Project No. 03-859-030 Client: United States Army Corps of Engineers

Project: Corpus Christi Ship Channel Improvements - LaQuinta Extension; Contract DACW64-03-D-0008; Delivery Order 0030

Boring No.	Depth (feet)	Soil Description	USCS	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plastic Limit	Plast. Index	Finer than #200 Sieve (%)	Uc/UU. Compr. (tsf)	Cell Press. (psi)	Failure Strain (%)	Failure Type
	16-18	Tan and light gray FAT CLAY	CH	29.5		91	25	66	99.7				
	18.5-20	Light gray and tan SILTY SAND	SM	13.8					34.6				
04-181													
	3.5-5	Gray SILTY SAND	SM	27.5									
	8.5-10	Gray and tan SILTY SAND	SM	31.3					46.7				
	13.5-15	Gray and tan SILTY SAND	SM	29.6		23	23	NP					
	18.5-20	Gray and tan SILTY SAND	SM	29.1									
04-182													
	0-1.5	Gray CLAYEY SAND; few shells	SC	24.4					24.7				
	8-10	FAT CLAY with SAND	CH	22.8	105.3	61	20	41	80.3				
	10-12	Tan FAT CLAY; traces of calcareous nodules	CH	21.9									
	12-14	Tan and light gray FAT CLAY with SAND	CH	21.7		74	24	50	81.9				
	14-16	Tan and light gray FAT CLAY	CH	22.7									
	16-18	Tan FAT CLAY	CH	19.6		62	21	41					
04-183													
	0-1.5	Gray and tan FAT CLAY	CH	33.6									
	2-4	Tan and gray FAT CLAY	CH	36.6	86.5	66	20	46	99.1	1.48	10	6.0	bulge/vertical
	4-6	Tan and light gray FAT CLAY, slickenside	CH	32.4									
	6-8	Tan and light gray FAT CLAY; few calcareous nodules	CH	17.1									
	8-10	Tan and light gray SANDY LEAN CLAY	CL	18.0		42	17	25	59.9				
	10-12	Tan and light gray SANDY LEAN CLAY	CL	21.5									
	14-16	Light gray and tan FAT CLAY with SAND; and traces of calcareous and ferrous nodules	CH	19.4									
	16-18	Light gray and tan SANDY LEAN CLAY	CL	16.6									
04-184													
	0-2	Dark gray FAT CLAY with SAND	CH	26.1	93.5	59	21	38	73.6	1.74	8	7.0	multi shear
	2-4	Dark gray FAT CLAY	CH	22.7									
	4-6	Dark gray and tan FAT CLAY	CH	22.2									
	6-8	Tan and light gray LEAN CLAY	CL	20.4		46	17	29	97.0				
	8-10	Light gray and tan LEAN CLAY; few calcareous nodules	CL	18.5									
04-185													
	0-2	Dark gray LEAN CLAY with SAND; some roots	CL	15.6									
	2-4	Gray LEAN CLAY with SAND; traces of calcareous nodules	CL	14.0									
	4-6	Light gray and tan LEAN CLAY with SAND; traces of calcareous nodules	CL	15.4									
	6-8	Light gray and tan LEAN CLAY with SAND; traces of calcareous nodules	CL	15.4									
	8-10	Tan and light gray LEAN CLAY with SAND	CL	13.8									
	10-12	Light gray and tan LEAN CLAY with SAND; traces of ferrous nodules	CL	13.7									
04-186													
	0-2	Dark gray FAT CLAY with SAND	CH	30.6	92.2	65	21	44	71.2				
	2-4	Dark gray FAT CLAY	CH	30.5		57	22	35					

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Project No. 03-859-030 Client: United States Army Corps of Engineers

Project: Corpus Christi Ship Channel Improvements - LaQuinta Extension; Contract DACW64-03-D-0008; Delivery Order 0030

Boring No.	Depth (feet)	Soil Description	USCS	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plastic Limit	Plast. Index	Finer than #200 Sieve (%)	Uc/UU. Compr. (tsf)	Cell Press. (psi)	Failure Strain (%)	Failure Type
	4-6	Light gray and gray FAT CLAY; traces of calcareous nodules	CH	31.9									
	6-8	Light gray and gray FAT CLAY	CH	29.3									
	8-10	Light gray and tan FAT CLAY	CH	27.1									
	10-12	Tan FAT CLAY with SAND	CH	22.2		66	21	45	82.9				
04-187													
	0-2	Light gray and gray FAT CLAY	CH	20.5									
	2-4	Gray and dark gray FAT CLAY	CH	19.1									
	4-6	Light gray and tan FAT CLAY with SAND	CH	22.4		65	22	43	76.1				
	6-8	Tan FAT CLAY	CH	25.6									
	8-10	Tan and gray FAT CLAY	CH	22.2									
	10-12	Tan FAT CLAY	CH	23.8									

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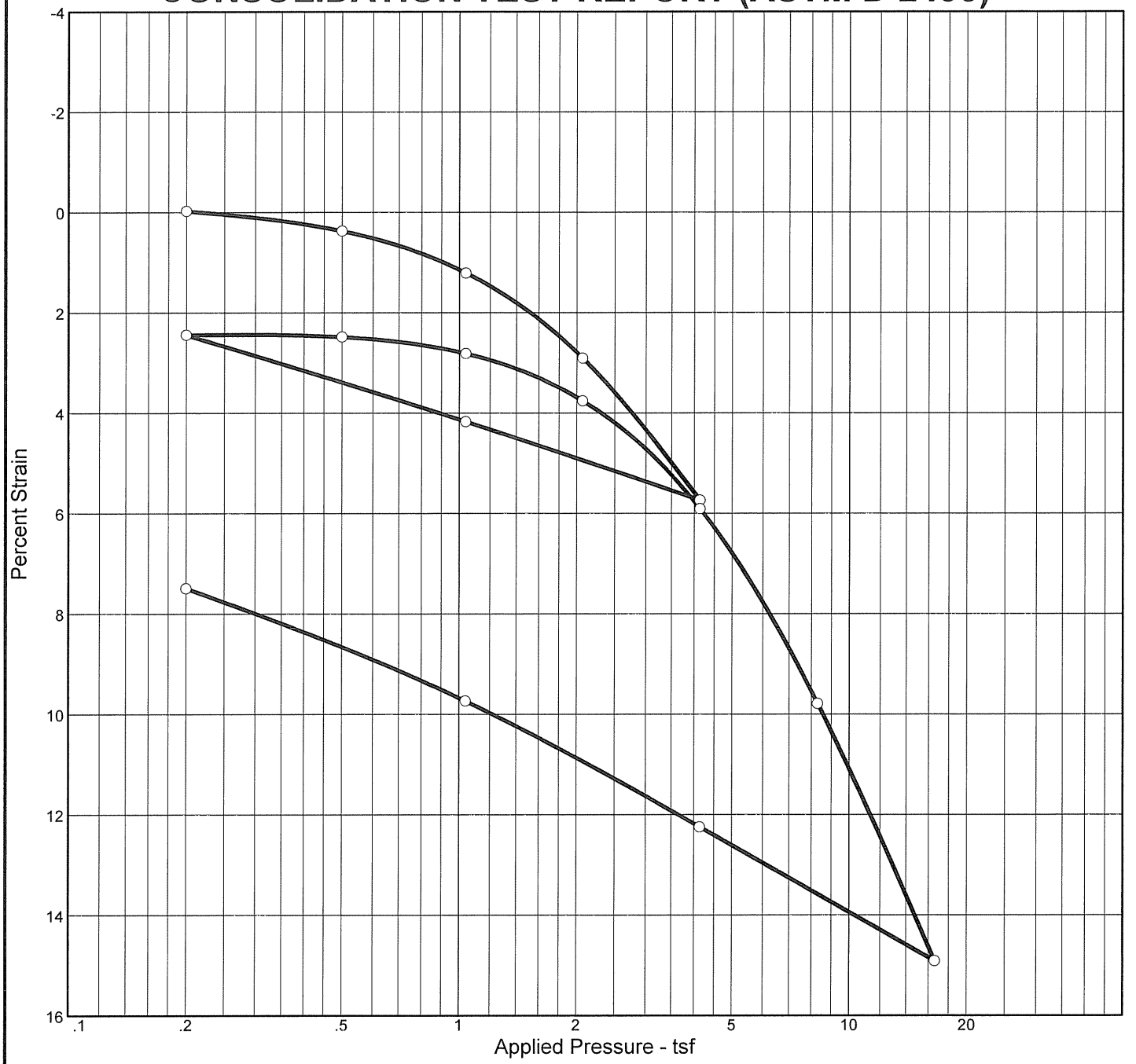
CONSOLIDATION TEST REPORT (ASTM D 2435)



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	USCS	AASHTO	Initial Void Ratio
Saturation	Moisture							
92.7 %	33.6 %	86.0	57	35	2.75	CH		0.997

MATERIAL DESCRIPTION

Dark gray FAT CLAY

Project No. 03-859-030 **Client:** United States Army Corps of Engineers

Project: Corpus Christi Ship Channel Improvements - LaQuinta Extension
Contract DACW64-03-D-0008; Delivery Order 0030

Source: 04-186 **Elev./Depth:** 2-4

Remarks:
Specific Gravity Assumed

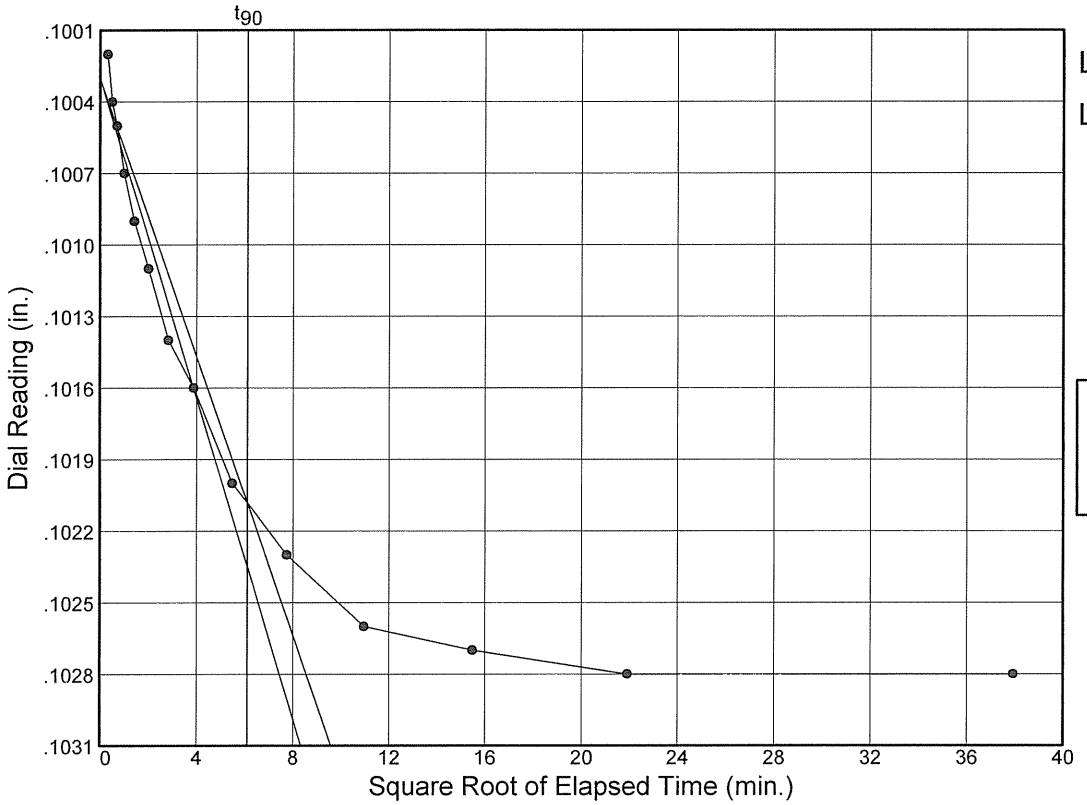
CONSOLIDATION TEST REPORT (ASTM D 2435)

Tolunay-Wong Engineers, Inc.

Dial Reading vs. Time

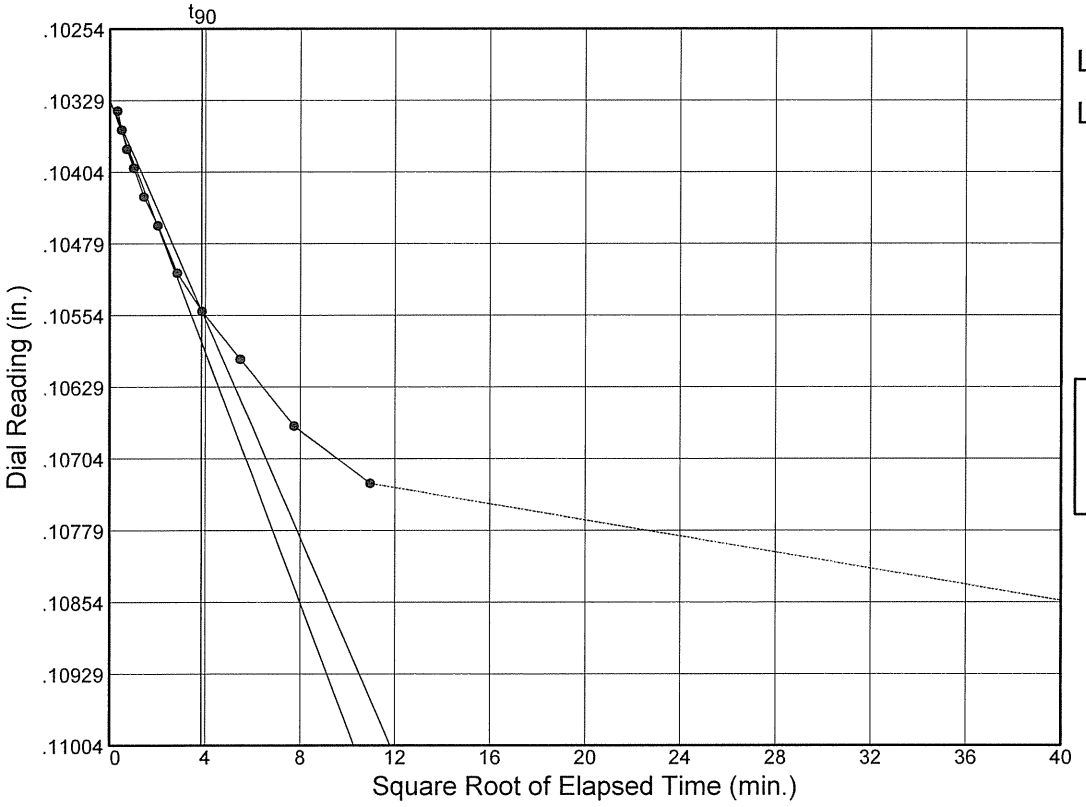
Project No.: 03-859-030
Project: Corpus Christi Ship Channel Improvements - LaQuinta Extension

Source: 04-186 Elev./Depth: 2-4



Load No.= 2
Load= 0.50 tsf
D_0 = 0.10030
D_{90} = 0.10208
D_{100} = 0.10228
T_{90} = 37.17 min.

C_v @ T_{90}
0.03 ft.^{2}/day



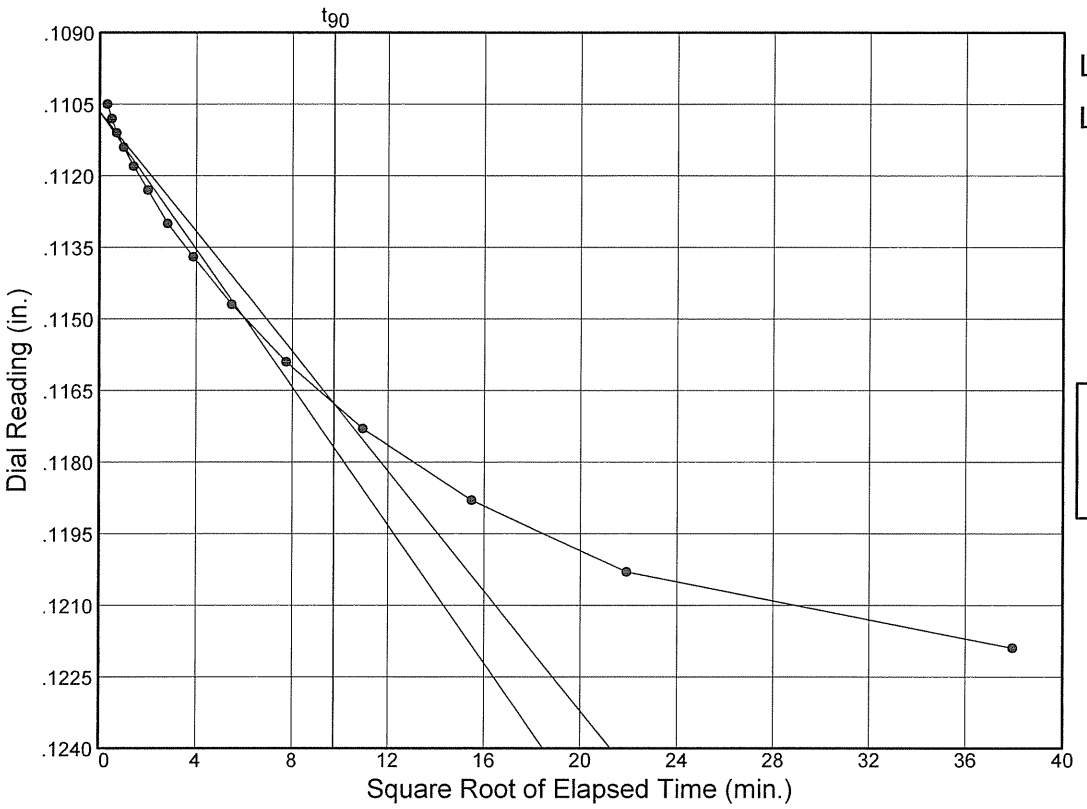
Load No.= 3
Load= 1.04 tsf
D_0 = 0.10329
D_{90} = 0.10549
D_{100} = 0.10573
T_{90} = 14.81 min.

C_v @ T_{90}
0.08 ft.^{2}/day

Dial Reading vs. Time

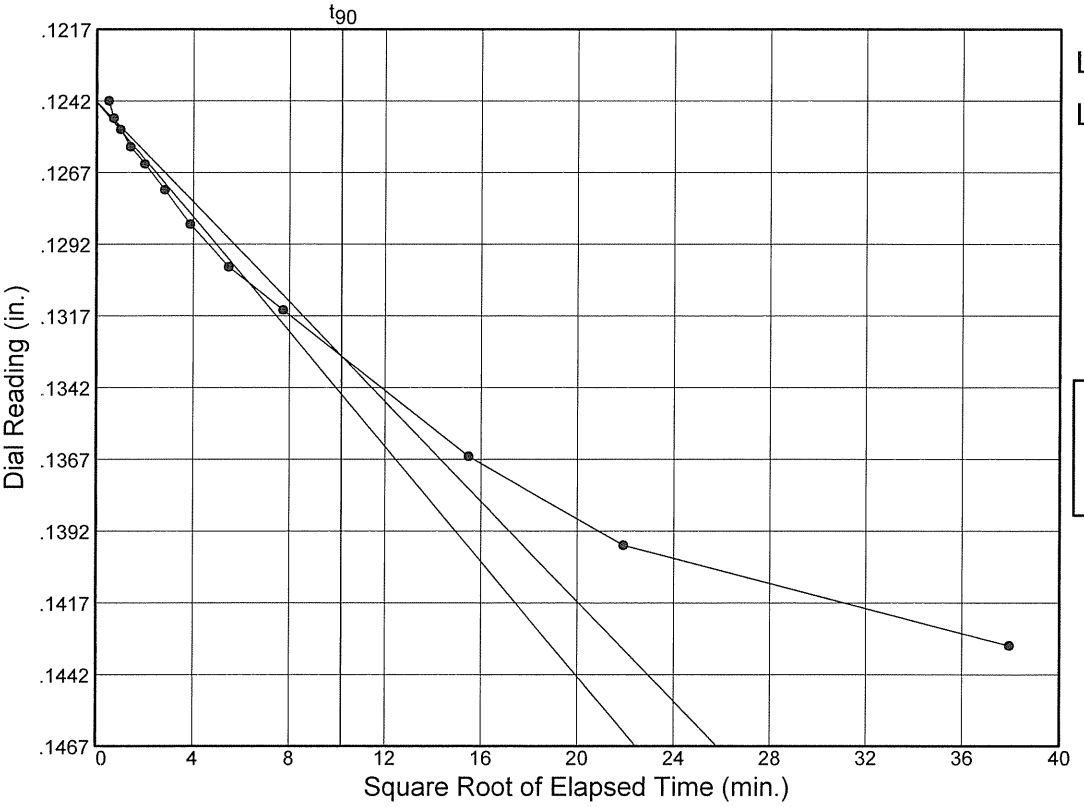
Project No.: 03-859-030
Project: Corpus Christi Ship Channel Improvements - LaQuinta Extension

Source: 04-186 Elev./Depth: 2-4



Load No.= 4
Load= 2.07 tsf
D_0 = 0.11065
D_{90} = 0.11677
D_{100} = 0.11745
T_{90} = 95.04 min.

C_v @ T_{90}
0.01 ft.^{2}/day



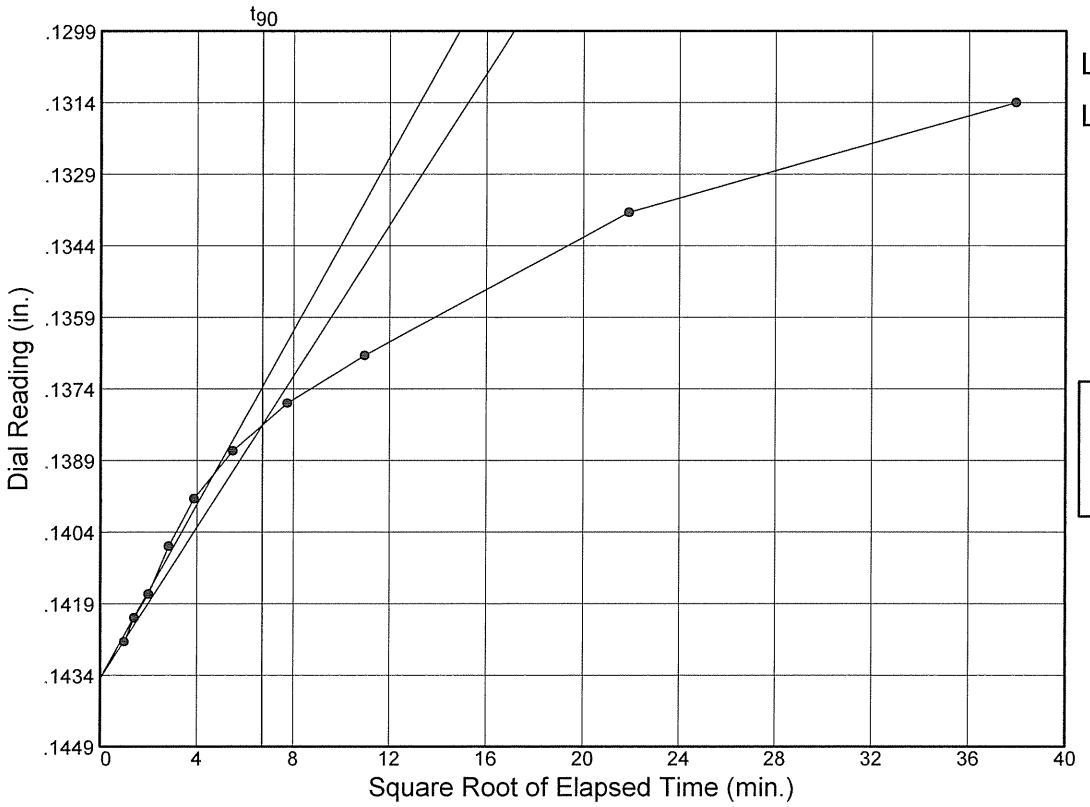
Load No.= 5
Load= 4.14 tsf
D_0 = 0.12424
D_{90} = 0.13311
D_{100} = 0.13410
T_{90} = 103.89 min.

C_v @ T_{90}
0.01 ft.^{2}/day

Dial Reading vs. Time

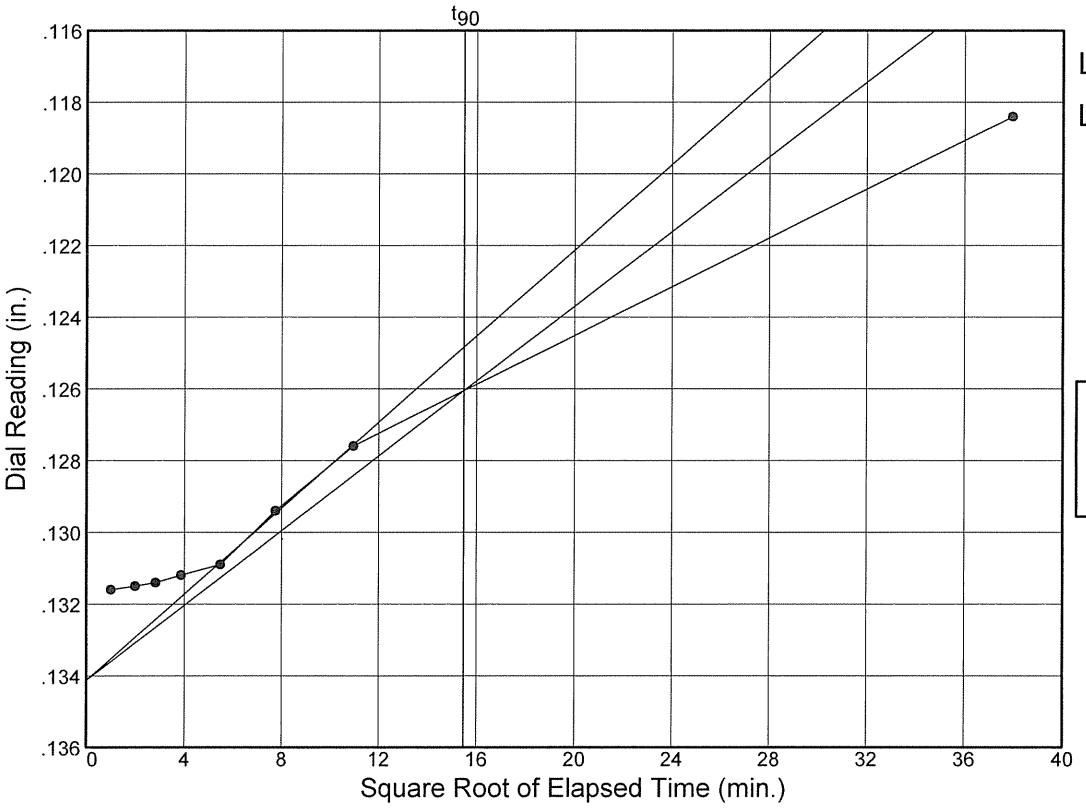
Project No.: 03-859-030
Project: Corpus Christi Ship Channel Improvements - LaQuinta Extension

Source: 04-186 Elev./Depth: 2-4



Load No.= 6
Load= 1.04 tsf
D_0 = 0.14347
D_{90} = 0.13816
D_{100} = 0.13757
T_{90} = 44.94 min.

C_v @ T_{90}
0.02 ft.^{2}/day



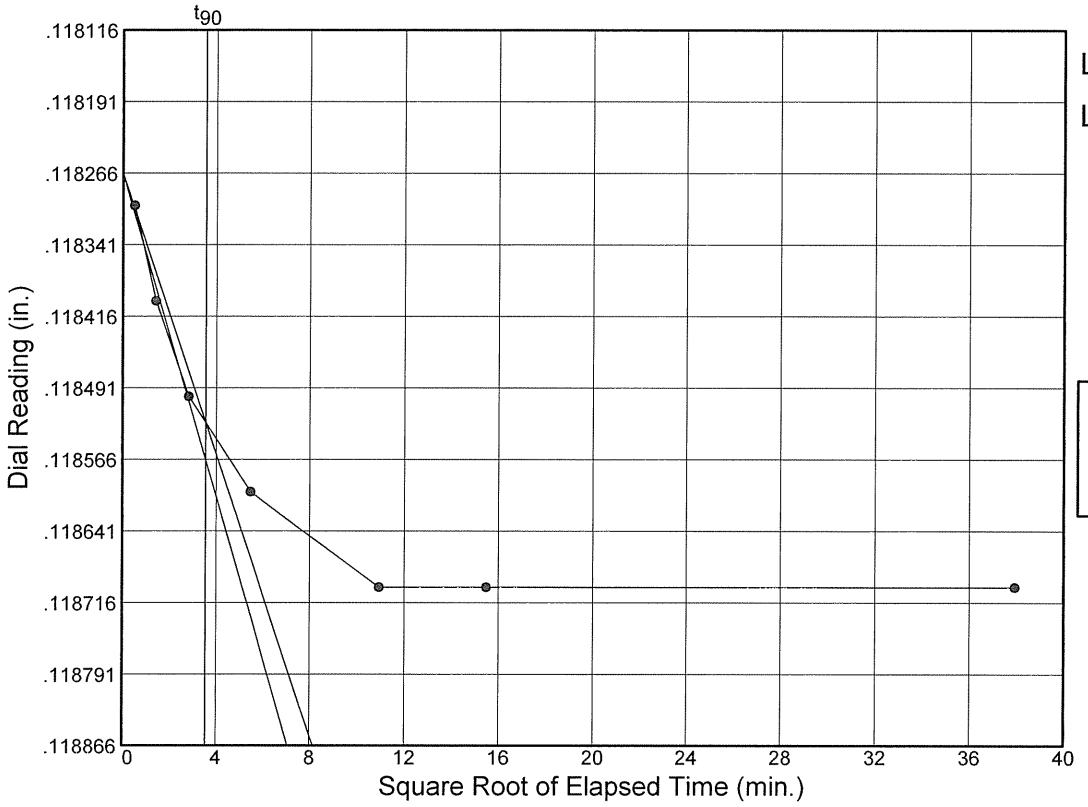
Load No.= 7
Load= 0.20 tsf
D_0 = 0.13413
D_{90} = 0.12605
D_{100} = 0.12515
T_{90} = 240.12 min.

C_v @ T_{90}
0.00 ft.^{2}/day

Dial Reading vs. Time

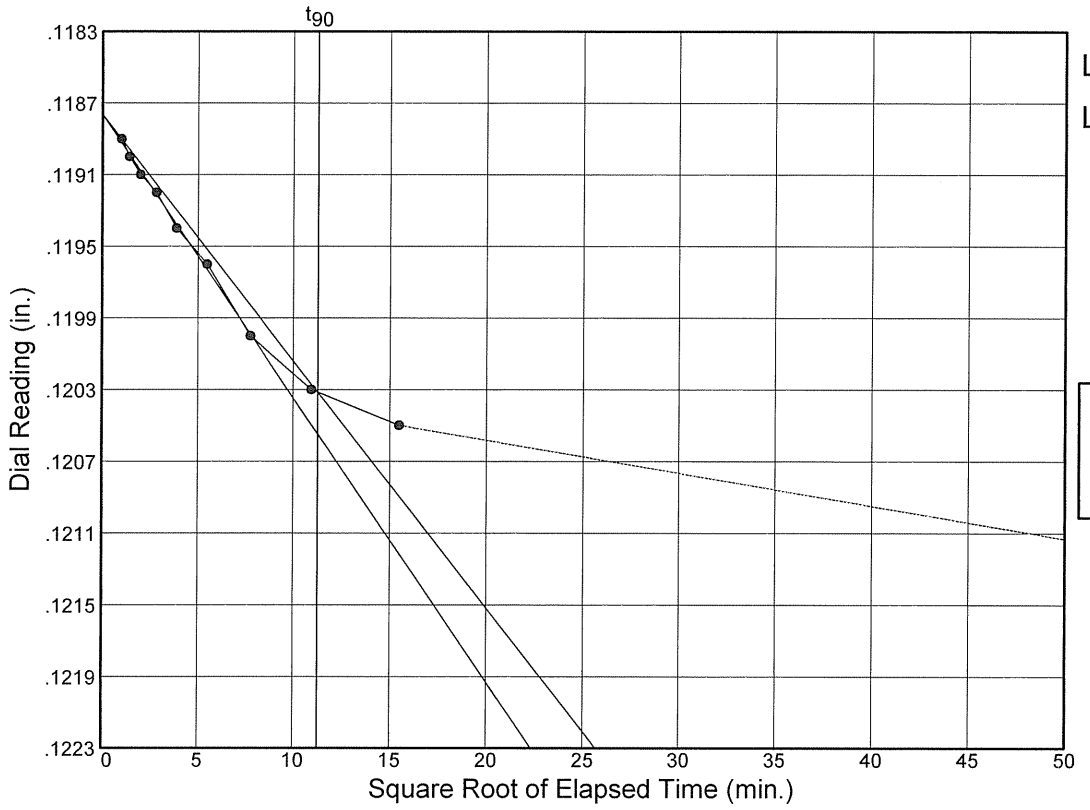
Project No.: 03-859-030
Project: Corpus Christi Ship Channel Improvements - LaQuinta Extension

Source: 04-186 Elev./Depth: 2-4



Load No.= 8
Load= 0.50 tsf
D_0 = 0.11827
D_{90} = 0.11853
D_{100} = 0.11856
T_{90} = 12.57 min.

C_v @ T_{90}
0.09 ft.^{2}/day



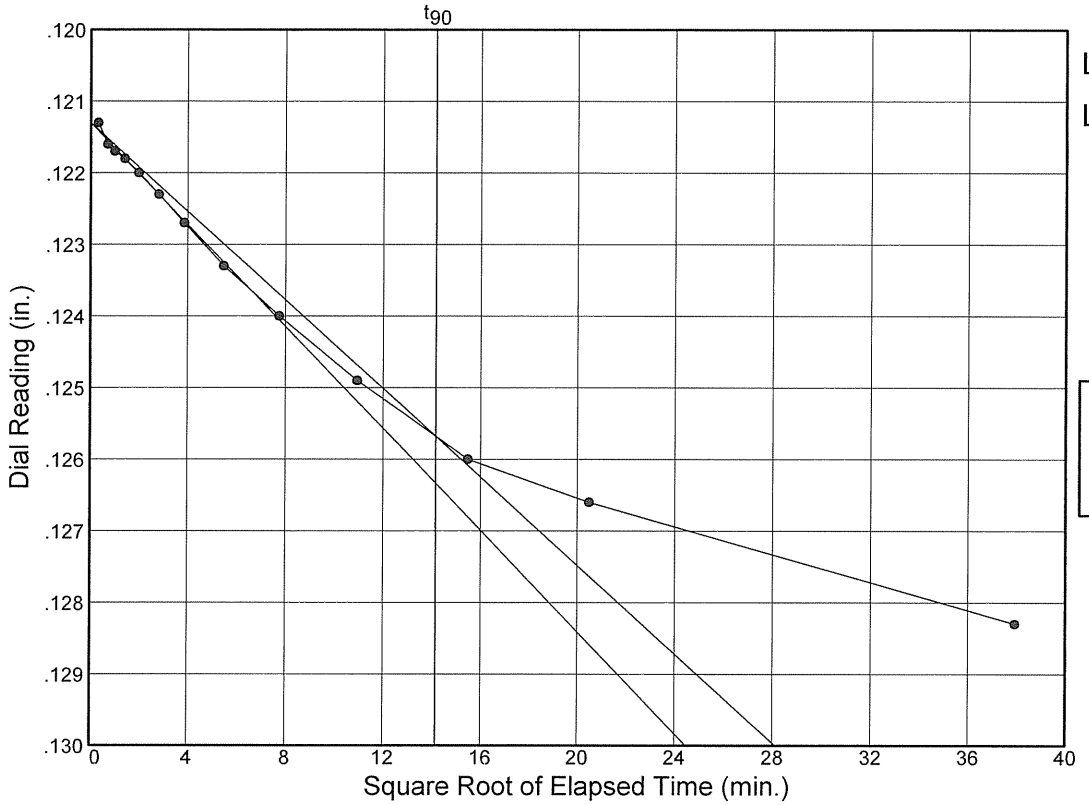
Load No.= 9
Load= 1.04 tsf
D_0 = 0.11876
D_{90} = 0.12031
D_{100} = 0.12049
T_{90} = 126.78 min.

C_v @ T_{90}
0.01 ft.^{2}/day

Dial Reading vs. Time

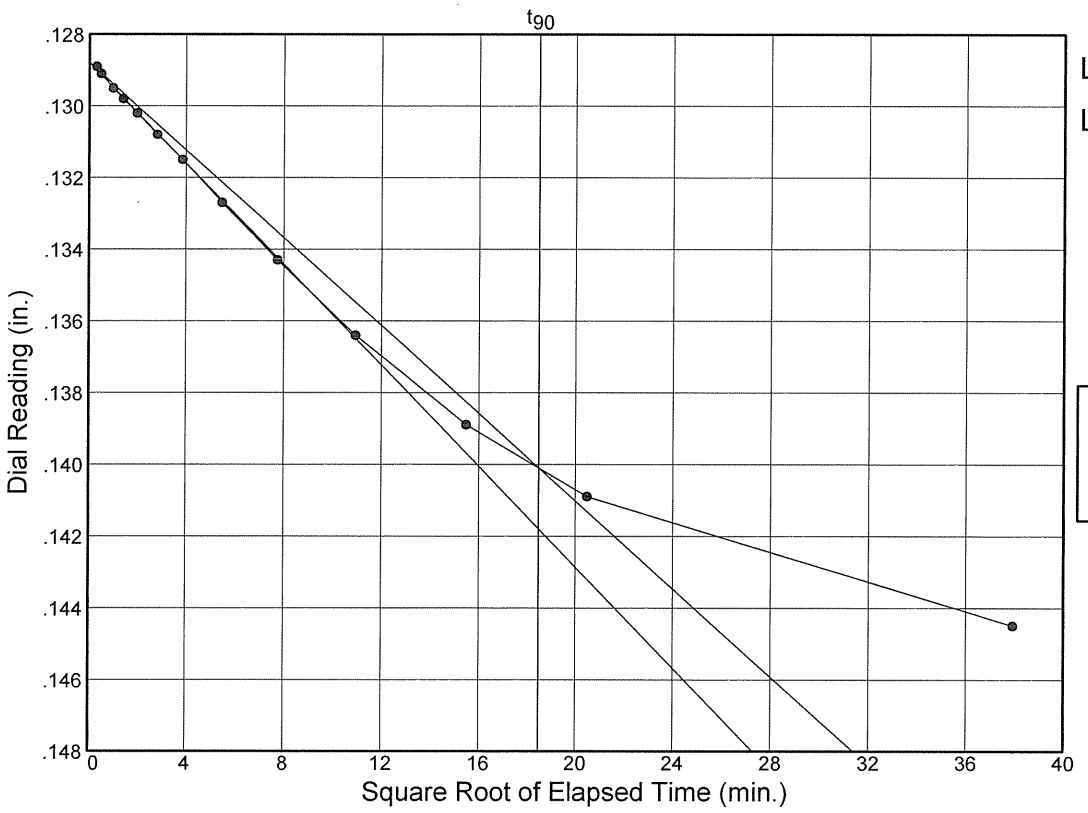
Project No.: 03-859-030
Project: Corpus Christi Ship Channel Improvements - LaQuinta Extension

Source: 04-186 Elev./Depth: 2-4



Load No.= 10
Load= 2.07 tsf
D_0 = 0.12130
D_{90} = 0.12568
D_{100} = 0.12616
T_{90} = 200.30 min.

C_v @ T_{90}
0.01 ft.^{2}/day



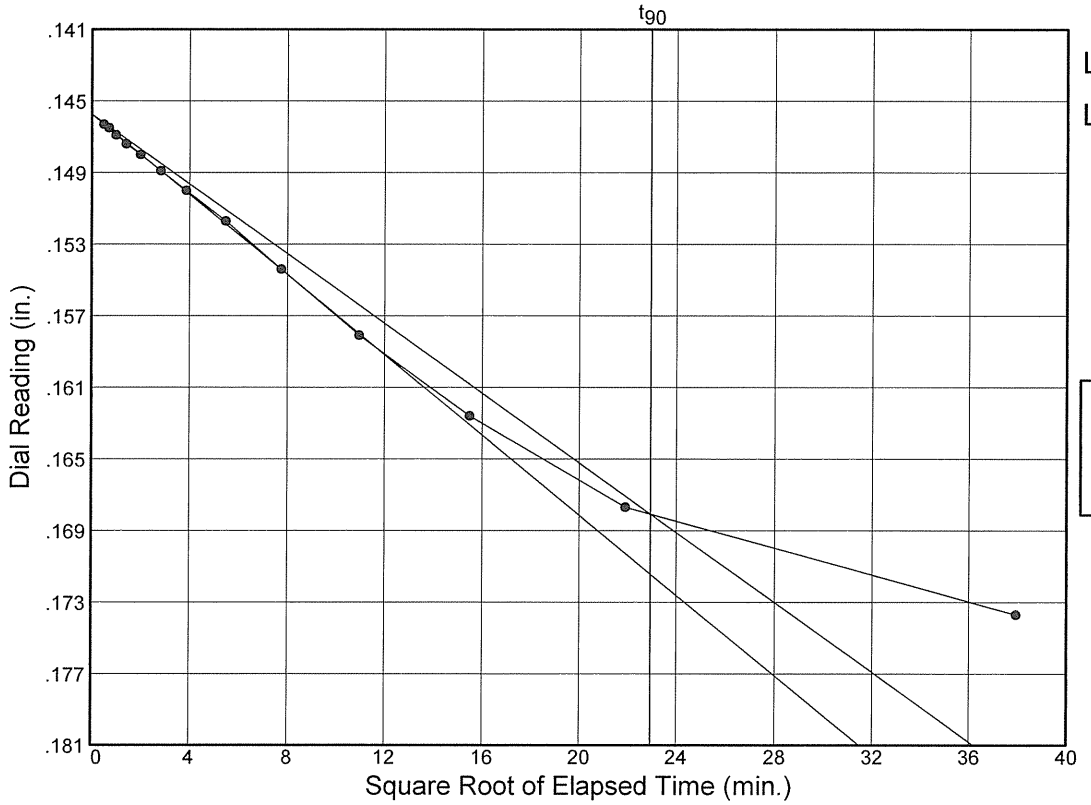
Load No.= 11
Load= 4.14 tsf
D_0 = 0.12878
D_{90} = 0.14010
D_{100} = 0.14136
T_{90} = 341.80 min.

C_v @ T_{90}
0.00 ft.^{2}/day

Dial Reading vs. Time

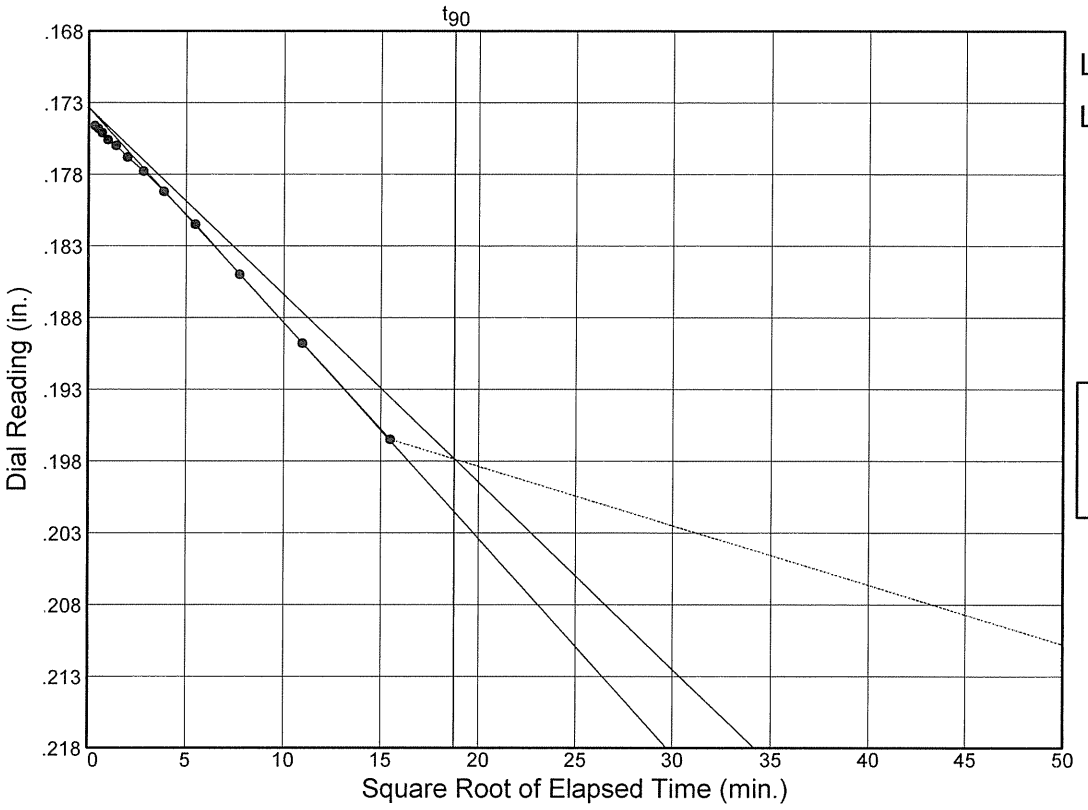
Project No.: 03-859-030
Project: Corpus Christi Ship Channel Improvements - LaQuinta Extension

Source: 04-186 Elev./Depth: 2-4



Load No.= 12
Load= 8.30 tsf
D_0 = 0.14573
D_{90} = 0.16809
D_{100} = 0.17057
T_{90} = 526.52 min.

C_v @ T_{90}
0.00 ft.^{2}/day



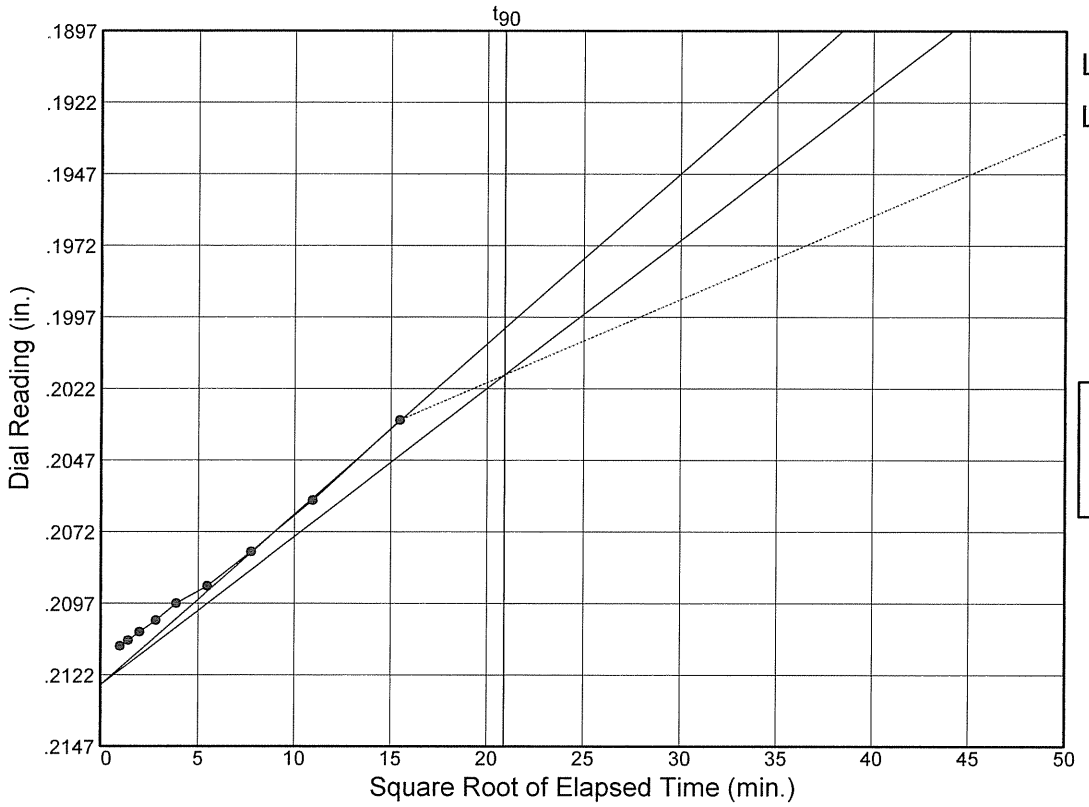
Load No.= 13
Load= 16.60 tsf
D_0 = 0.17334
D_{90} = 0.19785
D_{100} = 0.20057
T_{90} = 351.75 min.

C_v @ T_{90}
0.00 ft.^{2}/day

Dial Reading vs. Time

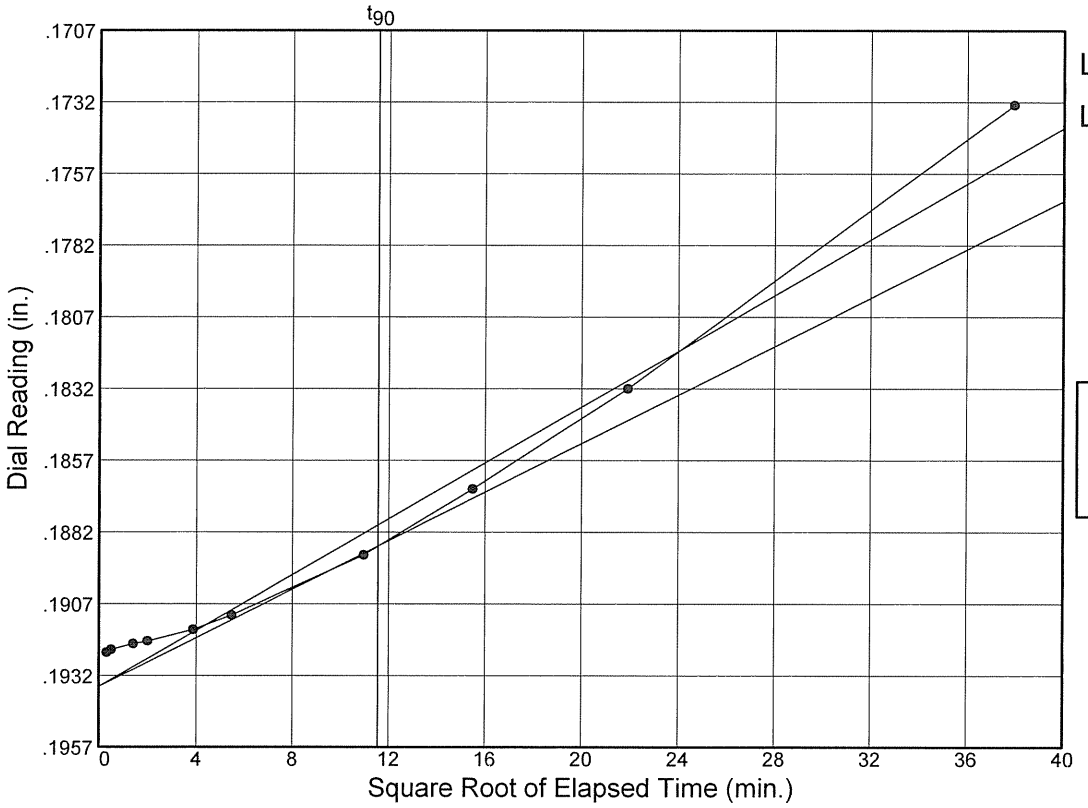
Project No.: 03-859-030
Project: Corpus Christi Ship Channel Improvements - LaQuinta Extension

Source: 04-186 Elev./Depth: 2-4



Load No.= 14
Load= 4.14 tsf
D_0 = 0.21255
D_{90} = 0.20172
D_{100} = 0.20052
T_{90} = 437.64 min.

C_v @ T_{90}
0.00 ft.^{2}/day



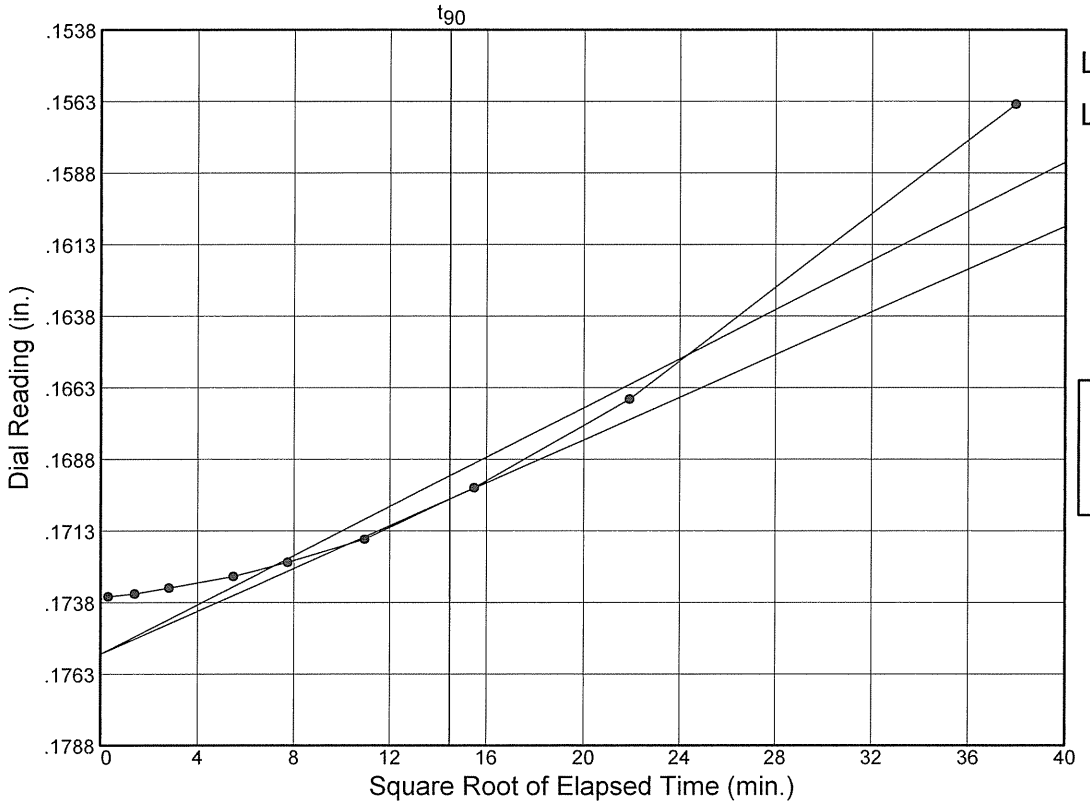
Load No.= 15
Load= 1.04 tsf
D_0 = 0.19359
D_{90} = 0.18869
D_{100} = 0.18815
T_{90} = 133.64 min.

C_v @ T_{90}
0.01 ft.^{2}/day

Dial Reading vs. Time

Project No.: 03-859-030
Project: Corpus Christi Ship Channel Improvements - LaQuinta Extension

Source: 04-186 Elev./Depth: 2-4



Load No.= 16

Load= 0.20 tsf

D_0 = 0.17561

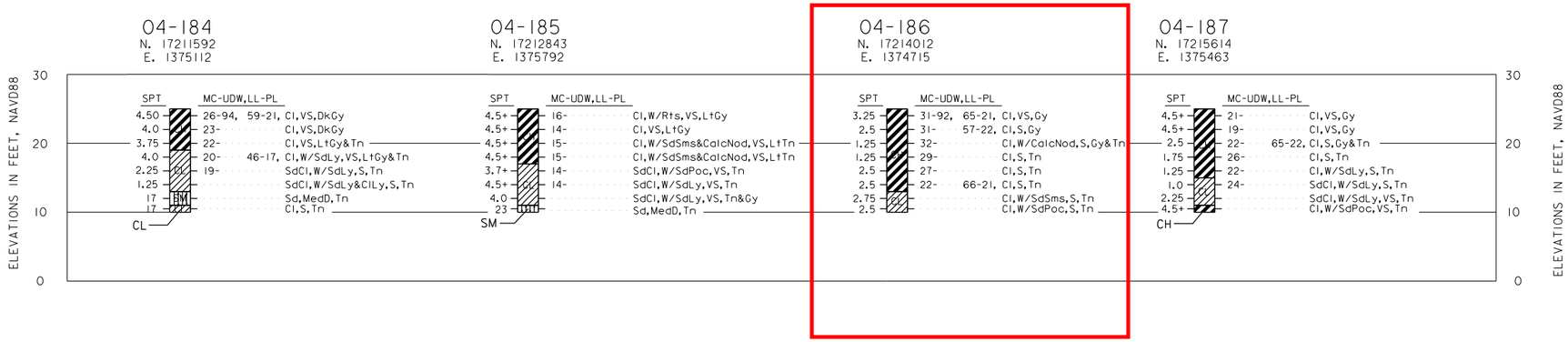
D_{90} = 0.17019

D_{100} = 0.16959

T_{90} = 210.31 min.

C_v @ T_{90}
0.00 ft.^{2}/day

PLACEMENT AREA NO. 14



NOTE:
SEE DRAWING C-2 FOR BORING LOCATIONS.

BORING NOTES;

1. SOILS HAVE BEEN CLASSIFIED IN ACCORDANCE WITH ASTM 2487-93 "CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (UNIFIED SOILS CLASSIFICATION SYSTEM)". CONSISTENCY OF SOILS SUCH AS SOFT, MEDIUM, HARD, LOOSE, DENSE, ETC., ARE RELATIVE TERMS BASED ON ESTIMATED UNDISTURBED SHEAR STRENGTH OF THE MATERIAL AS DETERMINED BY VISUAL CLASSIFICATION POCKET PENETROMETER TESTS AND PENETRATION RESISTANCE DURING SAMPLING.
2. FIGURES TO THE RIGHT OF BORING LOGS ARE WATER CONTENTS IN PERCENT OF THE DRY WEIGHT, DRY DENSITY, LIQUID LIMIT, PLASTIC LIMIT, AND BAR LINEAR SHRINKAGE. (MC-UDW),(LL-PL),(B.L.S.)* FIGURES TO THE LEFT OF BORING LOGS ARE BLOWS PER FOOT OF PENETRATION FROM STANDARD PENETRATION TESTING.
3. BORINGS WERE DRILLED USING WET ROTARY DRILLING TECHNIQUES AND UNDISTURBED SAMPLES WERE RECOVERED WITH A 3-INCH DIAMETER THIN WALL SAMPLER WHERE COHESIVE MATERIALS WERE ENCOUNTERED.WHERE COHESIONLESS MATERIALS WERE ENCOUNTERED, DISTURBED SAMPLES WERE TAKEN WITH A SPLIT SPOON SAMPLER DURING PERFORMANCE OF STANDARD PENETRATION TESTING.
4. WATER TABLE LEVELS SHOWN ON BORING LOGS WERE DETERMINED AFTER DRILLING BORINGS BY MEASURING THE TOP OF FLUID LEVELS IN THE BORINGS. INASMUCH AS WET ROTARY DRILLING TECHNIQUES AND DRILLING MUD WERE USED TO DRILL THE HOLES, THE LEVEL OF DRILLING FLUIDS IN THE BORE HOLES MAY NOT HAVE STABLILIZED TO THE LEVEL OF THE ACTUAL WATER TABLE. ADDITIONALLY, WATER TABLES IN THE FIELD ARE LIKELY TO FLUCTUATE DEPENDING ON WEATHER CONDITIONS. THEREFORE, SOME VARIATION SHOULD BE ANTICIPATED BETWEEN WATER TABLES INDICATED AND WATER TABLES ENCOUNTERED IN THE FIELD.

LABORATORY CLASSIFICATION

CH INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.

CL INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, LEAN CLAYS.
CL-ML OR ML-CL CLAY AND SILT MIXTURES WITH SLIGHT PLASTICITY

ML INORGANIC SILTS AND VERY FINE SANDS, WITH SLIGHT PLASTICITY.

SC CLAYEY SANDS, SAND-CLAY MIXTURES.
SC-SM SLIGHTLT SILTY AND CLAYEY SAND, SAND WITH SILTS AND CLAYS.

SM SILTY SANDS, SAND-SILT MIXTURES.

SP POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES.
SP-SM SLIGHTLY SILTY SANDS, SANDS WITH SOME SILTS.

VISUAL CLASSIFICATIONS:

Bn Brown(ish)	Gv Gravel(ly)	Si Silty
Calc Calcareous	H Hard	Sms Seams
Cl Clay(ey)	L Loose	So Soft
D Dense	Lt Light	Sta Stain(s)
Dk Dark	Med Medium	Tn Tan(nish)
Fer Ferrous	Nod Nodules	Tr Trace(s)
Fi Fine(s)	Poc Pocket(s)	V Very
F Firm	S Stiff	W With
Frag Fragment(s)	Sd Sand(y)	W.S. Water Surface
Gr Grained	Sh Shell(y)	
Gy Gray(ish)	Siks Slicken Sides	

SOLICITATION NO.
W912HY-
09-B-00

US Army Corps of Engineers
Galveston District

Rev.	Description	Date	By

TIME:$TIME$ DATE:$DATE$ BY:$USER$

Drawn by: P.N. Date: JULY, 2009 Rev. --
Designed by: R.B./J.D.
Checked by: W.M. Scale: AS SHOWN
Submitted by: LORIK THOMAS, P.E. Chief, Getech/Structure Section
Approval Recommended: HARRISON T. SUTCLIFFE, P.E. Chief, Engineering Branch
Approved by: PETE G. PEREZ, P.E. Chief, Engineering and Construction Division

U.S. ARMY ENGINEER DISTRICT, GALVESTON
CORPS OF ENGINEERS
GALVESTON, TEXAS

PREPARED UNDER THE DIRECTION OF
DAVID C. WESTON, COL., C.E.
DISTRICT COMMANDER

CORPUS CHRISTI SHIP CHANNEL, TEXAS
CHANNEL IMPROVEMENT PROJECT
LA QUINTA CHANNEL EXTENSION -
PLACEMENT AREA NO. 14

LOGS OF BORINGS P.A. NO.14,
BORING NOTES, & LEGEND

Drawing No.:
F-4
Sheet 8 of 13

File:$FILE$

File No. NUECES 803-334