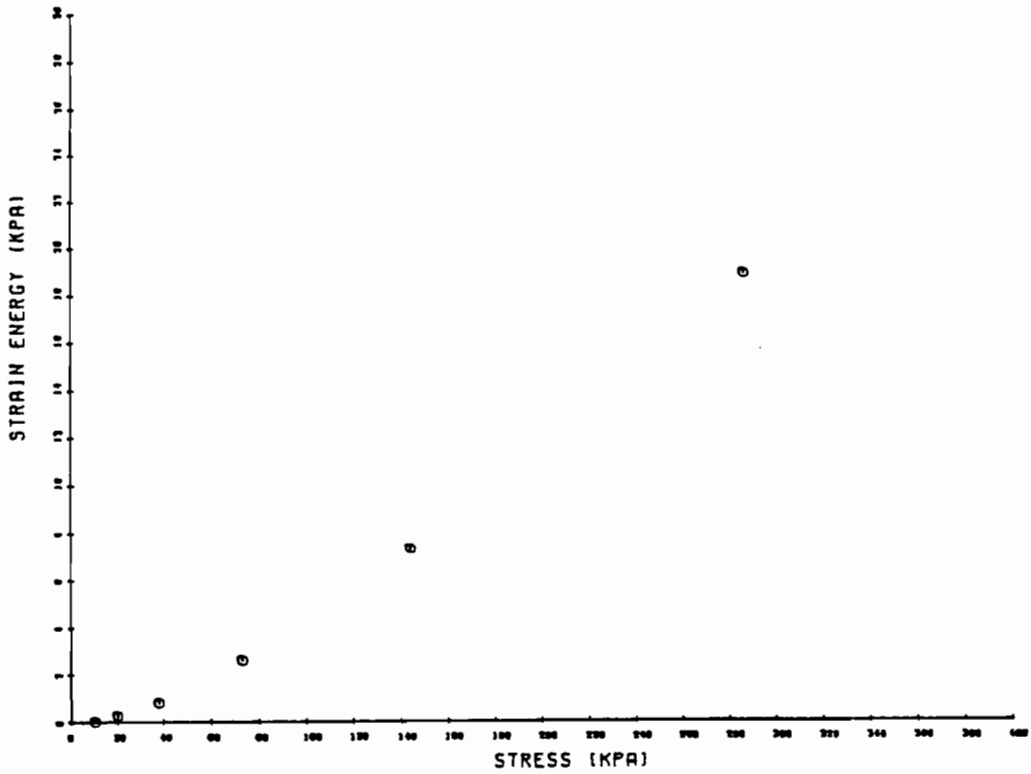
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.40 MM
 WATER CONTENT = 58.20 %
 INITIAL VOID RATIO = 1.529
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	EE-EE M
10.0	1.524	2.93E-03	1.75E-04	5.05E-08	0.01	0.18	0.09
20.0	1.486	3.81E-04	1.50E-03	5.59E-08	0.23	1.67	0.02
38.0	1.439	3.66E-04	1.05E-03	3.75E-08	0.78	3.54	0.05
73.0	1.357	3.44E-04	9.23E-04	3.11E-08	2.57	6.70	0.04
144.0	1.247	1.77E-04	6.13E-04	1.06E-08	7.29	11.13	0.07
286.0	1.112	3.14E-04	3.77E-04	1.16E-08	18.79	16.48	0.02
570.0	0.942	6.04E-04	2.36E-04	1.40E-08	47.48	23.19	0.03
1138.0	0.776	5.50E-04	1.16E-04	6.23E-09	103.63	29.76	0.03
2273.0	0.589	4.62E-04	6.52E-05	2.95E-09	229.74	37.15	0.07
570.0	0.659	2.01E-04	1.63E-05	3.22E-10	190.22	34.37	-0.10
144.0	0.777	8.01E-05	1.09E-04	8.57E-10	173.61	29.72	-0.07
38.0	0.905	7.68E-05	4.77E-04	3.59E-09	169.01	24.66	-0.03
10.0	1.020	5.02E-05	1.63E-03	7.99E-09	167.92	20.11	-0.00

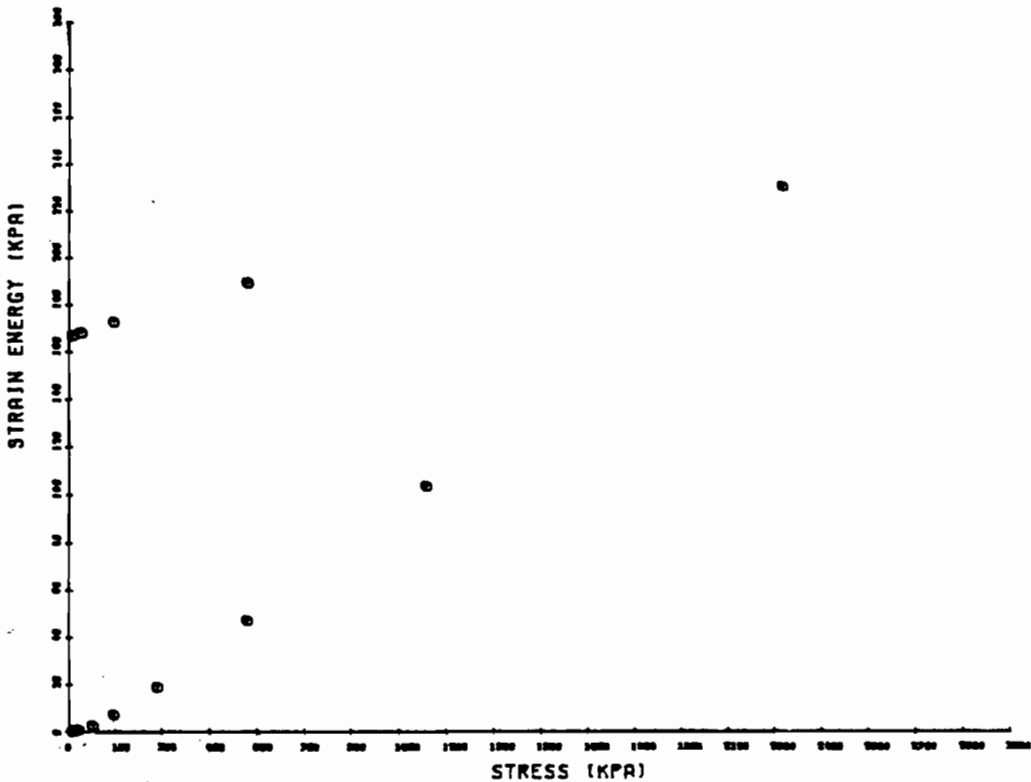
THE UNIVERSITY OF CHICAGO

STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ:852-2007 BH:AE84S101 SA:6 H DEPTH:4.79



PROJ:852-2007 BH:AE84S101 SA:6H DEPTH:4.79M

Project No. 852-2007 Drawn C9 Revised _____ Date JUNE 05

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CONSOLIDATION TEST

PROJECT: B52-2007
 BOREHOLE: AEB4S101
 SAMPLE: 7V
 DEPTH: 5.8-5.85M

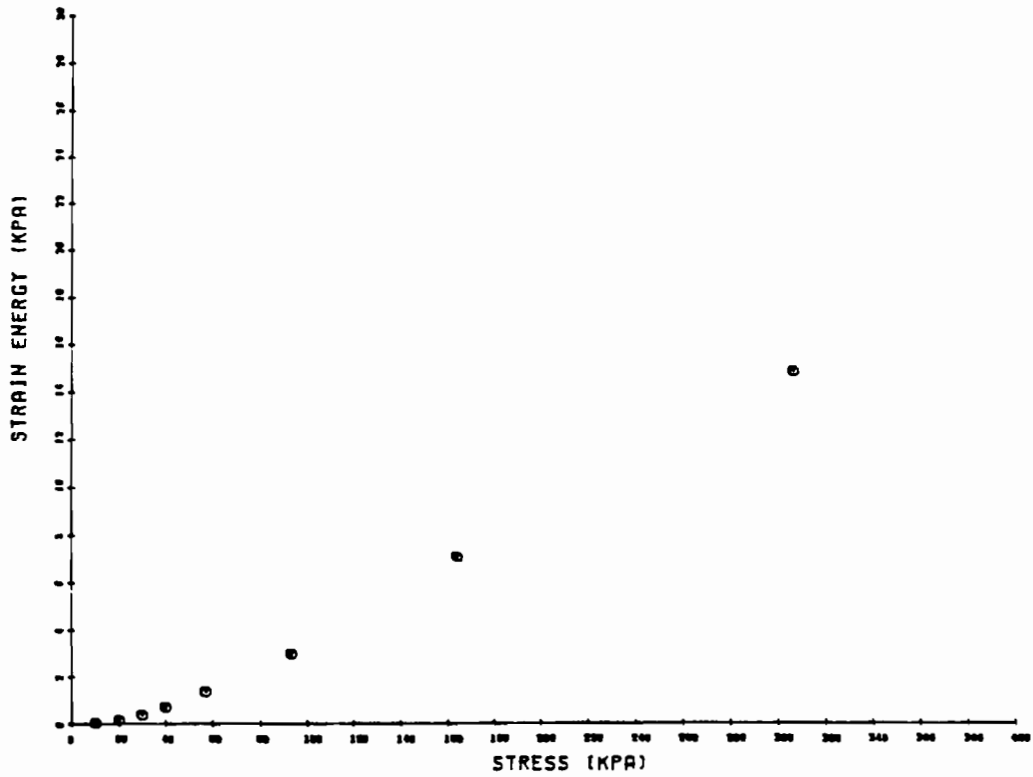
DIAMETER OF SAMPLE = 4.95 CM
 HEIGHT OF SAMPLE = 11.26 MM
 WATER CONTENT = 51.10 %
 INITIAL VOID RATIO = 1.390
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	RI-SO MM
10.0	1.381	7.89E-03	3.82E-04	2.95E-07	0.02	0.38	0.10
20.0	1.361	1.18E-03	8.38E-04	9.67E-08	0.14	1.22	0.01
30.0	1.341	4.90E-04	8.38E-04	4.02E-08	0.35	2.06	0.01
40.0	1.318	2.40E-04	9.38E-04	2.21E-08	0.68	3.00	0.00
57.0	1.286	4.25E-04	7.87E-04	3.28E-08	1.33	4.33	0.01
93.0	1.234	5.98E-04	6.06E-04	3.55E-08	2.97	6.51	0.02
164.0	1.159	8.40E-04	4.45E-04	3.66E-08	7.02	9.67	0.03
306.0	1.080	1.53E-03	2.31E-04	3.45E-08	14.73	12.95	0.04
590.0	0.948	7.48E-04	1.95E-04	1.43E-08	39.58	18.50	0.04
1158.0	0.796	8.06E-04	1.12E-04	8.83E-09	95.07	24.85	0.04
2293.0	0.651	9.48E-04	5.35E-05	4.97E-09	199.80	30.92	0.06
590.0	0.702	1.42E-03	1.24E-05	1.72E-09	169.31	28.80	-0.09
164.0	0.786	4.59E-04	8.26E-05	3.72E-09	156.05	25.28	-0.05
57.0	0.866	1.82E-04	3.12E-04	5.59E-09	152.35	21.94	-0.02
20.0	0.941	7.43E-05	8.48E-04	6.17E-09	151.14	18.80	-0.01

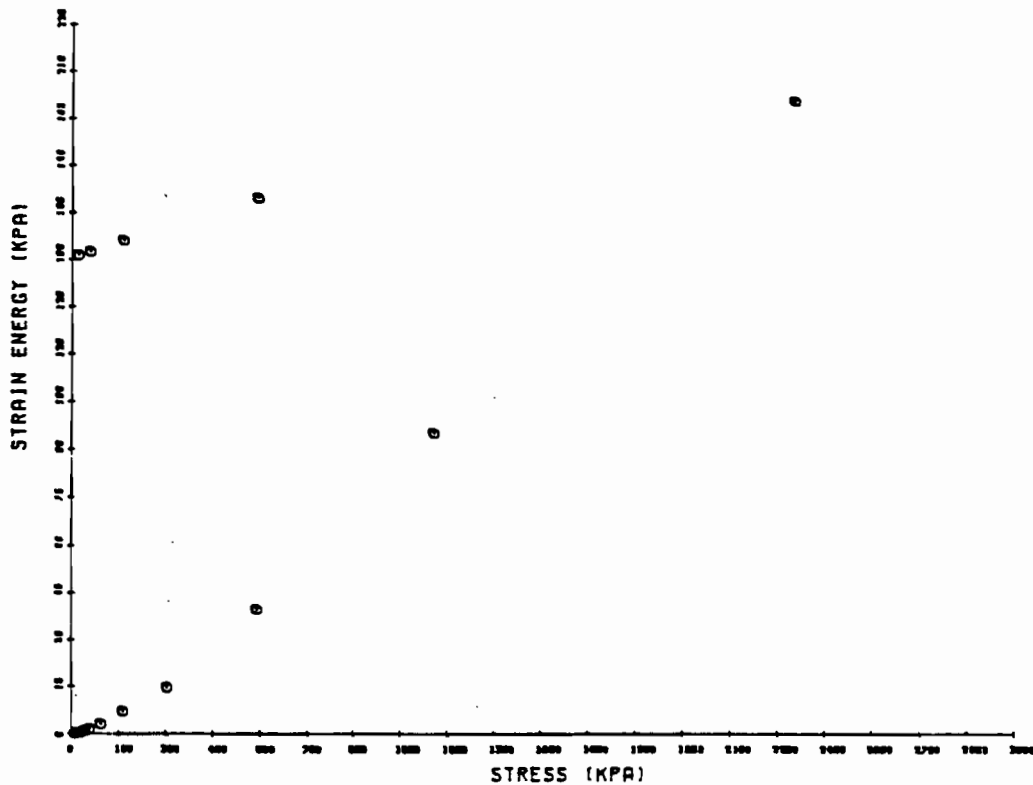


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AE84S101 SA: 7V DEPTH: 5.8-5.85M



PROJ: 852-2007 BH: AE84S101 SA: 7V DEPTH: 5.8-5.85M

Project No. 52-2007 Drawn CG Reviewed _____ Date JUNE 05

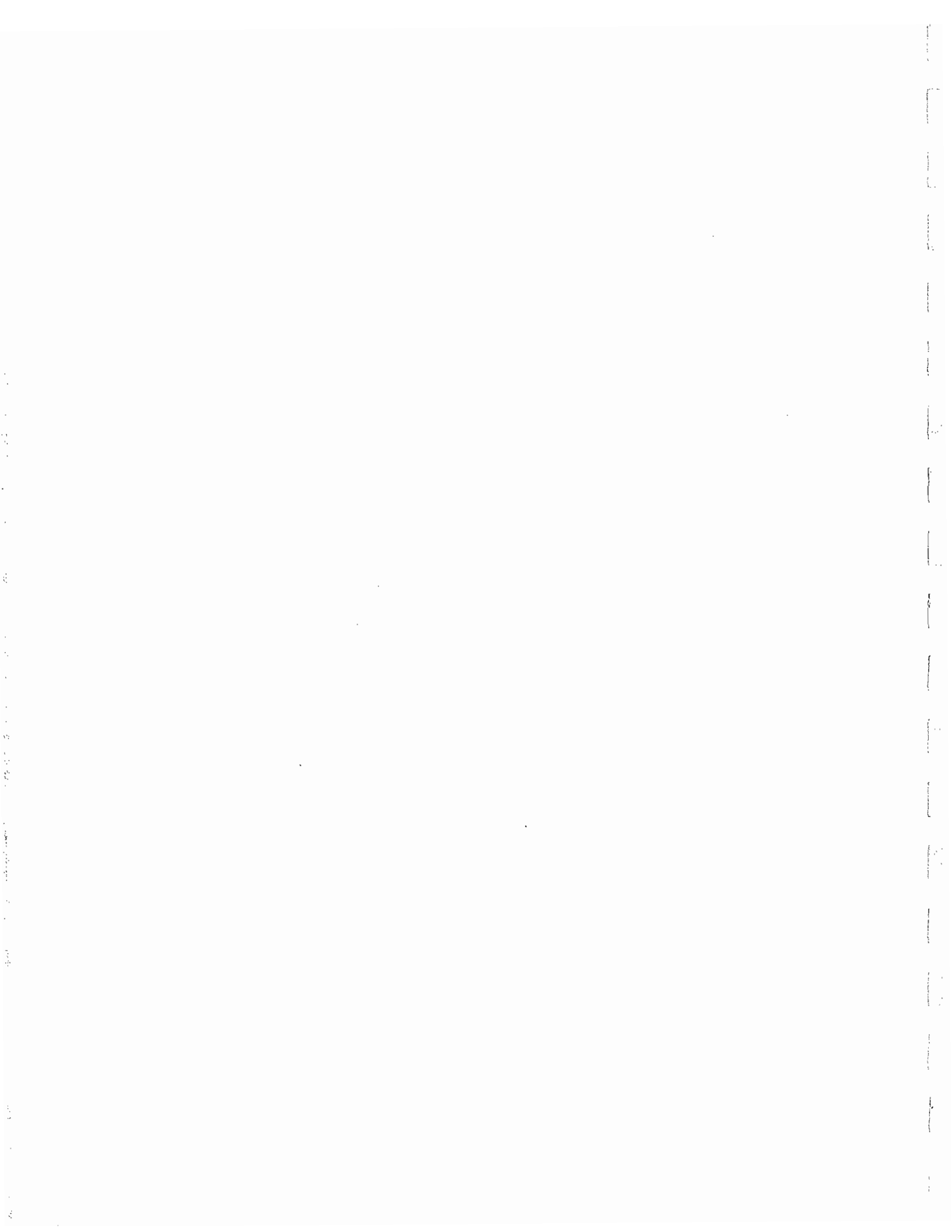


CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: ABB4S101
 SAMPLE: 7H
 DEPTH: 5.87M

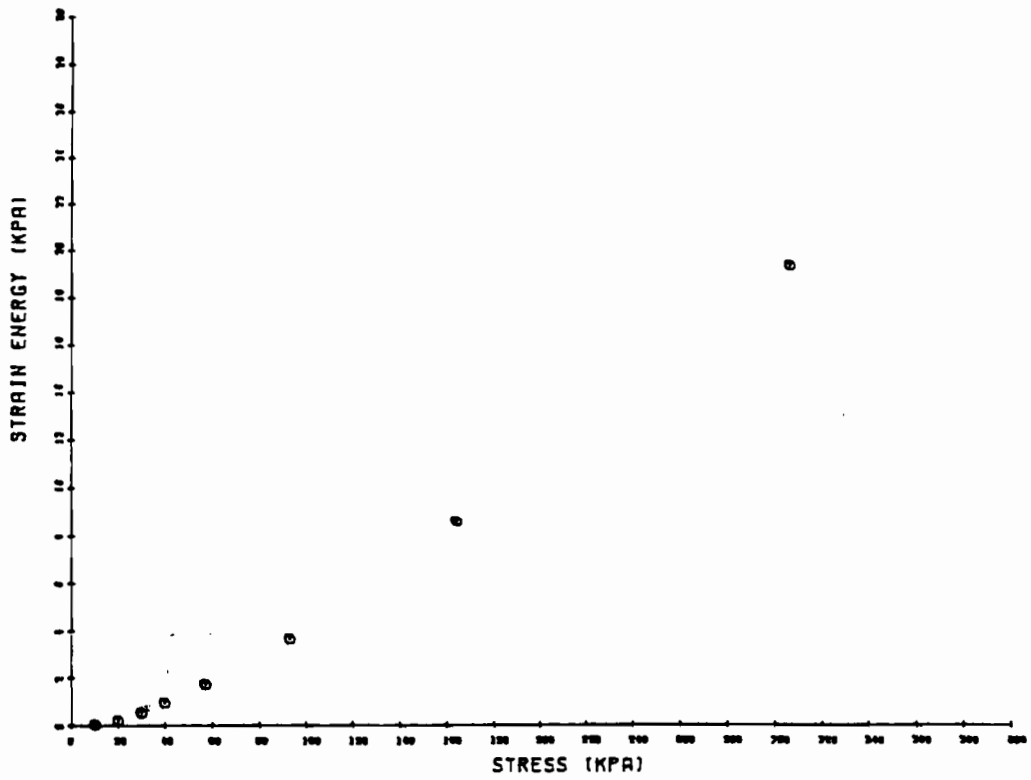
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.92 MM
 WATER CONTENT = 50.80 %
 INITIAL VOID RATIO = 1.392
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	R1-R2 MM
10.0	1.376	4.63E-03	2.35E-04	1.07E-07	0.01	0.23	0.05
20.0	1.350	1.41E-03	1.11E-03	1.53E-07	0.18	1.34	0.07
30.0	1.318	7.75E-04	1.34E-03	1.01E-07	0.51	2.68	0.06
40.0	1.288	4.55E-04	1.25E-03	5.56E-08	0.95	3.93	0.02
57.0	1.250	5.91E-04	9.40E-04	5.45E-08	1.72	5.52	0.04
93.0	1.189	4.70E-04	7.09E-04	3.26E-08	3.64	8.08	0.16
164.0	1.098	6.61E-04	5.38E-04	3.49E-08	8.55	11.90	0.01
306.0	0.990	6.45E-04	3.20E-04	2.02E-08	19.24	16.45	0.02
590.0	0.851	6.16E-04	2.06E-04	1.24E-08	45.40	22.29	0.02
1158.0	0.690	6.11E-04	1.19E-04	7.10E-09	104.31	29.03	0.03
2293.0	0.537	4.42E-04	5.68E-05	2.46E-09	215.62	35.48	0.14
590.0	0.594	4.17E-04	1.41E-05	5.76E-10	181.04	33.08	-0.10
164.0	0.688	2.00E-04	9.24E-05	1.81E-09	166.20	29.14	-0.04
57.0	0.774	1.27E-04	3.38E-04	4.20E-09	162.20	25.53	-0.01
20.0	0.858	7.52E-05	9.60E-04	7.08E-09	160.84	21.97	-0.00

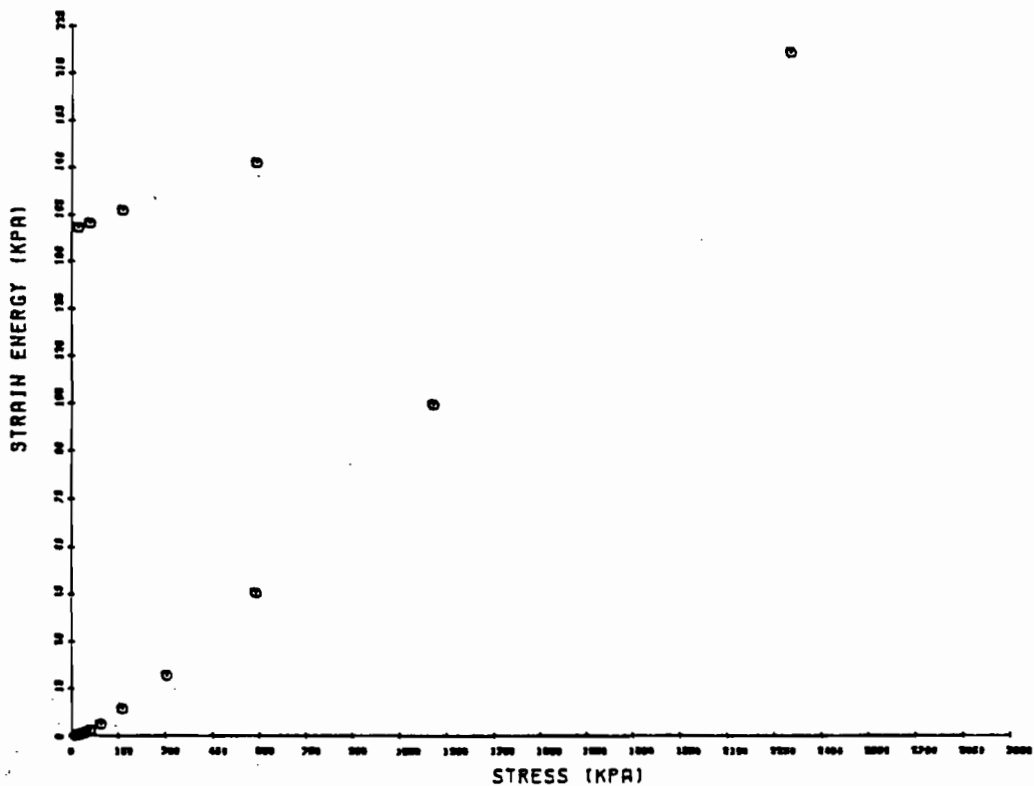


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AE84SI01 SA: 7H DEPTH: 5.89M



PROJ: 852-2007 BH: AE84SI01 SA: 7H DEPTH: 5.89M

Project No 852-2007 Drawn cg Reviewed _____ Date JUNE 05



CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: AE848101
 SAMPLE: 9V
 DEPTH: 7.54-7.59M

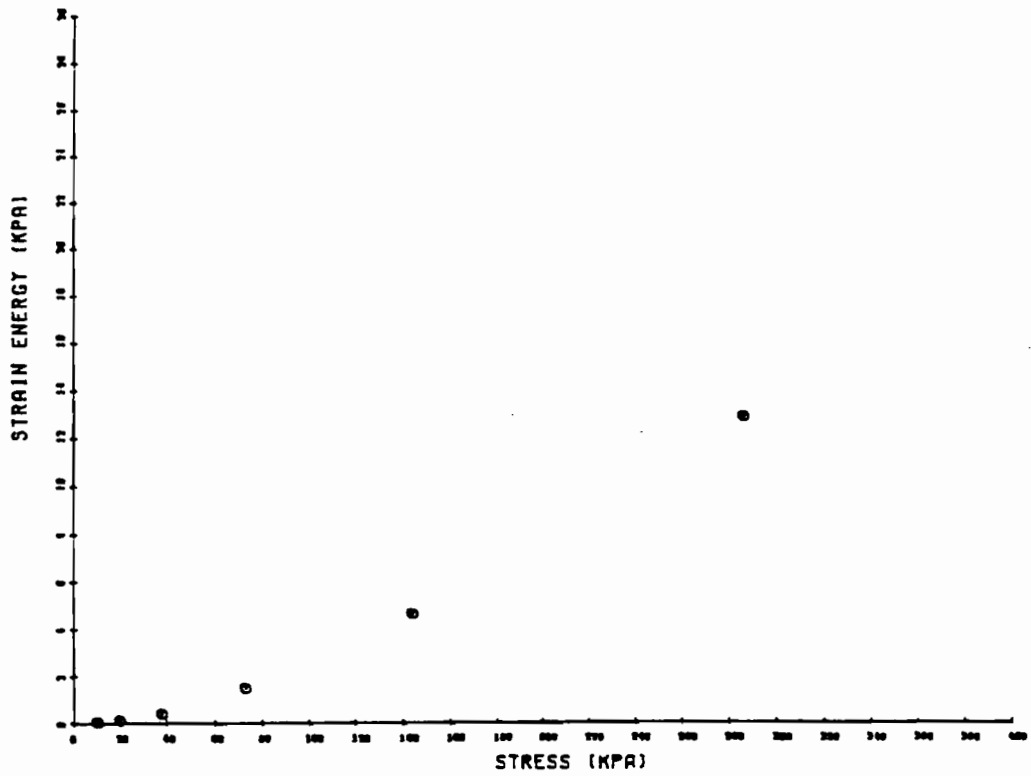
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.26 MM
 WATER CONTENT = 46.10 %
 INITIAL VOID RATIO = 1.254
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	SI-SO MM
10.0	1.242	4.13E-03	5.51E-04	2.23E-07	0.03	0.55	0.03
20.0	1.230	1.57E-03	5.20E-04	8.00E-08	0.11	1.07	0.12
38.0	1.209	9.78E-04	5.21E-04	4.99E-08	0.38	2.01	0.02
73.0	1.161	7.23E-04	5.66E-04	4.03E-08	1.48	3.99	0.02
144.0	1.099	9.36E-04	4.08E-04	3.75E-08	4.62	6.89	0.03
286.0	1.013	8.82E-04	2.69E-04	2.32E-08	12.82	10.70	0.04
570.0	0.976	7.45E-04	2.13E-04	1.56E-08	38.75	16.76	0.03
1138.0	0.714	7.33E-04	1.26E-04	9.07E-09	100.00	23.93	0.05
2273.0	0.561	7.60E-04	6.02E-05	4.48E-09	216.51	30.76	0.04
570.0	0.597	1.24E-03	9.59E-06	1.16E-09	193.30	29.13	-0.05
144.0	0.673	5.30E-04	7.93E-05	4.12E-09	181.25	25.75	-0.03
38.0	0.775	1.56E-04	4.26E-04	6.52E-09	177.14	21.24	-0.00
10.0	0.852	5.23E-05	1.22E-03	6.26E-09	176.32	17.82	-0.01

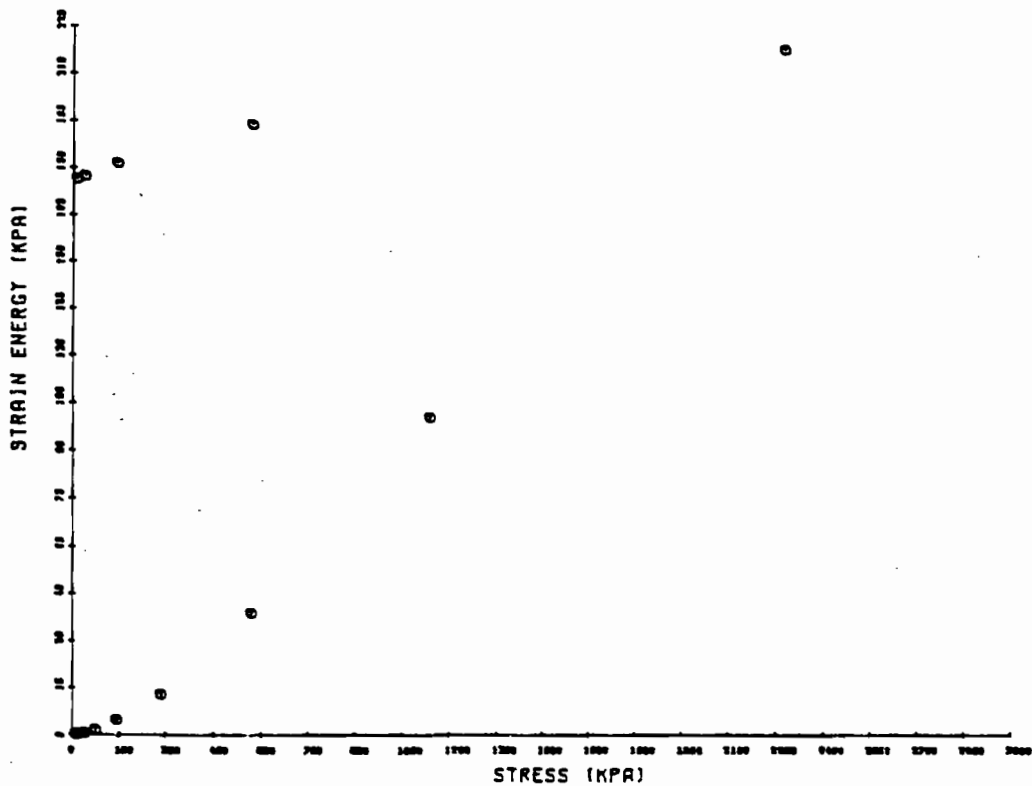
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure

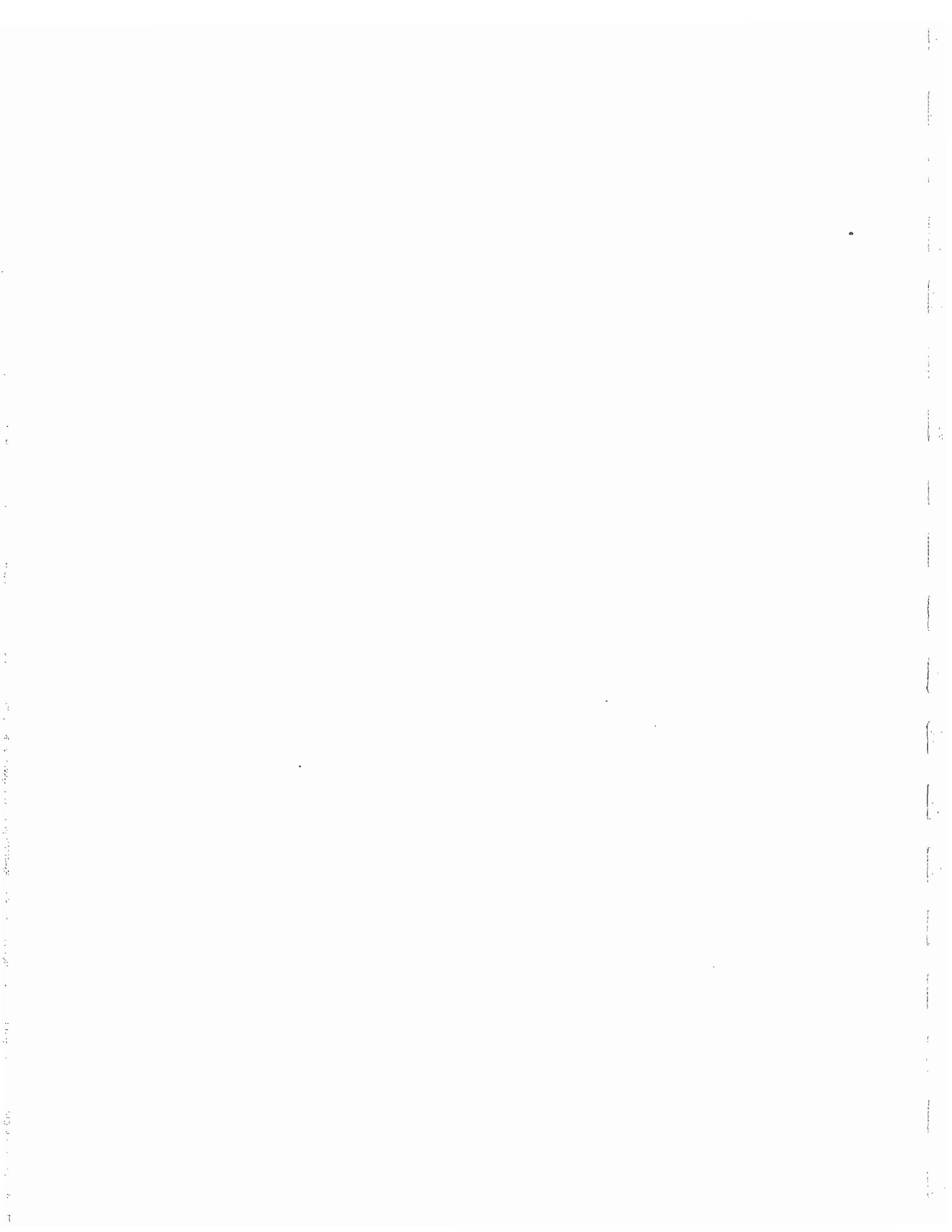


PROJ: 852-2007 BH: AE84SI01 SA: 9V DEPTH: 7.54-7.59M



PROJ: 852-2007 BH: AE84SI01 SA: 9V DEPTH: 7.54-7.59M

Project No. 852-2007 Drawn CG Reviewed _____ Date JUNE 05

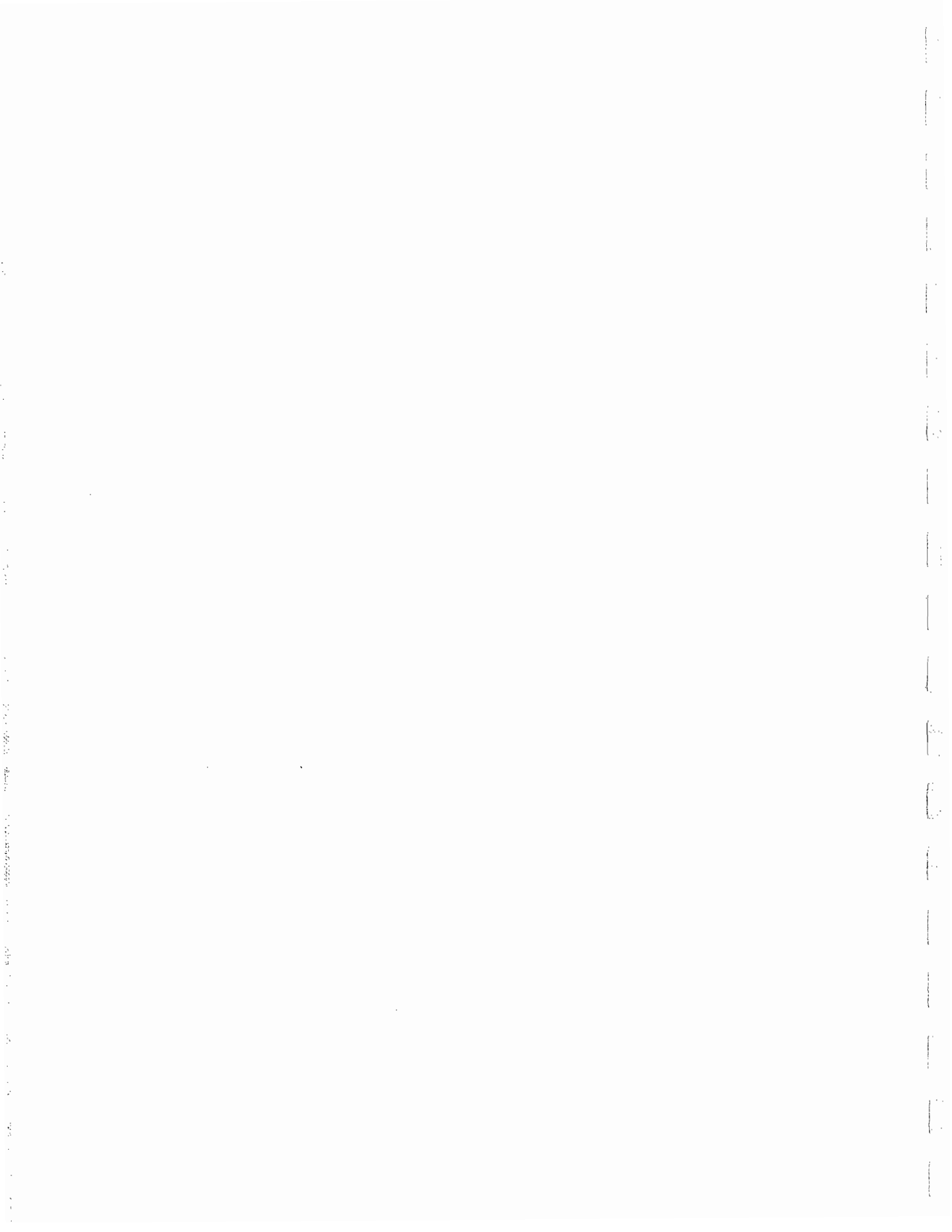


CONSOLIDATION TEST

PROJECT: 952-2007
 BOREHOLE: A6946101
 SAMPLE: 9H
 DEPTH: 7.61M

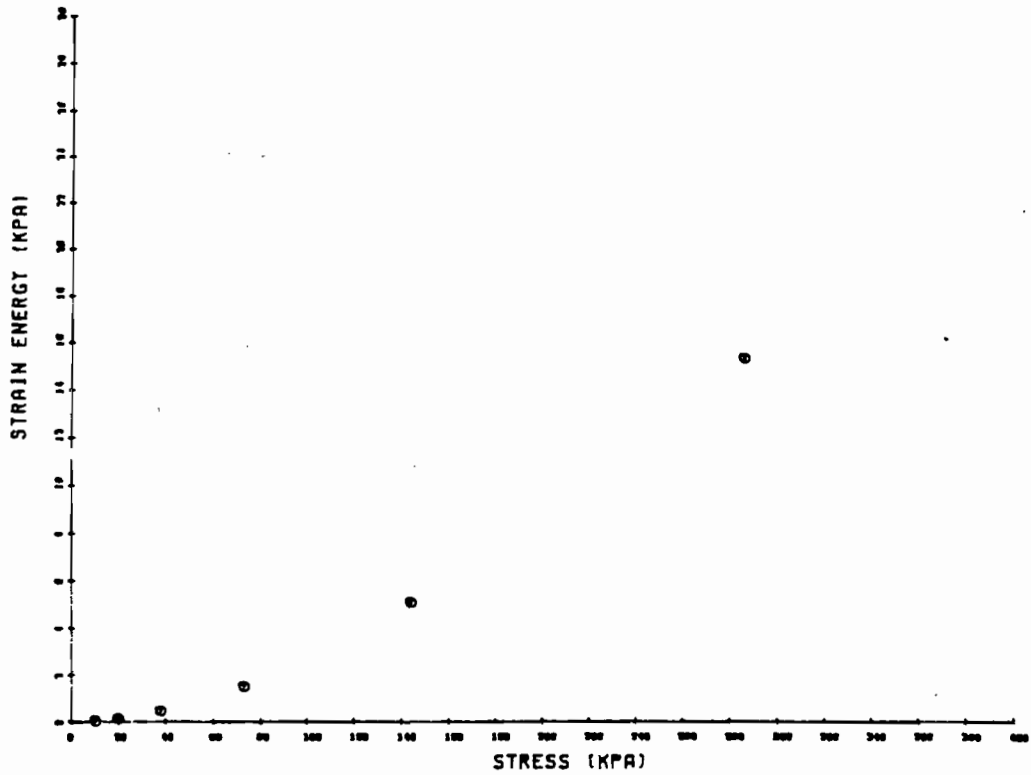
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.90 MM
 WATER CONTENT = 45.20 %
 INITIAL VOID RATIO = 1.229
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	DV CM ² /SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	SI-PI MM
10.0	1.224	5.82E-03	2.52E-04	1.43E-07	0.01	0.25	0.00
20.0	1.209	1.14E-03	6.81E-04	7.63E-08	0.11	0.93	0.08
38.0	1.184	6.93E-04	6.21E-04	4.22E-08	0.44	2.05	0.04
70.0	1.141	6.65E-04	5.30E-04	3.48E-08	1.47	0.92	0.03
144.0	1.069	5.67E-04	4.64E-04	2.67E-08	5.05	7.21	0.04
286.0	0.963	5.33E-04	3.35E-04	1.75E-08	15.28	11.97	0.03
570.0	0.842	5.74E-04	1.90E-04	1.07E-08	39.34	17.36	0.03
1138.0	0.715	5.85E-04	1.01E-04	5.77E-09	87.23	23.08	0.05
2273.0	0.578	5.50E-04	5.42E-05	2.92E-09	192.06	29.23	0.06
570.0	0.625	2.89E-04	1.25E-05	3.52E-10	161.91	27.11	-0.10
144.0	0.713	1.90E-04	9.22E-05	1.71E-09	147.88	23.18	-0.05
38.0	0.798	1.29E-04	3.61E-04	4.58E-09	144.40	19.35	-0.03
10.0	0.874	6.19E-05	1.22E-03	7.40E-09	143.58	15.94	-0.01

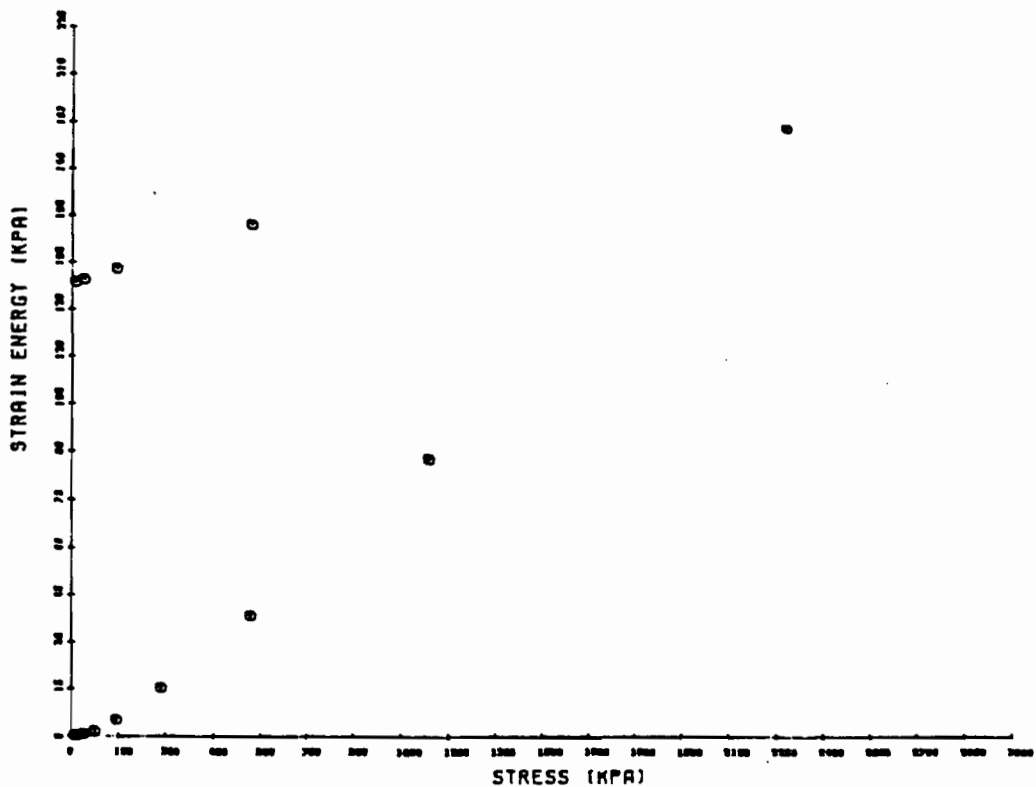


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure

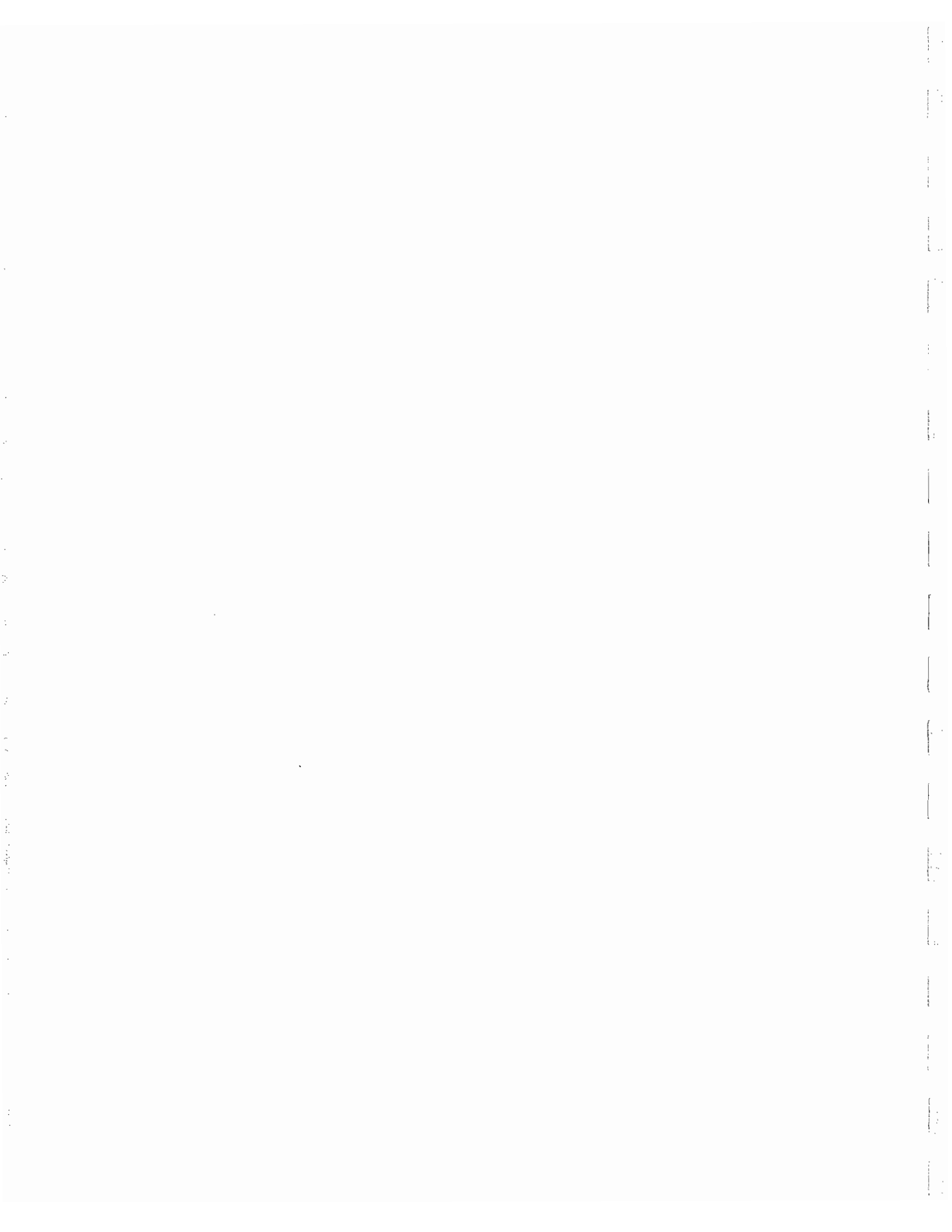


PROJ: 852-2007 BH: AE84S101 SA: 9H DEPTH: 7.61M



PROJ: 852-2007 BH: AE84S101 SA: 9H DEPTH: 7.61M

Project No. 852-2007 Drawn CJ Reviewed _____ Date JUNE 95

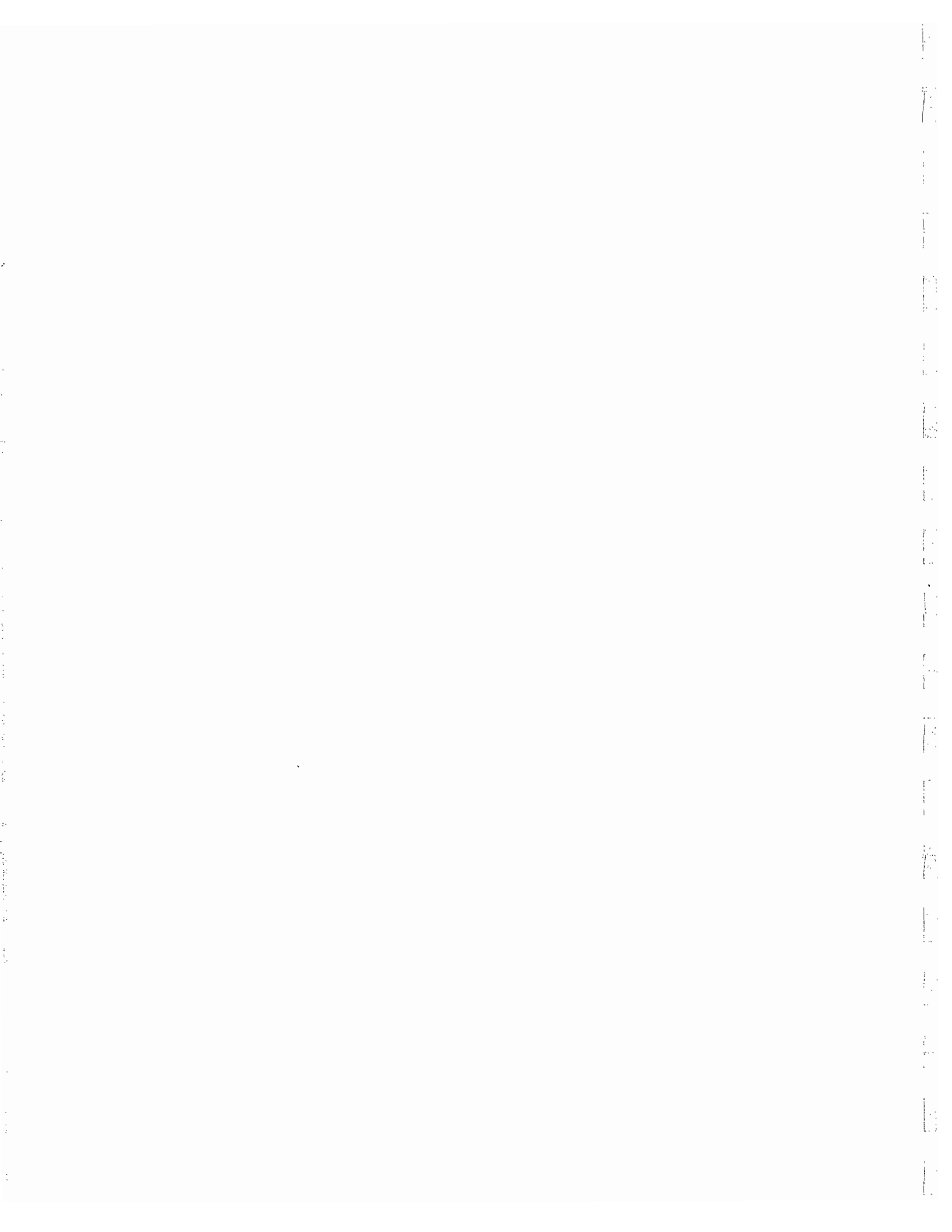


CONSOLIDATION TEST

PROJECT: 952-2007
 BOREHOLE: A5848101
 SAMPLE: 10V
 DEPTH: 8.62-8.67M

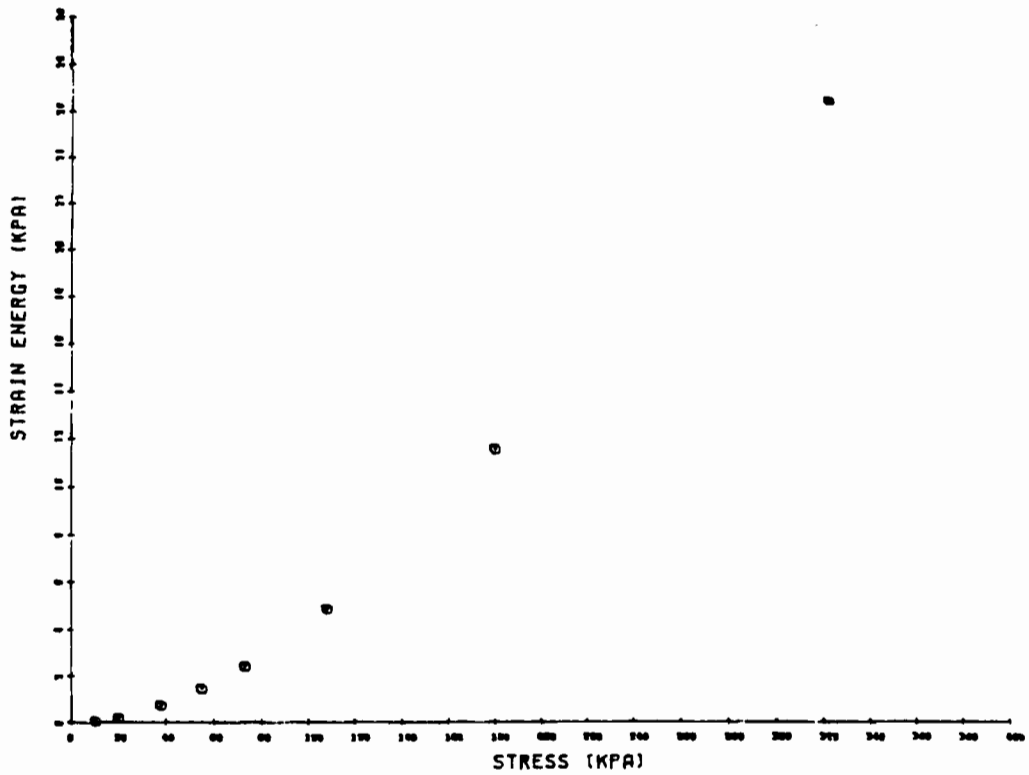
DIAMETER OF SAMPLE = 4.95 CM
 HEIGHT OF SAMPLE = 11.28 MM
 WATER CONTENT = 55.10 %
 INITIAL VOID RATIO = 1.499
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	DV CM ² /SEC	MV 1/KPA	E CM/SEC	SE KPA	STRAIN %	E ₁₋₈₀ MM
10.0	1.487	1.14E-03	4.88E-04	5.48E-08	0.02	0.45	0.05
20.0	1.465	8.07E-04	8.62E-04	6.82E-08	0.15	1.35	0.01
38.0	1.417	7.82E-04	1.08E-03	8.11E-08	0.71	3.25	0.01
55.0	1.379	7.53E-04	9.15E-04	6.75E-08	1.43	4.81	0.00
73.0	1.341	4.54E-04	8.32E-04	7.70E-08	2.39	6.31	0.00
109.0	1.274	7.19E-04	7.62E-04	5.37E-08	4.80	8.97	0.01
180.0	1.159	7.90E-04	6.48E-04	5.02E-08	11.51	13.84	0.00
321.0	1.011	7.36E-04	4.16E-04	3.00E-08	26.21	19.50	0.01
605.0	0.857	8.18E-04	2.17E-04	1.74E-08	54.79	25.68	0.03
1173.0	0.672	8.14E-04	1.31E-04	1.04E-08	120.69	33.09	0.03
2310.0	0.495	7.92E-04	6.21E-05	4.82E-09	243.75	40.15	0.05
605.0	0.545	1.61E-03	1.17E-05	1.84E-09	214.78	38.17	-0.09
180.0	0.630	4.34E-04	7.96E-05	3.39E-09	201.49	34.78	-0.04
38.0	0.741	2.25E-04	3.13E-04	6.92E-09	196.65	30.33	-0.02

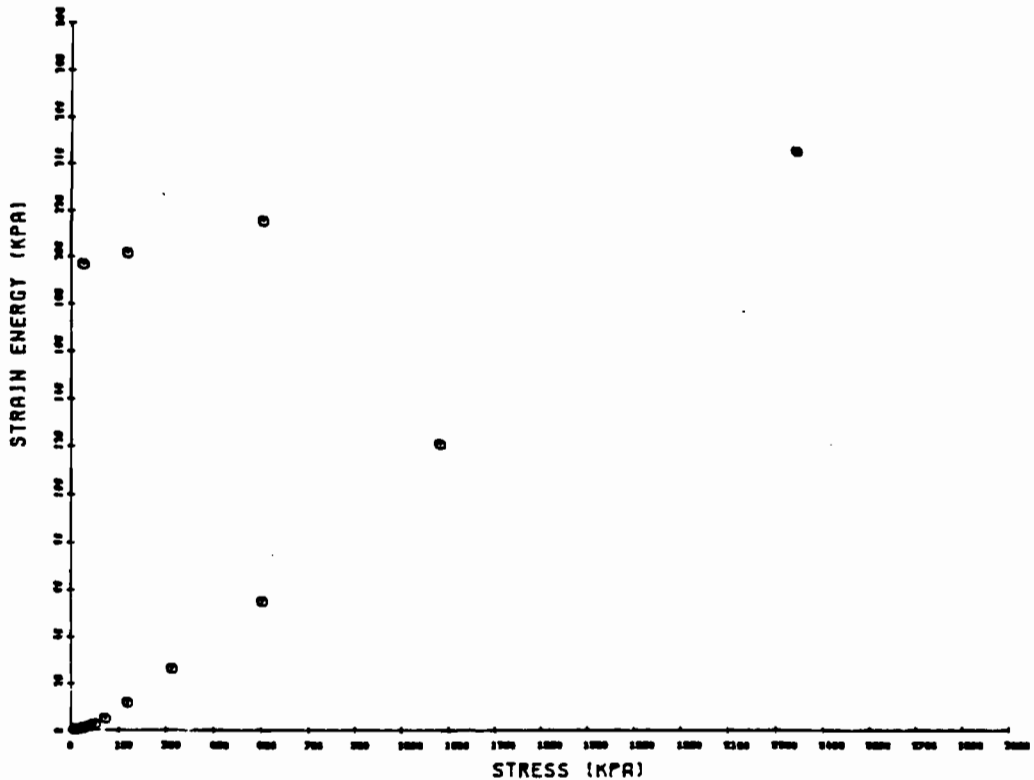


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure

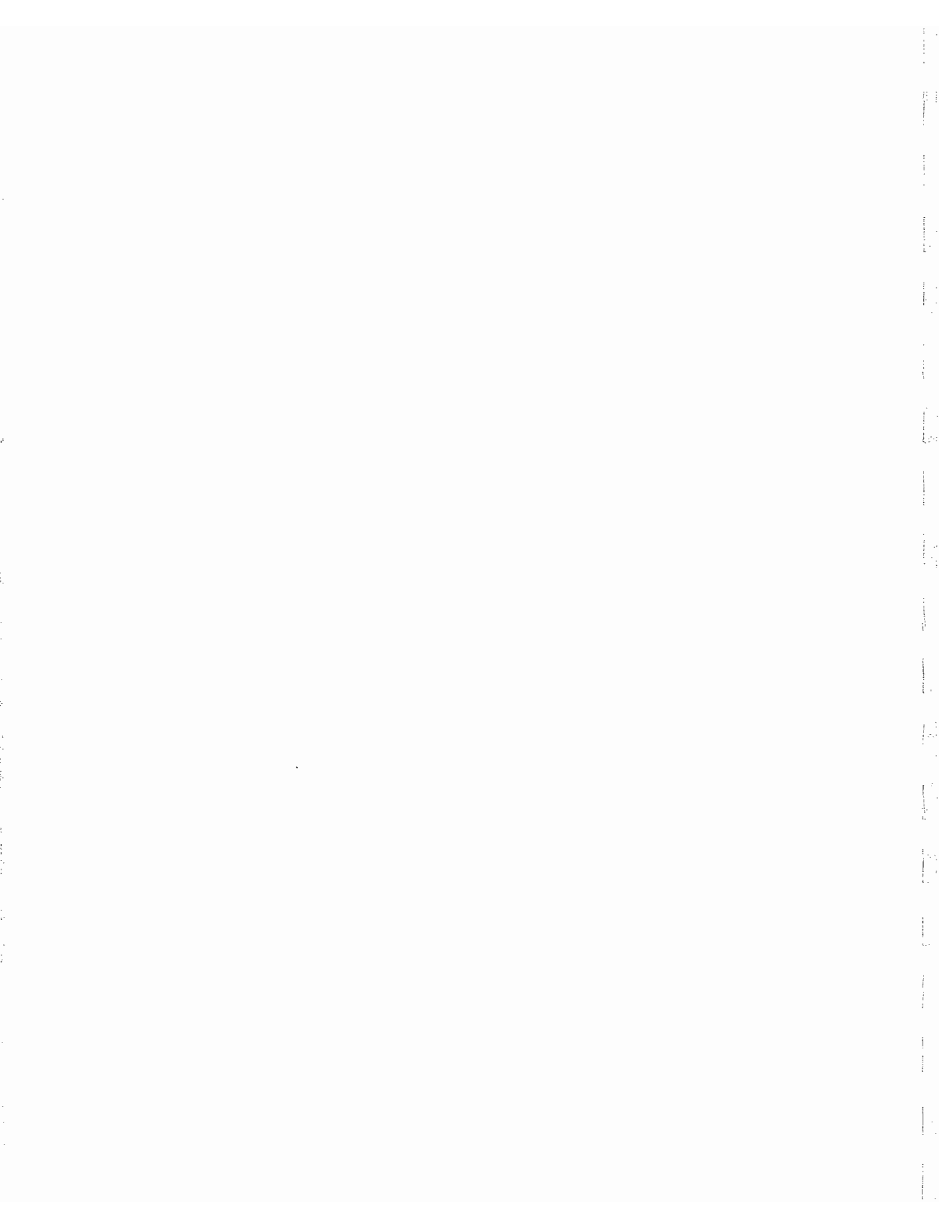


PROJ:852-2007 BH:AE84SI01 SA:10V DEPTH:8.62-8.67M



PROJ:852-2007 BH:AE84SI01 SA:10V DEPTH:8.62-8.67M

Project No: 52-2007 Drawn CG Reviewed _____ Date JUNE '05



CONSOLIDATION TEST

PROJECT: B52-2007
 BOREHOLE: AEB4SI01
 SAMPLE: 10H
 DEPTH: 8.67M

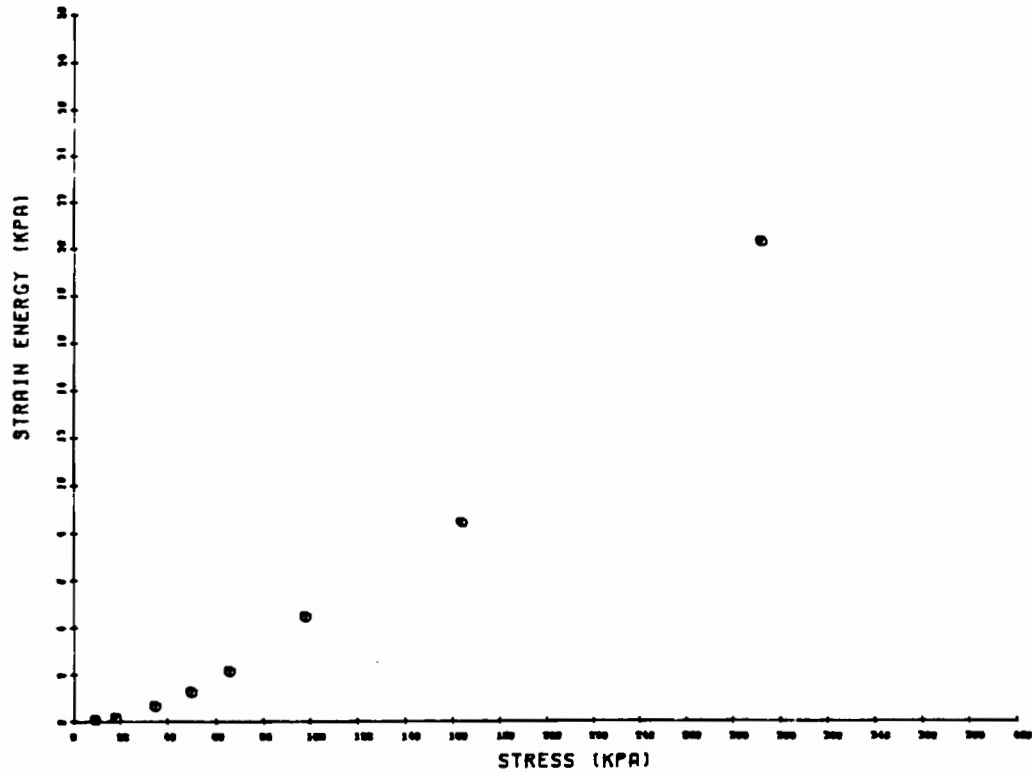
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.40 MM
 WATER CONTENT = 55.70 %
 INITIAL VOID RATIO = 1.515
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	BIASED MM
9.0	1.484	6.12E-04	1.38E-03	8.31E-08	0.06	1.25	0.11
18.0	1.464	7.72E-04	8.69E-04	6.58E-08	0.16	2.03	0.01
35.0	1.419	5.09E-04	1.04E-03	5.21E-08	0.63	3.80	0.02
50.0	1.384	2.79E-04	9.27E-04	2.54E-08	1.22	5.19	0.01
66.0	1.346	6.82E-05	9.54E-04	6.38E-09	2.11	6.72	0.00
98.0	1.275	1.91E-04	8.85E-04	1.65E-08	4.43	9.55	0.01
164.0	1.199	2.27E-04	4.59E-04	1.02E-08	8.40	12.58	0.01
292.0	1.069	3.85E-04	4.03E-04	1.52E-08	20.15	17.74	0.03
550.0	0.922	4.27E-04	2.27E-04	9.49E-09	44.81	23.59	0.04
1066.0	0.768	3.91E-04	1.19E-04	4.53E-09	94.08	29.69	0.04
2100.0	0.601	3.91E-04	6.42E-05	2.46E-09	199.18	36.33	0.04
550.0	0.659	1.02E-03	1.47E-05	1.47E-09	168.92	34.05	-0.05
98.0	0.759	2.23E-04	8.84E-05	1.93E-09	155.98	30.05	-0.06
35.0	0.898	6.22E-05	8.73E-04	5.32E-09	152.32	24.55	-0.07

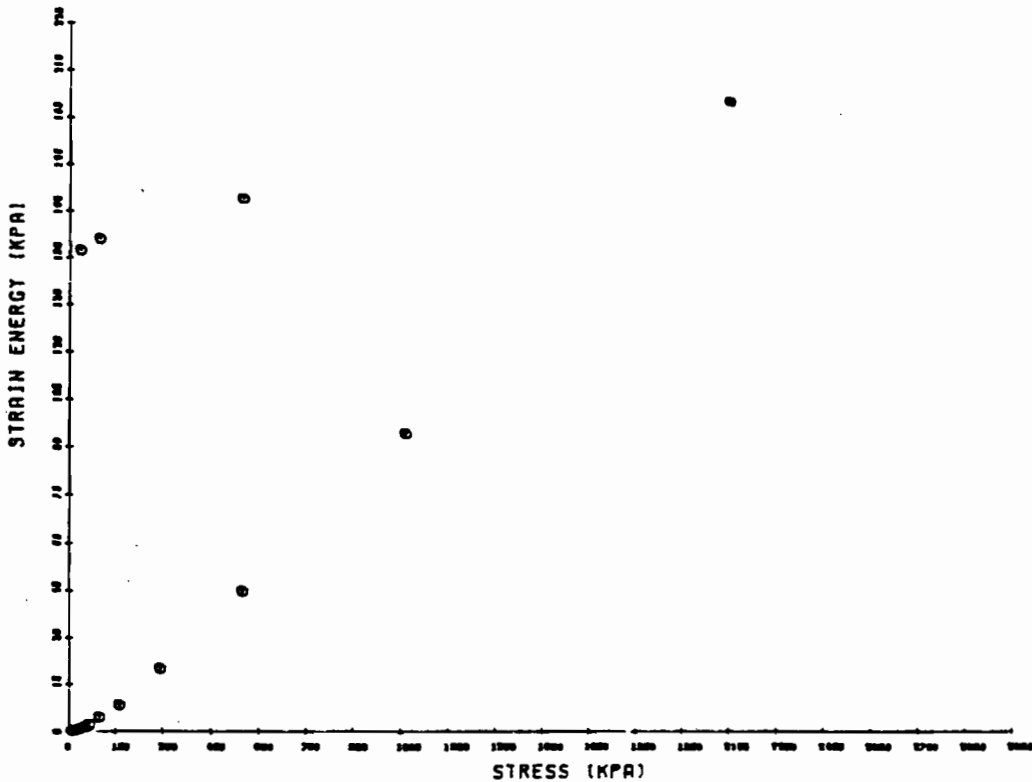
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure

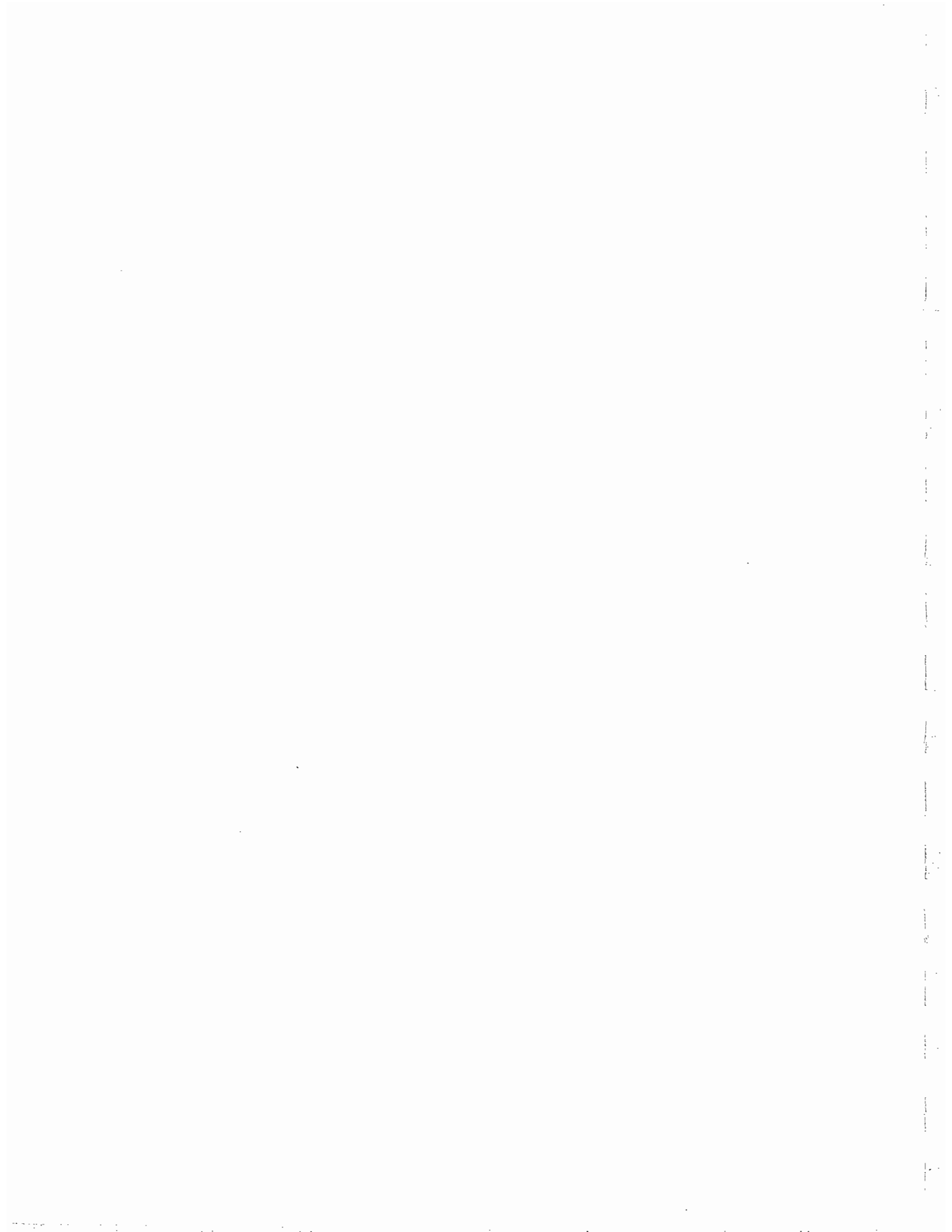


PROJ:852-2007 BH:AE84SI01 SA:10H DEPTH:8.67M



PROJ:852-2007 BH:AE84SI01 SA:10H DEPTH:8.67M

Project No 852-2007 Drawn Cg Reviewed Date JUNE 85



CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: AB84B101
 SAMPLE: 11V
 DEPTH: 9.57-9.62M

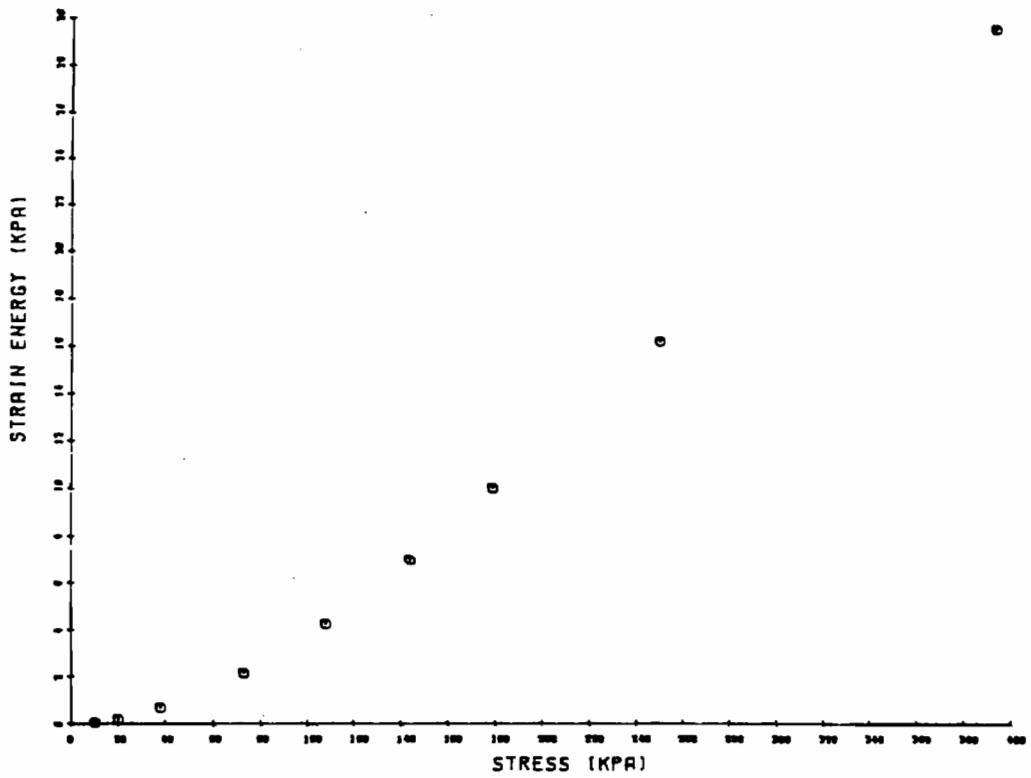
DIAMETER OF SAMPLE = 4.93 CM
 HEIGHT OF SAMPLE = 11.26 MM
 WATER CONTENT = 53.60 %
 INITIAL VOID RATIO = 1.458
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	E1-E0 MM
10.0	1.447	4.27E-03	4.26E-04	1.79E-07	0.02	0.43	0.09
20.0	1.420	4.34E-04	1.11E-03	4.71E-08	0.19	1.53	0.01
36.0	1.380	5.35E-04	9.04E-04	4.73E-08	0.66	3.16	0.02
73.0	1.315	6.06E-04	7.60E-04	4.51E-08	2.14	5.82	0.03
109.0	1.258	5.67E-04	6.64E-04	3.69E-08	4.24	8.14	0.01
144.0	1.205	3.82E-04	5.95E-04	2.23E-08	6.94	10.29	0.01
179.0	1.159	2.25E-04	5.30E-04	1.17E-08	9.94	12.14	0.00
250.0	1.089	3.61E-04	4.03E-04	1.43E-08	16.08	15.01	0.01
392.0	0.988	4.75E-04	2.90E-04	1.35E-08	29.29	19.12	0.02
676.0	0.850	5.38E-04	1.97E-04	1.04E-08	59.24	24.73	0.02
1244.0	0.697	6.04E-04	1.10E-04	6.48E-09	118.97	30.95	0.04
2380.0	0.539	6.89E-04	5.67E-05	3.83E-09	235.78	37.40	0.04
676.0	0.581	9.20E-04	1.01E-05	9.08E-10	209.58	38.69	-0.08
250.0	0.649	4.01E-04	6.51E-05	2.56E-09	196.73	32.91	-0.04

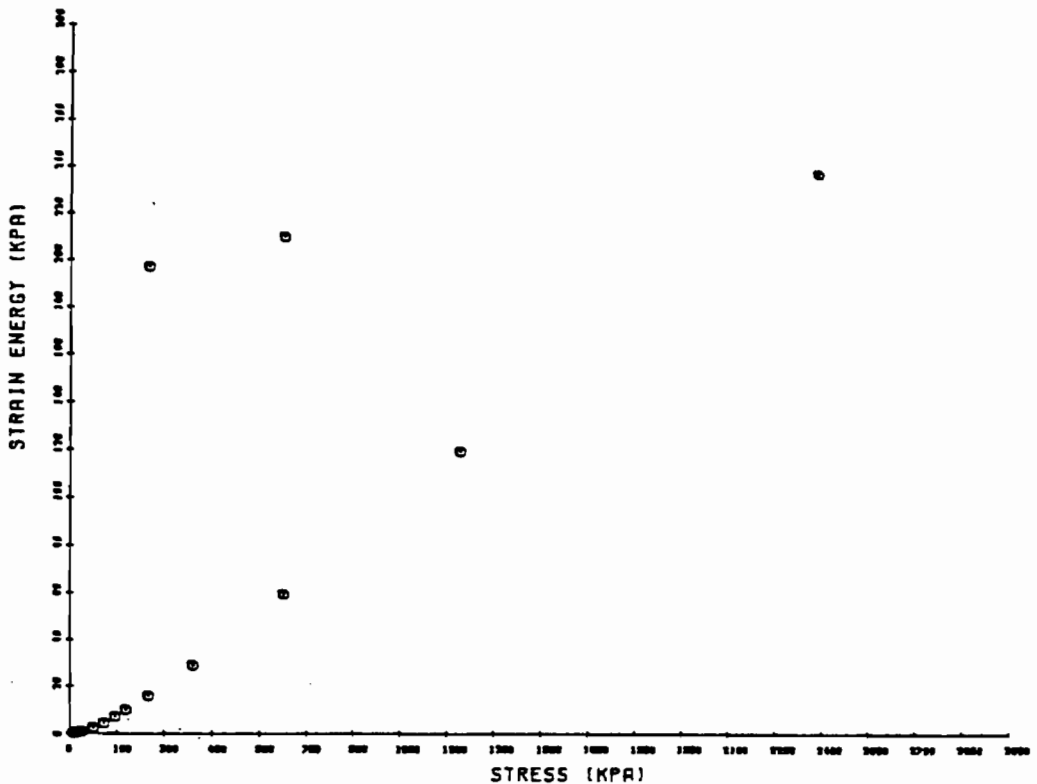


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AE84SI01 SA: 11V DEPTH: 9.57-9.62M



PROJ: 852-2007 BH: AE84SI01 SA: 11V DEPTH: 9.57-9.62M

Project No. 852-2007 Drawn C9 Reviewed _____ Date JUNE 05



CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: A8849101
 SAMPLE: 11H
 DEPTH: 9.63M

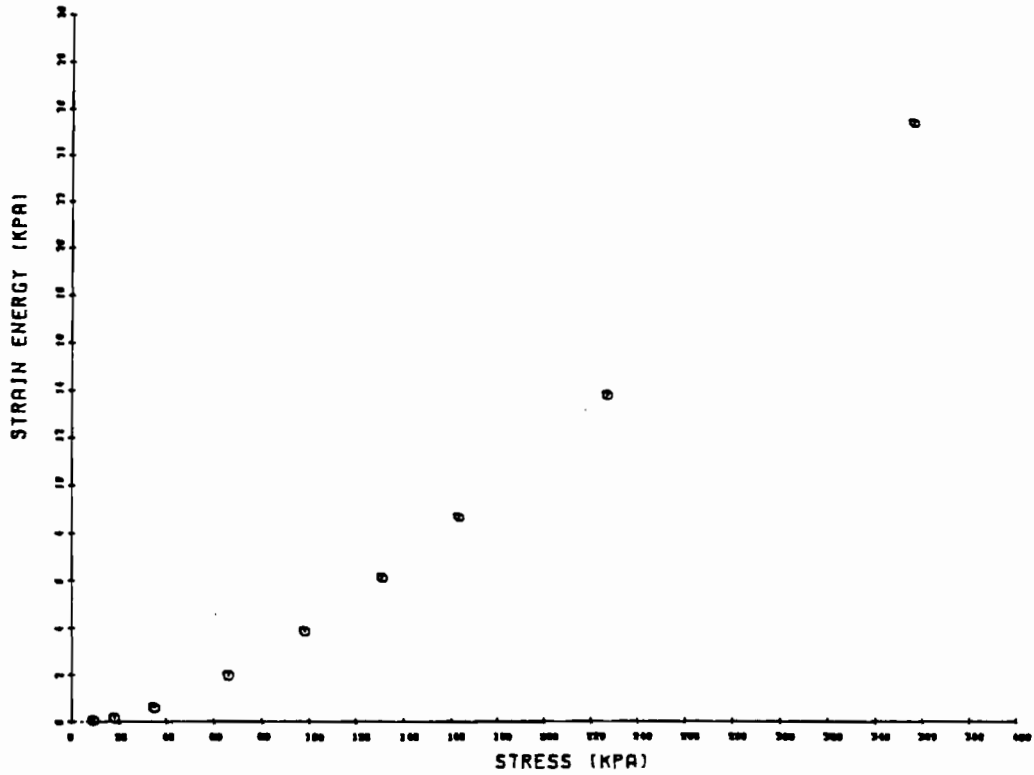
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.92 MM
 WATER CONTENT = 49.10 %
 INITIAL VOID RATIO = 1.336
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	E CM/SEC	SE KPA	STRAIN %	E1-E2 MP
9.0	1.315	1.27E-03	9.69E-04	1.20E-07	0.04	0.27	0.13
18.0	1.293	7.32E-04	1.05E-03	7.52E-08	0.17	1.22	0.04
35.0	1.254	5.57E-04	9.80E-04	5.34E-08	0.21	3.42	0.02
66.0	1.192	5.01E-04	8.62E-04	4.27E-08	1.96	6.15	0.02
98.0	1.132	4.30E-04	7.19E-04	3.03E-08	3.84	8.45	0.01
131.0	1.092	2.77E-04	5.98E-04	1.62E-08	6.10	10.42	0.01
163.0	1.052	2.33E-04	5.40E-04	1.23E-08	8.64	12.15	0.00
227.0	0.991	3.28E-04	4.05E-04	1.30E-08	13.70	14.75	0.00
356.0	0.899	3.80E-04	3.07E-04	1.14E-08	25.24	18.71	0.02
615.0	0.792	4.89E-04	1.76E-04	8.42E-09	47.35	23.26	0.02
1131.0	0.657	5.22E-04	1.12E-04	5.74E-09	97.89	29.05	0.02
2164.0	0.505	5.41E-04	6.32E-05	3.35E-09	205.44	35.58	0.04
615.0	0.552	2.71E-04	1.32E-05	3.50E-10	177.04	33.53	-0.09
227.0	0.603	2.48E-04	5.63E-05	1.37E-09	167.25	31.35	-0.04
35.0	0.751	1.23E-04	3.28E-04	4.02E-09	159.59	25.05	-0.04

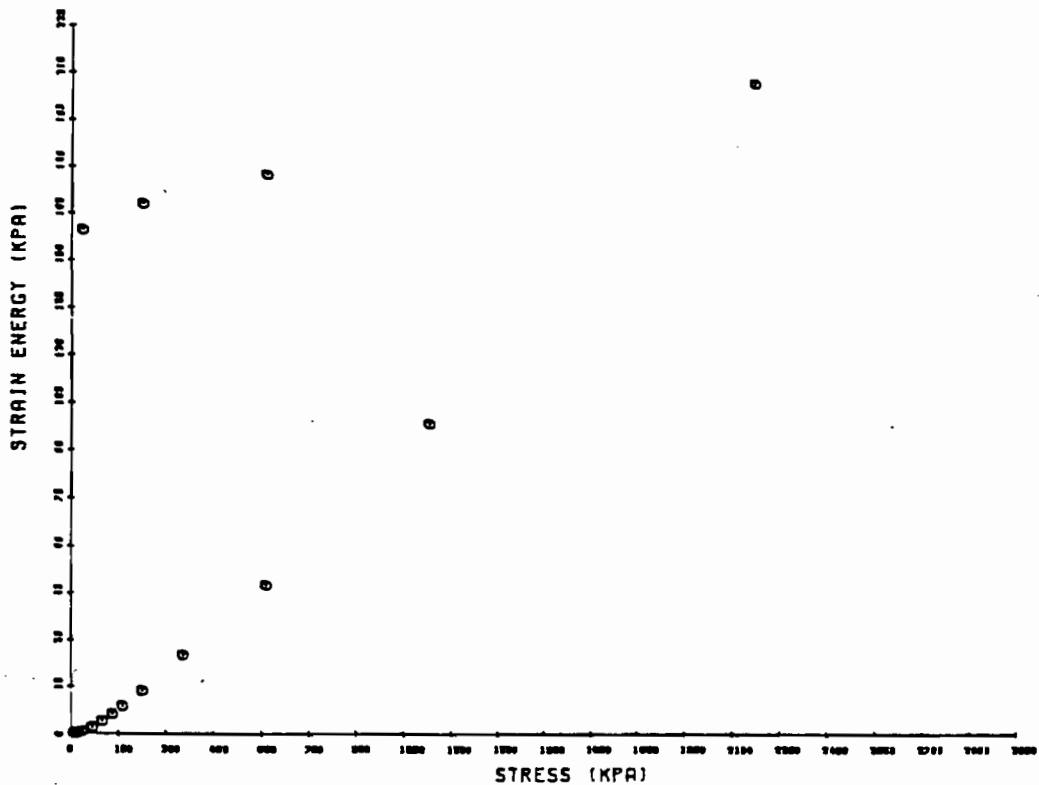


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure

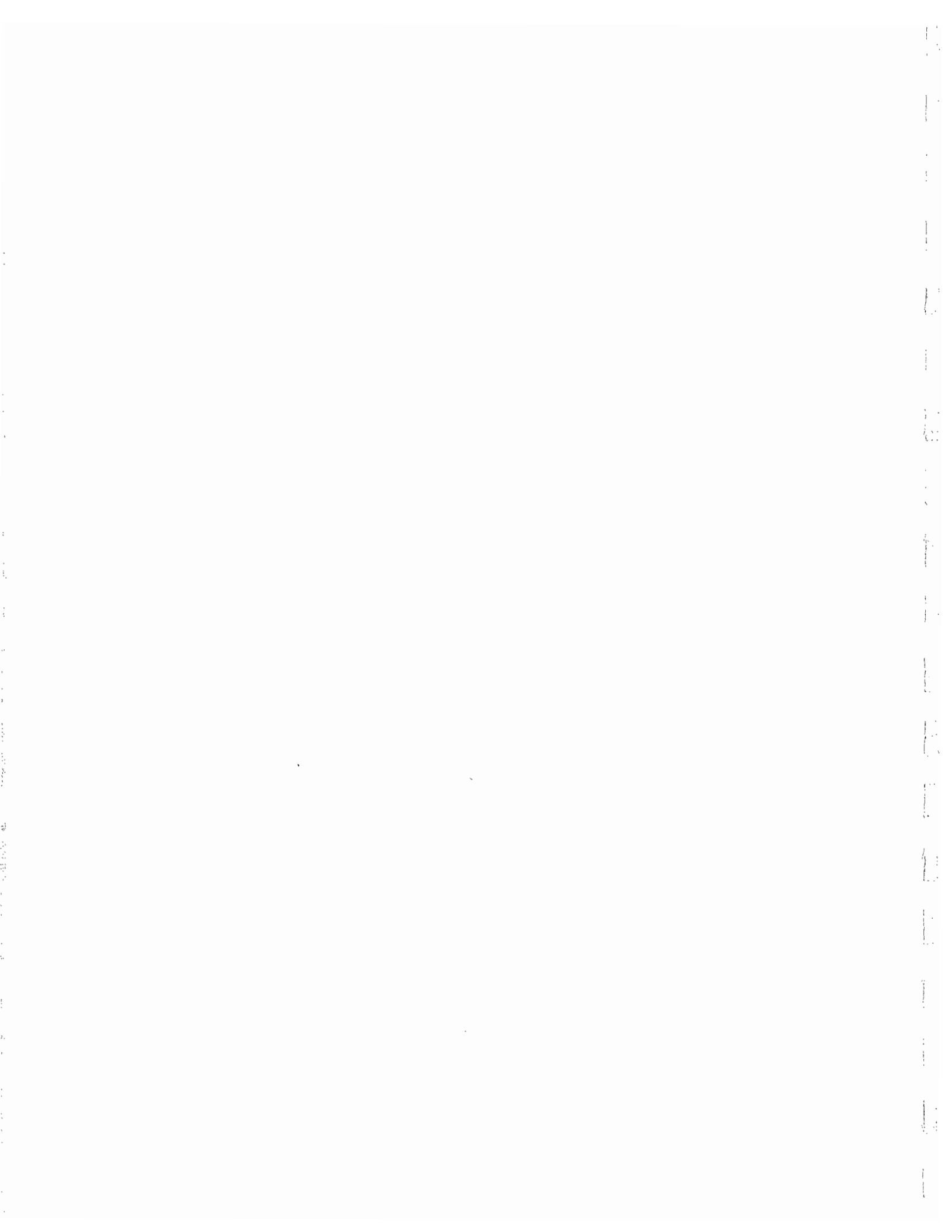


PROJ: 852-2007 BH: AE84SI01 SA: 11H DEPTH: 9.63M



PROJ: 852-2007 BH: AE84SI01 SA: 11H DEPTH: 9.63M

Project No: 52-2007 Drawn: CG Reviewed: Date: JUNE 05



CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: AEB49101
 SAMPLE: 1CV
 DEPTH: 11.33-11.39M

DIAMETER OF SAMPLE = 4.95 CM
 HEIGHT OF SAMPLE = 11.26 MM
 WATER CONTENT = 48.50 %
 INITIAL VOID RATIO = 1.319
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	E1-E2 MM
10.0	1.312	2.07E-03	3.20E-04	6.49E-02	0.02	0.22	0.02
20.0	1.290	7.26E-04	9.38E-04	6.67E-02	0.16	1.24	0.01
38.0	1.250	8.18E-04	9.55E-04	7.65E-02	0.66	2.98	0.02
73.0	1.188	9.57E-04	7.71E-04	7.23E-02	2.15	5.68	0.02
144.0	1.100	8.55E-04	5.32E-04	4.46E-02	6.26	9.46	0.02
286.0	0.993	9.14E-04	3.25E-04	2.91E-02	16.18	14.07	0.05
570.0	0.839	9.61E-04	2.03E-04	1.91E-02	40.83	19.83	0.03
1139.0	0.724	1.06E-03	1.03E-04	1.07E-02	90.72	25.67	0.05
2273.0	0.566	9.36E-04	5.98E-05	5.49E-03	206.52	32.46	0.06
570.0	0.610	1.68E-03	1.10E-05	1.80E-03	179.99	30.60	-0.10
144.0	0.691	5.64E-04	8.21E-05	4.54E-03	167.50	27.10	-0.05
38.0	0.780	1.98E-04	3.63E-04	7.04E-03	164.00	23.25	-0.03
10.0	0.863	8.01E-05	1.28E-03	1.00E-02	163.14	19.68	-0.01

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CONSOLIDATION TEST

PROJECT: 952-2007
 BORERHOLE: AE849101
 SAMPLE: 13H
 DEPTH: 11.4M

DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.92 MM
 WATER CONTENT = 48.96 %
 INITIAL VOID RATIO = 1.312
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	BI-RY MM
10.0	1.315	7.15E-04	7.13E-04	5.00E-08	0.04	0.71	0.13
20.0	1.279	3.65E-04	1.56E-03	5.56E-08	0.27	2.27	0.10
38.0	1.237	4.53E-04	9.99E-04	4.44E-08	0.79	4.07	0.03
72.0	1.164	4.68E-04	8.98E-04	4.10E-08	2.53	7.21	0.02
144.0	1.075	6.03E-04	5.32E-04	3.15E-08	6.64	10.99	0.02
286.0	0.957	5.82E-04	3.58E-04	2.04E-08	17.57	16.08	0.02
570.0	0.829	6.50E-04	1.92E-04	1.23E-08	40.95	21.54	0.03
1138.0	0.692	5.62E-04	1.04E-04	5.71E-09	91.23	27.43	0.04
2273.0	0.550	5.59E-04	5.38E-05	2.95E-09	195.30	33.53	0.06
570.0	0.601	3.91E-04	1.29E-05	4.95E-10	164.05	31.33	-0.09
144.0	0.696	1.97E-04	9.50E-05	1.84E-09	149.60	27.28	-0.04
38.0	0.799	1.17E-04	4.17E-04	4.77E-09	145.58	22.87	-0.02
10.0	0.888	5.53E-05	1.37E-03	7.39E-09	144.66	19.04	-0.01

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CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: ABB48101
 SAMPLE: 14V
 DEPTH: 12.12-12.17M

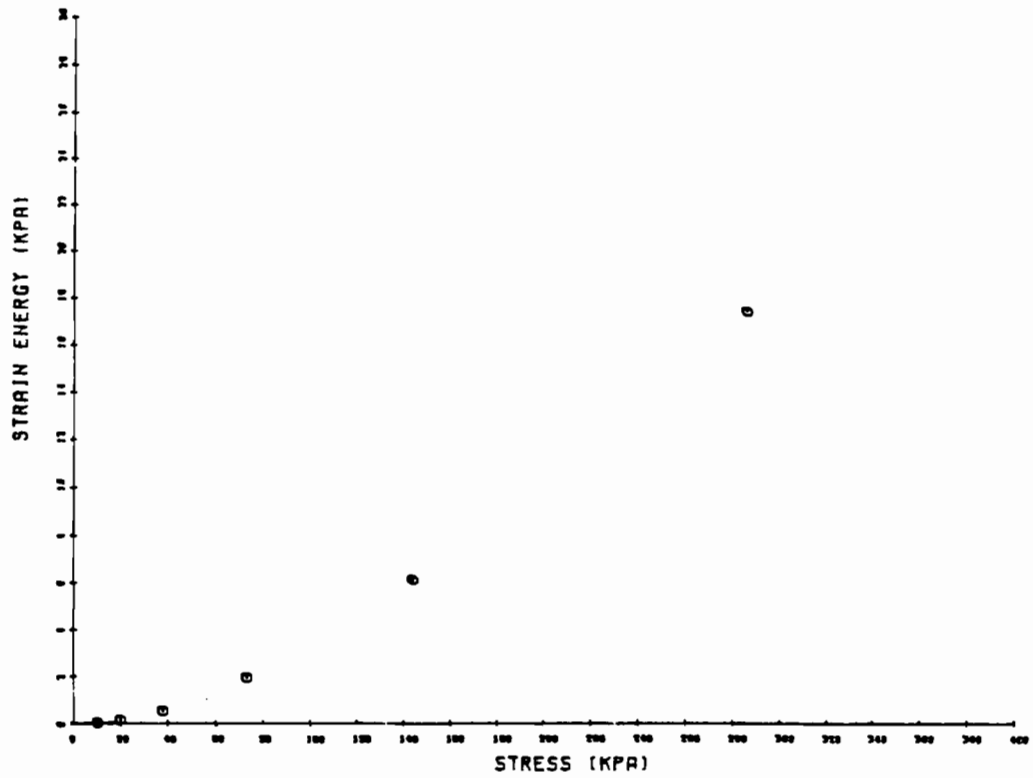
DIAMETER OF SAMPLE = 4.98 CM
 HEIGHT OF SAMPLE = 11.26 MM
 WATER CONTENT = 53.50 %
 INITIAL VOID RATIO = 1.455
 SPECIFIC GRAVITY = 2.72

STRESS	VOID	CV	MV	L	SE	STRAIN	SI-SU
(KPA)	RATIO	CM/SEC	1/KPA	CM/SEC	KPA	%	MM
10.0	1.450	4.12E-03	2.21E-04	9.33E-02	0.01	0.23	0.07
20.0	1.429	5.61E-04	8.59E-04	4.78E-02	0.14	1.10	0.12
38.0	1.397	8.93E-04	7.15E-04	6.26E-02	0.52	2.39	0.01
73.0	1.353	7.79E-04	7.43E-04	5.67E-02	1.95	4.99	0.01
144.0	1.239	7.15E-04	5.37E-04	3.76E-02	6.09	9.80	0.03
286.0	1.111	6.34E-04	3.68E-04	2.29E-02	17.32	14.02	0.05
570.0	0.941	5.95E-04	2.43E-04	1.42E-02	46.87	20.53	0.04
1138.0	0.774	6.42E-04	1.20E-04	7.57E-02	105.23	27.76	0.05
2273.0	0.605	2.57E-04	6.07E-05	1.53E-02	222.66	34.64	0.05
570.0	0.666	1.10E-03	1.52E-05	1.63E-02	185.98	32.04	-0.04
144.0	0.773	4.01E-04	1.00E-04	3.94E-02	170.76	27.80	-0.04
38.0	0.893	1.34E-04	4.62E-04	6.07E-02	166.30	22.90	-0.03
10.0	0.991	5.90E-05	1.42E-03	6.23E-02	165.34	18.92	-0.01

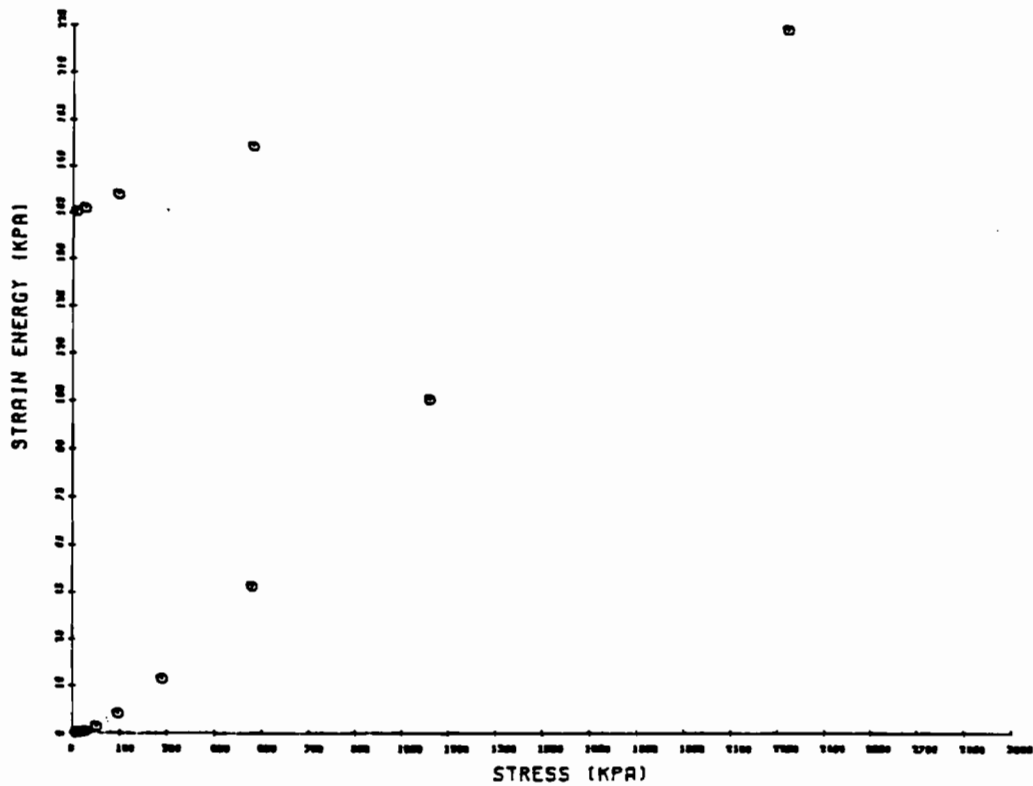
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AEB4SI01 SA: 14V DEPTH: 12.12-12.17M



PROJ: 852-2007 BH: AEB4SI01 SA: 14V DEPTH: 12.12-12.17M

Project No. 52-2007 Drawn CG Reviewed Date JUNE 05

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CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: ABB49101
 SAMPLE: 14H
 DEPTH: 12.26M

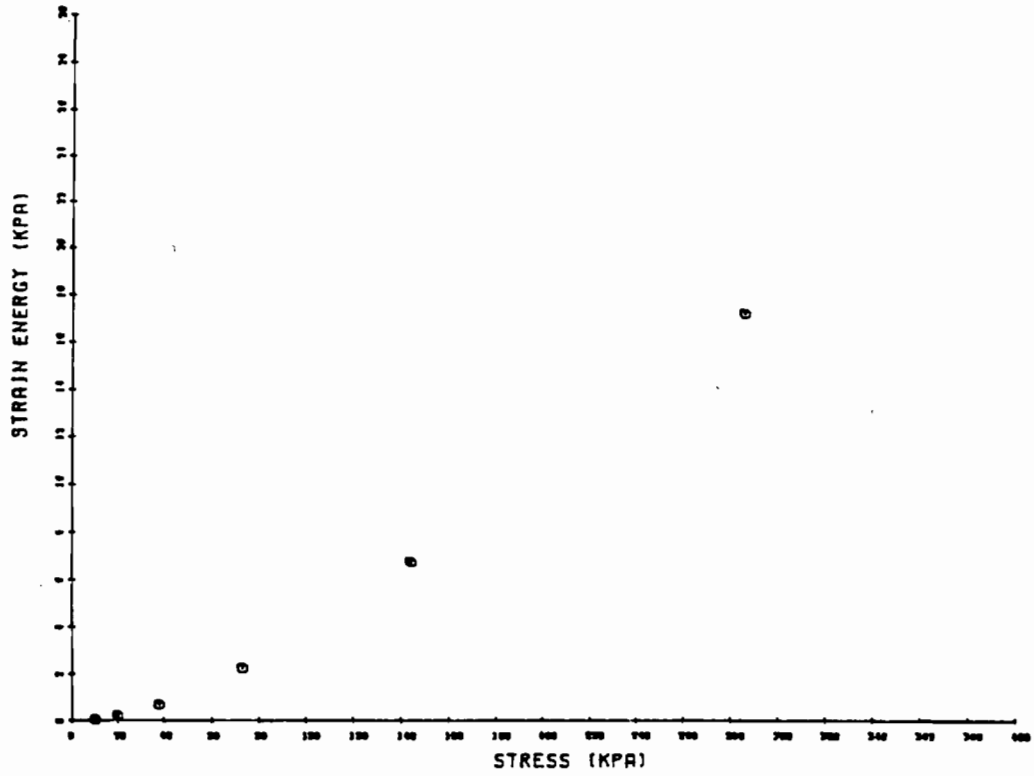
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.92 MM
 WATER CONTENT = 54.20 %
 INITIAL VOID RATIO = 1.474
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	BI-BD MM
10.0	1.460	1.36E-03	5.96E-04	7.93E-09	0.03	0.60	0.03
20.0	1.433	4.19E-04	1.09E-03	4.41E-09	0.19	1.67	0.01
38.0	1.393	5.20E-04	8.97E-04	4.57E-09	0.66	3.29	0.01
73.0	1.323	4.71E-04	8.06E-04	3.72E-09	2.22	6.11	0.02
144.0	1.221	4.78E-04	5.94E-04	2.74E-09	6.72	10.25	0.02
286.0	1.101	6.60E-04	3.41E-04	2.20E-09	17.13	15.09	0.02
570.0	0.954	6.00E-04	2.10E-04	1.23E-09	42.61	21.04	0.03
1138.0	0.779	5.93E-04	1.24E-04	7.09E-09	102.76	28.09	0.01
2273.0	0.612	5.42E-04	5.96E-05	3.16E-09	218.10	34.85	0.04
570.0	0.678	3.68E-04	1.56E-05	5.61E-10	180.42	32.20	-0.05
144.0	0.772	1.94E-04	8.98E-05	1.71E-09	166.75	28.37	-0.04
38.0	0.887	1.24E-04	4.39E-04	5.35E-09	162.52	23.72	-0.01
10.0	0.989	5.24E-05	1.44E-03	7.41E-09	161.55	19.67	-0.00

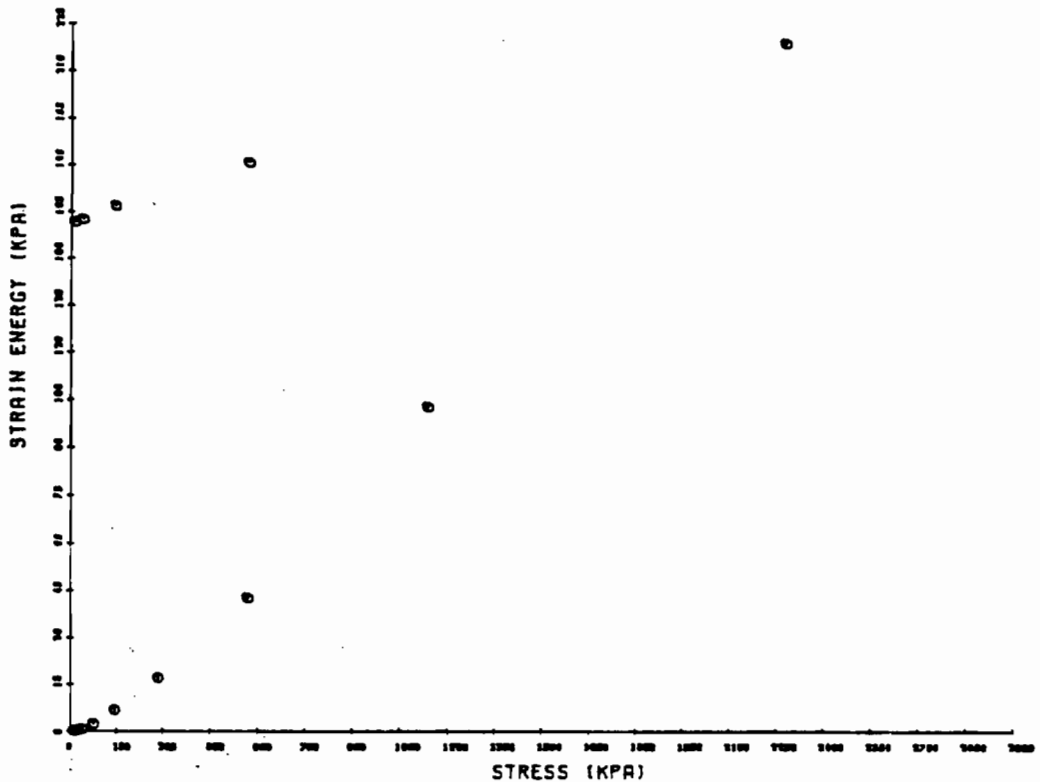
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ:852-2007 BH:AE84SI01 SA:14H DEPTH:12.26M



PROJ:852-2007 BH:AE84SI01 SA:14H DEPTH:12.26M

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CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: AE848101
 SAMPLE: 14V
 DEPTH: 14.11-14.16M

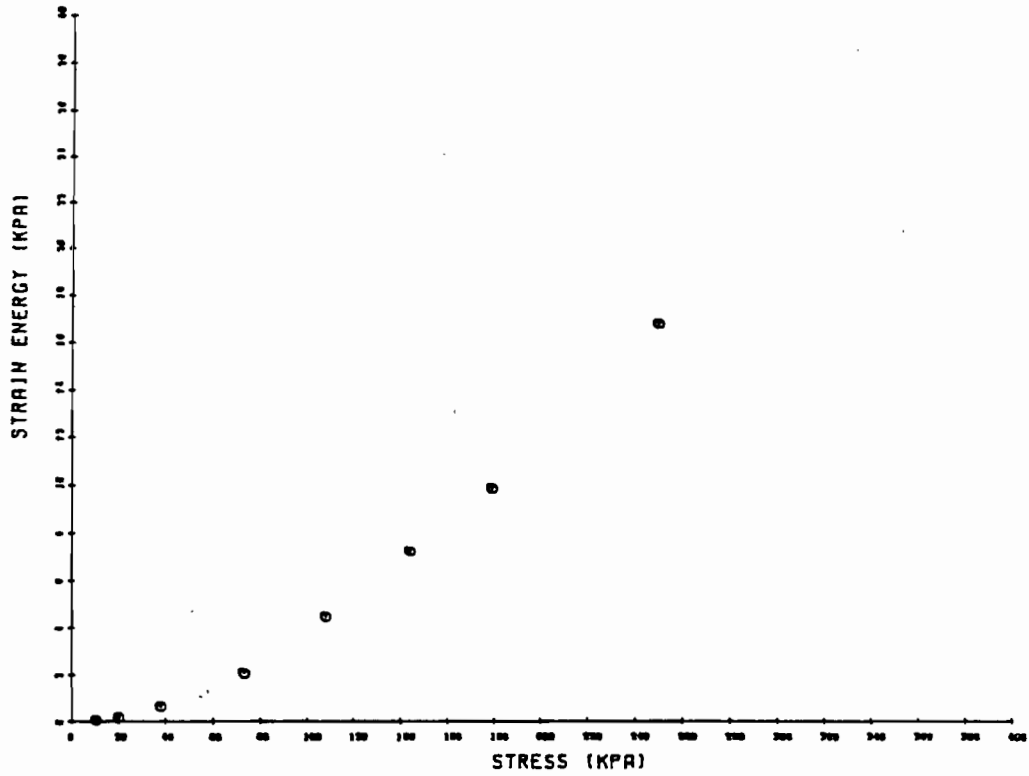
DIAMETER OF SAMPLE = 4.95 CM
 HEIGHT OF SAMPLE = 11.26 MM
 WATER CONTENT = 60.20 %
 INITIAL VOID RATIO = 1.637
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	E1-E0 MM
10.0	1.619	1.71E-03	6.93E-04	1.16E-07	0.03	0.69	0.04
20.0	1.598	8.37E-04	7.91E-04	6.49E-08	0.15	1.48	0.02
38.0	1.556	6.49E-04	8.94E-04	5.68E-08	0.62	3.09	0.02
73.0	1.488	7.10E-04	7.34E-04	5.11E-08	2.05	5.66	0.03
108.0	1.418	3.76E-04	7.59E-04	2.60E-08	4.45	8.32	0.01
144.0	1.361	3.27E-04	6.05E-04	1.94E-08	7.19	10.49	0.01
179.0	1.318	3.90E-04	4.64E-04	1.77E-08	9.81	12.12	0.00
250.0	1.233	3.50E-04	4.53E-04	1.55E-08	16.71	15.33	0.01
392.0	1.102	4.96E-04	3.49E-04	1.69E-08	32.61	20.25	0.00
676.0	0.943	5.33E-04	2.13E-04	1.11E-08	64.89	26.33	0.03
1244.0	0.762	5.55E-04	1.21E-04	6.58E-09	130.87	33.20	0.04
2380.0	0.557	4.16E-04	6.84E-05	2.79E-09	271.60	40.97	0.06
676.0	0.617	1.18E-03	1.34E-05	1.56E-09	236.61	35.68	-0.08
250.0	0.706	3.13E-04	7.89E-05	2.42E-09	221.05	35.32	-0.04
38.0	0.895	1.13E-04	3.38E-04	3.75E-09	210.72	28.15	-0.06

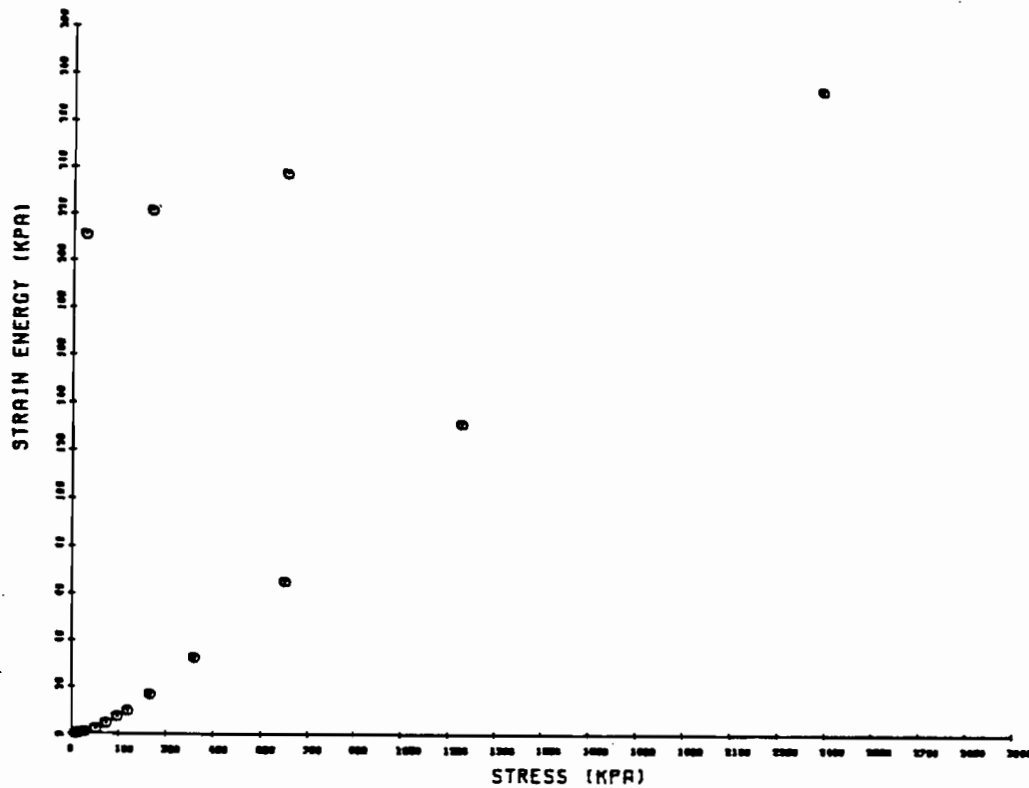


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AE84SI01 SA: 16V DEPTH: 14.11-14.16M



PROJ: 852-2007 BH: AE84SI01 SA: 16V DEPTH: 14.11-14.16M

Project No. 852-2007 Drawn CJ Reviewed _____ Date JUNE 05



CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: A8848101
 SAMPLE: 164
 DEPTH: 14.24

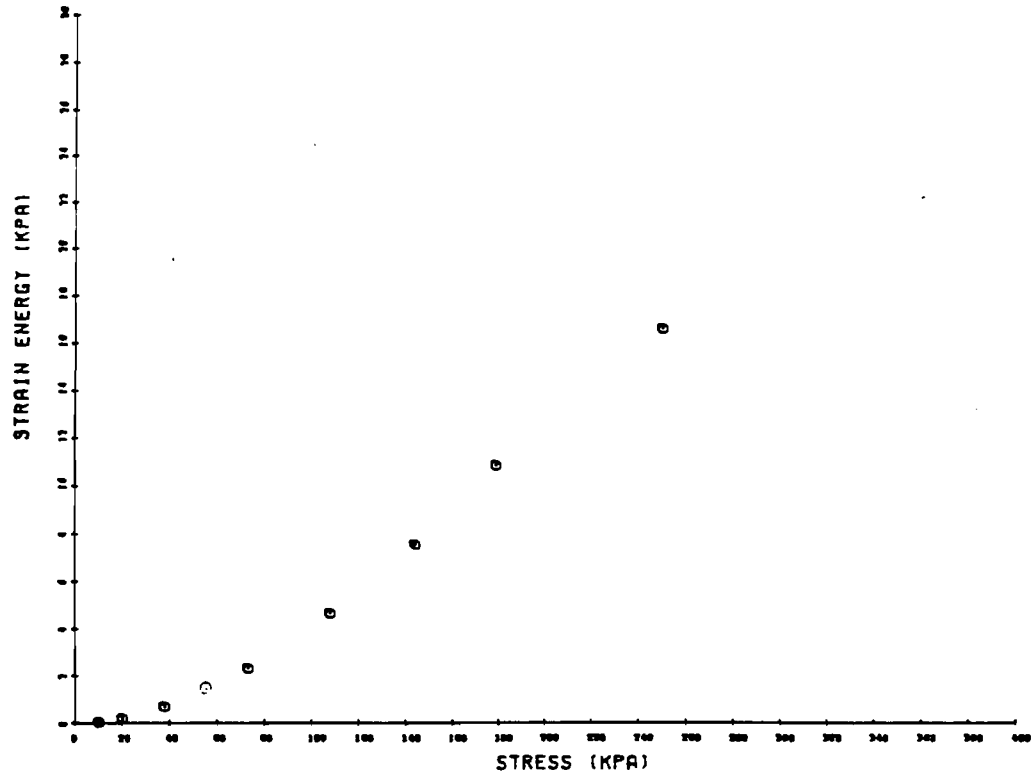
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.92 MM
 WATER CONTENT = 53.10 %
 INITIAL VOID RATIO = 1.444
 SPECIFIC GRAVITY = 2.72

STRESS	VOID	CV	MV	E	SE	STRAIN	SI
(KPA)	RATIO	CM2/SEC	1/KPA	CM/SEC	KPA	%	MM
10.0	1.435	2.88E-03	3.78E-04	1.07E-07	0.02	0.38	0.00
20.0	1.409	6.55E-04	1.09E-03	6.97E-09	0.10	1.46	0.01
38.0	1.366	4.79E-04	9.55E-04	4.49E-08	0.68	3.18	0.14
73.0	1.295	4.92E-04	8.33E-04	4.01E-08	2.30	6.10	0.04
105.0	1.232	3.17E-04	7.34E-04	2.28E-08	4.62	8.67	0.02
144.0	1.176	2.63E-04	6.40E-04	1.65E-08	7.53	10.97	0.01
179.0	1.126	1.62E-04	5.82E-04	9.27E-09	10.82	13.01	0.01
250.0	1.061	2.62E-04	3.76E-04	9.63E-09	16.54	15.68	0.02
392.0	0.954	3.44E-04	3.07E-04	1.04E-08	30.55	20.04	0.02
676.0	0.821	3.78E-04	1.93E-04	7.14E-09	59.75	25.51	0.03
1244.0	0.655	3.70E-04	1.19E-04	4.32E-09	124.82	32.29	0.05
2380.0	0.478	3.58E-04	6.36E-05	2.24E-09	255.82	39.52	0.05
676.0	0.535	1.57E-04	1.36E-05	2.10E-10	220.31	37.19	-0.10
250.0	0.618	1.22E-04	7.93E-05	9.48E-10	204.68	33.82	-0.04
38.0	0.817	7.71E-05	3.85E-04	2.91E-09	192.91	25.65	-0.04

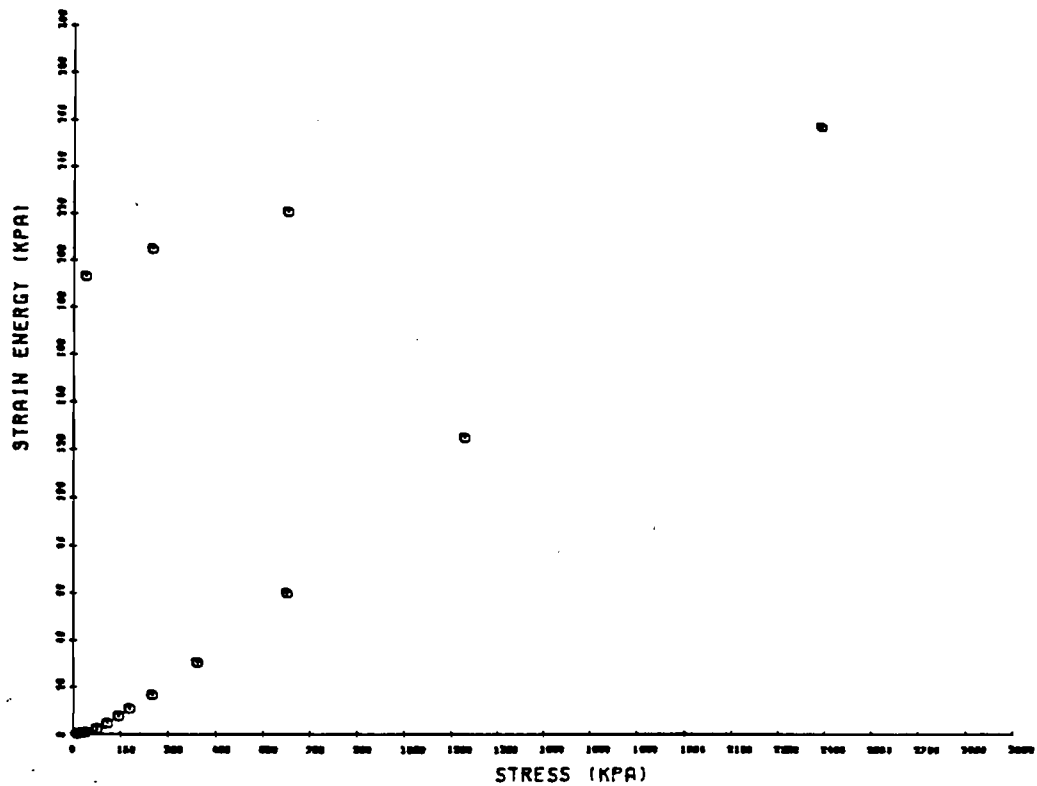
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ:852-2007 BH:AE84S101 SA:16H DEPTH:14.24



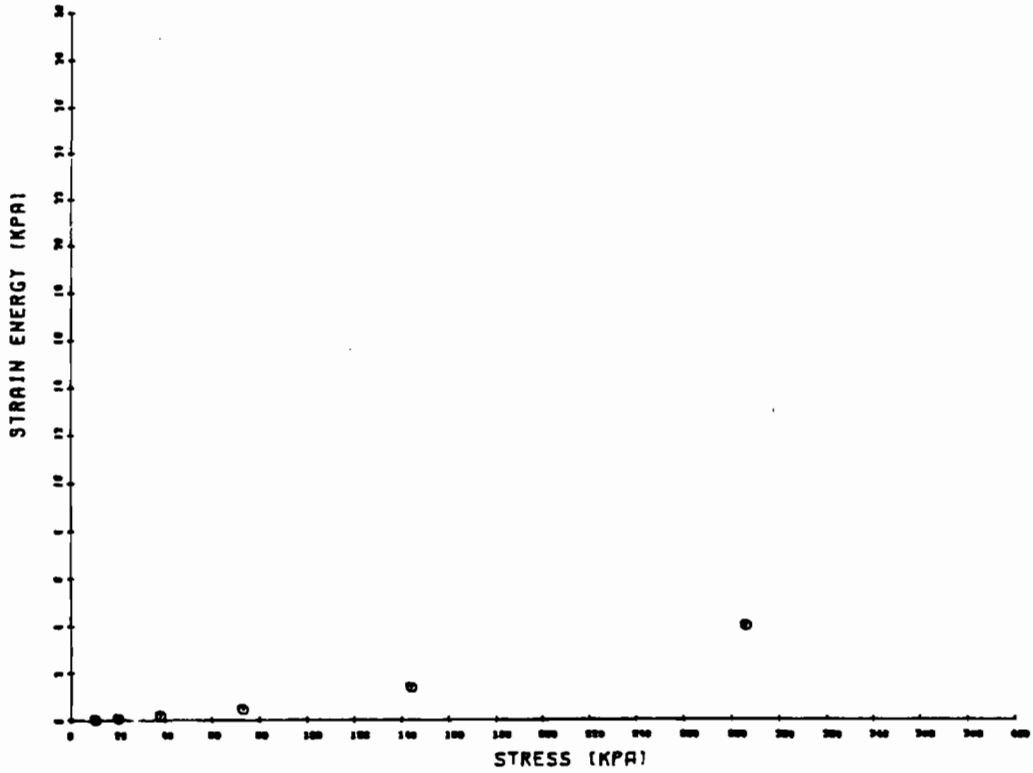
PROJ:852-2007 BH:AE84S101 SA:16H DEPTH:14.24

Project No 852-2007 Draw C9 Reviewed Date JUNE 05

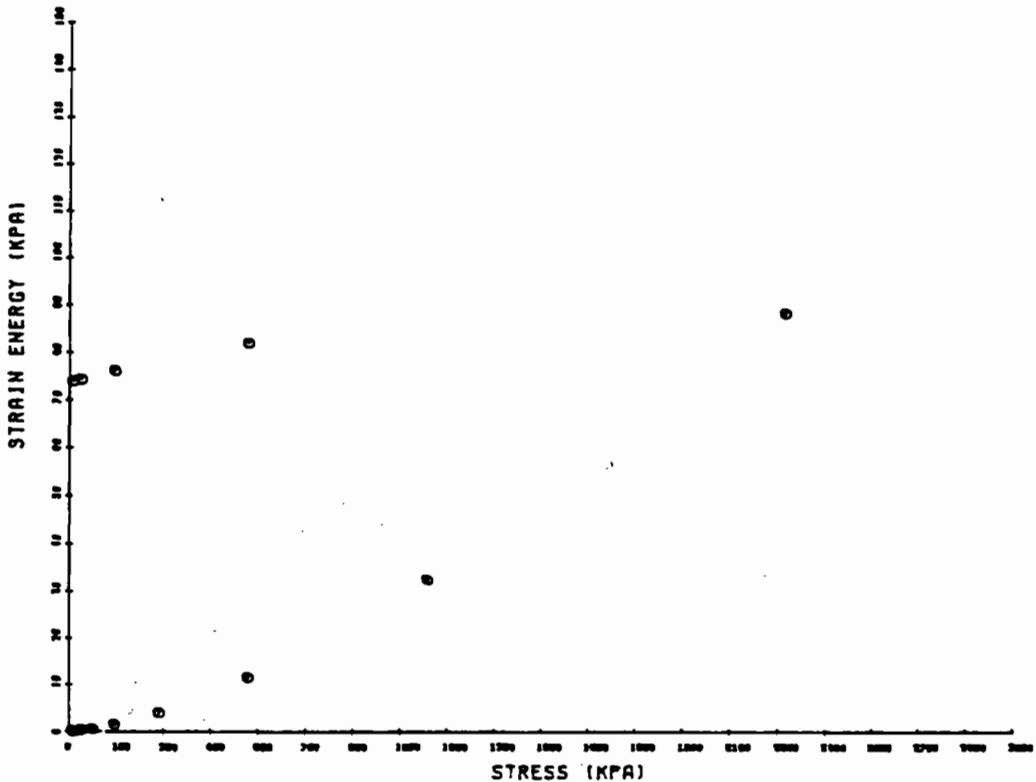


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure

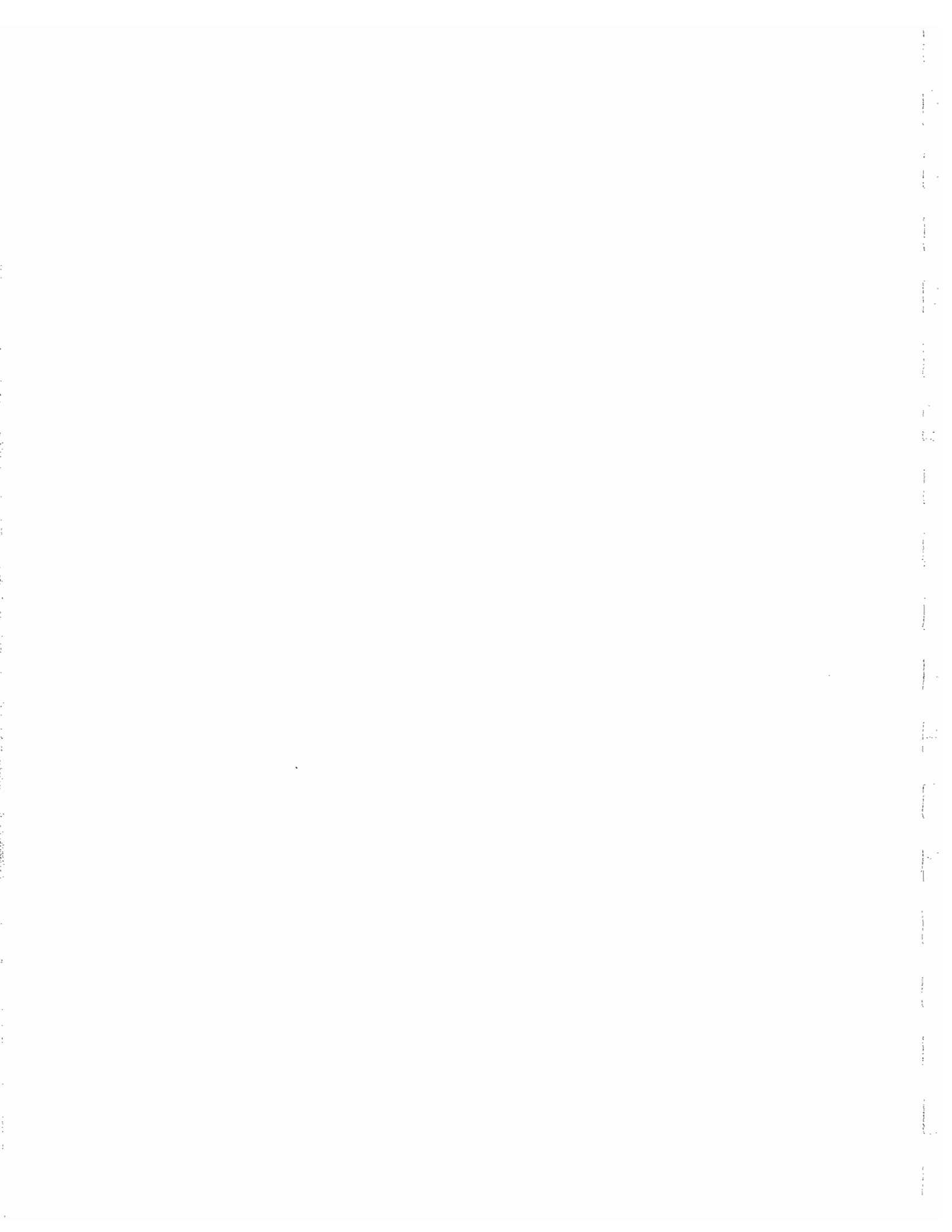


PROJ: 852-2007 BH: AE84SI01 SA: 27V DEPTH: 38.48-38.52M



PROJ: 852-2007 BH: AE84SI01 SA: 27V DEPTH: 38.48-38.52M

Project No. 852-2007 Drawn C9 Reviewed _____ Date JUNE 05



CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: A8848101
 SAMPLE: 27H
 DEPTH: 38.57M

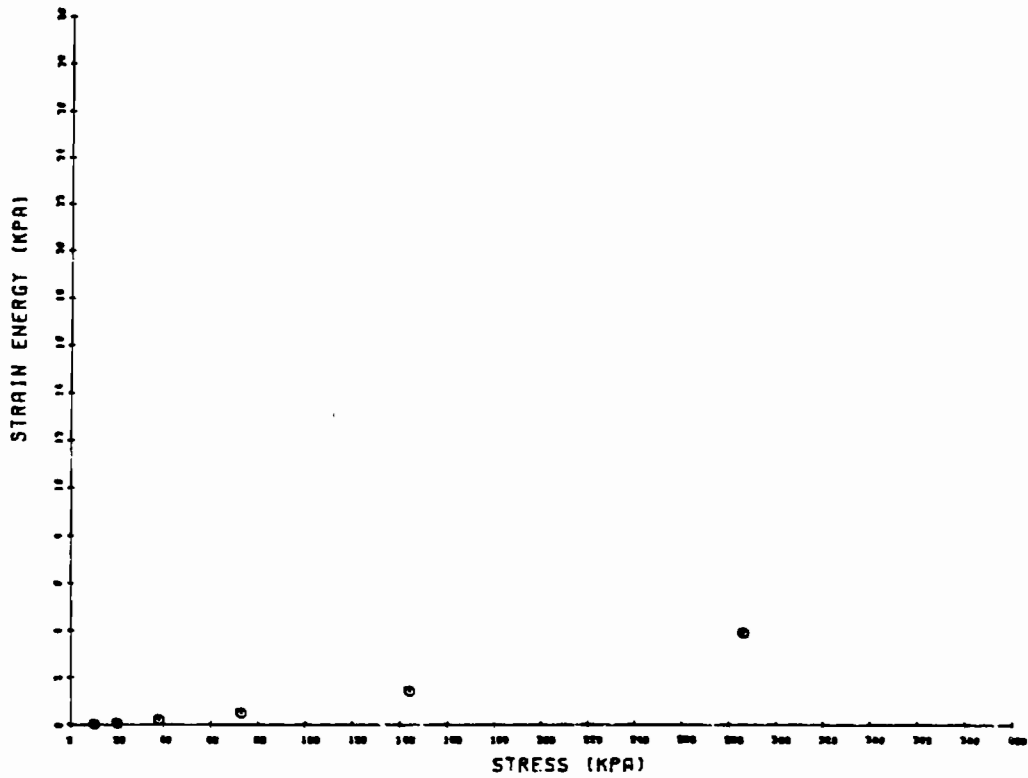
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.90 MM
 WATER CONTENT = 30.50 %
 INITIAL VOID RATIO = 0.824
 SPECIFIC GRAVITY = 2.70

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	SI-RO MM
10.0	0.822	3.86E-03	7.56E-05	2.86E-08	0.00	0.08	0.02
20.0	0.817	5.23E-03	2.87E-04	1.47E-07	0.05	0.38	0.02
38.0	0.809	2.10E-03	2.45E-04	5.04E-08	0.17	0.80	0.04
75.0	0.799	1.92E-03	1.61E-04	2.87E-08	0.49	1.37	0.06
144.0	0.783	2.16E-03	1.18E-04	2.50E-08	1.40	2.21	0.07
286.0	0.762	3.16E-03	8.04E-05	2.49E-08	3.83	5.35	0.08
570.0	0.733	3.01E-03	5.72E-05	1.69E-08	10.80	4.97	0.09
1138.0	0.687	3.34E-03	4.39E-05	1.44E-08	32.11	7.47	0.07
2273.0	0.627	3.20E-03	2.93E-05	9.19E-09	88.85	10.79	0.07
570.0	0.640	1.85E-03	4.16E-06	7.55E-10	78.79	10.09	-0.12
144.0	0.667	8.13E-04	3.53E-05	2.81E-09	73.41	8.58	-0.06
38.0	0.708	3.96E-04	2.13E-04	8.27E-09	71.35	6.32	-0.02
10.0	0.752	2.29E-04	8.49E-04	1.90E-08	70.78	3.94	-0.02

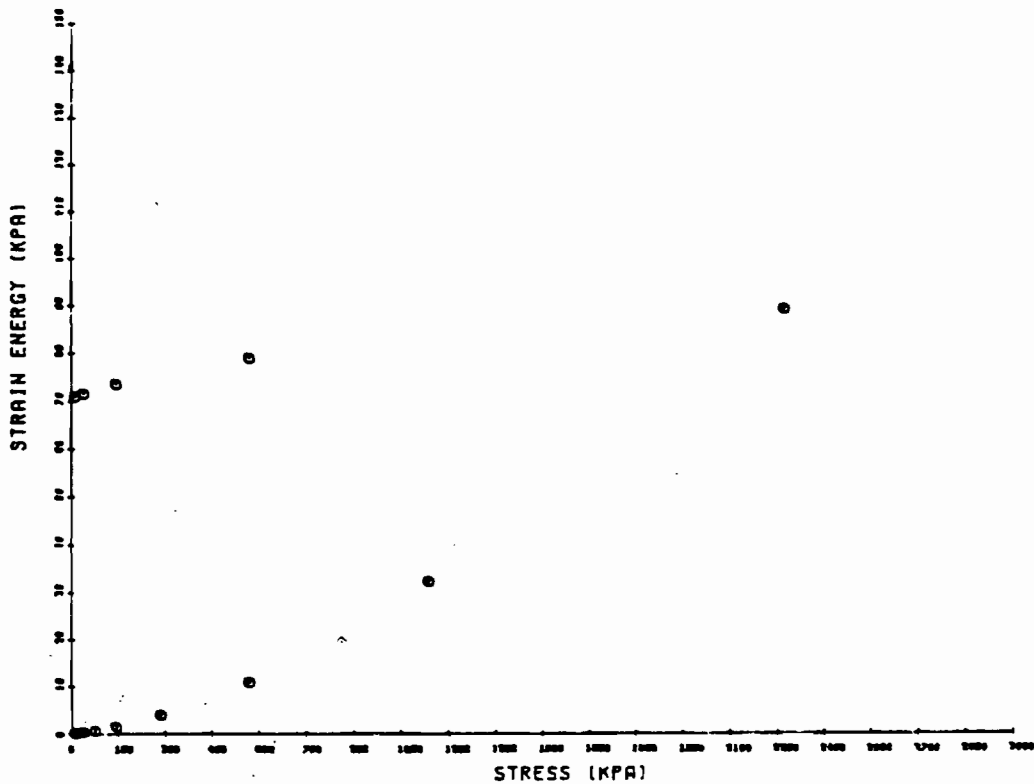
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ:852-2007 BH:AE84S101 SA:27H DEPTH:38.57M



PROJ:852-2007 BH:AE84S101 SA:27H DEPTH:38.57M

Project No. 852-2007 Drawn CJ Reviewed _____ Date JUNE 95

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CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: A8849101
 SAMPLE: 28V
 DEPTH: 41.51-41.53M

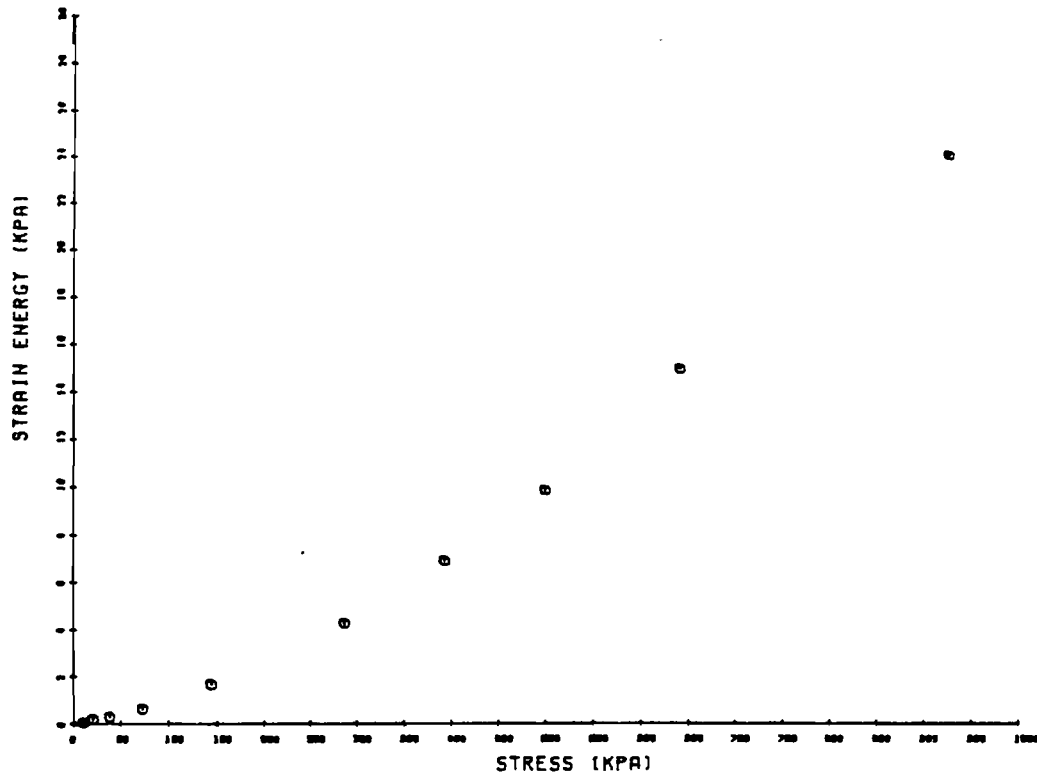
DIAMETER OF SAMPLE = 4.95 CM
 HEIGHT OF SAMPLE = 11.26 MM
 WATER CONTENT = 26.50 %
 WEIGHT OF SOLIDS = 34.13 GMS
 SPECIFIC GRAVITY = 2.70

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	L CM/SEC	SE KPA	SIRGIE %	SI-SI MM
10.0	0.700	7.91E-05	8.97E-04	6.95E-09	0.04	0.90	0.04
20.0	0.685	1.26E-04	8.54E-04	1.05E-08	0.17	1.75	0.01
36.0	0.679	1.80E-03	2.22E-04	3.92E-08	0.29	2.15	0.02
73.0	0.669	3.14E-03	1.57E-04	4.82E-08	0.59	2.70	0.03
144.0	0.653	2.37E-03	1.35E-04	3.14E-08	1.63	3.66	0.05
288.0	0.632	2.86E-03	8.51E-05	2.39E-08	4.23	4.87	0.07
392.0	0.619	2.01E-03	7.32E-05	1.44E-08	6.86	5.64	0.02
499.0	0.607	1.73E-03	6.15E-05	1.05E-08	9.79	6.30	0.02
641.0	0.592	1.41E-03	6.26E-05	8.68E-09	14.86	7.19	0.02
925.0	0.572	3.29E-03	4.04E-05	1.30E-08	23.86	8.34	0.03
1492.0	0.541	3.74E-03	3.24E-05	1.19E-08	46.03	10.17	0.05
2628.0	0.491	3.50E-03	2.54E-05	8.72E-09	7105.59	13.06	0.07
925.0	0.498	5.50E-03	2.41E-06	1.30E-09	98.30	12.65	-0.09
392.0	0.514	3.50E-03	1.72E-05	5.89E-09	92.28	11.74	-0.14
73.0	0.561	1.07E-03	8.51E-05	8.94E-09	85.96	9.02	-0.05

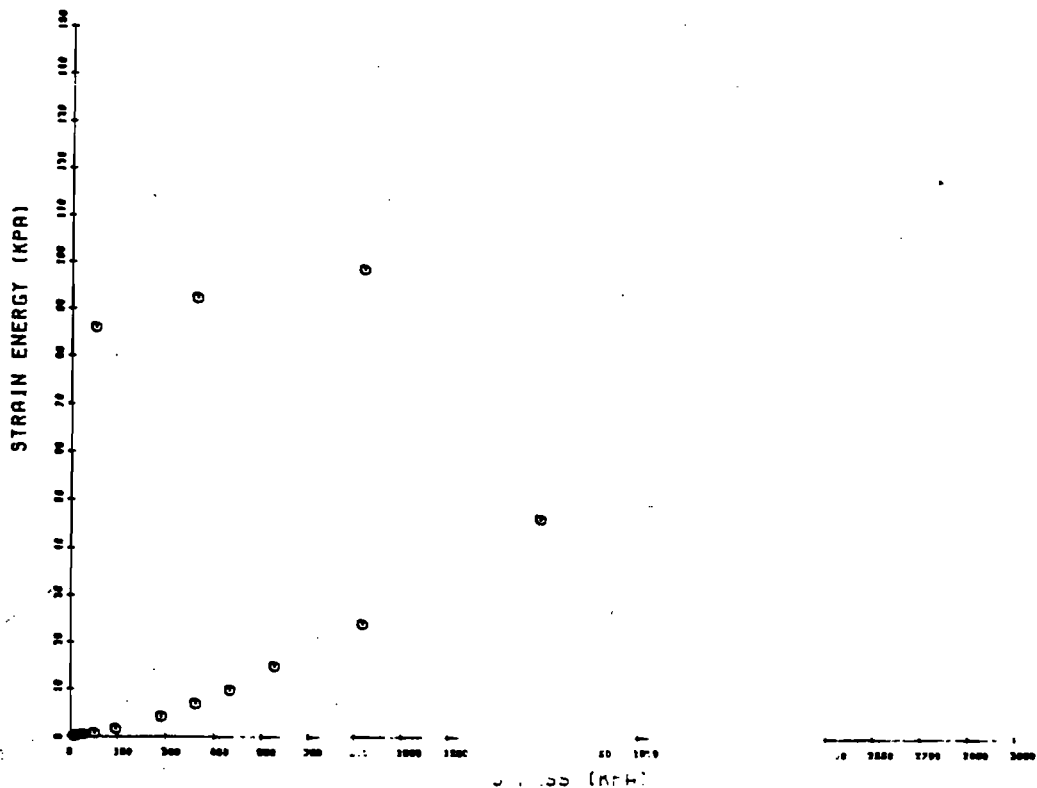
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure

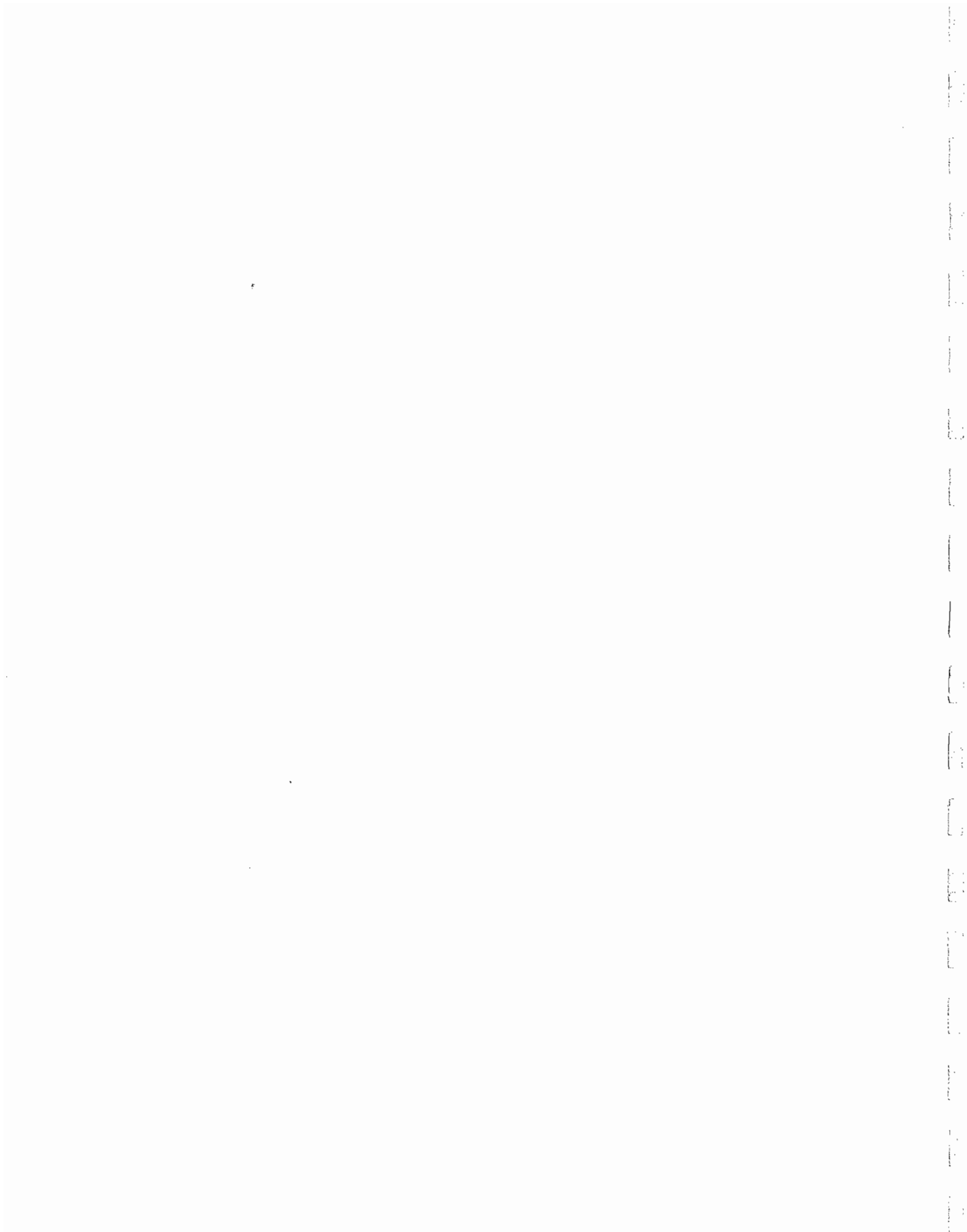


PROJ: 852-2007 BH: AE84SI01 SA: 28V DEPTH: 41.51-41.56M



PROJ: 852-2007 BH: AE84SI01 SA: 28V DEPTH: 41.51-41.56M

Project No 852-2007 Drawn CJ Reviewed _____ Date JUNE 05



CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: AES01
 SAMPLE: 28H
 DEPTH: 41.51-41.56 M

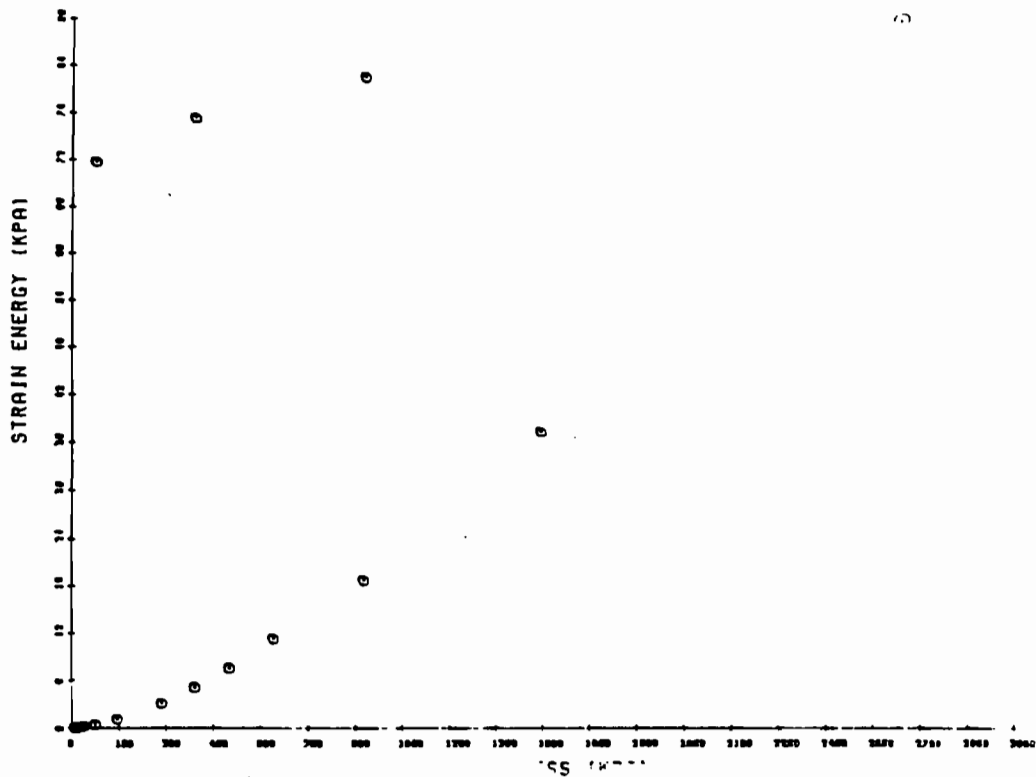
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.92 MM
 WATER CONTENT = 29.30 %
 WEIGHT OF SOLIDS = 34.11 GMS
 SPECIFIC GRAVITY = 2.70

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SC KPA	STRAIN %	DL-RO MM
10.0	0.763	1.16E-02	6.71E-05	7.65E-08	0.00	0.07	0.03
20.0	0.760	4.62E-03	1.43E-04	6.47E-08	0.02	0.21	0.02
38.0	0.756	1.63E-03	1.50E-04	2.40E-08	0.10	0.48	0.03
73.0	0.747	3.41E-03	1.38E-04	4.63E-08	0.37	0.97	0.04
144.0	0.735	3.24E-03	9.43E-05	2.99E-08	1.10	1.63	0.05
286.0	0.719	3.34E-03	6.61E-05	2.16E-08	3.12	2.57	0.07
392.0	0.708	1.49E-03	5.59E-05	9.14E-09	5.12	3.17	0.02
499.0	0.698	1.14E-03	5.25E-05	5.85E-09	7.63	3.73	0.02
641.0	0.687	9.38E-04	4.56E-05	3.74E-09	11.32	4.37	0.02
925.0	0.670	2.04E-03	3.29E-05	6.63E-09	18.64	5.31	0.04
1492.0	0.643	2.35E-03	2.71E-05	6.26E-09	37.24	6.85	0.08
2628.0	0.599	2.76E-03	2.23E-05	6.04E-09	89.45	9.38	0.08
925.0	0.606	1.73E-03	2.36E-06	4.00E-10	82.30	8.98	-0.10
392.0	0.619	1.27E-03	1.45E-05	1.81E-09	77.20	8.21	-0.05
73.0	0.662	5.14E-04	7.52E-05	3.79E-09	71.62	5.81	-0.05



STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 RP: CR: 28H DEPTH: 41 1.55 M

Project No: 852-2007 Draw: C9 Revised: Date: JUNE 85

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CONSOLIDATION TEST

PROJECT: 952-2007
 BOREHOLE: A8848101
 SAMPLE: 29V
 DEPTH: 44.73-44.78M

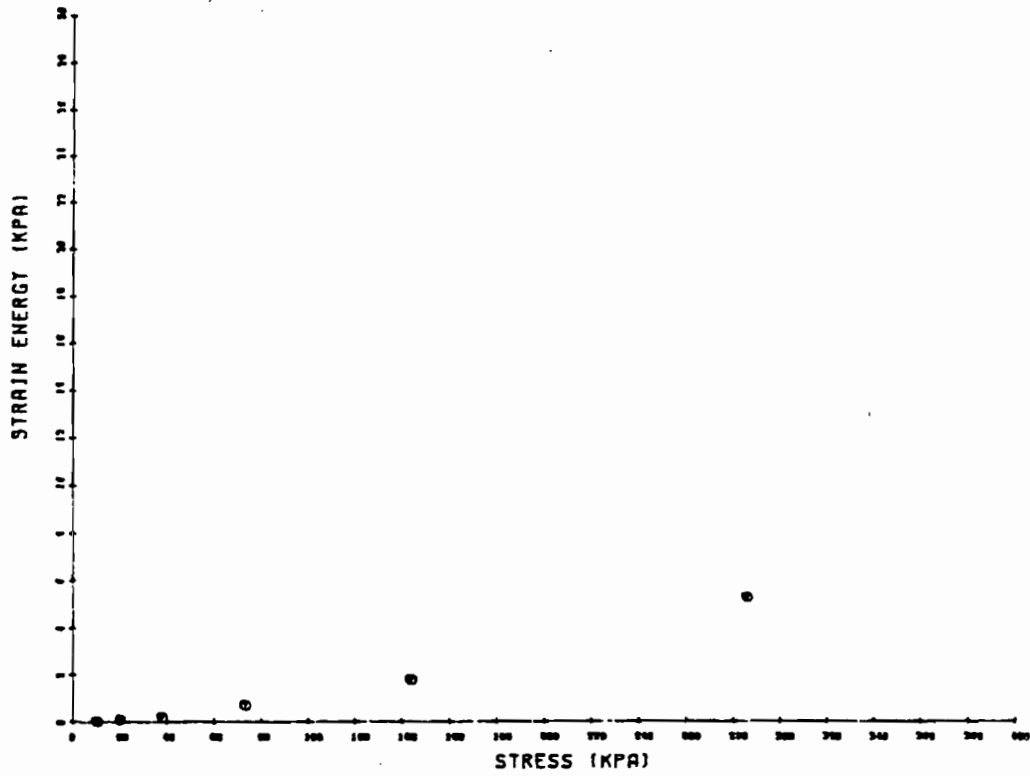
DIAMETER OF SAMPLE = 4.95 CM
 HEIGHT OF SAMPLE = 11.06 MM
 WATER CONTENT = 33.50 %
 INITIAL VOID RATIO = 0.902
 SPECIFIC GRAVITY = 2.70

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	BI-90 MM
10.0	0.902	4.97E-03	1.21E-04	5.89E-09	0.01	0.12	0.19
20.0	0.896	1.06E-03	3.23E-04	3.35E-09	0.05	0.44	0.03
38.0	0.889	2.08E-03	2.15E-04	4.40E-09	0.17	0.83	0.02
73.0	0.871	2.43E-03	2.59E-04	6.19E-09	0.67	1.74	0.12
144.0	0.852	2.75E-03	1.42E-04	3.83E-09	1.76	2.75	0.04
286.0	0.822	2.96E-03	1.12E-04	3.26E-09	5.20	4.34	0.06
570.0	0.776	2.77E-03	8.46E-05	2.30E-09	15.48	6.74	0.06
1138.0	0.702	2.23E-03	6.86E-05	1.50E-09	48.77	10.64	0.09
2273.0	0.581	2.06E-03	5.58E-05	1.12E-09	156.74	16.97	0.05
570.0	0.603	1.66E-03	6.56E-06	1.06E-09	140.85	15.86	-0.11
144.0	0.657	1.04E-03	6.74E-05	6.98E-09	130.60	12.98	-0.03
38.0	0.712	4.23E-04	2.74E-04	1.14E-08	127.96	10.08	-0.01
10.0	0.767	1.36E-04	1.02E-03	1.35E-08	127.27	7.23	-0.00

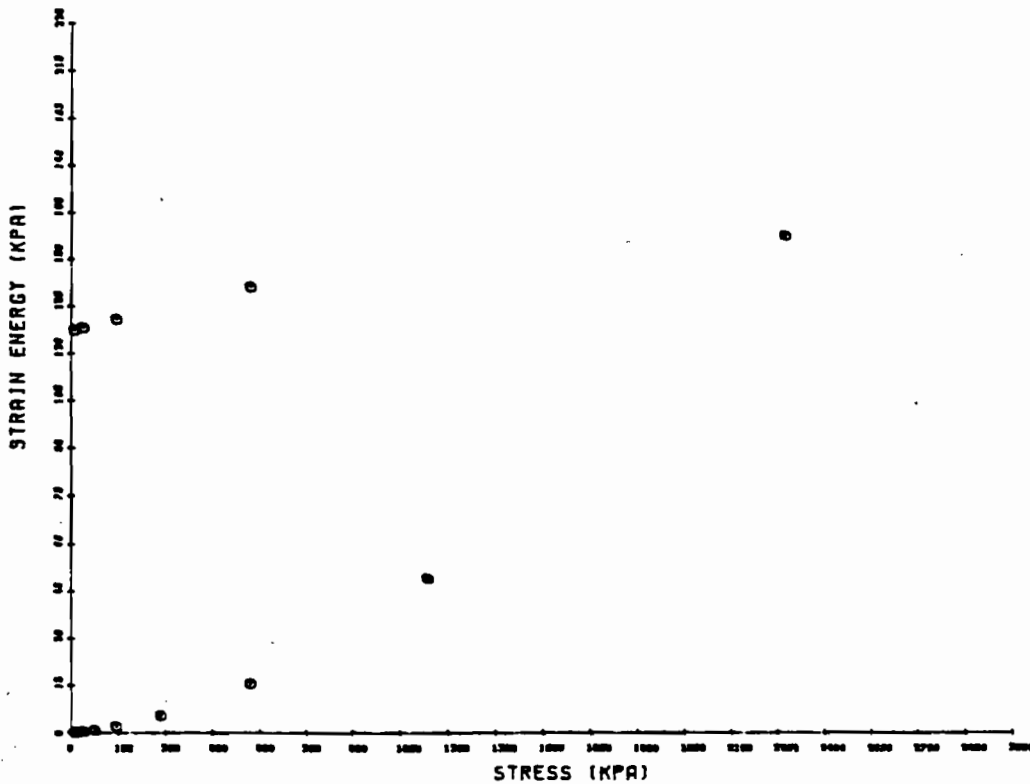
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ:852-2007 BH:REB4SI01 SR:29V DEPTH:44.73-44.78M



PROJ:852-2007 BH:REB4SI01 SR:29V DEPTH:44.73-44.78M

Project No 852-2007 Drawn CG Reviewed Date JUNE 05

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CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: AE94E101
 SAMPLE: 29H
 DEPTH: 44.69

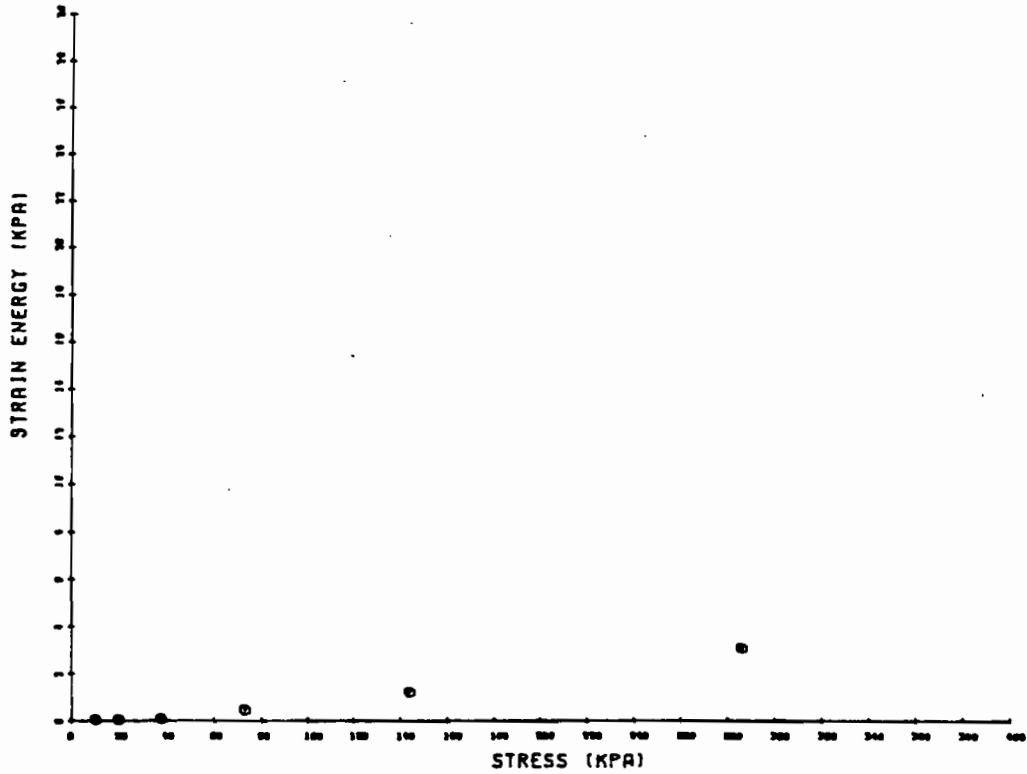
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.92 MM
 WATER CONTENT = 30.70 %
 INITIAL VOID RATIO = 0.829
 SPECIFIC GRAVITY = 2.70

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	R1-R0 MM
10.0	0.824	1.05E-02	2.85E-04	2.95E-07	0.01	0.29	0.02
20.0	0.823	1.15E-02	1.69E-05	1.90E-08	0.02	0.30	0.02
38.0	0.820	5.59E-03	9.42E-05	5.17E-09	0.07	0.47	0.02
73.0	0.808	1.09E-02	1.93E-04	2.05E-07	0.44	1.15	0.01
144.0	0.795	4.26E-03	9.59E-05	4.00E-08	1.18	1.83	0.02
285.0	0.780	5.75E-03	6.10E-05	3.44E-08	3.04	2.69	0.02
570.0	0.757	4.98E-03	4.27E-05	2.08E-08	8.23	3.91	0.03
1138.0	0.721	4.70E-03	3.54E-05	1.63E-08	25.41	5.92	0.05
2273.0	0.657	2.98E-03	3.09E-05	9.02E-09	85.28	9.43	0.05
570.0	0.668	1.67E-03	3.82E-05	6.25E-10	76.02	8.78	-0.11
144.0	0.697	8.71E-04	3.73E-05	3.19E-09	70.34	7.19	-0.06
38.0	0.733	4.57E-04	1.82E-04	8.16E-09	68.58	5.26	-0.03
10.0	0.761	2.17E-04	5.58E-04	1.18E-08	68.21	3.70	0.00

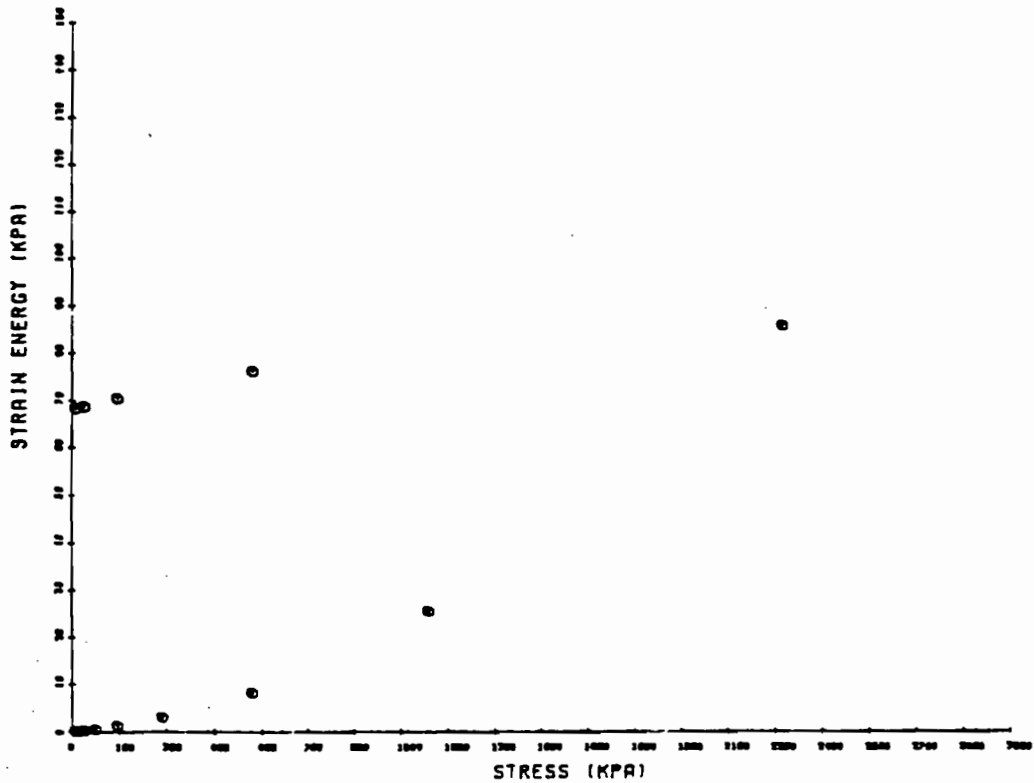


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AE84SI01 SA: 29H DEPTH: 44.69



PROJ: 852-2007 BH: AE84SI01 SA: 29H DEPTH: 44.69

Project No. 852-2007 Drawn CG Reviewed _____ Date JUNE 05

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CONSOLIDATION TEST

PROJECT: B52-2007
 BOREHOLE: ABB48101
 SAMPLE: 30V
 DEPTH: 47.83-47.88M

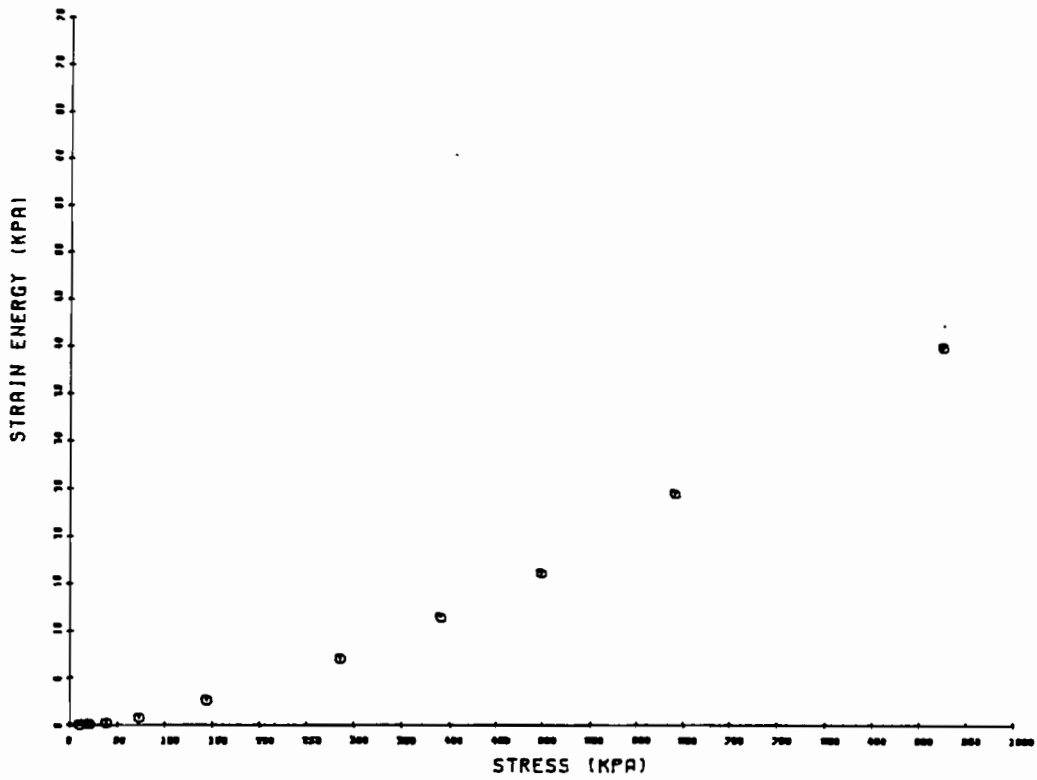
DIAMETER OF SAMPLE = 4.97 CM
 HEIGHT OF SAMPLE = 10.96 MM
 WATER CONTENT = 34.00 %
 WEIGHT OF SOLIDS = 29.52 GMS
 SPECIFIC GRAVITY = 2.70

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MY 1/KPA	N CM/SEC	SE KPA	STRAIN %	R1-R0 MM
10.0	0.916	9.78E-03	1.09E-04	1.05E-07	0.01	0.11	0.07
20.0	0.910	9.65E-04	3.31E-04	3.13E-08	0.06	0.44	0.02
38.0	0.899	1.04E-03	2.93E-04	3.03E-08	0.21	0.97	0.02
73.0	0.890	1.07E-03	2.83E-04	3.02E-08	0.71	1.96	0.01
144.0	0.848	9.24E-04	1.32E-04	2.30E-08	2.59	3.65	0.02
286.0	0.808	1.14E-03	1.46E-04	1.63E-08	7.04	5.72	0.10
392.0	0.784	9.26E-04	1.21E-04	1.10E-08	11.40	7.00	0.03
499.0	0.764	9.52E-04	9.63E-05	8.98E-09	15.99	8.03	0.01
641.0	0.736	5.67E-04	1.02E-04	5.69E-09	24.28	9.49	0.02
925.0	0.698	8.29E-04	6.90E-05	5.60E-09	39.62	11.45	0.02
1492.0	0.646	1.14E-03	4.84E-05	5.40E-09	72.82	14.19	0.01
2628.0	0.576	1.21E-03	3.21E-05	3.79E-09	147.99	17.84	0.02
925.0	0.590	2.32E-03	4.22E-06	9.62E-10	135.21	17.12	-0.05
392.0	0.615	1.20E-02	2.52E-05	2.98E-09	126.36	15.75	-0.03
73.0	0.687	3.20E-04	1.17E-04	3.66E-09	117.70	12.06	-0.05

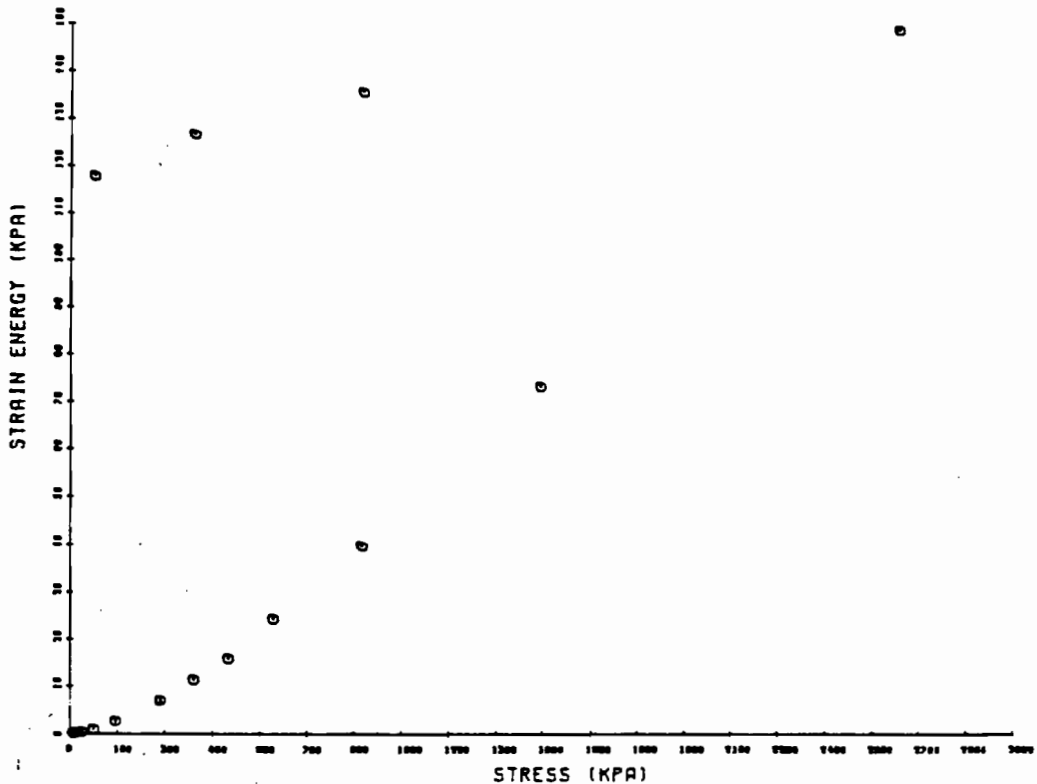
THE UNIVERSITY OF CHICAGO LIBRARY

STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AE84SI01 SA: 30V DEPTH: 47.83-47.88M



PROJ: 852-2007 BH: AE84SI01 SA: 30V DEPTH: 47.83-47.88M

Project No. 852-2007 Draw C9 Revised _____ Date JUNE 05

THE UNIVERSITY OF CHICAGO

CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: A6849101
 SAMPLE: 30H
 DEPTH: 47.89M

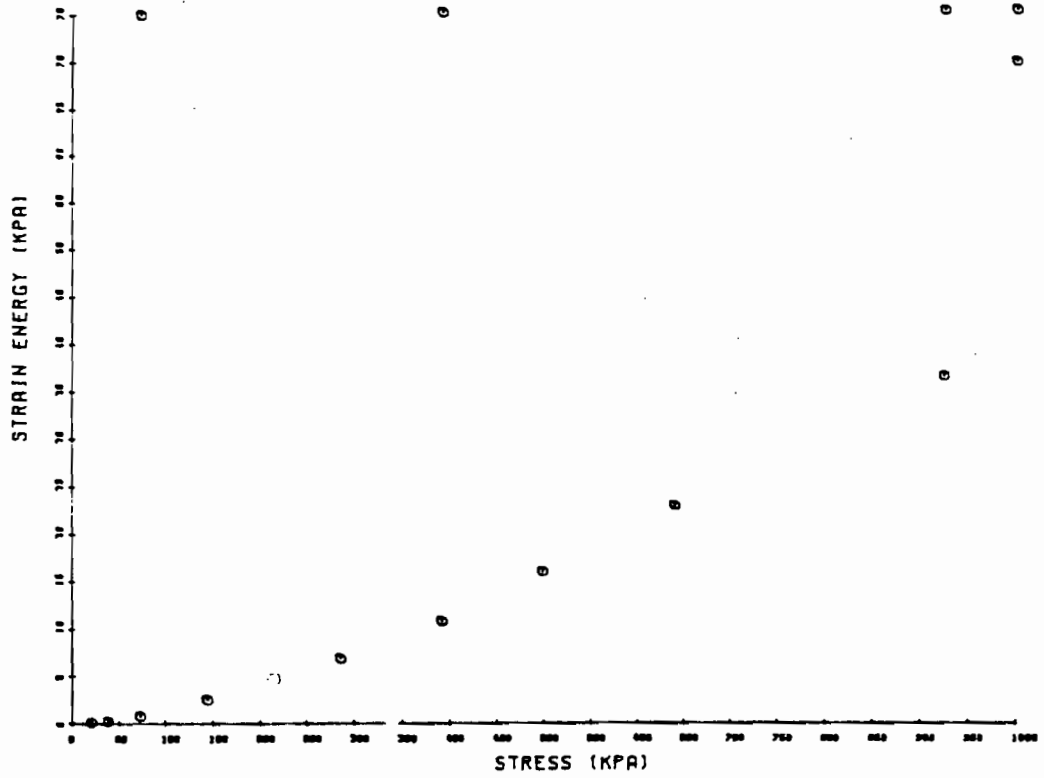
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.76 MM
 WATER CONTENT = 31.40 %
 WEIGHT OF SOLIDS = 33.38 GMS
 SPECIFIC GRAVITY = 2.70

STRESS (KPA)	VOID RATIO	DV CM ² /SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	E1-E2 MM
20.0	0.841	6.98E-04	1.71E-04	1.17E-08	0.03	0.34	0.03
38.0	0.832	1.10E-03	2.87E-04	3.09E-08	0.18	0.86	0.05
73.0	0.813	8.55E-04	2.98E-04	2.50E-08	0.76	1.90	0.07
144.0	0.783	8.53E-04	2.25E-04	1.88E-08	2.50	3.50	0.09
286.0	0.746	8.77E-04	1.43E-04	1.23E-08	6.67	5.53	0.11
392.0	0.724	7.96E-04	1.09E-04	8.50E-09	10.78	6.69	0.03
499.0	0.703	4.92E-04	1.09E-04	5.25E-09	15.97	7.85	0.02
641.0	0.680	4.09E-04	8.47E-05	3.39E-09	22.83	9.05	0.03
925.0	0.649	7.49E-04	6.07E-05	4.46E-09	36.33	10.78	0.05
1492.0	0.598	7.02E-04	4.85E-05	3.34E-09	69.56	13.53	0.07
2628.0	0.528	7.36E-04	3.31E-05	2.39E-09	7147.09	17.29	0.07
925.0	0.545	8.06E-04	5.20E-05	4.10E-10	7131.37	16.41	-0.10
392.0	0.571	3.04E-04	2.66E-05	7.93E-10	7122.02	14.99	-0.05
73.0	0.653	1.70E-04	1.39E-04	2.33E-09	7111.68	10.54	-0.06

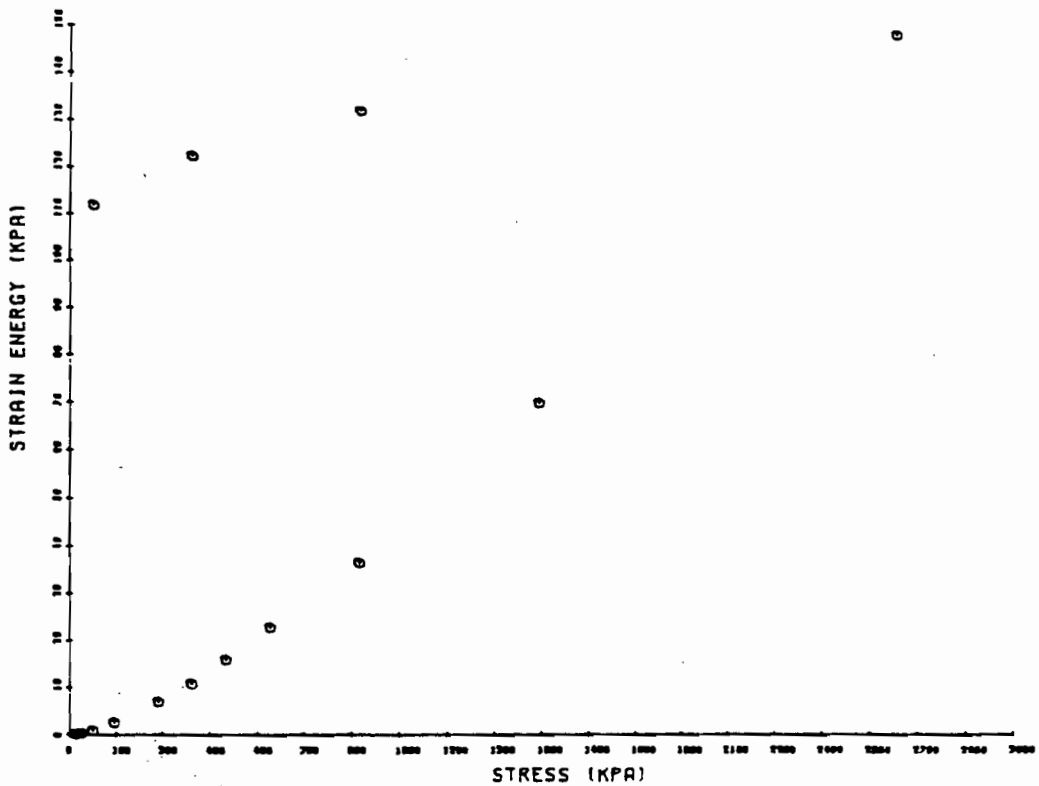
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AE84S101 SA: 30M DEPTH: 47.89M



PROJ: 852-2007 BH: AE84S101 SA: 30M DEPTH: 47.89M

Project No 852-2007 Drawn CG Reviewed _____ Date JUNE 85

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CONSOLIDATION TEST

PROJECT: B52-2007
 BOREHOLE: AWS4SI01
 SAMPLE: 2V
 DEPTH: 2.71-2.76M

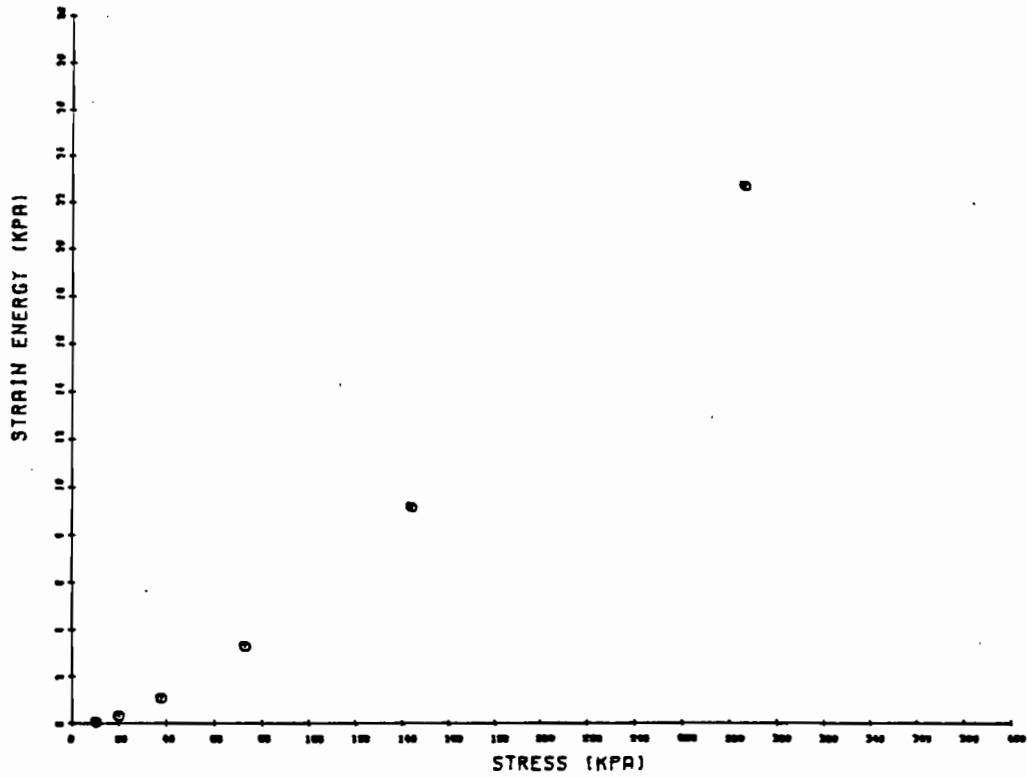
DIAMETER OF SAMPLE = 4.96 CM
 HEIGHT OF SAMPLE = 11.26 MM
 WATER CONTENT = 50.00 %
 INITIAL VOID RATIO = 1.360
 SPECIFIC GRAVITY = 2.72

STRESS	VOID	CV	WV	V	SE	SE/CM	SE-E
(KPA)	RATIO	CM/SEC	1/KPA	CM/SEC	KPA	%	MM
10.0	1.346	2.45E-03	6.08E-04	1.46E-07	0.03	0.61	0.02
20.0	1.302	1.96E-04	1.64E-03	3.54E-08	0.31	2.45	0.03
38.0	1.241	2.52E-04	1.43E-03	3.54E-08	1.05	5.03	0.03
73.0	1.146	2.05E-04	1.15E-03	2.31E-08	3.29	9.05	0.03
144.0	1.019	2.54E-04	7.59E-04	1.89E-08	9.13	14.44	0.03
286.0	0.871	2.62E-04	4.41E-04	1.22E-08	22.60	20.70	0.03
570.0	0.694	2.77E-04	2.65E-04	7.17E-09	54.76	28.22	0.04
1136.0	0.499	2.86E-04	1.45E-04	4.06E-09	125.17	36.46	0.05
2273.0	0.292	2.52E-04	7.75E-05	1.91E-09	275.14	48.26	0.07
570.0	0.375	4.61E-04	2.07E-05	9.34E-10	225.13	41.74	-0.10
144.0	0.509	1.54E-04	1.52E-04	2.31E-09	201.95	35.25	-0.05
38.0	0.678	6.39E-05	5.95E-04	3.75E-09	196.17	28.89	-0.08
10.0	0.809	2.78E-05	1.99E-03	5.41E-09	194.83	23.33	-0.01

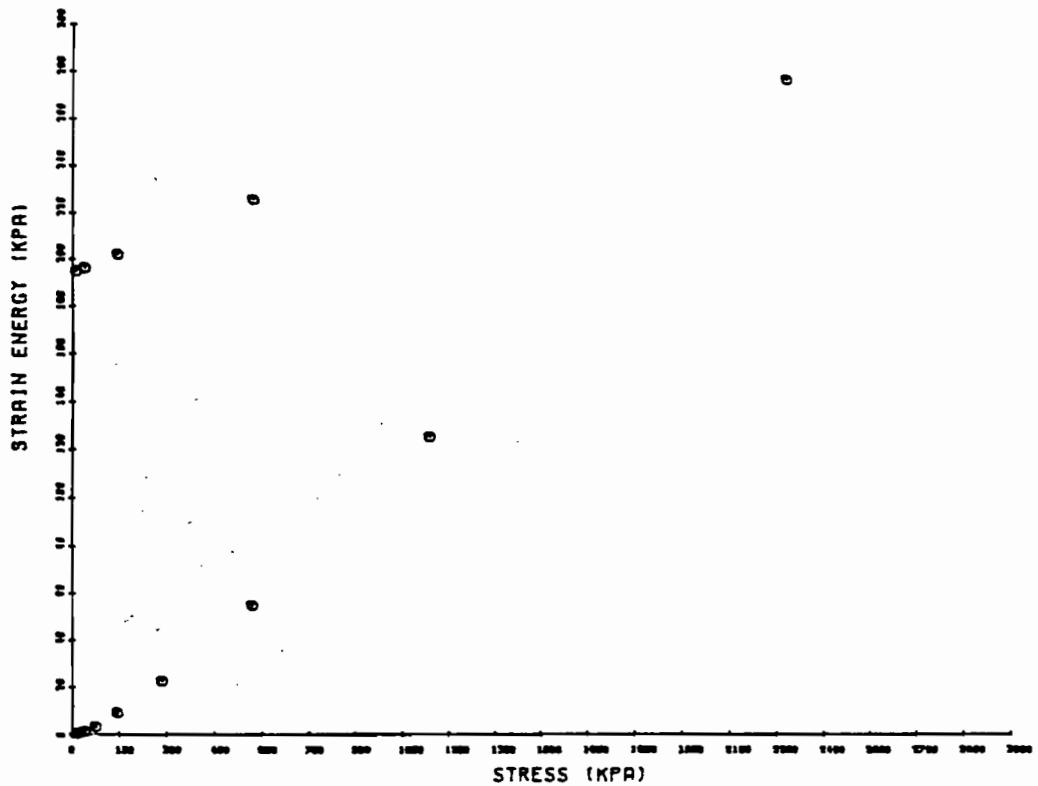


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure

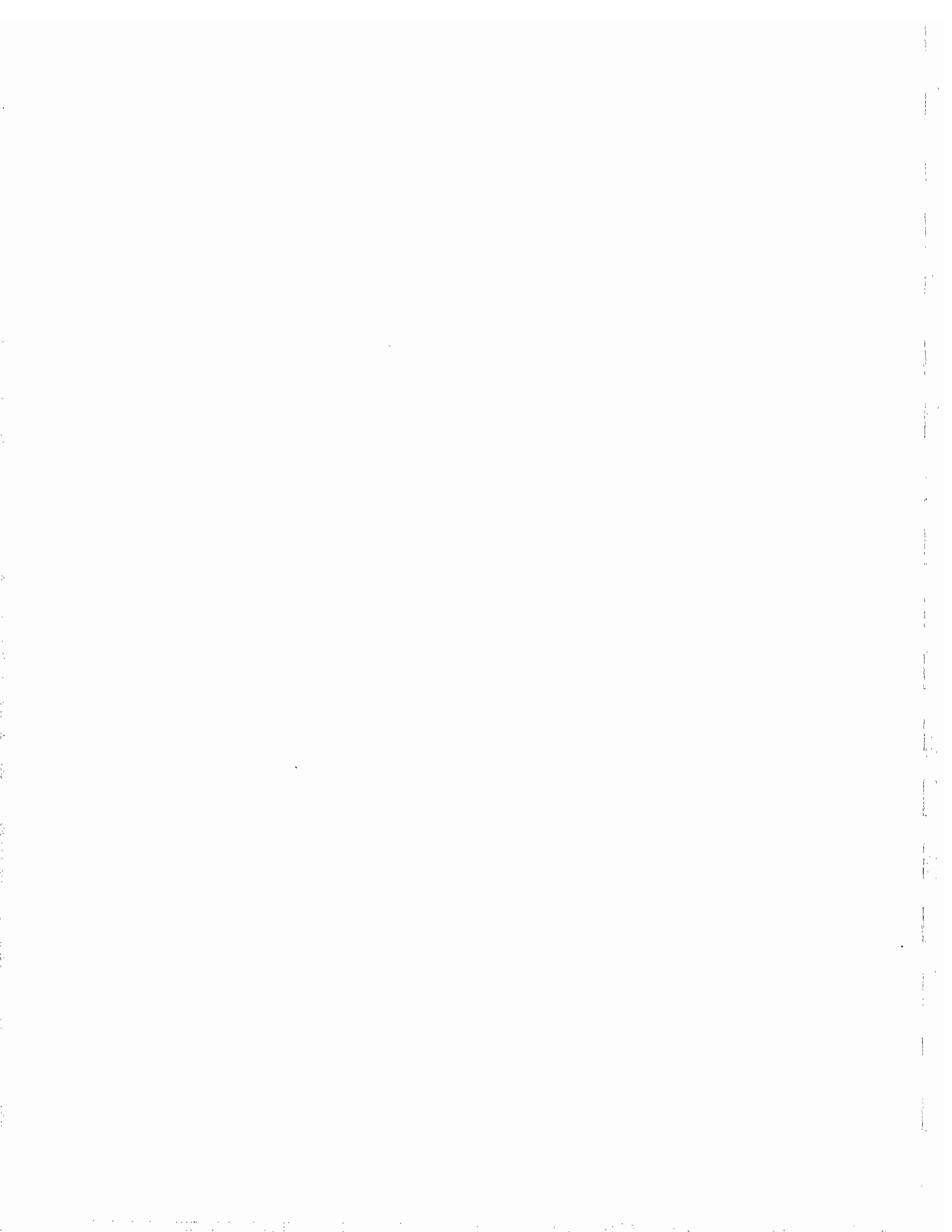


PROJ: 852-2007 BH: AW84S101 SA: 2V DEPTH: 2.71-2.76M



PROJ: 852-2007 BH: AW84S101 SA: 2V DEPTH: 2.71-2.76M

Project No 852-2007 Drawn C9 Reviewed _____ Date JUNE 85



CONSOLIDATION TEST

PROJECT: 952-2007
 BOREHOLE: ANS49101
 SAMPLE: 2H
 DEPTH: 2.78M

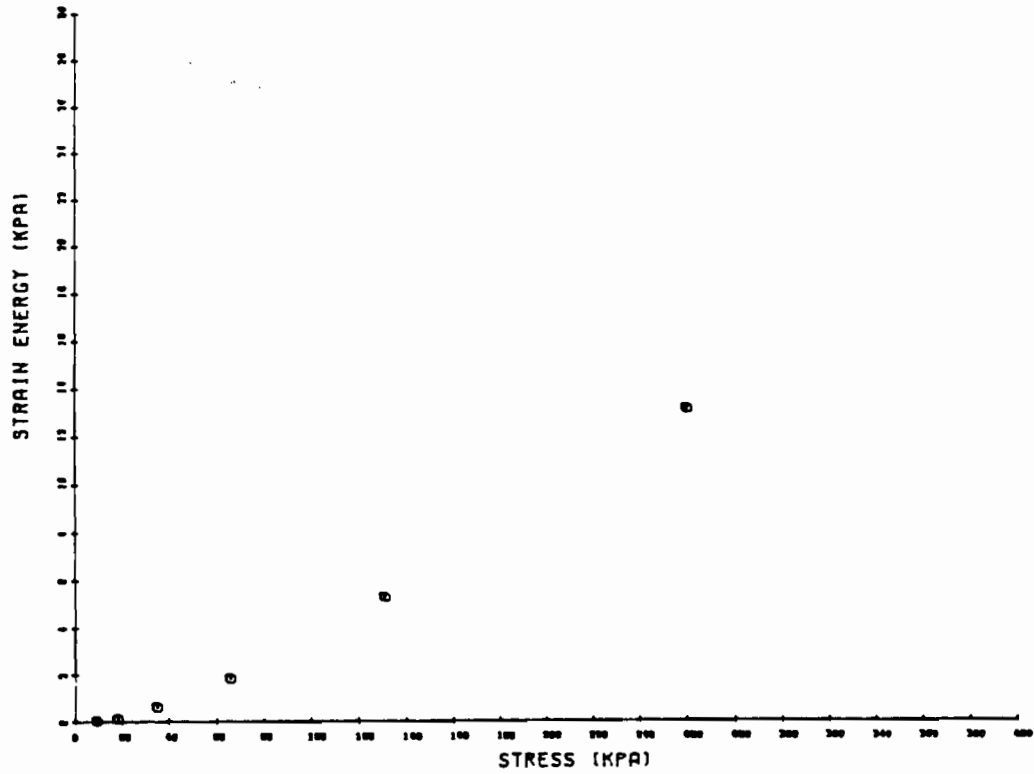
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 17.50 MM
 WATER CONTENT = 46.50 %
 INITIAL VOID RATIO = 1.258
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM/SEC	MV 1/KPA	F CM/SEC	SE KPA	STRAIN %	11-R
9.0	1.258	1.08E-07	3.56E-04	3.79E-08	0.01	0.32	0.00
18.0	1.239	1.76E-04	9.26E-04	1.60E-08	0.13	1.15	0.01
35.0	1.197	1.84E-04	1.07E-03	1.93E-08	0.61	2.97	0.01
66.0	1.143	2.28E-04	7.73E-04	1.73E-08	1.82	5.37	0.02
131.0	1.064	3.60E-04	5.37E-04	1.89E-08	5.26	8.86	0.00
260.0	0.973	3.46E-04	3.10E-04	1.05E-08	13.08	12.87	0.04
518.0	0.871	5.28E-04	1.73E-04	8.96E-09	30.47	17.33	0.05
1035.0	0.755	3.10E-04	9.99E-05	4.99E-09	70.55	22.00	0.10
2069.0	0.643	4.92E-04	4.79E-05	2.31E-09	107.17	27.44	0.13
518.0	0.692	1.23E-03	1.39E-05	1.74E-09	119.41	25.29	-0.11
103.0	0.778	3.45E-04	9.76E-05	3.30E-09	107.15	21.51	-0.06
35.0	0.869	1.26E-04	4.18E-04	5.14E-09	103.81	17.50	-0.02
9.0	0.930	5.39E-05	1.04E-03	5.50E-09	103.22	14.79	-0.01

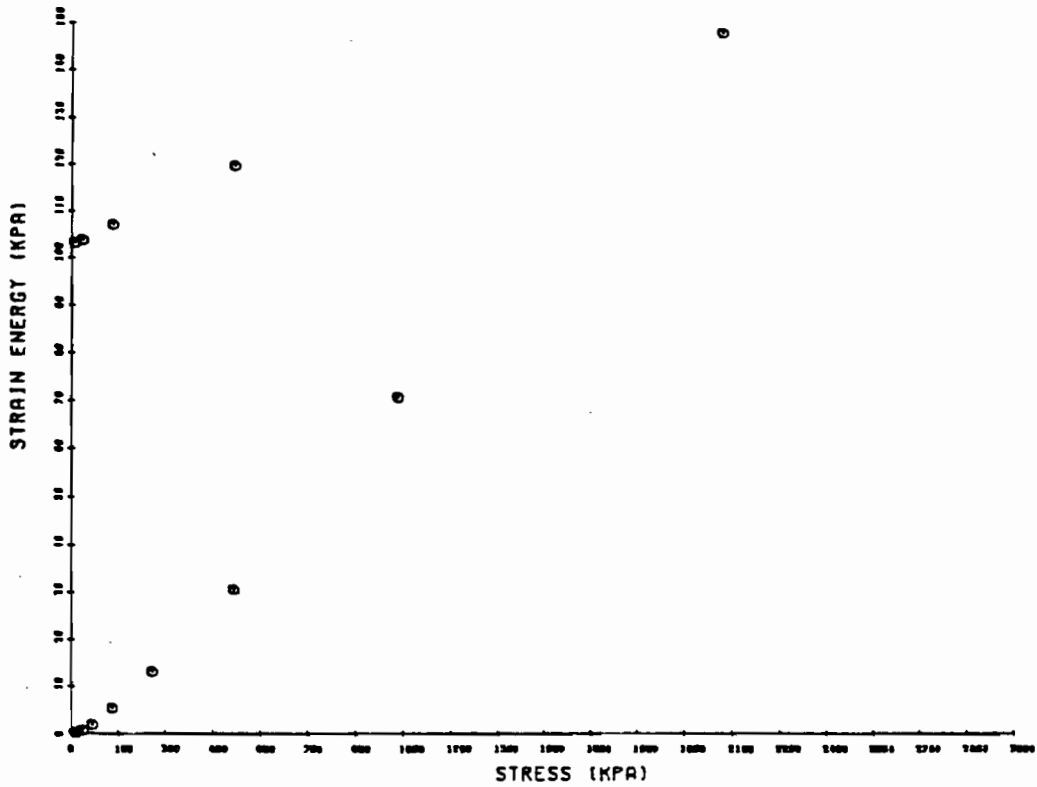


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: B52-2007 BH: AW84SI01 SA: 2H DEPTH: 2.78M



PROJ: B52-2007 BH: AW84SI01 SA: 2H DEPTH: 2.78M

Project No B52-2007 Drawn CJ Reviewed _____ Date JUNE 05

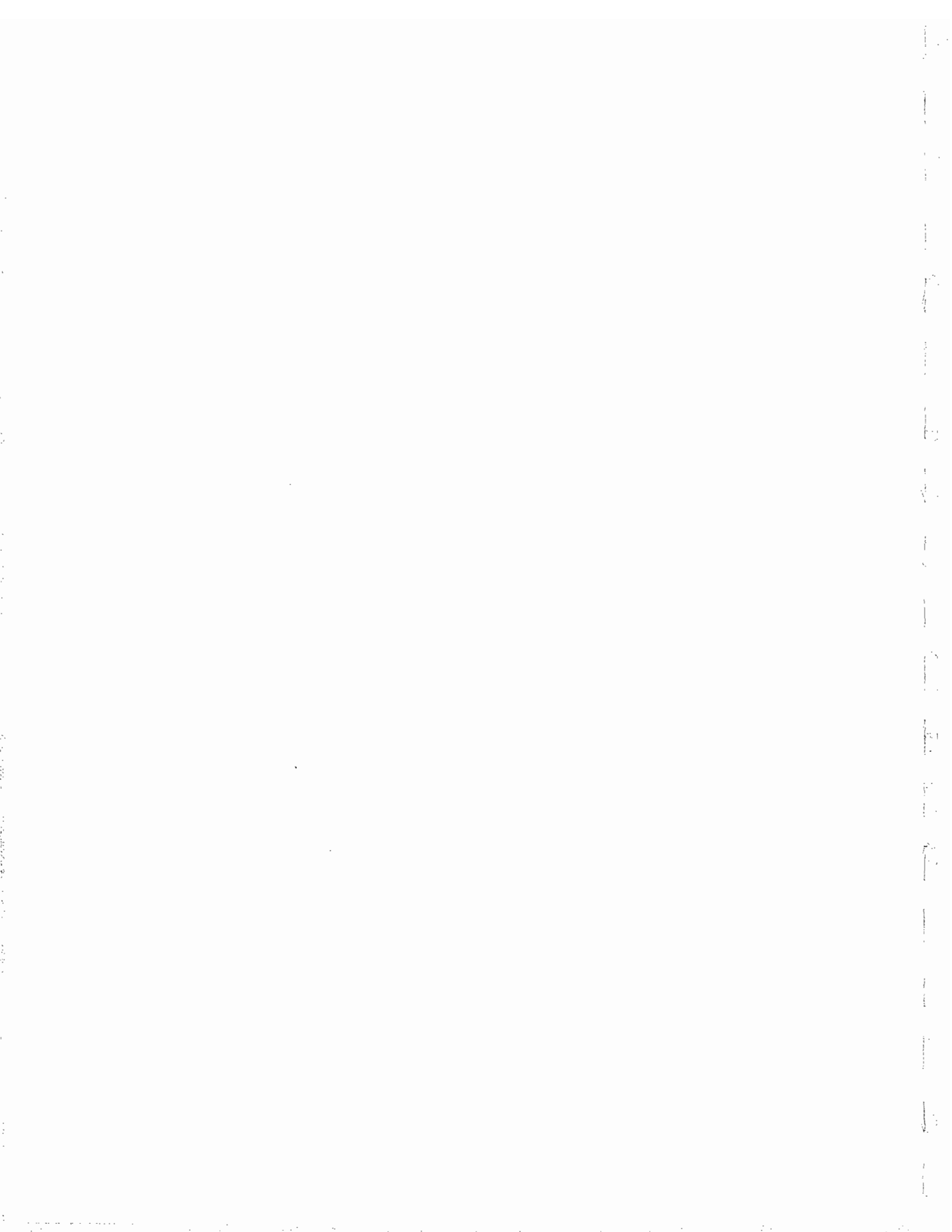
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CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: AWS48101
 SAMPLE: 3V
 DEPTH: 4.14-4.19M

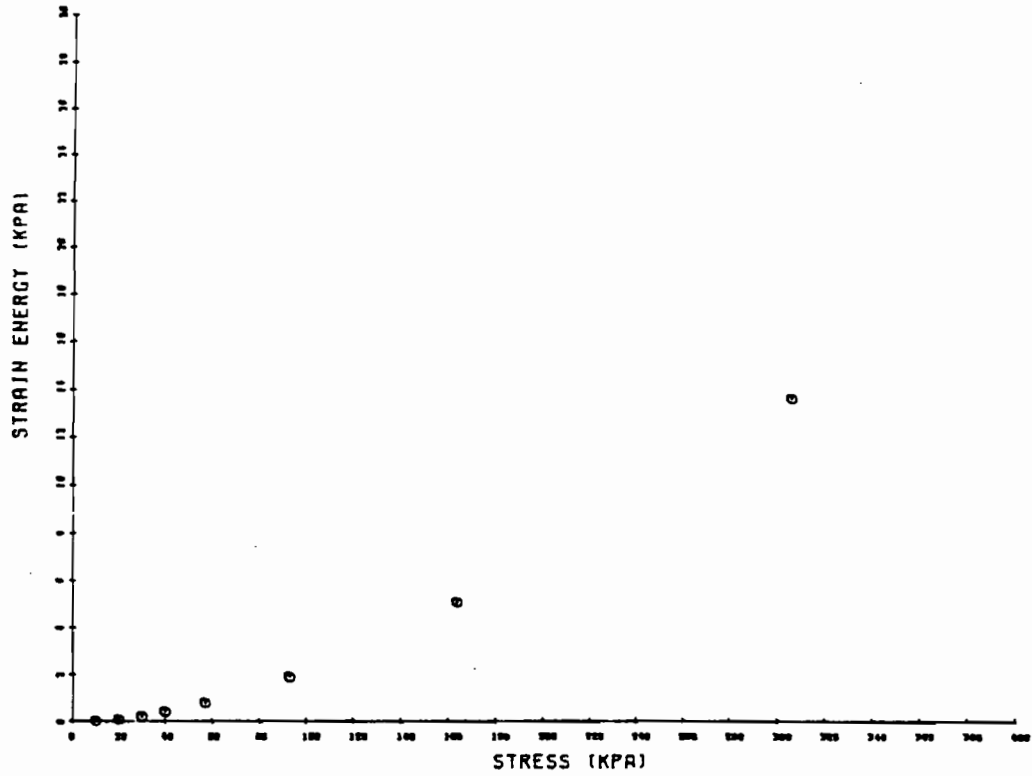
DIAMETER OF SAMPLE = 4.95 CM
 HEIGHT OF SAMPLE = 11.25 MM
 WATER CONTENT = 39.50 %
 INITIAL VOID RATIO = 1.047
 SPECIFIC GRAVITY = 2.72

STRESS	VOID	CV	MV	E	SE	STRAIN	E1-E0
(KPA)	RATIO	CM2/SEC	1/KPA	CM/SEC	KPA	%	MM
10.0	1.044	2.77E-03	1.79E-04	4.92E-02	0.01	0.16	0.01
20.0	1.024	1.47E-03	3.74E-04	5.39E-02	0.06	0.55	0.01
30.0	1.026	5.65E-04	4.64E-04	2.59E-02	0.16	1.02	0.01
40.0	1.015	3.72E-04	5.59E-04	2.04E-02	0.38	1.58	0.01
57.0	0.999	3.78E-04	4.59E-04	1.70E-02	0.76	2.36	0.01
93.0	0.969	5.61E-04	4.09E-04	2.25E-02	1.66	3.83	-0.03
164.0	0.918	6.07E-04	3.49E-04	2.08E-02	3.06	6.31	0.02
306.0	0.844	5.63E-04	2.55E-04	1.41E-02	12.54	9.92	0.03
590.0	0.755	6.39E-04	1.53E-04	9.56E-03	32.91	14.26	0.04
1159.0	0.648	8.02E-04	9.26E-05	7.28E-03	79.94	19.52	0.03
2293.0	0.539	7.44E-04	3.09E-05	3.72E-03	178.72	25.30	0.05
590.0	0.564	1.42E-03	1.00E-05	1.40E-02	154.19	22.60	-0.05
164.0	0.625	5.53E-04	6.95E-05	3.77E-02	142.99	20.64	-0.05
57.0	0.693	1.87E-04	2.66E-04	4.97E-02	129.84	17.79	-0.02
20.0	0.733	9.89E-05	6.53E-04	6.33E-02	138.91	15.37	-0.02

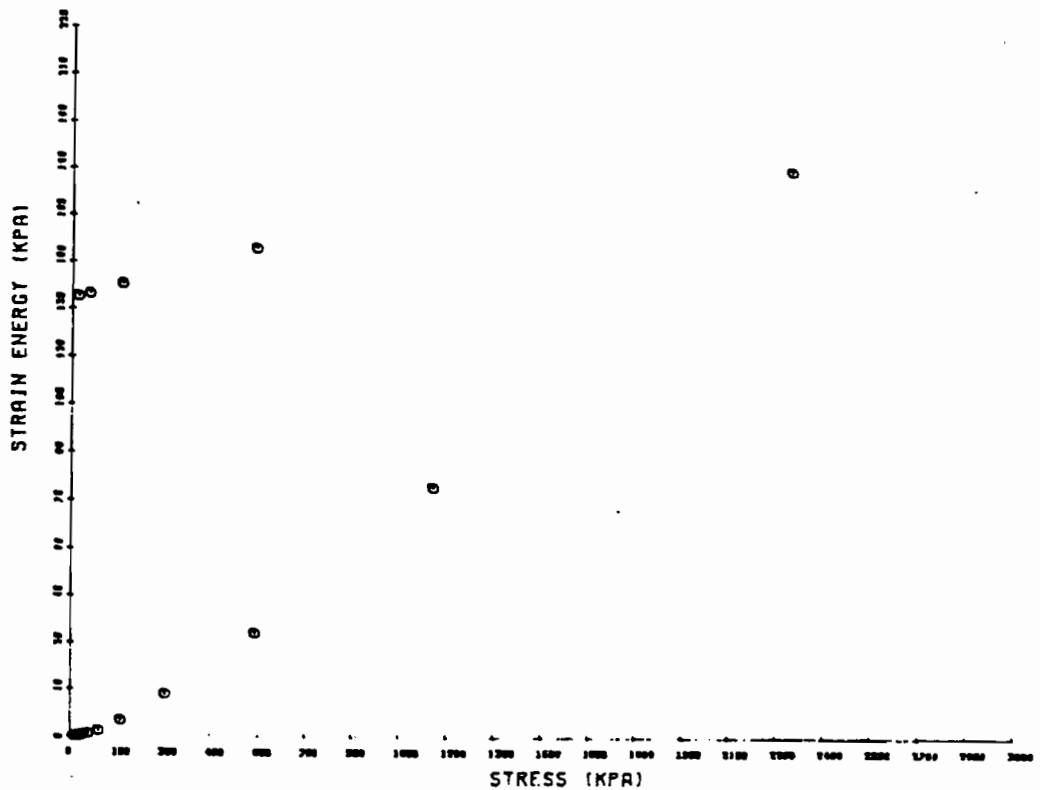


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AW84S101 SA: 3V DEPTH: 4.14-4.19M



PROJ: 852-2007 BH: AW84S101 SA: 3V DEPTH: 4.14-4.19M

Project No 852-2007 Drawn C9 Reviewed _____ Date JUNE 05

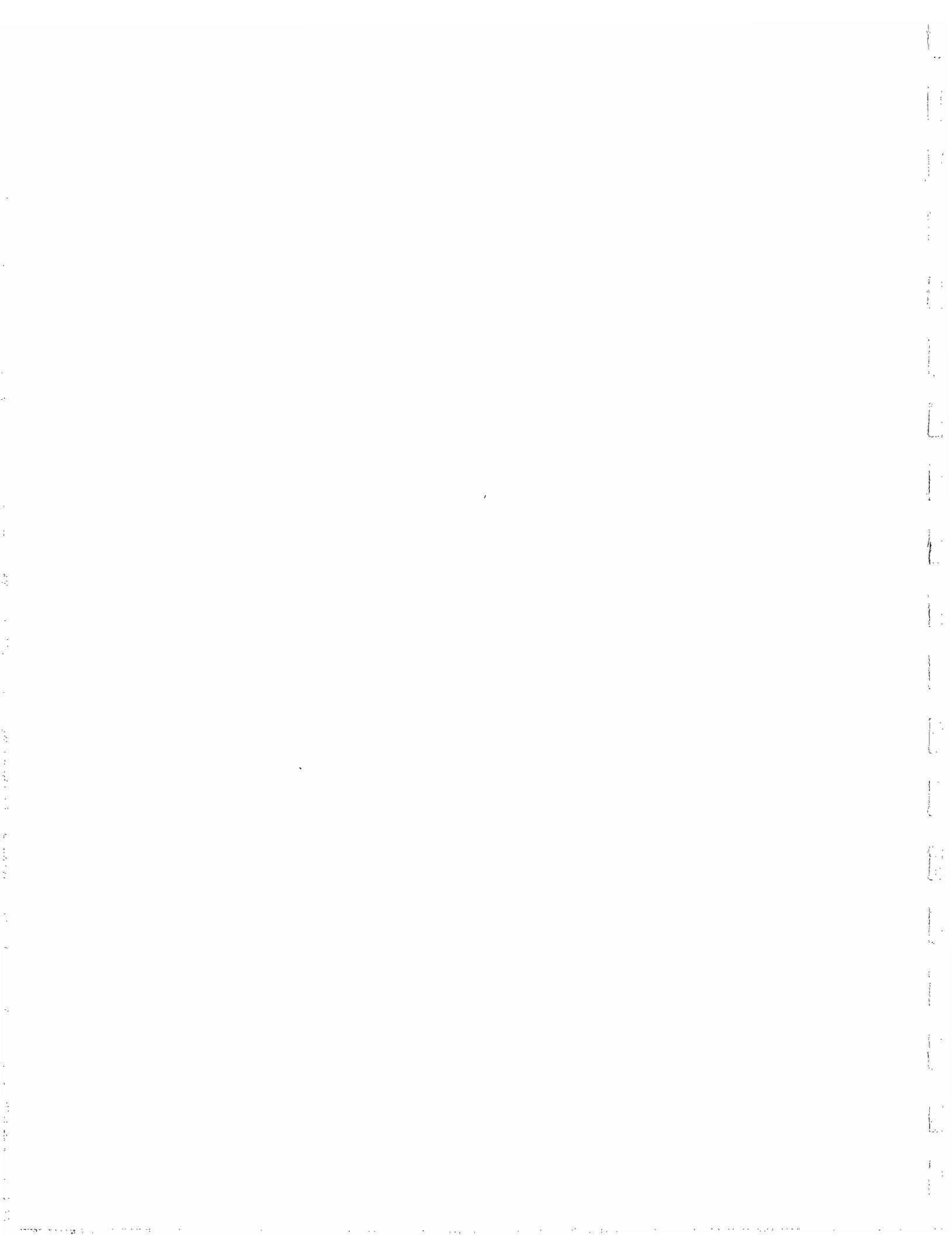


CONSOLIDATION TEST

PROJECT: 537-2007
 BOREHOLE: AWR45101
 SAMPLE: 3 H
 DEPTH: 4.21

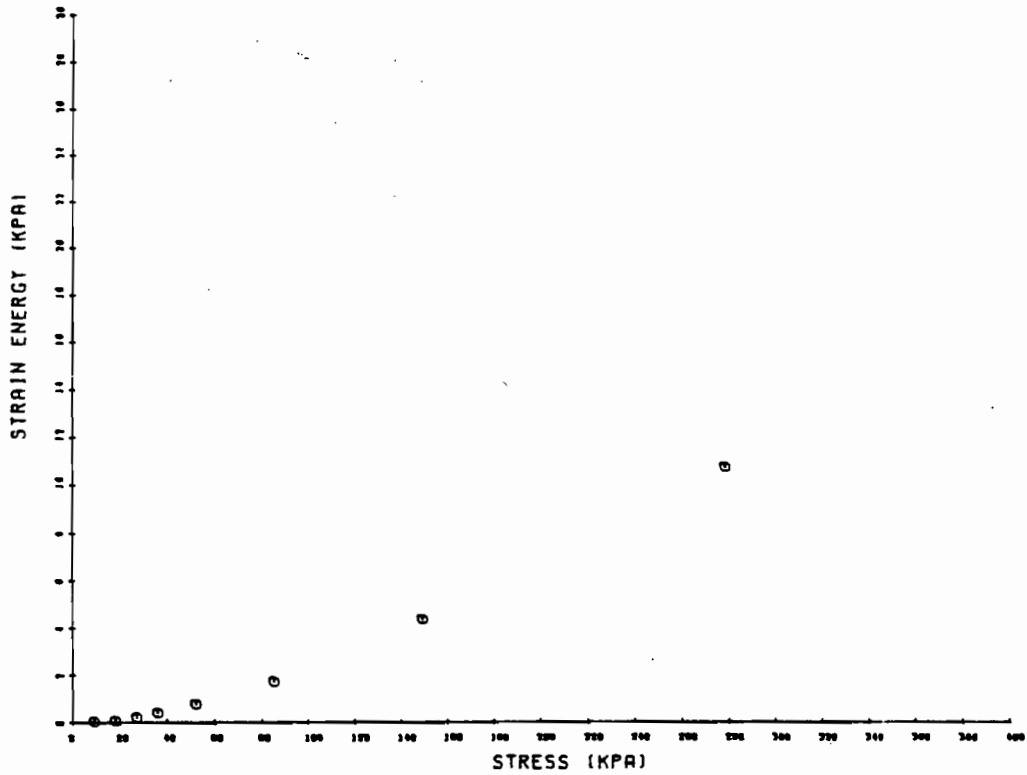
DIAMETER OF SAMPLE = 50.00 MM
 HEIGHT OF SAMPLE = 11.92 MM
 WATER CONTENT = 77.89 %
 INITIAL VOID RATIO = 1.028
 SPECIFIC GRAVITY = 2.72

STRESS	VOID	CV	EV	E	SE	STRAIN	FIELD
(KPA)	RATIO	CM2/SEC	1/MPA	CM/SEC	KPP	%	M
0.0	1.028	2.92E-07	2.98E-04	2.61E-07	0.01	0.21	0.00
18.0	1.015	1.91E-07	4.23E-04	7.90E-08	0.06	0.68	0.00
37.0	1.003	2.53E-04	6.70E-04	3.71E-08	0.10	1.21	0.00
55.0	0.991	2.97E-04	6.15E-04	1.91E-08	0.09	1.80	0.00
92.0	0.974	4.17E-04	5.27E-04	2.15E-08	0.76	2.69	0.00
95.0	0.946	4.26E-04	4.14E-04	1.73E-08	1.69	4.56	0.00
149.0	0.900	4.07E-04	3.54E-04	1.41E-08	4.35	6.33	0.00
278.0	0.840	4.33E-04	2.29E-04	9.74E-09	10.67	9.29	0.00
516.0	0.753	4.36E-04	1.65E-04	7.06E-09	28.00	13.55	0.00
1033.0	0.650	4.05E-04	9.91E-05	4.22E-09	68.69	16.67	0.00
2085.0	0.553	5.78E-04	4.60E-05	2.61E-09	143.19	23.42	0.00
516.0	0.593	2.91E-04	1.27E-05	3.62E-10	117.44	21.55	-0.05
149.0	0.659	2.24E-04	6.45E-05	1.86E-09	106.23	18.13	-0.13
51.0	0.721	1.37E-04	7.13E-04	4.10E-09	100.17	15.14	-0.00
18.0	0.784	6.36E-05	9.08E-04	5.66E-09	102.09	12.85	-0.00

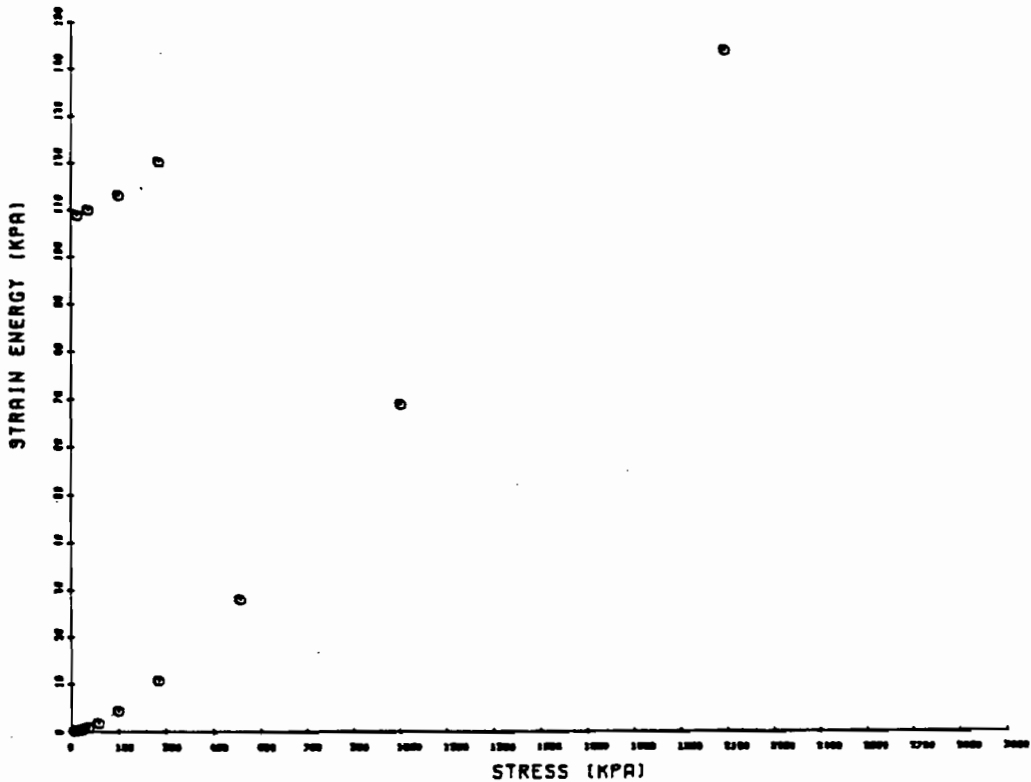


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure

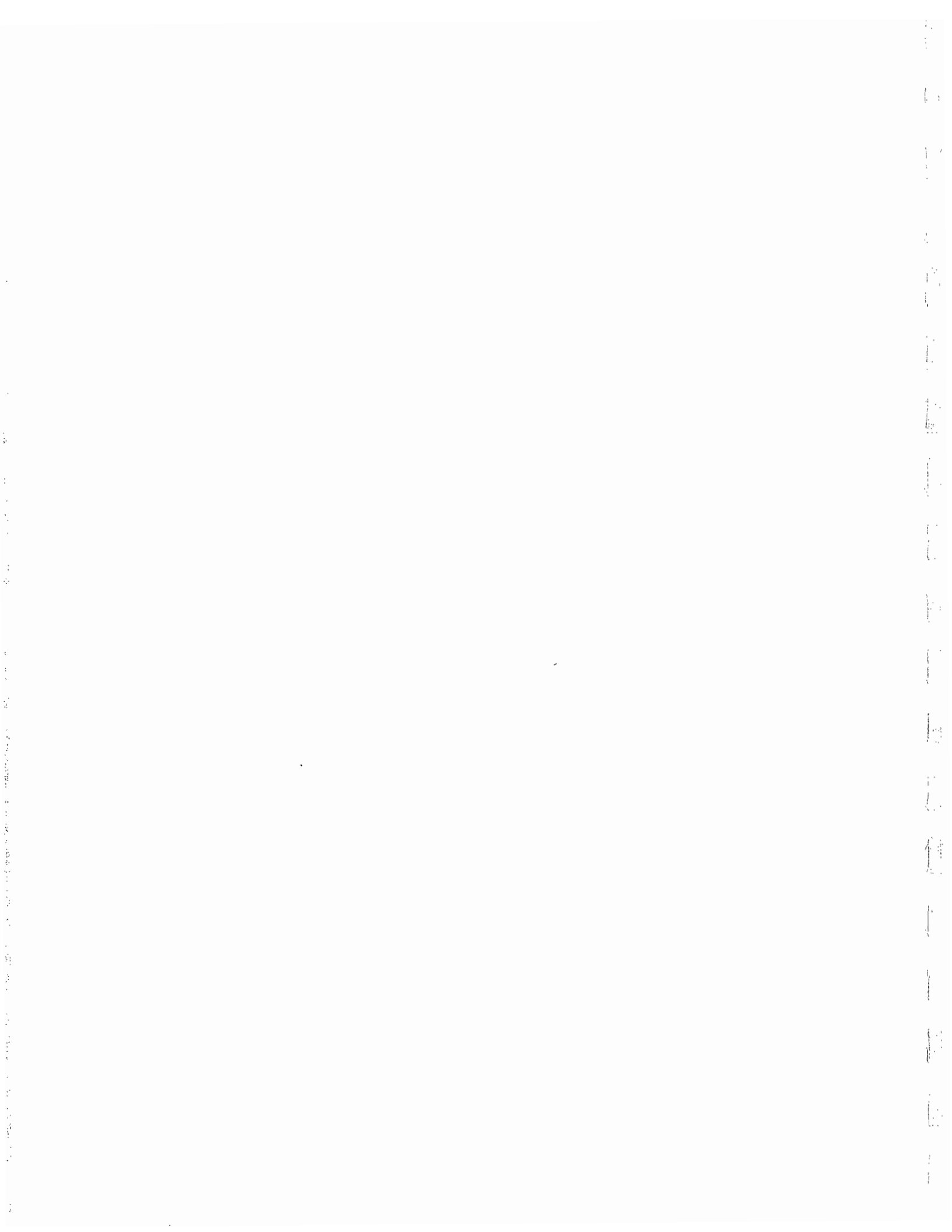


PROJ:852-2007 BH:AW845101 SA:3 H DEPTH:4.21



PROJ:852-2007 BH:AW845101 SA:3H DEPTH:4.21

Project No. 852-2007 Drawn CG Reviewed _____ Date JUNE 05



CONSOLIDATION TEST

PROJECT: 882-2007
 BORING: AWS49101
 SAMPLE: 4V
 DEPTH: 5.95-6.00M

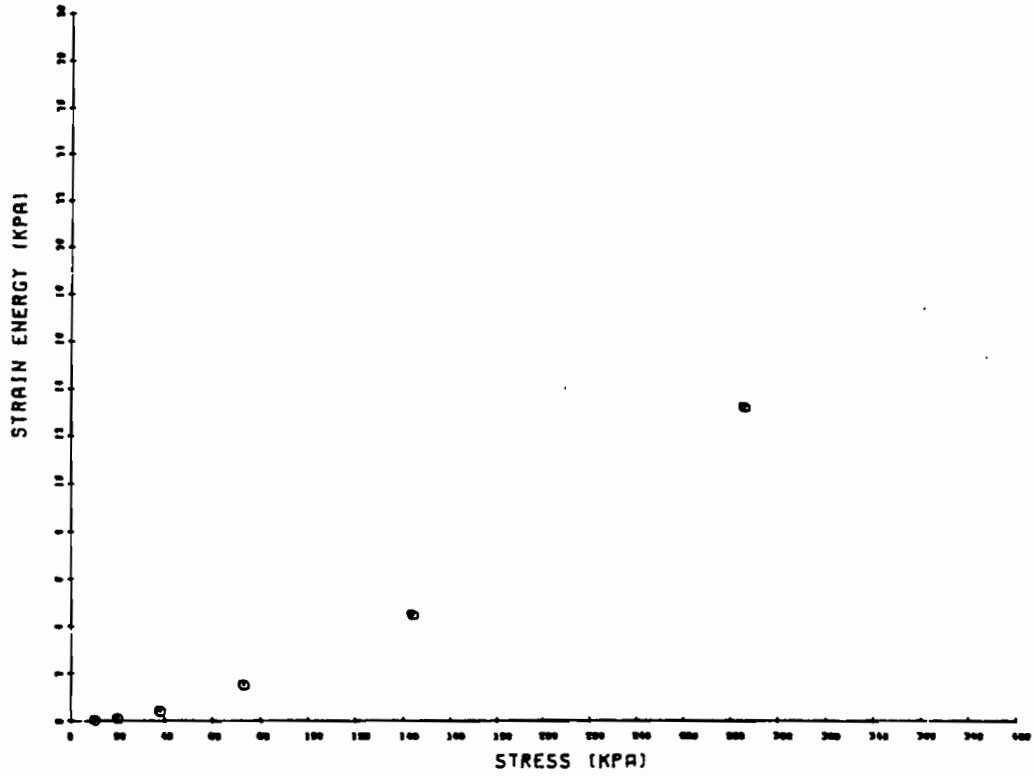
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.76 MM
 WATER CONTENT = 41.20 %
 INITIAL VOID RATIO = 1.121
 SPECIFIC GRAVITY = 2.70

STRESS (KPA)	VOID RATIO	CV CM ² /SEC	e _v 1/100%	e CM ³ /CC	SE KPA	SR ₁₀₀ %	SR ₅₀ %
10.0	1.118	5.63E-05	1.11E-04	6.10E-06	0.01	0.11	0.07
20.0	1.109	1.70E-03	4.07E-04	7.30E-06	0.07	0.50	0.32
30.0	1.086	7.20E-04	6.05E-04	4.27E-06	0.39	1.24	0.65
70.0	1.043	6.47E-04	5.73E-04	3.67E-06	1.50	3.64	0.92
144.0	0.985	9.12E-04	3.95E-04	3.06E-06	4.46	6.37	0.92
286.0	0.900	6.91E-04	2.85E-04	1.93E-06	13.16	10.42	0.92
570.0	0.801	7.37E-04	1.64E-04	1.18E-06	33.06	15.07	0.92
1138.0	0.695	7.71E-04	8.79E-05	6.64E-07	75.69	20.06	0.92
2273.0	0.573	7.27E-04	5.07E-05	3.61E-07	173.79	25.81	0.92
570.0	0.606	4.27E-04	9.07E-06	3.79E-10	151.84	24.20	-0.01
144.0	0.672	3.28E-04	7.33E-05	1.64E-09	140.69	21.14	-0.01
39.0	0.750	1.60E-04	3.45E-04	5.41E-09	137.36	17.49	-0.01
10.0	0.817	5.93E-05	1.14E-03	6.62E-09	136.60	14.30	-0.01

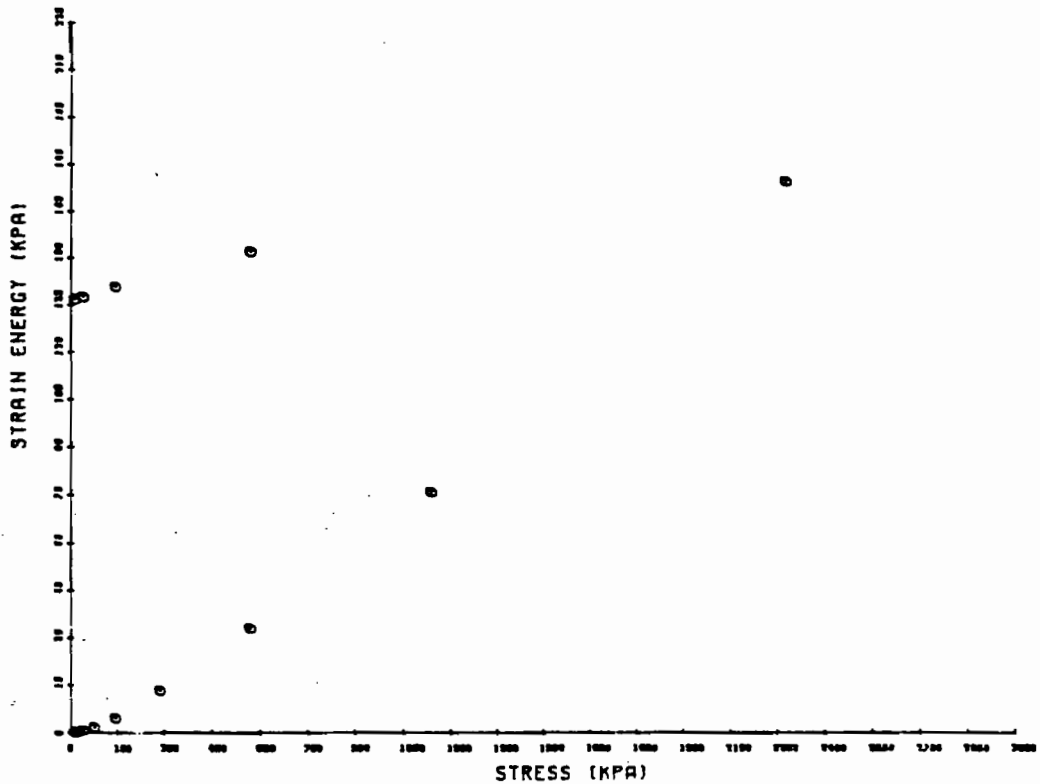


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AW84SI01 SA: 4V DEPTH: 5.95-6.00M



PROJ: 852-2007 BH: AW84SI01 SA: 4V DEPTH: 5.95-6.00M

Project No. 852-2007 Drawn C9 Reviewed _____ Date JUNE 05

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CONSOLIDATION TEST

PROJECT: 822-2007
 BOREHOLE: AKB46101
 SAMPLE: 4H
 DEPTH: 6.00M

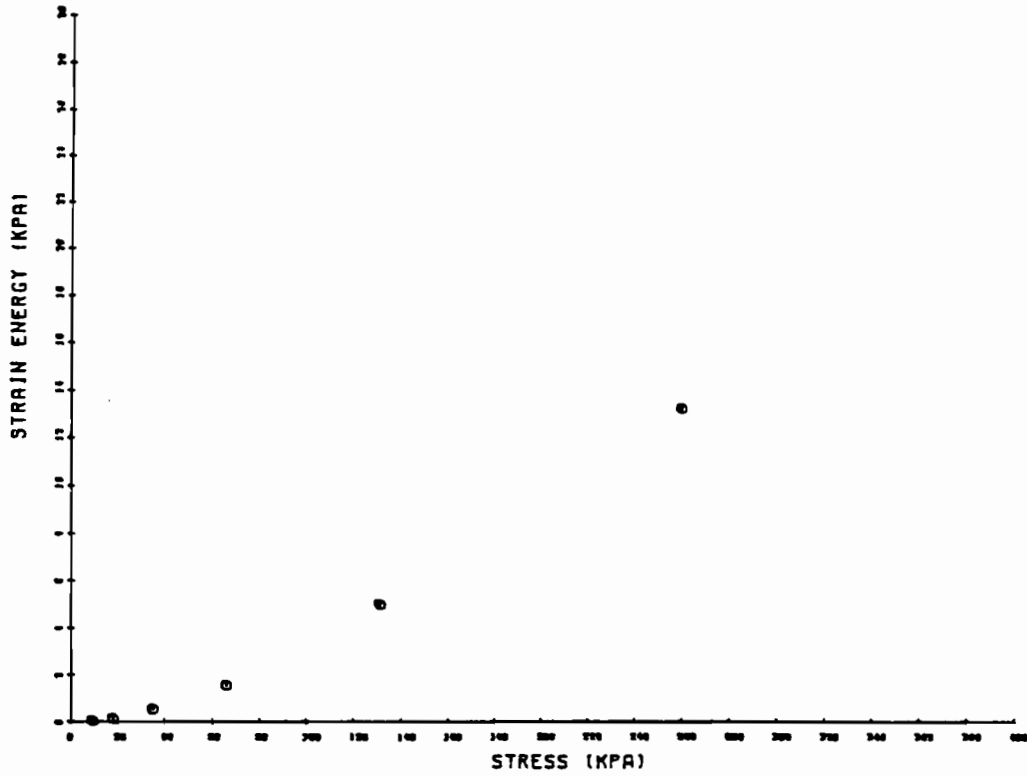
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.40 MM
 WATER CONTENT = 42.00 %
 INITIAL VOID RATIO = 1.142
 SPECIFIC GRAVITY = 2.72

STRESS	VOID	CV	MV	V	SE	STRAIN	U1-MV
(KPA)	RATIO	CM2/SEC	1/KPA	CM/SEC	KPA	%	MM
9.0	1.134	2.11E-03	4.59E-04	9.46E-08	0.92	0.81	0.02
18.0	1.118	3.22E-04	7.89E-04	2.45E-08	0.91	1.12	0.01
35.0	1.085	2.50E-04	9.02E-04	2.21E-08	0.92	2.66	0.02
66.0	1.043	1.80E-04	6.47E-04	1.14E-08	1.53	4.66	0.02
131.0	0.966	2.02E-04	5.35E-04	1.06E-08	4.96	8.14	0.02
260.0	0.878	2.00E-04	3.25E-04	6.77E-09	13.15	12.37	0.02
515.0	0.764	2.11E-04	2.08E-04	4.29E-09	33.99	17.66	0.02
1035.0	0.651	2.27E-04	1.02E-04	2.26E-09	74.79	22.94	0.02
2066.0	0.523	2.40E-04	5.81E-05	1.36E-09	167.62	28.93	0.02
515.0	0.589	3.93E-04	1.99E-05	7.58E-10	127.93	25.35	-0.11
131.0	0.695	1.01E-04	1.28E-04	1.26E-09	111.95	20.91	-0.02
35.0	0.799	3.50E-05	5.02E-04	1.72E-09	107.85	16.08	-0.02

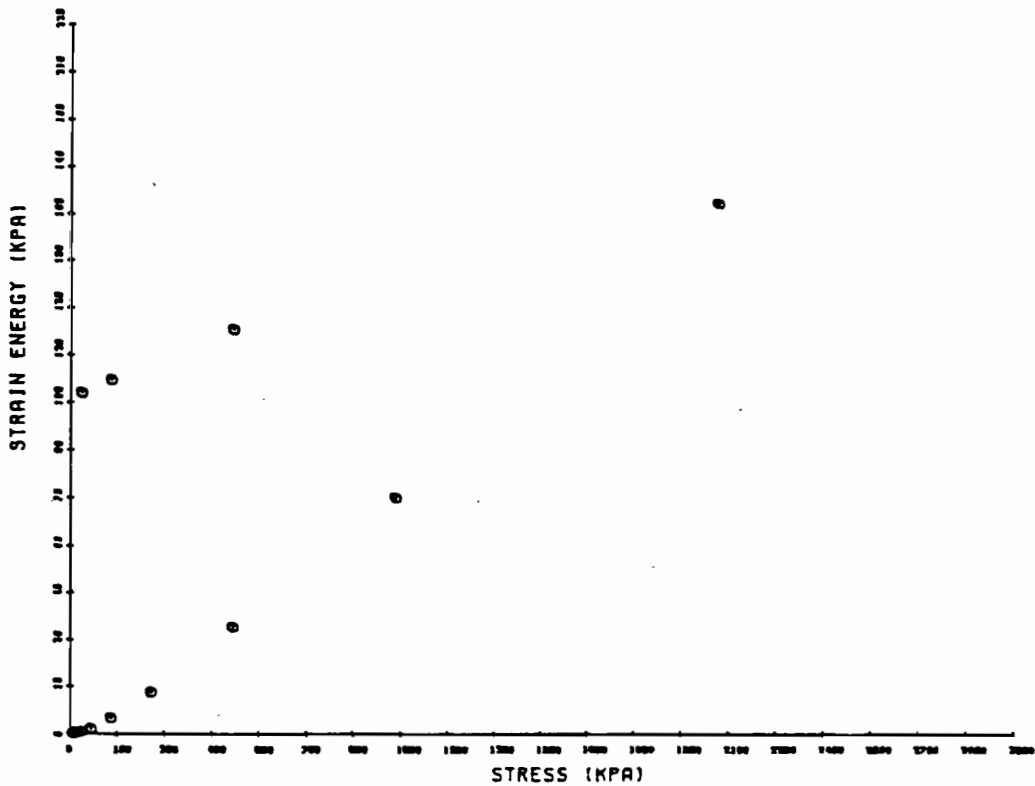
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AW84SI01 SA: 4H DEPTH: 6.03M



PROJ: 852-2007 BH: AW84SI01 SA: 4H DEPTH: 6.03M

Project No 852-2007 Drawn CG Reviewed _____ Date JUNE 85



CONSOLIDATION TEST

PROJECT: 932-2007
 BORHOLE: AWS45101
 SAMPLE: SW
 DEPTH: 7.25-7.31M

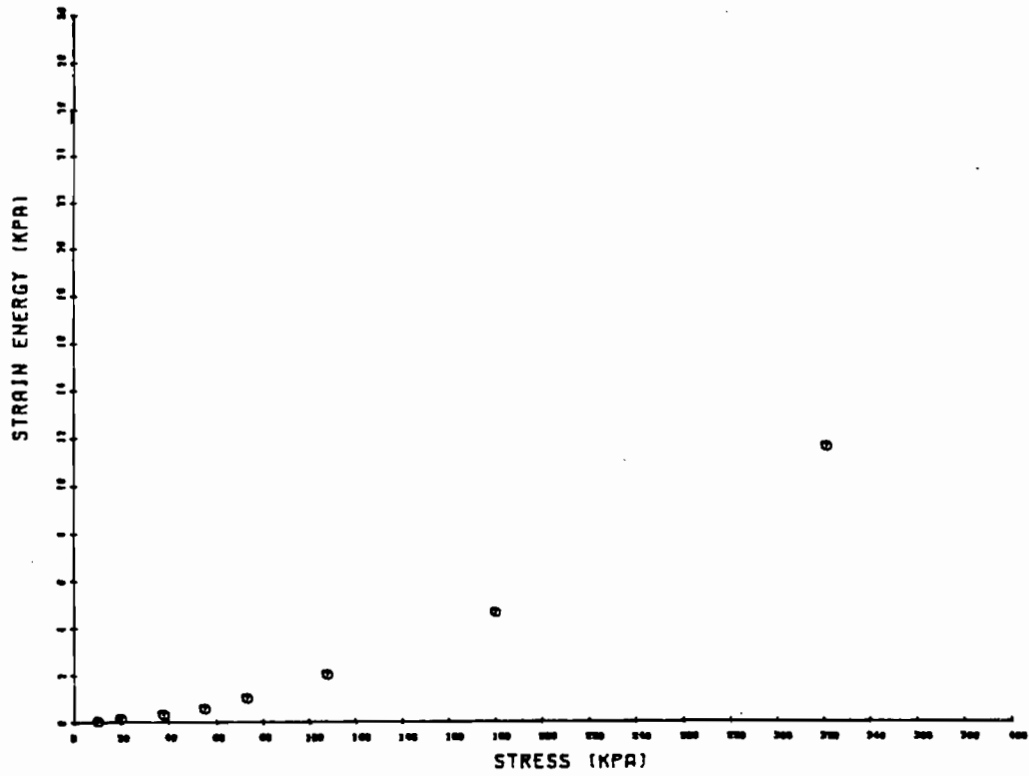
DIAMETER OF SAMPLE = 4.95 CM
 HEIGHT OF SAMPLE = 11.26 MM
 WATER CONTENT = 20.20 %
 INITIAL VOID RATIO = 1.017
 SPECIFIC GRAVITY = 2.75

STRESS (KPA)	VOID RATIO	CV CM/SEC	MV 1/KPA	F CM/SEC	SE KPA	STRAIN %	FI-5 %
10.0	1.005	2.06E-03	5.68E-04	1.15E-07	0.00	0.57	0.01
20.0	0.992	3.50E-04	7.07E-04	2.43E-06	0.10	1.28	0.02
38.0	0.980	9.94E-04	3.01E-04	3.23E-06	0.01	1.87	0.02
55.0	0.968	9.79E-04	3.22E-04	3.09E-06	0.02	2.42	0.01
73.0	0.955	5.30E-04	3.73E-04	1.94E-06	0.99	3.09	0.01
105.0	0.932	7.50E-04	3.20E-04	2.17E-06	2.01	4.11	0.01
180.0	0.896	9.07E-04	2.51E-04	2.20E-06	4.61	6.02	0.01
321.0	0.840	5.54E-04	1.97E-04	1.65E-06	11.55	8.79	0.01
605.0	0.762	7.67E-04	1.37E-04	1.05E-06	29.01	12.67	0.03
1170.0	0.668	6.14E-04	8.16E-05	4.91E-06	70.70	17.30	0.05
2310.0	0.531	5.69E-04	5.10E-05	4.44E-06	171.72	23.10	0.07
605.0	0.597	4.25E-03	1.33E-05	5.55E-09	138.62	20.83	0.00
180.0	0.649	6.30E-04	6.12E-05	3.73E-09	128.42	18.23	-0.05
38.0	0.733	1.64E-04	2.93E-04	5.28E-09	123.89	14.05	-0.03

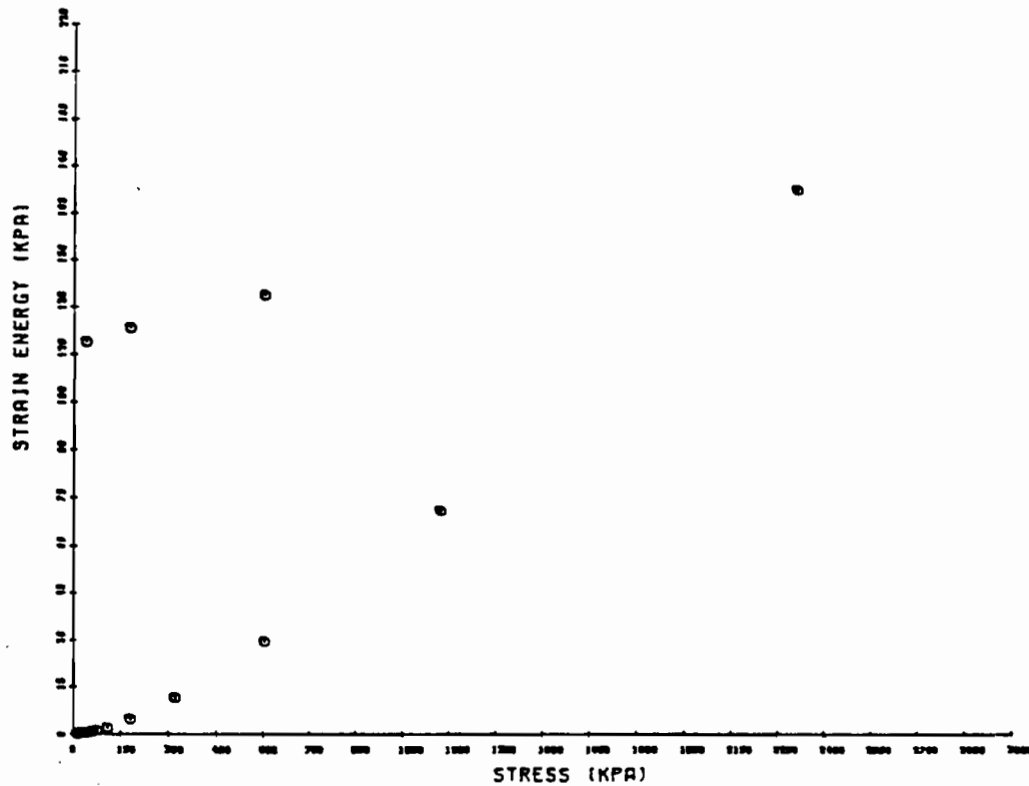


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure

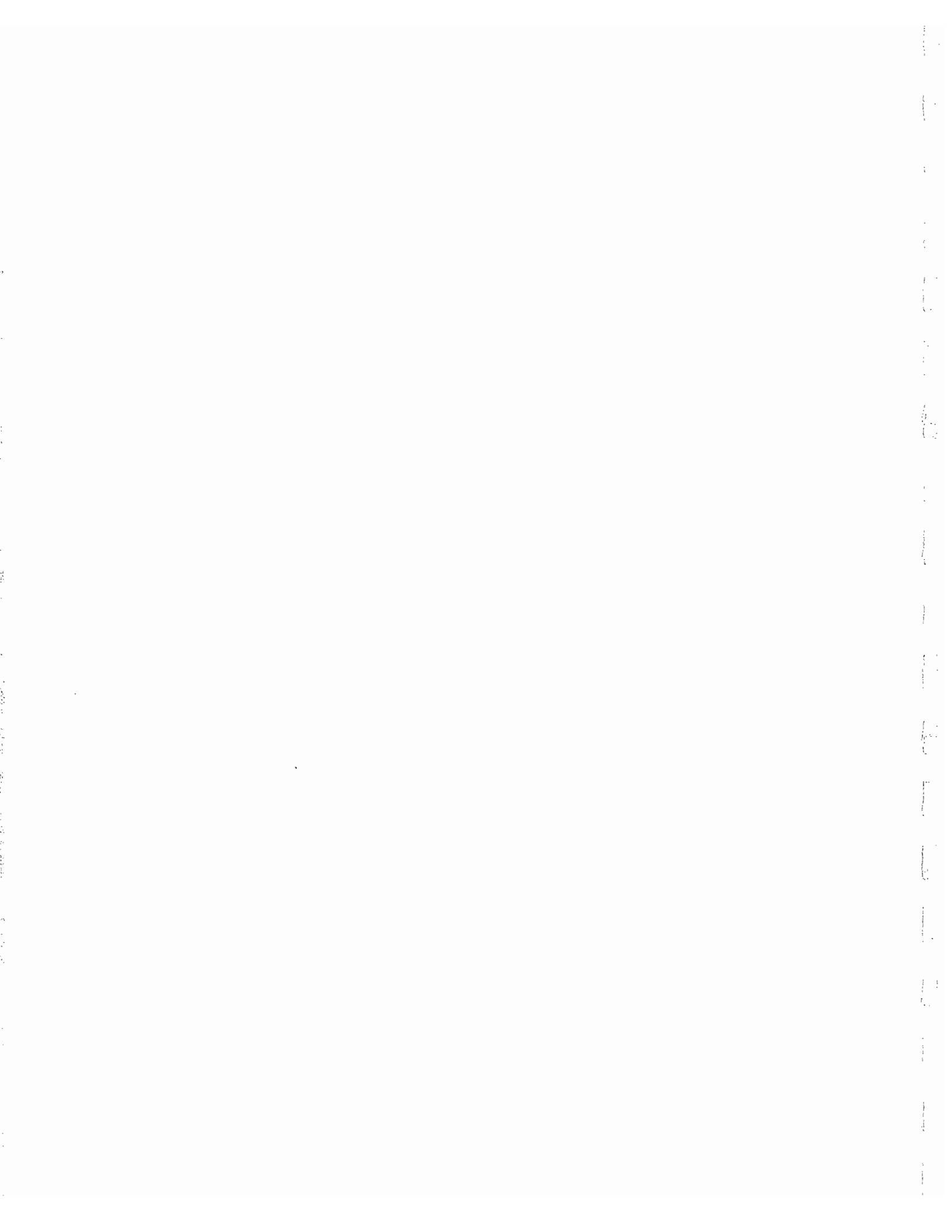


PROJ:852-2007 BH:AW84S101 SA:5V DEPTH:7.26-7.31M



PROJ:852-2007 BH:AW84S101 SA:5V DEPTH:7.26-7.31M

Project No 852-2007 Drawn Cg Reviewed Date JUNE 05



CONSOLIDATION TEST

PROJECT: 982-2007
 BOREHOLE: AWB46101
 SAMPLE: S H
 DEPTH: 7.73

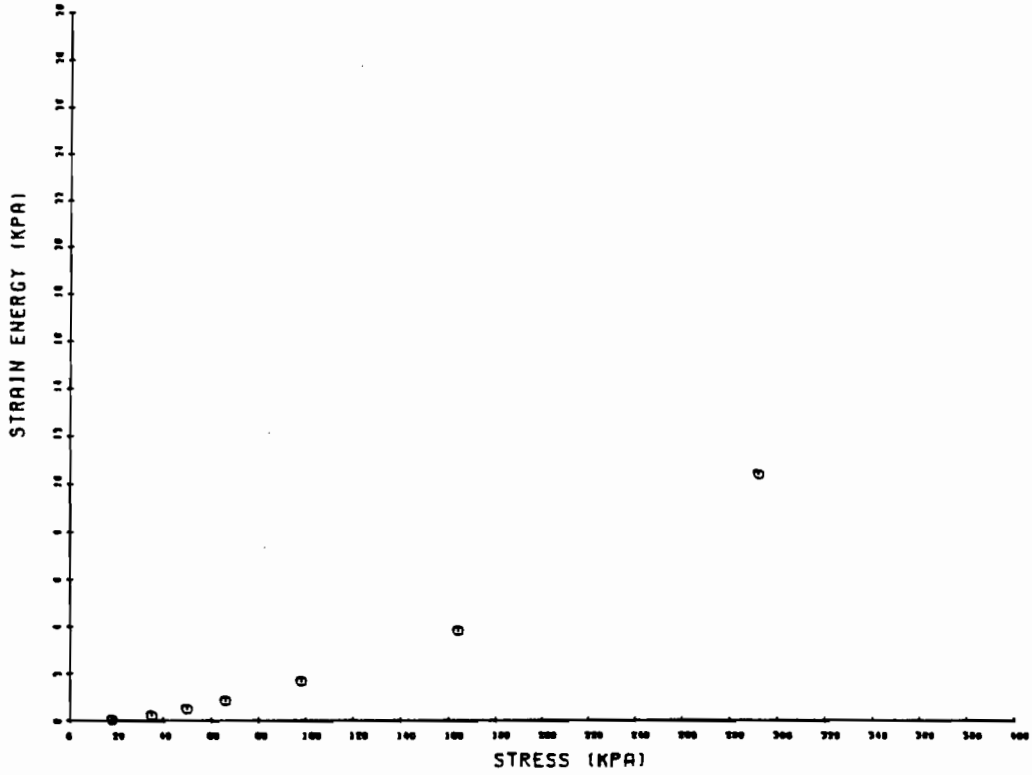
DIAMETER OF SAMPLE = 5.14 CM
 HEIGHT OF SAMPLE = 11.52 CM
 WATER CONTENT = 37.10 %
 INITIAL VOID RATIO = 1.009
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM/SEC	MV 1/KPA	K CM/SEC	SE KPA	STEADY %	BI-50 %
18.0	1.004	2.72E-03	1.35E-04	3.07E-08	0.00	0.24	0.01
35.0	0.991	5.17E-04	3.77E-04	3.02E-08	0.19	1.88	0.01
52.0	0.978	5.32E-04	4.37E-04	2.91E-08	0.47	1.54	0.01
69.0	0.966	5.57E-04	5.70E-04	2.81E-08	0.81	2.13	-0.01
86.0	0.946	1.21E-03	3.39E-04	3.76E-08	1.65	3.15	0.01
164.0	0.913	6.99E-04	2.45E-04	1.68E-08	3.77	4.77	0.01
292.0	0.856	5.50E-04	2.24E-04	1.21E-08	10.32	7.64	0.01
530.0	0.770	5.06E-04	1.64E-04	8.16E-09	22.18	11.89	0.01
1066.0	0.679	6.72E-04	8.84E-05	5.48E-09	45.01	16.45	0.01
2100.0	0.569	5.59E-04	5.27E-05	2.89E-09	101.25	21.89	0.01
550.0	0.607	4.65E-04	1.20E-05	5.47E-10	122.62	20.03	-0.01
164.0	0.645	2.66E-04	7.48E-05	2.10E-09	112.31	17.15	-0.01
35.0	0.766	9.81E-05	3.92E-04	3.76E-09	113.29	12.05	-0.01

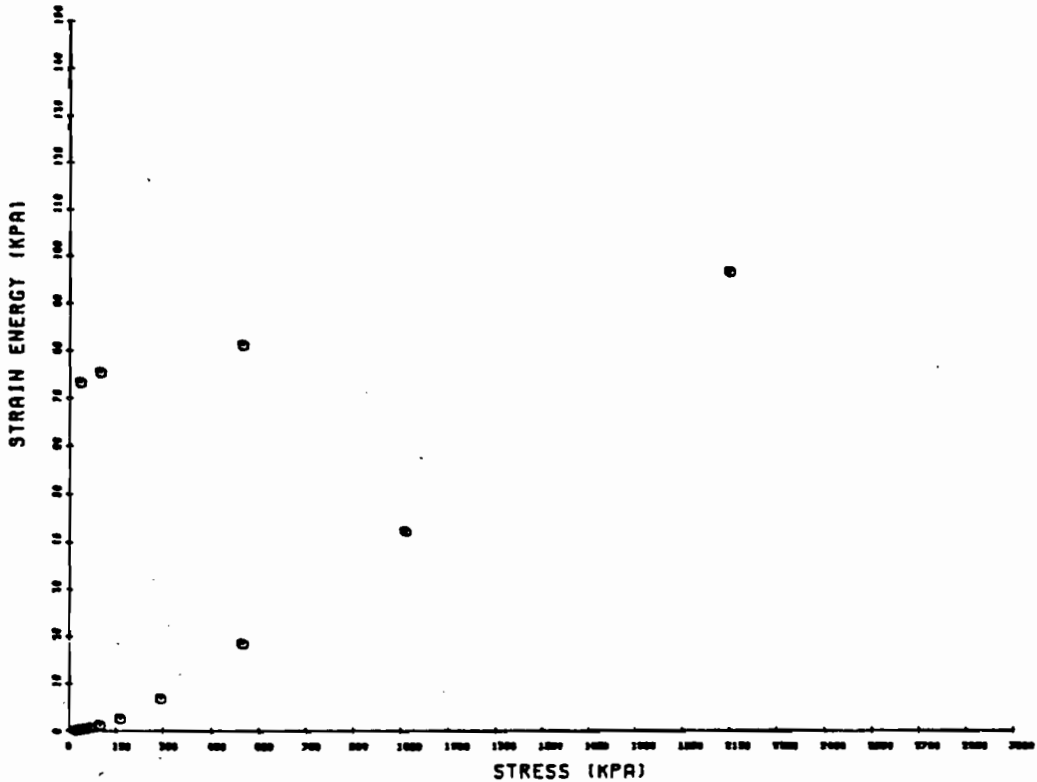


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AW84S101 SA: S H DEPTH: 7.33



PROJ: 852-2007 BH: AW84S101 SA: SH DEPTH: 7.33M

Project No 852-2007 Drawn CG Revised _____ Date JUNE 05

THE UNIVERSITY OF CHICAGO

CONSOLIDATION TEST

PROJECT: 952-2007
 BOREHOLE: AW848101
 SAMPLE: 4V
 DEPTH: 8.78-8.80M

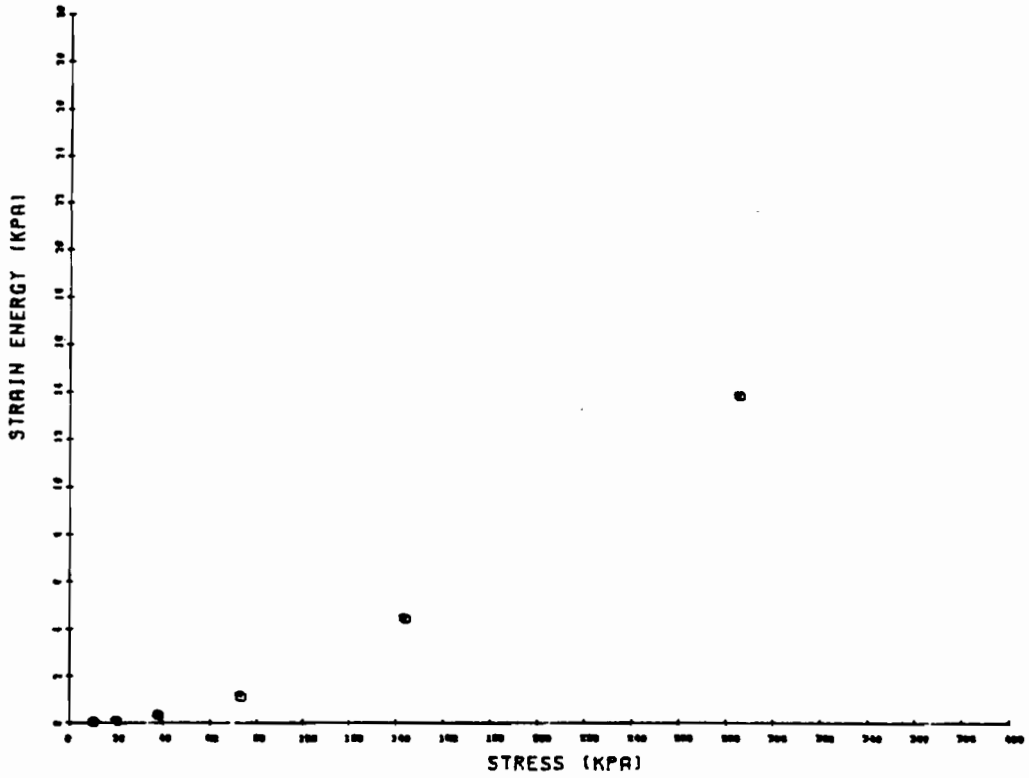
DIAMETER OF SAMPLE = 4.95 CM
 HEIGHT OF SAMPLE = 11.24 MM
 WATER CONTENT = 44.20 %
 INITIAL VOID RATIO = 1.202
 SPECIFIC GRAVITY = 2.72

STRESS	VOID	CV	MV	E	SE	STRAIN	SI-PO
(KPA)	RATIO	CM2/SEC	1/KPA	CM/SEC	KPA	%	MM
10.0	1.197	5.75E-03	2.31E-04	1.30E-07	0.01	0.23	0.03
20.0	1.191	3.93E-04	2.86E-04	1.10E-08	0.05	0.52	0.00
38.0	1.171	2.19E-04	4.94E-04	1.06E-08	0.31	1.41	0.00
73.0	1.140	6.13E-04	4.02E-04	2.41E-08	1.09	2.81	0.00
144.0	1.073	6.66E-04	4.29E-04	2.90E-08	4.40	5.86	0.01
281.0	0.978	8.53E-04	3.06E-04	3.56E-08	13.74	10.20	0.02
570.0	0.850	9.64E-04	1.98E-04	1.81E-08	36.60	15.84	0.01
1108.0	0.732	8.80E-04	1.02E-04	8.82E-09	86.22	21.35	0.04
2273.0	0.601	8.77E-04	5.25E-05	4.51E-09	187.87	27.31	0.05
570.0	0.633	9.72E-04	8.49E-06	8.08E-10	167.31	25.87	-0.11
144.0	0.711	4.18E-04	8.33E-05	3.41E-09	154.65	22.32	-0.04
38.0	0.794	1.59E-04	3.56E-04	5.54E-09	151.22	18.55	-0.02
10.0	0.876	5.73E-05	1.33E-03	7.49E-09	150.32	14.82	-0.01

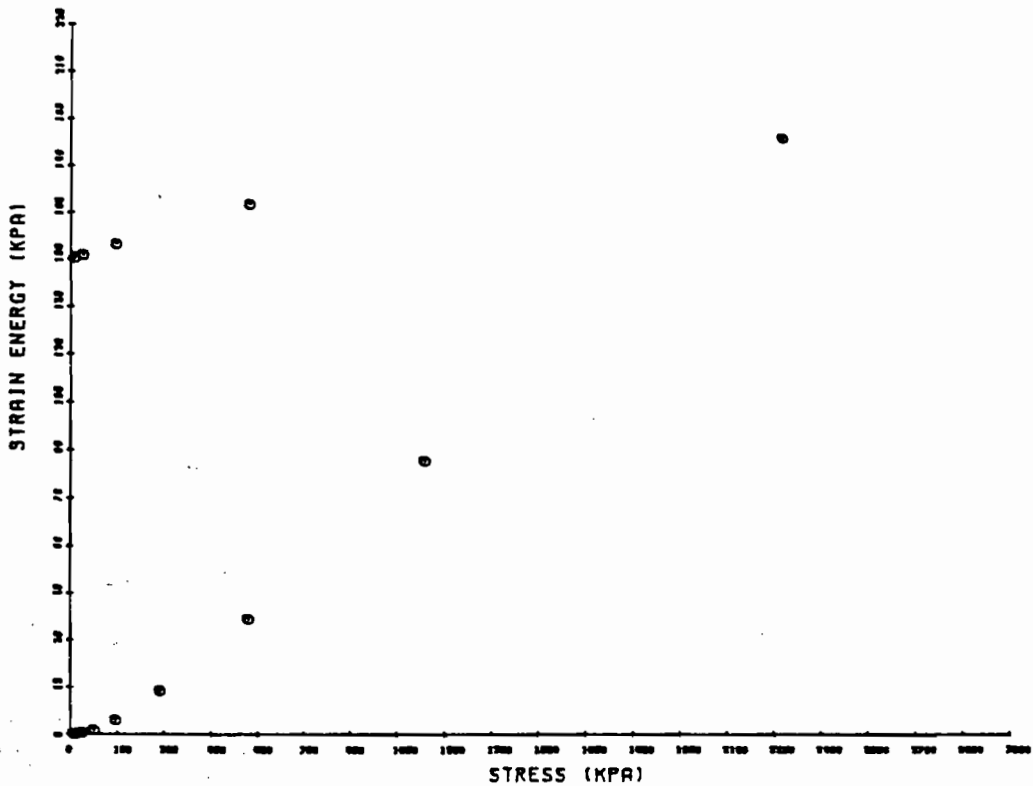
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AW84SI01 SA: 6V DEPTH: 8.78-8.83M



PROJ: 852-2007 BH: AW84SI01 SA: 6V DEPTH: 8.78-8.83M

Project No. 852-2007 Drawn CG Reviewed Date JUNE 05

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CONSOLIDATION TEST

PROJECT: 952-2007
 BOREHOLE: AWB48101
 SAMPLE: 6H
 DEPTH: 9.85M

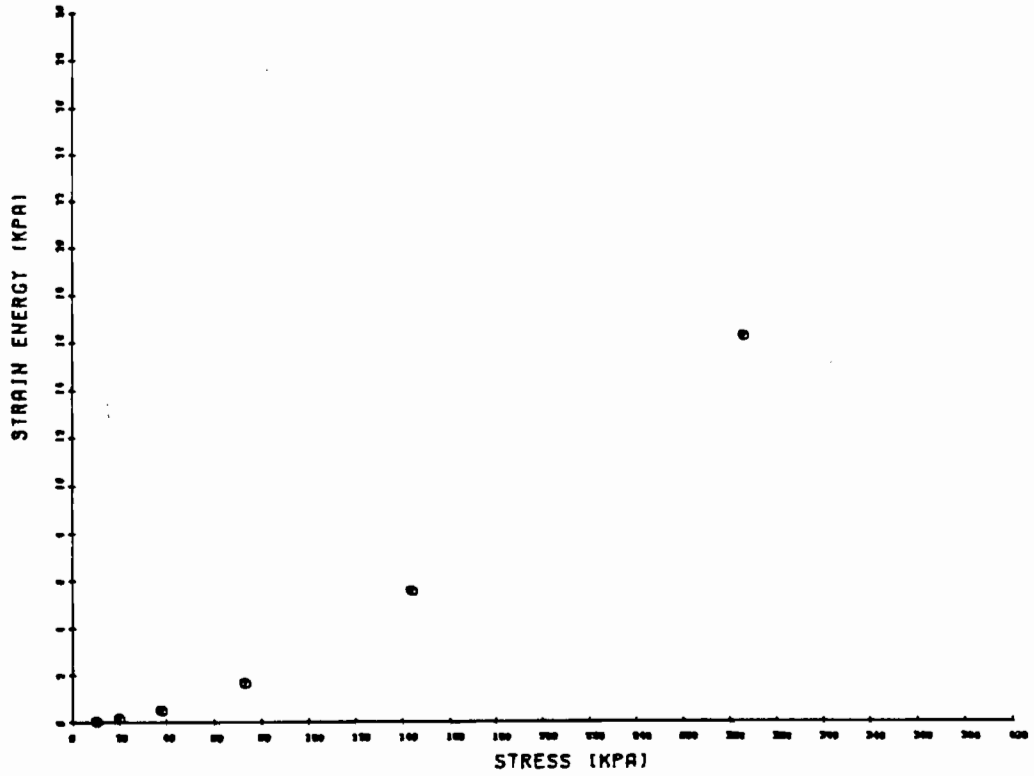
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.92 MM
 WATER CONTENT = 45.40 %
 INITIAL VOID RATIO = 1.235
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	SIGMA %	SI-PI MM
10.0	1.225	2.32E-07	4.45E-04	1.01E-07	0.02	0.44	0.11
20.0	1.208	1.14E-03	7.81E-04	8.49E-08	0.14	1.21	0.12
38.0	1.181	9.62E-04	6.64E-04	6.27E-08	0.48	2.40	0.07
73.0	1.134	7.06E-04	6.00E-04	4.15E-08	1.65	4.50	0.15
144.0	1.054	5.45E-04	5.03E-04	2.70E-08	5.52	8.07	0.04
281.0	0.944	6.34E-04	3.46E-04	2.16E-08	16.15	18.07	0.11
570.0	0.810	5.93E-04	2.11E-04	1.23E-08	41.84	19.02	0.13
1138.0	0.664	5.30E-04	1.15E-04	5.97E-09	97.54	25.54	0.08
2273.0	0.515	5.62E-04	5.88E-05	3.24E-09	211.27	32.21	0.05
570.0	0.564	3.15E-04	1.27E-05	3.93E-10	180.43	30.04	-0.11
144.0	0.658	1.45E-04	9.91E-05	1.41E-09	165.36	25.82	-0.04
38.0	0.758	1.17E-04	4.21E-04	4.91E-09	161.29	21.35	-0.01
10.0	0.864	4.15E-05	1.70E-03	6.90E-09	160.15	16.60	-0.01

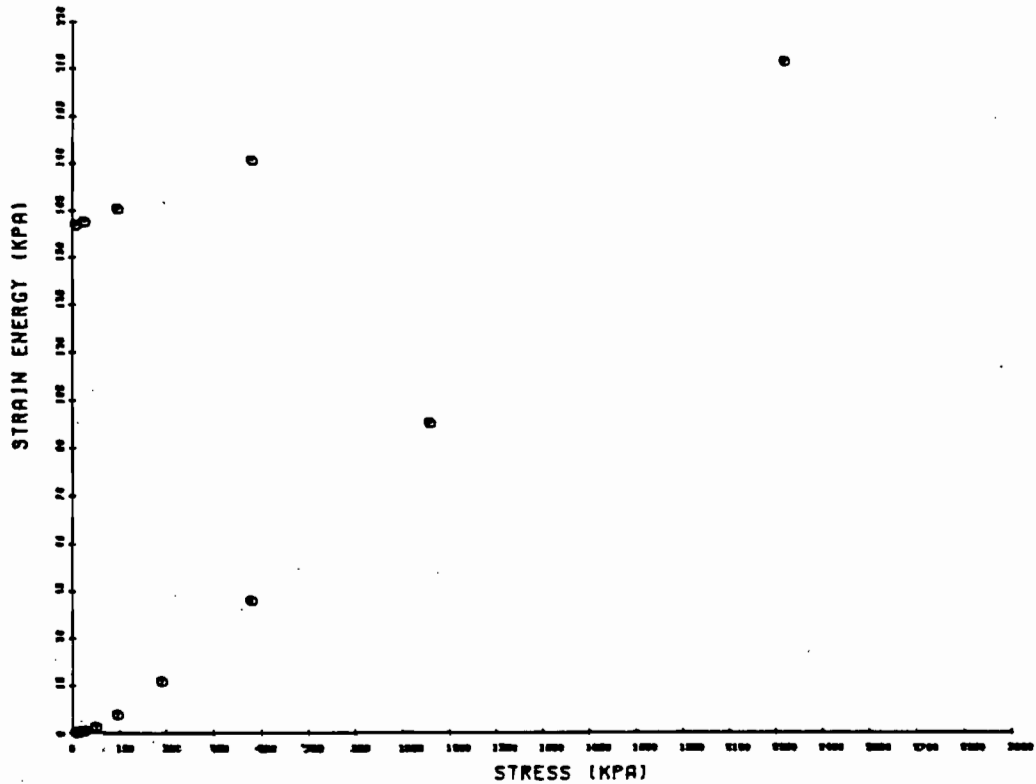
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AW84SI01 SA: 6H DEPTH: 8.85M



PROJ: 852-2007 BH: AW84SI01 SA: 6H DEPTH: 8.85M

Project No. 852-2007 Drawn CG Reviewed _____ Date JUNE 05

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CONSOLIDATION TEST

PROJECT: 652-2007
 BOREHOLE: AW849I01
 SAMPLE: 7V
 DEPTH: 10.45-10.5M

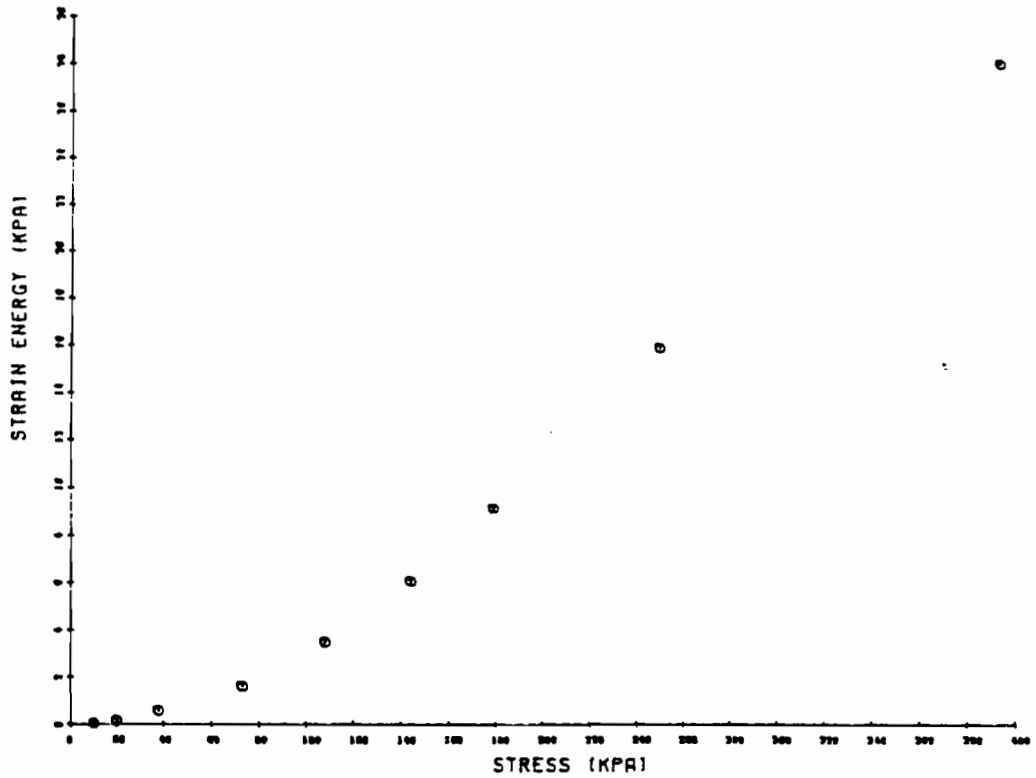
DIAMETER OF SAMPLE = 4.95 CM
 HEIGHT OF SAMPLE = 11.25 MM
 WATER CONTENT = 49.30 %
 INITIAL VOID RATIO = 1.341
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	SI-SO MM
10.0	1.329	1.95E-03	4.99E-04	9.50E-08	0.02	0.50	0.11
20.0	1.312	1.13E-03	7.60E-04	9.40E-08	0.14	1.26	0.02
38.0	1.280	5.81E-04	7.53E-04	4.29E-08	0.53	2.61	0.02
73.0	1.235	7.87E-04	5.52E-04	4.27E-08	1.60	4.55	0.03
108.0	1.186	5.01E-04	5.90E-04	2.90E-08	3.47	6.61	0.11
144.0	1.139	2.97E-04	5.63E-04	1.64E-08	6.03	8.64	0.00
179.0	1.095	2.36E-04	5.29E-04	1.25E-08	9.07	10.52	0.00
250.0	1.021	2.70E-04	4.40E-04	1.16E-08	15.77	13.65	0.01
392.0	0.934	5.16E-04	2.64E-04	1.34E-08	27.81	17.40	0.02
676.0	0.819	4.99E-04	1.72E-04	9.43E-09	53.95	22.29	0.07
1244.0	0.695	7.45E-04	9.30E-05	6.79E-09	104.68	27.58	0.05
2380.0	0.542	7.69E-04	5.79E-05	4.36E-09	223.78	34.15	0.04
676.0	0.580	1.27E-03	9.73E-05	1.21E-09	198.44	32.49	-0.09
250.0	0.643	5.42E-04	6.29E-05	3.34E-09	186.04	29.61	-0.04
38.0	0.792	2.34E-04	3.01E-04	6.89E-09	176.86	23.43	-0.01

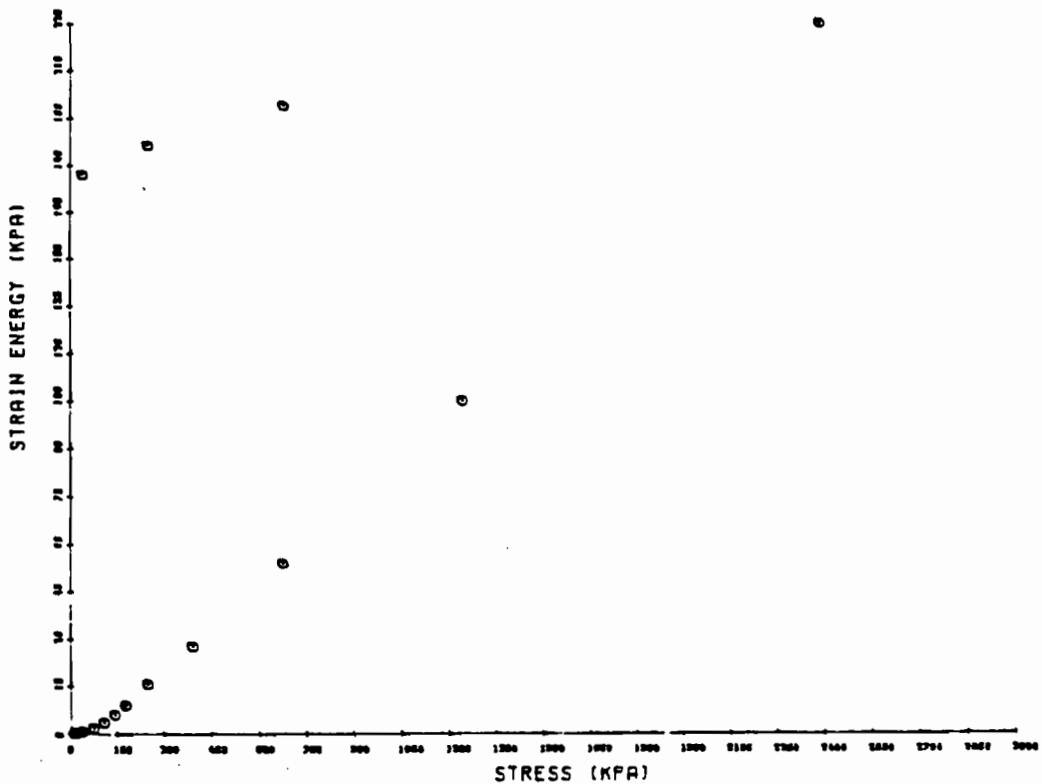
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ:852-2007 BH:AWB4SI01 SA:7V DEPTH:10.45-10.5M



PROJ:852-2007 BH:AWB4SI01 SA:7V DEPTH:10.45-10.5M

Project No 852-2007 Drawn C9 Revised Date JUNE 05

CONSOLIDATION TEST

PROJECT: 832-2007
 BOREHOLE: AWS49101
 SAMPLE: 7H
 DEPTH: 10.52M

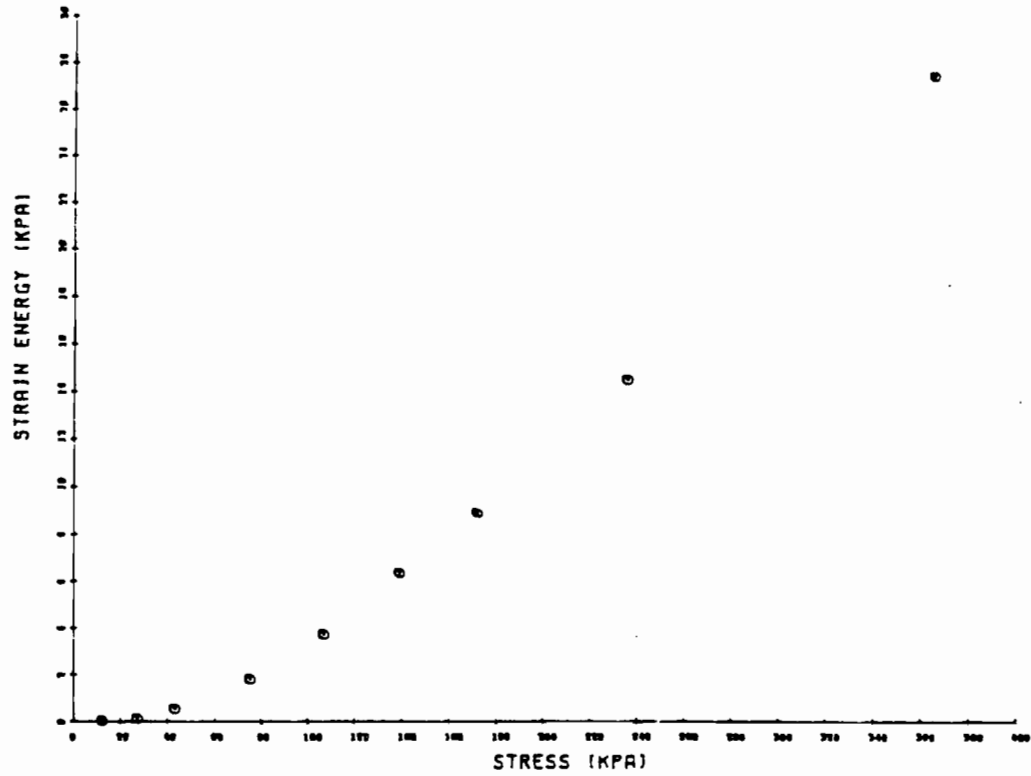
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.91 MM
 WATER CONTENT = 46.60 %
 INITIAL VOID RATIO = 1.268
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	BI-RO MM
12.0	1.254	4.20E-03	4.04E-04	1.67E-07	0.03	0.49	0.24
27.0	1.249	5.36E-03	2.30E-04	1.88E-07	0.10	0.83	0.03
43.0	1.222	7.54E-04	7.39E-04	5.46E-08	0.51	2.01	0.01
75.0	1.173	4.83E-04	6.74E-04	3.19E-08	1.78	4.17	0.02
107.0	1.125	3.84E-04	6.55E-04	2.48E-08	3.69	6.27	0.01
139.0	1.077	2.63E-04	6.67E-04	1.72E-08	6.32	8.40	0.01
172.0	1.040	1.92E-04	4.92E-04	9.25E-09	8.94	10.03	0.01
236.0	0.978	3.36E-04	4.26E-04	1.40E-08	14.40	12.75	0.01
365.0	0.882	3.88E-04	3.31E-04	1.26E-08	27.23	17.02	0.01
623.0	0.765	5.21E-04	1.99E-04	1.02E-08	52.55	22.15	0.03
1139.0	0.633	5.13E-04	1.13E-04	5.69E-09	104.02	27.99	0.48
2172.0	0.483	4.74E-04	6.41E-05	2.98E-09	213.71	34.62	0.06
623.0	0.539	2.15E-04	1.61E-05	3.40E-10	178.78	32.12	-0.08
236.0	0.600	1.96E-04	6.92E-05	1.33E-09	167.28	29.44	-0.04
43.0	0.741	1.17E-04	3.23E-04	3.70E-09	158.58	23.20	-0.03

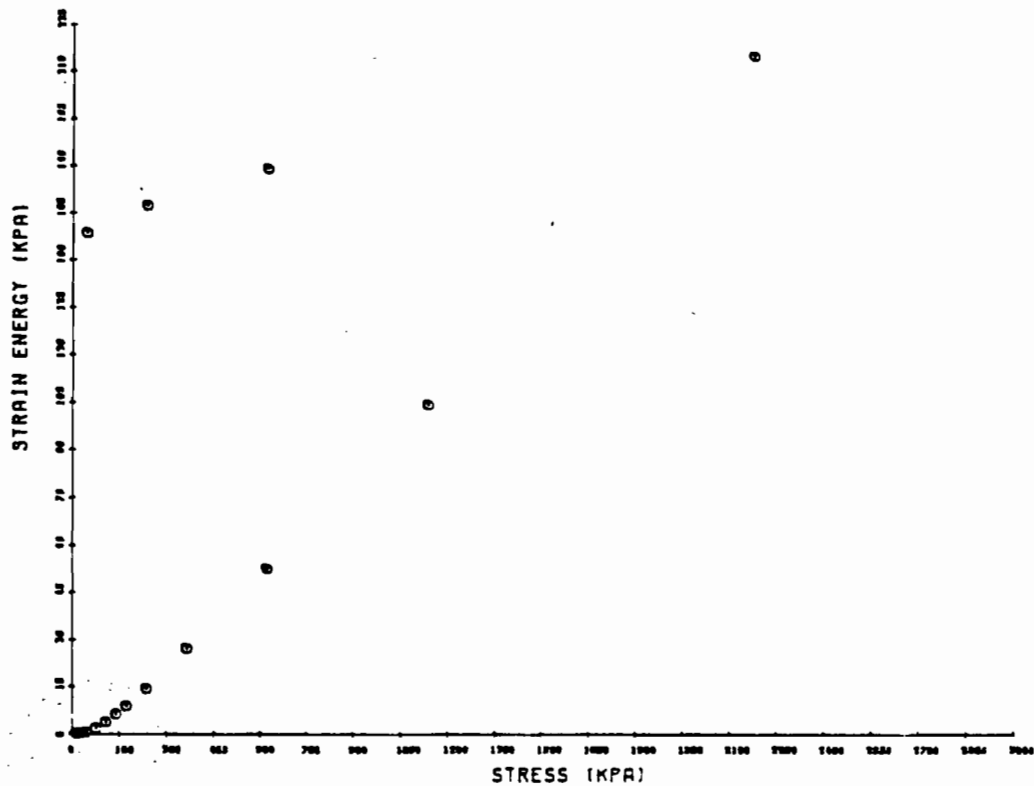


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AWB4SI01 SA: 7H DEPTH: 10.52M



PROJ: 852-2007 BH: AWB4SI01 SA: 7H DEPTH: 10.52M

Project No 852-2007 Drawn CG Reviewed _____ Date JUNE 05

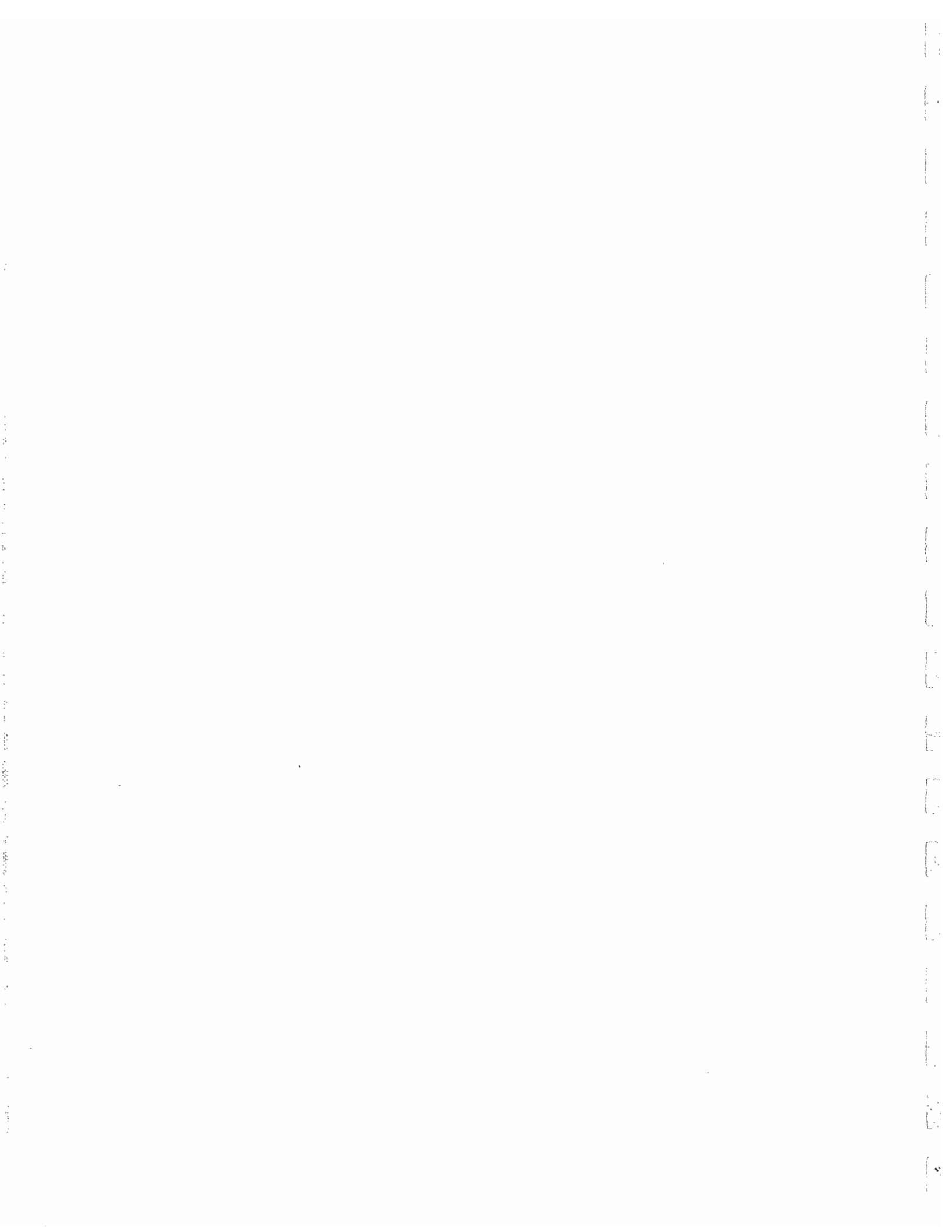
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CONSOLIDATION TEST

PROJECT: 952-2007
 BOREHOLE: AWB48101
 SAMPLE: 9V
 DEPTH: 12.46-12.51M

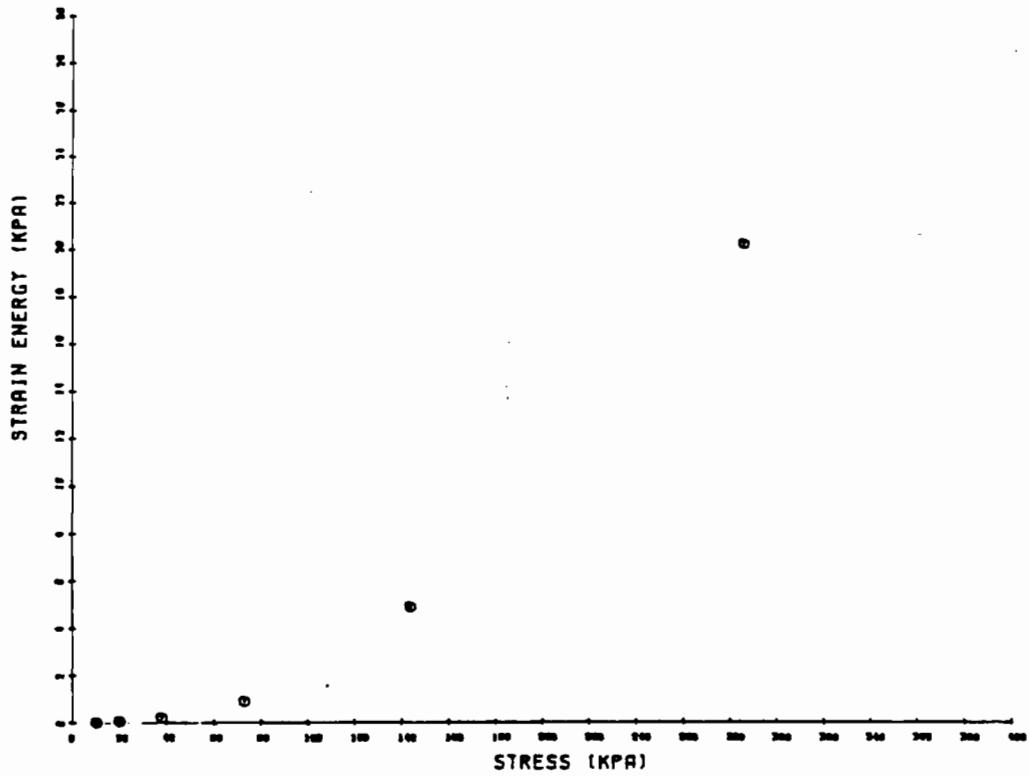
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.92 MM
 WATER CONTENT = 52.50 %
 INITIAL VOID RATIO = 1.428
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STRAIN %	SI-P MM
10.0	1.427	1.17E-03	5.87E-05	6.71E-09	0.00	0.06	0.00
20.0	1.422	2.90E-03	1.85E-04	5.25E-08	0.03	0.24	0.02
38.0	1.410	2.86E-03	2.86E-04	6.01E-08	0.18	0.76	0.02
72.0	1.378	1.85E-03	3.62E-04	4.58E-08	0.68	2.02	0.17
144.0	1.250	6.01E-04	5.16E-04	4.05E-08	4.85	5.69	0.02
288.0	1.118	4.57E-04	4.99E-04	2.23E-08	20.10	12.77	0.13
570.0	0.943	4.27E-04	2.53E-04	1.06E-08	50.85	19.96	0.07
1138.0	0.760	4.58E-04	1.33E-04	5.97E-09	115.45	27.52	0.03
2273.0	0.572	3.53E-04	6.80E-05	2.35E-09	247.17	35.25	0.05
570.0	0.620	2.75E-04	1.16E-05	3.13E-10	219.08	33.27	-0.10
144.0	0.709	1.62E-04	8.62E-05	1.37E-09	205.96	29.60	-0.06
38.0	0.808	1.03E-04	3.83E-04	3.88E-09	202.26	25.53	-0.02
10.0	0.897	4.00E-05	1.31E-03	5.13E-09	201.38	21.86	-0.00

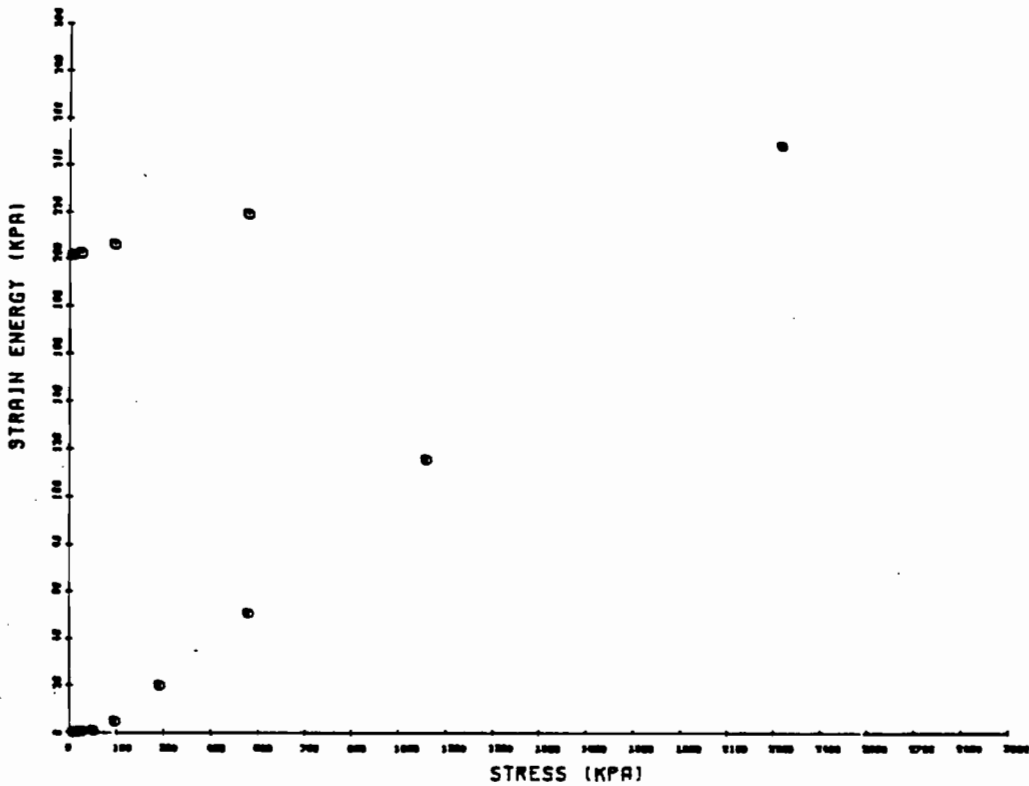


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH:AWB4S101 SA:9V DEPTH:13.46-13.51 M



PROJ: 852-2007 BH:AWB4S101 SA:9V DEPTH:13.46-13.51 M

Project No 852-2007 Drawn Cg Reviewed _____ Date JUNE 05



CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: AW848101
 SAMPLE: 9H
 DEPTH: 13.54M

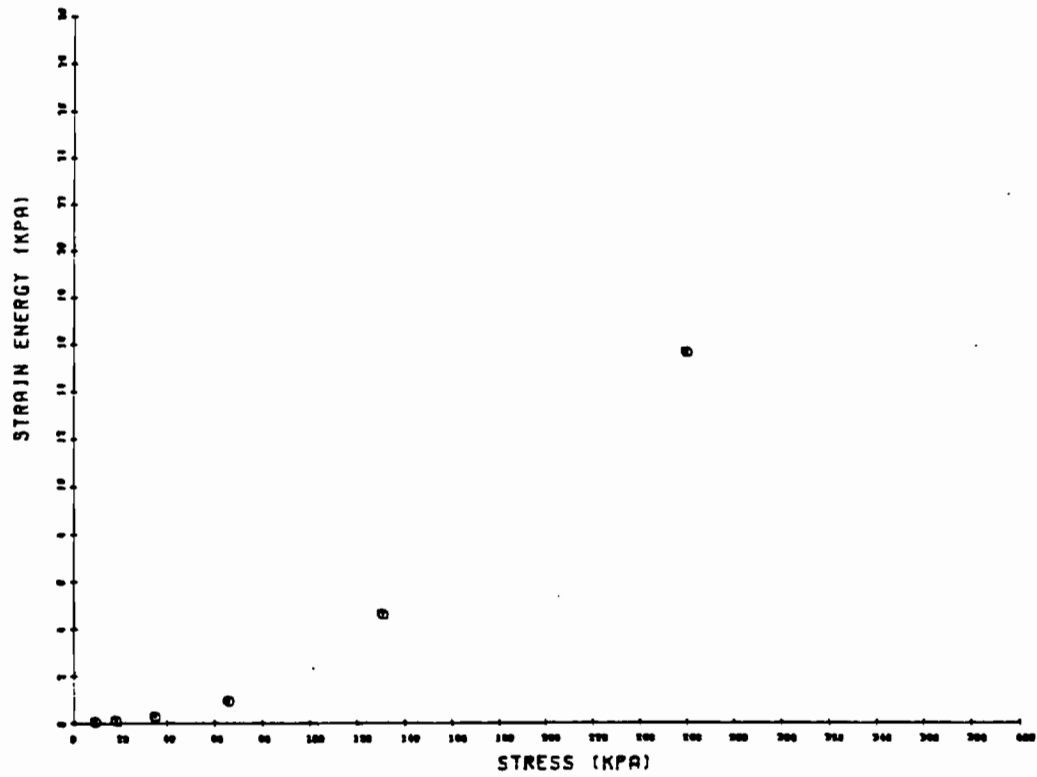
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.40 MM
 WATER CONTENT = 48.00 %
 INITIAL VOID RATIO = 1.206
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	SE KPA	STEPIN %	E1-E2 MM
9.0	1.259	7.41E-04	7.80E-04	5.66E-08	0.02	0.70	0.02
18.0	1.278	1.25E-03	5.61E-04	6.88E-08	0.10	1.21	0.01
35.0	1.264	1.27E-03	3.64E-04	4.54E-08	0.26	1.92	0.02
66.0	1.233	1.26E-03	4.22E-04	5.22E-08	0.92	3.13	0.02
131.0	1.147	3.97E-04	5.74E-04	2.23E-08	4.60	6.86	0.03
260.0	1.018	2.54E-04	4.34E-04	1.08E-08	15.55	12.46	0.03
518.0	0.863	3.41E-04	2.61E-04	6.71E-09	41.74	19.19	0.02
1035.0	0.730	3.62E-04	1.12E-04	3.97E-09	86.67	24.98	0.05
2069.0	0.585	3.50E-04	6.03E-05	2.07E-09	187.08	31.20	0.10
518.0	0.618	8.51E-04	8.84E-06	7.37E-10	165.40	29.63	-0.11
131.0	0.695	1.64E-04	8.66E-05	1.39E-09	154.53	26.48	-0.06
35.0	0.805	4.58E-05	4.95E-04	2.22E-09	150.59	21.73	-0.03

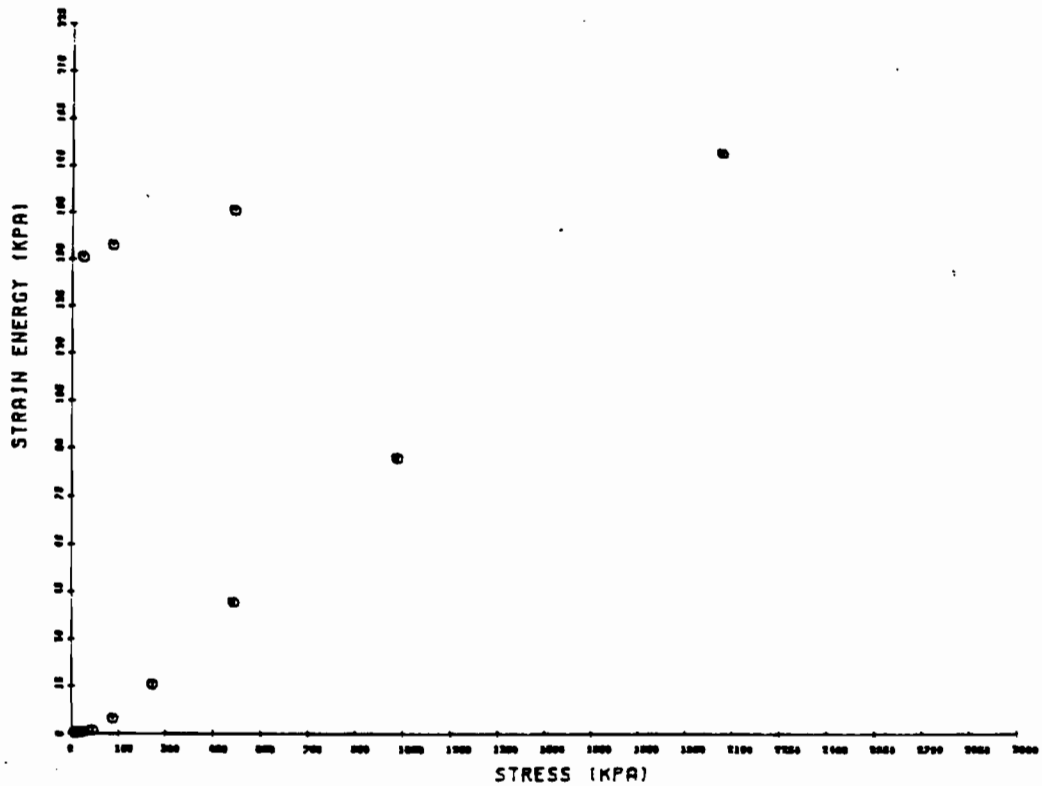


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AW84SI01 SA: 9H DEPTH: 13.54M



PROJ: 852-2007 BH: AW84SI01 SA: 9H DEPTH: 13.54M

Project No. 852-2007 Drawn CJ Reviewed _____ Date JUNE 05

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CONSOLIDATION TEST

PROJECT: B52-2007
 BOREHOLE: AD946105
 SAMPLE: 2V
 DEPTH: 9.9M

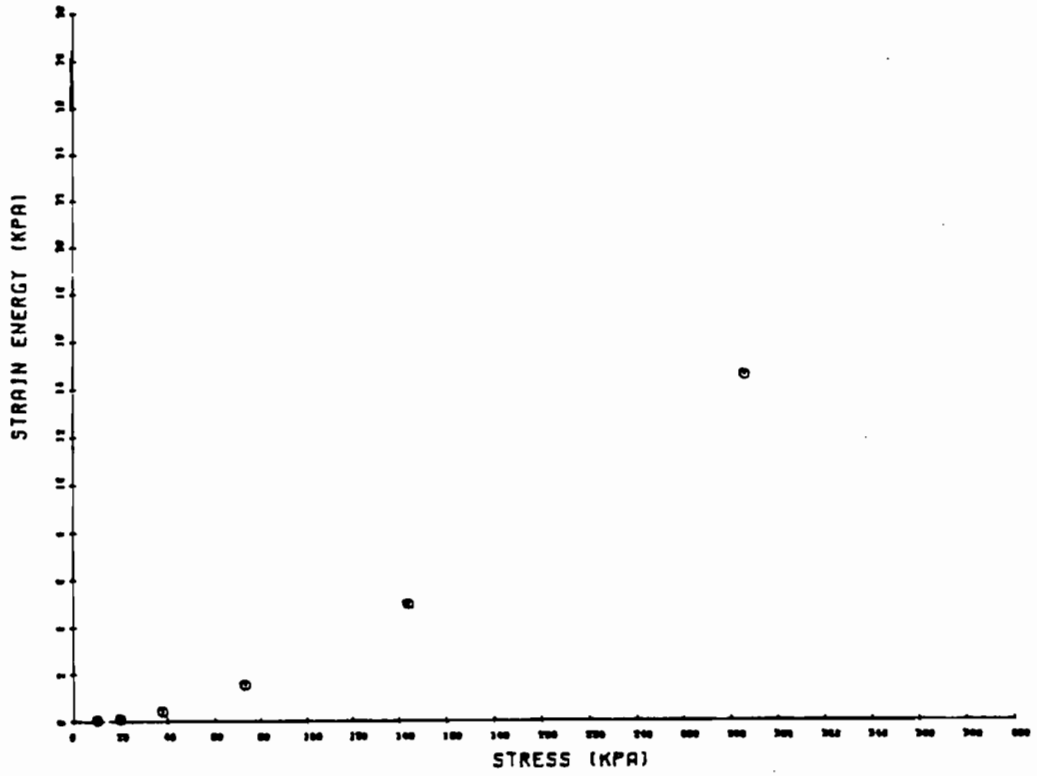
DIAMETER OF SAMPLE = 4.95 CM
 HEIGHT OF SAMPLE = 11.25 MM
 WATER CONTENT = 43.20 %
 INITIAL VOID RATIO = 1.175
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM/SEC	MC 1/KPA	V CM/SEC	SE KPA	STRAIN %	SI-2V
10.0	1.169	1.66E-03	2.67E-04	4.35E-08	0.01	0.27	0.04
20.0	1.159	1.34E-03	4.92E-04	6.46E-08	0.09	0.76	0.02
38.0	1.135	6.22E-04	5.96E-04	3.63E-08	0.40	1.93	0.13
73.0	1.092	7.35E-04	5.73E-04	4.12E-08	1.51	3.84	0.07
144.0	1.023	9.14E-04	4.44E-04	3.54E-08	4.93	6.99	0.13
286.0	0.926	7.40E-04	3.13E-04	2.27E-08	14.49	11.43	0.07
570.0	0.808	6.55E-04	1.97E-04	1.36E-08	39.45	17.07	0.04
1108.0	0.677	7.79E-04	1.03E-04	7.90E-09	99.65	22.91	0.01
2273.0	0.541	8.07E-04	5.51E-05	4.36E-09	198.38	29.17	0.05
570.0	0.576	1.27E-03	9.64E-06	1.20E-09	172.06	27.53	-0.09
144.0	0.647	4.36E-04	7.66E-05	3.27E-09	160.41	24.27	-0.06
38.0	0.731	1.75E-04	3.63E-04	6.22E-09	156.91	20.42	-0.04
10.0	0.803	6.44E-05	1.19E-03	7.48E-09	156.12	17.10	-0.01

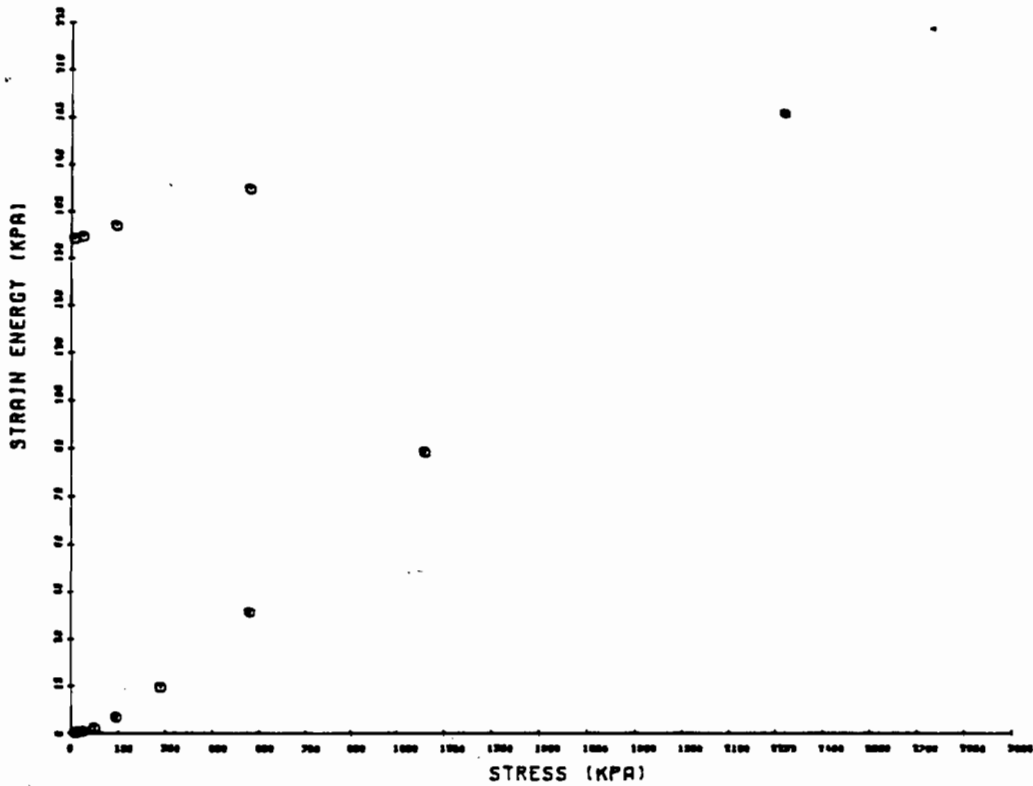
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STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AD84SI05 SA: 2V DEPTH: 9.9M



PROJ: 852-2007 BH: AD84SI05 SA: 2V DEPTH: 9.9M

Project No. 852-2007 Drawn CG Reviewed Date JUNE 05



CONSOLIDATION TEST

PROJECT: 952-2007
 BOREROLE: ADE49108
 SAMPLE: 2H
 DEPTH: 9.93-9.87M

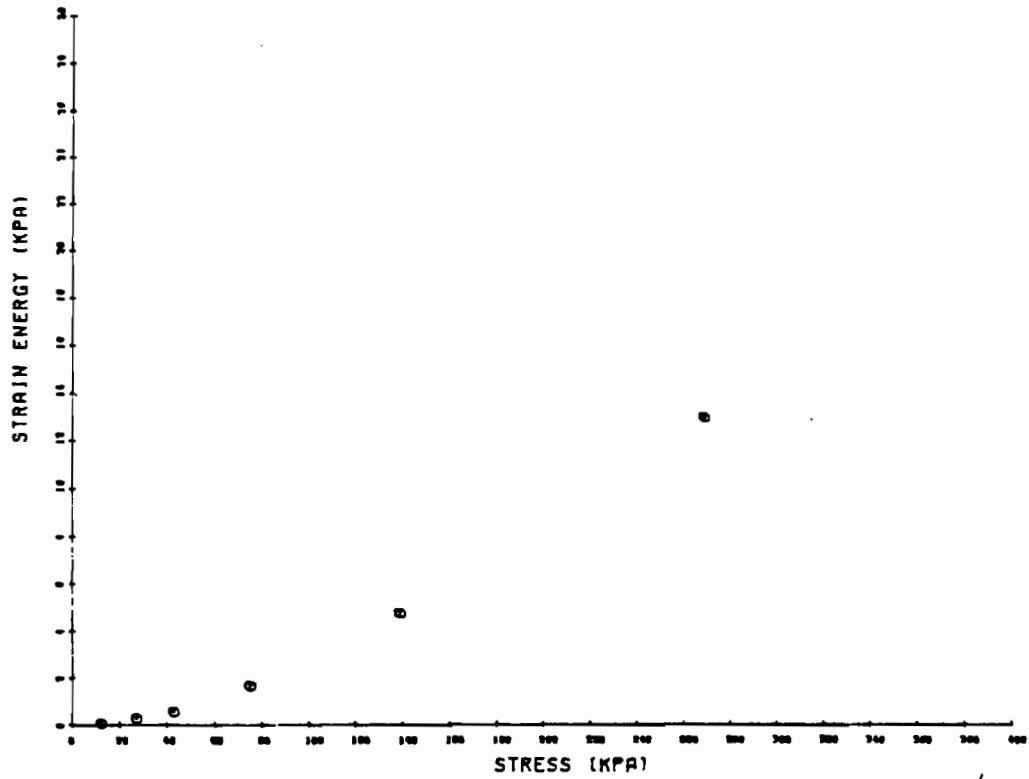
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.52 MM
 WATER CONTENT = 43.60 %
 INITIAL VOID RATIO = 1.186
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	KV 1/KPA	K CM/SEC	SE KPA	STRAIN %	SI-SO MM
12.0	1.175	1.70E-03	4.26E-04	7.11E-08	0.03	0.51	0.03
27.0	1.150	7.84E-04	7.55E-04	5.80E-08	0.25	1.64	0.03
43.0	1.132	6.68E-04	5.23E-04	7.42E-08	0.54	2.48	0.03
75.0	1.091	4.49E-04	5.81E-04	2.56E-08	1.64	4.74	0.03
139.0	1.028	4.29E-04	4.50E-04	2.16E-08	4.73	7.22	0.03
269.0	0.941	5.61E-04	3.07E-04	1.69E-08	12.87	11.22	0.11
527.0	0.821	4.57E-04	2.12E-04	9.51E-09	34.68	16.70	0.04
1043.0	0.690	4.33E-04	1.25E-04	5.30E-09	95.20	23.13	0.04
2075.0	0.533	4.92E-04	6.51E-05	3.14E-09	189.96	29.85	0.06
527.0	0.589	4.01E-04	1.64E-05	6.43E-10	157.00	27.32	-0.07
139.0	0.677	1.85E-04	1.04E-04	1.88E-09	143.58	23.29	-0.05
43.0	0.757	1.45E-04	3.80E-04	5.41E-09	140.25	19.64	-0.01
12.0	0.847	5.20E-05	1.34E-03	6.83E-09	139.11	15.49	-1.11

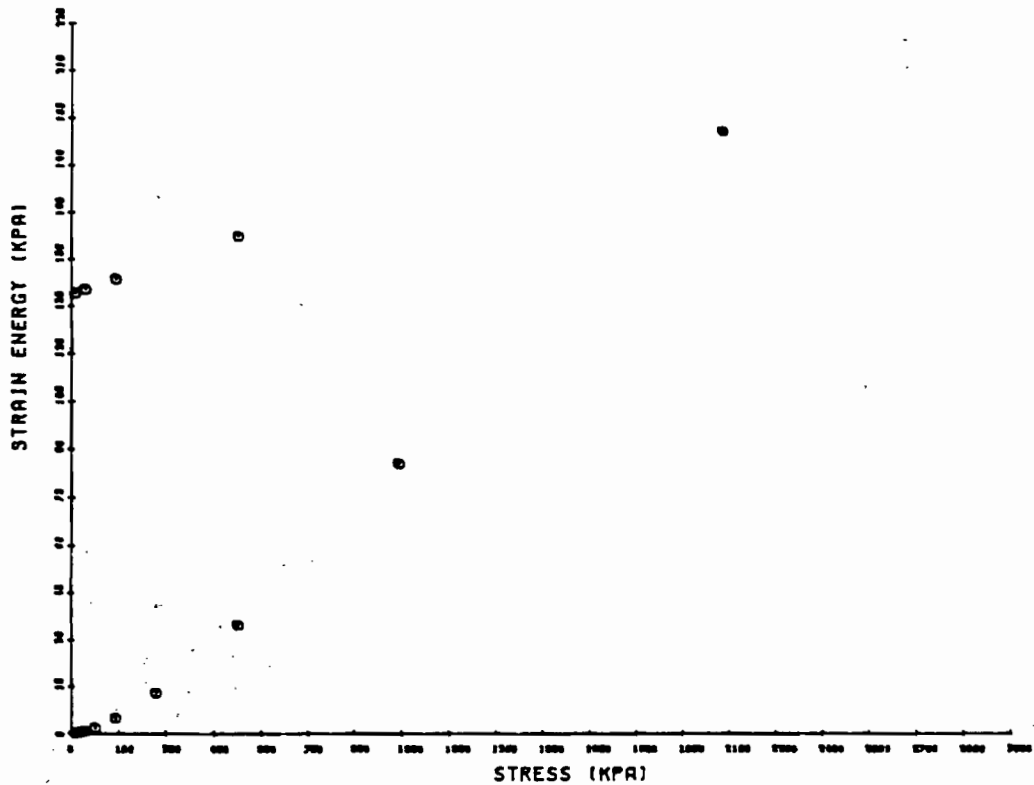


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AD84SI05 SR: 2H DEPTH: 9.83-9.87M



PROJ: 852-2007 BH: AD84SI05 SR: 2H DEPTH: 9.83-9.87M

Project No. 852-2007 Drawn Cg Reviewed _____ Date JUNE 05

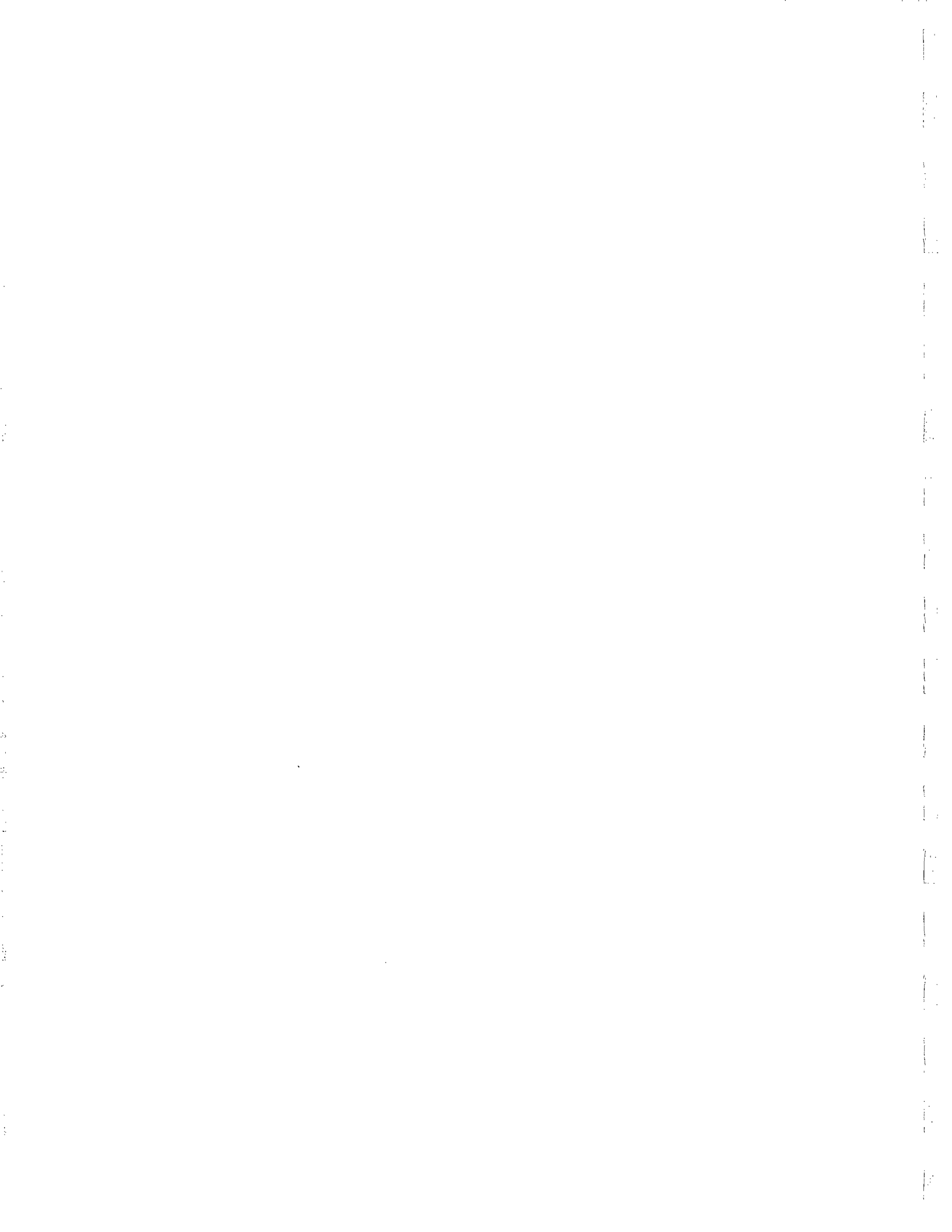


CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: AM64E105
 SAMPLE: 2V
 DEPTH: 3.80-3.85M

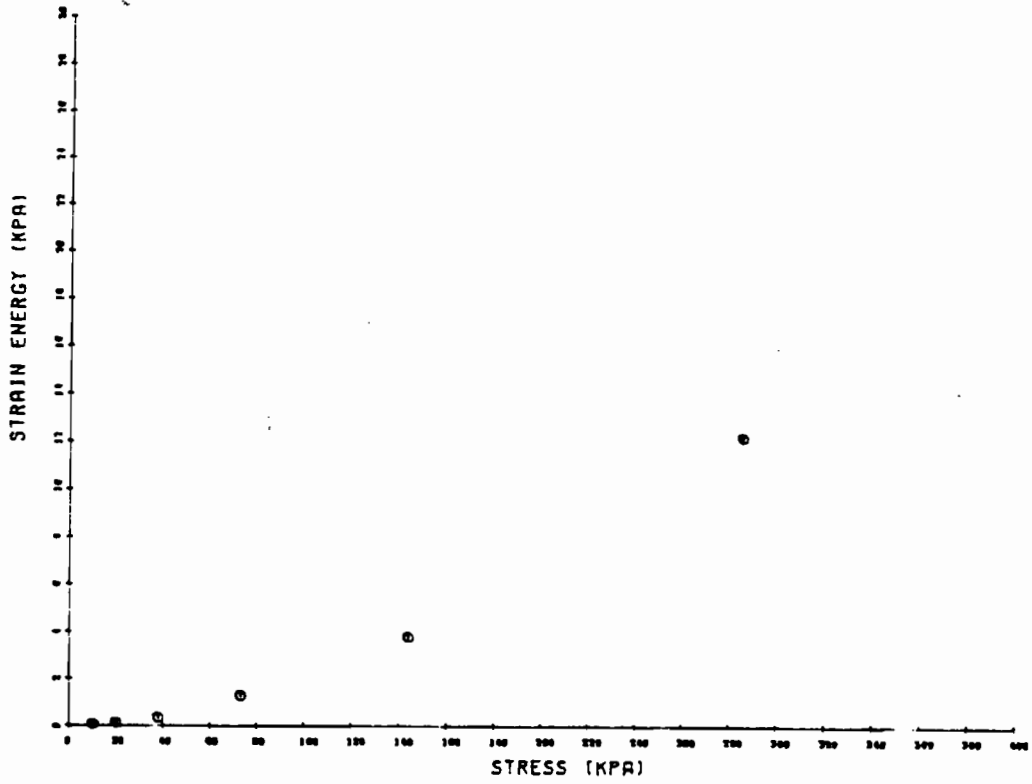
DIAMETER OF SAMPLE = 4.95 CM
 HEIGHT OF SAMPLE = 11.25 MM
 WATER CONTENT = 42.40 %
 INITIAL VOID RATIO = 1.157
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM2/SEC	MV 1/KPA	K CM/SEC	EE KPA	STRAIN %	FI-FO MM
10.0	1.139	2.39E-03	6.59E-04	1.53E-07	0.03	0.66	0.09
20.0	1.130	6.05E-04	4.33E-04	0.55E-08	0.10	1.09	0.01
38.0	1.113	1.16E-03	4.23E-04	4.82E-08	0.32	1.85	0.02
73.0	1.077	5.61E-04	4.82E-04	2.65E-08	1.25	3.54	0.07
144.0	1.027	5.30E-04	3.28E-04	1.71E-08	3.78	5.87	0.04
286.0	0.943	6.65E-04	2.73E-04	1.78E-08	12.12	9.75	0.02
570.0	0.834	6.17E-04	1.75E-04	1.08E-08	33.93	14.84	0.02
1135.0	0.703	5.67E-04	1.07E-04	6.12E-09	85.83	20.72	0.01
2272.0	0.566	2.61E-04	5.70E-05	3.69E-09	196.17	27.39	0.05
570.0	0.607	1.05E-03	1.17E-05	1.20E-09	167.73	25.39	-0.11
144.0	0.657	2.84E-04	9.46E-05	2.63E-09	153.34	21.36	-0.08
38.0	0.786	1.25E-04	4.04E-04	4.96E-09	149.44	17.07	-0.07
10.0	0.859	6.18E-05	1.22E-03	7.38E-09	148.62	13.66	-0.01

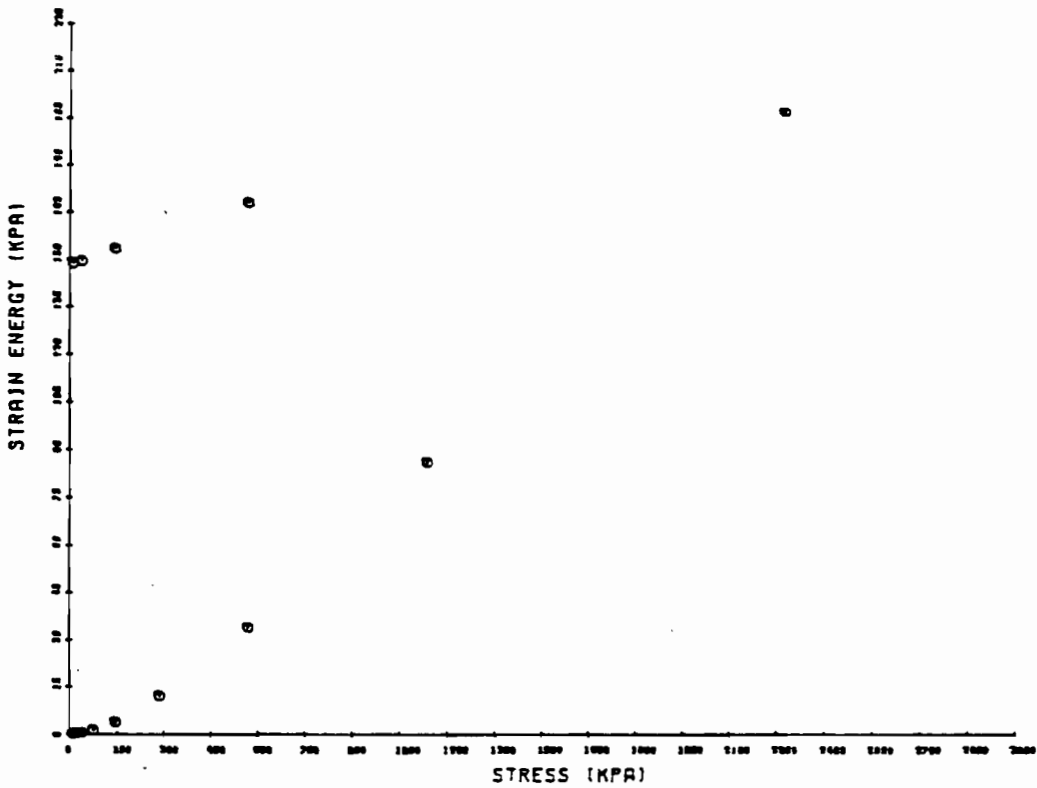


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AM84SI05 SA: 2V DEPTH: 3.80-3.85M



PROJ: 852-2007 BH: AM84SI05 SA: 2V DEPTH: 3.80-3.85M

Project No 852-2007 Drawn Cg Reviewed _____ Date JUNE 05



CONSOLIDATION TEST

PROJECT: 852-2007
 BOREHOLE: AMS48105
 SAMPLE: 2F
 DEPTH: 2.66-2.88M

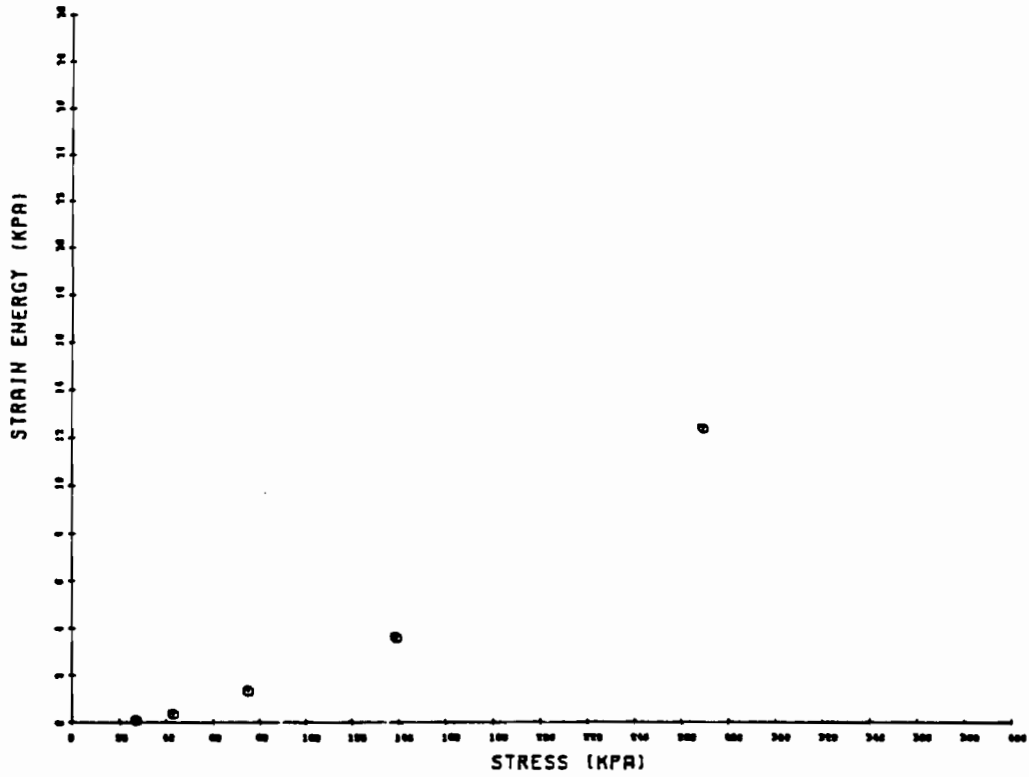
DIAMETER OF SAMPLE = 5.00 CM
 HEIGHT OF SAMPLE = 11.91 MM
 WATER CONTENT = 44.60 %
 INITIAL VOID RATIO = 1.219
 SPECIFIC GRAVITY = 2.72

STRESS (KPA)	VOID RATIO	CV CM/SEC	MV 1/KPA	V CM/SEC	SE KPA	STRAIN %	E1-E2 MM
27.0	1.209	4.61E-04	1.65E-04	7.46E-09	0.06	0.45	0.11
43.0	1.192	2.99E-04	4.66E-04	1.36E-08	0.32	1.19	0.11
75.0	1.155	1.97E-04	5.19E-04	9.99E-09	1.30	2.85	0.11
139.0	1.108	1.99E-04	3.31E-04	6.44E-09	3.57	4.97	0.11
269.0	1.012	1.84E-04	3.30E-04	5.97E-09	12.32	9.24	0.11
527.0	0.889	1.75E-04	2.19E-04	3.75E-09	34.83	14.91	0.11
1043.0	0.741	1.61E-04	1.26E-04	2.03E-09	64.78	21.55	0.11
2075.0	0.582	1.44E-04	6.92E-05	1.12E-09	198.11	28.17	0.11
557.0	0.635	2.26E-04	1.54E-03	3.41E-10	187.17	26.30	-0.11
139.0	0.715	1.32E-04	9.26E-05	1.20E-09	105.21	22.70	-0.11
43.0	0.797	4.79E-05	3.87E-04	1.82E-09	151.82	18.99	-0.11
12.0	0.880	2.16E-05	1.21E-03	2.56E-09	150.79	15.24	-0.11

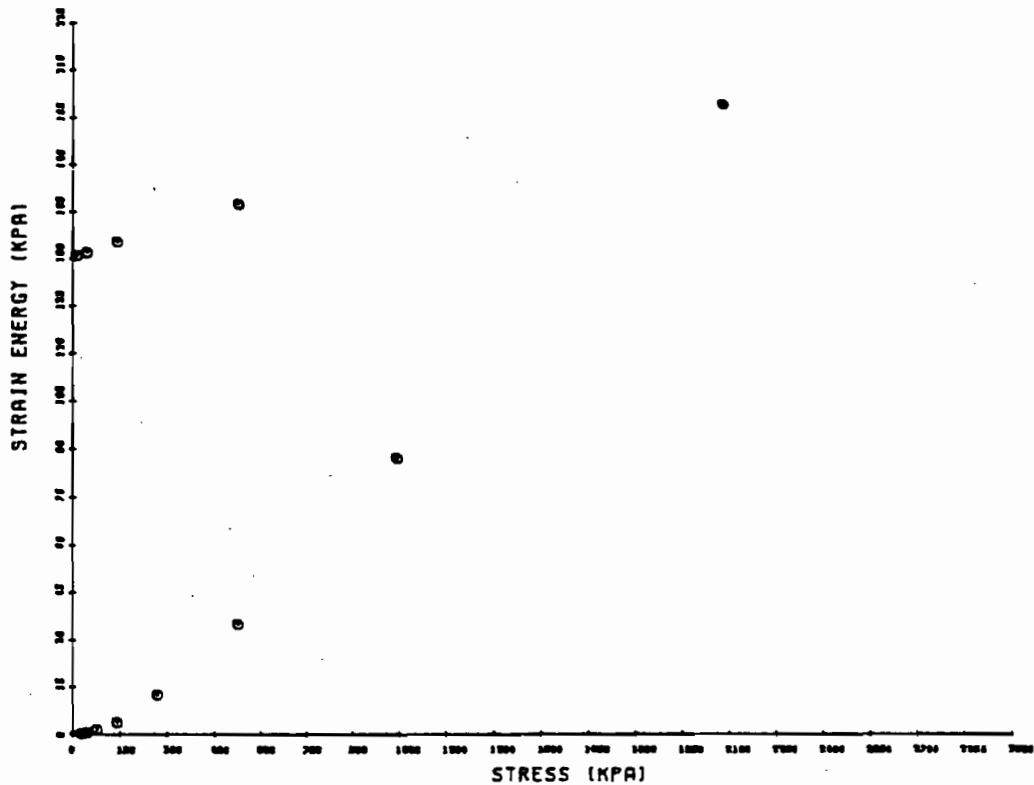


STRAIN ENERGY - STRESS RELATIONSHIPS

Figure



PROJ: 852-2007 BH: AM84SI05 SA: 2H DEPTH: 3.86-3.88M



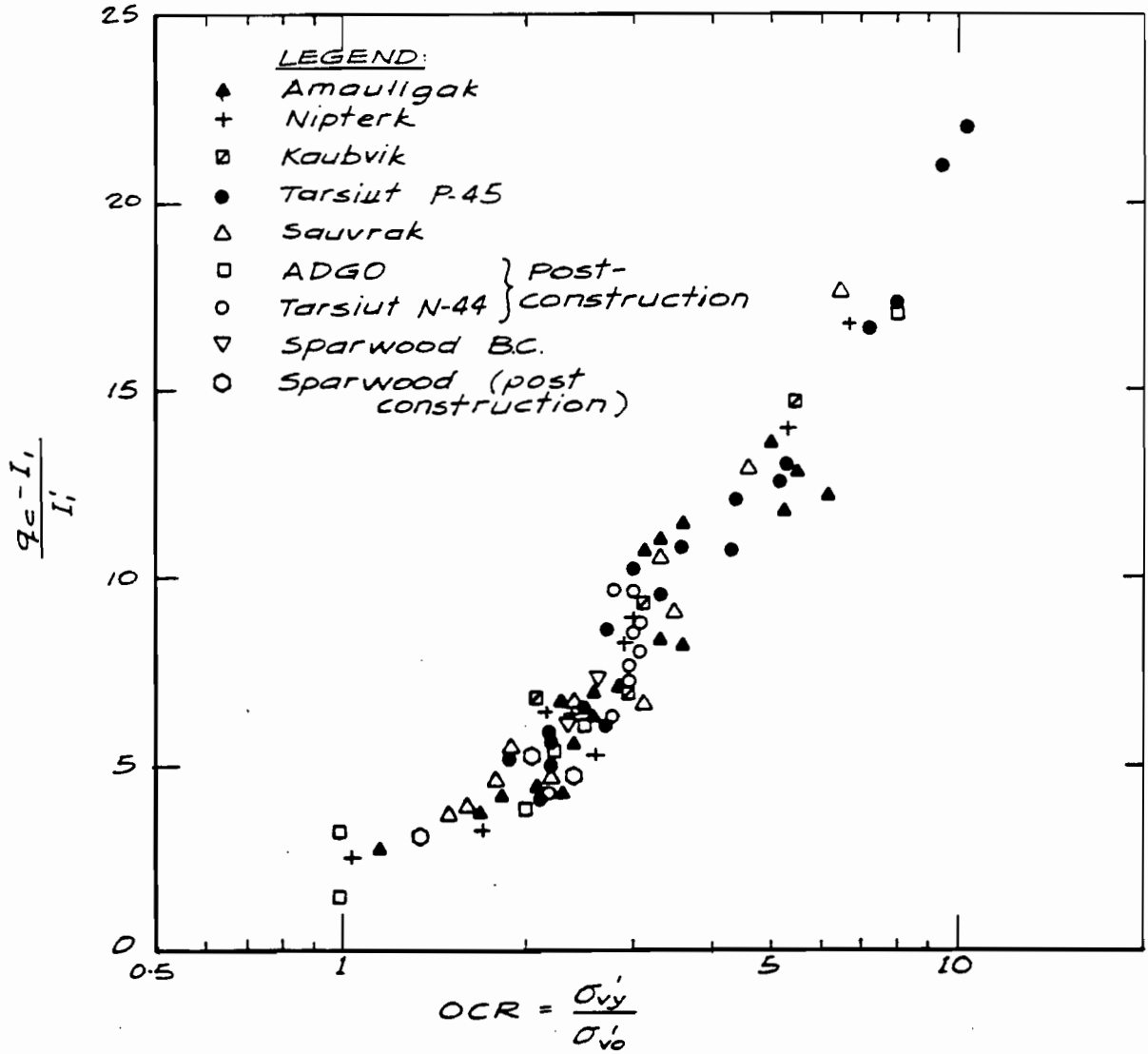
PROJ: 852-2007 BH: AM84SI05 SA: 2H DEPTH: 3.86-3.88M

Project No. 852-2007 Drawn CJ Reviewed _____ Date JUNE 05

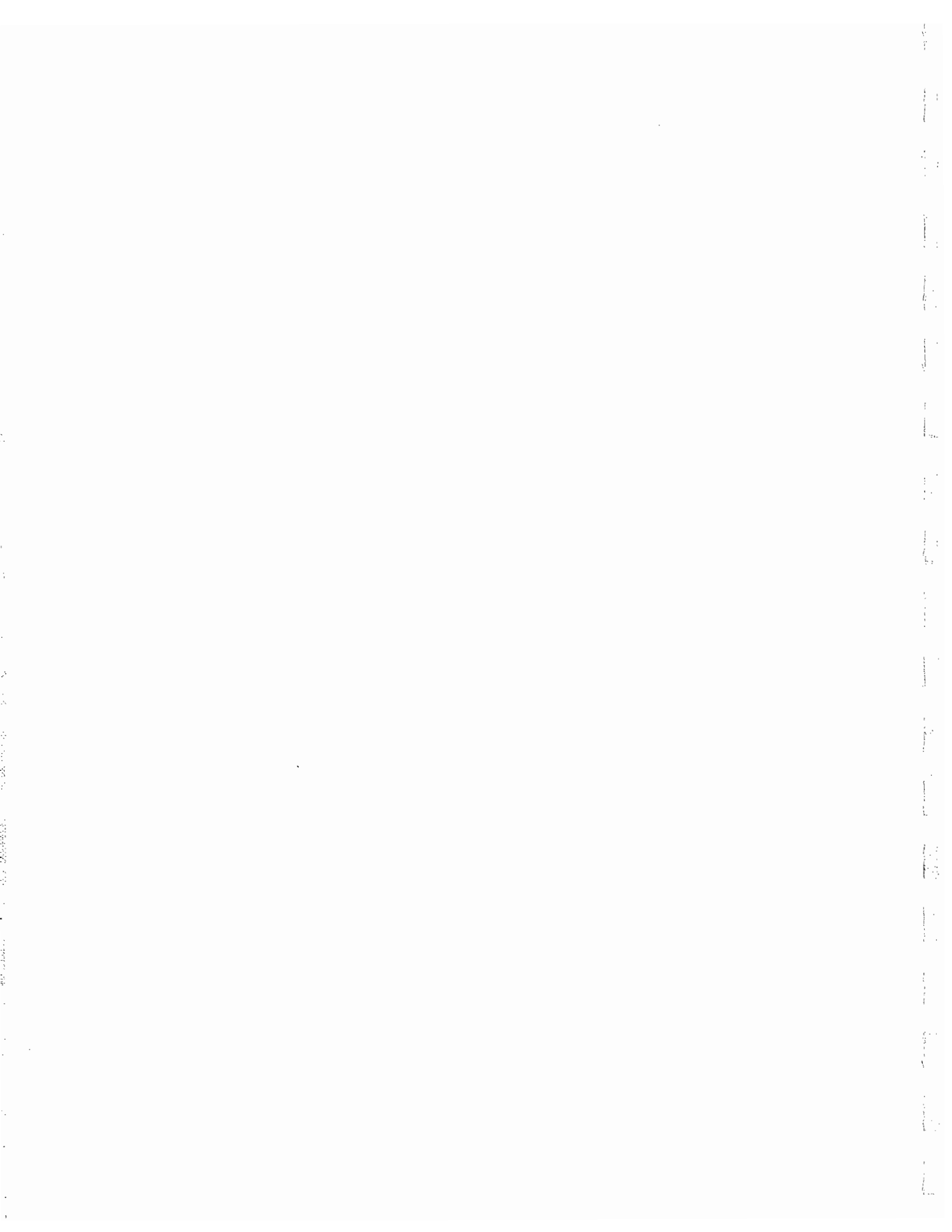


APPENDIX 7 - CONE PENETRATION TEST DATA

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Project No. 852-2007 Drawn RK Reviewed RA Date JUNE '85



GULF CANADA RESOURCES INC.

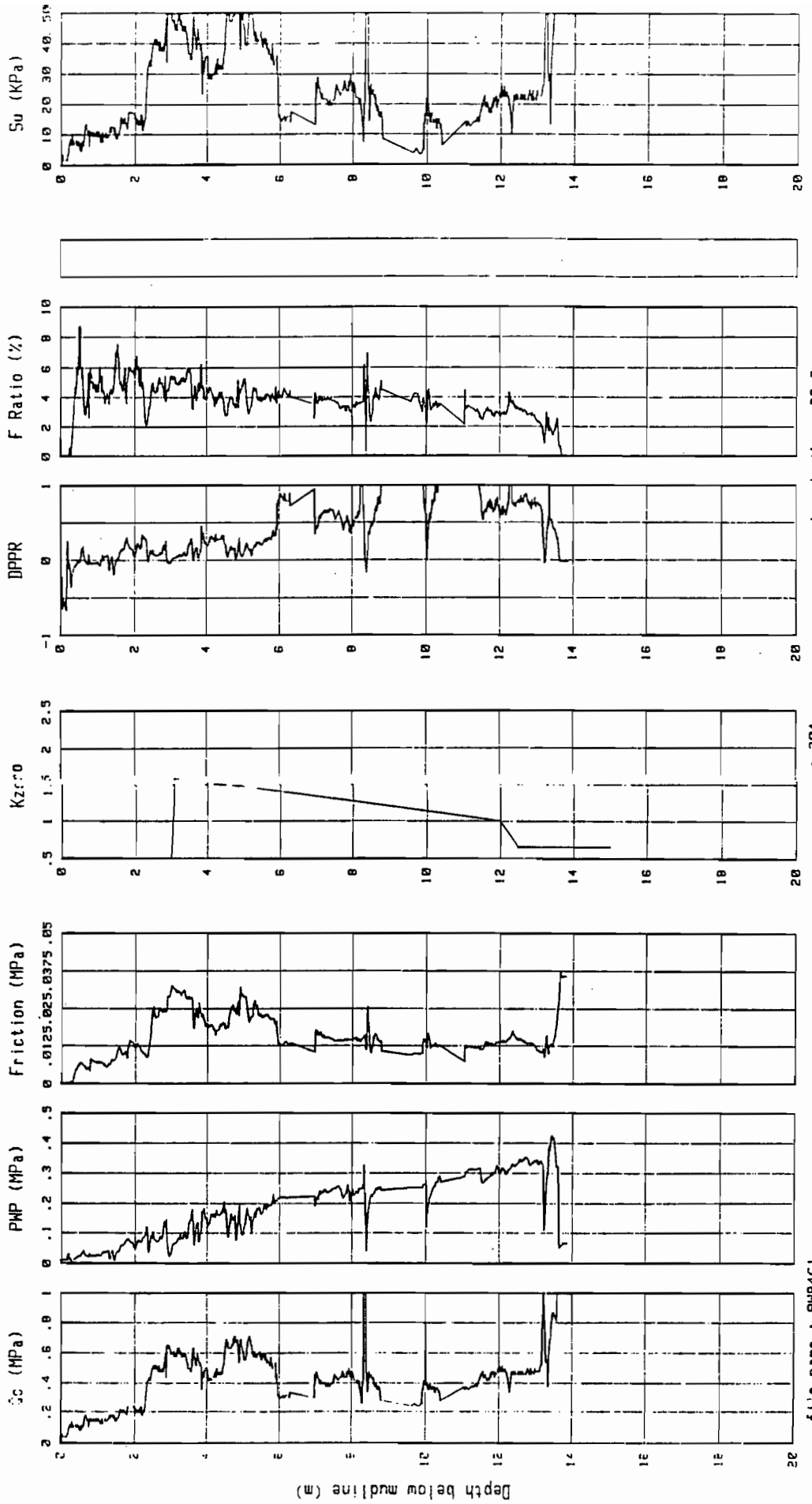
Location: AMRULIGAK (WEST)

Water depth (m) : 30.7

PAGE 1 of 1

DATE : 11 SEPT 84

CPT : AMR4C101



file name : AMR4C1

conn : 304

zeroing depth : 20.7

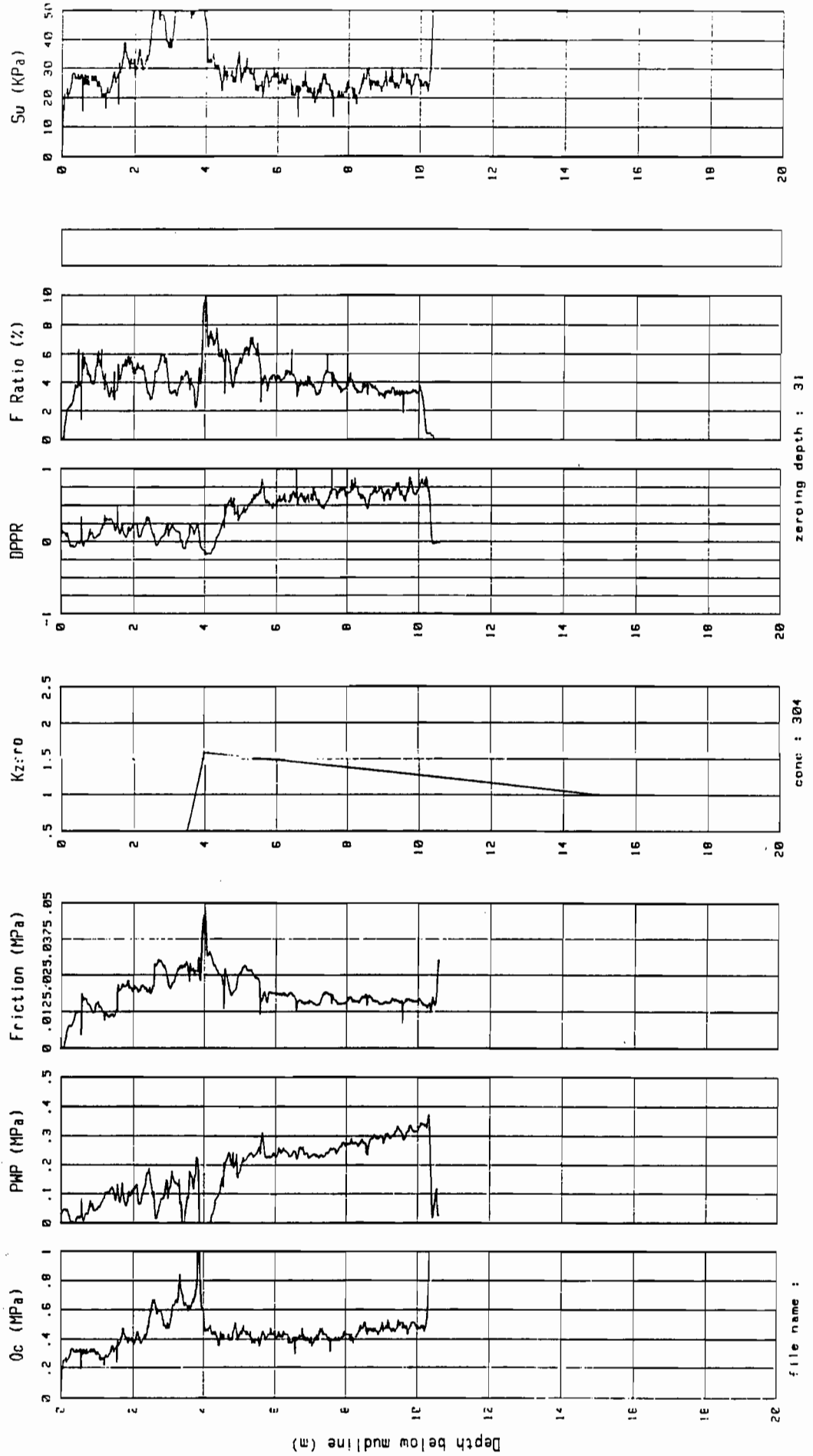
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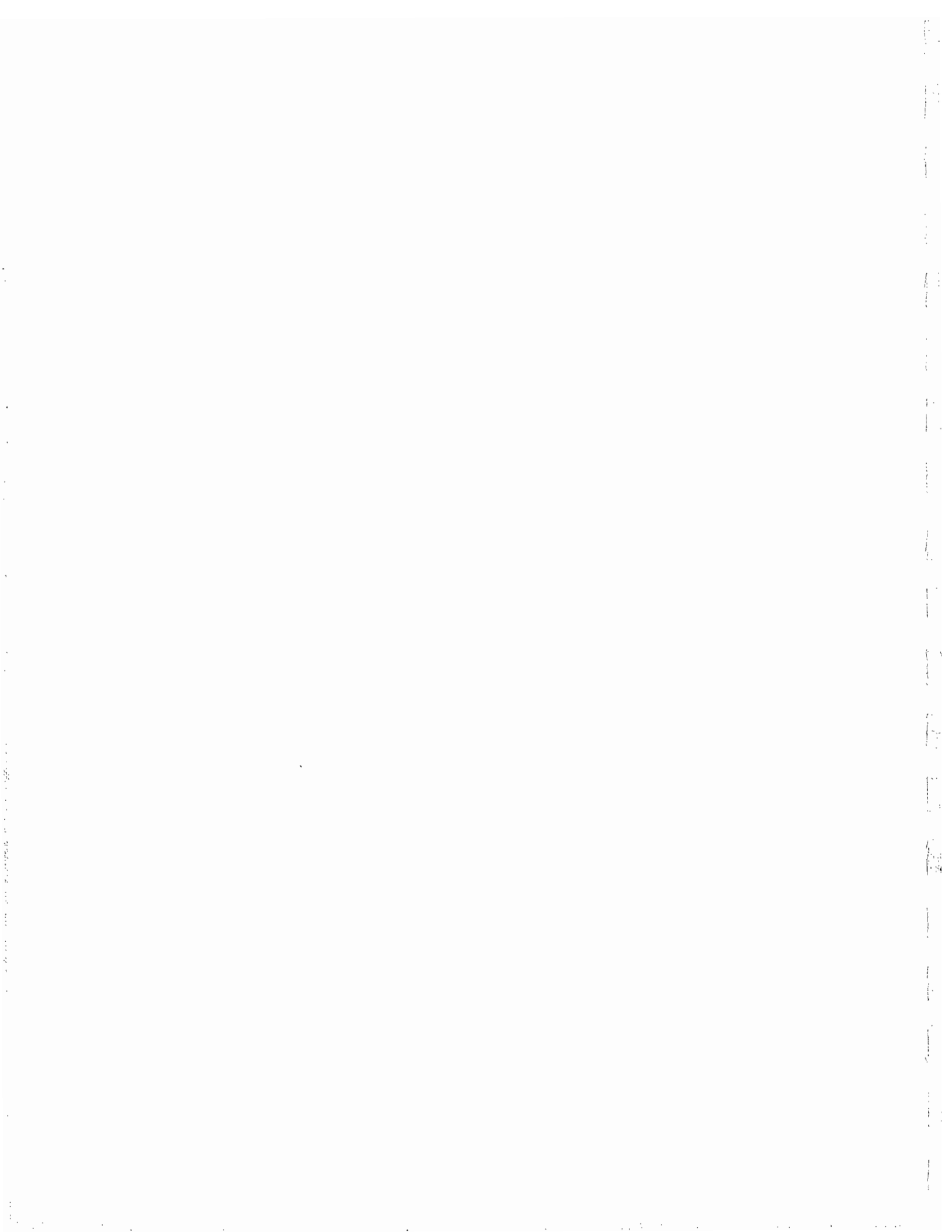
GULF CANADA RESOURCES INC.

PAGE 1 of 1
 DATE : 11 SEPT 84

Location: AMRULIGAK (WEST)
 Water depth (m) : 32.9

CPT : ANS-1C102





GULF CANADA RESOURCES INC.

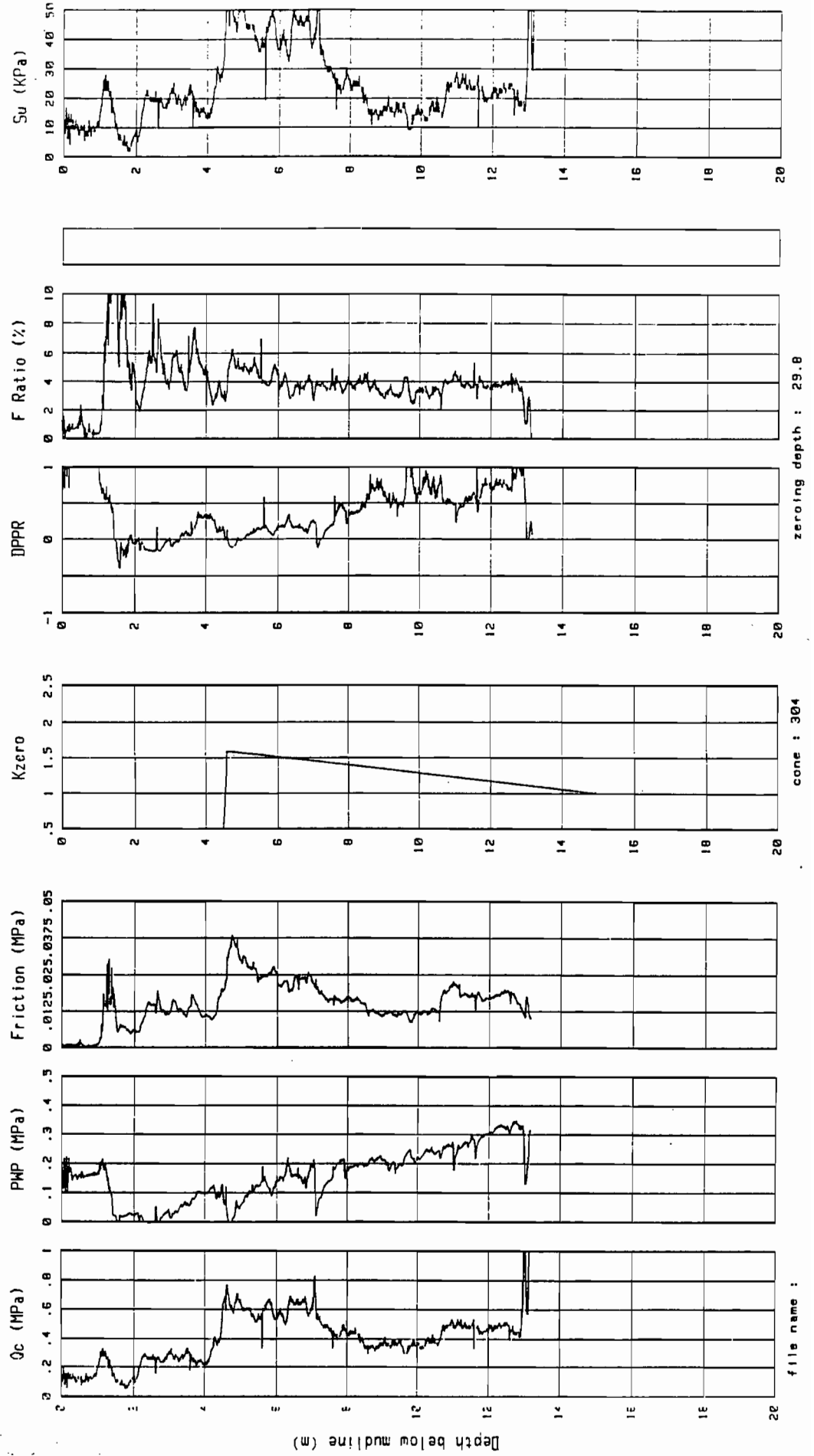
Location: AMRULIGAK (WEST)

Water depth (m) : 30.8

CPT : AMR4CI03

PAGE 1 of 1

DATE : 11 SEPT 84



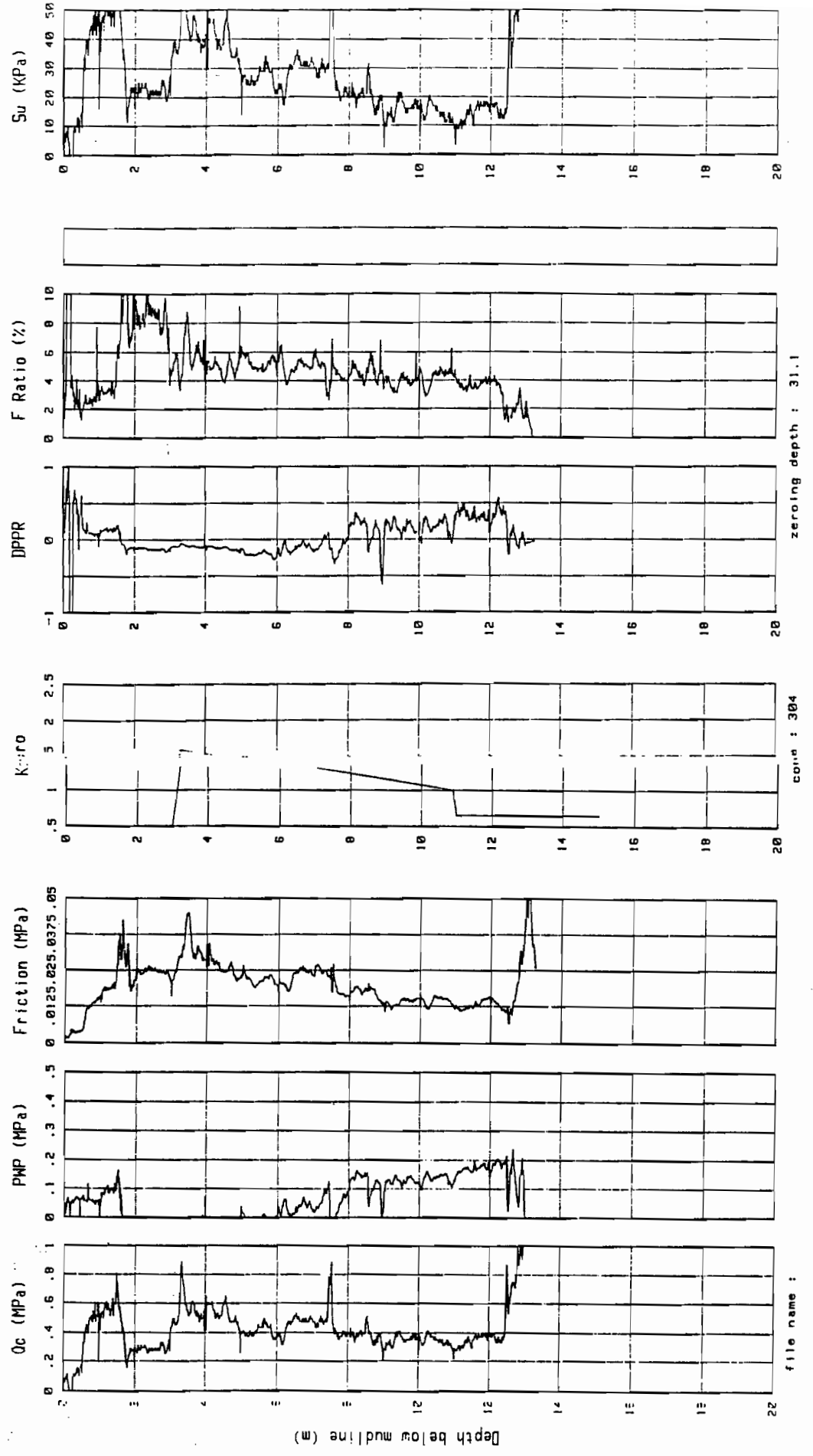


GULF CANADA RESOURCES INC.

PAGE 1 of 1
 DATE : 11 SEPT 84

Location: AMALUGAK (WEST)
 Water depth (m) : 31.8

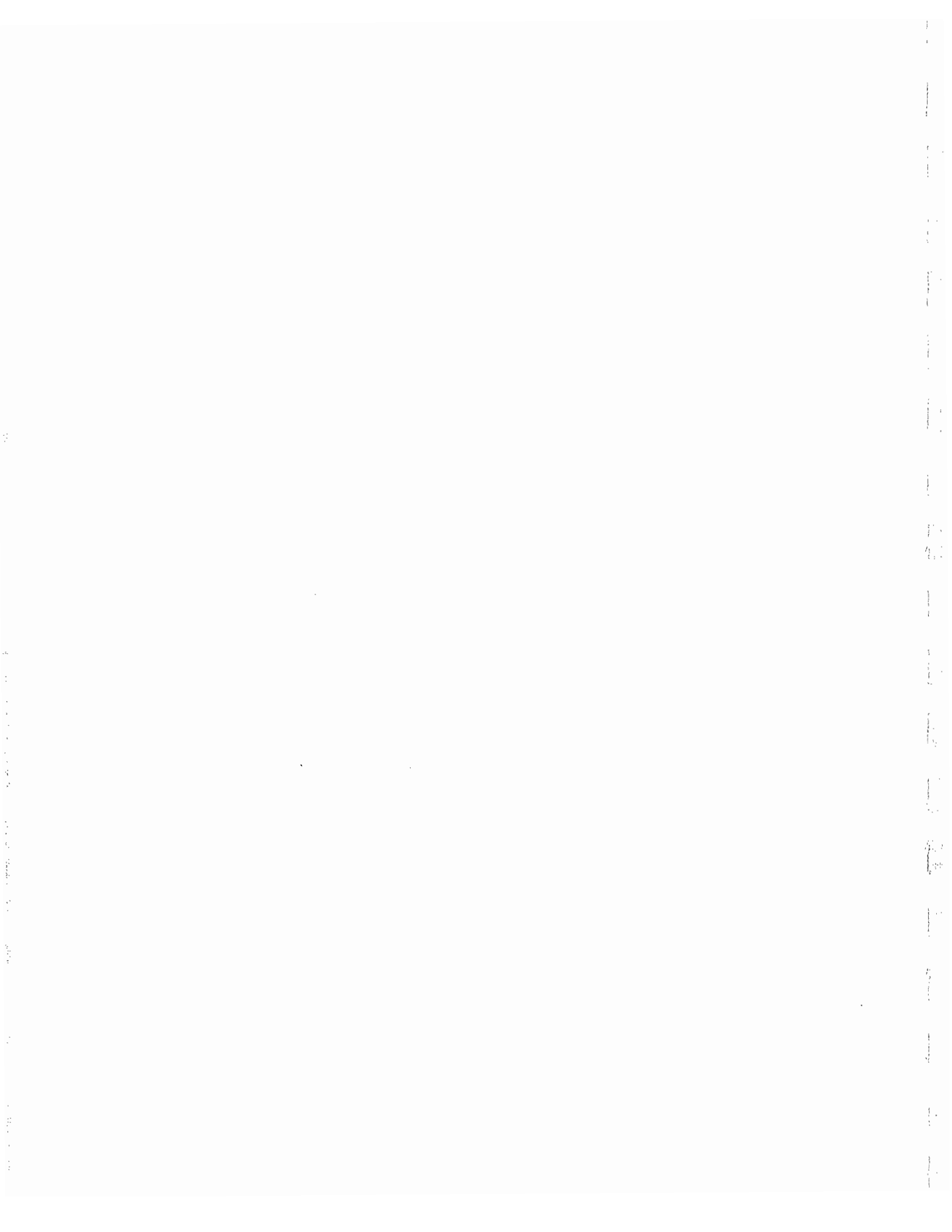
CPT : AM41C104



zeroing depth : 31.1

core : 304

file name :



GULF CANADA RESOURCES INC.

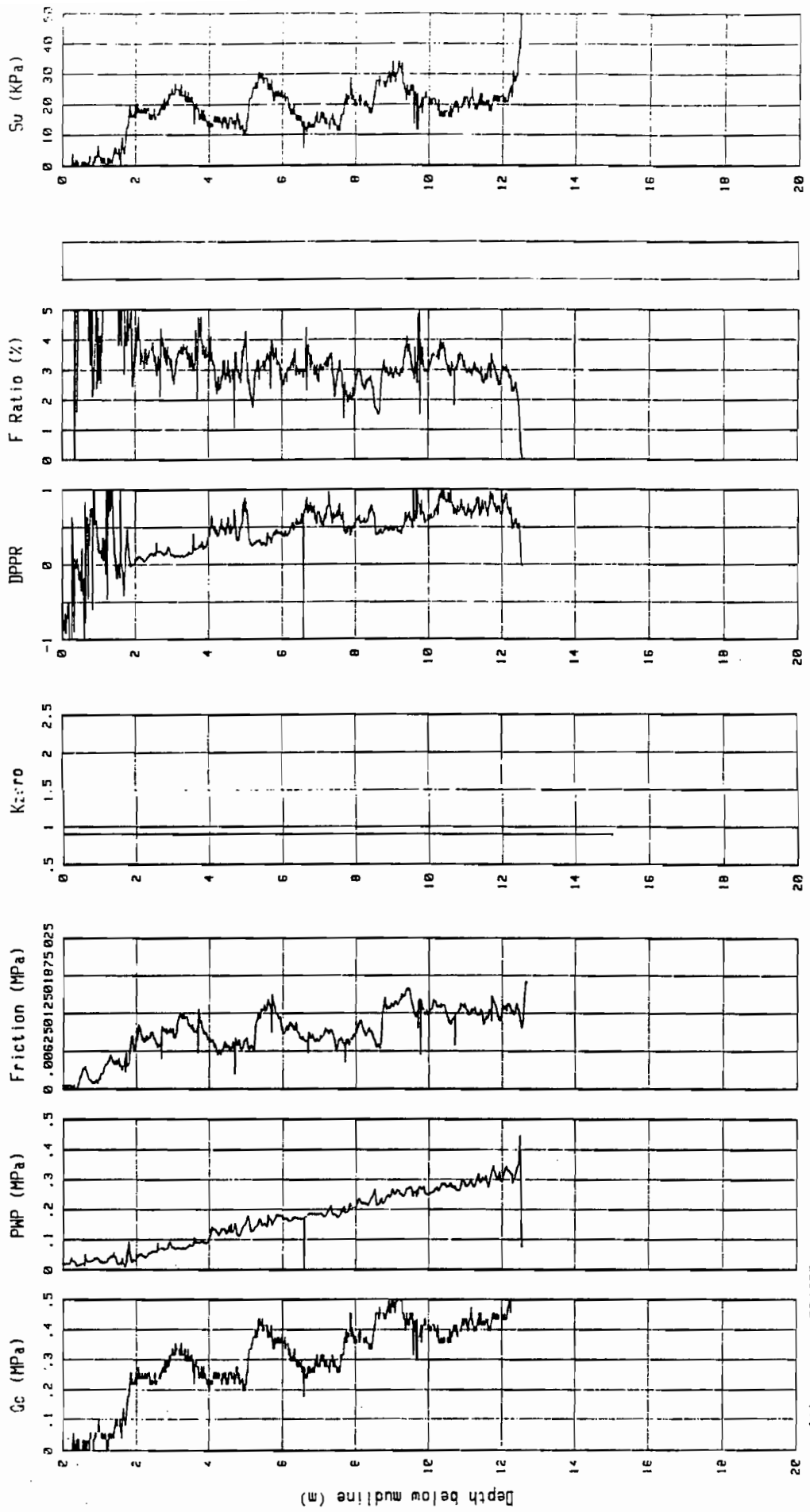
Location: AMALIGAK EAST

Water depth (m) : 30.7

PAGE 1 of 1

DATE : 10 SEPT 84

CPT : RE4CI05



file name : AB4C05

cone : 304

zeroing depth : 29.7



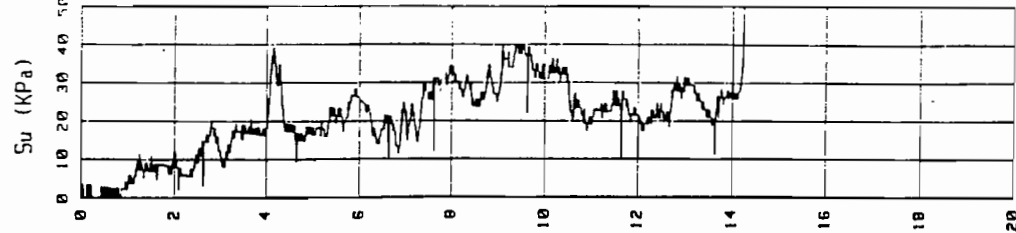
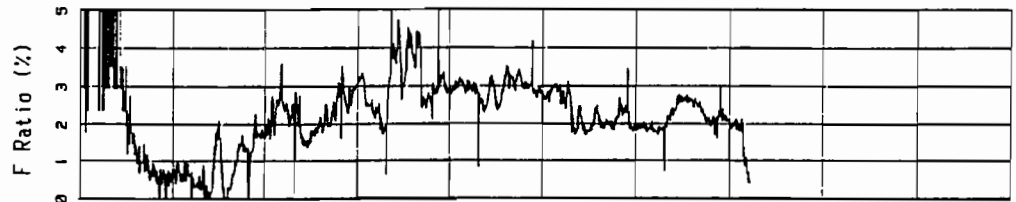
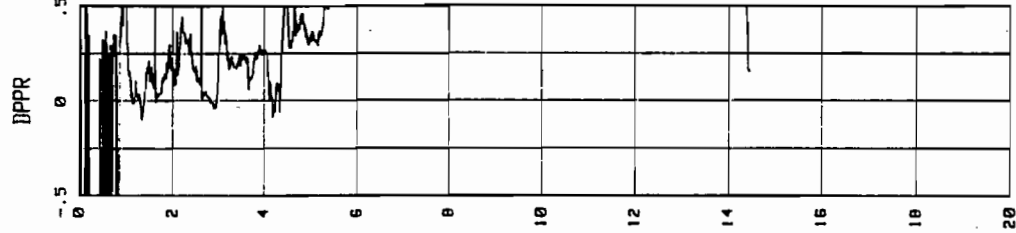
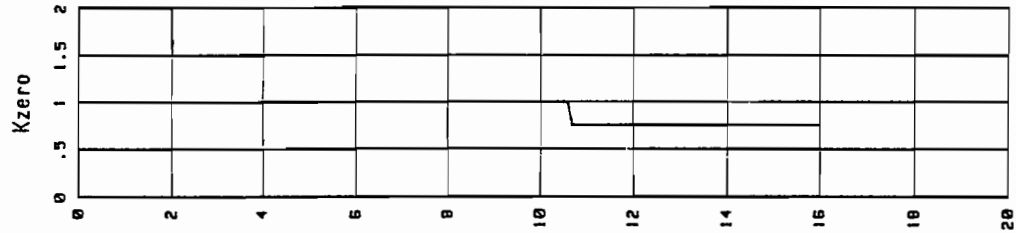
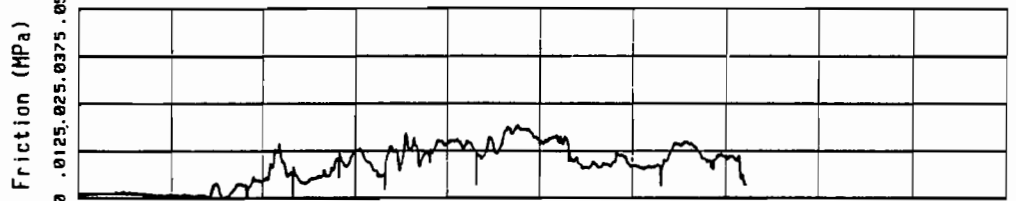
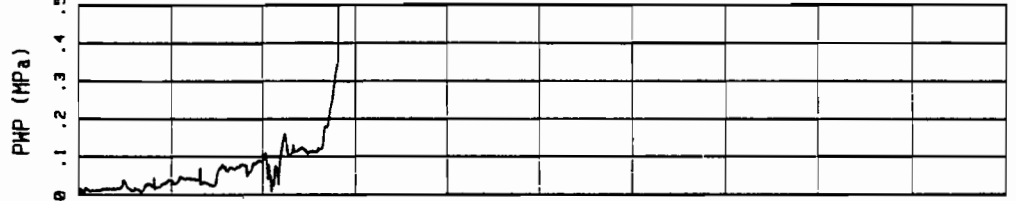
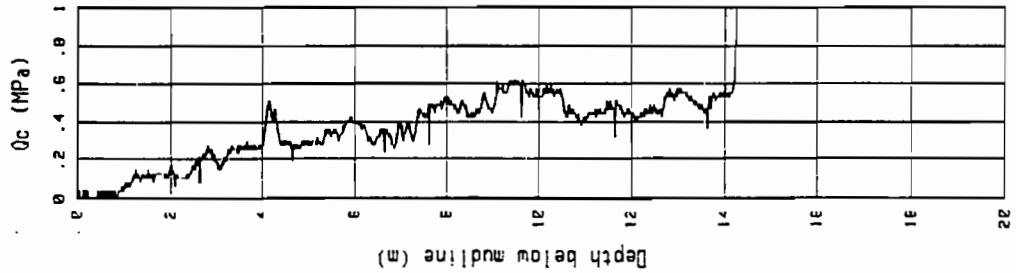
GULF CANADA RESOURCES INC.

Location: AMRULIGAK EAST

Water depth (m) : 29.4

CPT : AEB4CI01

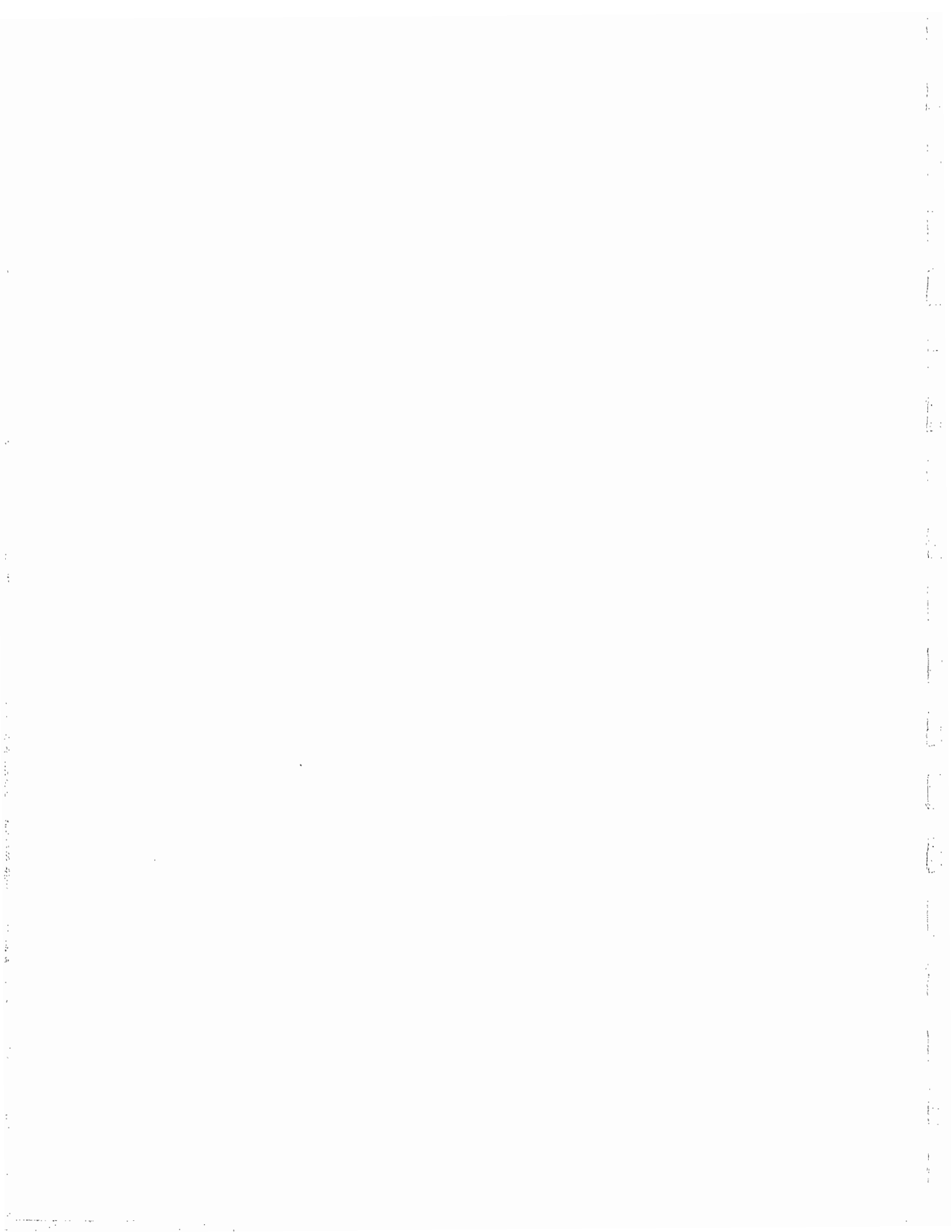
PAGE 1 of 1
DATE : 10 SEPT 84



file name :

cone :

zeroing depth : 29.4



GULF CANADA RESOURCES INC.

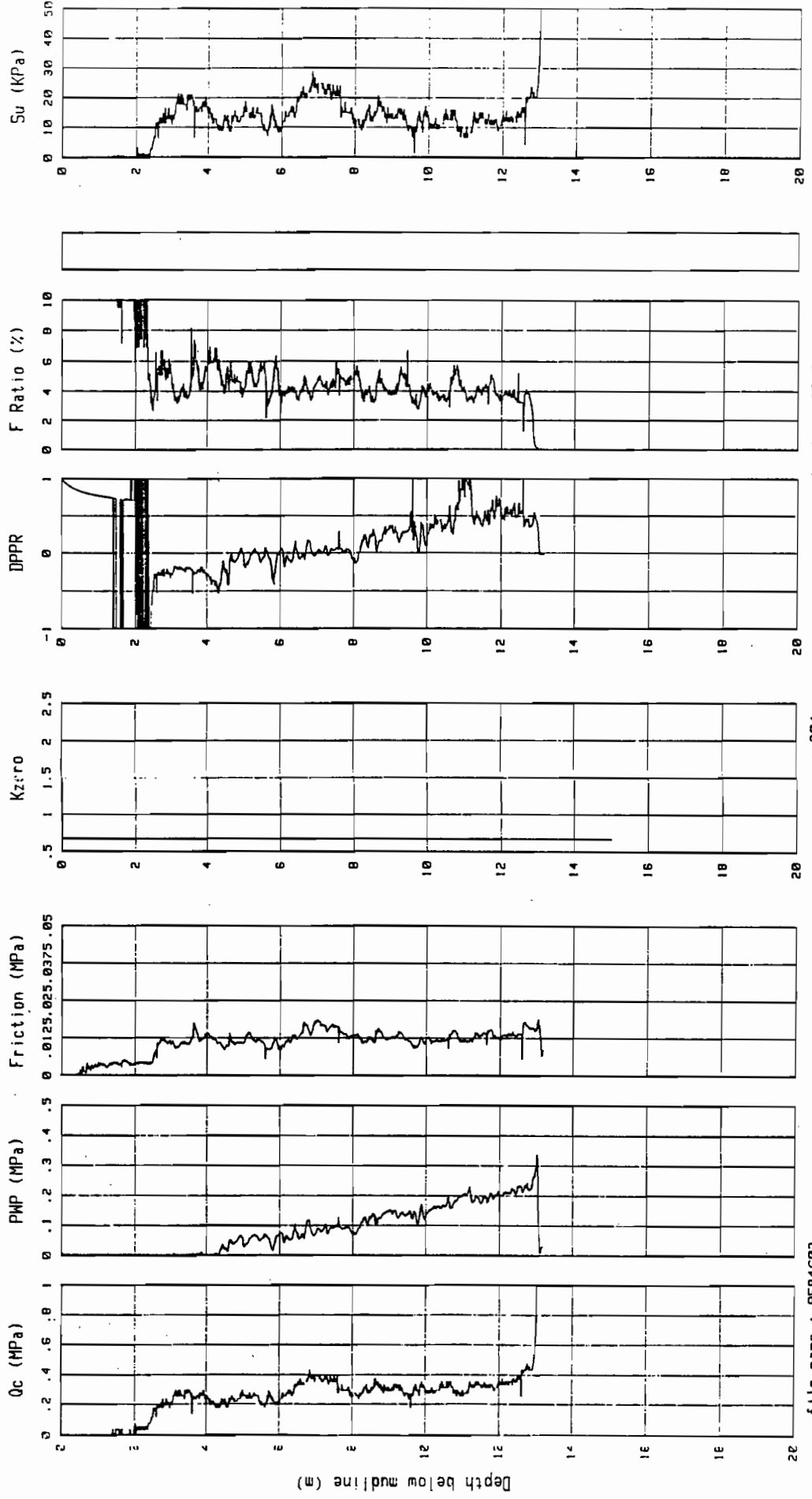
Location: AMAULIGAK (EAST)

Water depth (m) : 30.7

CPT : AEB4C02

PAGE 1 of 1

DATE : 10 SEPT 84



file name : AEB4C02

cone : 304

zeroing depth : 29.7

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GULF CANADA RESOURCES INC.

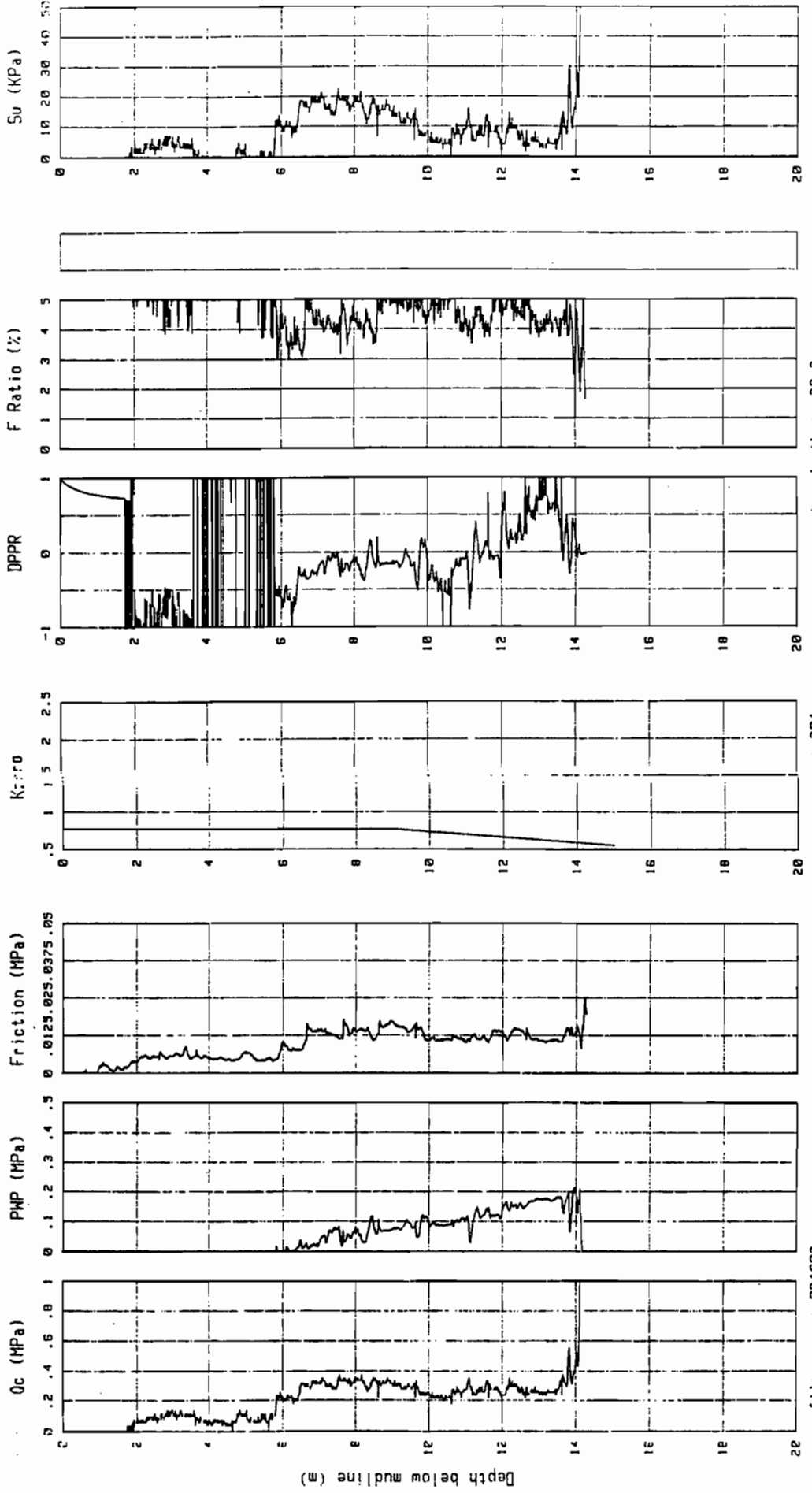
Location: AMAULIGAK EAST

Water depth (m) : 29.2

CPT : AF4CI03

PAGE 1 of 1

DATE : 10 SEPT 84



file name : AB4CB3

conn : 304

zeroing depth : 28.2

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GULF CANADA RESOURCES INC.

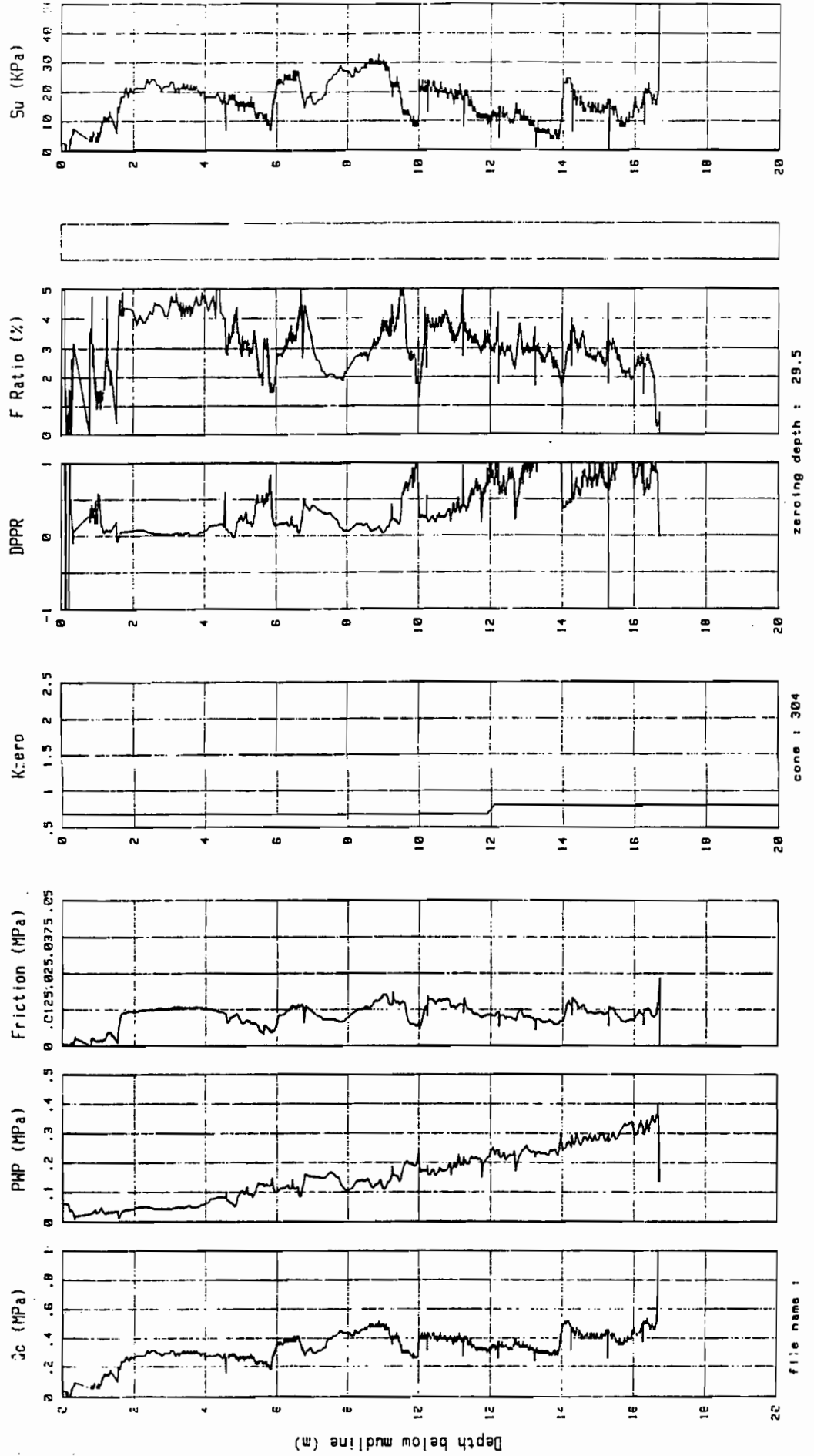
Location: AMAULIGAK (EAST)

Water depth (m) : 30.5

PAGE 1 of 1

DATE : 10 SEPT 04

CPT : AEB4C104



file name 1

