Consolidation Test Data Sheet

REVISED FORM FOR NCR NO. 25237-NCR-028 and 25237-NCR-031 3/9/2007

Consolidometer ID: 5

2/15/07

Schnabel Contract: *06120048*

Test Method: *ASTM D2435 Method A*

Project: *Calvert Cliffs Nuclear Power Plant*

Test Condition: *Inundated @ 4 tsf*

Initial Height of Specimen (H_o), in.: 0.7500

Boring No.: *B-321*

Height of Solids (H_s), in.: 0.3699

Depth: *23.5-25.5 ft*

Seating Press. (tsf): 0.05

Initial Dial Gauge Reading (D_o), in.: -0.0005

Reviewed by: CJS

Pressure, P (tsf)	TimeReadings Required	Date Load Applied	Time Load Applied	Load Applied By	A: Final[1] Dial Reading, D_{fi} x 10^{-4} in.	B: Apparatus Correction[2], D_{ci} x 10^{-4} in.	C: Cumulative Change in Height[3], ΔH_i in.	D: Height of Voids[4], H_{vi} in.	Vertical Strain[5], ε_i (%)	Void Ratio[6], e_i
0.5		10/4/2006	9:20	DWC	-1	12	-0.0008	0.3809	-0.11	1.030
1		10/5/2006	9:20	DWC	8	21	-0.0008	0.3809	-0.11	1.030
2		10/6/2006	9:20	DWC	40	33	0.0012	0.3789	0.16	1.024
4		10/7/2006	9:20	DWC	99	40	0.0064	0.3737	0.85	1.010
8		10/9/2006	9:20	DWC	204	50	0.0159	0.3642	2.12	0.985
4		10/10/2006	9:20	DWC	181	40	0.0146	0.3655	1.95	0.988
2		10/11/2006	9:20	DWC	152	33	0.0124	0.3677	1.65	0.994
4		10/12/2006	9:20	DWC	166	40	0.0131	0.3670	1.75	0.992
8		10/13/2006	9:20	DWC	213	50	0.0168	0.3633	2.24	0.982
16		10/14/2006	9:20	CJS	408	63	0.0350	0.3451	4.67	0.933
32		10/16/2006	9:20	DWC	976	76	0.0905	0.2896	12.07	0.783
64		10/17/2006	9:20	DWC	1677	87	0.1595	0.2206	21.27	0.596
16		10/18/2006	9:20	DWC	1457	63	0.1399	0.2402	18.65	0.649
4		10/19/2006	9:20	DWC	1129	40	0.1094	0.2707	14.59	0.732
0.5		10/20/2006	9:20	DWC	689	12	0.0682	0.3119	9.09	0.843

Notes:
1. "Final" based on test method; 24 hrs for Method A, end of primary for Method B.
2. Correction value, for the current pressure, from the consolidometer's calibration curve.
3. $\Delta H = D_{fi} - D_o - D_{ci}$ = Col. A - D_o - Col. B
4. $H_{vi} = (H_o - H_s) - \Delta H$
5. $\varepsilon_i = (\Delta H / H_o) \times 100$ = (Col. C / H_o) x 100
6. $e_i = H_{vi} / Hs$ = Col. D / Hs

Consol 8/2006 Rev. 1

Consolidation Test Data Sheet

Consolidometer ID: 3

10/26/06

REVISED FORM FOR
NCR NO. 25237-NCR-028
2/12/2007

Schnabel Contract: *06120048*

Test Method: *ASTM D2435 Method A*

Project: *Calvert Cliffs Nuclear Power Plant*

Test Condition: *Inundated @ 0.05 tsf*

Initial Height of Specimen (H_o), in.: 0.7315

Boring No.: *B-321*

Height of Solids (H_s), in.: 0.4253

Depth: *73.5-75.5 ft*

Seating Press. (tsf): 0.05

Initial Dial Gauge Reading (D_o), in.: 0.0009

Reviewed by: CJS

Pressure, P (tsf)	TimeReadings Required	Date Load Applied	Time Load Applied	Load Applied By	A Final[1] Dial Reading, D_{fi} x 10^{-4} in.	B Apparatus Correction[2], D_{ci} x 10^{-4} in.	C Cumulative Change in Height[3], ΔH_i in.	D Height of Voids[4], H_{vi} in.	Vertical Strain[5], ε_i (%)	Void Ratio[6], e_i
0.5		10/7/2006	9:10	DWC	76	6	0.0061	0.3002	0.83	0.706
1		10/9/2006	9:10	DWC	116	13	0.0094	0.2969	1.28	0.698
2		10/10/2006	9:10	DWC	158	20	0.0129	0.2934	1.76	0.690
4		10/11/2006	9:10	DWC	210	27	0.0174	0.2889	2.38	0.679
8		10/12/2006	9:10	DWC	275	36	0.0230	0.2833	3.14	0.666
4		10/13/2006	9:10	DWC	263	27	0.0227	0.2836	3.10	0.667
2		10/14/2006	9:10	CJS	249	20	0.0220	0.2843	3.01	0.668
4		10/16/2006	9:10	DWC	260	27	0.0224	0.2839	3.06	0.668
8		10/17/2006	9:10	DWC	286	36	0.0241	0.2822	3.29	0.664
16		10/18/2006	9:10	DWC	367	44	0.0314	0.2749	4.29	0.646
32		10/19/2006	9:10	DWC	517	53	0.0455	0.2608	6.22	0.613
8		10/20/2006	9:10	DWC	476	36	0.0431	0.2632	5.89	0.619
2		10/21/2006	9:10	DWC	435	20	0.0406	0.2657	5.55	0.625
0.5		10/23/2006	9:10	DWC	399	6	0.0384	0.2679	5.25	0.630

Notes:
1. "Final" based on test method; 24 hrs for Method A, end of primary for Method B.
2. Correction value, for the current pressure, from the consolidometer's calibration curve.
3. $\Delta H = D_{fi} - D_o - D_{ci}$ = Col. A - D_o - Col. B
4. $H_{vi} = (H_o - H_s) - \Delta H$
5. $\varepsilon_i = (\Delta H / H_o) \times 100$ = (Col. C / H_o) x 100
6. $e_i = H_{vi} / Hs$ = Col. D / Hs

Consol 8/2006 Rev. 1

Schnabel Engineering

Load Time Readings

10/26/06

Project: Calvert Cliffs Nuclear Power Plant

Schnabel Contract: 06120048

Boring No.: B-321 Depth: 73.5-75.5 ft

Consol. ID: 3 Reviewed by: CJS

Elapsed Time (min.)	Dial Guage Readings (inches)					
	4 tsf Reload 10/16/2006	16 tsf Load 10/18/2006	X tsf Load Date	X tsf Load Date	X tsf Load Date	X tsf Load Date
0.1	0.0258	0.0336				
0.25	0.0258	0.0339				
0.5	0.0258	0.0340				
1	0.0258	0.0342				
2	0.0258	0.0345				
4	0.0259	0.0346				
8	0.0259	0.0348				
15	0.0259	0.0350				
30	0.0259	0.0353				
60	0.0259	0.0355				
120	0.0259	0.0357				
240	0.0259	0.0361				
480	0.0260	0.0363				
720	0.0260	0.0363				
960	0.0260	0.0364				
1200	0.0260	0.0365				
1440	0.0260	0.0367				
1680						
1920						
2160						
2400						
2640						
2880						

Schnabel Engineering

Consolidation Time Curves

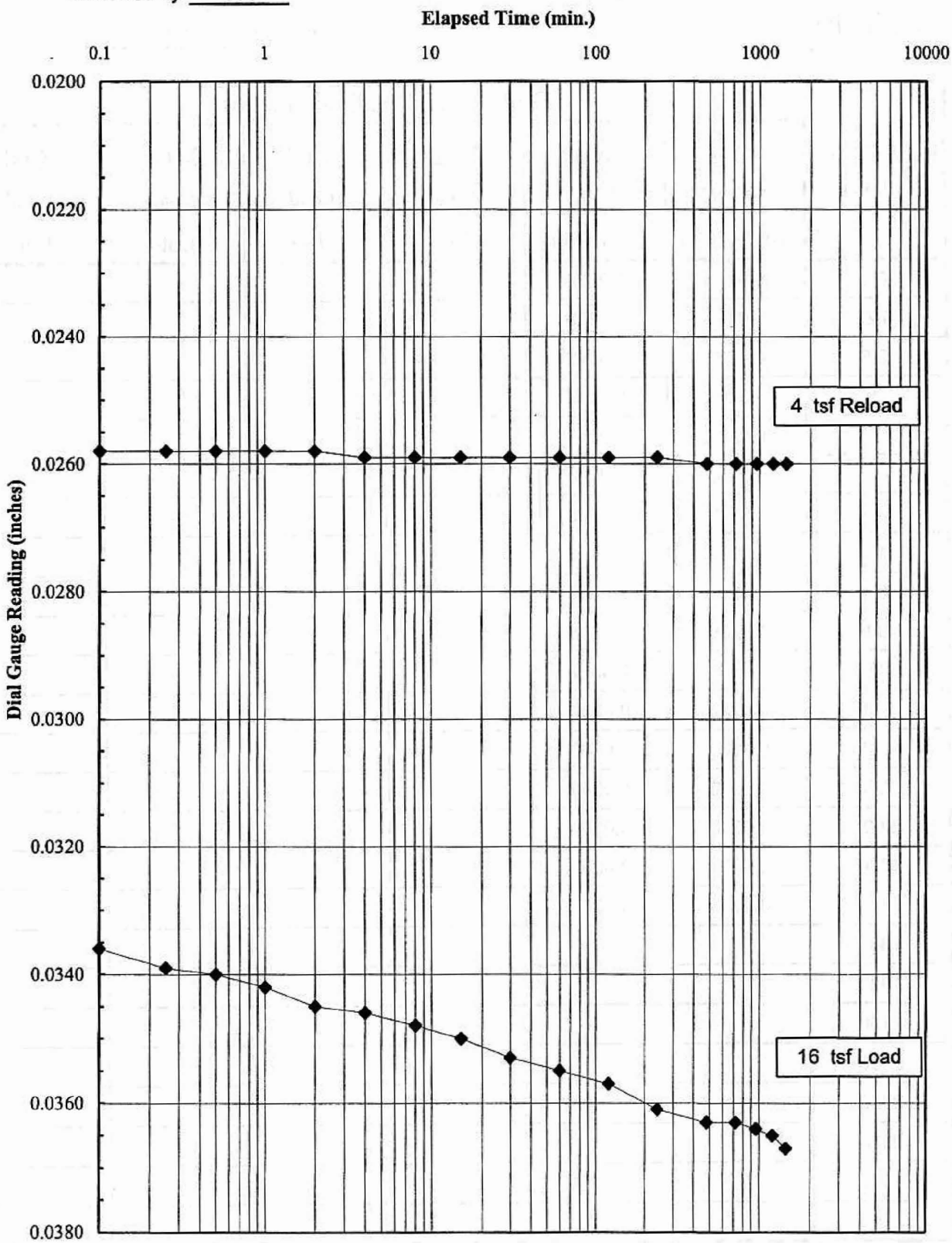
10/26/06

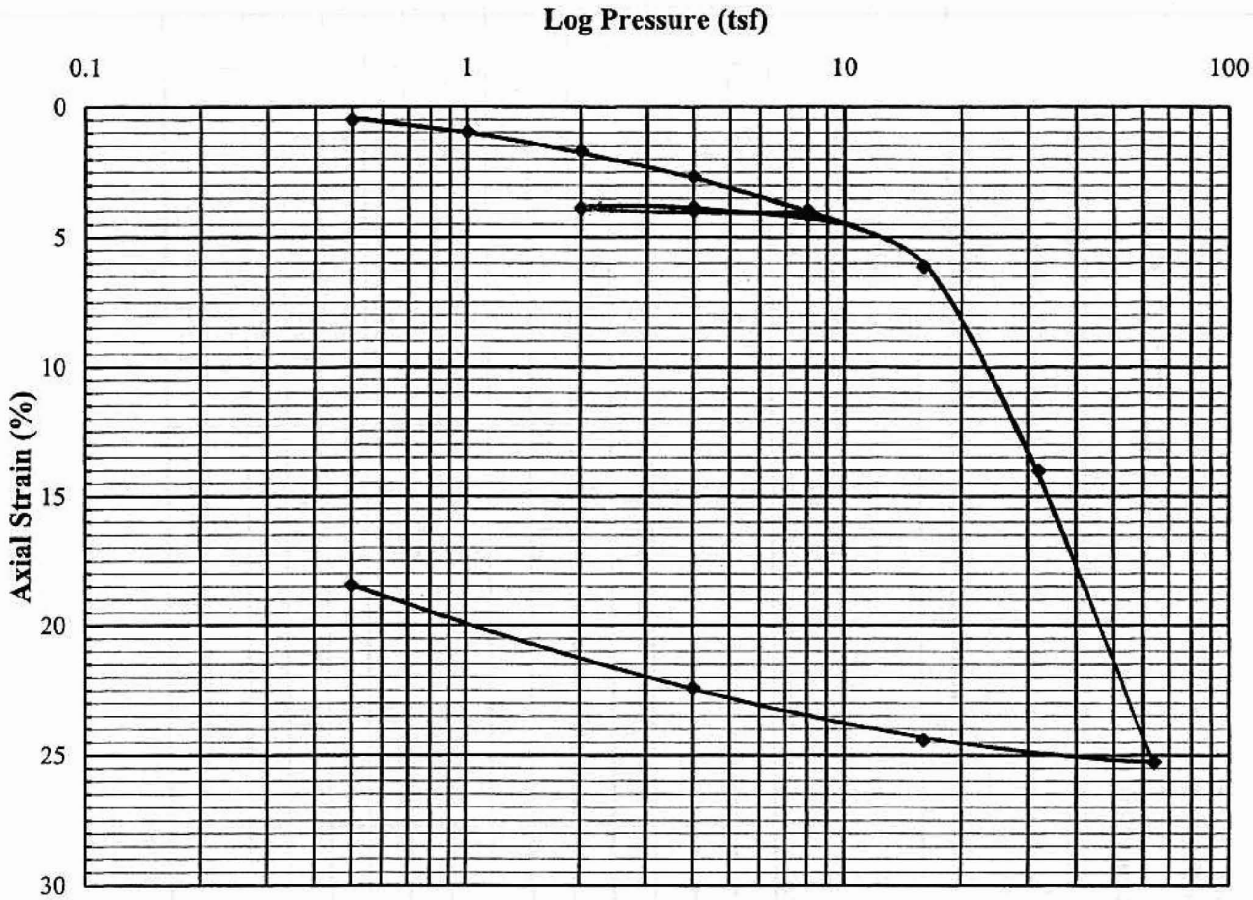
Project: Calvert Cliffs Nuclear Power Plant

Schnabel Contract: 06120048

Boring No.: B-321 Depth: 73.5-75.5 ft

Reviewed by: CJS





REVISED FORM FOR
NCR NO. 25237-NCR-028
2/12/07

Probable Preconsolidation Pressure (Pp), tsf:	*20.6*			**Recompression Ratio (Cεr):**		*0.003*
Type of Specimen:	*Tube Sample*			**Compression Ratio (Cεc):**		*0.374*
Description:	*Sandy FAT CLAY (CH), contains shells - gray*				**Initial**	**Final**
				Water Content, %	*46.4*	*34.6*
LL: *60*	**PI:** *36*	**Gs:** *2.70*	**P_o' (tsf):** *4.00*	**Void Ratio**	*1.34*	*0.90*
% < No. 200:	*51.9*	**Test Method:**	*ASTM D2435 Method A*	**Saturation, %**	*94*	*100*
Test Condition:	*Inundated @ 0.5 tsf*			**Dry Unit Weight, pcf**	*72.1*	*88.4*

Remarks: Coefficient of Consolidation, Cv, equals 2693 ft2/yr at an average pressure of 24 tsf (square root of time method).

Average Water Content of Trimmings, %: *45.0*

Schnabel
Schnabel Engineering

Project: Calvert Cliffs Nuclear Power Plant

Location:	*Calvert County, MD*		
Boring:	*B-327*	**Schnabel No.:**	*06120048*
Depth:	*113.5-114.2 ft*	**Elevation:**	*-26.6 to -27.3*
Date:	*11/21/2006*	**Reviewed by:**	*CJS*

Consolidation Test Report

Consolidation Test Data Sheet

Consolidometer ID: 4

11/21/06

REVISED FORM FOR
NCR NO. 25237-NCR-028
2/12/2007

Schnabel Contract: *06120048*

Test Method: *ASTM D2435 Method A*

Project: *Calvert Cliffs Nuclear Power Plant*

Test Condition: *Inundated @ 0.5 tsf*

Initial Height of Specimen (H_o), in.: 0.7538

Boring No.: *B-327*

Height of Solids (H_s), in.: 0.3228

Depth: *113.5-114.2 ft*

Seating Press. (tsf): 0.05

Initial Dial Gauge Reading (D_o), in.: 0.0000

Reviewed by: CJS

Pressure, P (tsf)	TimeReadings Required	Date Load Applied	Time Load Applied	Load Applied By	A Final[1] Dial Reading, D_{fi} x 10^{-4} in.	B Apparatus Correction[2], D_{ci} x 10^{-4} in.	C Cumulative Change in Height[3], ΔH_i in.	D Height of Voids[4], H_{vi} in.	Vertical Strain[5], ε_i (%)	Void Ratio[6], e_i
0.5		10/7/2006	9:15	DWC	74	36	0.0038	0.4272	0.50	1.324
1		10/9/2006	9:15	DWC	118	45	0.0073	0.4237	0.97	1.313
2		10/10/2006	9:15	DWC	185	58	0.0127	0.4183	1.68	1.296
4		10/11/2006	9:15	DWC	270	69	0.0201	0.4109	2.67	1.273
8		10/12/2006	9:15	DWC	384	84	0.0300	0.4010	3.98	1.242
4		10/13/2006	9:15	DWC	370	69	0.0301	0.4009	3.99	1.242
2		10/14/2006	9:15	CJS	351	58	0.0293	0.4017	3.89	1.245
4		10/16/2006	9:15	DWC	360	69	0.0291	0.4019	3.86	1.245
8		10/17/2006	9:15	DWC	397	84	0.0313	0.3997	4.15	1.238
16		10/18/2006	9:15	DWC	566	104	0.0462	0.3848	6.13	1.192
32		10/19/2006	9:15	DWC	1180	123	0.1057	0.3253	14.02	1.008
64		10/20/2006	9:15	DWC	2048	143	0.1905	0.2405	25.27	0.745
16		10/21/2006	9:15	DWC	1945	104	0.1841	0.2469	24.42	0.765
4		10/23/2006	9:15	DWC	1758	69	0.1689	0.2621	22.41	0.812
0.5		10/24/2006	9:15	DWC	1427	36	0.1391	0.2919	18.45	0.904

Notes:
1. "Final" based on test method; 24 hrs for Method A, end of primary for Method B.
2. Correction value, for the current pressure, from the consolidometer's calibration curve.
3. $\Delta H = D_{fi} - D_o - D_{ci}$ = Col. A - D_o - Col. B
4. $H_{vi} = (H_o - H_s) - \Delta H$
5. $\varepsilon_i = (\Delta H / H_o) \times 100$ = (Col. C / H_o) x 100
6. $e_i = H_{vi} / Hs$ = Col. D / Hs

Consol 8/2006 Rev. 1

Schnabel Engineering

Load Time Readings

11/21/06

Project: Calvert Cliffs Nuclear Power Plant

Schnabel Contract: 06120048

Boring No.: B-327 Depth: 113.5-114.2 ft

Consol. ID: 4 Reviewed by: CJS

Elapsed Time (min.)	Dial Guage Readings (inches)					
	4 tsf Reload 10/16/2006	32 tsf Load 10/19/2006	X tsf Load Date	X tsf Load Date	X tsf Load Date	X tsf Load Date
0.1	0.0359	0.0716				
0.25	0.0359	0.0752				
0.5	0.0359	0.0780				
1	0.0359	0.0807				
2	0.0359	0.0830				
4	0.0359	0.0855				
8	0.0359	0.0884				
15	0.0359	0.0915				
30	0.0359	0.0949				
60	0.0360	0.0986				
120	0.0360	0.1027				
240	0.0360	0.1071				
480	0.0360	0.1116				
720	0.0360	0.1140				
960	0.0360	0.1158				
1200	0.0360	0.1170				
1440	0.0360	0.1180				
1680						
1920						
2160						
2400						
2640						
2880						

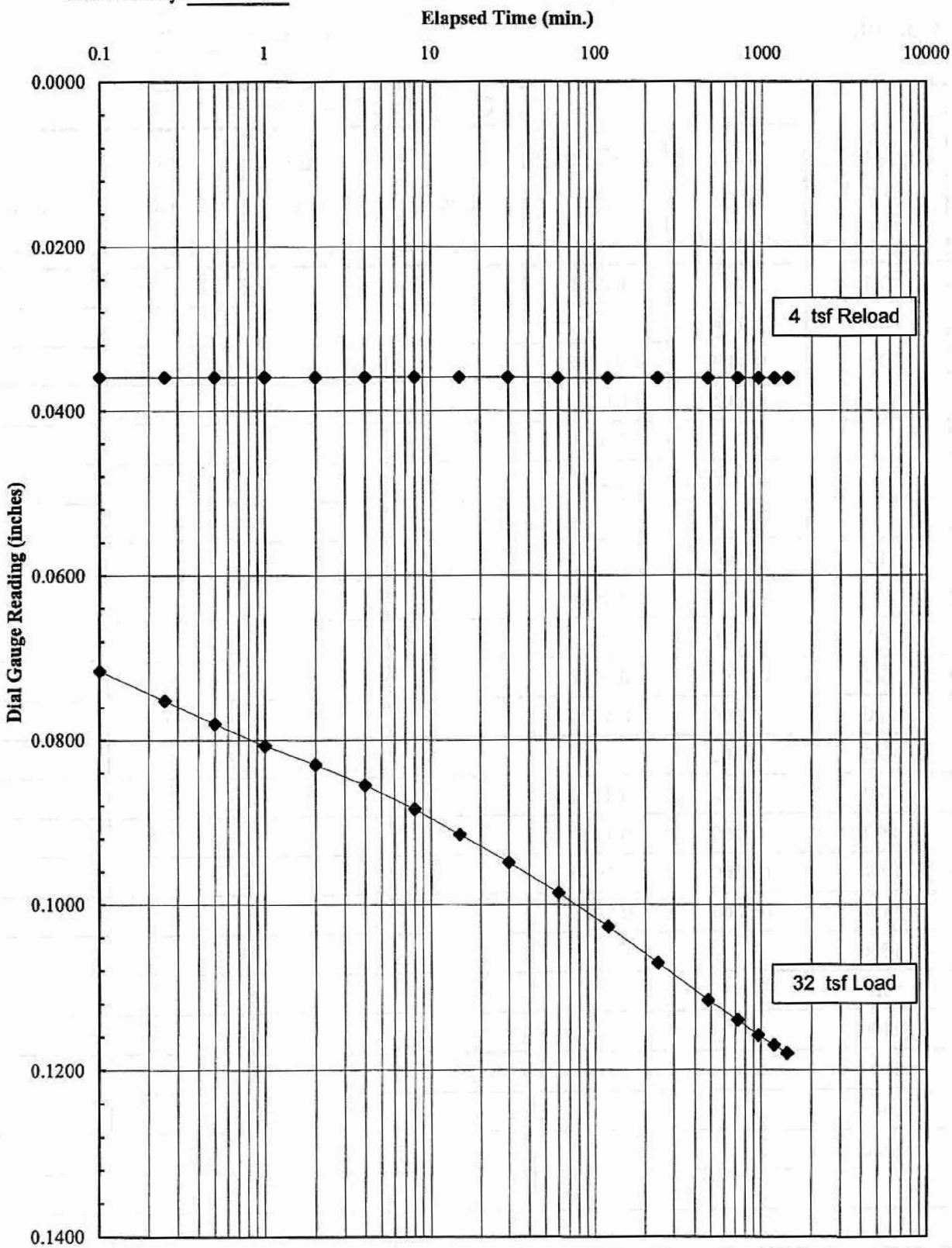
Schnabel
Schnabel Engineering

Consolidation Time Curves

11/21/06

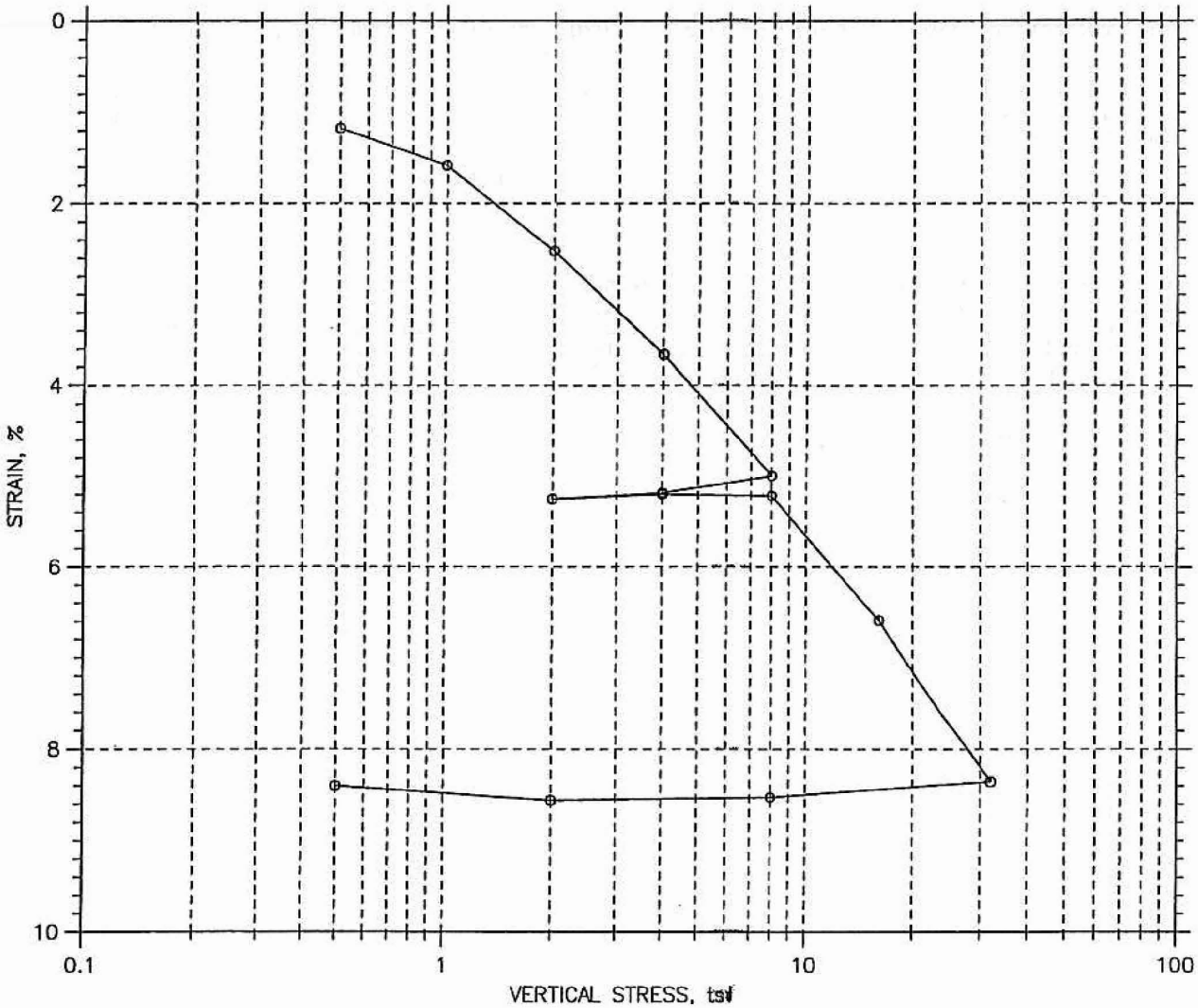
Project: Calvert Cliffs Nuclear Power Plant
Schnabel Contract: 06120048
Boring No.: B-327 Depth: 113.5-114.2 ft

Reviewed by: CJS



Consol 8/2006 Rev. 1

CONSOLIDATION TEST DATA
SUMMARY REPORT



					Before Test	After Test
Overburden Pressure: ---				Water Content, %	28.19	27.09
Preconsolidation Pressure: 2.3 tsf				Dry Unit Weight, pcf	87.46	95.48
Compression Index: ---				Saturation, %	83.43	97.48
Diameter: 2.5 in		Height: 1 in		Void Ratio	0.90	0.74
LL: 72	PL: 41	PI: 31	GS: 2.66			

GeoTesting express a subsidiary of Geocomp Corporation	Project: Calvert Cliffs	Location: MD	Project No.: GTX-6880
	Boring No.: B-328	Tested By: md	Checked By: jdt
	Sample No.: S-16	Test Date: 09/11/06	Depth: 63.5-65.5
	Test No.: C-8	Sample Type: tube	Elevation: ---
	Description: Moist, dark gray organic silt (OH), 87% passing #200 sieve, inundated @ 0.5 tsf		
	Remarks: System Q - Compression Ratio: .06, Recompression Ratio: >0.01		

Thu, 09-NOV-2006 16:33:14

CONSOLIDATION TEST DATA

Project: Calvert Cliffs	Location: MD	Project No.: GTX-6880
Boring No.: B-328	Tested By: md	Checked By: jdt
Sample No.: S-16	Test Date: 09/11/06	Depth: 63.5-65.5
Test No.: C-8	Sample Type: tube	Elevation: ---

Soil Description: Moist, dark gray organic silt (OH), 87% passing #200 sieve, inundated @ 0.5 tsf
Remarks: System Q - Compression Ratio: .06, Recompression Ratio: >0.01

Measured Specific Gravity: 2.66	Liquid Limit: 72	Initial Height: 1.00 in
Initial Void Ratio: 0.90	Plastic Limit: 41	Specimen Diameter: 2.50 in
Final Void Ratio: 0.74	Plasticity Index: 31	

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	245	RING		1842
Wt. Container + Wet Soil, gm	246.93	352.11	350.87	150.8
Wt. Container + Dry Soil, gm	194.43	320.34	320.34	120.4
Wt. Container, gm	8.24	207.65	207.65	8.17
Wt. Dry Soil, gm	186.19	112.69	112.69	112.23
Water Content, %	28.20	28.19	27.09	27.09
Void Ratio	---	0.90	0.74	---
Degree of Saturation, %	---	83.43	97.48	---
Dry Unit Weight, pcf	---	87.46	95.482	---

CONSOLIDATION TEST DATA

Project: Calvert Cliffs
Boring No.: B-328
Sample No.: S-16
Test No.: C-8

Location: MD
Tested By: md
Test Date: 09/11/06
Sample Type: tube

Project No.: GTX-6880
Checked By: jdt
Depth: 63.5-65.5
Elevation: ---

Soil Description: Moist, dark gray organic silt (OH), 87% passing #200 sieve, inundated @ 0.5 tsf
Remarks: System Q - Compression Ratio: .06, Recompression Ratio: >0.01

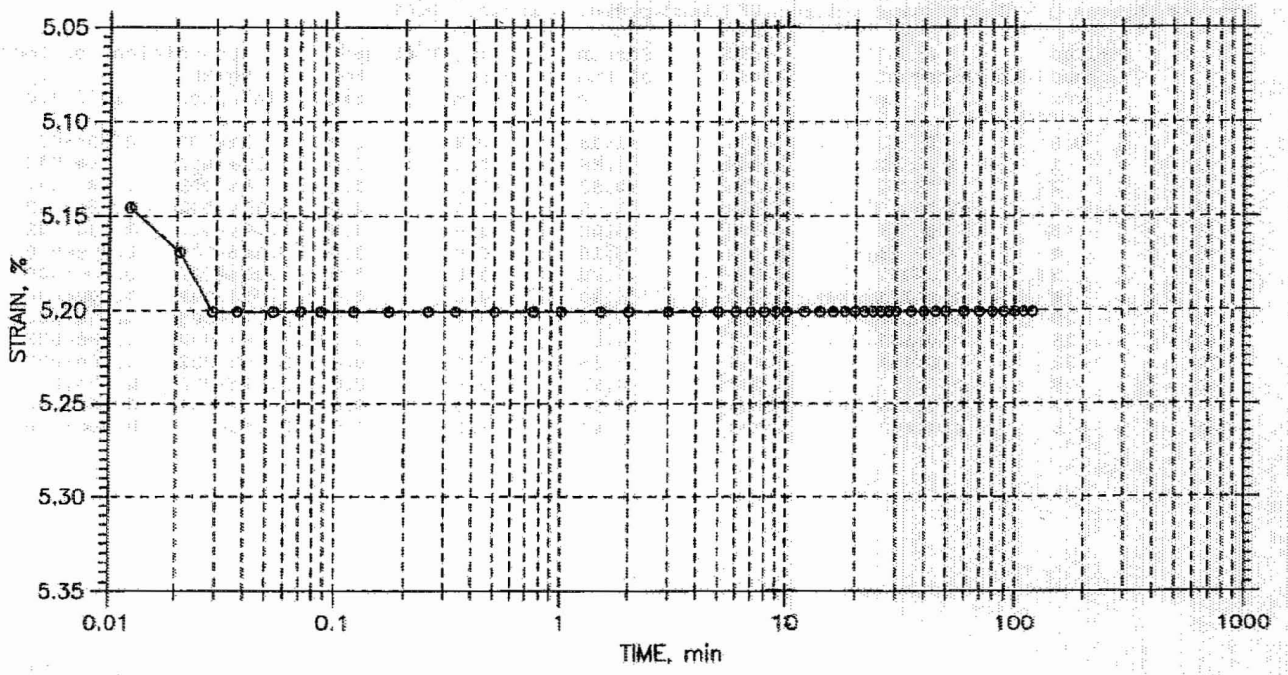
	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. in^2/sec	Coefficient of Consolidation Log in^2/sec	Coefficient of Consolidation Ave. in^2/sec
1	0.5	0.01177	0.876	1.18	0.1	0.0	1.30e-002	0.00e+000	1.30e-002
2	1	0.01582	0.869	1.58	0.1	0.0	1.27e-002	1.88e-002	1.51e-002
3	2	0.0252	0.851	2.52	0.1	0.1	9.74e-003	1.42e-002	1.16e-002
4	4	0.03657	0.829	3.66	0.0	0.0	1.75e-002	2.11e-002	1.91e-002
5	8	0.04996	0.804	5.00	0.0	0.0	1.71e-002	2.13e-002	1.90e-002
6	4	0.05185	0.800	5.18	0.0	0.0	5.14e-002	0.00e+000	5.14e-002
7	2	0.05252	0.799	5.25	0.0	0.0	4.30e-002	0.00e+000	4.30e-002
8	4	0.05201	0.800	5.20	0.0	0.0	5.73e-002	0.00e+000	5.73e-002
9	8	0.05216	0.800	5.22	0.4	0.0	1.67e-003	0.00e+000	1.67e-003
10	16	0.06586	0.774	6.59	0.0	0.0	1.76e-002	2.35e-002	2.01e-002
11	32	0.08358	0.740	8.36	0.0	0.0	2.34e-002	2.35e-002	2.34e-002
12	8	0.08527	0.737	8.53	0.0	0.0	3.38e-002	0.00e+000	3.38e-002
13	2	0.08559	0.736	8.56	0.0	0.0	2.76e-002	0.00e+000	2.76e-002
14	0.5	0.08402	0.739	8.40	0.0	0.0	2.15e-002	0.00e+000	2.15e-002

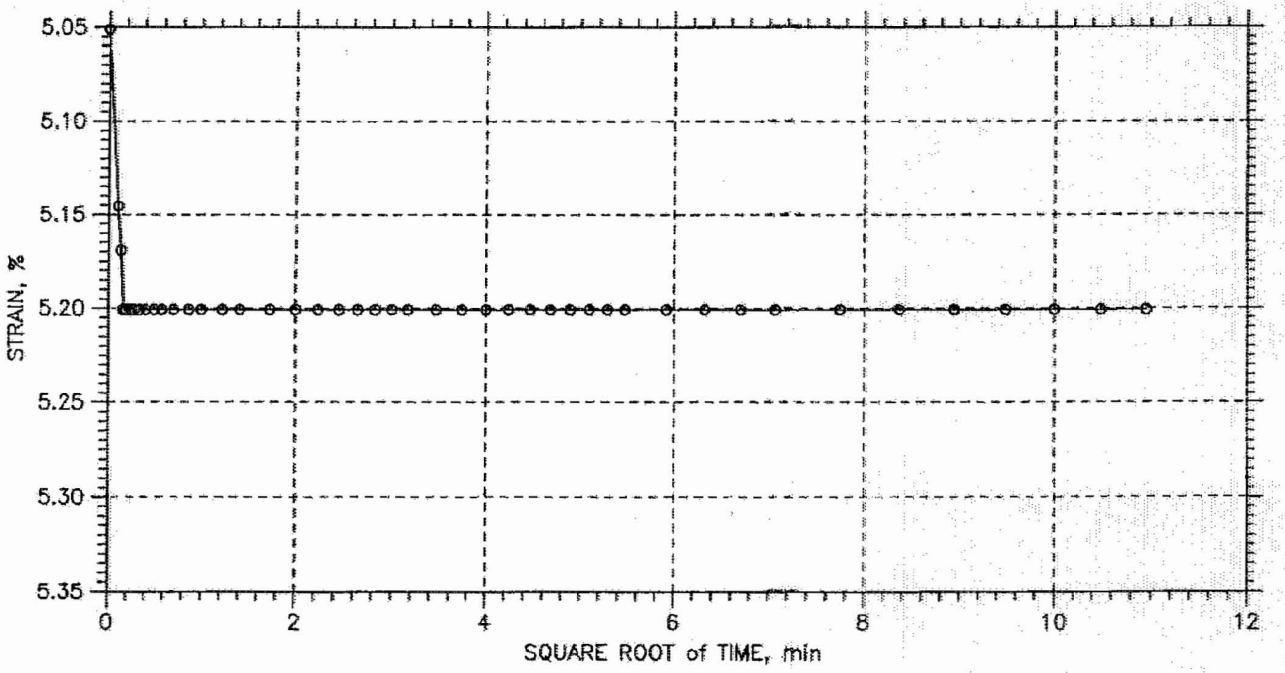
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 8 of 14

Stress: 4. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: Calvert Cliffs	Location: MD	Project No.: GTX-6880
	Boring No.: B-328	Tested By: md	Checked By: jdt
	Sample No.: S-16	Test Date: 09/11/06	Depth: 63.5-65.5
	Test No.: C-8	Sample Type: tube	Elevation: ---
	Description: Moist, dark gray organic silt (OH), 87% passing #200 sieve, inundated @ 0.5 tsf		
	Remarks: System Q - Compression Ratio: .06, Recompression Ratio: >0.01		

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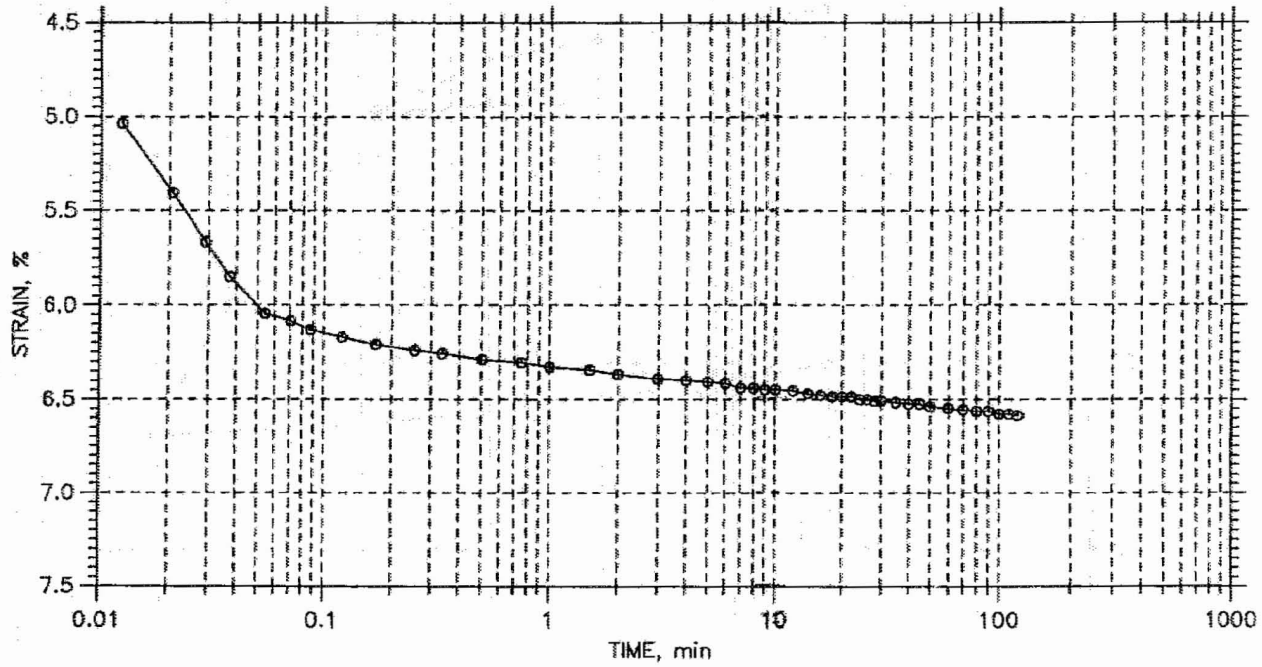
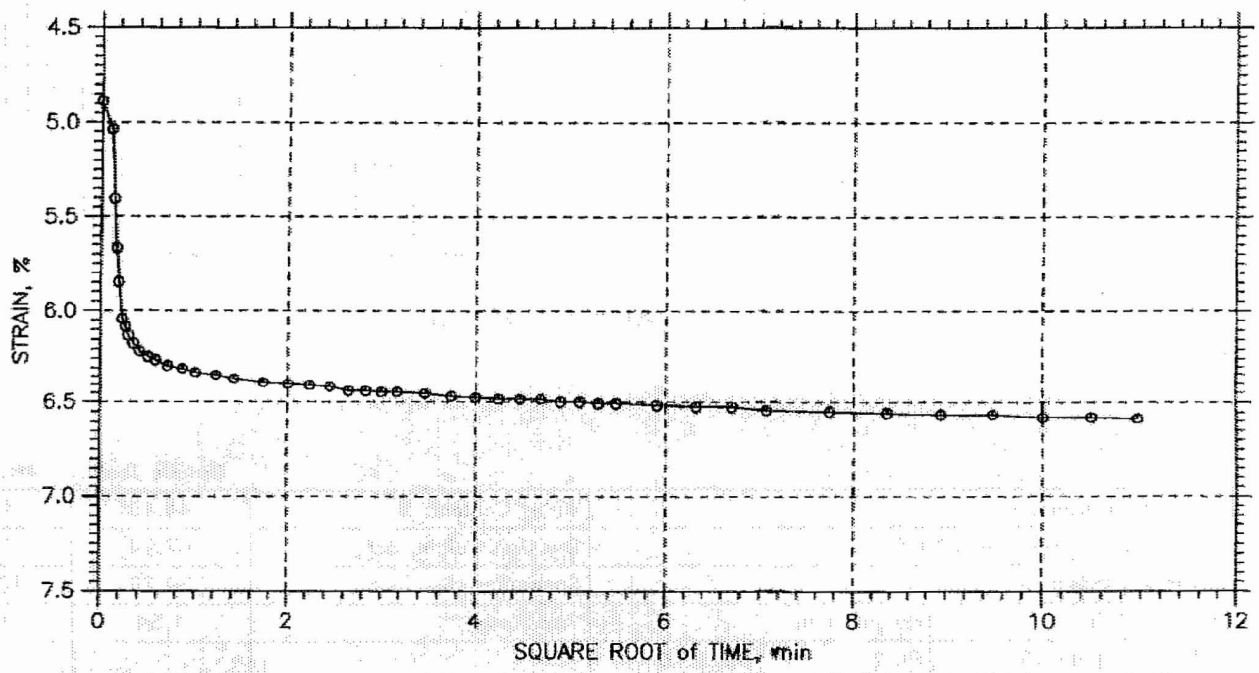
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 10 of 14

Stress: 16. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: Calvert Cliffs	Location: MD	Project No.: GTX-6880
	Boring No.: B-328	Tested By: md	Checked By: jdt
	Sample No.: S-16	Test Date: 09/11/06	Depth: 63.5-65.5
	Test No.: C-8	Sample Type: tube	Elevation: ---
	Description: Moist, dark gray organic silt (OH), 87% passing #200 sieve, inundated @ 0.5 tsf		
	Remarks: System Q - Compression Ratio: .06, Recompression Ratio: >0.01		

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