

# One-Dimensional Consolidation Properties of Soils ASTM D-2435



Project: BYU (Dr. Youd)

Number: M00399-003

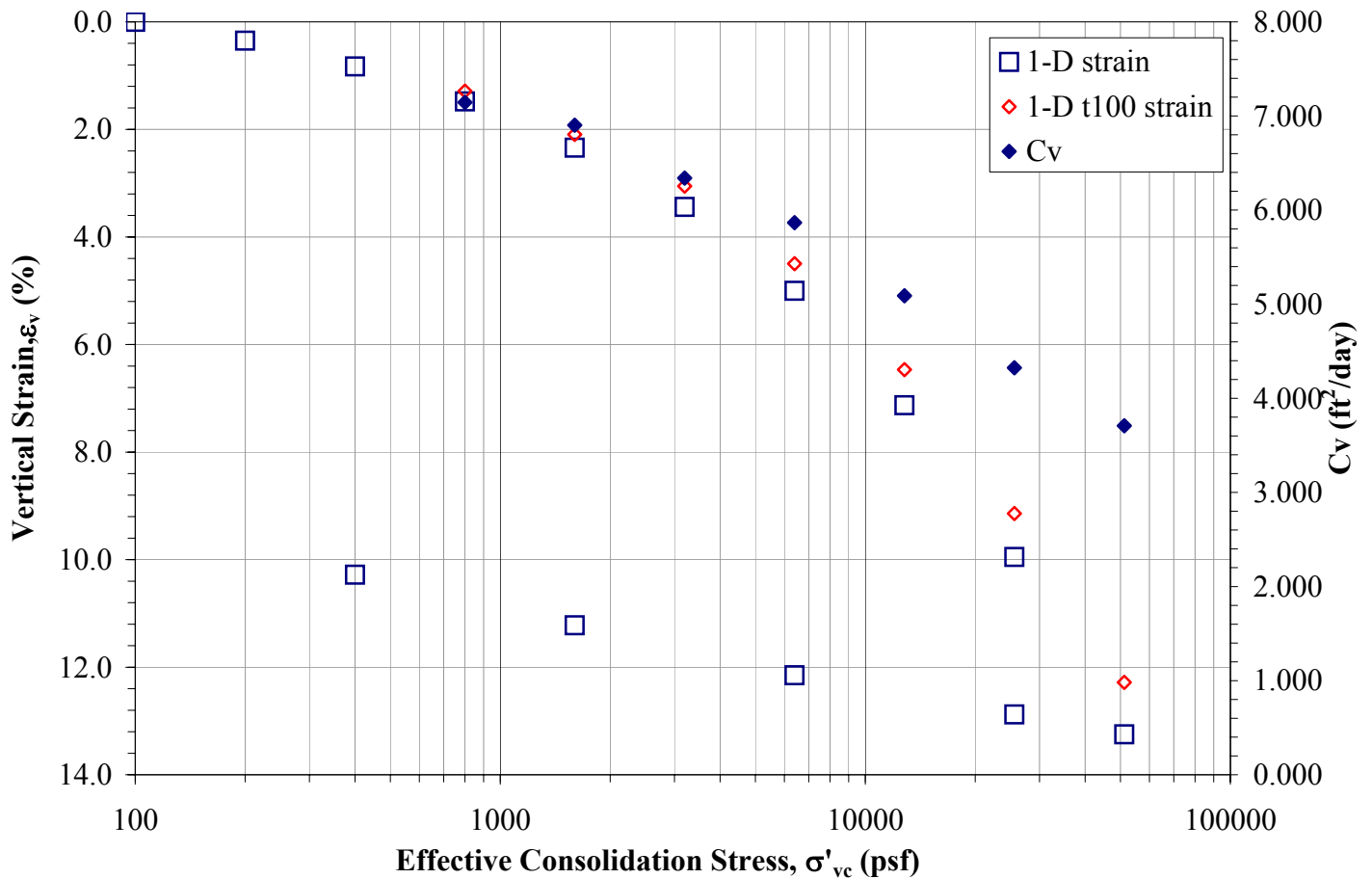
Sample: GVDA

Depth: 12.5-15 ft

	Initial	Final
Sample height, $H_0$ (in)	1.0000	0.8972
Sample Diameter, $D_0$ (in)	2.416	2.416
Moist unit weight (pcf)	127.0	138.2
Dry unit weight (pcf)	104.8	116.8
Moisture content (%)	21.2	18.4

Gs (Determined)	2.711
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Stress (psf)	Dial (in)	1-D $\epsilon_v$ (%)	Hc (in)	Void ratio e	Cv (ft /day)	1-D $t_{100}$ $\epsilon_v$ (%)
100	0.1628	0.00	1.0000	0.616		
200	0.1663	0.35	0.9965	0.610		
400	0.1711	0.83	0.9917	0.602		
800	0.1776	1.48	0.9852	0.592	7.145	1.288
1600	0.1862	2.34	0.9766	0.578	6.903	2.093
3200	0.1972	3.44	0.9656	0.560	6.340	3.054
6400	0.2128	5.00	0.9500	0.535	5.867	4.496
12800	0.2341	7.13	0.9287	0.500	5.090	6.467
25600	0.2623	9.95	0.9005	0.455	4.325	9.143
51200	0.2953	13.25	0.8675	0.402	3.709	12.283
25600	0.2916	12.88	0.8712	0.408		
6400	0.2843	12.15	0.8785	0.419		
1600	0.2750	11.22	0.8878	0.434		
400	0.2656	10.28	0.8972	0.450		



Tested by: \_\_\_\_\_

Reviewed: \_\_\_\_\_

One-Dimensional Consolidation Time-Deformation Relationship



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Number: M00399-003

Sample: GVDA

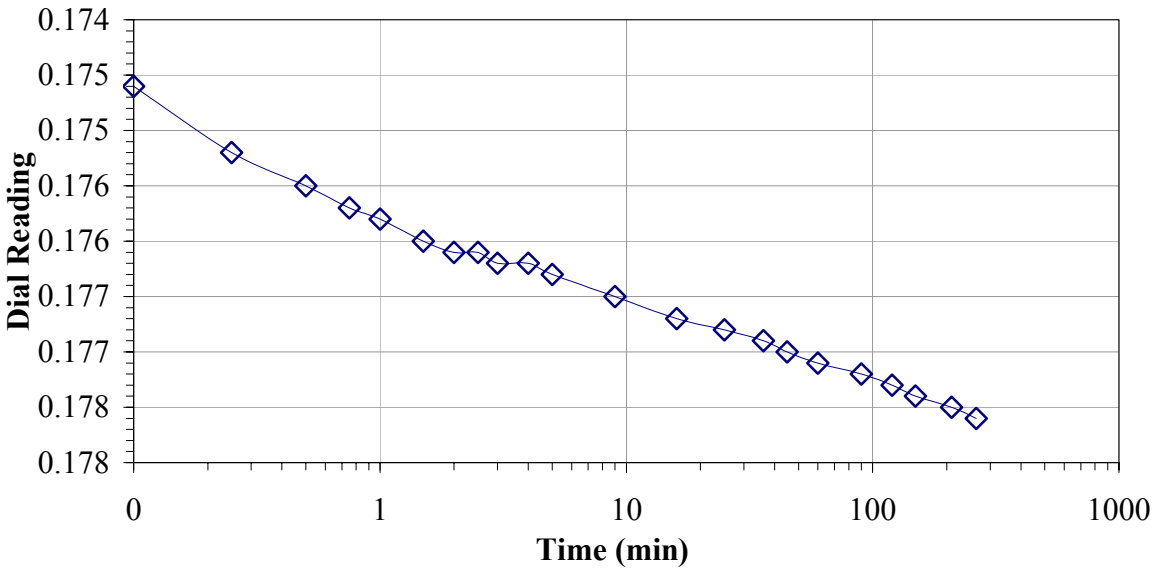
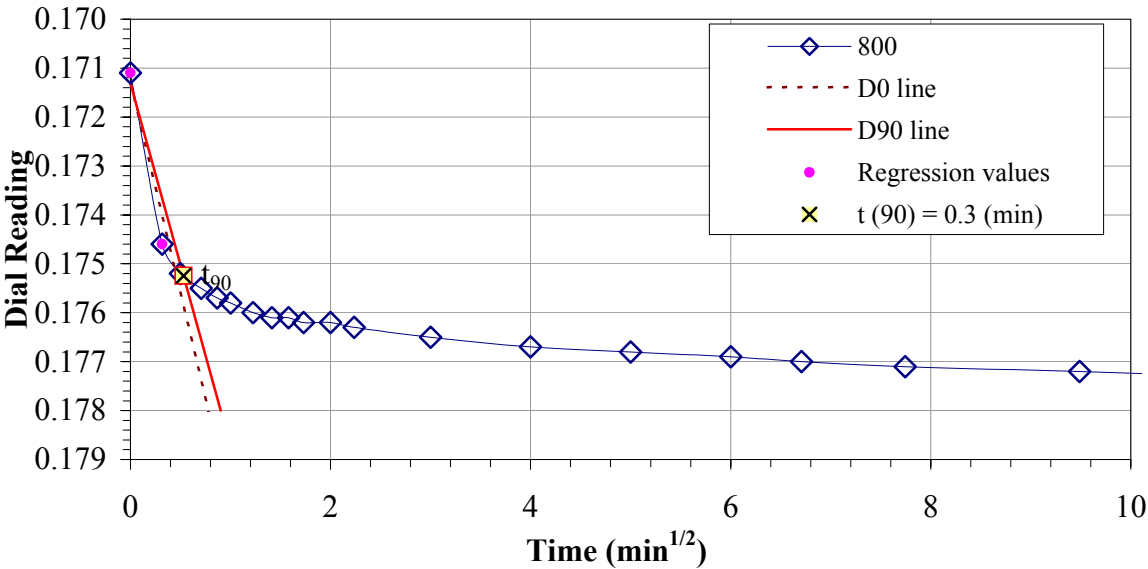
Depth: 12.5-15 ft

Stress: 800 (psf)

Time rate consolidation data

Data Summary	
$H_{DR}$	= 0.4870 (in)
Slope of $t_{int}$ line	= 0.00851 (dial/min <sup>1/2</sup> )
Slope of $t_{90}$ line	= 0.0074 (dial/min <sup>1/2</sup> )
$D_0$	= 0.17 (dial)
$D(90)$	= 0.1752 (dial)
$D(100)$	= 0.17568 (dial)
$t(90)$	= 0.3 (min)
$C_v$	= 0.715 (in <sup>2</sup> /min)
$C_v$	= 7.15 (ft <sup>2</sup> /day)

Time (min)	Dial Reading (cc)
0	0.1711
0.1	0.1746
0.25	0.1752
0.5	0.1755
0.75	0.1757
1	0.1758
1.5	0.176
2	0.1761
2.5	0.1761
3	0.1762
4	0.1762
5	0.1763
9	0.1765
16	0.1767
25	0.1768
36	0.1769
45	0.177
60	0.1771
90	0.1772
120	0.1773
149	0.1774
209	0.1775
263	0.1776



One-Dimensional Consolidation Time-Deformation Relationship



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Sample: GVDA

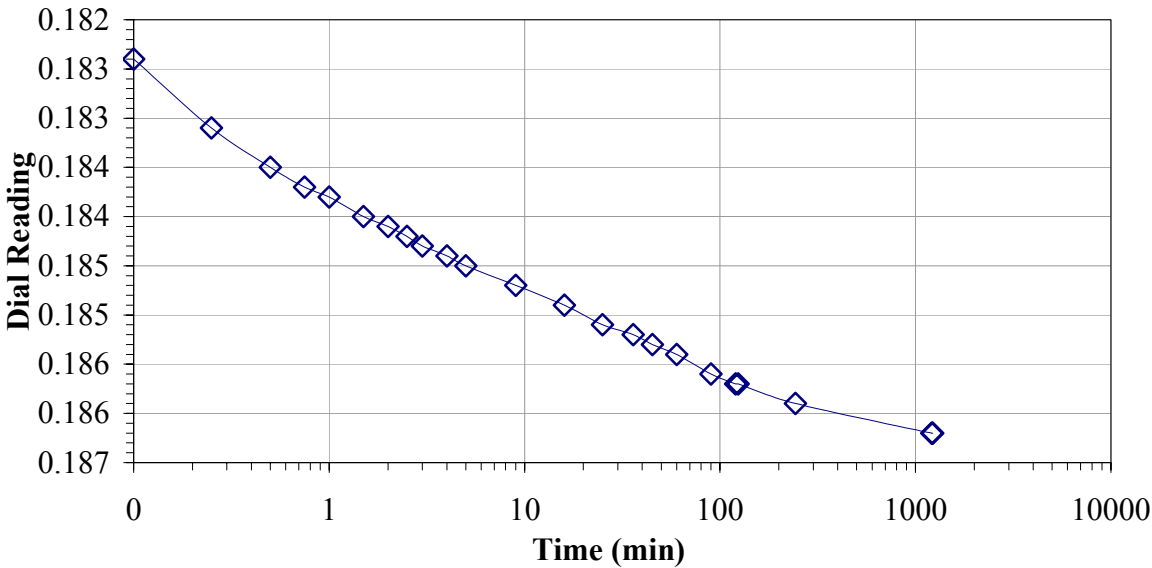
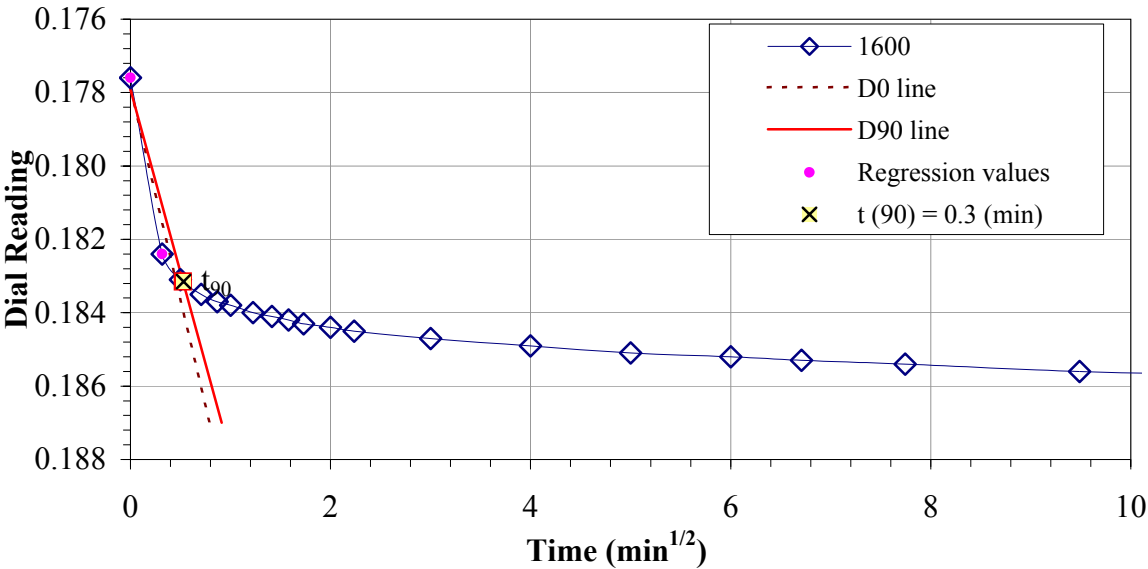
Depth: 12.5-15 ft

Stress: 1600 (psf)

Time rate consolidation data

Data Summary	
$H_{DR}$	= 0.4739 (in)
Slope of $t_{int}$ line	= 0.01146 (dial/min <sup>1/2</sup> )
Slope of $t_{90}$ line	= 0.00996 (dial/min <sup>1/2</sup> )
$D_0$	= 0.18 (dial)
$D(90)$	= 0.1831 (dial)
$D(100)$	= 0.18373 (dial)
$t(90)$	= 0.3 (min)
$C_v$	= 0.690 (in <sup>2</sup> /min)
$C_v$	= 6.90 (ft <sup>2</sup> /day)

Time (min)	Dial Reading (cc)
0	0.1776
0.1	0.1824
0.25	0.1831
0.5	0.1835
0.75	0.1837
1	0.1838
1.5	0.184
2	0.1841
2.5	0.1842
3	0.1843
4	0.1844
5	0.1845
9	0.1847
16	0.1849
25	0.1851
36	0.1852
45	0.1853
60	0.1854
90	0.1856
120	0.1857
124	0.1857
243	0.1859
1209	0.1862
1223	0.1862



One-Dimensional Consolidation Time-Deformation Relationship



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Sample: GVDA

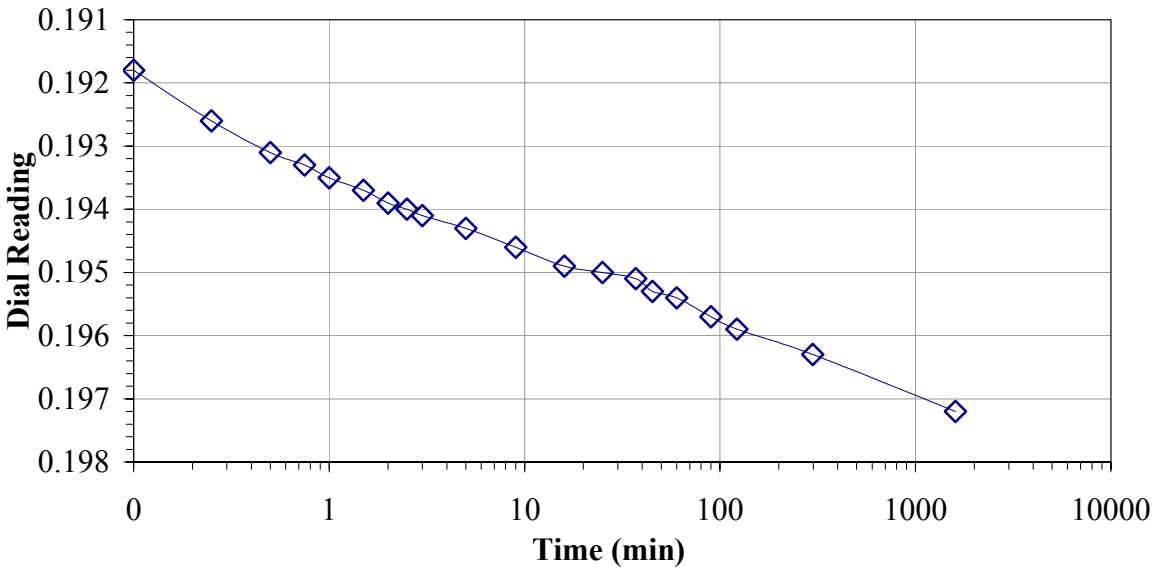
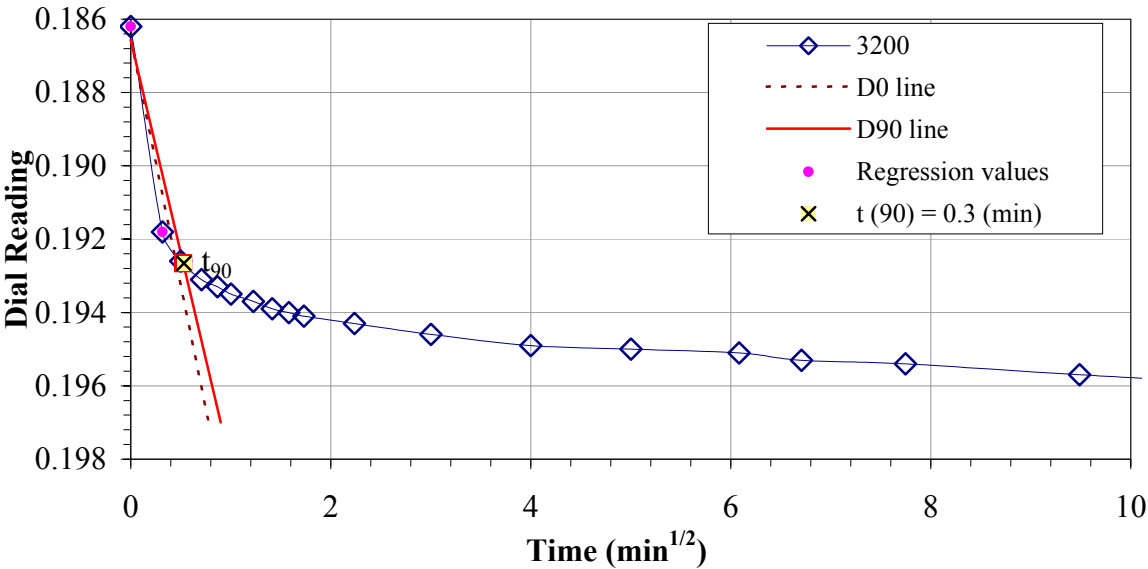
Depth: 12.5-15 ft

Stress: 3200 (psf)

Time rate consolidation data

Data Summary	
$H_{DR}$	= 0.4540 (in)
Slope of $t_{int}$ line	= 0.01334 (dial/min <sup>1/2</sup> )
Slope of $t_{90}$ line	= 0.0116 (dial/min <sup>1/2</sup> )
$D_0$	= 0.19 (dial)
$D(90)$	= 0.1927 (dial)
$D(100)$	= 0.19334 (dial)
$t(90)$	= 0.3 (min)
$C_v$	= 0.634 (in <sup>2</sup> /min)
$C_v$	= 6.34 (ft <sup>2</sup> /day)

Time (min)	Dial Reading (cc)
0	0.1862
0.1	0.1918
0.25	0.1926
0.5	0.1931
0.75	0.1933
1	0.1935
1.5	0.1937
2	0.1939
2.5	0.194
3	0.1941
5	0.1943
9	0.1946
16	0.1949
25	0.195
37	0.1951
45	0.1953
60	0.1954
90	0.1957
122	0.1959
298	0.1963
1598	0.1972



One-Dimensional Consolidation Time-Deformation Relationship

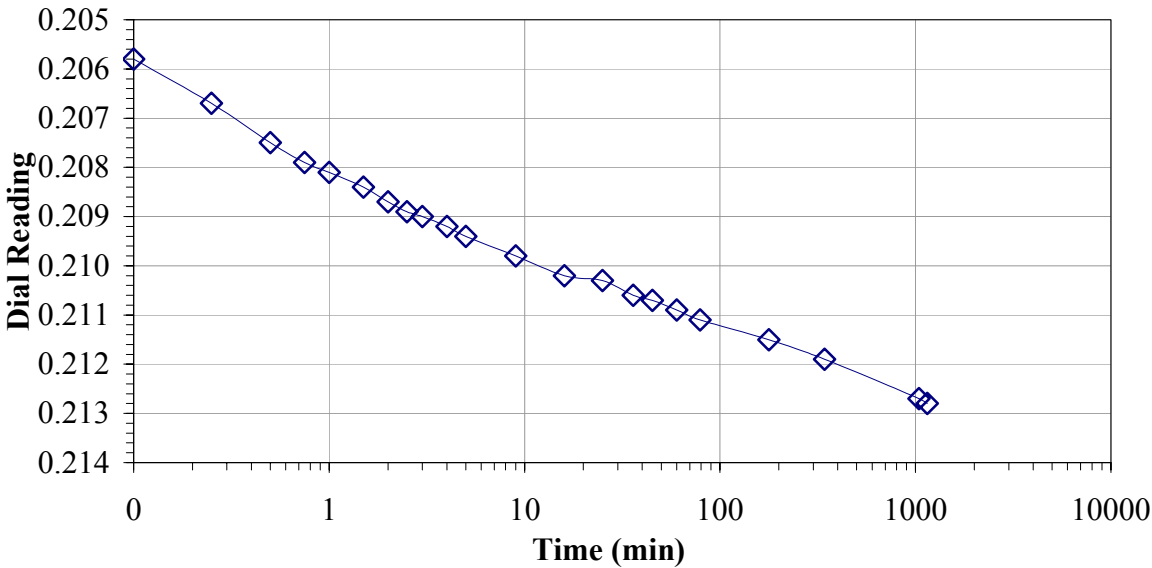
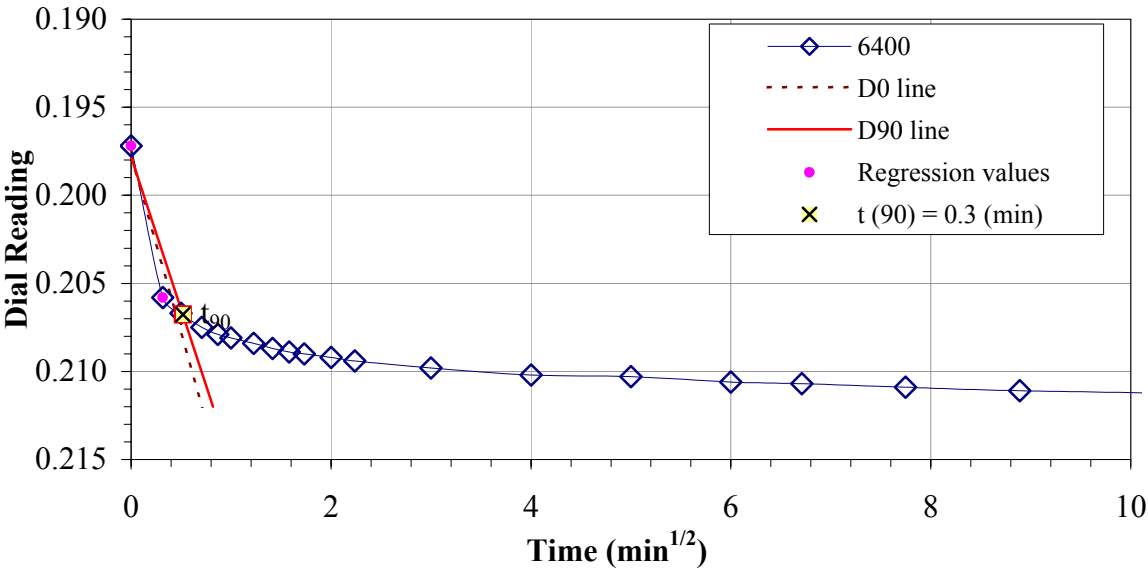
Project: BYU (Dr. Youd)  
Number: M00399-003  
Sample: GVDA  
Depth: 12.5-15 ft  
Stress: 6400 (psf)



Time rate consolidation data

Data Summary	
$H_{DR}$	= 0.4301 (in)
Slope of $t_{int}$ line	= 0.01989 (dial/min <sup>1/2</sup> )
Slope of $t_{90}$ line	= 0.0173 (dial/min <sup>1/2</sup> )
$D_0$	= 0.20 (dial)
$D(90)$	= 0.2068 (dial)
$D(100)$	= 0.20776 (dial)
$t(90)$	= 0.3 (min)
$C_v$	= 0.587 (in <sup>2</sup> /min)
$C_v$	= 5.87 (ft <sup>2</sup> /day)

Time (min)	Dial Reading (cc)
0	0.1972
0.1	0.2058
0.25	0.2067
0.5	0.2075
0.75	0.2079
1	0.2081
1.5	0.2084
2	0.2087
2.5	0.2089
3	0.209
4	0.2092
5	0.2094
9	0.2098
16	0.2102
25	0.2103
36	0.2106
45	0.2107
60	0.2109
79	0.2111
178	0.2115
342	0.2119
1042	0.2127
1150	0.2128



One-Dimensional Consolidation Time-Deformation Relationship

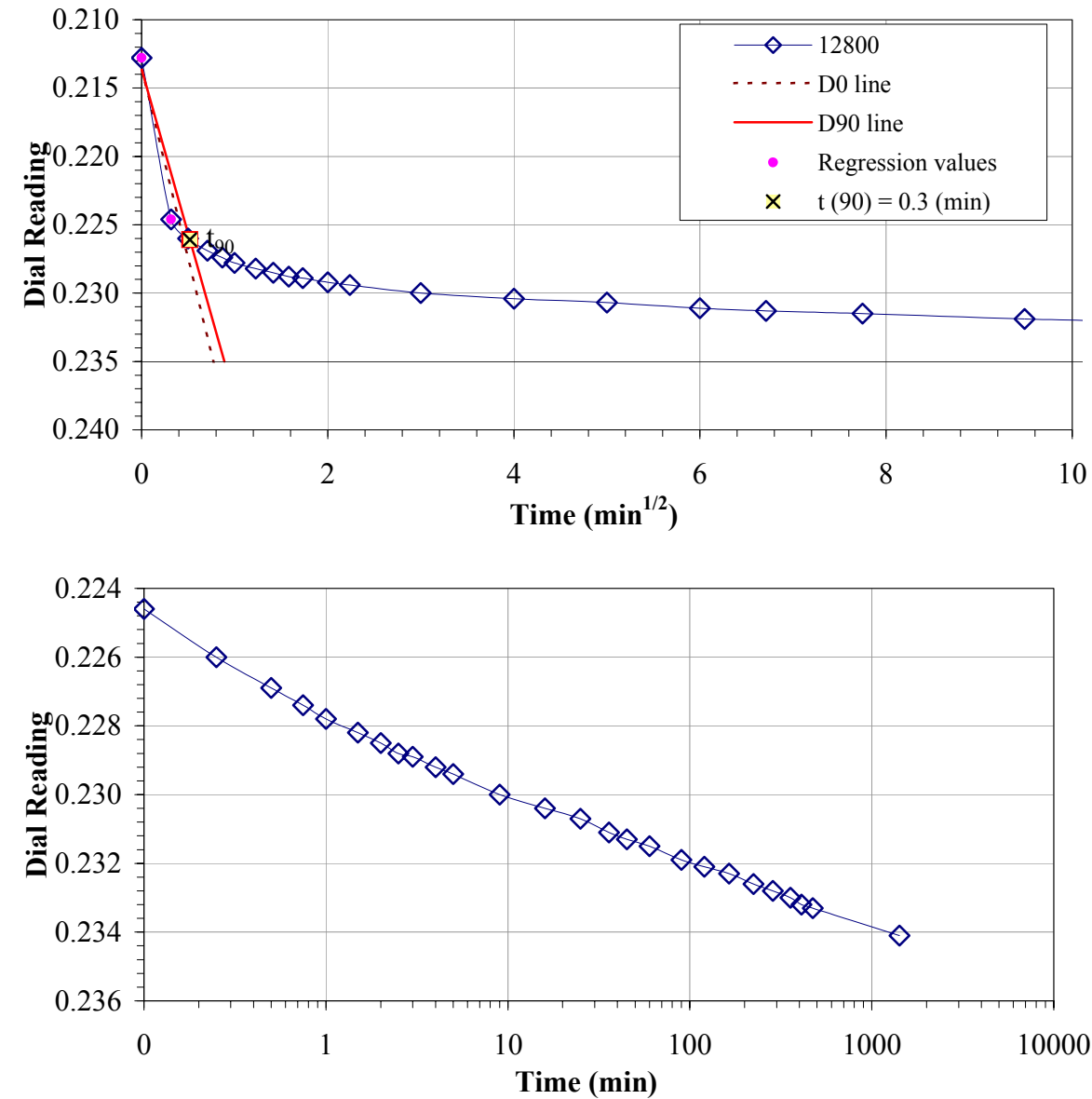
Project: BYU (Dr. Youd)  
Number: M00399-003  
Sample: GVDA  
Depth: 12.5-15 ft  
Stress: 12800 (psf)



Time rate consolidation data

Data Summary	
$H_{DR}$	= 0.4023 (in)
Slope of $t_{int}$ line	= 0.02759 (dial/min <sup>1/2</sup> )
Slope of $t_{90}$ line	= 0.02399 (dial/min <sup>1/2</sup> )
$D_0$	= 0.21 (dial)
$D(90)$	= 0.2261 (dial)
$D(100)$	= 0.22747 (dial)
$t(90)$	= 0.3 (min)
$C_v$	= 0.509 (in <sup>2</sup> /min)
$C_v$	= 5.09 (ft <sup>2</sup> /day)

Time (min)	Dial Reading (cc)
0	0.2128
0.1	0.2246
0.25	0.2226
0.5	0.2269
0.75	0.2274
1	0.2278
1.5	0.2282
2	0.2285
2.5	0.2288
3	0.2289
4	0.2292
5	0.2294
9	0.23
16	0.2304
25	0.2307
36	0.2311
45	0.2313
60	0.2315
90	0.2319
120	0.2321
164	0.2323
224	0.2326
286	0.2328
357	0.233
410	0.2332
474	0.2333
1417	0.2341



One-Dimensional Consolidation Time-Deformation Relationship



Project: BYU (Dr. Youd)

Number: M00399-003

Sample: GVDA

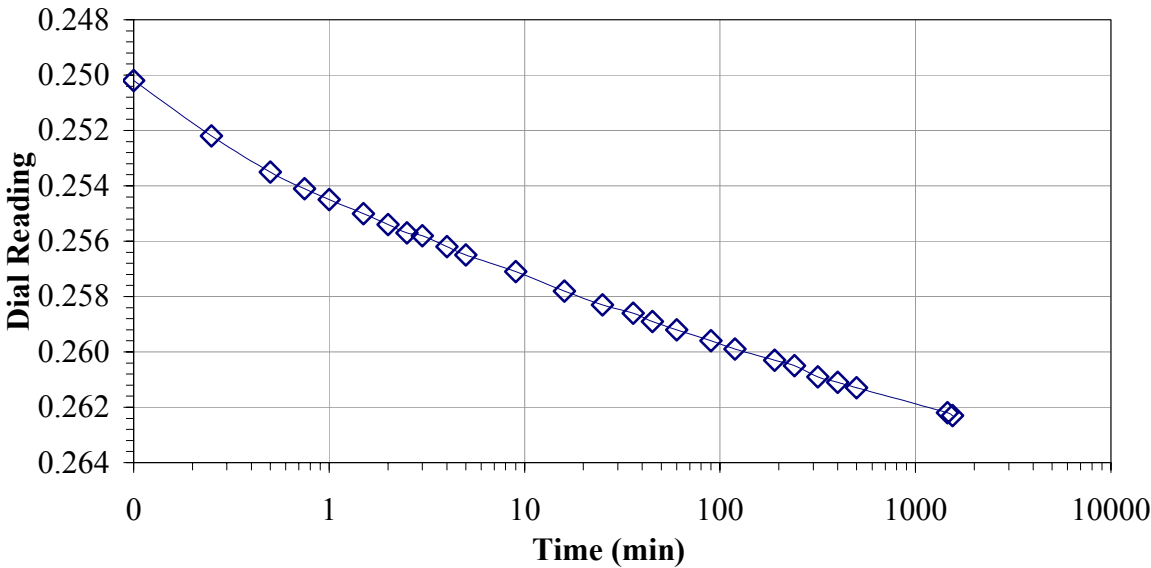
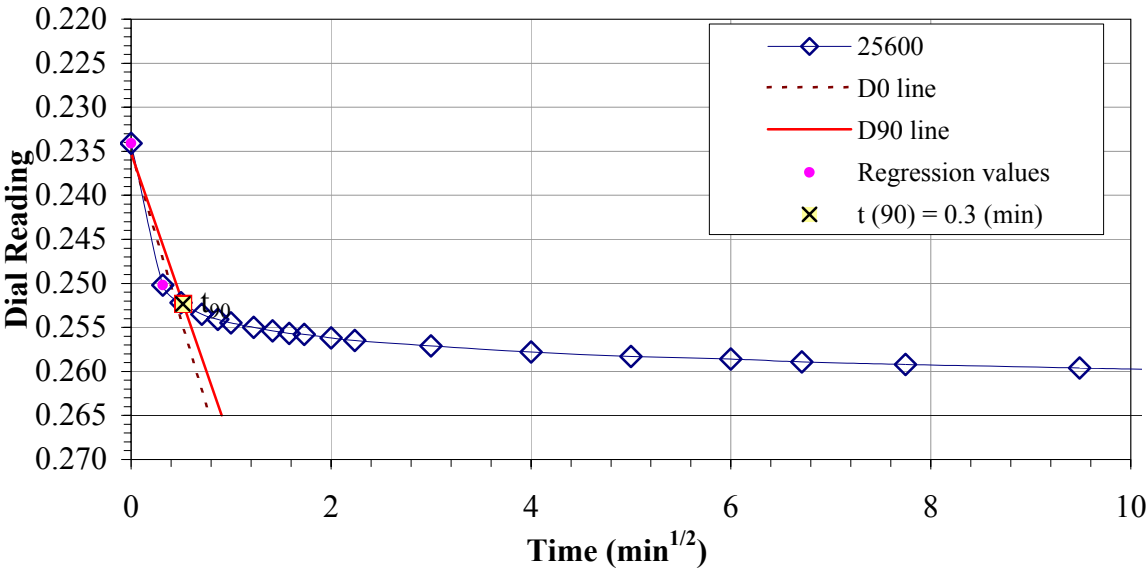
Depth: 12.5-15 ft

Stress: 25600 (psf)

Time rate consolidation data

Data Summary	
$H_{DR}$	= 0.3718 (in)
Slope of $t_{int}$ line	= 0.03781 (dial/min <sup>1/2</sup> )
Slope of $t_{90}$ line	= 0.03287 (dial/min <sup>1/2</sup> )
$D_0$	= 0.24 (dial)
$D(90)$	= 0.2523 (dial)
$D(100)$	= 0.25423 (dial)
$t(90)$	= 0.3 (min)
$C_v$	= 0.433 (in <sup>2</sup> /min)
$C_v$	= 4.33 (ft <sup>2</sup> /day)

Time (min)	Dial Reading (cc)
0	0.2341
0.1	0.2502
0.25	0.2522
0.5	0.2535
0.75	0.2541
1	0.2545
1.5	0.255
2	0.2554
2.5	0.2557
3	0.2558
4	0.2562
5	0.2565
9	0.2571
16	0.2578
25	0.2583
36	0.2586
45	0.2589
60	0.2592
90	0.2596
119	0.2599
190	0.2603
240	0.2605
316	0.2609
400	0.2611
499	0.2613
1458	0.2622
1547	0.2623



One-Dimensional Consolidation Time-Deformation Relationship



Project: BYU (Dr. Youd)

Number: M00399-003

Sample: GVDA

Depth: 12.5-15 ft

Stress: 51200 (psf)

Time rate consolidation data

Data Summary	
$H_{DR}$	= 0.3437 (in)
Slope of $t_{int}$ line	= 0.04387 (dial/min <sup>1/2</sup> )
Slope of $t_{90}$ line	= 0.03815 (dial/min <sup>1/2</sup> )
$D_0$	= 0.26 (dial)
$D(90)$	= 0.2834 (dial)
$D(100)$	= 0.28563 (dial)
$t(90)$	= 0.3 (min)
$C_v$	= 0.371 (in <sup>2</sup> /min)
$C_v$	= 3.71 (ft <sup>2</sup> /day)

Time (min)	Dial Reading (cc)
0	0.2623
0.1	0.281
0.25	0.2833
0.5	0.2846
0.75	0.2853
1	0.2858
1.5	0.2864
2	0.2869
2.5	0.2872
3	0.2875
4	0.2879
5	0.2882
9	0.289
16	0.2898
25	0.2902
36	0.2907
45	0.291
60	0.2914
90	0.2919
146	0.2925
201	0.2929
265	0.2933
384	0.2938
1271	0.2952
1298	0.2953

