

One-Dimensional Consolidation Properties of Soils ASTM D-2435



Project: BYU (Dr. Youd)

Number: M00399-003

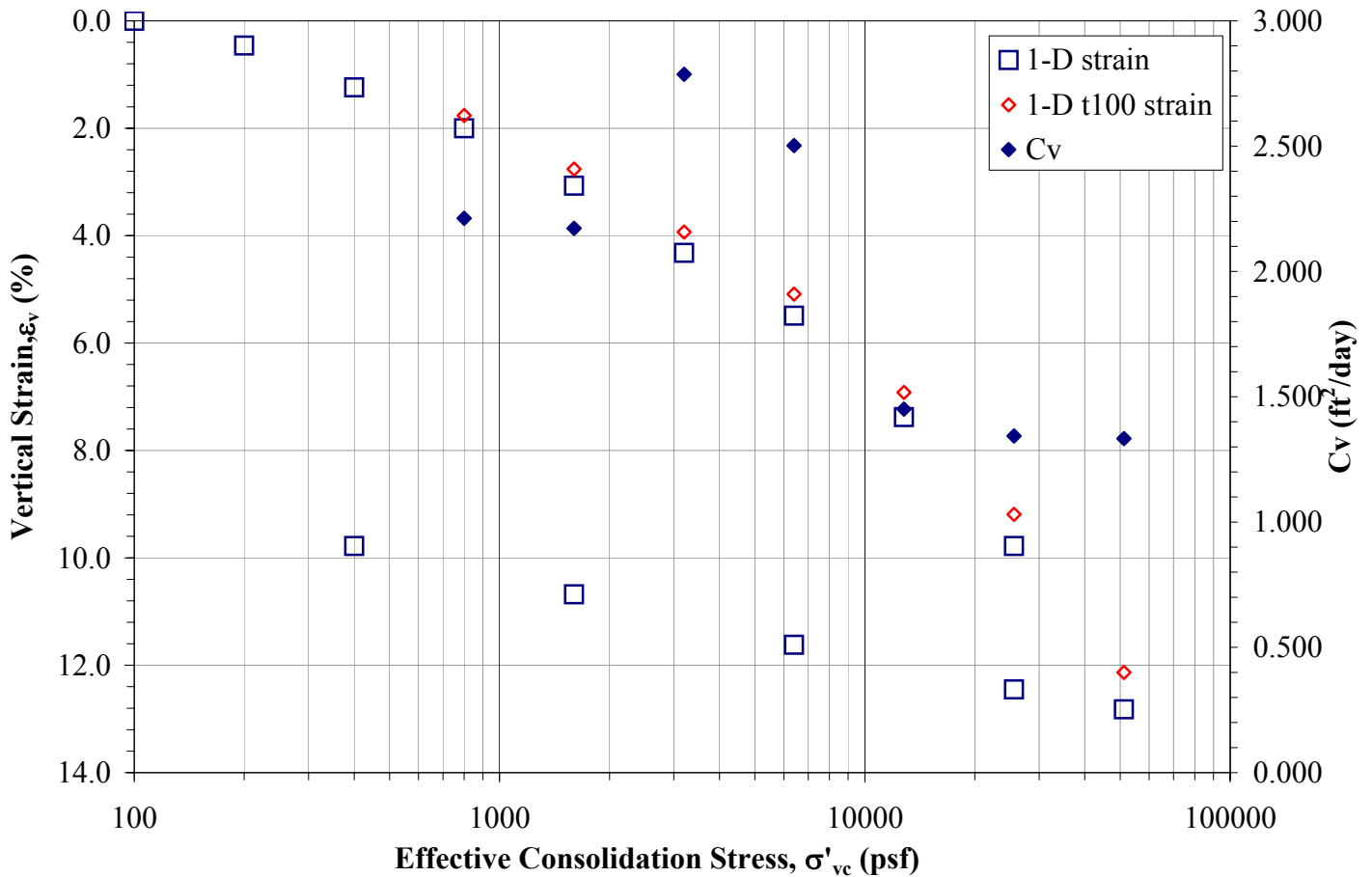
Sample: WLA D-2

Depth: 5-7.5

	Initial	Final
Sample height, H_0 (in)	1.0000	0.9022
Sample Diameter, D_0 (in)	2.416	2.416
Moist unit weight (pcf)	122.1	127.9
Dry unit weight (pcf)	94.4	104.6
Moisture content (%)	29.4	22.3

Gs (Determined)	2.723
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Stress (psf)	Dial (in)	1-D ϵ_v (%)	Hc (in)	Void ratio e	Cv (ft ² /day)	1-D t_{100} ϵ_v (%)
100	0.2168	0.00	1.0000	0.801		
200	0.2214	0.46	0.9954	0.793		
400	0.2292	1.24	0.9876	0.779		
800	0.2368	2.00	0.9800	0.765	2.212	1.761
1600	0.2475	3.07	0.9693	0.746	2.172	2.761
3200	0.2600	4.32	0.9568	0.723	2.787	3.933
6400	0.2717	5.49	0.9451	0.702	2.502	5.089
12800	0.2906	7.38	0.9262	0.668	1.451	6.919
25600	0.3146	9.78	0.9022	0.625	1.343	9.192
51200	0.3450	12.82	0.8718	0.570	1.333	12.134
25600	0.3413	12.45	0.8755	0.577		
6400	0.3330	11.62	0.8838	0.592		
1600	0.3236	10.68	0.8932	0.609		
400	0.3146	9.78	0.9022	0.625		



Tested by: _____

Reviewed: _____

One-Dimensional Consolidation Time-Deformation Relationship

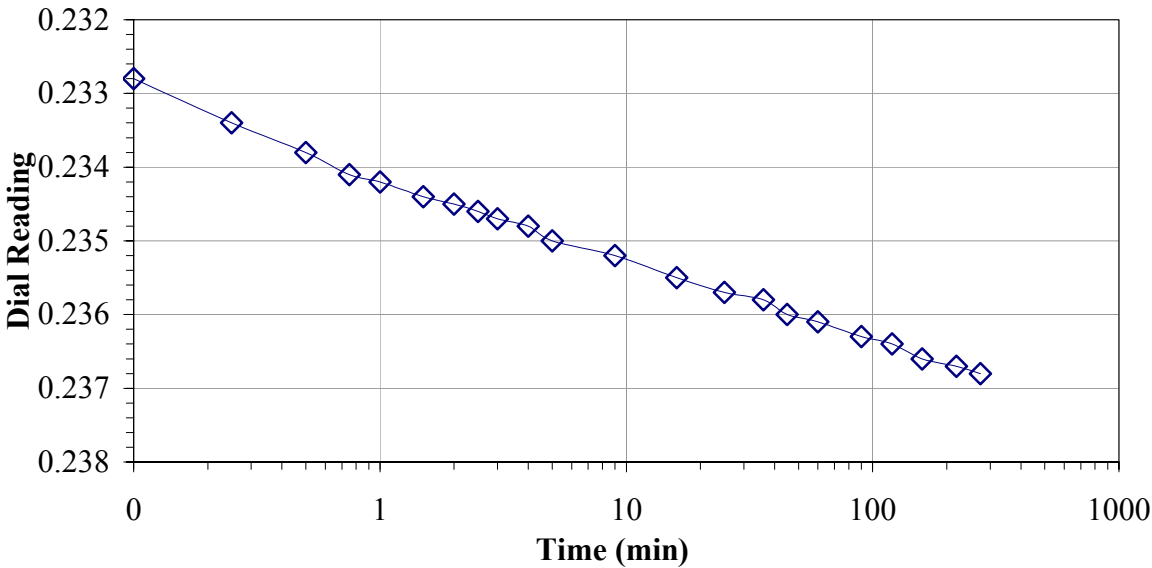
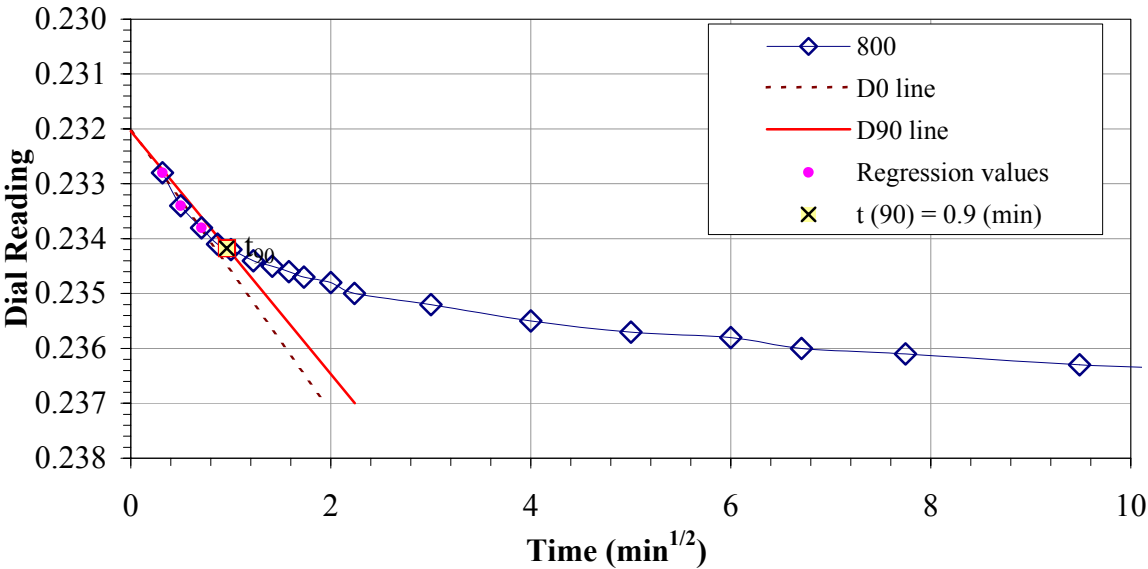


Project: BYU (Dr. Youd)
Number: M00399-003
Sample: WLA D-2
Depth: 5-7.5
Stress: 800 (psf)

Time rate consolidation data

Data Summary	
H_{DR}	= 0.4919 (in)
Slope of t_{int} line	= 0.00255 (dial/min ^{1/2})
Slope of t_{90} line	= 0.00221 (dial/min ^{1/2})
D_0	= 0.23 (dial)
$D(90)$	= 0.2342 (dial)
$D(100)$	= 0.23441 (dial)
$t(90)$	= 0.9 (min)
C_v	= 0.221 (in ² /min)
C_v	= 2.21 (ft ² /day)

Time (min)	Dial Reading (cc)
0	
0.1	0.2328
0.25	0.2334
0.5	0.2338
0.75	0.2341
1	0.2342
1.5	0.2344
2	0.2345
2.5	0.2346
3	0.2347
4	0.2348
5	0.235
9	0.2352
16	0.2355
25	0.2357
36	0.2358
45	0.236
60	0.2361
90	0.2363
120	0.2364
159	0.2366
219	0.2367
274	0.2368



One-Dimensional Consolidation Time-Deformation Relationship



Project: BYU (Dr. Youd)

Number: M00399-003

Sample: WLA D-2

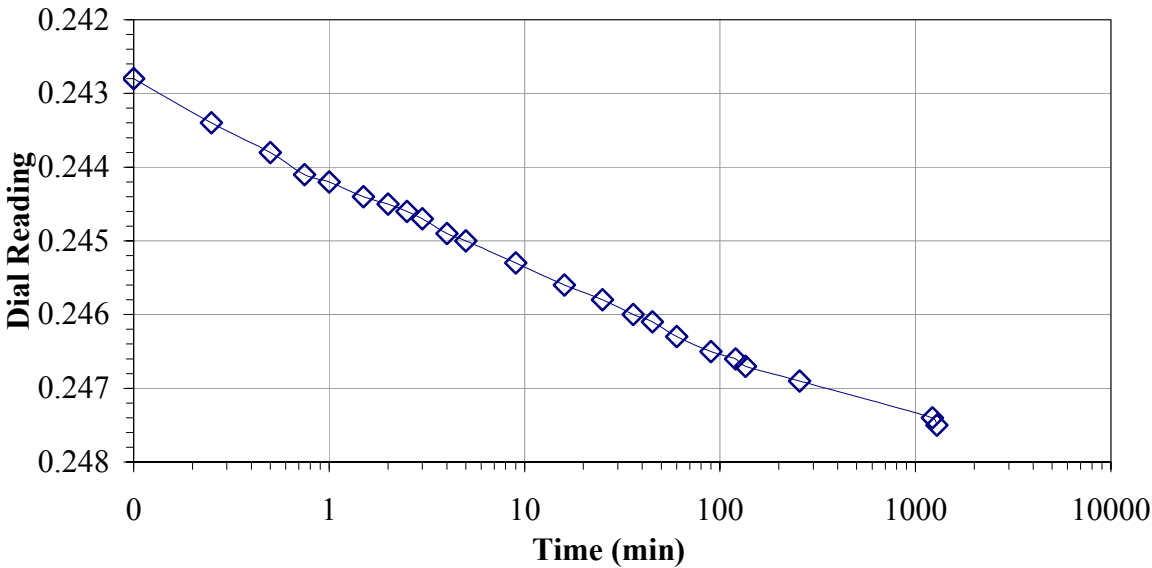
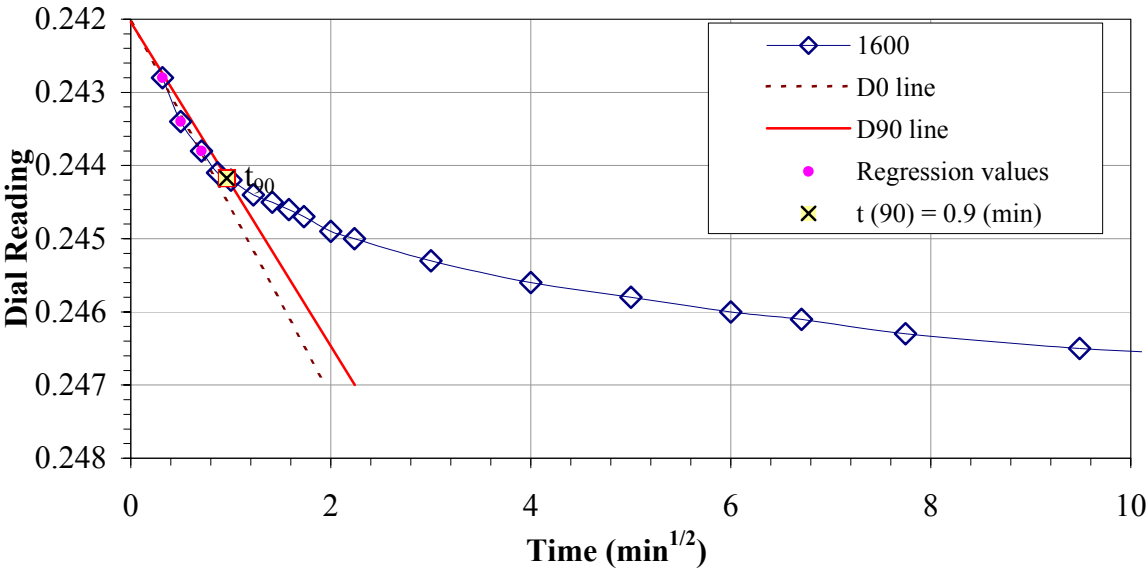
Depth: 5-7.5

Stress: 1600 (psf)

Time rate consolidation data

Data Summary	
H_{DR}	= 0.4873 (in)
Slope of t_{int} line	= 0.00255 (dial/min ^{1/2})
Slope of t_{90} line	= 0.00221 (dial/min ^{1/2})
D_0	= 0.24 (dial)
$D(90)$	= 0.2442 (dial)
$D(100)$	= 0.24441 (dial)
$t(90)$	= 0.9 (min)
C_v	= 0.217 (in ² /min)
C_v	= 2.17 (ft ² /day)

Time (min)	Dial Reading (cc)
0	
0.1	0.2428
0.25	0.2434
0.5	0.2438
0.75	0.2441
1	0.2442
1.5	0.2444
2	0.2445
2.5	0.2446
3	0.2447
4	0.2449
5	0.245
9	0.2453
16	0.2456
25	0.2458
36	0.246
45	0.2461
60	0.2463
90	0.2465
120	0.2466
135	0.2467
255	0.2469
1221	0.2474
1284	0.2475



One-Dimensional Consolidation Time-Deformation Relationship



Project: BYU (Dr. Youd)

Number: M00399-003

Sample: WLA D-2

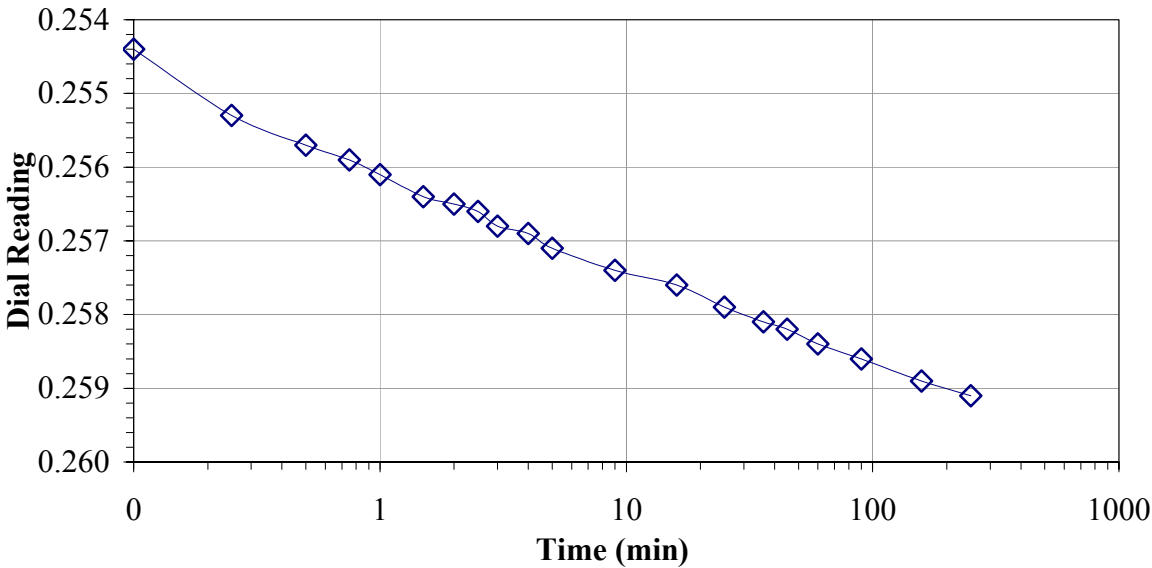
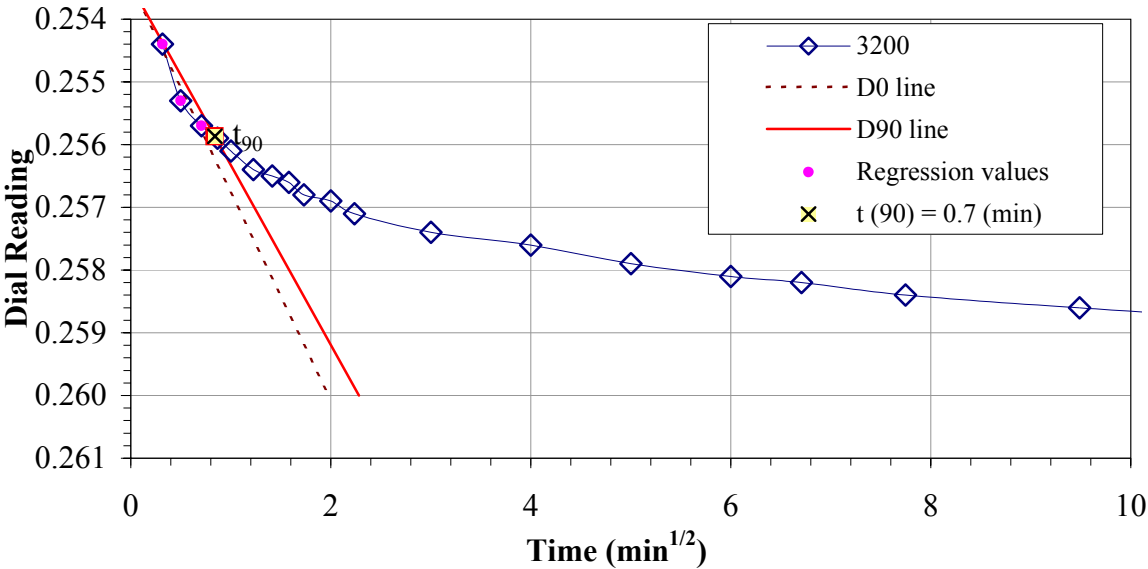
Depth: 5-7.5

Stress: 3200 (psf)

Time rate consolidation data

Data Summary	
H_{DR}	= 0.4815 (in)
Slope of t_{int} line	= 0.0033 (dial/min ^{1/2})
Slope of t_{90} line	= 0.00287 (dial/min ^{1/2})
D_0	= 0.25 (dial)
$D(90)$	= 0.2559 (dial)
$D(100)$	= 0.25613 (dial)
$t(90)$	= 0.7 (min)
C_v	= 0.279 (in ² /min)
C_v	= 2.79 (ft ² /day)

Time (min)	Dial Reading (cc)
0	
0.1	0.2544
0.25	0.2553
0.5	0.2557
0.75	0.2559
1	0.2561
1.5	0.2564
2	0.2565
2.5	0.2566
3	0.2568
4	0.2569
5	0.2571
9	0.2574
16	0.2576
25	0.2579
36	0.2581
45	0.2582
60	0.2584
90	0.2586
158	0.2589
250	0.2591



One-Dimensional Consolidation Time-Deformation Relationship

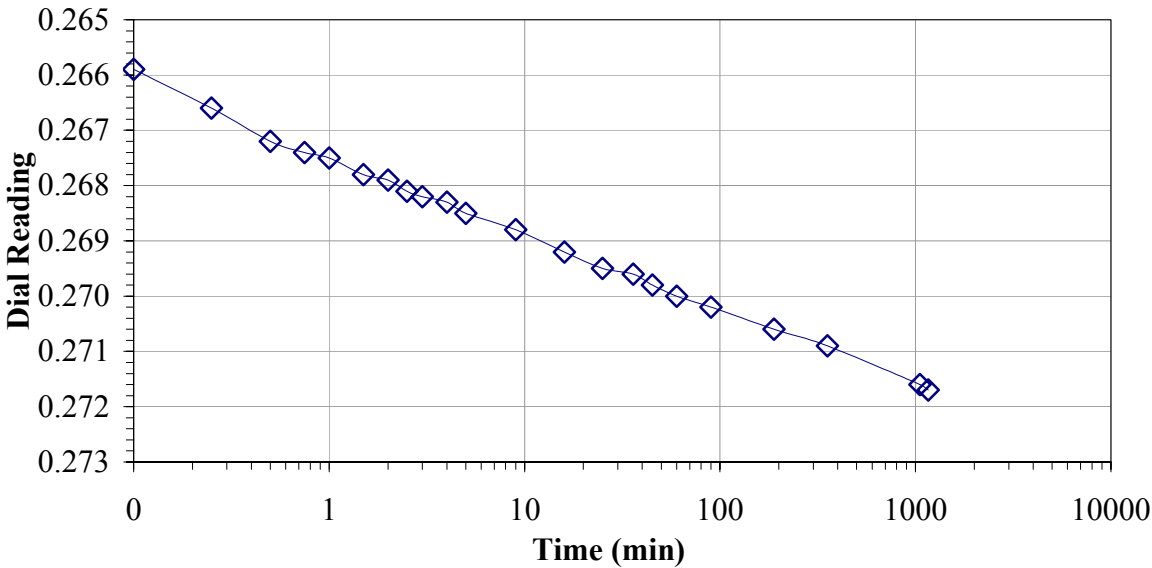
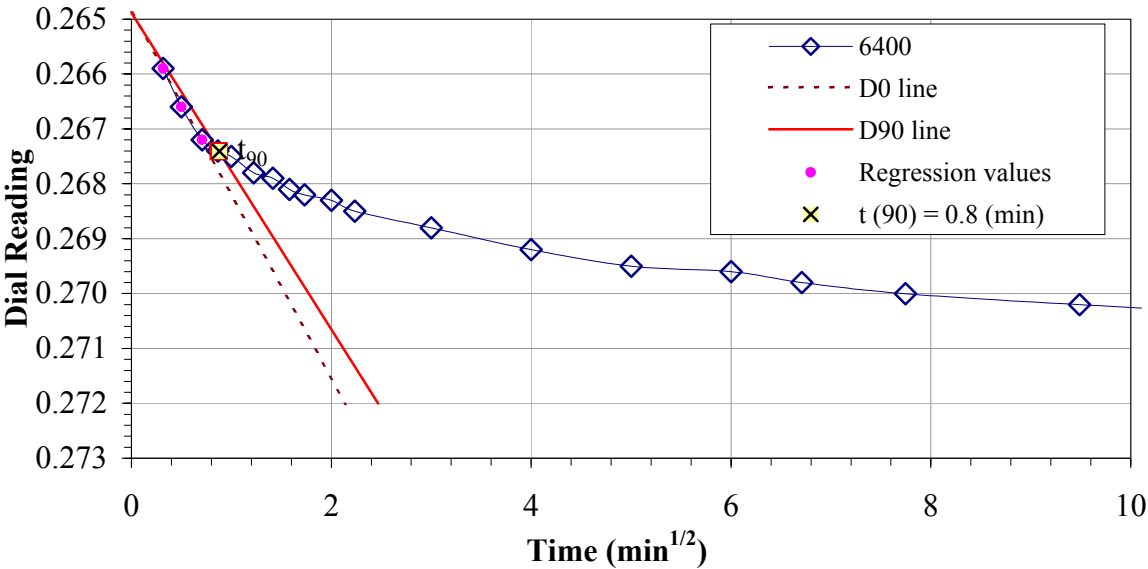
Project: BYU (Dr. Youd)
Number: M00399-003
Sample: WLA D-2
Depth: 5-7.5
Stress: 6400 (psf)



Time rate consolidation data

Time (min)	Dial Reading (cc)
0	
0.1	0.2659
0.25	0.2666
0.5	0.2672
0.75	0.2674
1	0.2675
1.5	0.2678
2	0.2679
2.5	0.2681
3	0.2682
4	0.2683
5	0.2685
9	0.2688
16	0.2692
25	0.2695
36	0.2696
45	0.2698
60	0.27
90	0.2702
189	0.2706
354	0.2709
1054	0.2716
1160	0.2717

Data Summary	
H_{DR}	= 0.4755 (in)
Slope of t_{int} line	= 0.00332 (dial/min ^{1/2})
Slope of t_{90} line	= 0.00288 (dial/min ^{1/2})
D_0	= 0.26 (dial)
$D(90)$	= 0.2674 (dial)
$D(100)$	= 0.26769 (dial)
$t(90)$	= 0.8 (min)
C_v	= 0.250 (in ² /min)
C_v	= 2.50 (ft ² /day)



One-Dimensional Consolidation Time-Deformation Relationship

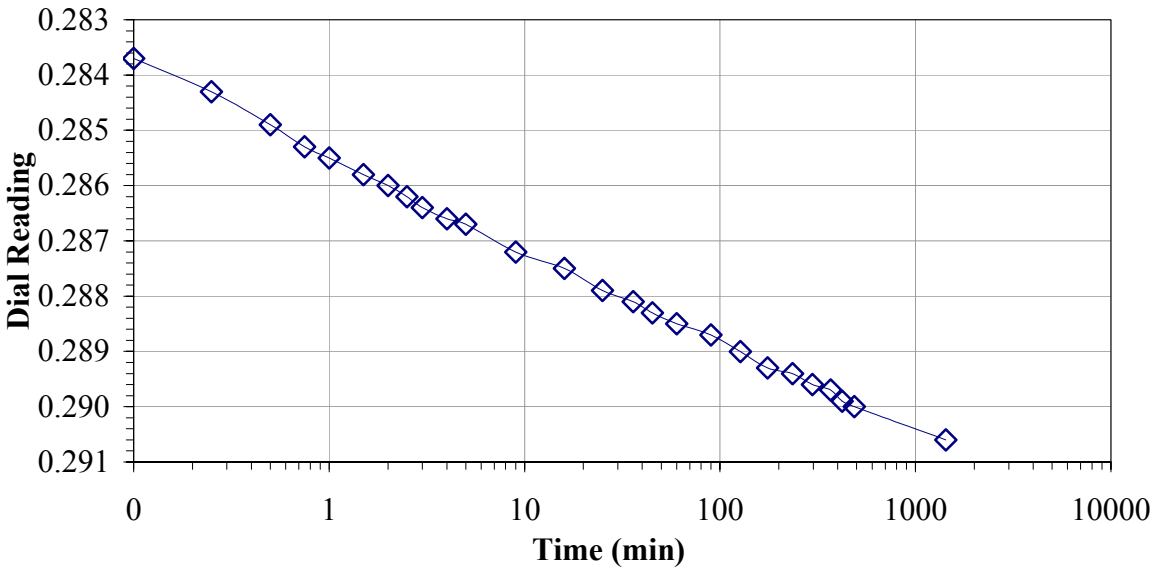
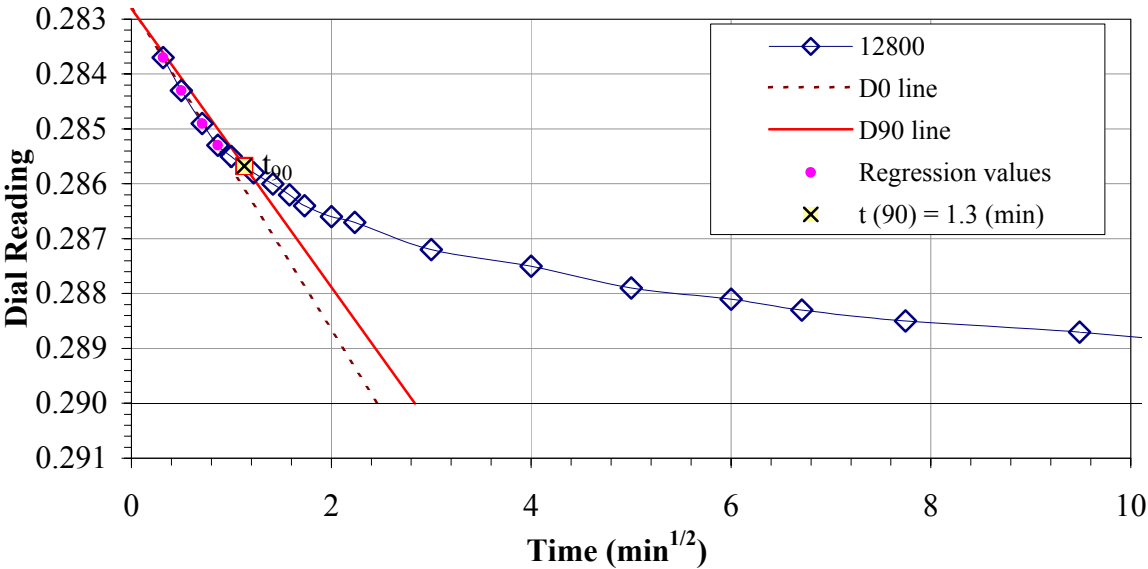


Project: BYU (Dr. Youd)
Number: M00399-003
Sample: WLA D-2
Depth: 5-7.5
Stress: 12800 (psf)

Time rate consolidation data

Data Summary	
H_{DR}	= 0.4678 (in)
Slope of t_{int} line	= 0.00291 (dial/min ^{1/2})
Slope of t_{90} line	= 0.00253 (dial/min ^{1/2})
D_0	= 0.28 (dial)
$D(90)$	= 0.2857 (dial)
$D(100)$	= 0.28599 (dial)
$t(90)$	= 1.3 (min)
C_v	= 0.145 (in ² /min)
C_v	= 1.45 (ft ² /day)

Time (min)	Dial Reading (cc)
0	
0.1	0.2837
0.25	0.2843
0.5	0.2849
0.75	0.2853
1	0.2855
1.5	0.2858
2	0.286
2.5	0.2862
3	0.2864
4	0.2866
5	0.2867
9	0.2872
16	0.2875
25	0.2879
36	0.2881
45	0.2883
60	0.2885
90	0.2887
127	0.289
175	0.2893
235	0.2894
297	0.2896
368	0.2897
421	0.2899
486	0.29
1430	0.2906



One-Dimensional Consolidation Time-Deformation Relationship

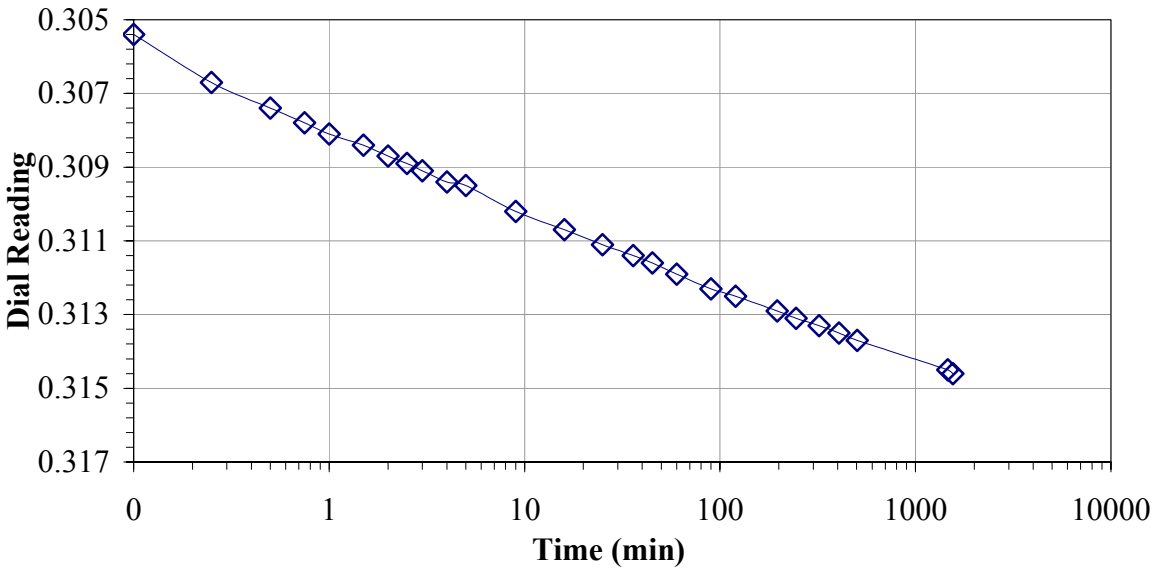
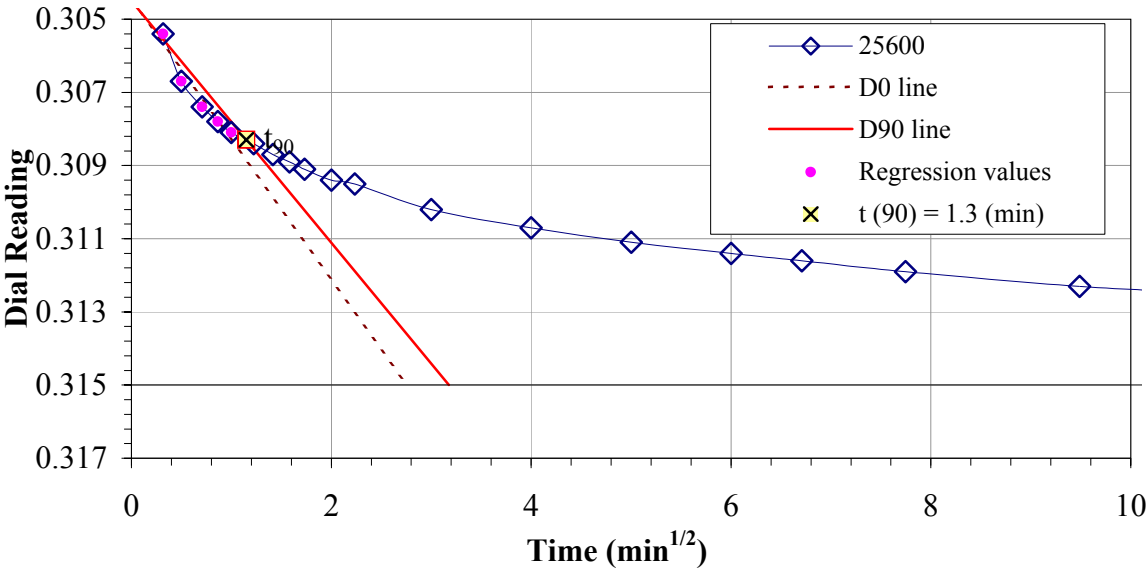


Project: BYU (Dr. Youd)
Number: M00399-003
Sample: WLA D-2
Depth: 5-7.5
Stress: 25600 (psf)

Time rate consolidation data

Data Summary	
H_{DR}	= 0.4571 (in)
Slope of t_{int} line	= 0.0038 (dial/min ^{1/2})
Slope of t_{90} line	= 0.0033 (dial/min ^{1/2})
D_0	= 0.30 (dial)
$D(90)$	= 0.3083 (dial)
$D(100)$	= 0.30872 (dial)
$t(90)$	= 1.3 (min)
C_v	= 0.134 (in ² /min)
C_v	= 1.34 (ft ² /day)

Time (min)	Dial Reading (cc)
0	
0.1	0.3054
0.25	0.3067
0.5	0.3074
0.75	0.3078
1	0.3081
1.5	0.3084
2	0.3087
2.5	0.3089
3	0.3091
4	0.3094
5	0.3095
9	0.3102
16	0.3107
25	0.3111
36	0.3114
45	0.3116
60	0.3119
90	0.3123
120	0.3125
196	0.3129
245	0.3131
321	0.3133
406	0.3135
504	0.3137
1463	0.3145
1552	0.3146



One-Dimensional Consolidation Time-Deformation Relationship



Project: BYU (Dr. Youd)

Number: M00399-003

Sample: WLA D-2

Depth: 5-7.5

Stress: 51200 (psf)

Time rate consolidation data

Data Summary	
H_{DR}	= 0.4435 (in)
Slope of t_{int} line	= 0.00492 (dial/min ^{1/2})
Slope of t_{90} line	= 0.00428 (dial/min ^{1/2})
D_0	= 0.33 (dial)
$D(90)$	= 0.3376 (dial)
$D(100)$	= 0.33814 (dial)
$t(90)$	= 1.3 (min)
C_v	= 0.133 (in ² /min)
C_v	= 1.33 (ft ² /day)

Time (min)	Dial Reading (cc)
0	
0.1	0.334
0.25	0.3356
0.5	0.3366
0.75	0.3372
1	0.3374
1.5	0.3378
2	0.3382
2.5	0.3384
3	0.3386
4	0.3389
5	0.3391
9	0.3398
16	0.3404
25	0.3409
36	0.3412
45	0.3414
60	0.3418
90	0.3422
157	0.3429
213	0.3432
276	0.3434
396	0.3438
1283	0.345
1308	0.345

