VC-083 (PI)

Baseline Geotechnical Investigation

Vineyard Connector

800 North to I-15 American Fork

Program Management S-R399(38)

Utah County, Utah

6524

Prepared for:
HDR Engineering, Inc.
Utah Department of Transportation Region 3

November 2008

RB&G ENGINEERING, INC.

VINEYARD connector

November 24, 2008

RB&G
ENGINEERING, INC.

Bethany Shingleton, HDR
c/o Brian Atkinson, Horrocks Engineers
2162 West Grove Parkway
Suite 400
Pleasant Grove, UT 84062

Reference: Vineyard Connector Project No. S-R399(38)
Baseline Geotechnical Investigation

Dear Ms. Shingleton:

We have completed four additional borings and five CPT soundings to provide additional baseline subsurface information at proposed bridge sites throughout the Vineyard Connector project. Provided herewith are the results of these subsurface investigations and the related laboratory testing. Also included are the boring logs and laboratory test results for the three preliminary borings performed earlier this year, as well as data obtained from two borings and two CPT soundings performed at the proposed location of the Proctor Road bridge over I-15. The work at the Proctor Road site was initially scheduled as part of our work on the I-15 CORE project; however, it is our understanding that this bridge is now expected to be constructed during the Vineyard Connector project.

Provided below are descriptions of the methods and equipment used to complete the subsurface investigations and laboratory testing.

CPT SOUNDINGS AND INTERPRETATION

Cone Penetration Testing was performed and interpreted by ConeTec, Inc. The CPT work at the Proctor Road site was performed under the direction of IGES, Inc., and all other CPT testing was performed under the direction of RB&G Engineering, Inc.

TEST BORINGS

The borings referenced herein were completed using CME-55 and CME-75 drill rigs with tri-cone rock bits and NW casing used to advance the borings in shallow soils, and drilling mud used at greater depths. As noted on the boring logs, significant artesian conditions were encountered at some locations and depths.

Disturbed samples were obtained from the borings by driving a 2-inch split-spoon sampling tube into the soil using the automatic trip hammers on the drill rigs. Sampling performed using this method is referred to as the Standard Penetration Test (SPT). The energy delivered by each of these hammers was tested and evaluated by PDA Engineering, Inc. in September 2008. It was determined that the hammer on the 2008 CME-55 delivered an average of approximately 80 percent of the maximum theoretical energy of a standard SPT hammer. The hammer on the RB&G 1996 CME-55 (Referred to as "CME-55 No. 1" on the boring logs) had an average energy ratio of about 79 percent, and the hammer on the CME-55 operated by Bedke Geotechnical Field Services had an average energy ratio of 82 percent of the theoretical maximum.

The number of hammer blows required to drive the sampling spoon through each six inches of penetration is shown on the boring logs. The sum of the last two blow counts, which represents the number of blows to drive the sampling spoon through twelve inches, is defined as the standard penetration value. The standard penetration value, corrected for overburden and hammer energy, provides a good indication of the in-place density of sandy material; however, it only provides an indication of the relative stiffness of cohesive material, since the penetration resistance of materials of this type is a function of the moisture content. In addition to listing the uncorrected field blow counts for each six inches of penetration, the boring logs also show in parentheses the corrected sum of the blow counts over the last twelve inches. These blow counts are referred to as $(N_1)_{60}$ values, and have been corrected to a standard overburden pressure of one ton per square foot, and to a standard hammer energy ratio of 60 percent.

Considerable care must be exercised in interpreting the standard penetration value in gravelly-type soils, particularly where the size of granular particles exceeds the inside diameter of the sampling spoon. If the spoon can be driven through the full 18 inches with a reasonable sample recovery, the standard penetration value provides a good indication of the in-place density of gravelly-type material. For materials containing more than 35% gravel size particles, the density descriptions shown on the boring logs were developed based on correlations between relative density and standard penetration value for gravelly soils. A 2.5-inch diameter split spoon was occasionally used to sample gravelly soils, and all blow counts shown on the logs have been corrected to account for sampler size.

Relatively undisturbed samples were obtained from the borings by pushing thin-walled sampling tubes into the soil using the hydraulic pressure on the drill rig. These

Shelby tubes had inside diameters of 2.62 inches. The locations of these samples and the length of soil recovered are noted on the boring logs.

Sampling was typically performed at five-foot intervals in the upper 100 feet of each boring, and at five to ten-foot intervals below depths of 100 feet. In cases where undisturbed samples appeared to terminate in non-plastic or marginally-plastic soil, attempts were typically made to immediately follow the Shelby tube sample with an SPT sample to provide an indication of the material's in-place density.

Miniature vane shear (torvane) tests, which provide an indication of the undrained shearing strength of cohesive materials, were performed on samples of the cohesive soils during the field investigations. The results of these tests are shown on the boring logs as the torvane value in units of tons per square foot.

LABORATORY CLASSIFICATION AND TESTING

Each sample obtained in the field was classified in the laboratory according to the Unified Soil Classification System. The symbols designating soil types according to this system are presented on the boring logs. A description of the Unified Soil Classification System is included with the logs, and the meaning of the various symbols shown on the logs can be obtained from this figure. Laboratory-tested samples were also classified according to the AASHTO Classification System, and the symbols designating the soil types according to this system are also presented on the boring logs.

Laboratory tests performed during this investigation to define the characteristics of the subsurface material included:

- Mechanical Analysis
- Density
- Natural Moisture Content
- Atterberg Limits
- Unconfined Compressive Strength
- Triaxial Shear (CU and UU)
- Consolidation
- Direct Shear
- pH, Resistivity, Sulfates, and Chlorides

Soil samples used in consolidation testing measured 1.0 inch in height and 2.375 inches in diameter, and the consolidation devices were configured so as to permit drainage through porous stones at both top and bottom of each specimen. For

purposes of estimating the void ratio of consolidation samples, the specific gravity of the soil solids was assumed to equal 2.7.

Laboratory testing was performed in accordance with applicable standards published by the American Society for Testing and Materials (ASTM) and/or the American Association of State Highway and Transportation Officials (AASHTO).

All of the data contained in this report are also provided electronically on a compact disk that is included herewith. The raw CPT data and computations provided by ConeTec are also included on the CD. In addition, we have included a scanned pdf of a portion of the as-constructed drawings for the existing Proctor Road bridge over I-15, as well as scanned settlement records from the original construction of I-15 between American Fork and Orem.

We appreciate the opportunity of performing these investigations for use by UDOT Region 3, their Program Management team, and prospective Design-Builders. It should be noted that the scope of this investigation is not considered sufficient for final design and construction of the project, and it is anticipated that the selected Design-Builder will perform additional investigations in order to confirm and refine their design assumptions. Please contact us if there are questions regarding the information contained herein.

Sincerely,

RB&G ENGINEERING, INC.

S. Robert Johnson, P.E.

PROFESSIONAL ENGINEER
S. ROBERT JOHNSON
No. 5148753
STATE OF UTAH

Bradford E. Price, P.E.

REGISTERED PROFESSIONAL ENGINEER
NO.162291
BRADFORD E. PRICE
STATE OF UTAH

RB&G ENGINEERING, INC.

Overall Site Plan
Vineyard Connector Project

Site plans referenced above are presented on separate pages

RB&G ENGINEERING, INC.

Site Plan A - Approximate Test Hole Locations
Vineyard Connector Project

RB&G ENGINEERING, INC.

Site Plan B - Approximate Test Hole Locations

Vineyard Connector Project

RB&G ENGINEERING, INC.

Site Plan C - Approximate Test Hole Locations

Vineyard Connector Project

RB&G ENGINEERING, INC.

Site Plan D - Approximate Test Hole Locations
Vineyard Connector Project

RB&G ENGINEERING, INC.

Site Plan E - Approximate Test Hole Locations

Vineyard Connector Project

RB&G ENGINEERING, INC.

Site Plan F - Approximate Test Hole Locations
Vineyard Connector Project

Concrete Report

ConeTec, Inc.
Geotechnical and Environmental Site Investigation Contractors
3589 West 500 South, Suite 3, Salt Lake City, UT 84104 • PO Box 22082, Salt Lake City, UT 84103
Tel: (801) 973-3801 • Fax: (801) 973-3802 • Web: www.conetec.com • Email: saltlakecity@conetec.com

October 12, 2008 Job No.: 08-437

Mr. Brad Price
RB & G Engineering, Inc.
1435 West 820 North
Provo, UT 84601

Tel: (801) 374-5771
Fax: (801) 374-5773

Re: CPT Results
Vineyard Connector Highway
Utah County, Utah

Dear Brad,

Per your request, we have completed the CPT investigation for the above referenced project. Enclosed is one set of standard CPT plots, PPD plots, CPT interpretations, and a data CD. The CD contains the CPT data files and the PPD data files in ASCII text file format and in Microsoft Excel format. Due to the size of the files, the CPT interpretations are presented only in Excel format on the enclosed CD. In addition to the data files, we have included digital copies of the CPT and PPD plots in PDF format. The following table summarizes the work performed at the site.

Vineyard Connector Highway							
CPT Location	**CPT Filename**	**CPT Depth (ft)**	**PPD Depth (ft)**	**PPD Time (sec)**	**Ueq (ft)**	**Apparent Water Table (ft)**	**Comments**
CPT08-C1	437CP01	58.40	29.69	300	27.5	2.2	Refusal
CPT08-C2	437CP02	99.24	13.94	200	9.0	4.9	Refusal
CPT08-C3	437CP03	108.76	90.88	300	115.4	5.0	Refusal
CPT08-C4	437CP04	132.87	10.17	300	8.0	2.2	Refusal
CPT08-C5	437CP05	75.79	23.79	400	11.2	12.6	Refusal

Many correlations have been developed for design parameters based on CPT data. The interpretations are presented only as a guide for geotechnical use and should be carefully scrutinized for consideration in any geotechnical design.

Assumptions have been made regarding soil unit weights, groundwater level and interpretational methods, which may or may not apply to this site. Soil Behavior Type Classifications are based on non-normalized classifications based on values assigned to the specific soil behavior type zones outlined in the following table. The coordinates shown on the plots are for general locating purpose only.

Zone	SPT qt/N	Unit Wt. (kN/m^3)	Unit Wt. (pcf)	k (cm/s)	Description
0	1.0	19.5	124.1	$1x10^{-15}$	Undefined
1	2.0	12.5	79.6	$1x10^{-7}$	Sensitive Fines
2	1.0	17.5	111.4	$1x10^{-15}$	Organic Soil
3	1.0	17.5	111.4	$5x10^{-8}$	Clay
4	1.5	18.0	114.6	$5x10^{-7}$	Silty Clay
5	2.0	18.0	114.6	$5x10^{-6}$	Clayey Silt
6	2.5	18.0	114.6	$5x10^{-5}$	Silt
7	3.0	18.5	117.8	$5x10^{-4}$	Sandy Silt
8	4.0	19.0	120.9	$5x10^{-3}$	Silty Sand/Sand
9	5.0	19.5	124.1	$5x10^{-2}$	Sand
10	6.0	20.0	127.3	5	Gravelly Sand
11	1.0	20.5	130.5	$1x10^{-15}$	Stiff Fine Grained
12	2.0	19.0	120.9	$1x10^{-5}$	Cemented Sand

We appreciate the opportunity of providing these services to you. If you have any questions regarding the enclosed material or if, we can be of additional assistance, please contact us.

Sincerely,

ConeTec, Inc.

Shawn Steiner

Shawn D. Steiner, P.E.
Regional Manager

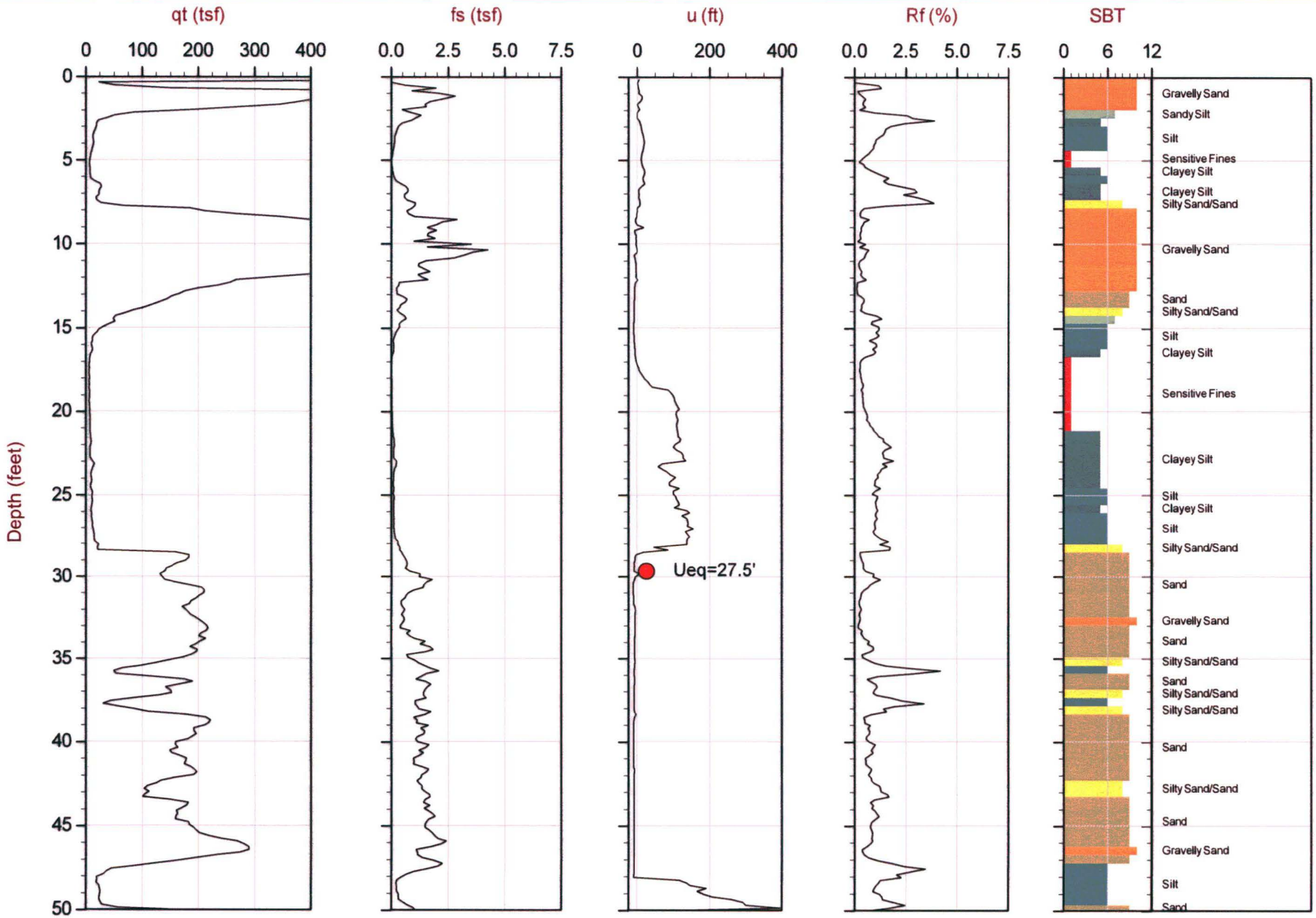
Enclosures

CONETEC

RB&G Engineering

Job No: 08-437
Date: 09:29:08 08:36
Site: VINEYARD CONNECTOR

Sounding: CPT08-C1
Cone: STD 20T AD146



Max Depth: 17.800 m / 58.40 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 437CP01.COR
Unit Wt: SBT Chart Soil Zones

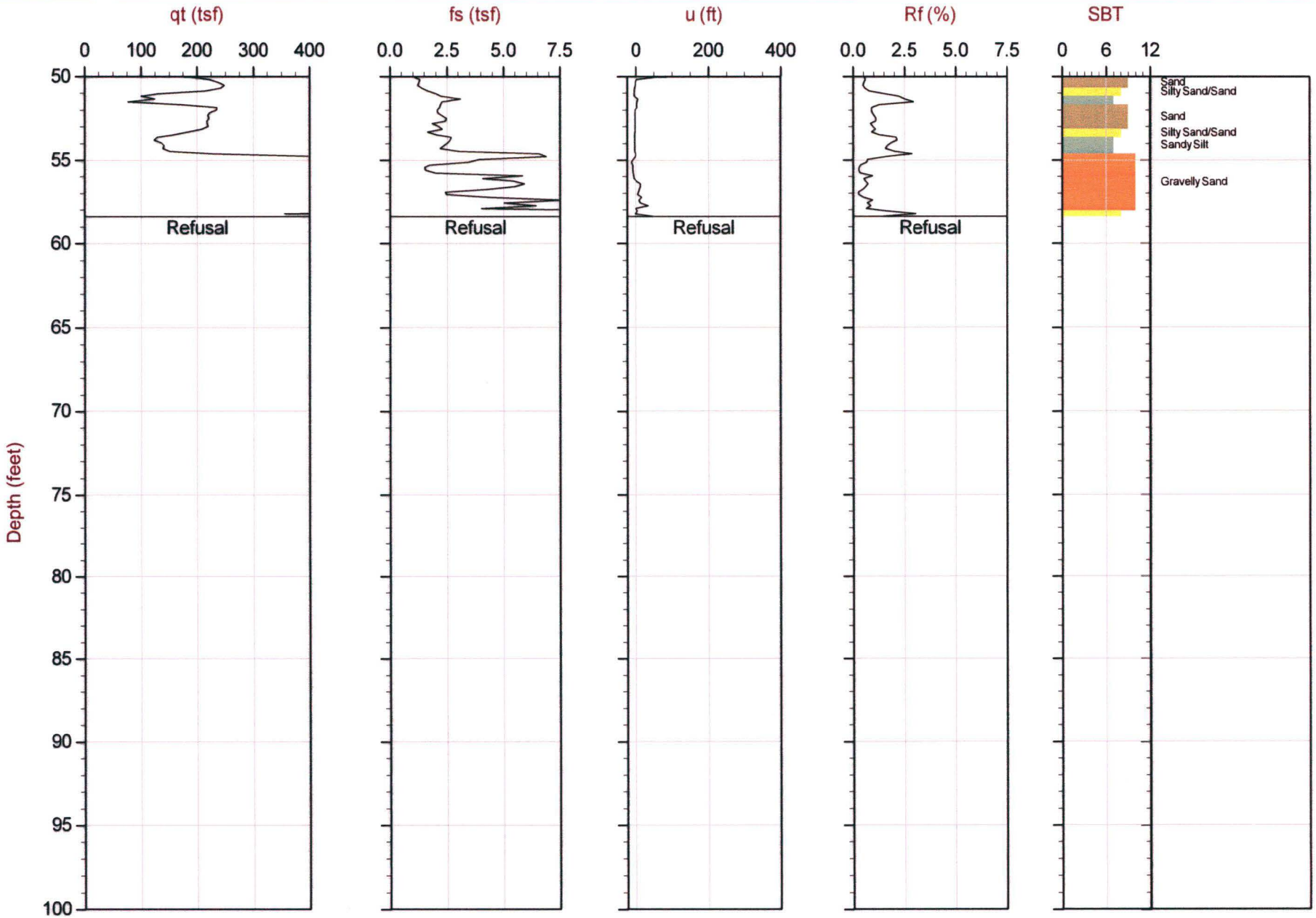
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N40.37543° Long: W111.82183°
● Equilibrium Pore Pressure from Dissipation

CONETEC

RB&G Engineering

Job No: 08-437
Date: 09:29:08 08:36
Site: VINEYARD CONNECTOR

Sounding: CPT08-C1
Cone: STD 20T AD146



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Avg Int: 0.150 m

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Unit Wt: SBT Chart Soil Zones

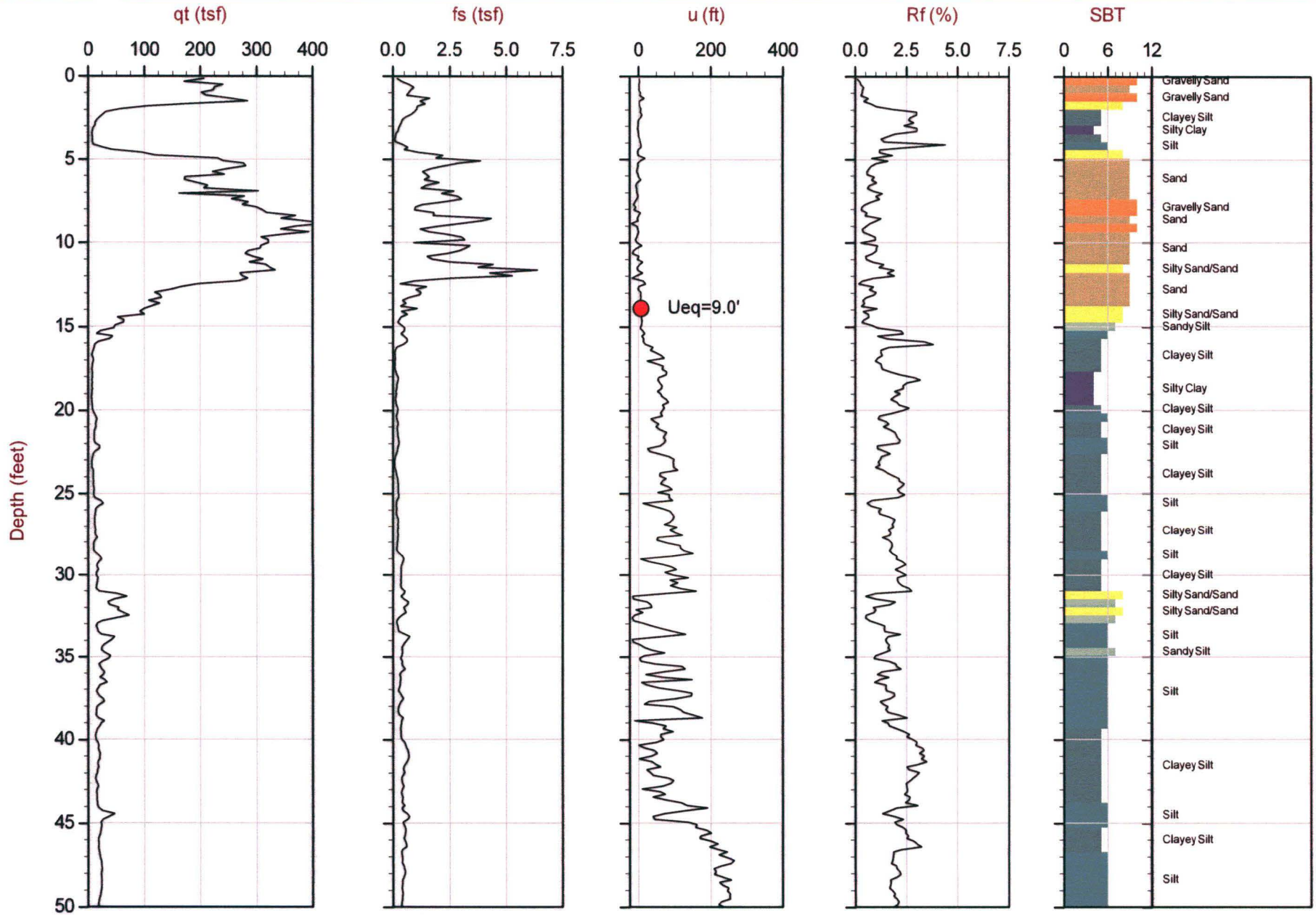
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N40.37543° Long: W111.82183°
● Equilibrium Pore Pressure from Dissipation

CONETEC

RB&G Engineering

Job No: 08-437
Date: 09:29:08 10:01
Site: VINEYARD CONNECTOR

Sounding: CPT08-C2
Cone: STD 20T AD146



Max Depth: 30.250 m / 99.24 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 437CP02.COR
Unit Wt: SBT Chart Soil Zones

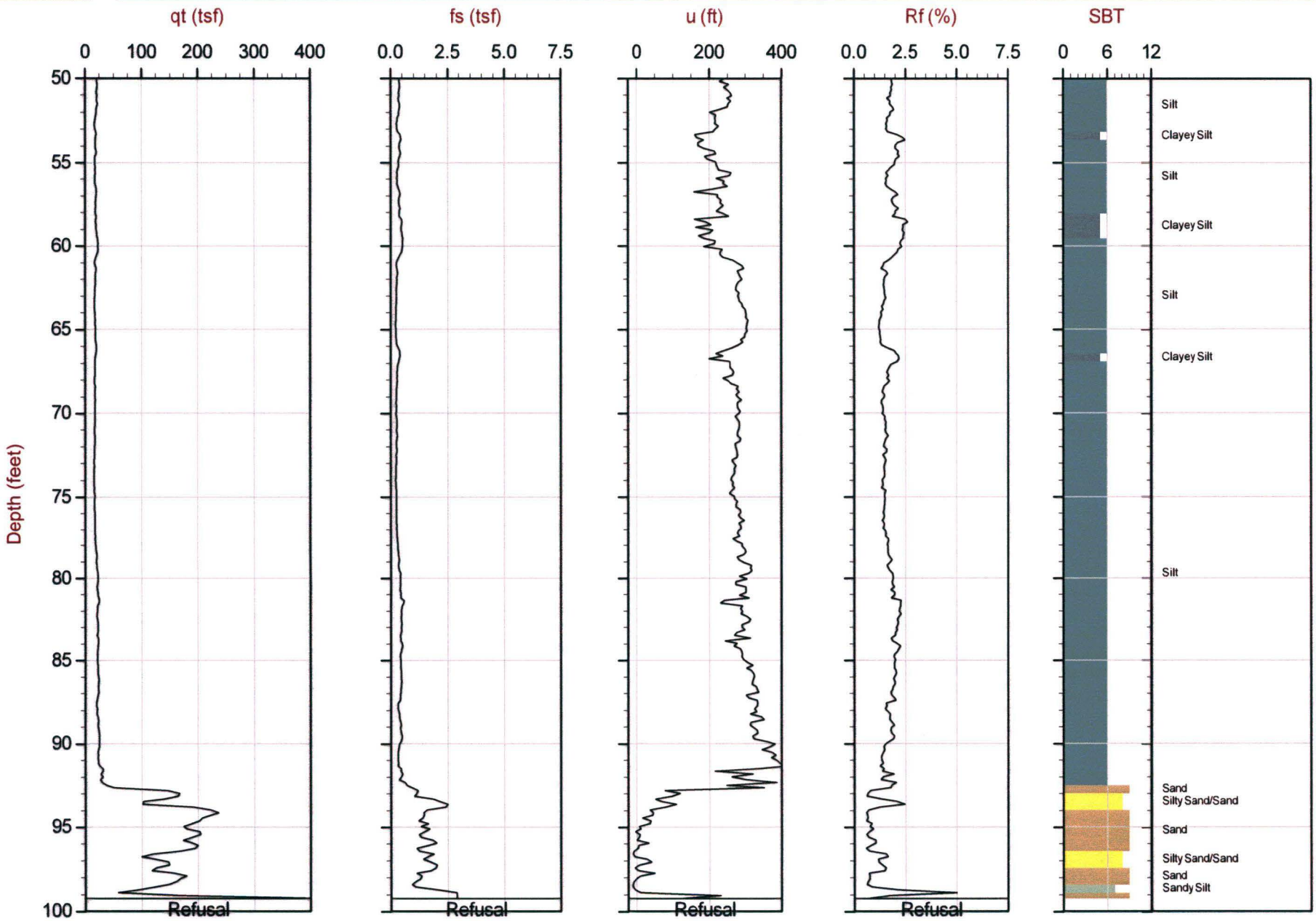
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N40.35431° Long: W111.78557°
● Equilibrium Pore Pressure from Dissipation

CONETEC

RB&G Engineering

Job No: 08-437
Date: 09:29:08 10:01
Site: VINEYARD CONNECTOR

Sounding: CPT08-C2
Cone: STD 20T AD146



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Avg Int: 0.150 m

File: 437CP02.COR
Unit Wt: SBT Chart Soil Zones

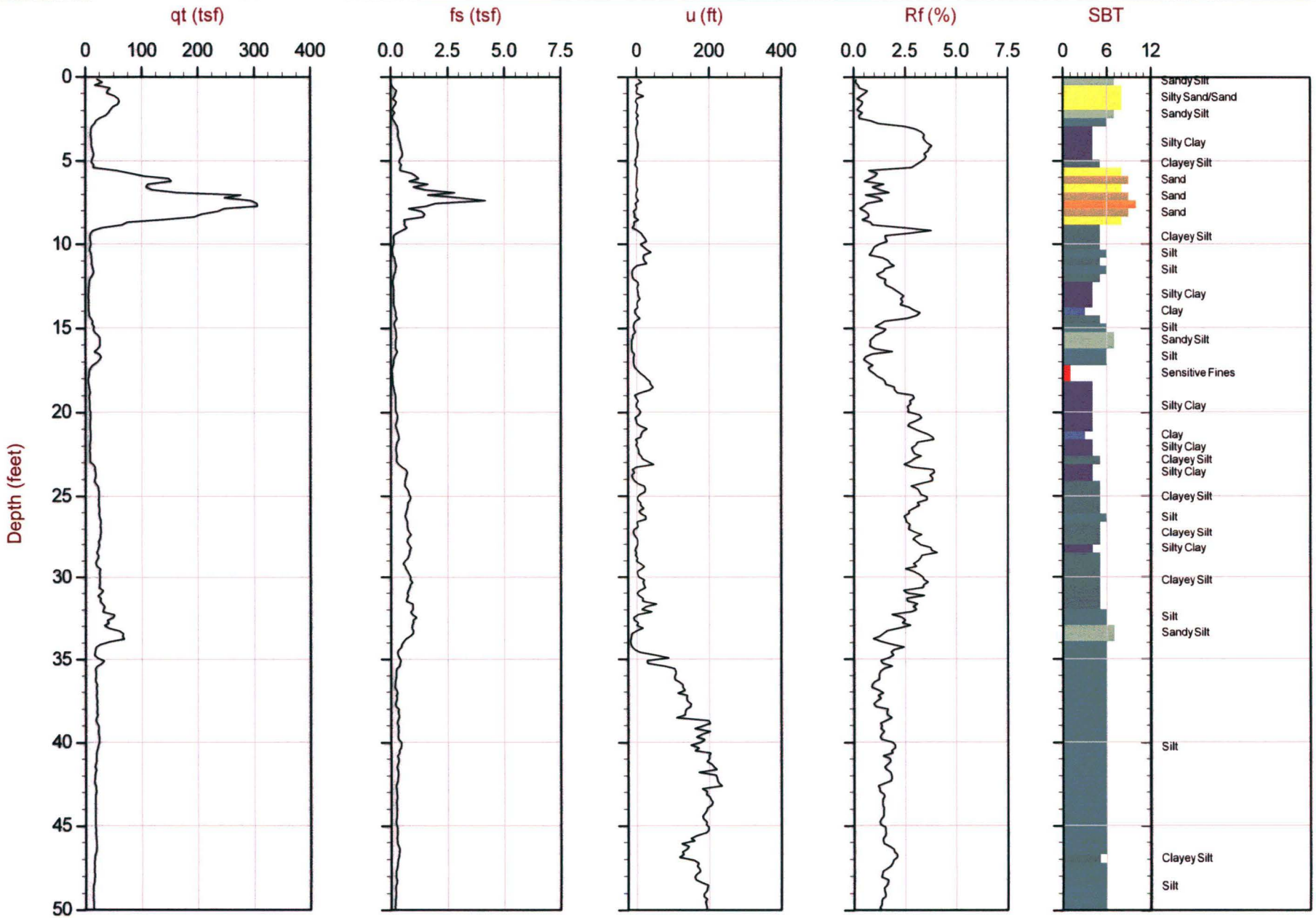
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N40.35431° Long: W111.78557°
● Equilibrium Pore Pressure from Dissipation

CONETEC

RB&G Engineering

Job No: 08-437
Date: 09:29:08 11:37
Site: VINEYARD CONNECTOR

Sounding: CPT08-C3
Cone: STD 20T AD146



Max Depth: 33.150 m / 108.76 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 437CP03.COR
Unit Wt: SBT Chart Soil Zones

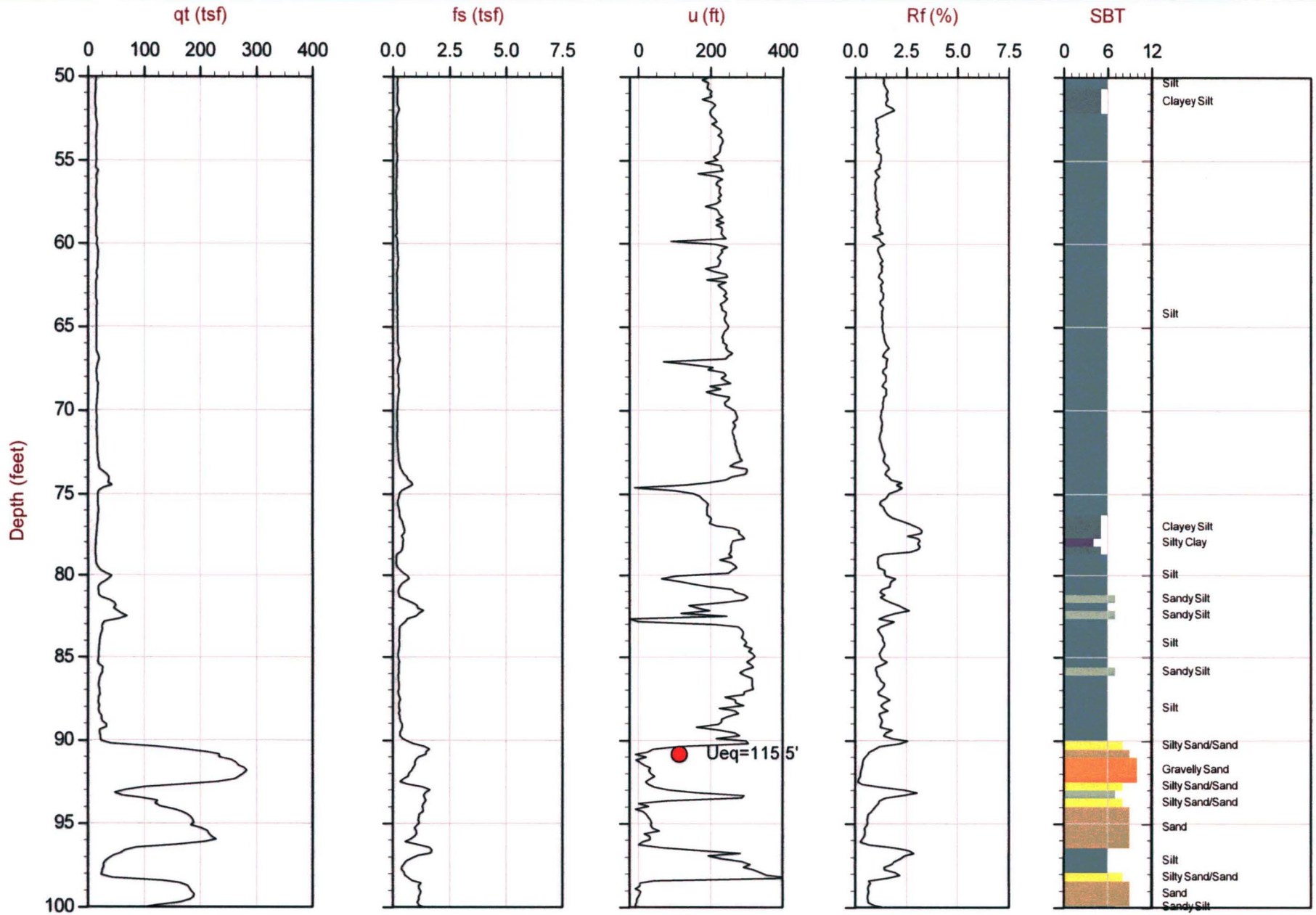
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N40.34753° Long: W111.77905°
● Equilibrium Pore Pressure from Dissipation

CONETEC

RB&G Engineering

Job No: 08-437
Date: 09:29:08 11:37
Site: VINEYARD CONNECTOR

Sounding: CPT08-C3
Cone: STD 20T AD146



Max Depth: 33.150 m / 108.76 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 437CP03.COR
Unit Wt: SBT Chart Soil Zones

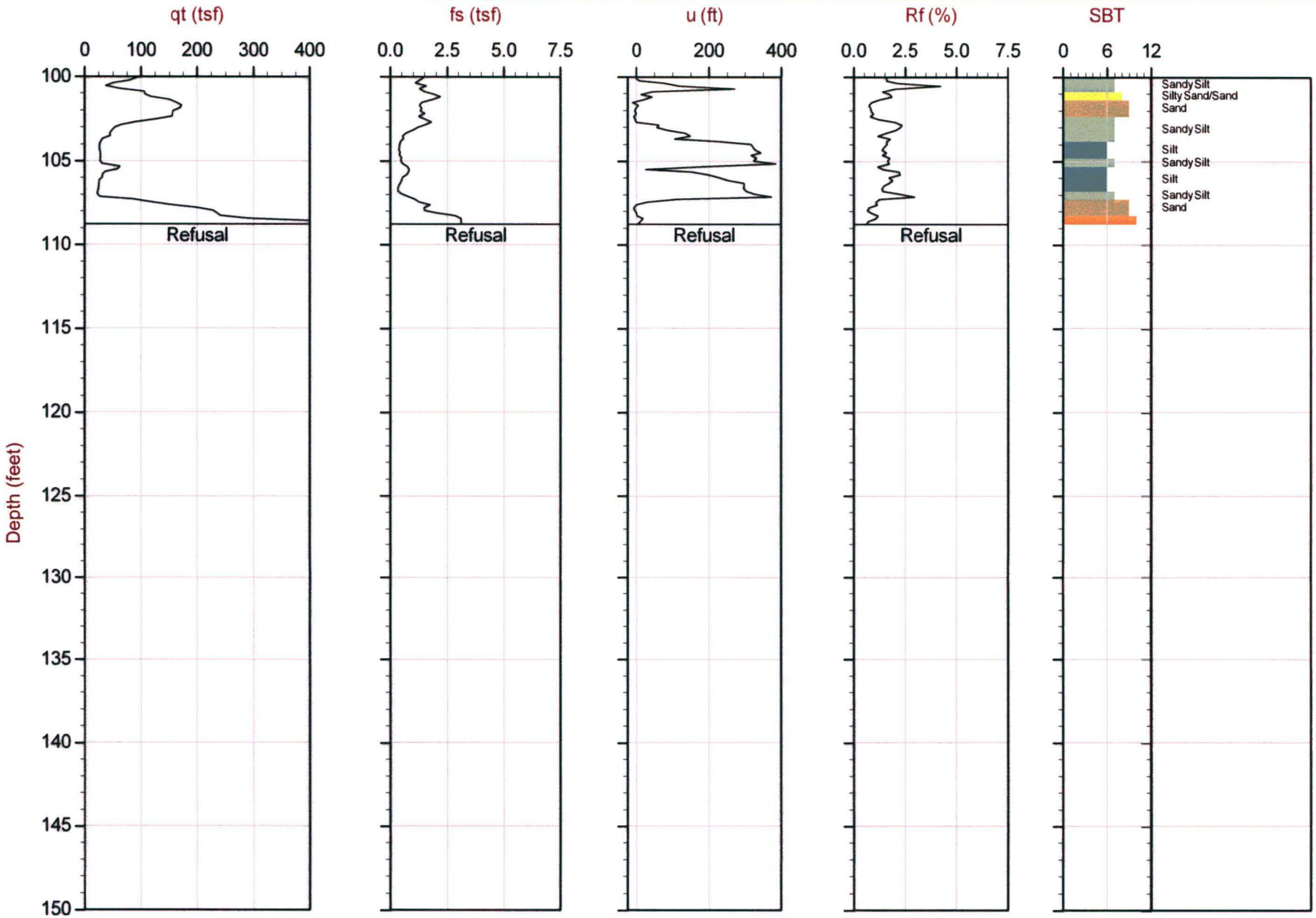
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N40.34753° Long: W111.77905°
● Equilibrium Pore Pressure from Dissipation

CONETEC

RB&G Engineering

Job No: 08-437
Date: 09:29:08 11:37
Site: VINEYARD CONNECTOR

Sounding: CPT08-C3
Cone: STD 20T AD146



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Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

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Unit Wt: SBT Chart Soil Zones

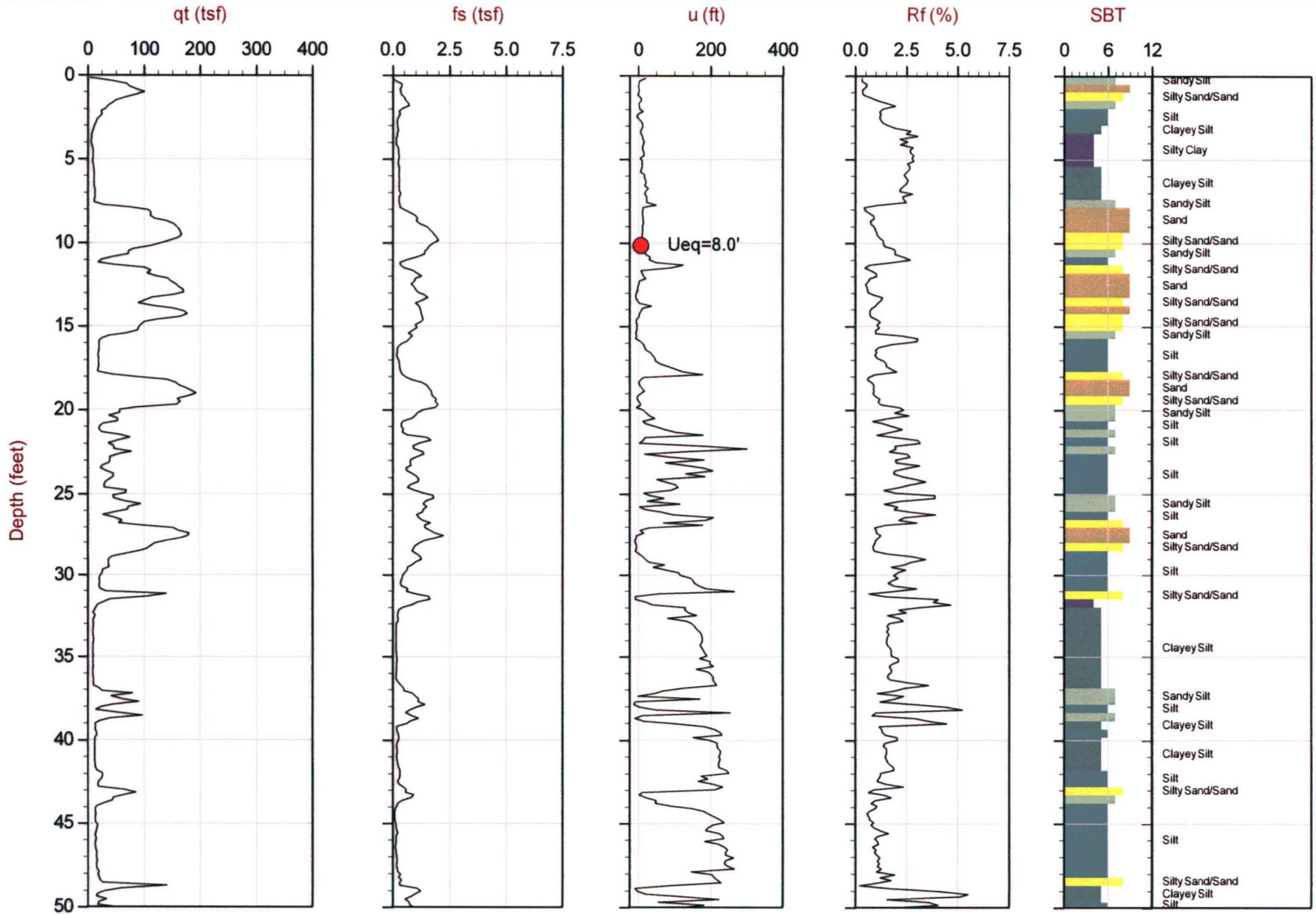
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N40.34753° Long: W111.77905°
● Equilibrium Pore Pressure from Dissipation

CONETEC

RB&G Engineering

Job No: 08-437
Date: 09:29:08 13:12
Site: VINEYARD CONNECTOR

Sounding: CPT08-C4
Cone: STD 20T AD146



Max Depth: 40.500 m / 132.87 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 437CP04.COR
Unit Wt: SBT Chart Soil Zones

SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N40.32788° Long: W111.75963°

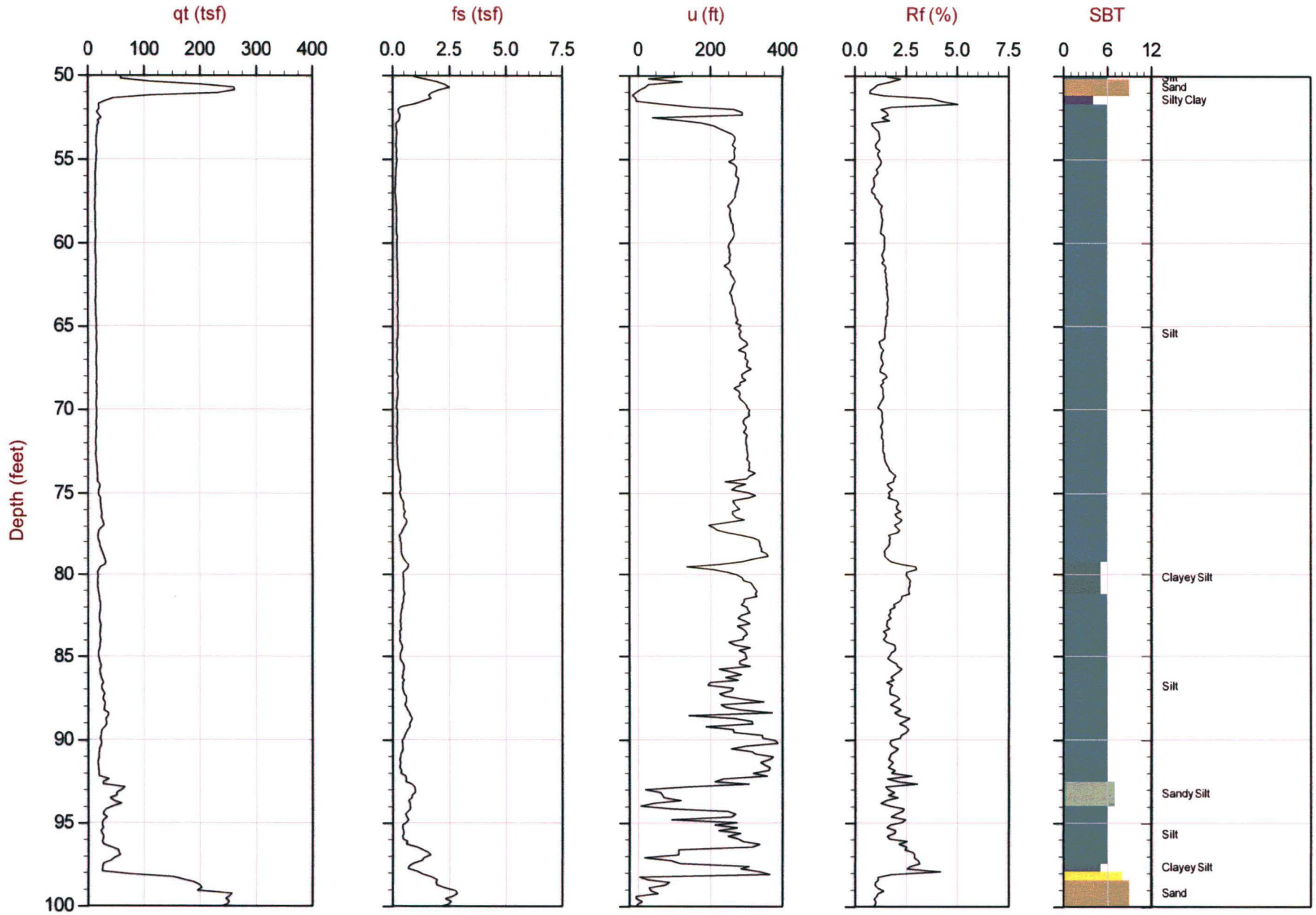
● Equilibrium Pore Pressure from Dissipation

CONETEC

RB&G Engineering

Job No: 08-437
Date: 09:29:08 13:12
Site: VINEYARD CONNECTOR

Sounding: CPT08-C4
Cone: STD 20T AD146



Max Depth: 40.500 m / 132.87 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 437CP04.COR
Unit Wt: SBT Chart Soil Zones

SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N40.32788° Long: W111.75963°

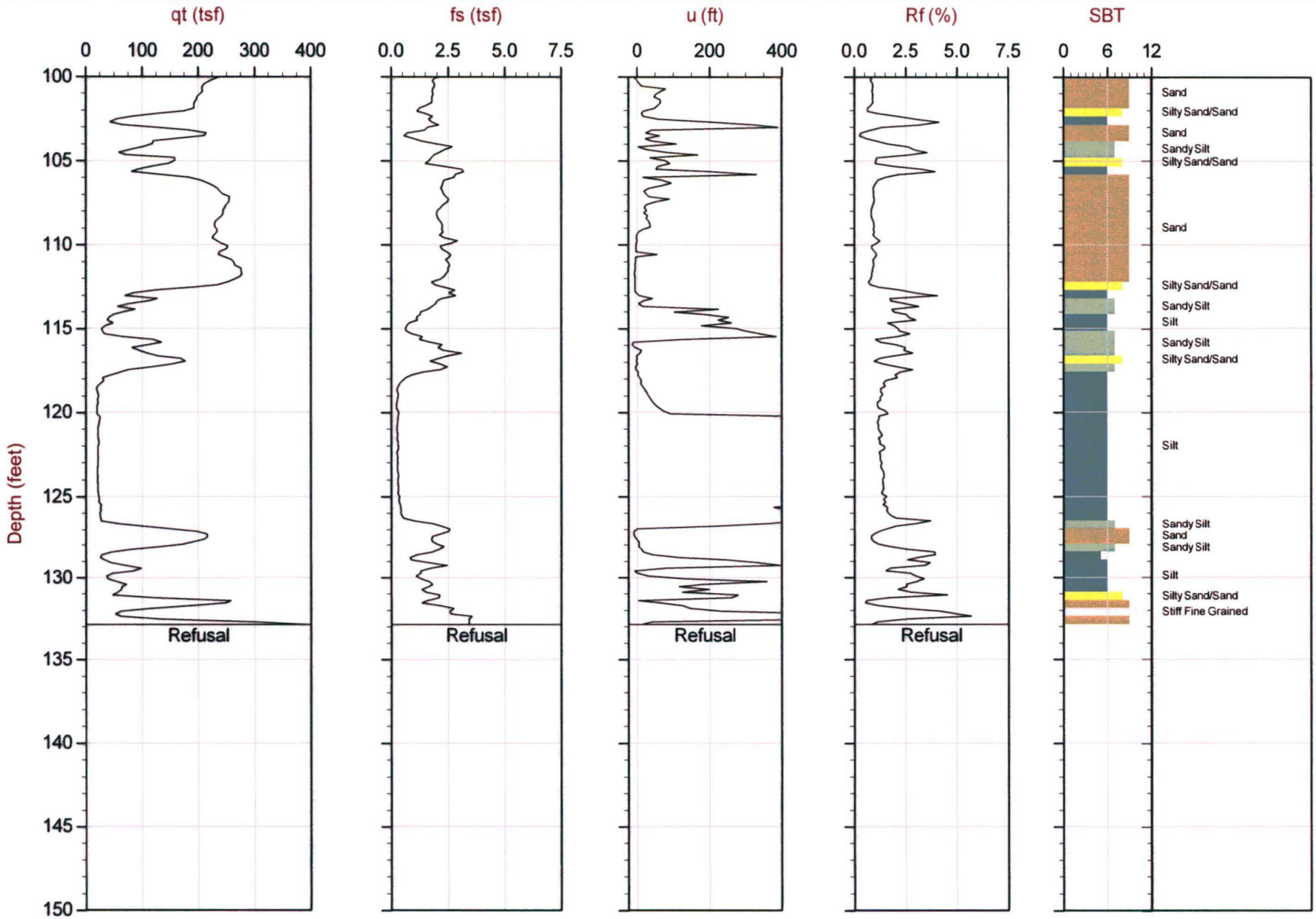
● Equilibrium Pore Pressure from Dissipation

CONETEC

RB&G Engineering

Job No: 08-437
Date: 09:29:08 13:12
Site: VINEYARD CONNECTOR

Sounding: CPT08-C4
Cone: STD 20T AD146



Max Depth: 40.500 m / 132.87 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 437CP04.COR
Unit Wt: SBT Chart Soil Zones

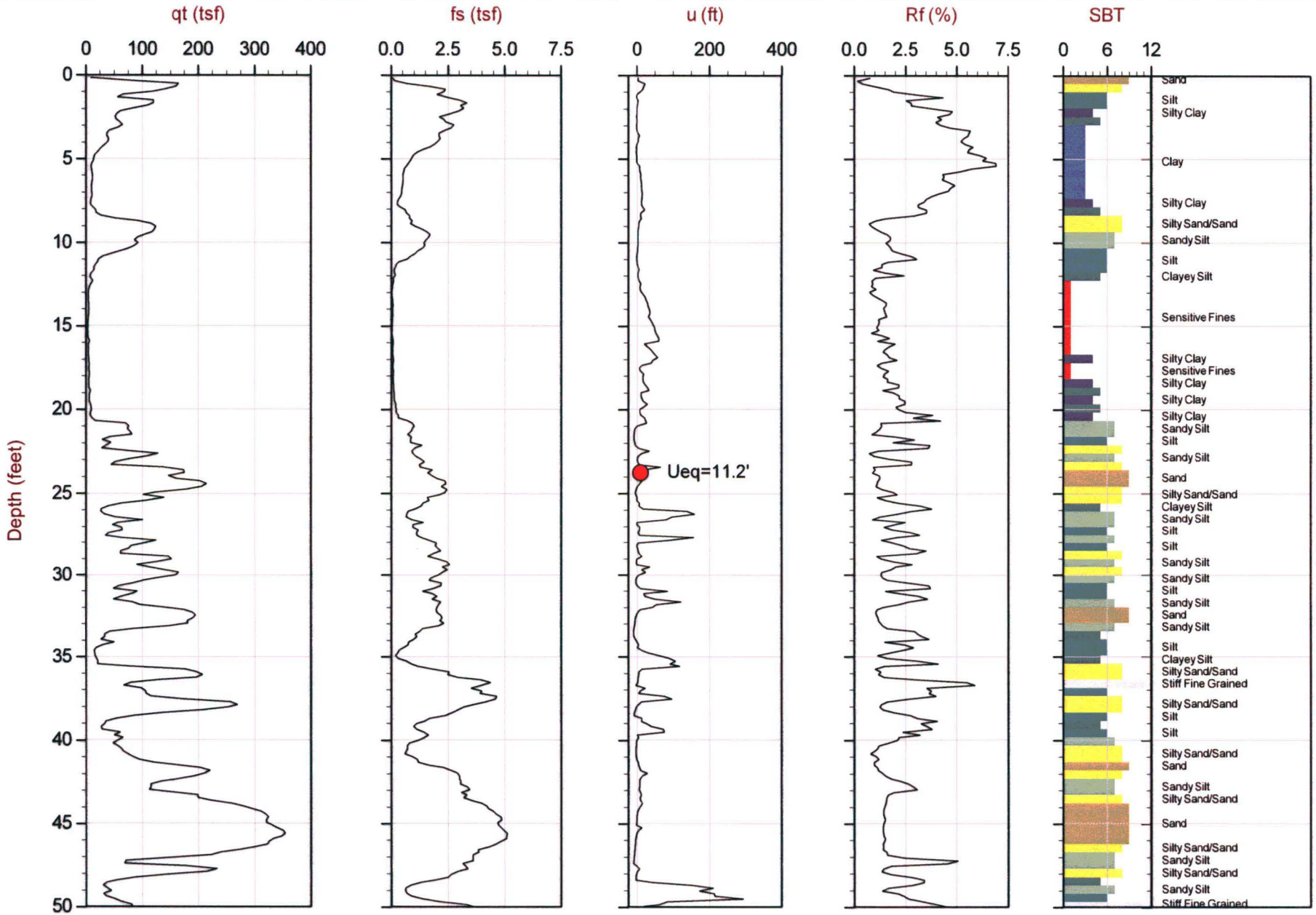
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N40.32788° Long: W111.75963°
● Equilibrium Pore Pressure from Dissipation

CONETEC

RB&G Engineering

Job No: 08-437
Date: 09:29:08 14:51
Site: VINEYARD CONNECTOR

Sounding: CPT08-C5
Cone: STD 20T AD146



Max Depth: 23.100 m / 75.79 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 437CP05.COR
Unit Wt: SBT Chart Soil Zones

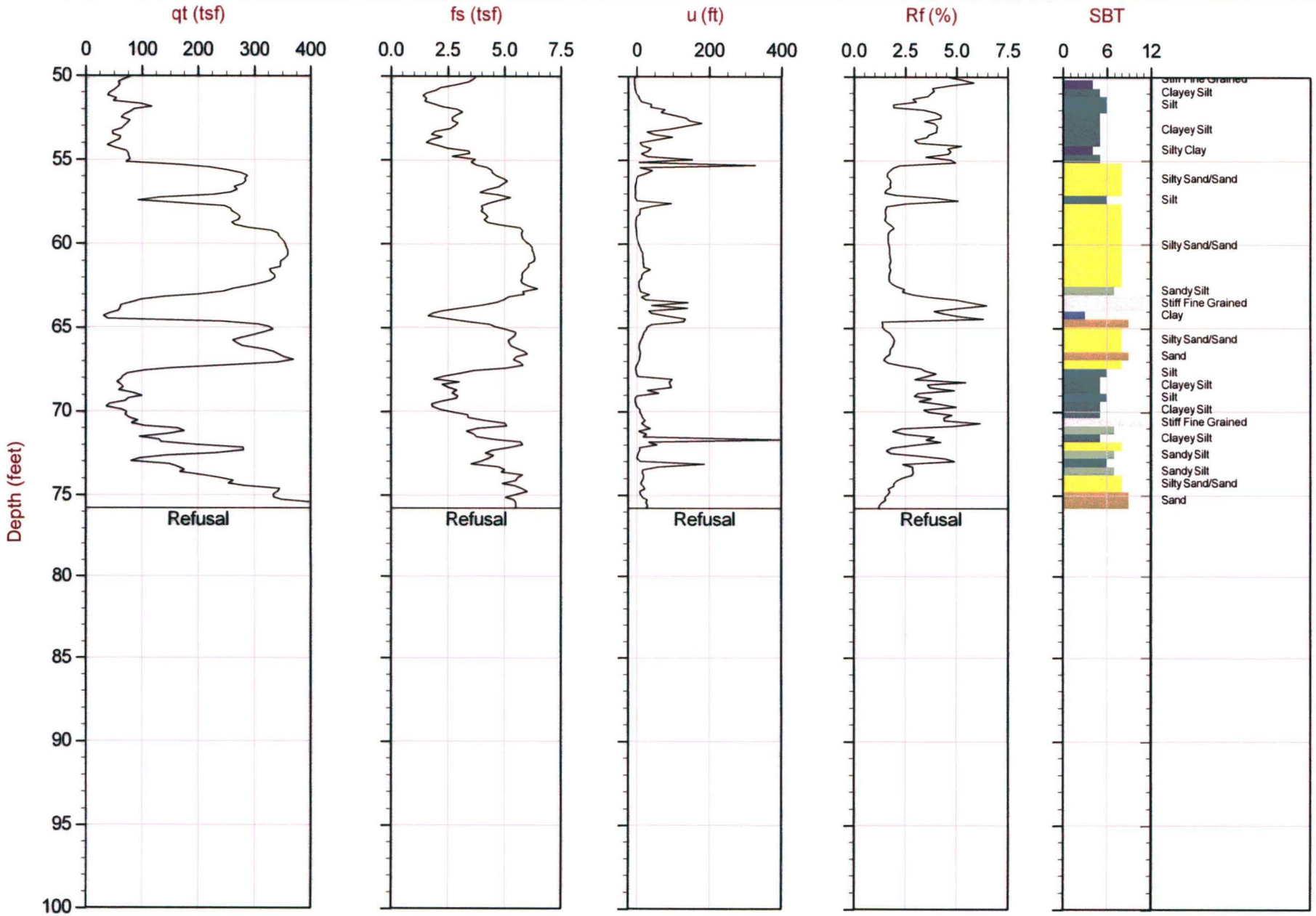
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N40.31070° Long: W111.74879°
● Equilibrium Pore Pressure from Dissipation

CONETEC

RB&G Engineering

Job No: 08-437
Date: 09:29:08 14:51
Site: VINEYARD CONNECTOR

Sounding: CPT08-C5
Cone: STD 20T AD146



Max Depth: 23.100 m / 75.79 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 437CP05.COR
Unit Wt: SBT Chart Soil Zones

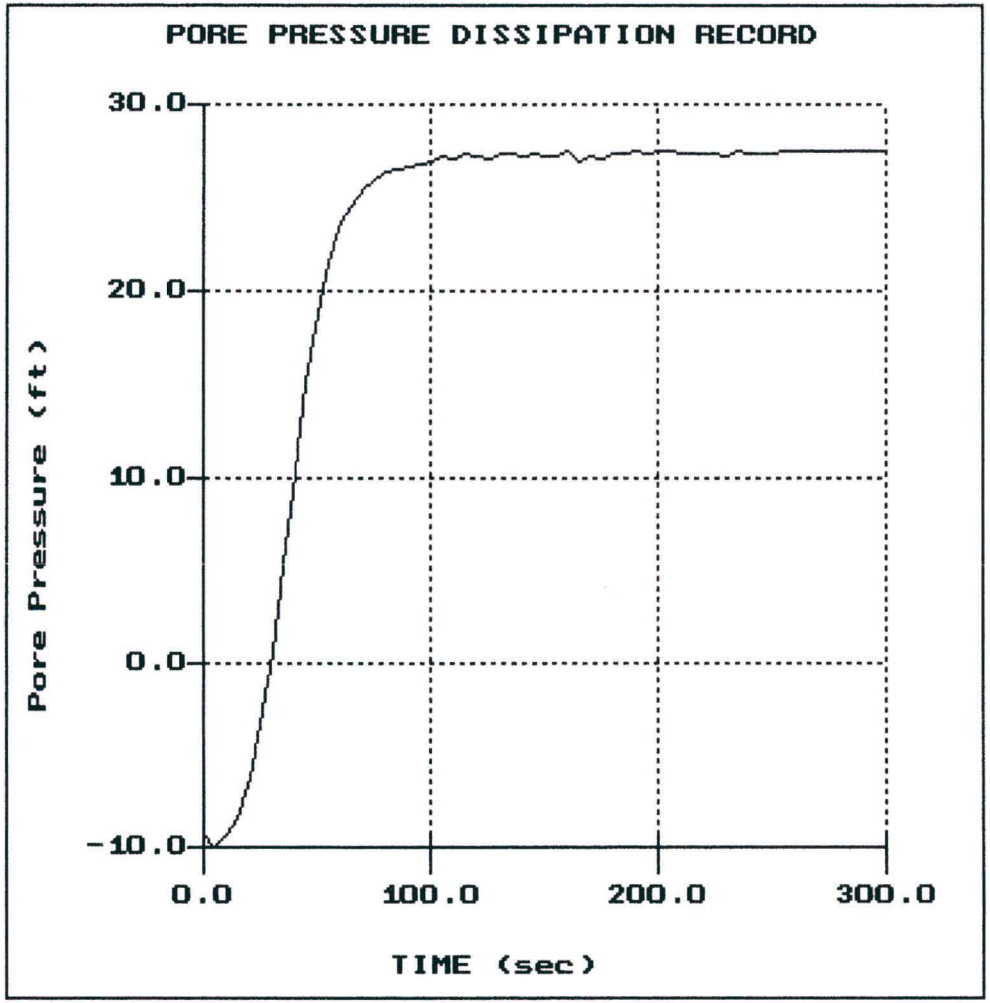
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N40.31070° Long: W111.74879°

● Equilibrium Pore Pressure from Dissipation

RB&G Engineering

Sounding: CPT08-C1
Site:VINEYARD CON.

Cone:STD 20T AD146
Date:09:29:08 08:36

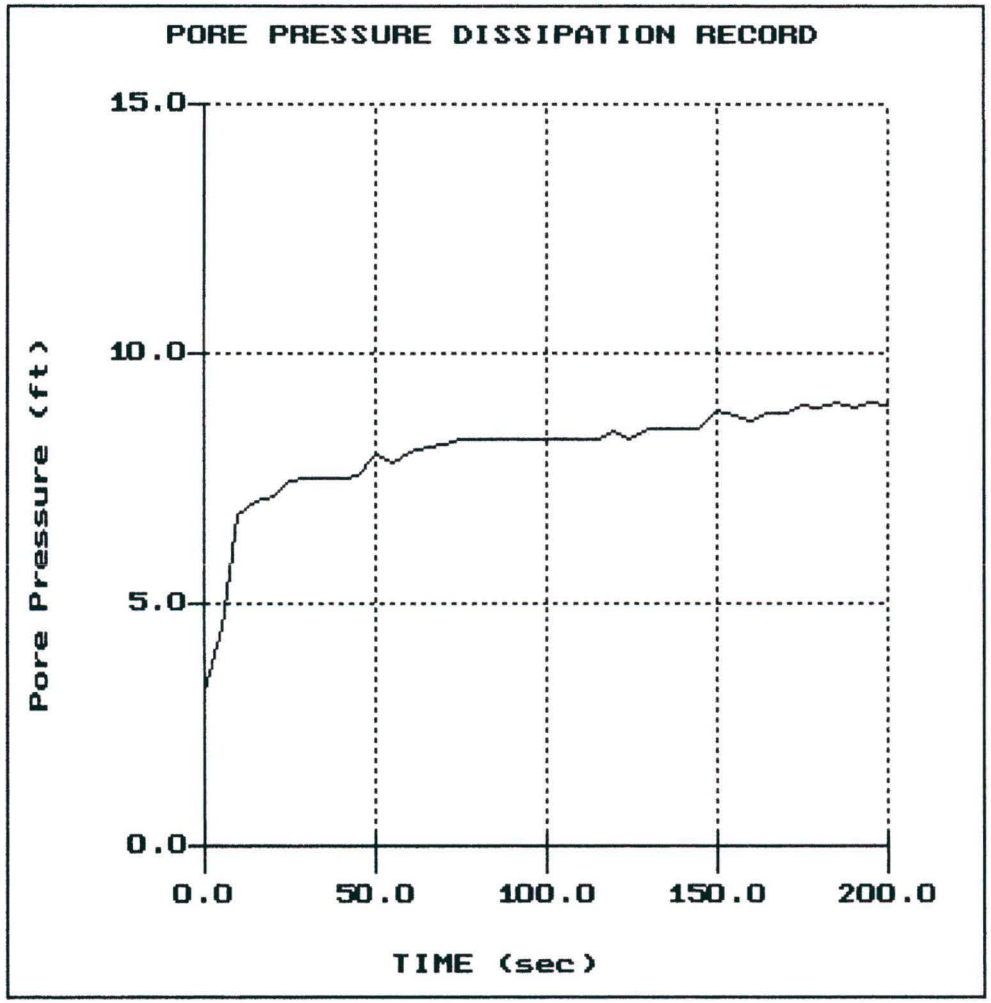


File: 437CP01.PPD
Depth (m): 9.05
(ft): 29.69
Duration : 300.0s
U-min: -10.00 5.0s
U-max: 27.50 300.0s

RB&G Engineering

Sounding: CPT08-C2
Site:VINEYARD CON.

Cone:STD 20T AD146
Date:09:29:08 10:01



File: 437CP02.PPD
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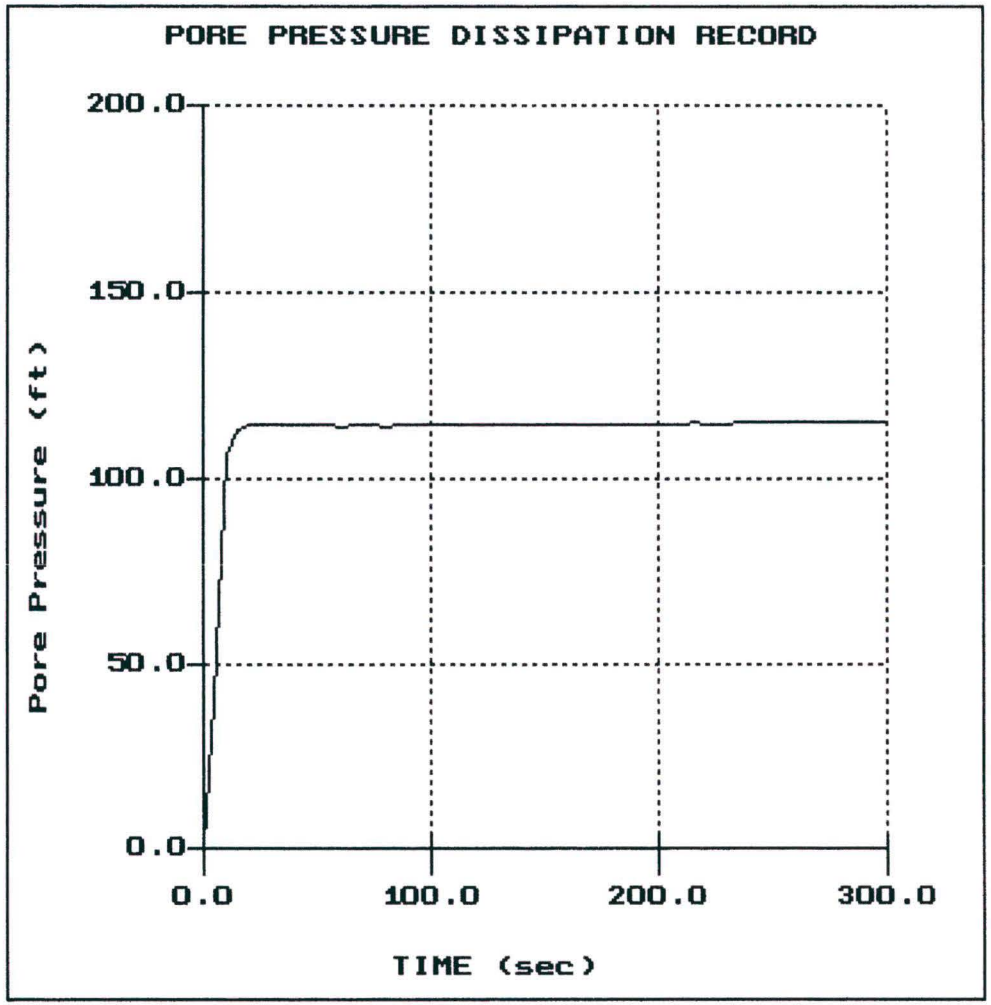
(ft): 13.94
Duration : 210.0s
U-min: 3.19 0.0s
U-max: 9.01 210.0s

RB&G Engineering

Sounding: CPT08-C3
Site:VINEYARD CON.

Cone:STD 20T AD146
Date:09:29:08 11:37

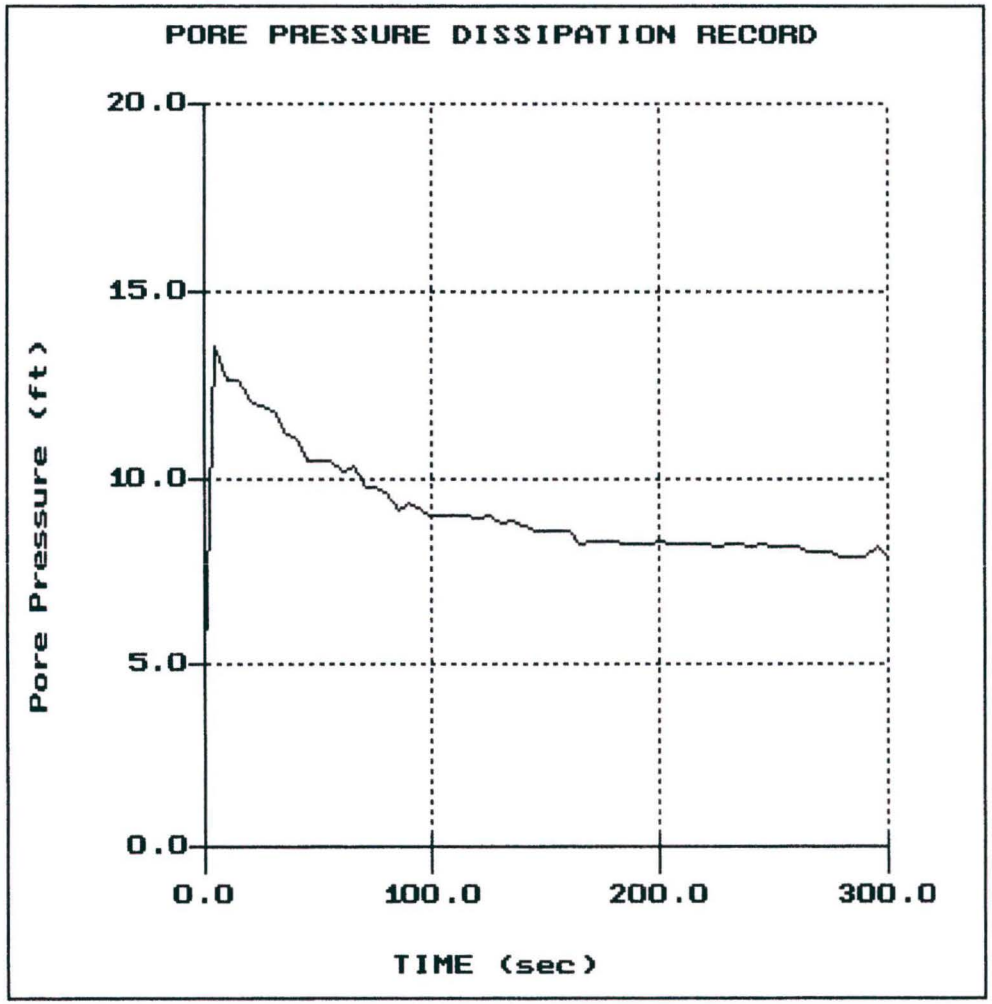


File: 437CP03.PPD
Depth (m): 27.70
(ft): 90.88
Duration : 300.0s
U-min: -13.33 0.0s
U-max: 115.44 280.0s

RB&G Engineering

Sounding: CPT08-C4
Site:VINEYARD CON.

Cone:STD 20T AD146
Date:09:29:08 13:12

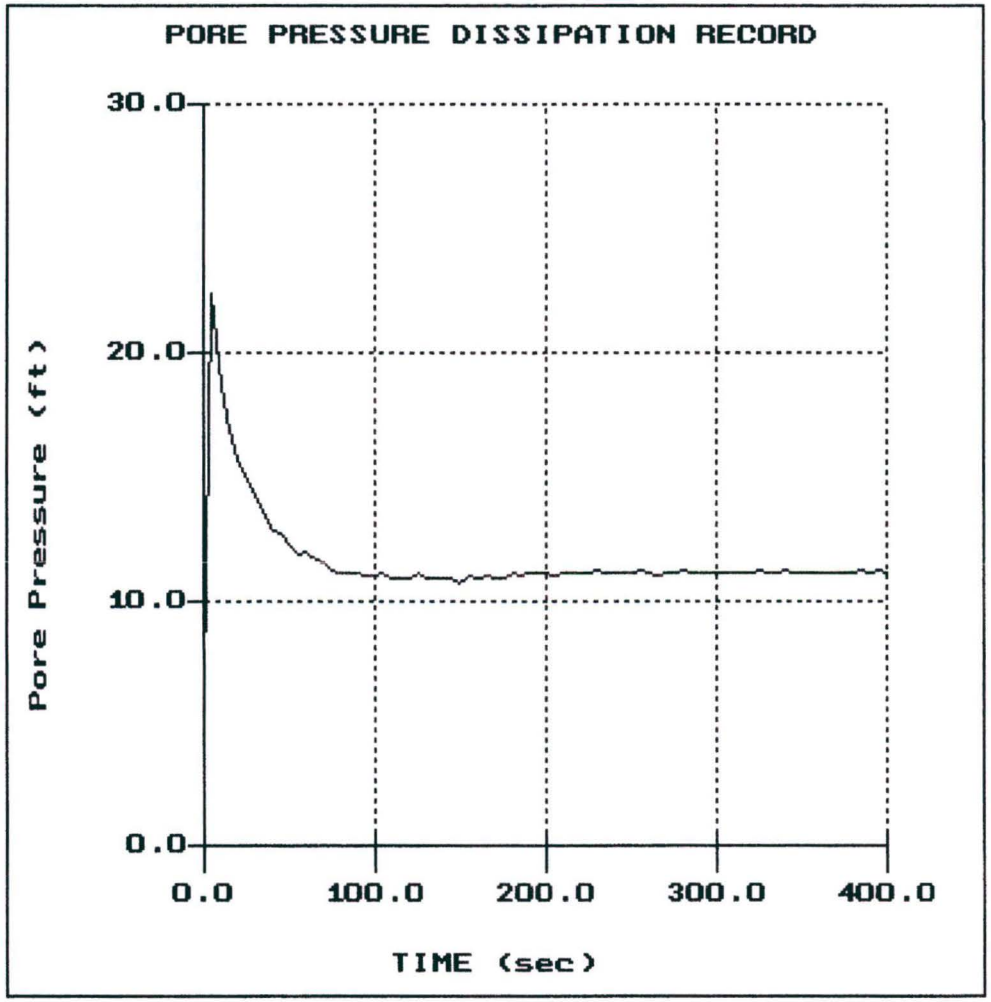


File: 437CP04.PPD
Depth (m): 3.10
(ft): 10.17
Duration : 300.0s
U-min: 4.88 0.0s
U-max: 13.52 5.0s

RB&G Engineering

Sounding: CPT08-C5
Site:VINEYARD CON.

Cone:STD 20T AD146
Date:09:29:08 14:51



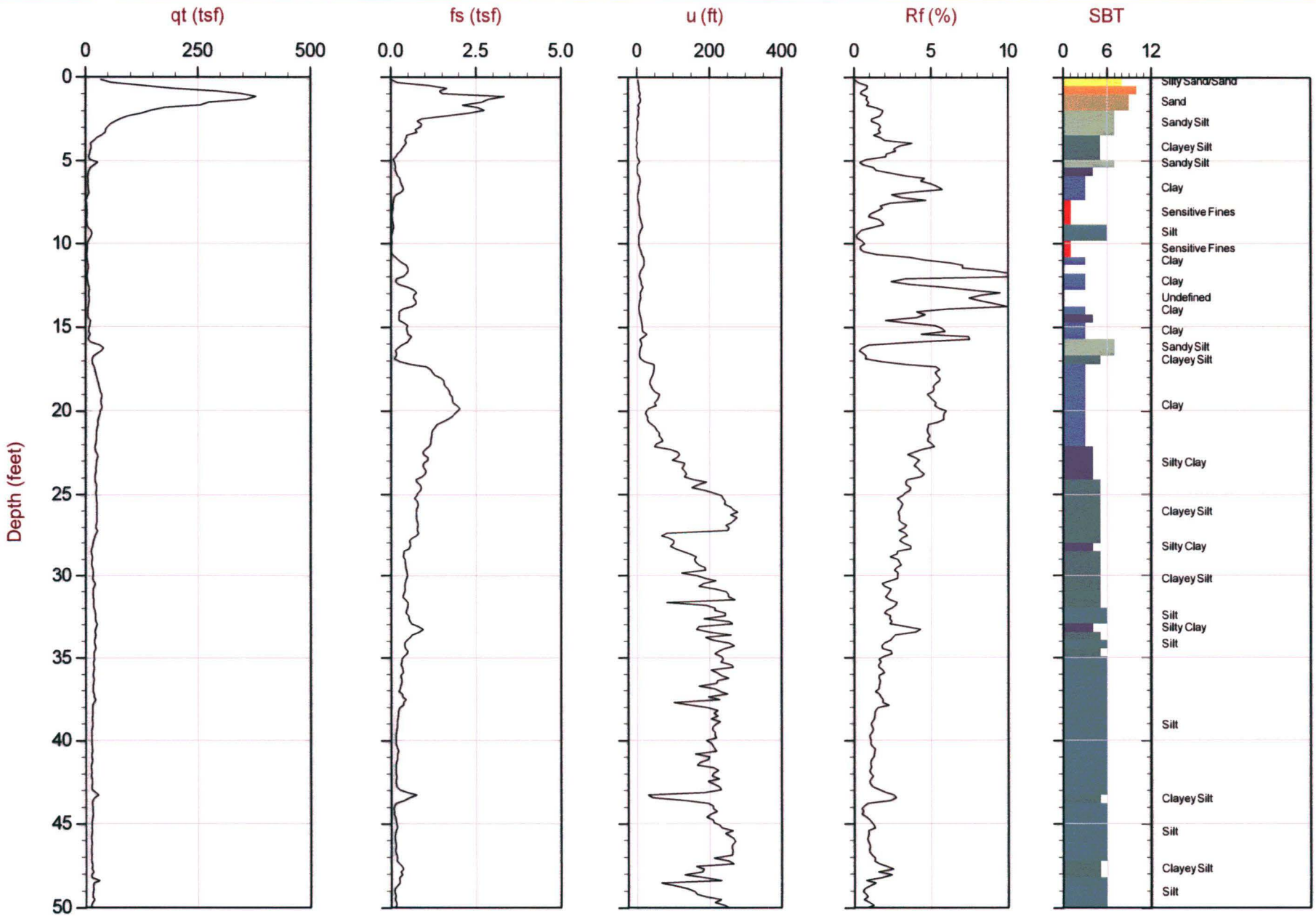
File: 437CP05.PPD
Depth (m): 7.25
(ft): 23.79
Duration : 400.0s
U-min: 5.96 0.0s
U-max: 22.43 5.0s

CONETEC

IGES

Job No: 08-419
Date: 08:05:08 12:44
Site: I-15

Sounding: 08-PG2-C1
Cone: STD 20T AD242



Max Depth: 30.500 m / 100.06 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 419CP04.COR
Unit Wt: SBT Chart Soil Zones

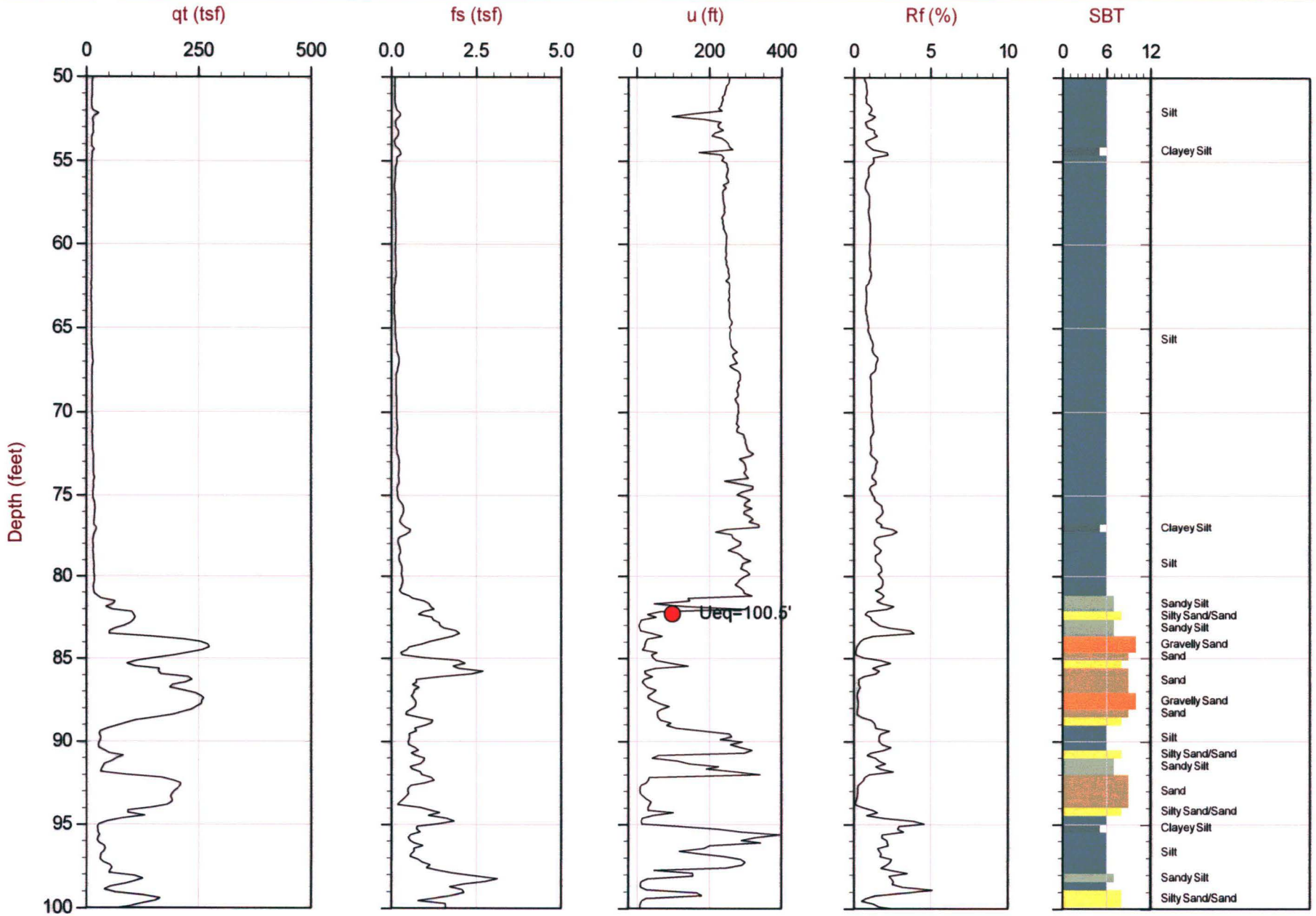
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N 40.34490° Long: W 111.75999°
● Equilibrium Pore Pressure from Dissipation

CONETEC

IGES

Job No: 08-419
Date: 08:05:08 12:44
Site: I-15

Sounding: 08-PG2-C1
Cone: STD 20T AD242



Max Depth: 30.500 m / 100.06 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 419CP04.COR
Unit Wt: SBT Chart Soil Zones

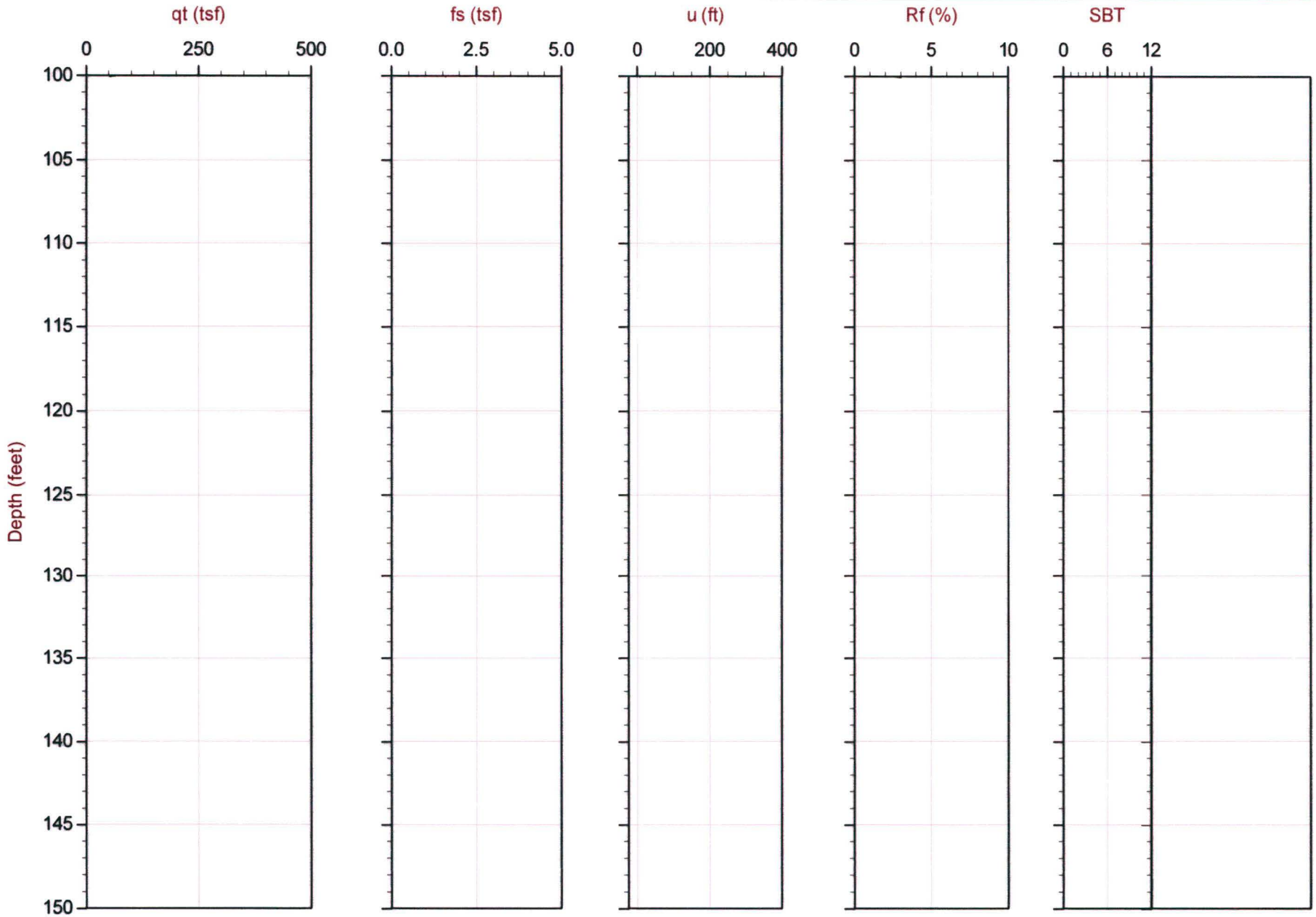
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N 40.34490° Long: W 111.75999°
● Equilibrium Pore Pressure from Dissipation

CONETEC

IGES

Job No: 08-419
Date: 08:05:08 12:44
Site: I-15

Sounding: 08-PG2-C1
Cone: STD 20T AD242



Max Depth: 30.500 m / 100.06 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 419CP04.COR
Unit Wt: SBT Chart Soil Zones

SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N 40.34490° Long: W 111.75999°

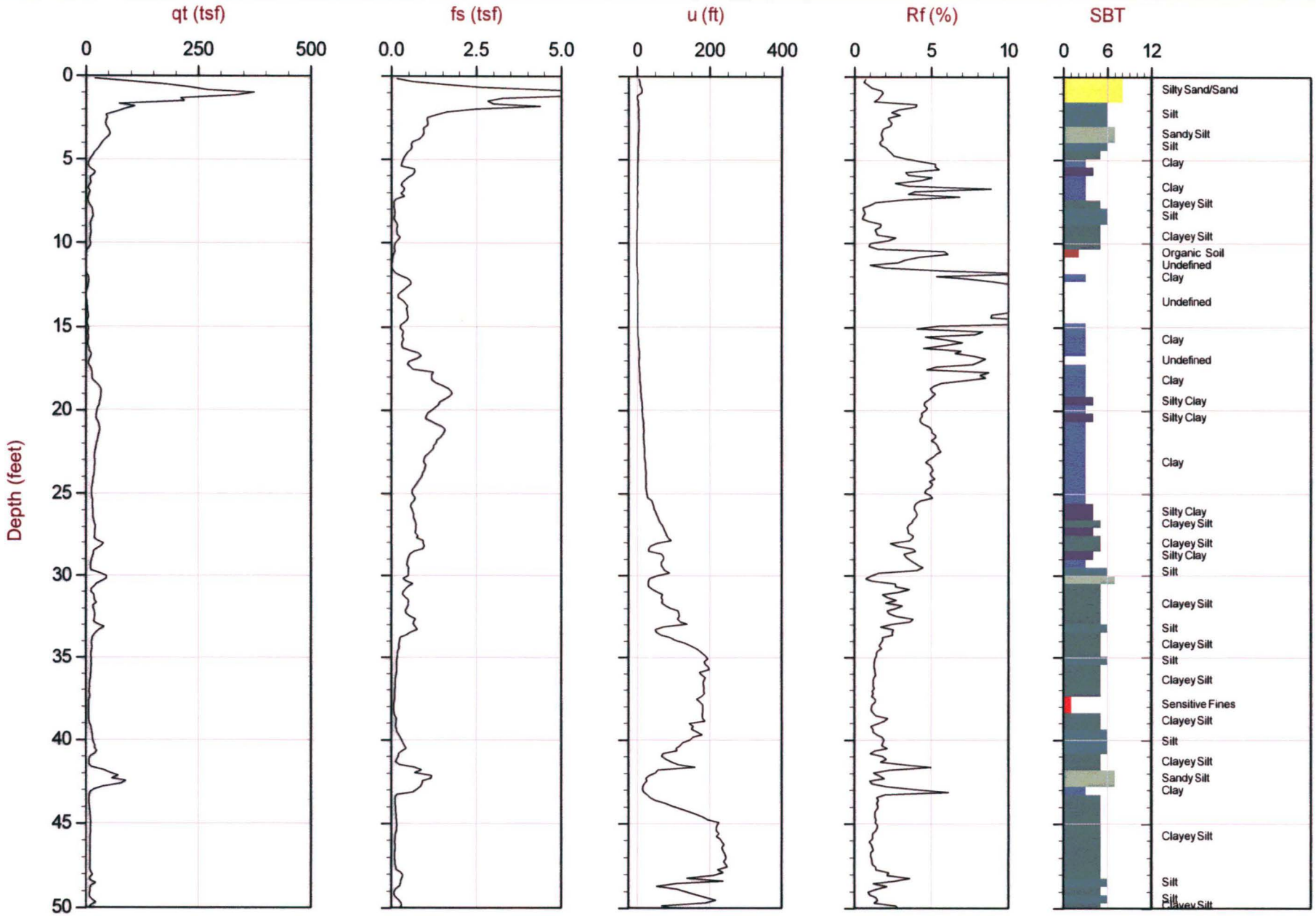
● Equilibrium Pore Pressure from Dissipation

CONETEC

IGES

Job No: 08-419
Date: 08:05:08 11:17
Site: I-15

Sounding: 08-PG2-C2
Cone: STD 20T AD242



Max Depth: 30.500 m / 100.06 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 419CP03.COR
Unit Wt: SBT Chart Soil Zones

SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N 40.34412° Long: W 111.76065°

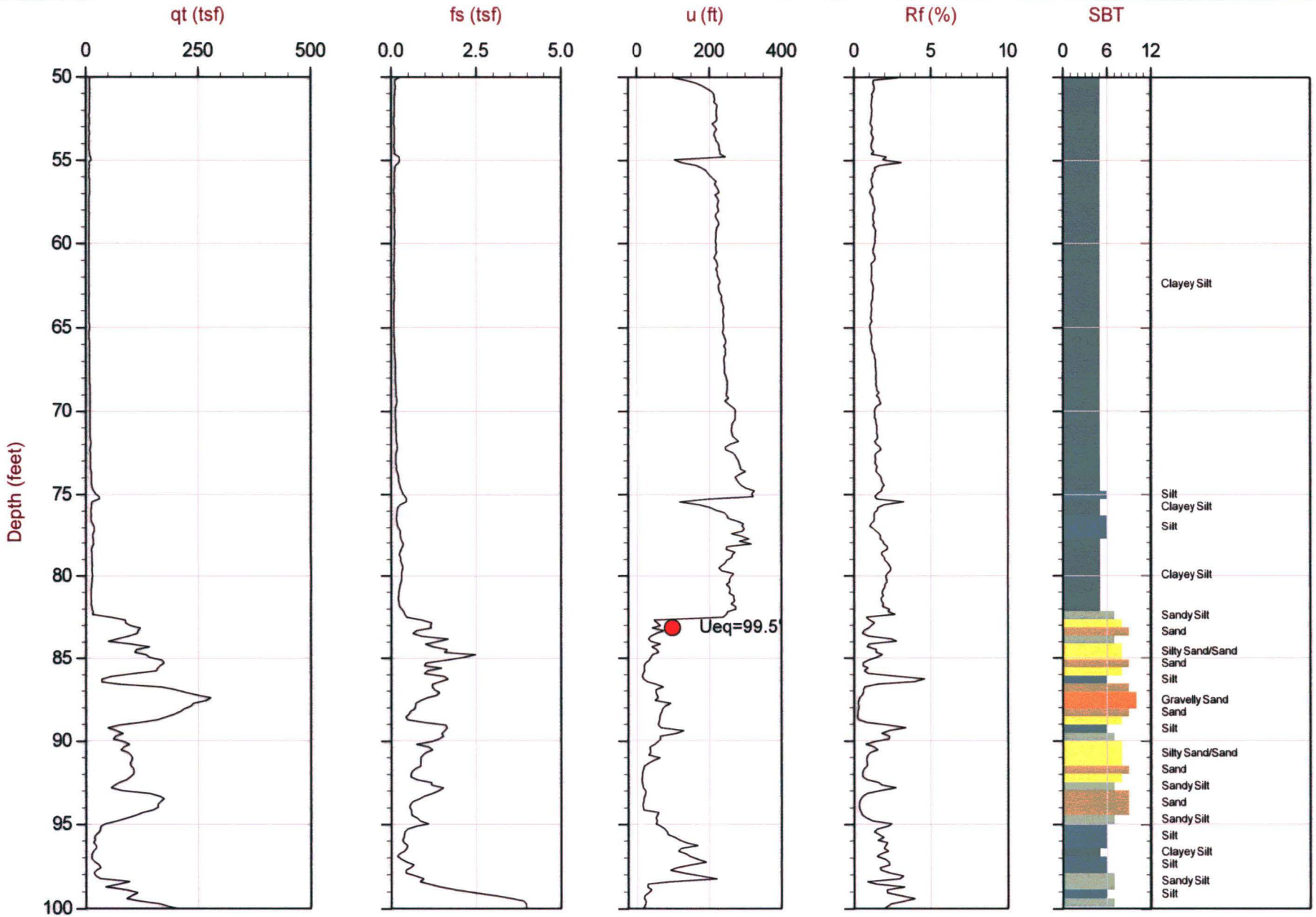
● Equilibrium Pore Pressure from Dissipation

CONETEC

IGES

Job No: 08-419
Date: 08:05:08 11:17
Site: I-15

Sounding: 08-PG2-C2
Cone: STD 20T AD242



Max Depth: 30.500 m / 100.06 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 419CP03.COR
Unit Wt: SBT Chart Soil Zones

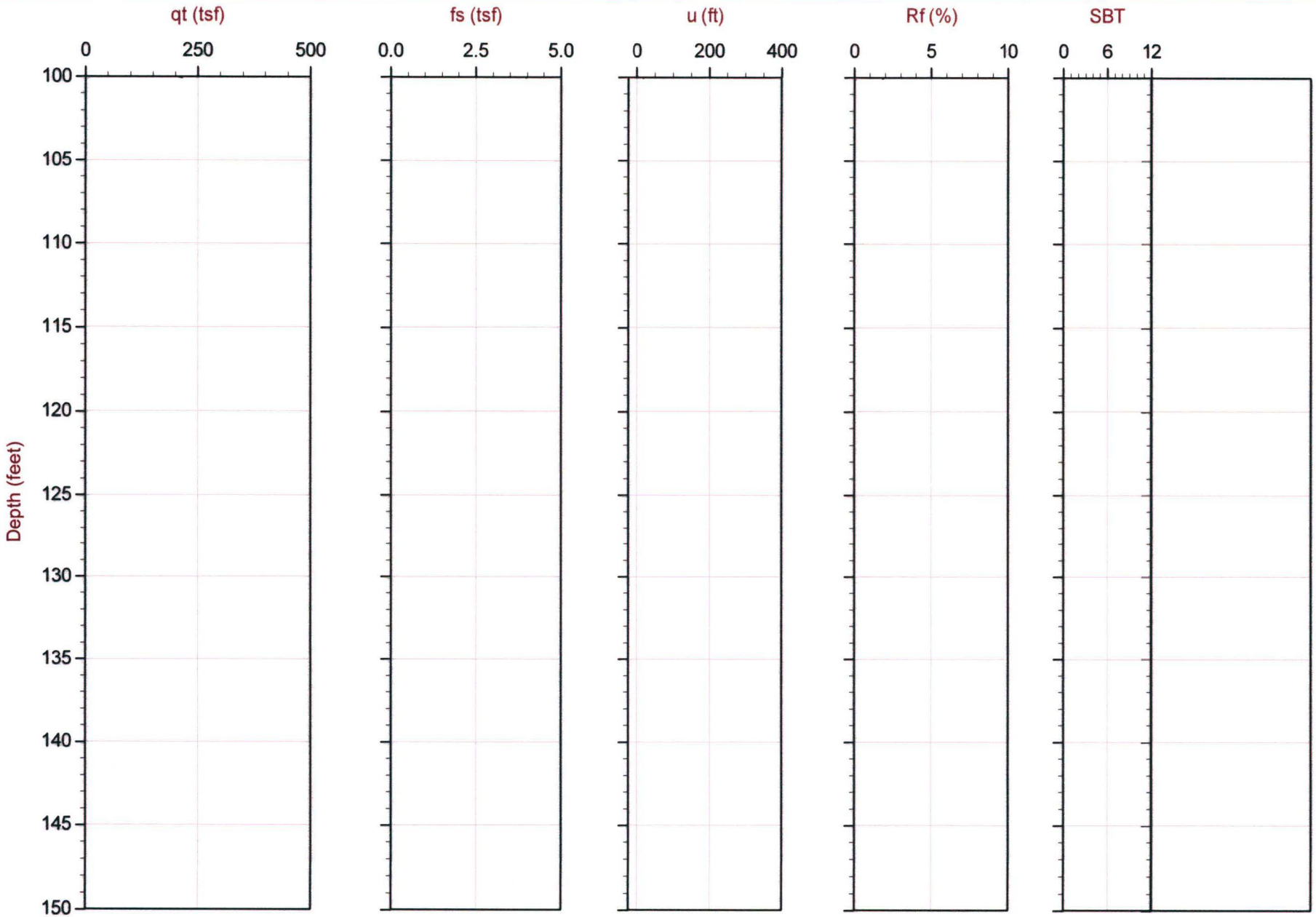
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N 40.34412° Long: W 111.76065°
● Equilibrium Pore Pressure from Dissipation

CONETEC

IGES

Job No: 08-419
Date: 08:05:08 11:17
Site: I-15

Sounding: 08-PG2-C2
Cone: STD 20T AD242



Max Depth: 30.500 m / 100.06 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 419CP03.COR
Unit Wt: SBT Chart Soil Zones

SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: N 40.34412° Long: W 111.76065°

● Equilibrium Pore Pressure from Dissipation

CONETEC

Shear Wave Velocity Calculations

Job No.: 08-419
Client: IGES, Inc.
CPT No.: 08-PG2-C1
CPT File: 419CP04.COR
Location I-15 - Utah County
Date: 8/4/08

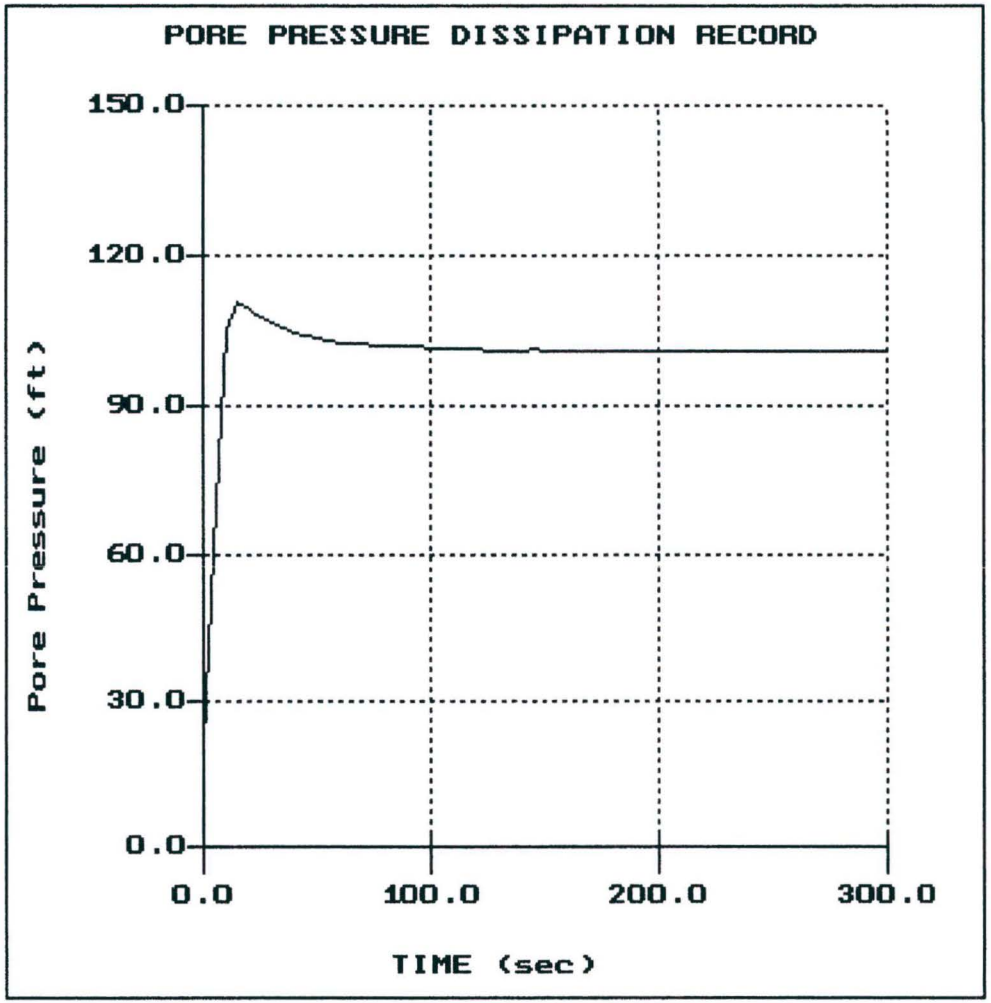
Geophone Offset (m): 0.20
Source Offset (18") (m): 0.46

Test Depth (m)	Geophone Depth (m)	Ray Path (m)	Incremental Distance (m)	Time Interval (ms)	Interval Velocity (m/s)	Interval Depth (m)	Interval Velocity (ft/s)	Interval Depth (ft)
12.20	12.00	12.01						
30.50	30.30	30.30	18.29	91.28	200	21.15	657	69.4

IGES

Sounding: 08-PG2-C1
Site:I-15

Cone:STD 20T AD242
Date:08:05:08 12:44

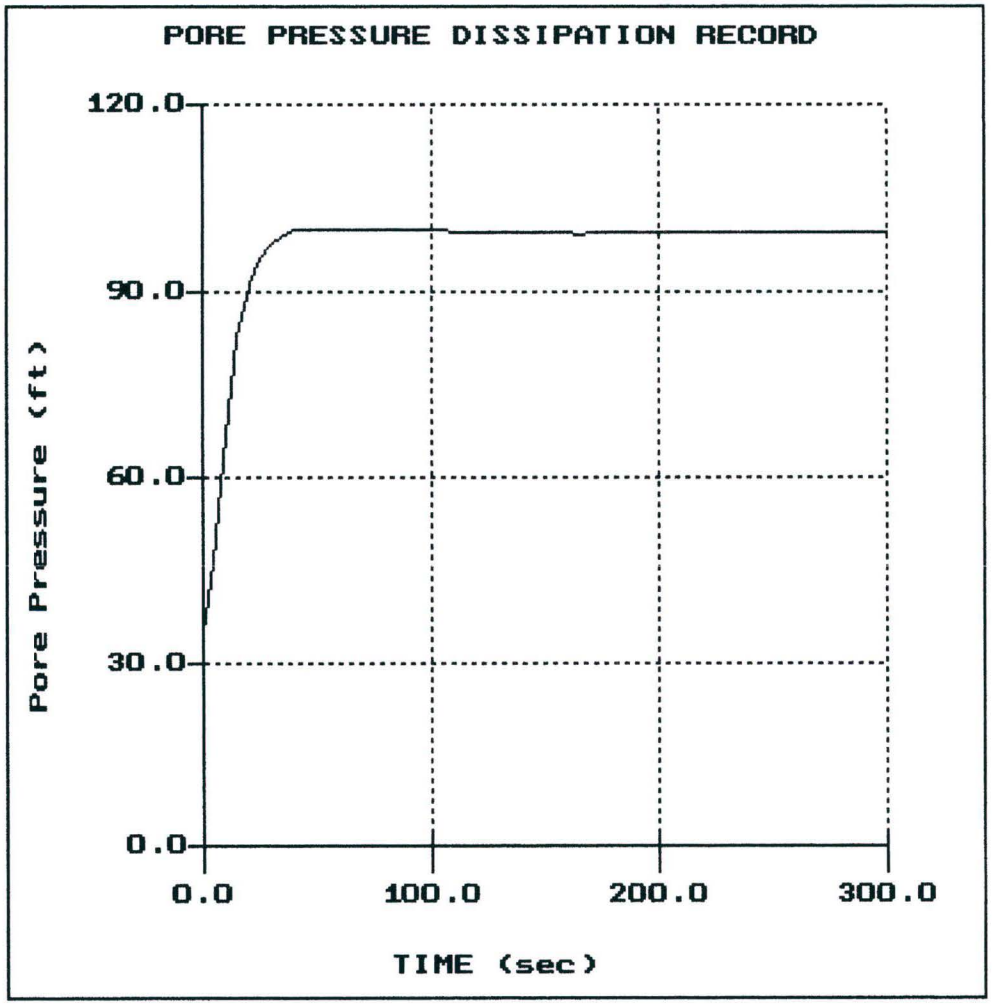


File: 419CP04.PPD
Depth (m): 25.10
(ft): 82.35
Duration : 300.0s
U-min: 20.08 0.0s
U-max: 110.33 15.0s

IGES

Sounding: 08-PG2-C2
Site:I-15

Cone:STD 20T AD242
Date:08:05:08 11:17

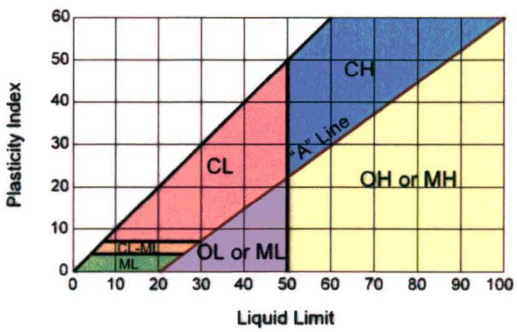


File: 419CP03.PPD
Depth (m): 25.35
(ft): 83.17
Duration : 300.0s
U-min: 35.10 0.0s
U-max: 100.14 45.0s

Boring Logs

Unified Soil Classification System

Major Divisions			Group Symbols		Typical Names	Laboratory Classification Criteria		
COARSE-GRAINED SOILS *more than half of material is larger than No. 200 sieve*	**Gravels** *more than half of coarse fraction is larger than No. 4 sieve size*	**Clean Gravels** *little or no fines*	**GW**		Well graded gravels, gravel-sand mixtures, little or no fines	*For laboratory classification of coarse-grained soils*	$C_u = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW	
		Gravels With Fines *appreciable amount of fines*	**GM***	**d**	Silty gravels, poorly graded gravel-sand-silt mixtures	Determine percentage of gravel and sand from grain-size curve. Depending on percentage of fines (*fraction smaller than No. 200 sieve size*), coarse-grained soils are classified as follows: **Less than 5%** GW, GP, SW, SP **More than 12%** GM, GC, SM, SC **5% to 12%** Borderline cases requiring use of dual symbols**	Atterberg limits below "A" line, or PI less than 4	Above "A" line with PI between 4 and 7 are borderline cases requiring uses of dual symbols
				u				
			GC		Clayey gravels, poorly graded gravel-sand-clay mixtures		Atterberg limits above "A" line, or PI greater	
	Sands *more than half of coarse fraction is smaller than No. 4 sieve size*	**Clean Sands** *little or no fines*	**SW**		Well graded sands, gravelly sands, little or no fines		$C_u = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
			SP		Poorly graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW	
		Sands with Fines *appreciable amount of fines*	**SM***	**d**	Silty sands, poorly graded sand-silt mixtures		Atterberg limits below "A" line, or PI less than 4	Above "A" line with PI between 4 and 7 are borderline cases requiring uses of dual symbols
				u				
			SC		Clayey sands, poorly graded sand-clay mixtures		Atterberg limits above "A" line, or PI greater	
FINE-GRAINED SOILS *more than half of material is smaller than No. 200 sieve*	**Silts and Clays** *liquid limit is less than 50*		**ML**		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	*For laboratory classification of fine-grained soils*		
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL		Organic silts and organic silt-clays of low plasticity			
	Silts and Clays *liquid limit is greater than 50*		**MH**		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
			CH		Inorganic clays of high plasticity, fat clays			
			OH		Organic clays of medium to high plasticity, organic silts			
HIGHLY ORGANIC SOILS			**Pt**		Peat and other highly organic soils			



Plasticity Chart

*Division of **GM** and **SM** groups into subdivisions of **d** and **u** for roads and airfields only. Subdivision is based on Atterberg limits; suffix **d** used when liquid limit is 28 or less and the PI is 6 or less, the suffix **u** used when liquid limit is greater than 28.

***Borderline classification*: Soils possessing characteristics of two groups are designated by combinations of group symbols. (For example **GW-GC**, well graded gravel-sand mixture with clay biner.)

DRILL HOLE LOG

BORING NO. 08-B1

SHEET 1 OF 2

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:307,659 E:551,088
DRILLING METHOD: 08-CME-55 / N.W. CASING
DRILLER: M.W. (BEDKE)
DEPTH TO WATER - INITIAL: ▽ 4.0' **AFTER 24 HOURS:** ▼ ARTESIAN'

PROJECT NUMBER: 200701.048
DATE STARTED: 10/17/08
DATE COMPLETED: 10/20/08
GROUND ELEVATION: 4529.8'
LOGGED BY: G.P., M.H., C.S., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				15	2,3,3,(14) *0.30*	CL	brown to lt. brown, moist, firm — Organics in top 11" LEAN CLAY								
4525	5			13	Pushed	GC (*A-2-6(0)*)	lt. brown, wet — CLAYEY GRAVEL W/SAND		24.6	30	12	45	27	28	
4520	10			6	5,13,10,(46)	SM (*A-1-b*)	lt. brown, wet, dense — SILTY SAND W/GRAVEL		12.9		NP	25	59	16	
4515	15			20	1,1,2,(6) *0.17*	ML (*A-6(13)*)	gray-brown, very moist, soft — SILT (PLASTIC) non-plastic silt layers		34.8	36	11	0	0	100	
4510	20			17	Pushed *0.32*	CH (*A-7-6(36)*)	mottled gray & black, moist, firm — FAT CLAY	68.9	57.3	57	31	0	0	100	CT UU
4505	25			20	1,2,4,(9) *0.37*	CH	dk. gray, moist, firm								
4500	30			0	Pushed	-	no recovery								
				12	2,7,13,(28)	SP-SM (*A-3(0)*)	gray-brown, wet, med. dense — SAND W/SILT		24.3		NP	11	81	8	
4495	35														
4490	40			19	7,10,14,(30)	SM	dk. gray, wet, med. dense — SILTY SAND clay layers								
4485	45			18	4,5,4,(11) *0.60*	CL (*A-7-6(20)*)	mottled lt. & dk. gray, moist, stiff — LEAN CLAY sand layers		31.7	43	20	1	7	92	
				18	*0.13* Pushed	CL (*A-6(11)*)	black & gray, wet, soft	99.1	26.3	31	13	0	11	89	CT

UT_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:
DISTURBED SAMPLE — 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value; *0.45* ← Torvane (tsf)
UNDISTURBED SAMPLE — PUSHED; *0.45* ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-B1

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:307,659 E:551,088
DRILLING METHOD: 08-CME-55 / N.W. CASING
DRILLER: M.W. (BEDKE)
DEPTH TO WATER - INITIAL: ▽ 4.0' **AFTER 24 HOURS:** ▼ ARTESIAN'

PROJECT NUMBER: 200701.048
DATE STARTED: 10/17/08
DATE COMPLETED: 10/20/08
GROUND ELEVATION: 4529.8'
LOGGED BY: G.P., M.H., C.S., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
						ML (A-4(0))	brown, very moist — SILT W/SAND clay lenses		23.6		NP	0	29	71	
4475	55			8	12,23,45,(74)	GP-GM	gray-brown, wet, dense								
							GRAVEL W/SILT & SAND possible cobbles, artesian at 53'								
4470	60			12	12,17,20,(39)	GP-GM (A-1-a)	gray-brown, wet, med. dense		9.3		NP	57	32	11	
4465	65			18	5,6,8,(14) *0.85* *0.64*	CL (A-4(7))	gray-brown, moist, stiff — LEAN CLAY sand lenses		22.7	27	8	0	5	95	
4460	70			19	53,74,79,(99+)	GM	gray-brown, wet, very dense								
							SILTY GRAVEL W/SAND possible cobbles, clay lenses								
4455	75			8	36,47,28,(71)	GM	gray-brown, wet, dense								
						GM	gray-brown, wet								
4450	80			13	5,3,9,(11) *0.70*	CL (A-4(4))	gray-brown, moist, stiff — SANDY LEAN CLAY		19.1	27	9	0	33	67	
						ML	gray-brown, wet, loose — SANDY SILT								
4445	85			15	7,9,16,(22) *0.79* *0.90*	ML / CL / GM/GC-GM	gray-brown, wet / brown, moist, stiff — SANDY LEAN CLAY sand layers / brown, wet								
4440	90			0	14,11,11,(19)	-	no recovery — SILTY GRAVEL W/SAND TO SILTY CLAYEY GRAVEL W/SAND								
				4	Pushed	GM/GC-GM	brown, wet								
4435	95														

DH_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE — 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value; *0.45* ← Torvane (tsf)

UNDISTURBED SAMPLE — PUSHED; *0.45* ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-B2

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N:300,453 E:561,273

DRILLING METHOD: 08-CME-55 / N.W. CASING

DRILLER: D. SAMPSON

DEPTH TO WATER - INITIAL: ▽ 3.6' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: 200701.048

DATE STARTED: 10/14/08

DATE COMPLETED: 10/16/08

GROUND ELEVATION: 4526.7'

LOGGED BY: M.H., B.H., G.P., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4525				13	35,19,12,(68)	GP-GM (A-1-a)	brown, slightly moist, dense — GRAVEL W/SILT & SAND (fill)		2.9		NP	48	44	8	
4520	5			11	2,2,1,(7) 0.21	CL	gray, very moist, soft — LEAN CLAY W/SAND organics								
4515	10			15	Pushed 0.35	CH (A-7-6(31))	lt. green-brown, moist, firm — FAT CLAY organics, silt lenses	75.5	40.5	53	29	0	5	95	CT UU
4510	15			18	0/18",(0) 0.28	CL	lt. gray, moist, firm — LEAN CLAY 1" organic silt layer in 15' sample								
4505	20			18	Pushed 0.40	CL ML (A-6(12))	lt. gray, moist; brown, very moist, firm — SILT plastic	89.9	32.1	36	11	0	1	99	CT
4500	25			13	0.46 2,4,24,(47)	ML GP-GM	brown, very moist, firm; brown, wet, med. dense								
4495	30			12	22,40,24,(97)	GP-GM (A-1-a)	brown, wet, dense — GRAVEL W/SILT & SAND possible cobbles		8.7		NP	52	38	10	
4490	35			10	18,20,16,(51)	GP-GM	brown, wet, dense								
4485	40			14	Pushed 1.38	CL (A-6(17))	gray-brown, moist, very stiff — LEAN CLAY occasional silt lenses	104.8	23.9	37	16	0	1	99	CT UU
4480	45			18	2,5,5,(12) 1.23	CL	gray-brown, moist, very stiff								

GDT_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE: 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value; 0.45 ← Torvane (tsf)

UNDISTURBED SAMPLE: PUSHED; 0.45 ← Torvane (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-B2

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:300,453 E:561,273
DRILLING METHOD: 08-CME-55 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 3.6' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: 200701.048
DATE STARTED: 10/14/08
DATE COMPLETED: 10/16/08
GROUND ELEVATION: 4526.7'
LOGGED BY: M.H., B.H., G.P., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description		Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4475				12	Pushed 0.72	CL (A-6(16))	gray-brown, moist, stiff		99.3	27.6	36	15	0	1	99	
4470	55			18	1,4,3,(8) 0.72	CL	gray-brown, moist, stiff									
4465	60			18	Pushed 0.71	CL (A-7-6(25))	gray-brown, moist, stiff		85.8	37.5	45	22	0	0	100	CT UU
4460	65			18	0,4,4,(8) 0.54	CL	gray-brown, moist, stiff									
4455	70			12	Pushed 0.67	CL (A-7-6(26))	gray-brown, moist, stiff	LEAN CLAY occasional silt lenses	90.2	36.8	47	23	0	0	100	UU
4450	75			18	0,3,5,(8) 0.58	CL	gray-brown, moist, stiff									
				6	Pushed 0.28	CL	gray-brown, moist, firm									
4445	80			20	Pushed 0.66	CL (A-6(14))	gray, moist, stiff		91.7	30.5	36	13	0	1	99	CT UU
4440	85			20	4,5,8,(12) 0.56	CL	gray to dk. gray, moist, stiff									
4435	90			15	Pushed 0.65	CL (A-6(14))	gray to dk. gray, moist, stiff		92.6	29.7	36	13	0	1	99	
4430	95			12	5,8,16,(21)	SM	gray, wet, med. dense	SILTY SAND 0.5" peat layer in 95' sample								

DH_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE — 2,3,2,(6) ← Blow Count per 6"; ← $(N_1)_{60}$ Value; 0.45 ← Torvane (tsf)

UNDISTURBED SAMPLE — PUSHED; 0.45 ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-B2

SHEET 3 OF 3

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:300,453 E:561,273
DRILLING METHOD: 08-CME-55 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 3.6' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: 200701.048
DATE STARTED: 10/14/08
DATE COMPLETED: 10/16/08
GROUND ELEVATION: 4526.7'
LOGGED BY: M.H., B.H., G.P., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4425	105			8	40,52,50,(80)	GM (*A-1-b*)	gray, wet, dense SILTY GRAVEL W/SAND artesian flow >5' above ground surface		10.9		NP	41	36	23	
4420							SAND (driller's observation)								
	110														
4415															
	115														
4410															
	120														
4405															
	125														
4400															
	130														
4395															
	135														
4390															
	140														
4385															
	145														
4380															

DH_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE — 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value; *0.45* ← Torvane (tsf)

UNDISTURBED SAMPLE — PUSHED; *0.45* ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-B3

SHEET 1 OF 3

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:297,812 E:562,819
DRILLING METHOD: 08-CME-55 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 4.0' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: 200701.048
DATE STARTED: 10/16/08
DATE COMPLETED: 10/17/08
GROUND ELEVATION: 4506.4'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4505				8	7,8,7,(32) *0.53*	CL	dk. gray, moist, stiff LEAN CLAY W/SAND organics								
4500	5			11	Pushed *0.33*	CL (*A-6(12)*)	brown, moist, firm	97.8	28.4	38	17	2	24	74	CT UU
4495	10			18	0/12",2,(4) *0.25*	CL,ML,SM	lt. brown, wet/moist, loose/soft INTERBEDDED LEAN CLAY, SANDY SILT & SILTY SAND LAYERS 3" TO 6" THICK								
4490	15			4	Pushed *0.30*	CL (*A-7-6(21)*)	lt. brown, moist, firm LEAN CLAY	95.3	27.4	42	21	0	7	93	CT
4485	20			14	0/18",(0) *0.10* *0.28*	CL (*A-7-6(22)*)	brown, moist & wet, firm & very soft LEAN CLAY very soft & wet layers		30.8	49	24	2	12	86	
4480	25			18	Pushed *1.28*	CL (*A-7-6(27)*)	mottled gray-brown, moist, very stiff LEAN CLAY		21.3	46	24	0	0	100	
4475	30			13	Pushed *0.99+*	CL (*A-6(19)*)	dk. gray, moist, very stiff LEAN CLAY occasional silt lenses	107.8	23.7	39	18	0	3	97	UU
4470	35			18	1,2,4,(8) *0.85*	CL	lt. gray, moist, stiff								
4465	40			17	Pushed *0.98*	CH (*A-7-6(38)*)	dk. gray, moist, stiff FAT CLAY slight organic odor, occasional silt lenses	80.5	40.1	58	32	0	0	100	CT UU
4460	45			18	0/12",3,(3) *0.41*	CL	gray-brown, moist, firm LEAN CLAY occasional silt lenses								

UH_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE — 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value; *0.45* ← Torvane (tsf)

UNDISTURBED SAMPLE — PUSHED; *0.45* ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-B3

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:297,812 E:562,819
DRILLING METHOD: 08-CME-55 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 4.0' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: 200701.048
DATE STARTED: 10/16/08
DATE COMPLETED: 10/17/08
GROUND ELEVATION: 4506.4'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4455				14	Pushed 0.50	CL (A-7-6(26))	gray-brown, moist, firm to stiff	77.0	40.9	46	23	0	0	100	
							LEAN CLAY occasional silt lenses								
4450	55			18	0/18",(0) 0.21	CL	gray-brown, moist, soft								
4445	60			18	Pushed 0.45	CH (A-7-6(33))	brown-gray, moist, firm	74.9	50.0	53	29	0	0	100	CT UU
4440	65			17	0/18",(0) 0.20	CH	brown-gray, moist, soft								
4435	70			15	Pushed 0.34	CH (A-7-6(37))	lt. gray, moist, firm some artesian flow at 70'	68.0	50.6	57	32	0	0	100	
							FAT CLAY occasional silt lenses								
4430	75			18	0/12",6,(5) 0.86	CH	dk. gray, moist, stiff								
4425	80			12	Pushed 1.0	CH (A-7-6(28))	gray w/black, moist, stiff to very stiff	74.7	43.8	51	24	0	1	99	CT UU
4420	85			18	0,1,3,(3) 0.67	CH	gray w/black, moist, stiff								
4415	90			0	Pushed	-	no recovery								
				18	7,7,8,(13) 0.46	SM (A-2-4(0))	gray, wet, med. dense		14.6		NP	12	72	16	
						CL	brown-gray, moist, firm								
							LEAN CLAY								
4410	95			17	9,10,10,(16)	SM	dk. gray, wet, med. dense								
							SILTY SAND silt layers to 3" thick, flowing sand								

DH_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE: 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value; 0.45 ← Torvane (tsf)

UNDISTURBED SAMPLE: PUSHED; 0.45 ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-B3

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:297,812 E:562,819
DRILLING METHOD: 08-CME-55 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 4.0' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: 200701.048
DATE STARTED: 10/16/08
DATE COMPLETED: 10/17/08
GROUND ELEVATION: 4506.4'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4405				18	16,18,37,(44)	SM (A-4(0))	gray-brown, wet, dense		20.7		NP	0	54	46	
							SILTY SAND silt layers to 3" thick, flowing sand								
	105														
4400				14	23,26,21,(37)	SM	brown-gray to dk. gray, wet, dense								
							SILT plastic								
	110														
4395				18	Pushed 0.55	ML (A-4(11))	black, moist, stiff	90.4	30.4	34	10	0	2	98	CT
							SANDY SILT								
	115														
4390				15	8,37,55,(69)	ML GC-GM	gray-brown, wet, dense gray-brown, wet, dense								
							SILTY CLAYEY GRAVEL W/SAND artesian flow >25' head above ground surface								
	120														
4385															
	125														
4380															
	130														
4375															
	135														
4370															
	140														
4365															
	145														
4360															

DH_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE: 2,3,2,(6) ← Blow Count per 6"; (N1)60 Value
0.45 ← Torvane (tsf)

UNDISTURBED SAMPLE: PUSHED
0.45 ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-B4

SHEET 1 OF 3

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:289,709 E:568,539
DRILLING METHOD: 08-CME-55 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 6.8' **AFTER 24 HOURS:** ▼ ARTESIAN'

PROJECT NUMBER: 200701.048
DATE STARTED: 10/2/08
DATE COMPLETED: 10/6/08
GROUND ELEVATION: 4509.4'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description		Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				12	18,60/5",(99+)	SM	gray, dry, very dense	SLAG (SILTY SAND W/GRAVEL pieces of asphalt (fill)								
4505	5			11	Pushed 1.48	CL (A-7-6(24))	brown, moist, very stiff	LEAN CLAY	100.1	23.9	44	23	0	3	97	CT UU
4500	10			10	5,4,7,(21) 0.35	ML (A-4(0)) SM	lt. brown, wet, med. dense	SANDY SILT clay & sand lenses		25.0		NP	1	32	67	
				14	6,9,12,(37)	SM (A-2-4(0))	brown, wet			22.3		NP	1	32	67	
4495	15			14	11,14,16,(51)	SM	brown, wet, very dense	SILTY SAND occasional silt layers								
4490	20			18	Pushed 0.70	CL (A-6(13))	brown, moist, stiff	LEAN CLAY sand lenses & layers	104.5	23.8	31	14	0	5	95	CT UU
4485	25			14	7,7,10,(24)	SP-SM	brown, wet, med. dense	SAND W/SILT								
				12	7,8,9,(23)	SP-SM (A-3(0))	brown, wet, med. dense			27.9		NP	0	93	7	
4480	30			14	3,7,9,(21) 0.36	SM,CL-ML	brown-gray, wet/moist, med. dense/firm	INTERBEDDED SILTY SAND & SILTY CLAY LAYERS TO 3" THICK								
						SM,CL-ML	brown-gray, wet/moist									
				16	4,6,18,(31)	ML (A-4(0))	gray, wet, dense	SILT W/SAND sand layers		24.3	22	1	0	28	72	
4475	35			18	Pushed 0.46	ML CL (A-6(20))	gray, wet									
							dk. gray, moist, firm	LEAN CLAY	82.9	37.6	40	18	0	0	100	UU
4470	40			18	0.34 0,1,2,(4) 0.40	CL CL	gray-brown, moist, firm									
							dk. gray, moist, firm	SANDY LEAN CLAY								
4465	45			18	Pushed 0.37	CL (A-6(17))	gray-brown, moist, firm	LEAN CLAY	89.1	34.6	37	16	0	2	98	CT
4460								LEAN CLAY silt lenses & layers to 6" thick								

LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE — 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value; 0.45 ← Torvane (tsf)

UNDISTURBED SAMPLE — PUSHED; 0.45 ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-B4

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:289,709 E:568,539
DRILLING METHOD: 08-CME-55 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 6.8' **AFTER 24 HOURS:** ▼ ARTESIAN'

PROJECT NUMBER: 200701.048
DATE STARTED: 10/2/08
DATE COMPLETED: 10/6/08
GROUND ELEVATION: 4509.4'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				18	3,5,4,(10) *0.41*	CL	gray, moist, firm — LEAN CLAY, silt lenses & layers to 6" thick								
4455	55			18	Pushed *0.46*	CL (*A-7-6(26)*)	gray-brown, moist, firm — LEAN CLAY	85.3	38.0	46	23	0	0	100	UU
4450	60			18	0/16",1,(1) *0.46*	CL	gray-brown, moist, firm								
4445	65			15	Pushed *0.43*	CL (*A-6(16)*)	LEAN CLAY, silt lenses to 4" apart — gray, moist, firm	91.9	29.5	37	15	0	1	99	
4440	70			18	0,3,4,(6) *0.54*	CL	gray-brown, moist, firm								
4435	75			15	Pushed *0.71*	CL (*A-6(19)*)	LEAN CLAY — gray-brown, moist, stiff	88.1	37.7	40	17	0	1	99	CT UU
4430	80			14	4,9,12,(18) *0.51*	CL	gray-brown, moist, firm to stiff — LEAN CLAY, silt lenses								
4425	85			16	Pushed *0.52*	CL (*A-4(7)*)	gray, moist, firm to stiff — LEAN CLAY, vertical sand layers		26.0	28	10	0	12	88	
4420	90			16	2,3,4,(6)	SM CL-ML	SILTY SAND — gray, wet, loose; gray, moist								
4415	95			15	Pushed *0.39*	CL-ML (*A-4(5)*)	dk. gray, moist, firm — SILTY CLAY, silt lenses	100.1	25.8	27	6	0	6	94	CT
4410															

DH_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:
DISTURBED SAMPLE: 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value; *0.45* ← Torvane (tsf)
UNDISTURBED SAMPLE: PUSHED; *0.45* ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-B4

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:289,709 E:568,539
DRILLING METHOD: 08-CME-55 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 6.8' **AFTER 24 HOURS:** ▼ ARTESIAN'

PROJECT NUMBER: 200701.048
DATE STARTED: 10/2/08
DATE COMPLETED: 10/6/08
GROUND ELEVATION: 4509.4'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				17	*0.30* 4,5,8,(10)	CL-ML SM	dk. gray, moist, firm gray, wet								
4405	105			17	7,12,22,(26)	SM (*A-2-4(0)*)	SILTY SAND dk. gray, wet, med. dense		22.9		NP	0	82	18	
4400	110			14	9,12,16,(21) *0.21*	ML	dk. gray, wet, med. dense SANDY SILT sand & silt layers to 3" thick								
4395	115			18	8,9,6,(11) *0.40*	ML CL	dk. gray, wet dk. gray, moist, firm								
4390	120			12	Pushed *0.49*	CL (*A-7-6(25)*)	gray w/black spots, moist, firm LEAN CLAY	43.0	75.2	44	22	0	0	100	CT
4385	125														
4380	130						GRAVELS (driller's observation)								
4375	135														
4370	140														
4365	145														
4360															

UH_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE — 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value; *0.45* ← Torvane (tsf)

UNDISTURBED SAMPLE — PUSHED; *0.45* ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-P1

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N:300,414 E:560,550

DRILLING METHOD: CME-55 NO. 1 / N.W. CASING

DRILLER: D. SAMPSON

DEPTH TO WATER - INITIAL: ▽ 3.7' **AFTER 24 HOURS:** ▼ 3.7'

PROJECT NUMBER: 200701.048

DATE STARTED: 4/10/08

DATE COMPLETED: 4/11/08

GROUND ELEVATION: 4525.2'

LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				12	3,4,7,(23)	CL	gray-brown, slightly moist, firm to stiff — LEAN CLAY W/GRAVEL debris in sample (fill?)								
							LEAN CLAY								
4520	5			10	Pushed	CL	brown, moist								
				10	8,11,8,(40)	GP-GM (A-1-a(0))	gray, wet — GRAVEL W/SILT & SAND		9.5		NP	59	34	7	
4515	10			12	0/18",(0) 0.01	ML	gray, wet, very soft — SILT W/SAND plastic								
4510	15			5	9,7,3,(17)	GP-GM (A-1-a(0))	gray, wet, very loose — GRAVEL W/SILT & SAND		12.8		NP	52	37	11	
4505	20			18	Pushed 0.45	CH (A-7-6(33))	brown-gray, moist, firm — FAT CLAY	79.2	39.7	59	30	0	6	94	CT UC
4500	25			18	4,2,2,(6) 0.28	ML	brown, very moist, soft to firm — SILT W/SAND plastic, sand lenses & layers to 2" thick								
4495	30			12	0.10 1,2,5,(9)	ML (A-4(2)) SM	brown-gray, wet, soft		27.1	27	4	0	20	80	
							brown, wet, loose — SILTY SAND								
4490	35			18	Pushed 0.30	CL	brown-gray, moist, firm — LEAN CLAY								
				18	3,5,11,(19) 0.25	CL	brown-gray, moist, soft to firm — sandy lean clay layers								
							LEAN CLAY								

DH_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE — 2,3,2,(6) ← Blow Count per 6" ($N_1)_{60}$ Value; 0.45 ← Torvane (tsf)

UNDISTURBED SAMPLE — PUSHED; 0.45 ← Torvane (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-P1

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:300,414 E:560,550
DRILLING METHOD: CME-55 NO. 1 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 3.7' **AFTER 24 HOURS:** ▼ 3.7'

PROJECT NUMBER: 200701.048
DATE STARTED: 4/10/08
DATE COMPLETED: 4/11/08
GROUND ELEVATION: 4525.2'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				14	Pushed *0.75*	CL (*A-7-6(24)*)	mottled brown & gray, moist, stiff	100.5	23.9	41	22	0	0	100	CT UC
4480	45			18	0,2,5,(8) *0.85*	CL	brown, moist, stiff								
							LEAN CLAY								
4475	50			18	Pushed *0.86*	CL (*A-6(19)*)	brown, moist, stiff	100.3	26.4	38	18	0	0	100	UC
4470	55			18	3,5,7,(12) *0.80*	CL	brown, moist, stiff								
4465	60			18	Pushed *0.46*	CL (*A-6(18)*)	brown, moist, firm	85.5	33.9	39	17	0	1	99	CT
							LEAN CLAY black silt lenses								
4460	65			18	0/18",(0) *0.38*	CL	dk. brown-gray, moist, firm								
4455	70			17	Pushed *0.55*	CL (*A-7-6(27)*)	black, moist, stiff LEAN CLAY organic odor	89.2	35.2	46	24	0	1	99	CT
							LEAN CLAY								
4450	75			18	0/18",(0) *0.63*	CL	brown-gray, moist, stiff								

DH_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE: 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value; *0.45* ← Torvane (tsf)

UNDISTURBED SAMPLE: PUSHED *0.45* ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-P2

SHEET 1 OF 2

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:290,301 E:568,476
DRILLING METHOD: CME-55 NO. 1 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 4.0' **AFTER 24 HOURS:** ▼ 1.9'

PROJECT NUMBER: 200701.048
DATE STARTED: 4/7/08
DATE COMPLETED: 4/9/08
GROUND ELEVATION: 4506.2'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4505			11	18,12,7,(40)	SM	black, dry, med. dense — SILTY SAND W/GRAVEL (fill)								
					CL-ML	lt. brown, dry, stiff — SILTY CLAY W/SAND								
						SILTY SAND								
	5				SM	brown, wet								
			16	0.53	CL	brown, moist, stiff — LEAN CLAY		25.4	40	22	0	2	98	
4500				Pushed	(A-6(23))	brown, wet — SILTY SAND		24.0		NP	0	72	28	
					SM (A-2-4(0))	CLAY driller's observation								
	10				SM	SILTY SAND								
			18	Pushed	(A-4(0))	brown, wet		20.0		NP	0	64	36	
4495				0.42	ML	brown, wet — SANDY SILT clay layers to 2" thick	100.8	22.1		NP	0	34	66	CT
			13	2,4,7,(21)	(A-4(0)) SM	brown, wet, med. dense		26.9		NP	0	86	14	
					(A-2-4(0))	SILTY SAND								
	15				SM	brown, wet								
			18	6,3,3,(10)	CL	brown, very moist, soft								
4490				0.15		LEAN CLAY sand lenses & layers								
	20				SM	SILTY SAND								
			18	Pushed	(A-4(0))	brown, wet		19.2		NP	0	61	39	
4485				0.56	CL	brown, moist, stiff	96.5	27.5	32	14	0	2	98	CT UC
					(A-6(13))	LEAN CLAY								
	25					SILTY SAND								
			18	8,21,14,(49)	SM	brown, wet, med. dense								
4480				0.21	CL	brown, moist — LEAN CLAY								
					SM	brown, wet — sand lenses								
						SILTY SAND								
	30					LEAN CLAY W/SAND								
			18	0.34	CL	gray, moist, firm	97.4	22.0	27	11	0	20	80	CT UC
4475				Pushed	(A-6(7))	dk. gray, wet, very loose — SILTY SAND								
			18	2,1,1,(3)	SM									
				0.20	CL	dk. gray-brown, moist, soft								
						LEAN CLAY silt & sand lenses								
	35					gray-brown, moist, soft								
			18	0.20	CL									
4470				10,12,11,(28)	SM	gray, wet, med. dense		23.9		NP	0	75	25	
					(A-2-4(0))	SILTY SAND possible clay layers (driller's observation)								

DH_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE — 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value; 0.45 ← Torvane (tsf)

UNDISTURBED SAMPLE — PUSHED; 0.45 ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-P2

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:290,301 E:568,476
DRILLING METHOD: CME-55 NO. 1 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 4.0' **AFTER 24 HOURS:** ▼ 1.9'

PROJECT NUMBER: 200701.048
DATE STARTED: 4/7/08
DATE COMPLETED: 4/9/08
GROUND ELEVATION: 4506.2'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4465				16	Pushed 0.40	SM (A-2-4(0))	gray, wet		21.7		NP	0	72	28	
						CL	gray, moist, firm								
4460	45			17	5,4,3,(8) 0.20	CL	gray, moist, soft LEAN CLAY silt & sand lenses & layers								
4455	50			18	Pushed 0.41	CL (A-7-6(27))	gray, moist, firm	79.4	41.3	46	24	0	0	100	CT
4450	55			24	0/24",(0) 0.23	CL	gray, moist, soft LEAN CLAY horizontal & vertical bedding								
4445	60			16	Pushed 0.45	CL (A-7-6(29))	gray, moist, firm	78.1	41.4	48	26	0	1	99	CT UC
4440	65			18	0/18",(0) 0.21	CL	LEAN CLAY silt & sand lenses gray, moist, soft								
4435	70			16	Pushed 0.53	CH (A-7-6(38))	gray, moist, stiff FAT CLAY slight organic odor	75.4	43.3	58	33	0	0	100	CT
4430	75			18	0/18",(0) 0.35	CH	gray to dk. gray, moist, firm								

C:_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:
DISTURBED SAMPLE — 2,3,2,(6) ← Blow Count per 6" ($N_1)_{60}$ Value; 0.45 ← Torvane (tsf)
UNDISTURBED SAMPLE — PUSHED; 0.45 ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-P3

SHEET 1 OF 2

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:283,989 E:571,592
DRILLING METHOD: CME-55 NO. 1 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 6.8' **AFTER 24 HOURS:** ▼ 3.8'

PROJECT NUMBER: 200701.048
DATE STARTED: 4/21/08
DATE COMPLETED: 4/22/08
GROUND ELEVATION: 4533.6'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				12	7,11,13,(51)	CL-ML	gray-brown, slightly moist, stiff — SILTY CLAY W/SAND & GRAVEL (fill)								
4530	5			6	Pushed 0.30	MH (A-7-5(26))	gray, moist, firm — ELASTIC SILT (fill)	79.3	38.1	57	25	0	13	87	CT
4525	10			16	0/18",(0) 0.09	CL	dk. brown-gray, very moist, very soft — LEAN CLAY W/SAND								
4520	15					CL	dk. brown-gray, very moist								
				16	Pushed	SM	gray, wet								
4515	20			16	4,8,6,(22)	SM (A-2-4(0))	gray-brown, wet, med. dense — SILTY SAND clay layers (driller's observation)		21.8		NP	0	80	20	
				15	8,11,14,(36)	SM	brown, wet, med. dense								
4510	25						CLAY driller's observation								
				18	Pushed	SM	brown, wet — SILTY SAND								
				18	2,4,5,(12)	SM (A-2-4(0))	brown, wet, loose		22.8		NP	0	74	26	
4505	30					SM	brown, wet, loose								
				15	Pushed	SM (A-2-4(0))	brown, wet		23.7		NP	0	74	26	
				18	5,6,6,(15)	SM (A-2-4(0))	brown, wet, med. dense		25.5		NP	0	76	24	
4500	35						SILTY SAND clay lenses & layers								
				18	3,10,10,(23)	SM	brown, wet, med. dense								
4495															

DH_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE — 2,3,2,(6) ← Blow Count per 6" ($N_1)_{60}$ Value; 0.45 ← Torvane (tsf)

UNDISTURBED SAMPLE — PUSHED; 0.45 ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-P3

PROJECT: VINEYARD CONNECTOR; 800 NORTH OREM TO I-15 AMERICAN FORK
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:283,989 E:571,592
DRILLING METHOD: CME-55 NO. 1 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 6.8' **AFTER 24 HOURS:** ▼ 3.8'

PROJECT NUMBER: 200701.048
DATE STARTED: 4/21/08
DATE COMPLETED: 4/22/08
GROUND ELEVATION: 4533.6'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				18	9,15,19,(38)	SM	brown, wet, dense SILTY SAND clay lenses & layers								
4490	45			16	Pushed *0.70*	ML *(A-4(0))*	lt. brown, wet SANDY SILT clay lenses & layers		21.5		NP	0	34	66	
4485	50			18	13,17,20,(37)	SM	lt. brown, wet, dense SILTY SAND								
4480	55			17	Pushed *0.28*	CL *(A-6(9))*	brown, moist, firm LEAN CLAY sand lenses	93.2	26.2	26	11	0	9	91	CT UC
4475	60			18	12,21,32,(49)	SM	brown, wet, very dense SILTY SAND								
4470	65			18	20,34,44,(70)	SM *(A-2-4(0))*	brown, wet, very dense		20.1		NP	0	84	16	
4465	70			18	2,9,15,(18)	SM	SILTY SAND clay lenses & layers brown, wet, med. dense								
4460	75														
4455															

DH_LOGV1 VINYARDCONNECTOR.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE — 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value; *0.45* ← Torvane (tsf)

UNDISTURBED SAMPLE — PUSHED; *0.45* ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-PG2-B1

PROJECT: I-15 UTAH COUNTY CORRIDOR - PG2, PROCTOR RD (2000 W) OVER I-15
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:296,392 E:568,265
DRILLING METHOD: 08-CME-55 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 6.0' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: 200801.200
DATE STARTED: 10/27/08
DATE COMPLETED: 10/29/08
GROUND ELEVATION: 4504.6'
LOGGED BY: M. HANSEN, J. PRICE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4500	5			13	7,6,4,(21)	SM CL	brown, slightly moist SILTY SAND W/GRAVEL (fill) dk. brown, slightly moist, stiff								
			▽	4	2,2,2,(9) *0.31*	CL *(A-6(8))*	LEAN CLAY W/SAND brown, moist, firm		21.1	35	14	13	19	68	
4495	10			16	2,1/12",(2) *0.04*	CH	FAT CLAY brown, very moist, very soft sand layers to 2" thick								
				15	Pushed *0.62*	CH *(A-7-6(33))*	brown, moist, stiff	90.5	33.5	54	29	0	1	99	CT CU
4490	15			18	1,2,3,(9) *0.46*	CH ML	FAT CLAY lt. brown, moist, firm brown, wet SANDY SILT								
4485	20			9	Pushed *0.79*	CH *(A-7-6(35))*	gray-brown, moist, stiff	91.1	34.2	53	31	0	0	100	UC
4480	25			18	3,3,3,(9) *0.64*	CH	FAT CLAY silt lenses gray-brown, moist, stiff								
4475	30			18	Pushed *0.61*	SM CL *(A-6(14))*	gray, wet SILTY SAND dk. gray, moist, stiff	103.4	23.6	35	17	0	13	87	UC
4470	35			18	0,3,2,(6) *0.35*	CL	LEAN CLAY sand lenses dk. gray, moist, firm								
4465	40			0	Pushed	-	no recovery								
				17	6,10,14,(28)	SM *(A-4(0))*	dk. gray, wet, med. dense SILTY SAND		22.4		NP	5	50	45	
4460	45			18	Pushed *0.31*	CL *(A-7-6(26))*	gray-brown, moist, firm	86.0	35.5	47	23	0	0	100	UU
4455							LEAN CLAY few silt lenses								

DH_LOGV1 08-PG2.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE: 2,3,2,(6) ← Blow Count per 6"; $(N_1)_{60}$ Value; *0.45* ← Torvane (tsf)

UNDISTURBED SAMPLE: PUSHED; *0.45* ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-PG2-B1

PROJECT: I-15 UTAH COUNTY CORRIDOR - PG2, PROCTOR RD (2000 W) OVER I-15
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:296,392 E:568,265
DRILLING METHOD: 08-CME-55 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 6.0' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: 200801.200
DATE STARTED: 10/27/08
DATE COMPLETED: 10/29/08
GROUND ELEVATION: 4504.6'
LOGGED BY: M. HANSEN, J. PRICE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				18	0/18",(0) *0.21*	CL	brown-gray, moist, soft								
4450	55			18	Pushed *0.34*	CL (*A-7-6(27)*)	LEAN CLAY few silt lenses brown-gray, moist, firm	75.2	46.2	47	24	0	0	100	CT UC
4445	60			18	0/18",(0) *0.35*	CH	gray, moist, firm								
4440	65			18	Pushed *0.44*	CH (*A-7-6(32)*)	gray, moist, firm	75.6	41.7	51	28	0	0	100	UU
4435	70			18	0/18",(0) *0.29*	CH	gray, moist, firm FAT CLAY								
4430	75			18	Pushed *0.75*	CH (*A-7-6(32)*)	gray, moist, stiff	75.1	46.3	51	28	0	0	100	CT UC
4425	80			18	0/12",4,(4) *0.56*	CH	gray, moist, stiff								
4420	85			18	Pushed *0.41*	CL	gray-brown, moist, firm LEAN CLAY sand lenses & layers to 4" thick		87.7	35.5					
4415	90			18	18,29,35,(53)	SM (*A-2-4(0)*)	dk. gray, wet, very dense SILTY SAND		18.4		NP	0	79	21	
4410	95			18	3,5,8,(11) *0.45*	SM (*A-2-4(0)*)	dk. gray, wet, med. dense		21.3		NP	0	78	22	
						ML	dk. gray, moist, firm SILT plastic								
4405							SILTY SAND								

DH_LOGV1 08-PG2.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE: 2,3,2,(6) ← Blow Count per 6"; $(N_1)_{60}$ Value; *0.45* ← Torvane (tsf)

UNDISTURBED SAMPLE: PUSHED; *0.45* ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-PG2-B1

PROJECT: I-15 UTAH COUNTY CORRIDOR - PG2, PROCTOR RD (2000 W) OVER I-15
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:296,392 E:568,265
DRILLING METHOD: 08-CME-55 / N.W. CASING
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 6.0' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: 200801.200
DATE STARTED: 10/27/08
DATE COMPLETED: 10/29/08
GROUND ELEVATION: 4504.6'
LOGGED BY: M. HANSEN, J. PRICE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				14	4,8,11,(15) *0.62*	SM ML	dk. gray, wet gray-brown, very moist, med. dense/stiff								
4400	105			16	Pushed *0.51*	ML (*A-4(9)*)	dk. gray to black, moist, firm to stiff	97.3	26.7	33	9	0	6	94	UU
4395	110			15	Pushed *0.50*	ML (*A-4(6)*)	dk. gray, moist, firm to stiff — SILT plastic, few scattered to interbedded sand lenses	94.7	30.2	31	6	0	5	95	CT
4390	115			6	Pushed	ML	dk. gray, moist								
				18	0,3,6,(7) *0.40*	ML	dk. gray, moist, firm								
4385	120														
4380	125			18	Pushed *0.66*	CL (*A-6(17)*)	dk. gray, moist, stiff — LEAN CLAY sand lenses	93.8	31.0	40	15	0	0	100	CT UU
				18	22,29,62,(65)	GC (*A-2-4(0)*)	dk. gray, wet, med. dense		16.7	28	7	38	31	31	
4375	130														
4370	135						CLAYEY GRAVEL W/SAND artesian pressure								
4365	140			6	65/6"	GC	dk. gray, wet, dense								
4360	145														
4355															

DH_LOGV1 08-PG2.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE — 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value; 0.45 ← Torvane (tsf)

UNDISTURBED SAMPLE — PUSHED; 0.45 ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-PG2-B2

SHEET 1 OF 3

PROJECT: I-15 UTAH COUNTY CORRIDOR - PG2, PROCTOR RD (2000 W) OVER I-15
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:296,490 E:568,406
DRILLING METHOD: CME-75 / N.W. CASING
DRILLER: D. BEDKE
DEPTH TO WATER - INITIAL: ▽ 5.0' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: 200801.200
DATE STARTED: 8/27/08
DATE COMPLETED: 8/30/08
GROUND ELEVATION: 4506.3'
LOGGED BY: M. HANSEN, J. PRICE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4505															
				15	6,8,13,(49)	GP-GM (A-1-a)	gray, dry to slightly moist, med. dense SLAG (GRAVEL W/SILT & SAND) (fill)		2.7		NP	46	43	11	
	5					GP-GM	gray, wet								
4500				11	1,1/12",(2) *0.45*	CL (A-6(11))	brown, moist, firm LEAN CLAY W/SAND vertical sand lenses		27.8	36	16	9	15	76	
	10			11	Pushed *0.20*	CL (A-6(11))	brown, moist, soft LEAN CLAY W/GRAVEL sand lenses	96.8	24.1	38	20	25	10	65	DS
4495															
	15			11	1,2,3,(8) *0.18*	CL	gray-brown, moist, soft								
4490															
	20			12	Pushed *0.80*	CL (A-7-6(30))	lt. brown, moist, stiff LEAN CLAY silt lenses	97.4	22.5	47	27	0	0	100	CT CU
4485															
	25			18	3,4,5,(13) *0.71*	CL	lt. brown, moist, stiff								
4480															
	30			11	Pushed *0.82*	CL (A-6(23))	gray & brown, moist, stiff	95.1	25.0	40	23	0	4	96	UU
4475															
	35			18	3,7,7,(17) *0.57*	CL	gray-brown, moist, stiff LEAN CLAY sand layers to 3" thick								
4470															
	40			16	Pushed *0.48*	SM (A-4(0))	SILTY SAND gray, wet		19.6		NP	0	63	37	
4465						CL (A-6(14))	gray, moist, firm	95.8	30.9	35	17	0	14	86	CT
	45			17	0/12",3,(3) *0.31*	CL	gray-brown, moist, firm LEAN CLAY silt & sand lenses								
4460															

UT_LOGV1 08-PG2.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE: 2,3,2,(6) ← Blow Count per 6"; $(N_1)_{60}$ Value; *0.45* ← Torvane (tsf)

UNDISTURBED SAMPLE: PUSHED; *0.45* ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-PG2-B2

PROJECT: I-15 UTAH COUNTY CORRIDOR - PG2, PROCTOR RD (2000 W) OVER I-15
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: N:296,490 E:568,406
DRILLING METHOD: CME-75 / N.W. CASING
DRILLER: D. BEDKE
DEPTH TO WATER - INITIAL: ▽ 5.0' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: 200801.200
DATE STARTED: 8/27/08
DATE COMPLETED: 8/30/08
GROUND ELEVATION: 4506.3'
LOGGED BY: M. HANSEN, J. PRICE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description		Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4455				15	Pushed *0.41*	CL (*A-7-6(31)*)	gray, moist, firm		77.4	42.2	47	28	0	0	100	UU
4450	55			18	0/15",1,(1) *0.25*	CL	gray-brown, moist, soft to firm									
4445	60			11	Pushed *0.39*	CL (*A-7-6(30)*)	brown-gray, moist, firm	LEAN CLAY silt & sand lenses	73.6	43.0	49	27	0	2	98	CT UC
4440	65			18	0/12",1,(1) *0.25*	CL	brown-gray, moist, soft to firm									
4435	70			17	Pushed *0.75*	CH (*A-7-6(37)*)	gray, moist, stiff		78.4	46.0	55	32	0	0	100	UU
4430	75			18	4,5,4,(8) *0.39*	CH	lt. to dk. gray, moist, firm	FAT CLAY								
4425	80			15	Pushed *0.77*	CH (*A-7-6(36)*)	lt. to dk. gray, moist, stiff		80.3	43.4	55	31	0	0	100	CT UC
4420	85			18	0,2,6,(7)	SM	dk. gray, wet, loose	SILTY SAND clay layers								
4415	90			15	Pushed *0.49*	CL-ML (*A-4(6)*)	gray, moist, firm	SILTY CLAY	99.4	25.6	28	6	0	1	99	UU
4410	95			14	13,10,13,(19)	SM	gray, wet, med. dense	SILTY SAND								
						ML	gray, wet, med. dense	SILT plastic								
								SILTY SAND								

UH_LOGV1 08-PG2.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE: 2,3,2,(6) ← Blow Count per 6"; $(N_1)_{60}$ Value; *0.45* ← Torvane (tsf)

UNDISTURBED SAMPLE: PUSHED; *0.45* ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG

BORING NO. 08-PG2-B2

PROJECT: I-15 UTAH COUNTY CORRIDOR - PG2, PROCTOR RD (2000 W) OVER I-15

CLIENT: UTAH DEPARTMENT OF TRANSPORTATION

LOCATION: N:296,490 E:568,406

DRILLING METHOD: CME-75 / N.W. CASING

DRILLER: D. BEDKE

DEPTH TO WATER - INITIAL: ▽ 5.0' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: 200801.200

DATE STARTED: 8/27/08

DATE COMPLETED: 8/30/08

GROUND ELEVATION: 4506.3'

LOGGED BY: M. HANSEN, J. PRICE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
4405							gray, wet		21.5		NP	0	71	29	
				15	Pushed 0.57	SM (A-2-4(0)) ML (A-4(2))	gray, very moist, stiff	95.0	27.8	26	3	1	8	91	CT
4400	105			16	4,8,13,(16) 0.50	ML	dk. gray, moist, firm to stiff								
							SILT plastic, sand lenses								
4395	110			15	Pushed 0.28	ML (A-4(1))	dk. gray, moist, firm	97.2	26.9	27	2	0	10	90	UU
4390	115			18	5,7,11,(13) 0.25	ML	dk. gray, moist, soft to firm								
4385	120			10	Pushed 0.55	CL (A-6(20))	dk. gray to black, moist, stiff	87.8	31.0	39	19	0	3	97	CT UC
							LEAN CLAY								
4380	125														
4375	130			13	35,45,39,(60)	SM (A-1-b)	gray-brown, wet, very dense		8.5		NP	36	44	20	
							SILTY SAND W/GRAVEL								
4370	135														
4365	140			7	34,50/4"	SM	lt. brown & gray, wet, very dense								
4360	145														

DH_LOGV1 08-PG2.GPJ US EVAL.GDT 11/21/08

RB&G ENGINEERING, INC.

LEGEND:

DISTURBED SAMPLE: 2,3,2,(6) ← Blow Count per 6" / $(N_1)_{60}$ Value; 0.45 ← Torvane (tsf)

UNDISTURBED SAMPLE: PUSHED; 0.45 ← Torvane (tsf)

OTHER TESTS

UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

Laboratory Test Data

Table 1

SUMMARY OF TEST DATA

PROJECT LOCATION: UDOT Vineyard Connector; 800 North to American Fork
Bridge 8, Southwest Corner, Utah County, Utah

PROJECT NO.: 200701-048
FEATURE: Foundations

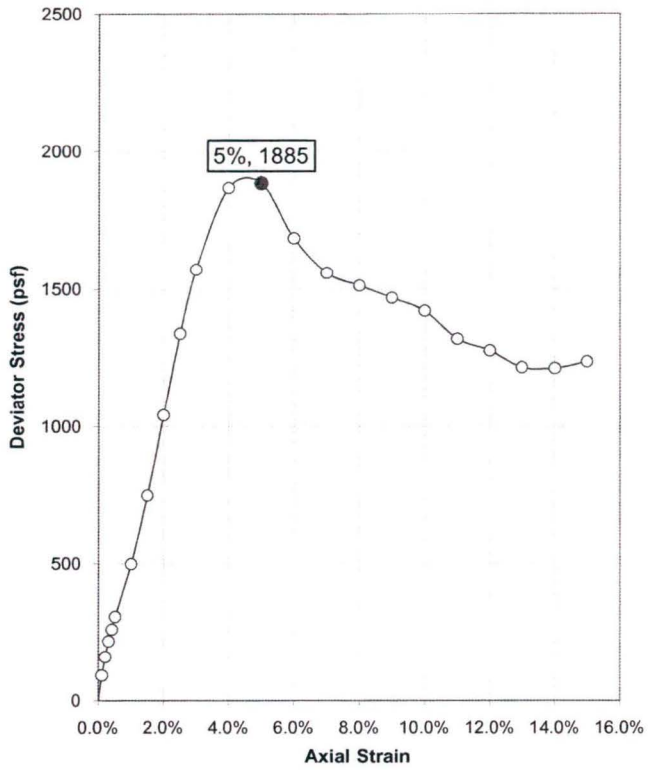
HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	STANDARD PENETRATION BLOWS PER FOOT Corrected (N_1)60	IN-PLACE		UNCONFINED COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO Classification)
			DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
08-B1	5-6.5	Shelby		24.6		30	22	12	45	27	28	GC (A-2-6(0))
	10-11.5	46		12.9				NP	25	59	16	SM (A-1-b)
	15-16.5	6		34.8		36	25	11	0	0	100	ML (A-6(13))
	20-21.5	Shelby	68.9	55.1		57	26	31	0	0	100	CH (A-7-6(36))
	31.5-33	28		24.3				NP	11	81	8	SP-SM (A-3(0))
	45-46.5	11		31.7		43	23	20	1	7	92	CL (A-7-6(20))
	49-49.7	Shelby	99.1	26.3		31	18	13	0	11	89	CL (A-6(11))
	49.7-51.5	Shelby		23.6				NP	0	29	71	ML (A-4(0))
	58.5-60	39		9.3				NP	57	32	11	GP-GM (A-1-a)
	63.5-65	14		22.7		27	19	8	0	5	95	CL (A-4(7))
	78.5-80	11		19.1		27	18	9	0	33	67	CL (A-4(4))

NP=Nonplastic

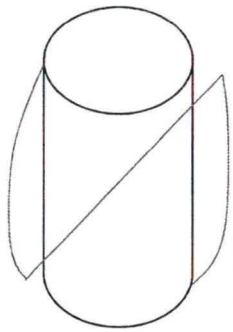
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B1
Project No.	200701-048	**Sample**	
Location	Bridge 8, SW Corner	**Depth / Elev. (ft)**	20-21.5'
Date	October 21, 2008	**Sample Description**	CH (A-7-6(36))
Tested By	J Boone	**Sample Type**	Shelby



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	0	0	
0.1%	93	47	
0.2%	161	81	
0.3%	218	109	
0.4%	261	130	
0.5%	307	154	
1.0%	499	250	
1.5%	751	375	
2.0%	1042	521	
2.5%	1339	669	
3.0%	1571	786	
4.0%	1868	934	
5.0%	1885	942	
6.0%	1685	843	
7.0%	1560	780	
8.0%	1514	757	
9.0%	1470	735	
10.0%	1422	711	
11.0%	1320	660	
12.0%	1278	639	
13.0%	1217	609	
14.0%	1214	607	
15.0%	1238	619	



Initial Sample Data

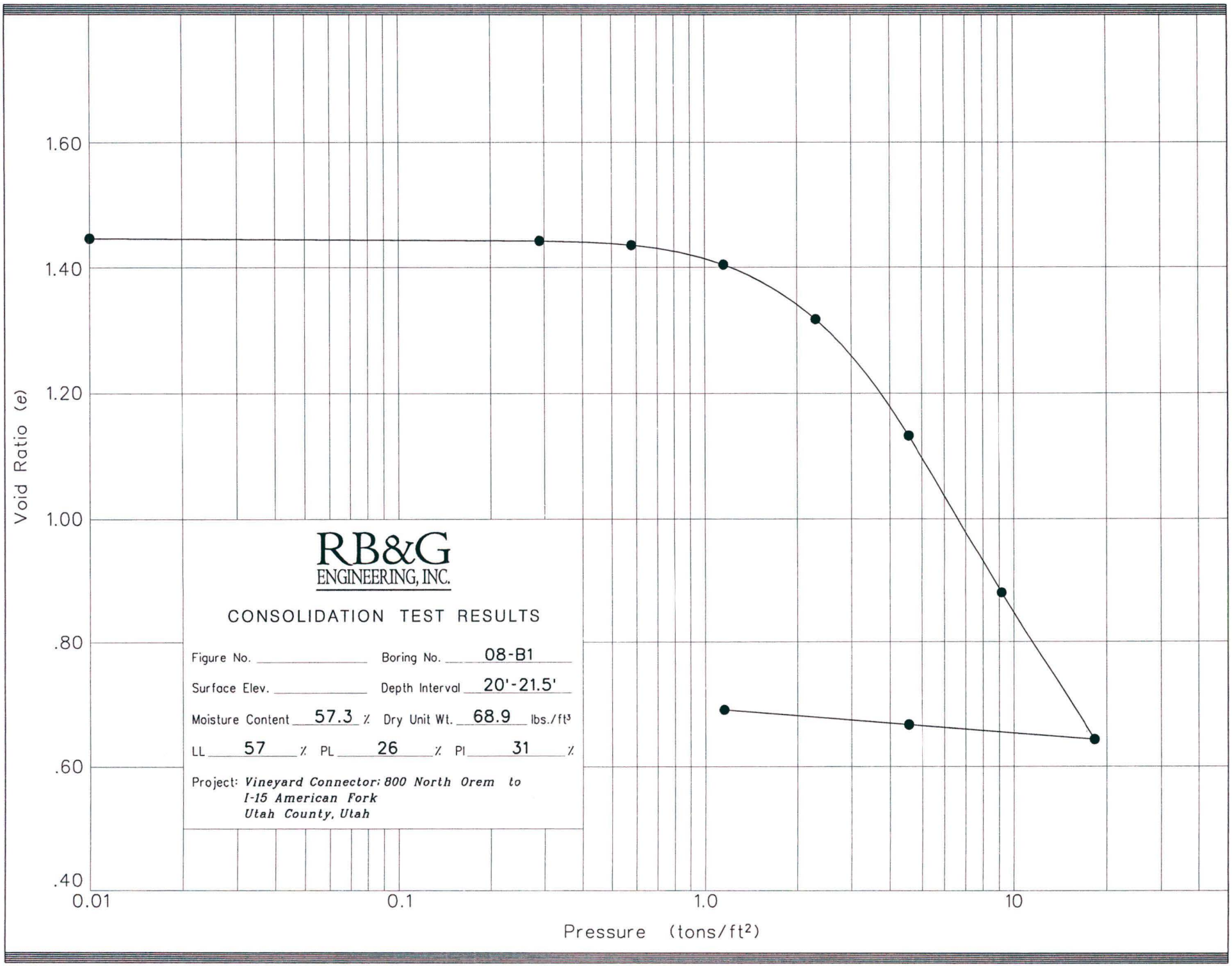
Initial height of specimen	L_o	5.21	(in)	**Moisture content***	w	57%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	68.9	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	57		**Initial void ratio**	e_o	1.445	
Plastic index	PI	31		**Saturation**	S	1.00	

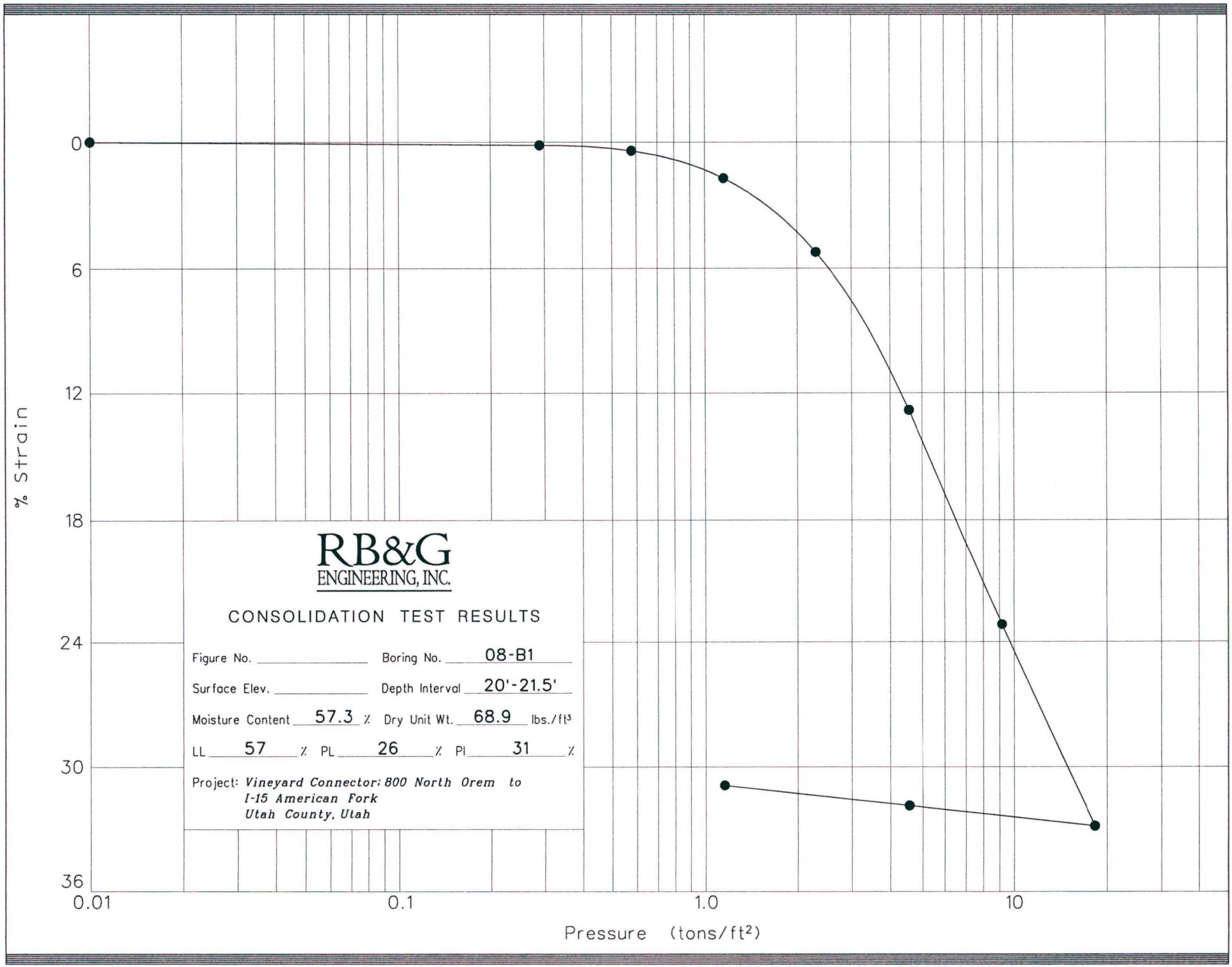
Test Results

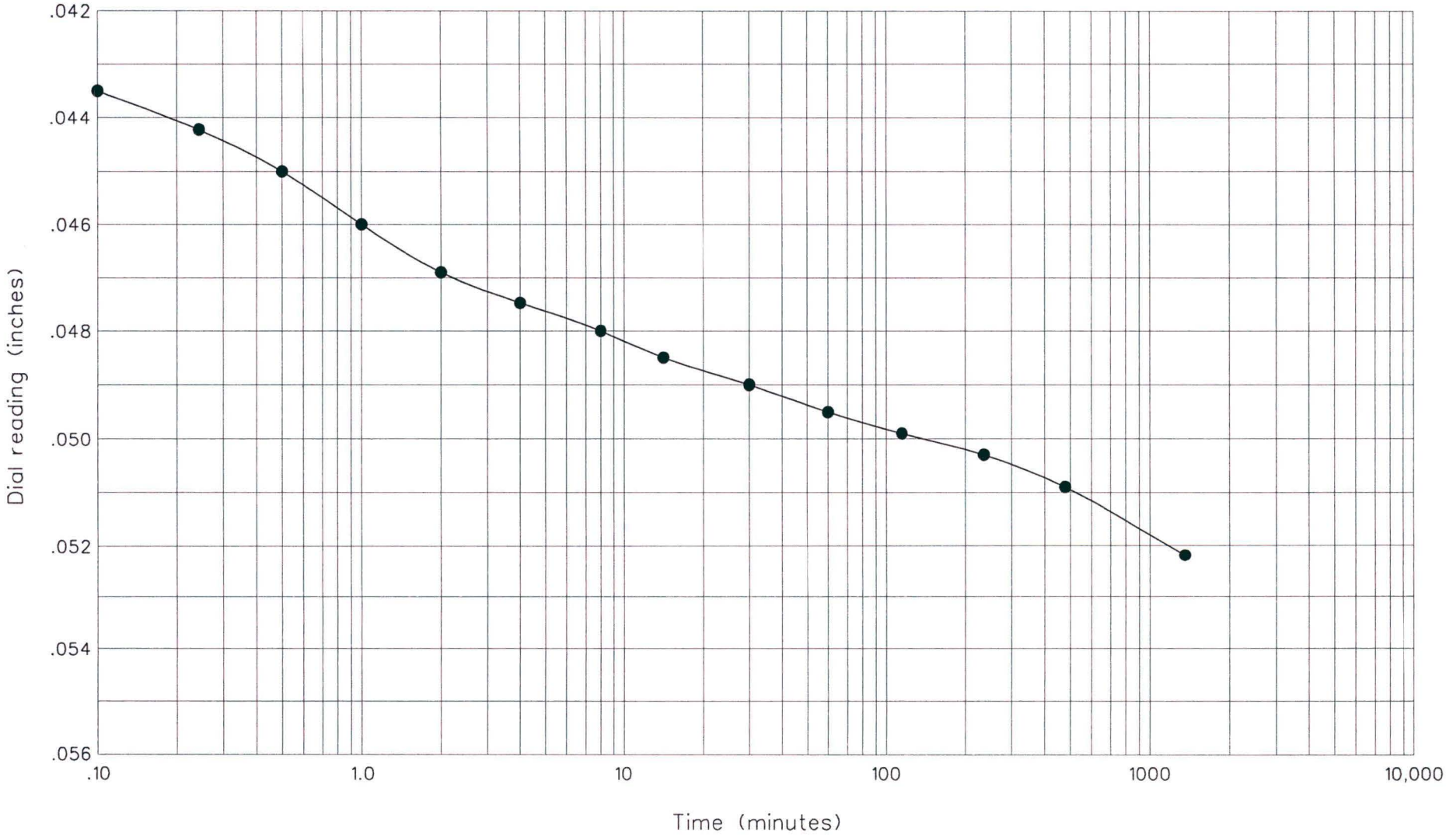
Deviator stress at failure**	$\sigma_{d,f}$	1885	(psf)	**Major principal stress at failure****	σ_1	3899	(psf)
Shear stress at failure**	q_f	942	(psf)	**Minor principal stress at failure****	σ_3	2014	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		5%					

Remarks

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects


1.60
1.40
1.20
1.00
.80
.60
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No.
Boring No. 08-B1
Surface Elev.
Depth Interval 20'-21.5'
Moisture Content 57.3 % Dry Unit Wt. 68.9 lbs./ft³
LL 57 % PL 26 % PI 31 %
Project: Vineyard Connector: 800 North Orem to
I-15 American Fork
Utah County, Utah


% Strain
0
6
12
18
24
30
36
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B1
Surface Elev. _____ Depth Interval 20'-21.5'
Moisture Content 57.3 % Dry Unit Wt. 68.9 lbs./ft³
LL 57 % PL 26 % PI 31 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah



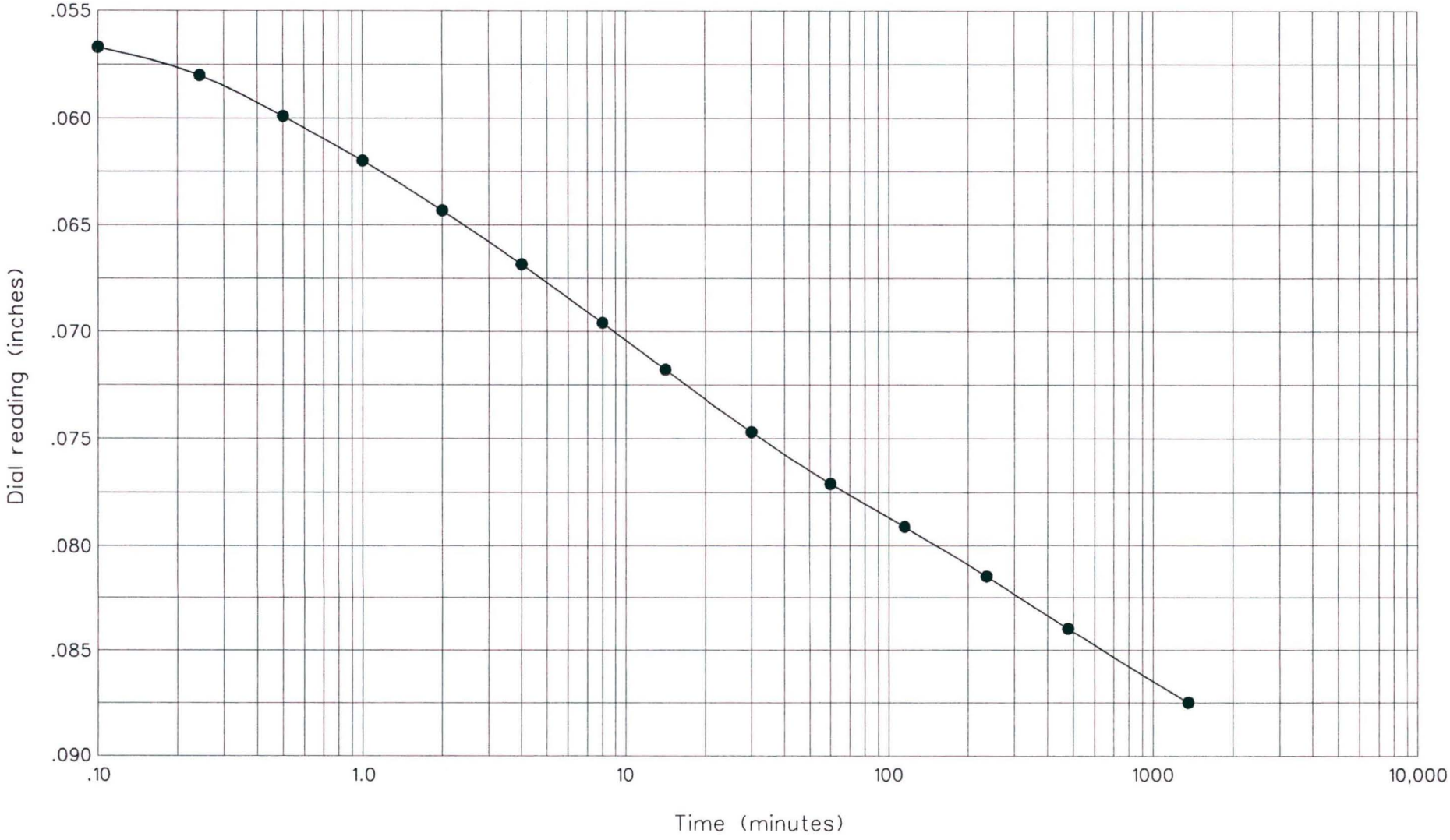
RB&G ENGINEERING, INC.

Hole no.: 08-B1
Depth: 20'-21.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



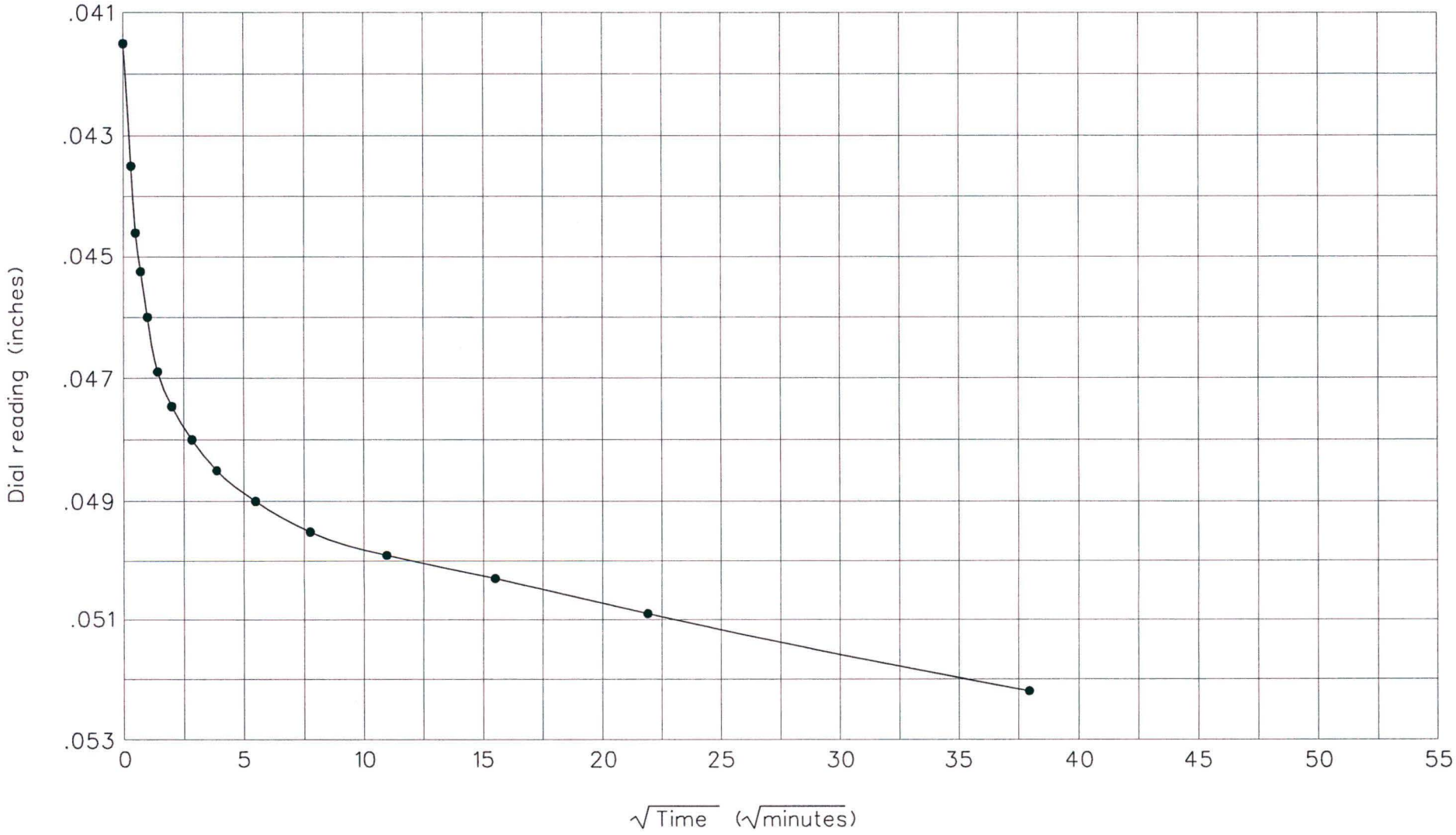
RB&G ENGINEERING, INC.

Hole no.: 08-B1
Depth: 20'-21.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



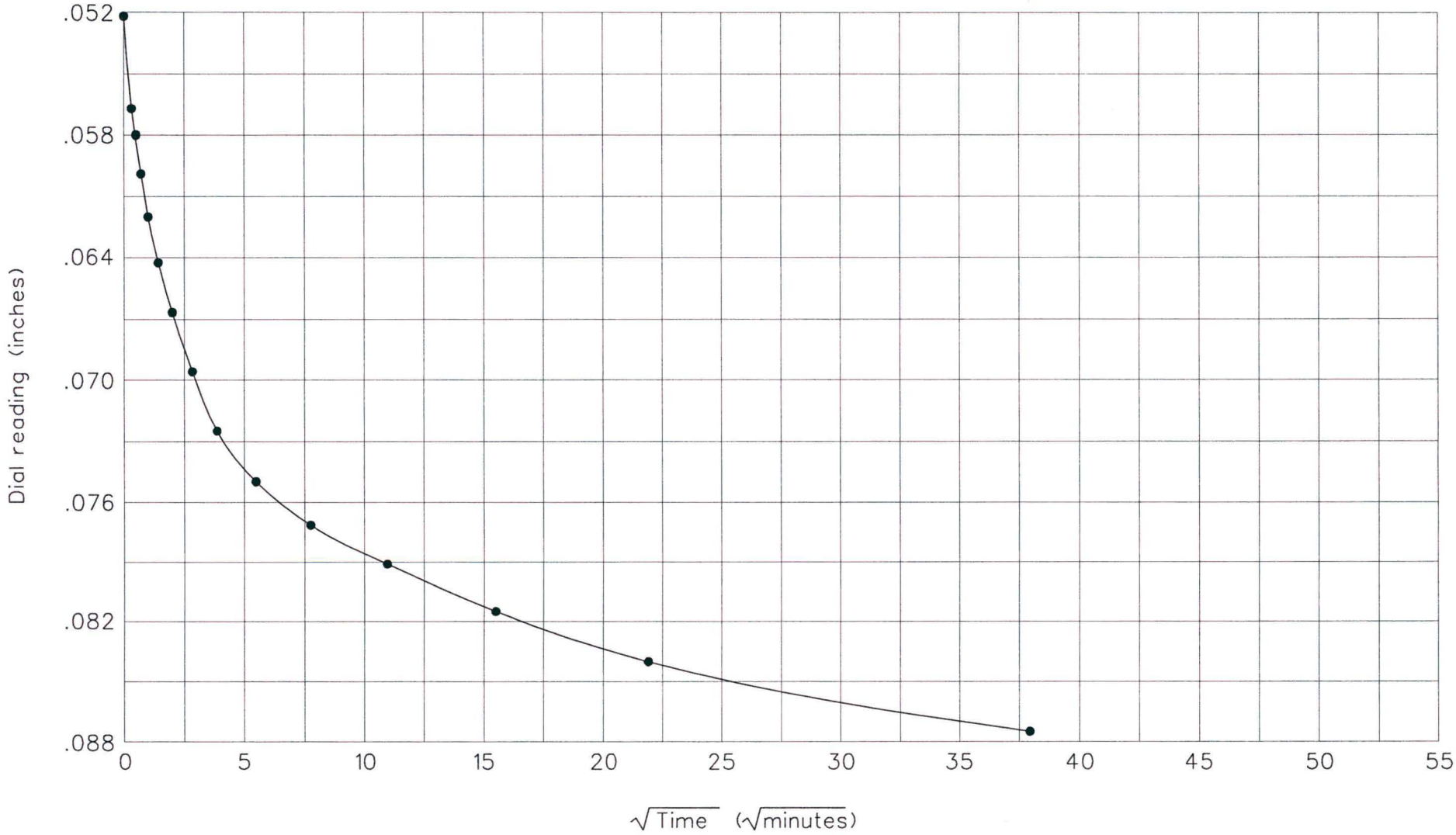
RB&G ENGINEERING, INC.

Hole no.: 08-B1
Depth: 20'-21.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



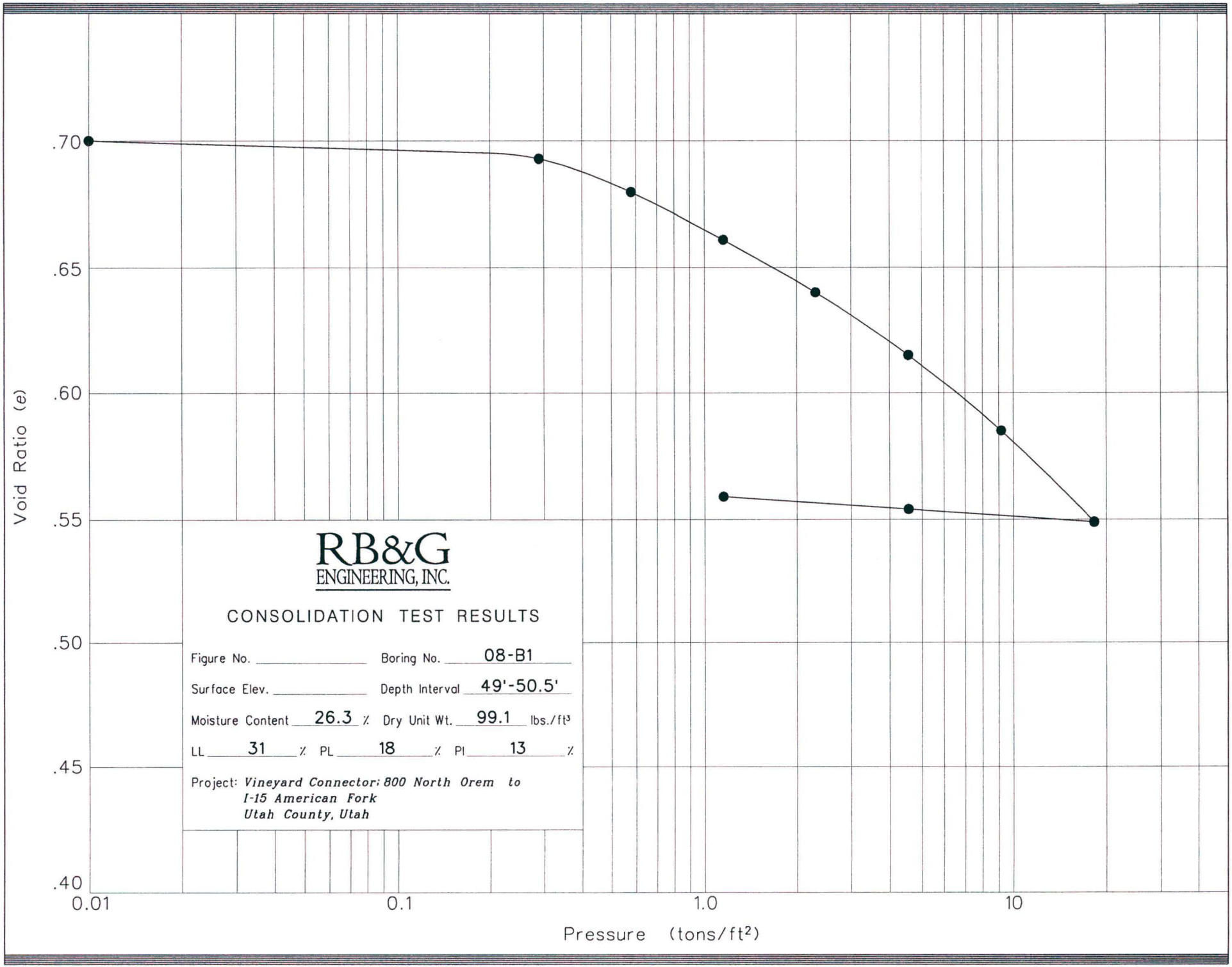
RB&G ENGINEERING, INC.

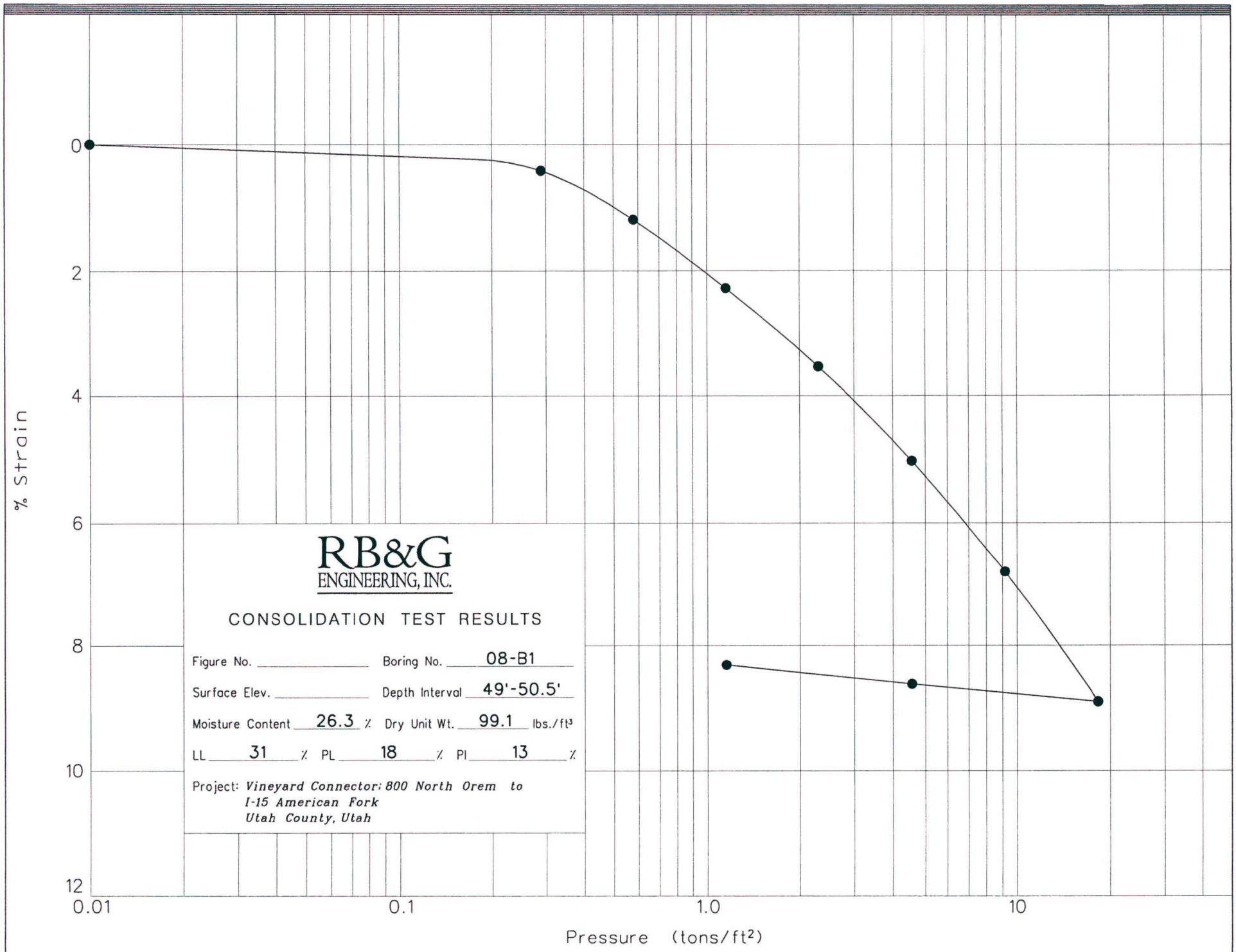
Hole no.: 08-B1
Depth: 20'-21.5'
Load: 1.15 to 2.30 tons

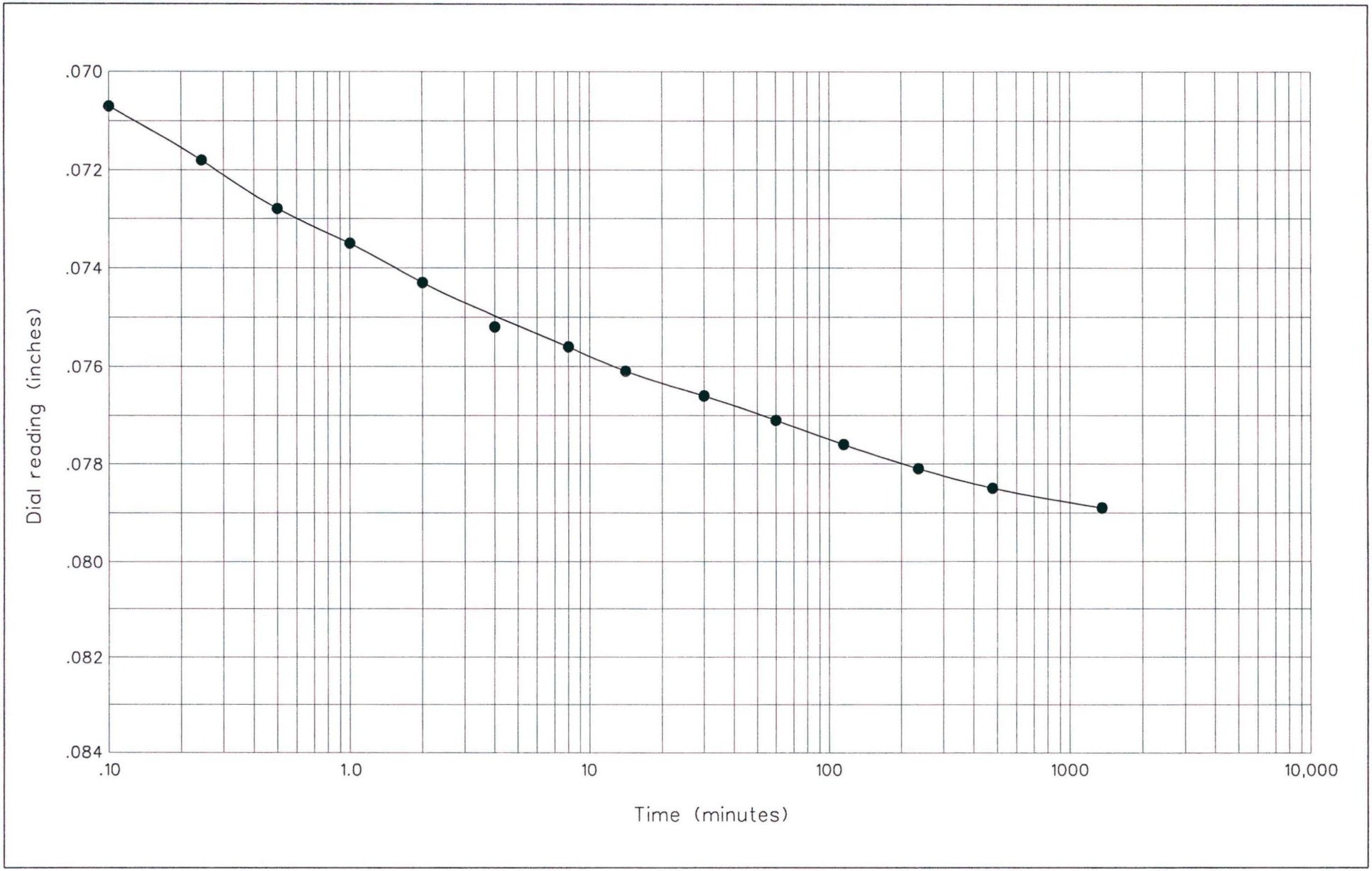
TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure


.70
.65
.60
.55
.50
.45
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B1
Surface Elev. _____ Depth Interval 49'-50.5'
Moisture Content 26.3 % Dry Unit Wt. 99.1 lbs./ft³
LL 31 % PL 18 % PI 13 %
Project: Vineyard Connector: 800 North Orem to
I-15 American Fork
Utah County, Utah


0
2
4
6
8
10
12
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B1
Surface Elev. _____ Depth Interval 49'-50.5'
Moisture Content 26.3 % Dry Unit Wt. 99.1 lbs./ft³
LL 31 % PL 18 % PI 13 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah



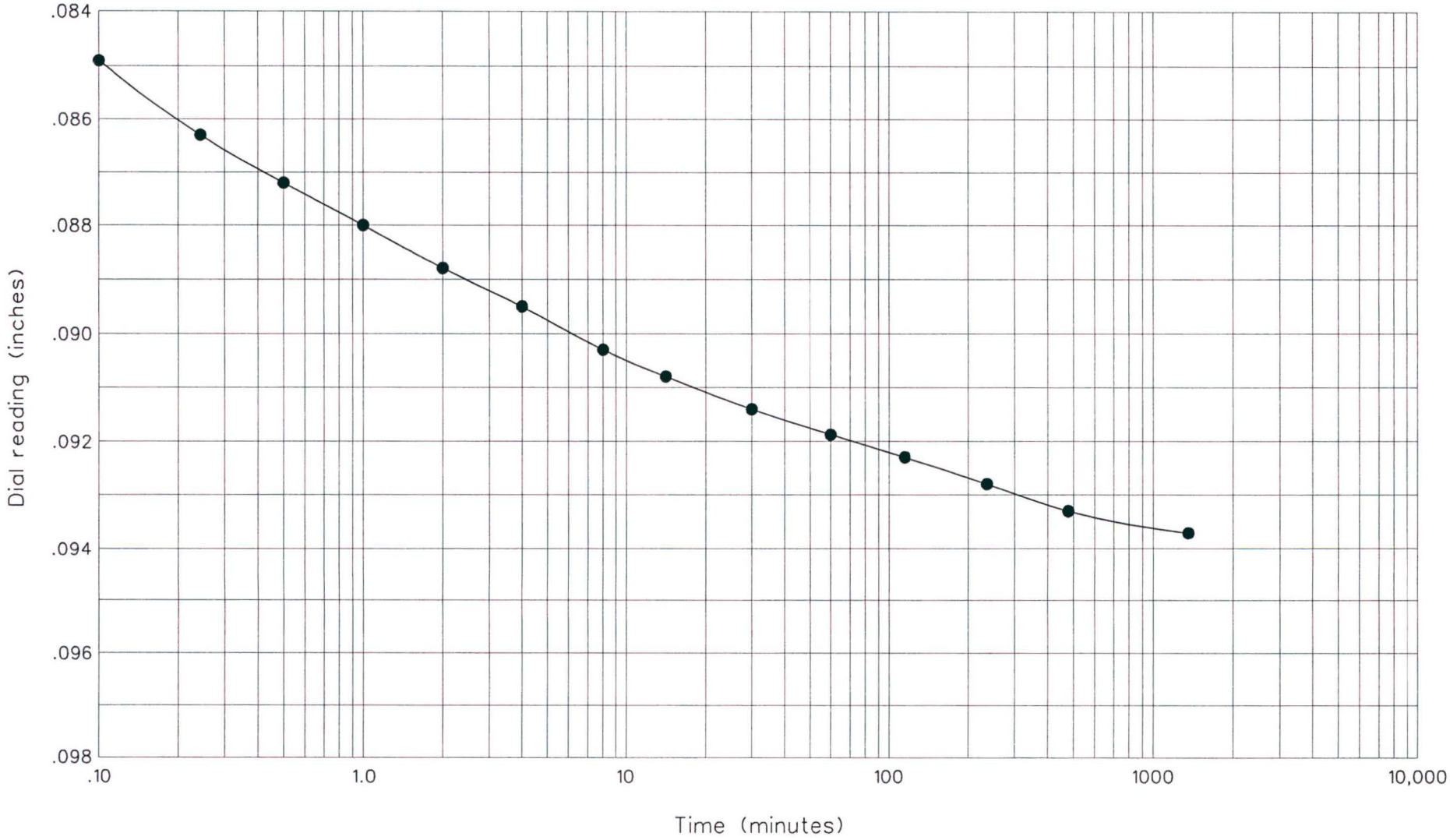
RB&G ENGINEERING, INC.

Hole no.: 08-B1
Depth: 49'-50.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



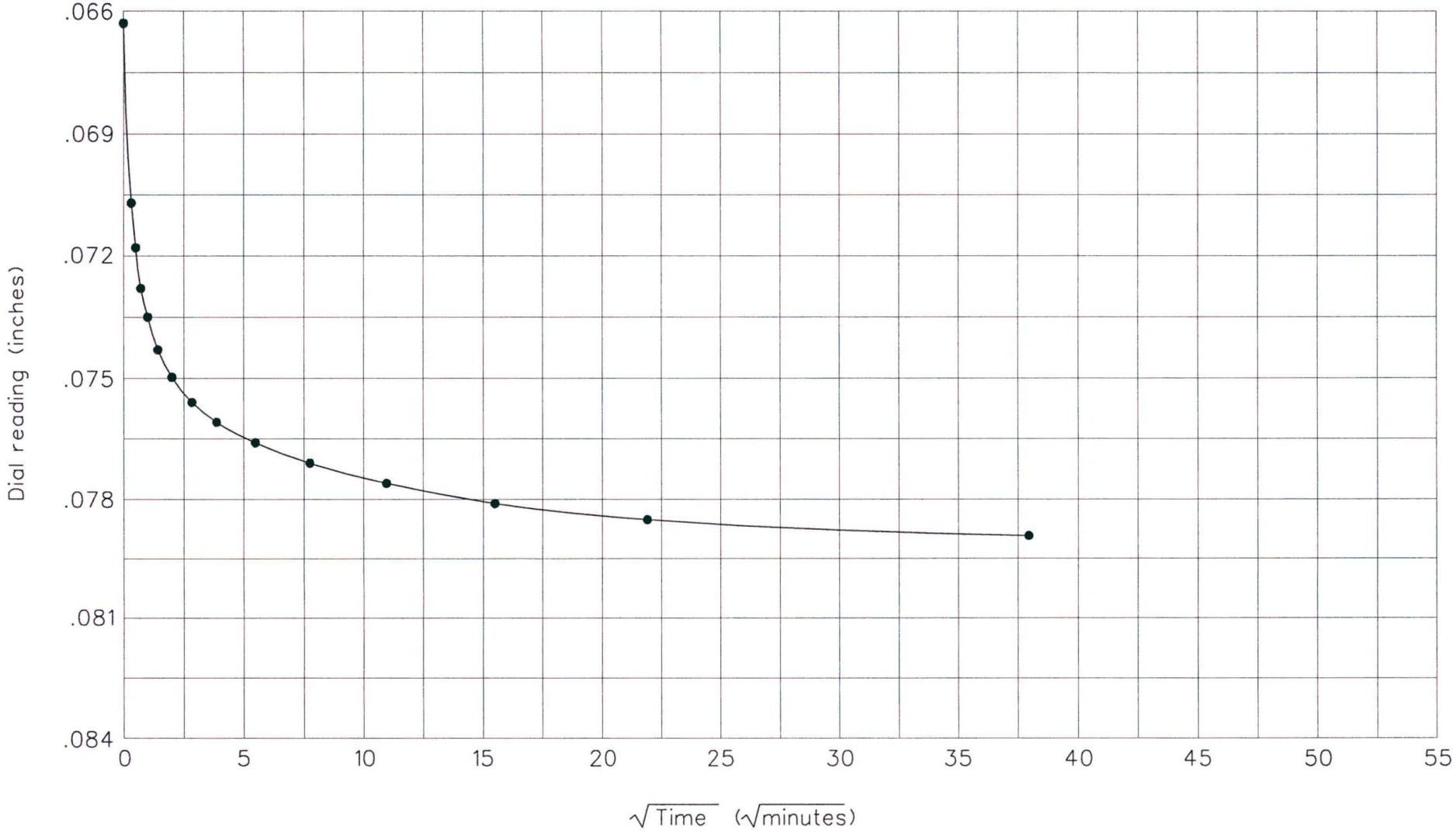
RB&G ENGINEERING, INC.

Hole no.: 08-B1
Depth: 49'-50.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



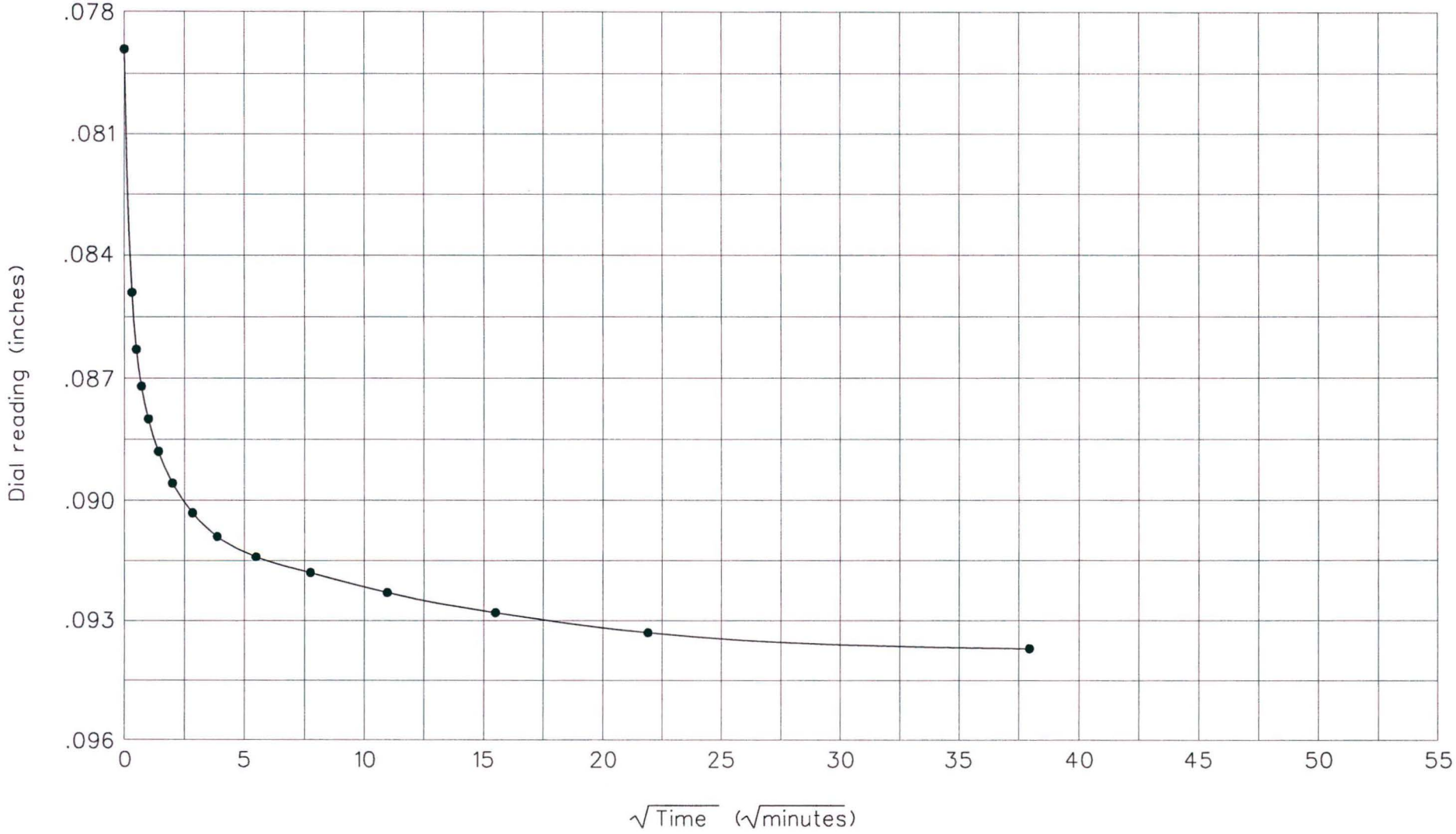
RB&G ENGINEERING, INC.

Hole no.: 08-B1
Depth: 49'-50.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G ENGINEERING, INC.

Hole no.: 08-B1
Depth: 49'-50.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure

Table 1

SUMMARY OF TEST DATA

PROJECT LOCATION: UDOT Vineyard Connector; 800 North to American Fork American Fork 500 East 1100 South

PROJECT NO.: 200701-048
FEATURE: Foundations

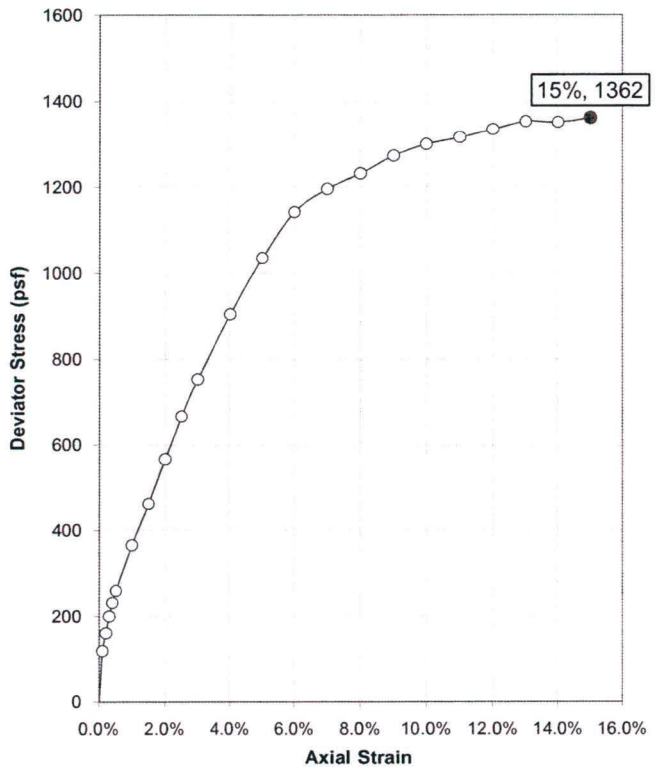
HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	STANDARD PENETRATION BLOWS PER FOOT Corrected (N_1)60	IN-PLACE		UNCONFINED COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO Classification)
			DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
08-B2	0-1.5	68		2.9				NP	48	44	8	GP-GM (A-1-a)
	10-11.5	Shelby		40.5		53	24	29	0	5	95	CH (A-7-6(31))
	20-21.5	Shelby	89.9	32.1		36	25	11	0	1	99	ML (A-6(12))
	30-31.5	97		8.7				NP	52	38	10	GP-GM (A-1-a)
	40-41.5	Shelby	104.8	23.9		37	21	16	0	1	99	CL (A-6(17))
	50-51.5	Shelby	99.3	27.6		36	21	15	0	0	100	CL (A-6(16))
	60-61.5	Shelby	85.8	37.5		45	23	22	0	0	100	CL (A-7-6(25))
	70-71.5	Shelby	90.2	36.8		47	24	23	0	0	100	CL (A-7-6(26))
	80-81.5	Shelby	91.7	30.5		36	23	13	0	1	99	CL (A-6(14))
	90-91.5	Shelby	92.6	29.7		36	23	13	0	1	99	CL (A-6(14))
	100-101.5	80		10.9				NP	41	36	23	GM (A-1-b)

NP=Nonplastic

RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B2
Project No.	200701-048	**Sample**	
Location	American Fork 500 East 1100 South	**Depth / Elev. (ft)**	10-11.5'
Date	October 27, 2008	**Sample Description**	CH (A-7-6 (31))
Tested By	J Boone	**Sample Type**	Shelby



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	0	0	
0.1%	119	59	
0.2%	162	81	
0.3%	201	100	
0.4%	232	116	
0.5%	260	130	
1.0%	366	183	
1.5%	464	232	
2.0%	567	284	
2.5%	667	333	
3.0%	754	377	
4.0%	906	453	
5.0%	1036	518	
6.0%	1143	572	
7.0%	1197	598	
8.0%	1233	616	
9.0%	1274	637	
10.0%	1300	650	
11.0%	1316	658	
12.0%	1335	668	
13.0%	1353	677	
14.0%	1352	676	
15.0%	1362	681	

Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	40.5%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	75.5	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	53		**Initial void ratio**	e_o	1.232	
Plastic index	PI	29		**Saturation**	S	0.89	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	1362	(psf)	**Major principal stress at failure****	σ_1	2369	(psf)
Shear stress at failure**	q_f	681	(psf)	**Minor principal stress at failure****	σ_3	1007	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

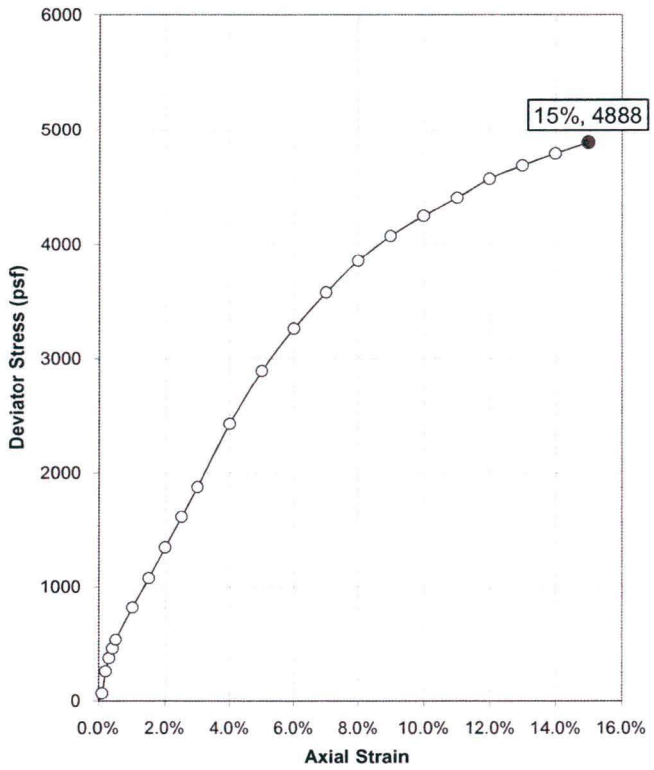
Remarks

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

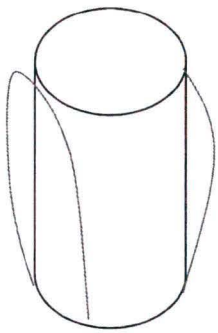
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B2
Project No.	200701-048	**Sample**	
Location	American Fork 500 East 1100 South	**Depth / Elev. (ft)**	40-41.5'
Date	October 21, 2008	**Sample Description**	CL (A-6 (17))
Tested By	J Boone	**Sample Type**	Shelby



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	-1	0	
0.1%	67	34	
0.2%	260	130	
0.3%	376	188	
0.4%	461	230	
0.5%	539	270	
1.0%	820	410	
1.5%	1078	539	
2.0%	1346	673	
2.5%	1612	806	
3.0%	1879	939	
4.0%	2428	1214	
5.0%	2897	1448	
6.0%	3265	1633	
7.0%	3581	1791	
8.0%	3856	1928	
9.0%	4075	2038	
10.0%	4252	2126	
11.0%	4407	2203	
12.0%	4571	2286	
13.0%	4686	2343	
14.0%	4790	2395	
15.0%	4888	2444	



Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	23.9%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	104.8	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	37		**Initial void ratio**	e_o	0.608	
Plastic index	PI	16		**Saturation**	S	1.00	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	4888	(psf)	**Major principal stress at failure****	σ_1	8918	(psf)
Shear stress at failure**	q_f	2444	(psf)	**Minor principal stress at failure****	σ_3	4030	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

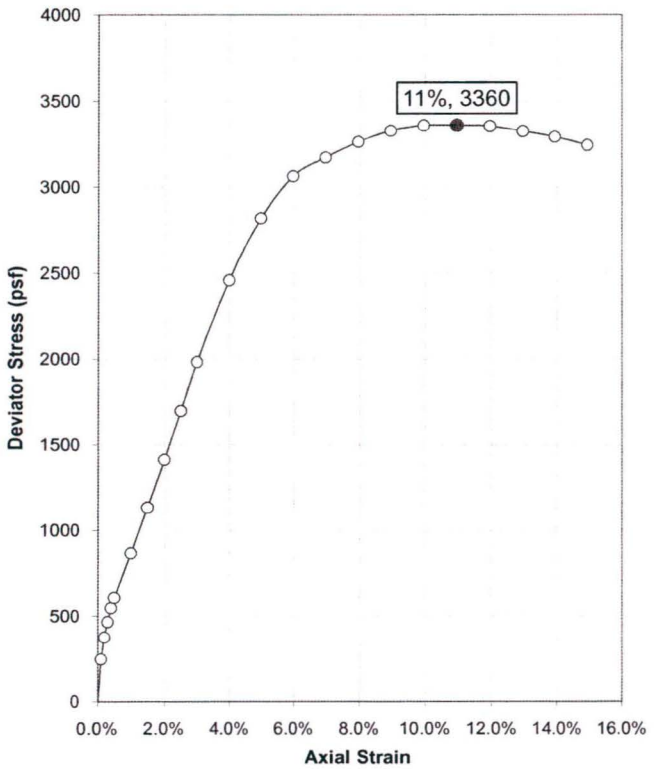
Remarks

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

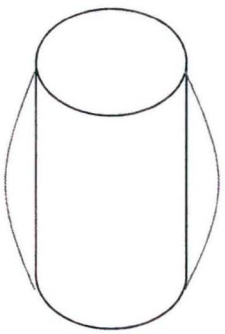
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B2
Project No.	200701-048	**Sample**	
Location	American Fork 500 East 1100 South	**Depth / Elev. (ft)**	60-61.5'
Date	October 21, 2008	**Sample Description**	CL (A-7-6 (25))
Tested By	J Boone	**Sample Type**	Shelby



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	-4	-2	
0.1%	249	125	
0.2%	375	188	
0.3%	465	232	
0.4%	547	274	
0.5%	607	304	
1.0%	867	433	
1.5%	1134	567	
2.0%	1414	707	
2.5%	1697	849	
3.0%	1985	992	
4.0%	2460	1230	
5.0%	2820	1410	
6.0%	3063	1532	
7.0%	3172	1586	
8.0%	3263	1631	
9.0%	3329	1665	
10.0%	3360	1680	
10.9%	3360	1680	
11.9%	3356	1678	
12.9%	3326	1663	
13.9%	3293	1646	
14.9%	3244	1622	



Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	37.5%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	85.8	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	45		**Initial void ratio**	e_o	0.964	
Plastic index	PI	22		**Saturation**	S	1.00	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	3360	(psf)	**Major principal stress at failure****	σ_1	9393	(psf)
Shear stress at failure**	q_f	1680	(psf)	**Minor principal stress at failure****	σ_3	6033	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		11%					

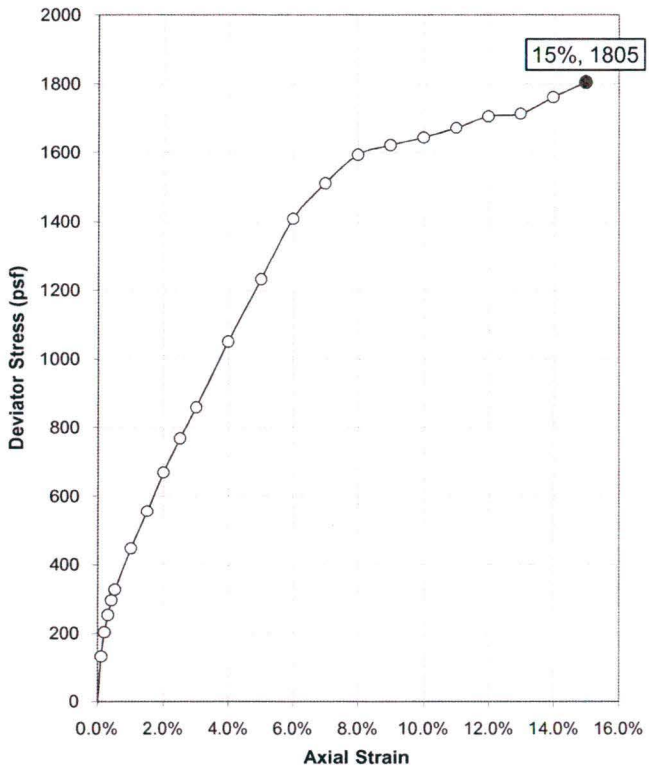
Remarks

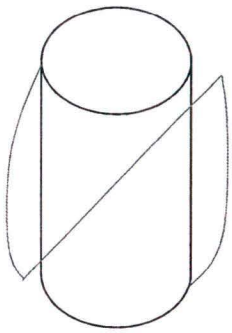
*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B2
Project No.	200701-048	**Sample**	
Location	American Fork 500 East 1100 South	**Depth / Elev. (ft)**	70-71.5'
Date	October 21, 2008	**Sample Description**	CL (A-7-6 (26))
Tested By	J Boone	**Sample Type**	Shelby



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	-5	-3	
0.1%	132	66	
0.2%	204	102	
0.3%	254	127	
0.4%	296	148	
0.5%	327	164	
1.0%	448	224	
1.5%	556	278	
2.0%	670	335	
2.5%	769	384	
3.0%	859	430	
4.0%	1051	526	
5.0%	1233	616	
6.0%	1409	705	
7.0%	1512	756	
8.0%	1594	797	
9.0%	1622	811	
10.0%	1644	822	
11.0%	1673	837	
12.0%	1707	854	
13.0%	1715	857	
14.0%	1763	881	
15.0%	1805	903	

Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	36.8%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	90.2	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	47		**Initial void ratio**	e_o	0.868	
Plastic index	PI	23		**Saturation**	S	1.00	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	1805	(psf)	**Major principal stress at failure****	σ_1	8858	(psf)
Shear stress at failure**	q_f	903	(psf)	**Minor principal stress at failure****	σ_3	7052	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

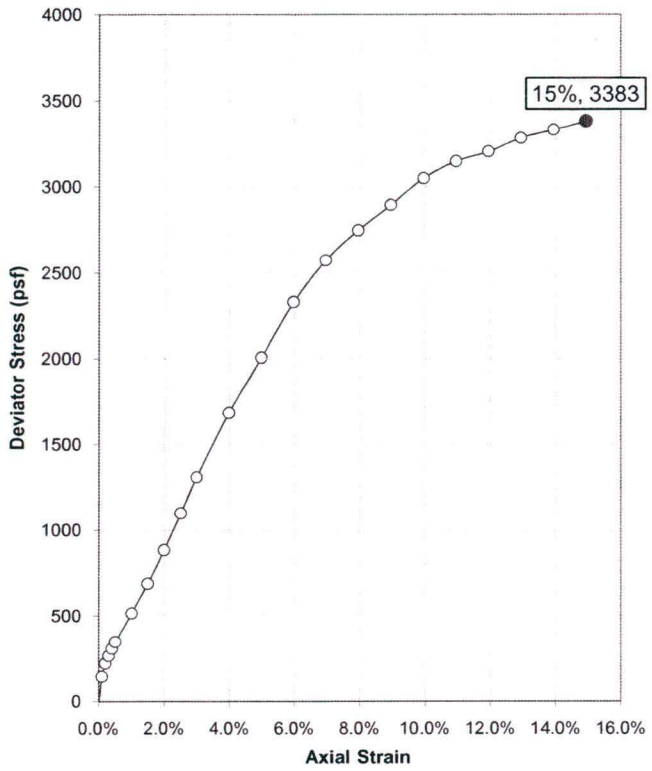
Remarks

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

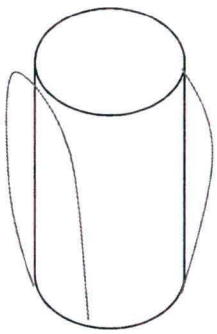
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B2
Project No.	200701-048	**Sample**	
Location	American Fork 500 East 1100 South	**Depth / Elev. (ft)**	80-81.5'
Date	October 21, 2008	**Sample Description**	CL (A-6 (14))
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	-6	-3	
0.1%	146	73	
0.2%	222	111	
0.3%	268	134	
0.4%	310	155	
0.5%	349	175	
1.0%	516	258	
1.5%	689	344	
2.0%	884	442	
2.5%	1099	550	
3.0%	1312	656	
4.0%	1685	843	
5.0%	2009	1004	
6.0%	2332	1166	
7.0%	2574	1287	
8.0%	2749	1375	
9.0%	2897	1449	
10.0%	3051	1525	
10.9%	3149	1574	
11.9%	3205	1603	
12.9%	3284	1642	
13.9%	3332	1666	
14.9%	3383	1691	



Initial Sample Data

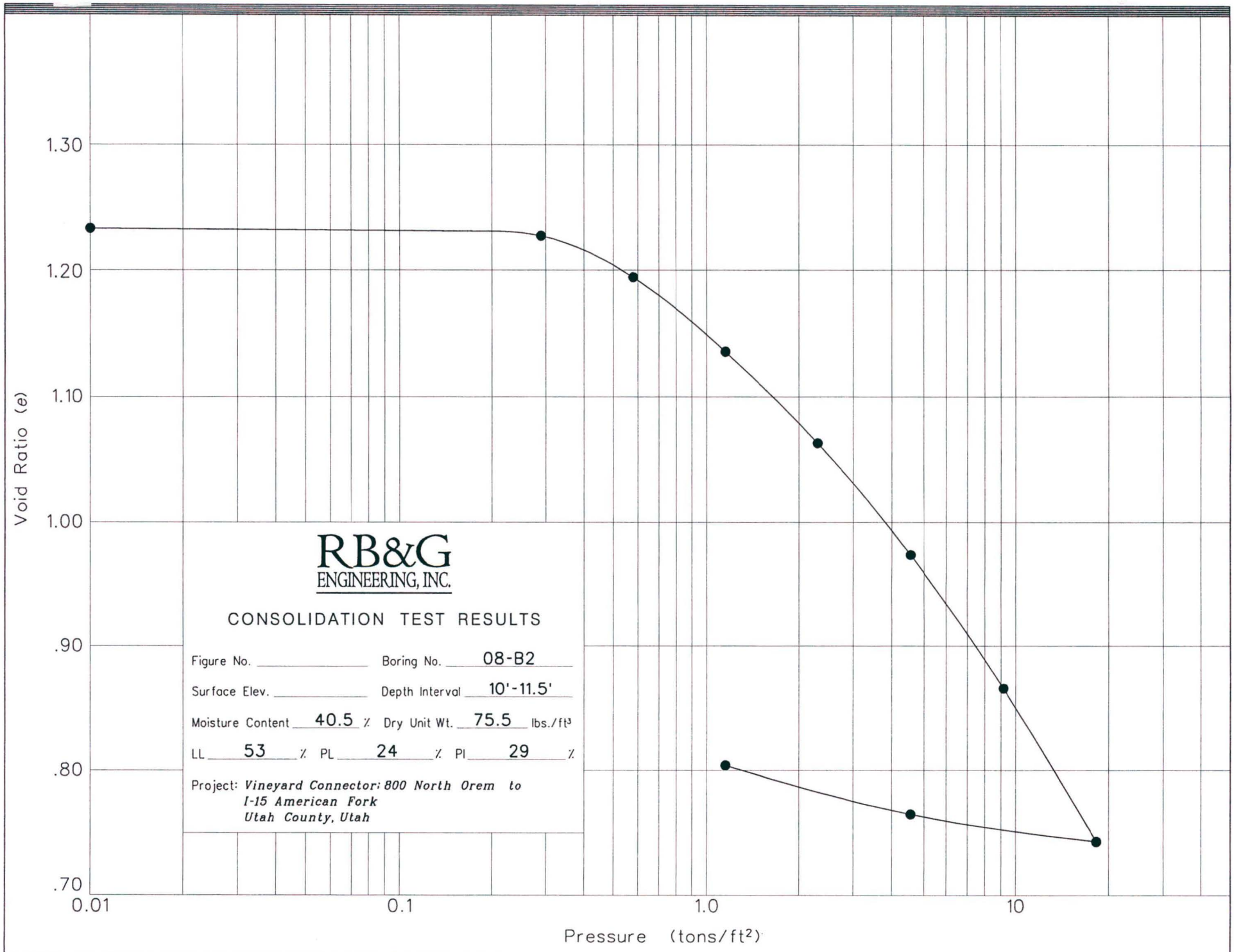
Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	30.5%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	91.7	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	36		**Initial void ratio**	e_o	0.837	
Plastic index	PI	13		**Saturation**	S	0.98	

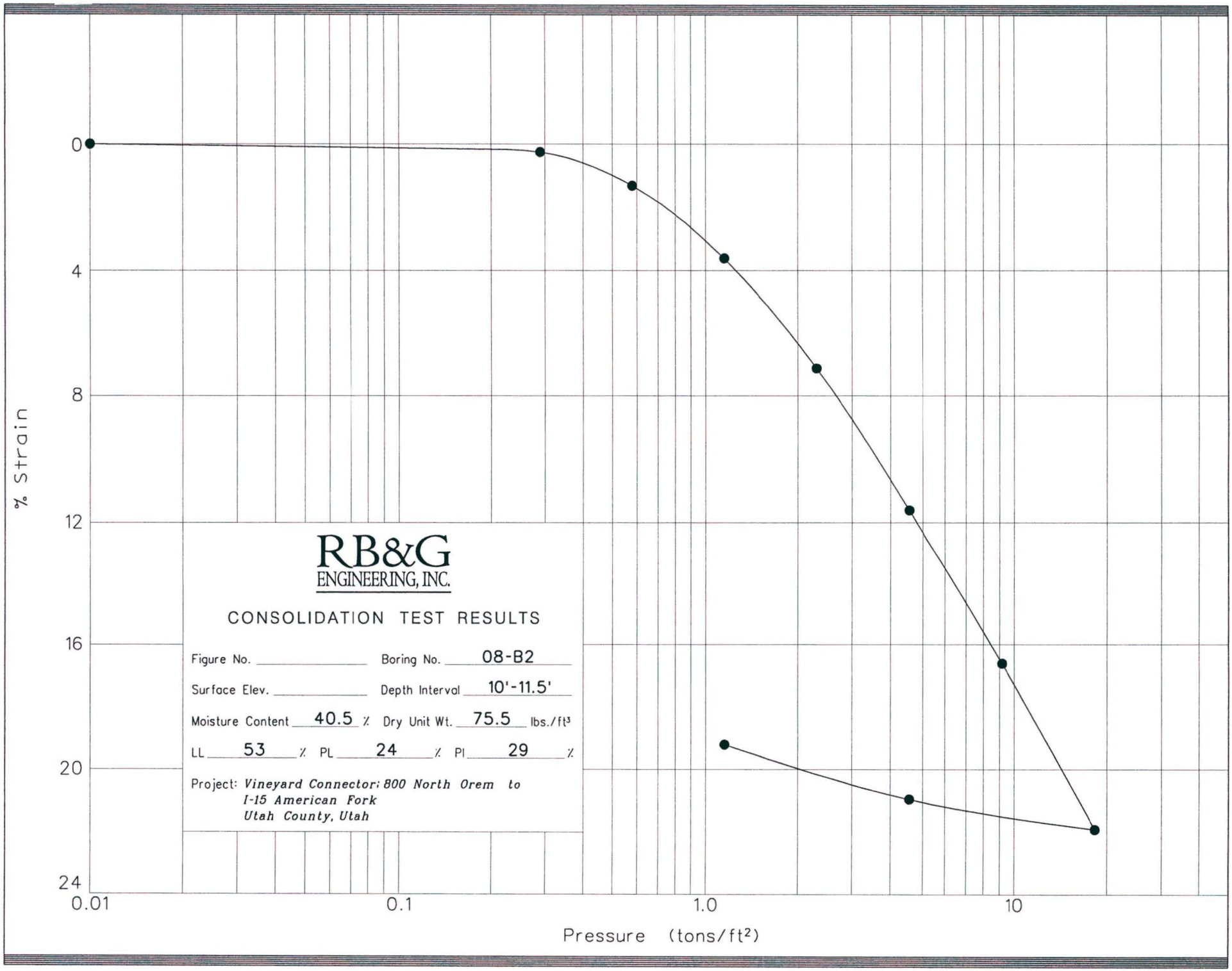
Test Results

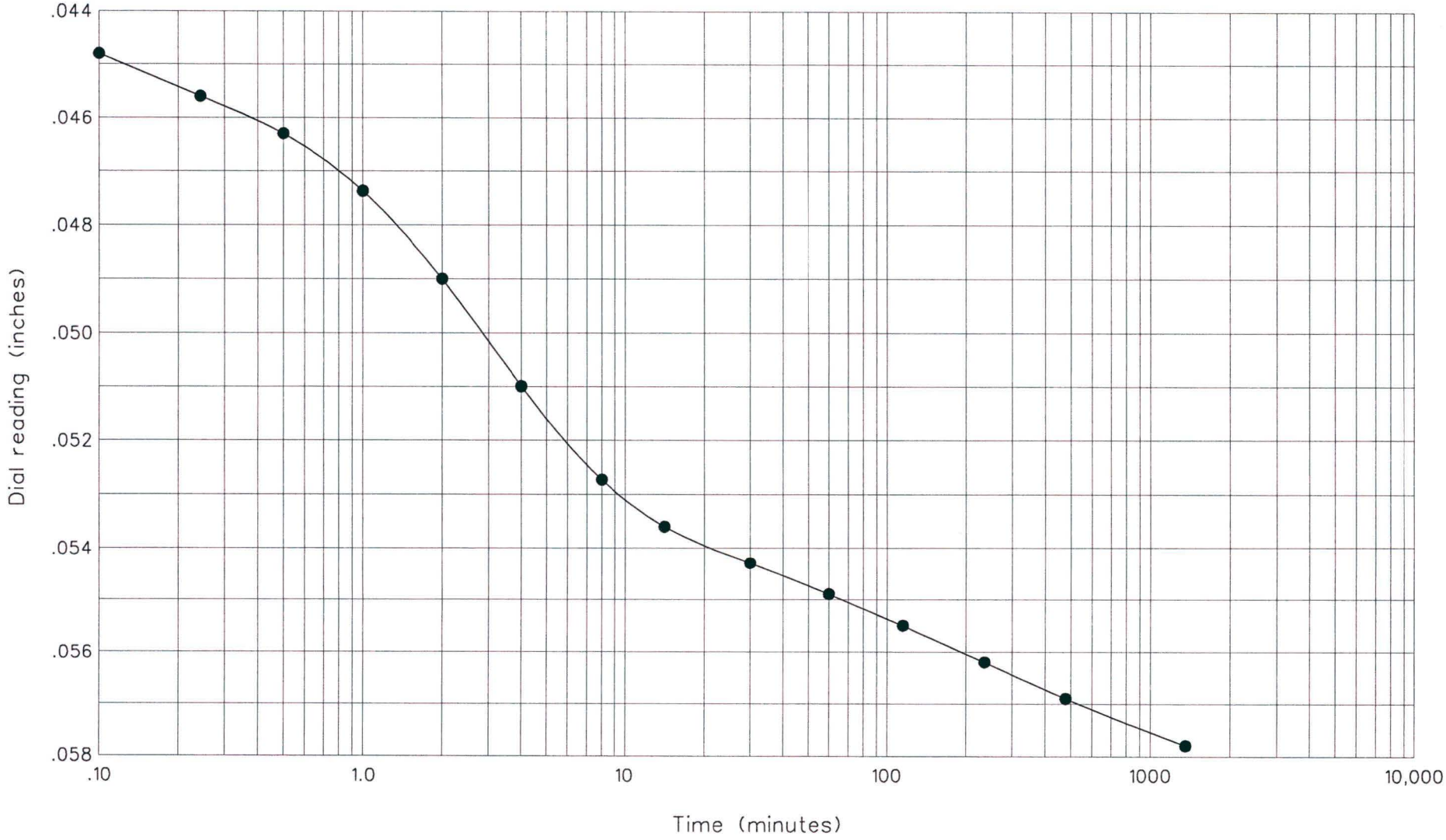
Deviator stress at failure**	$\sigma_{d,f}$	3383	(psf)	**Major principal stress at failure****	σ_1	11450	(psf)
Shear stress at failure**	q_f	1691	(psf)	**Minor principal stress at failure****	σ_3	8067	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

Remarks

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects


1.30
1.20
1.10
1.00
.90
.80
.70
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No.
Boring No. 08-B2
Surface Elev.
Depth Interval 10'-11.5'
Moisture Content 40.5 % Dry Unit Wt. 75.5 lbs./ft³
LL 53 % PL 24 % PI 29 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah


% Strain
0
4
8
12
16
20
24
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B2
Surface Elev. _____ Depth Interval 10'-11.5'
Moisture Content 40.5 % Dry Unit Wt. 75.5 lbs./ft³
LL 53 % PL 24 % PI 29 %
Project: Vineyard Connector: 800 North Orem to
I-15 American Fork
Utah County, Utah



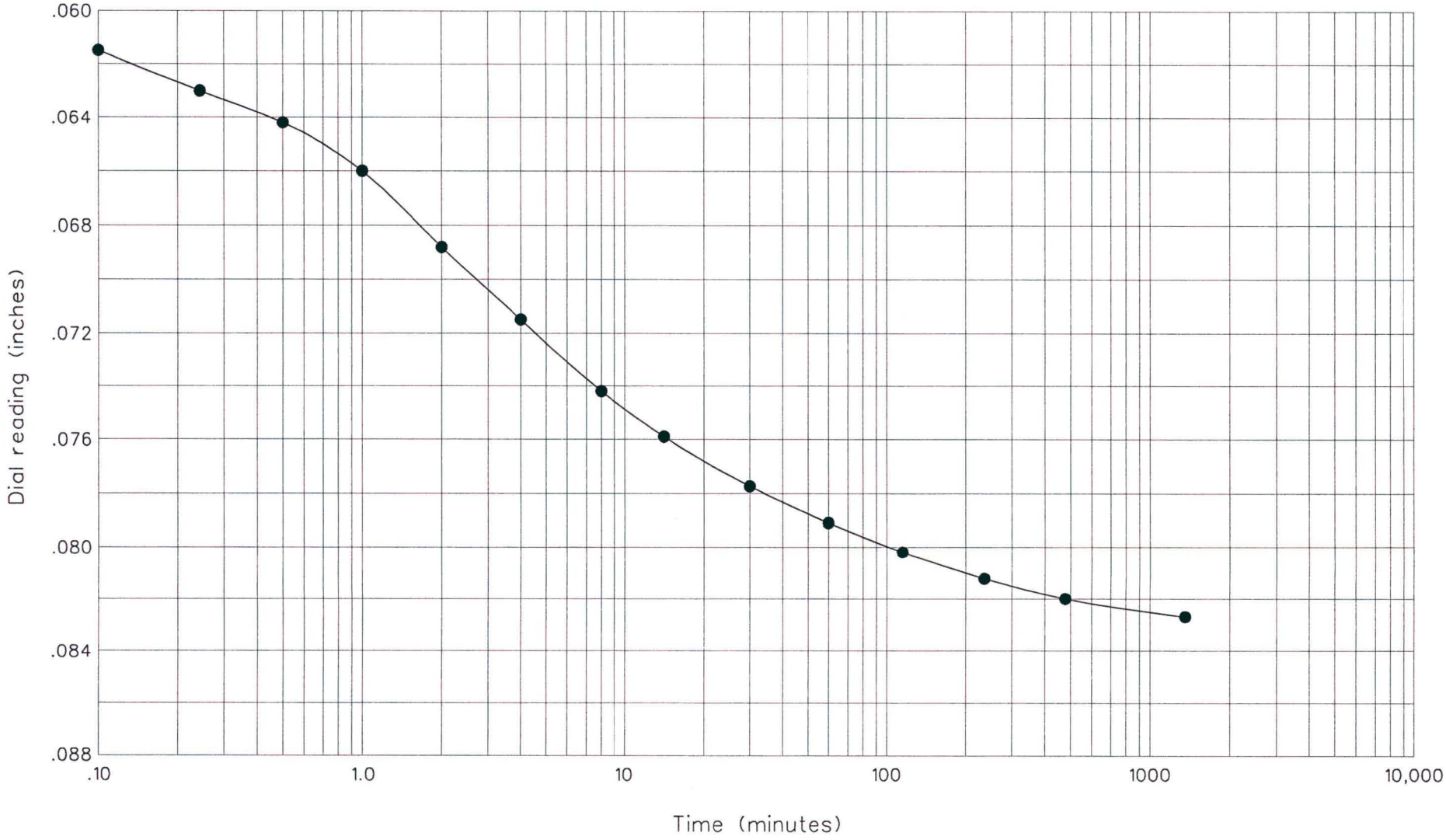
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 10'-11.5'
Load: 0.29 to 0.58 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



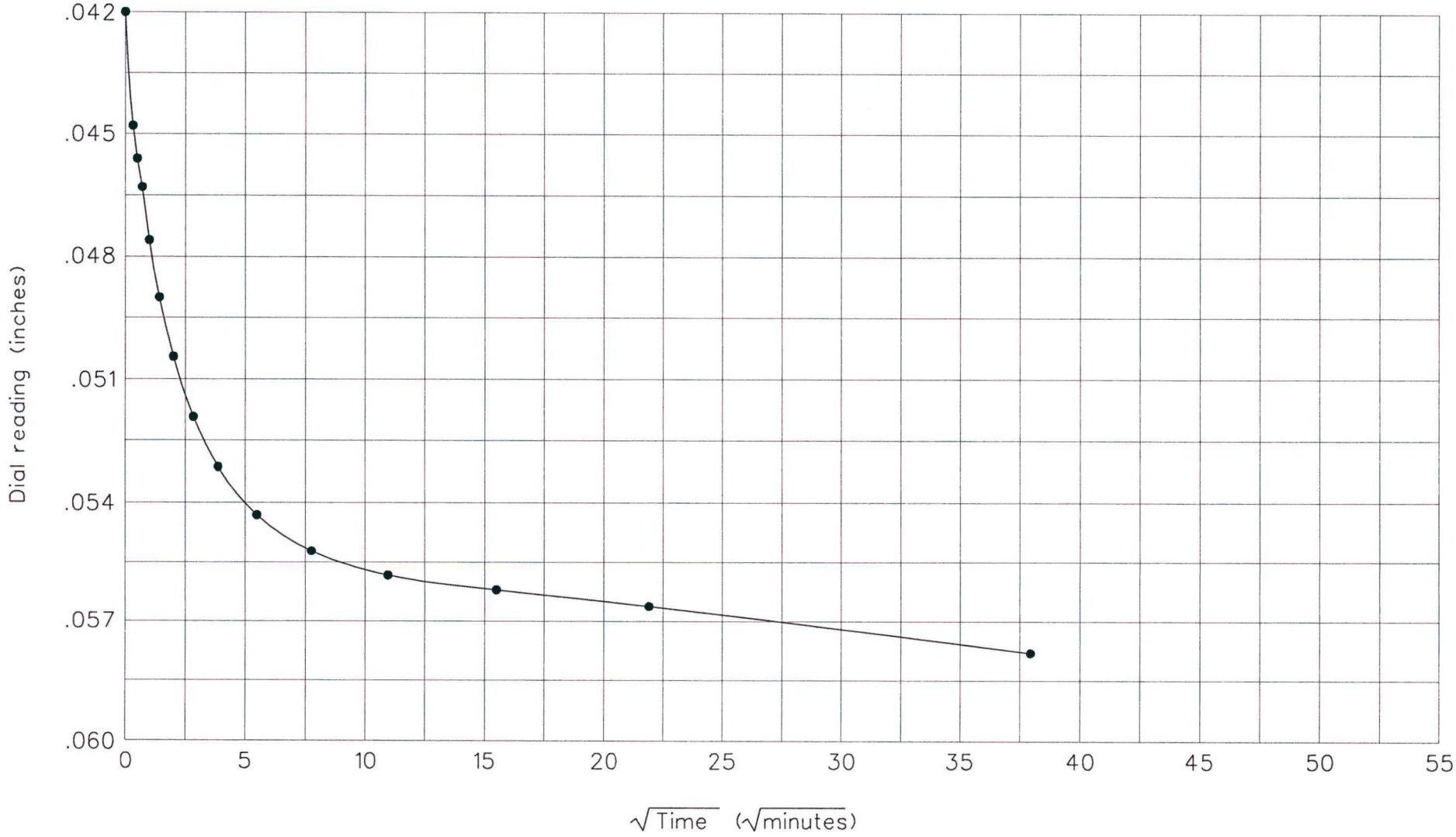
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 10'-11.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



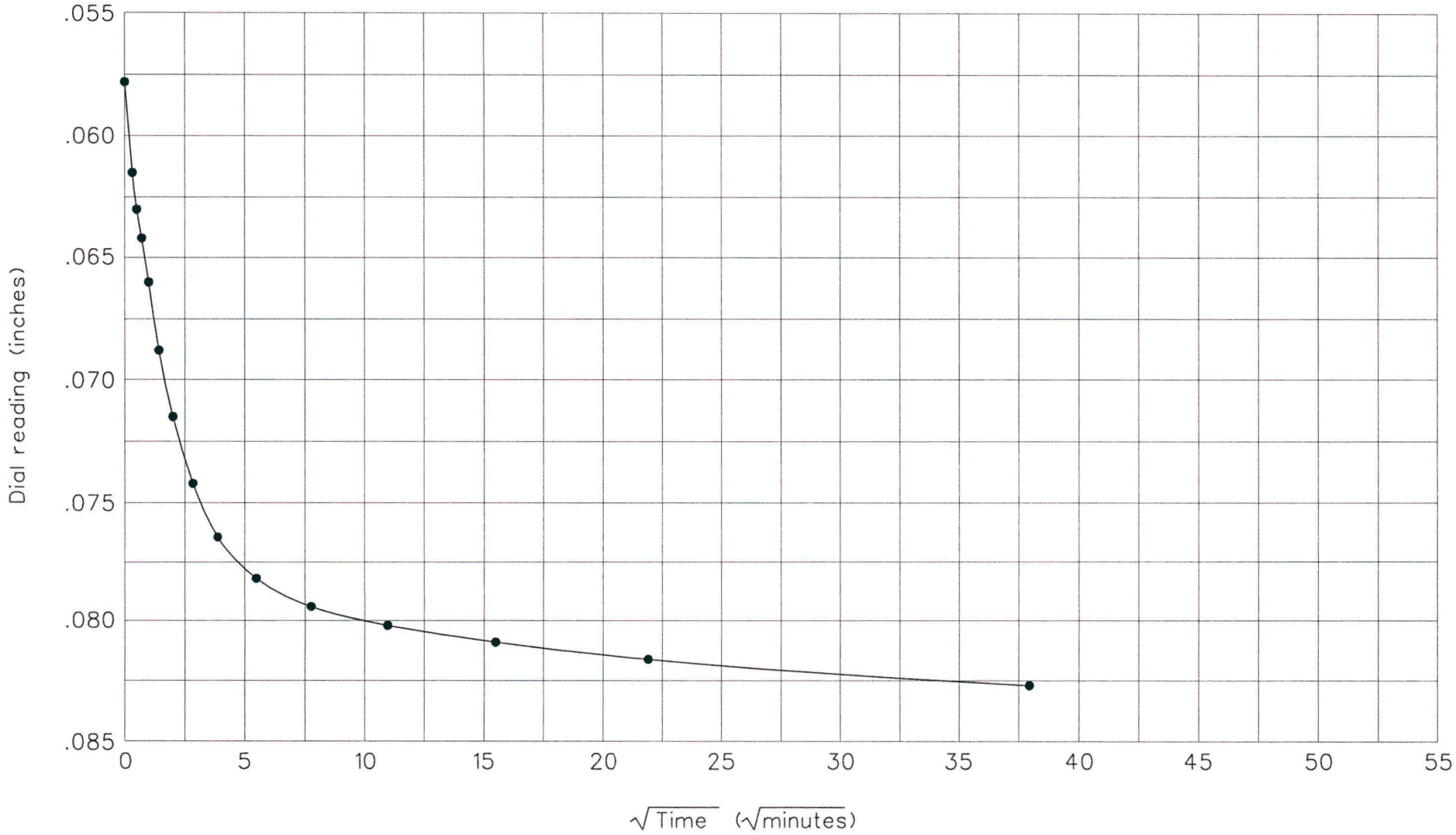
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 10'-11.5'
Load: 0.29 to 0.58 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



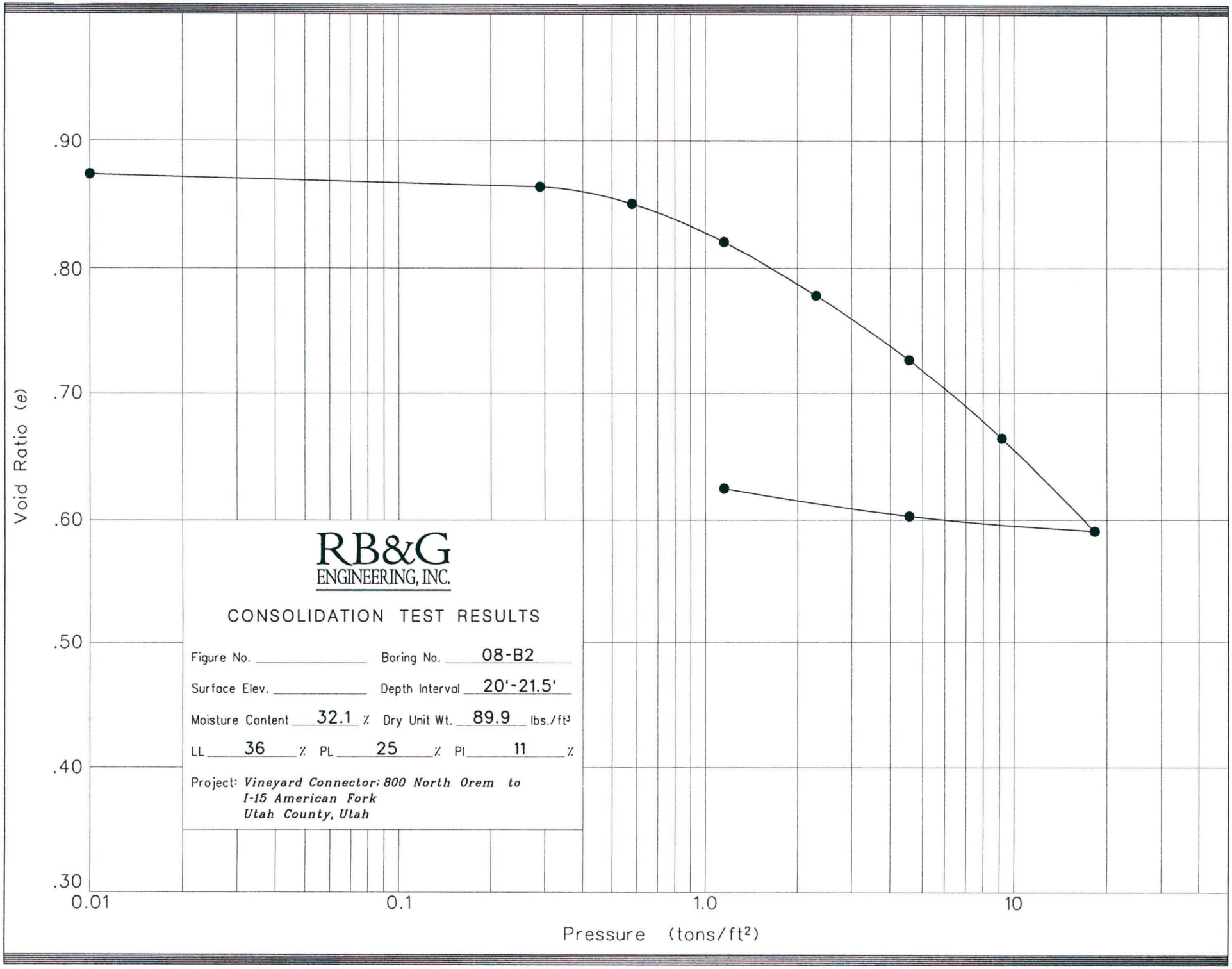
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 10'-11.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

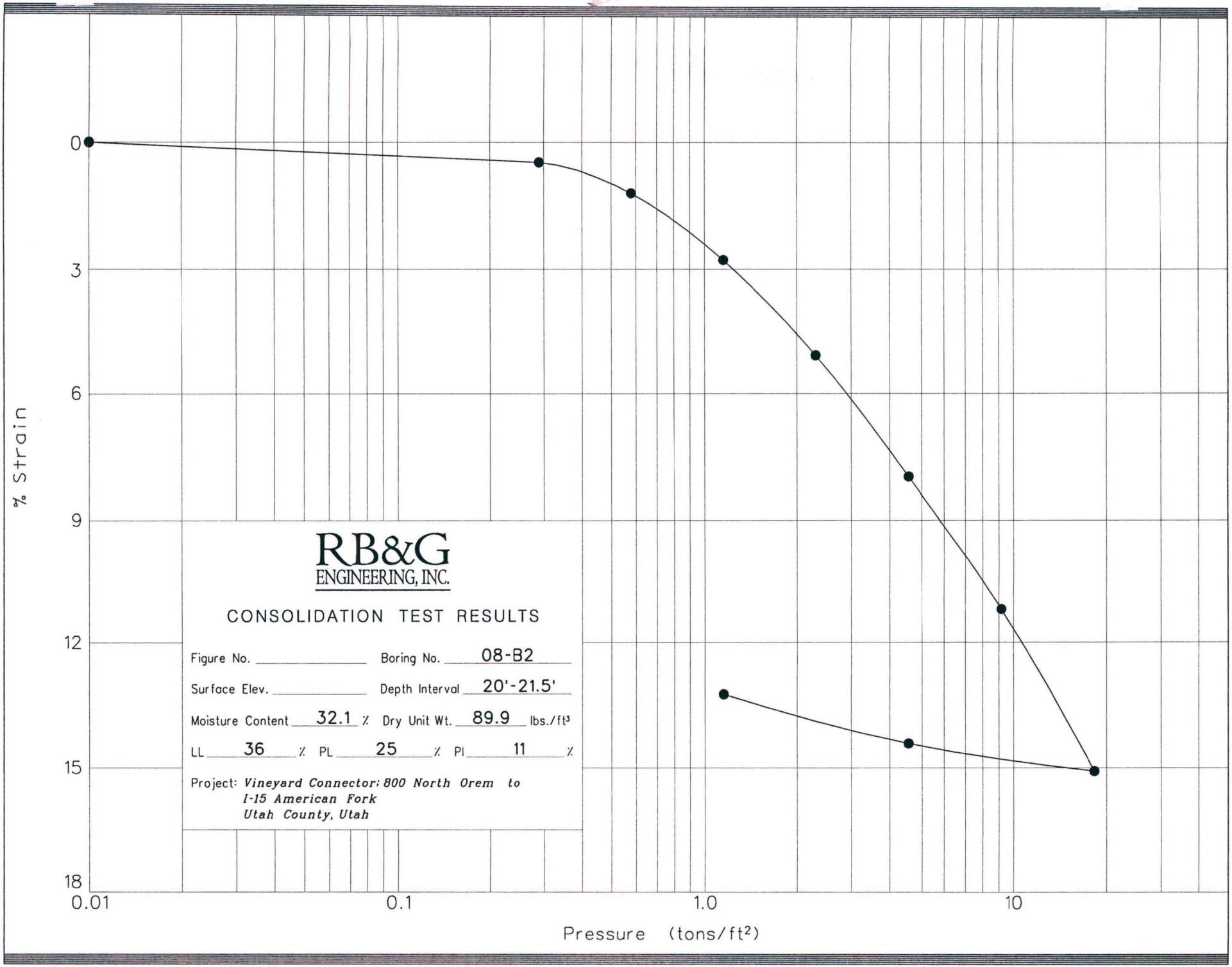
Figure No. _____ Boring No. 08-B2

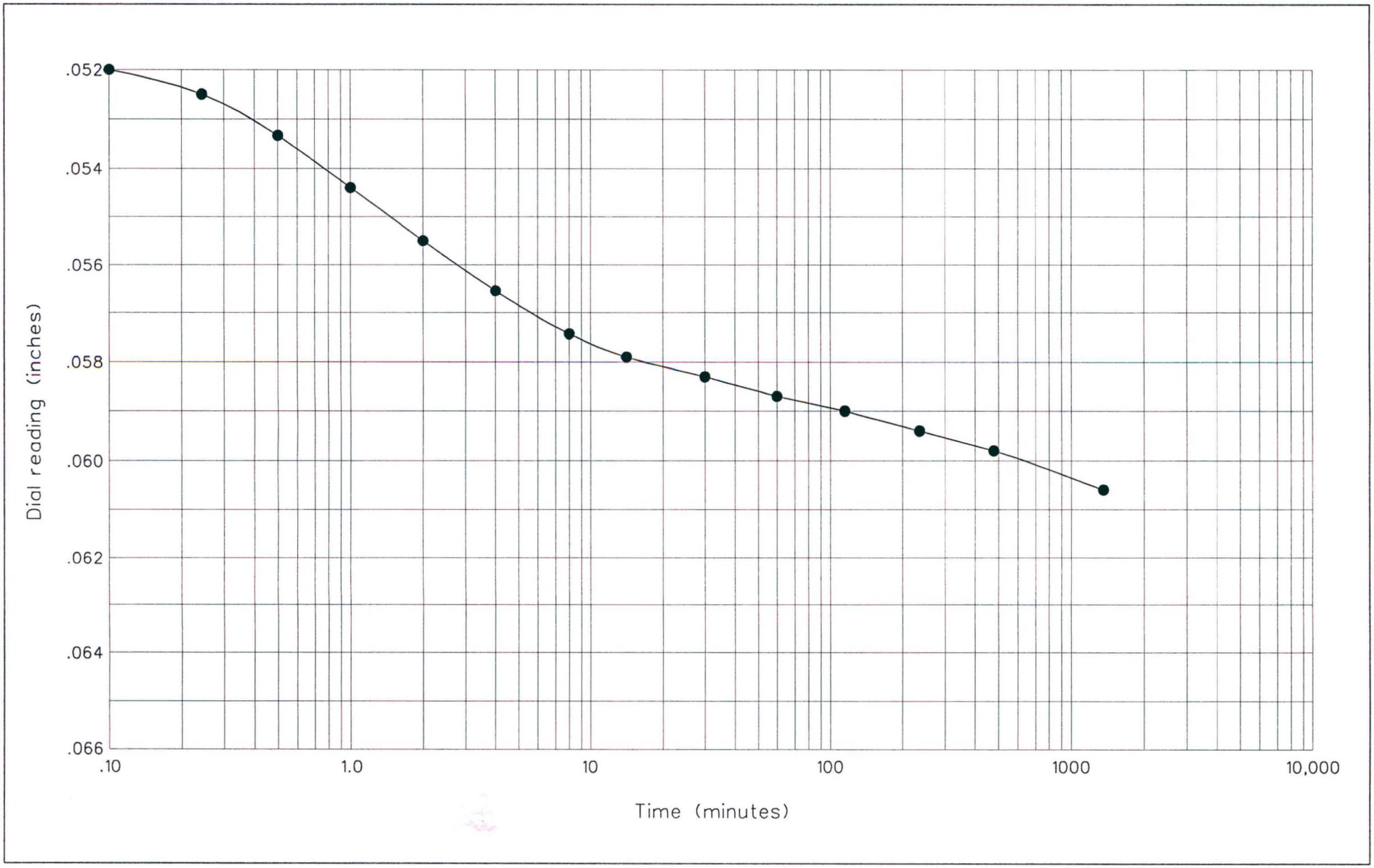
Surface Elev. _____ Depth Interval 20'-21.5'

Moisture Content 32.1 % Dry Unit Wt. 89.9 lbs./ft³

LL 36 % PL 25 % PI 11 %

Project: *Vineyard Connector: 800 North Orem to I-15 American Fork Utah County, Utah*


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B2
Surface Elev. _____ Depth Interval 20'-21.5'
Moisture Content 32.1 % Dry Unit Wt. 89.9 lbs./ft³
LL 36 % PL 25 % PI 11 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah



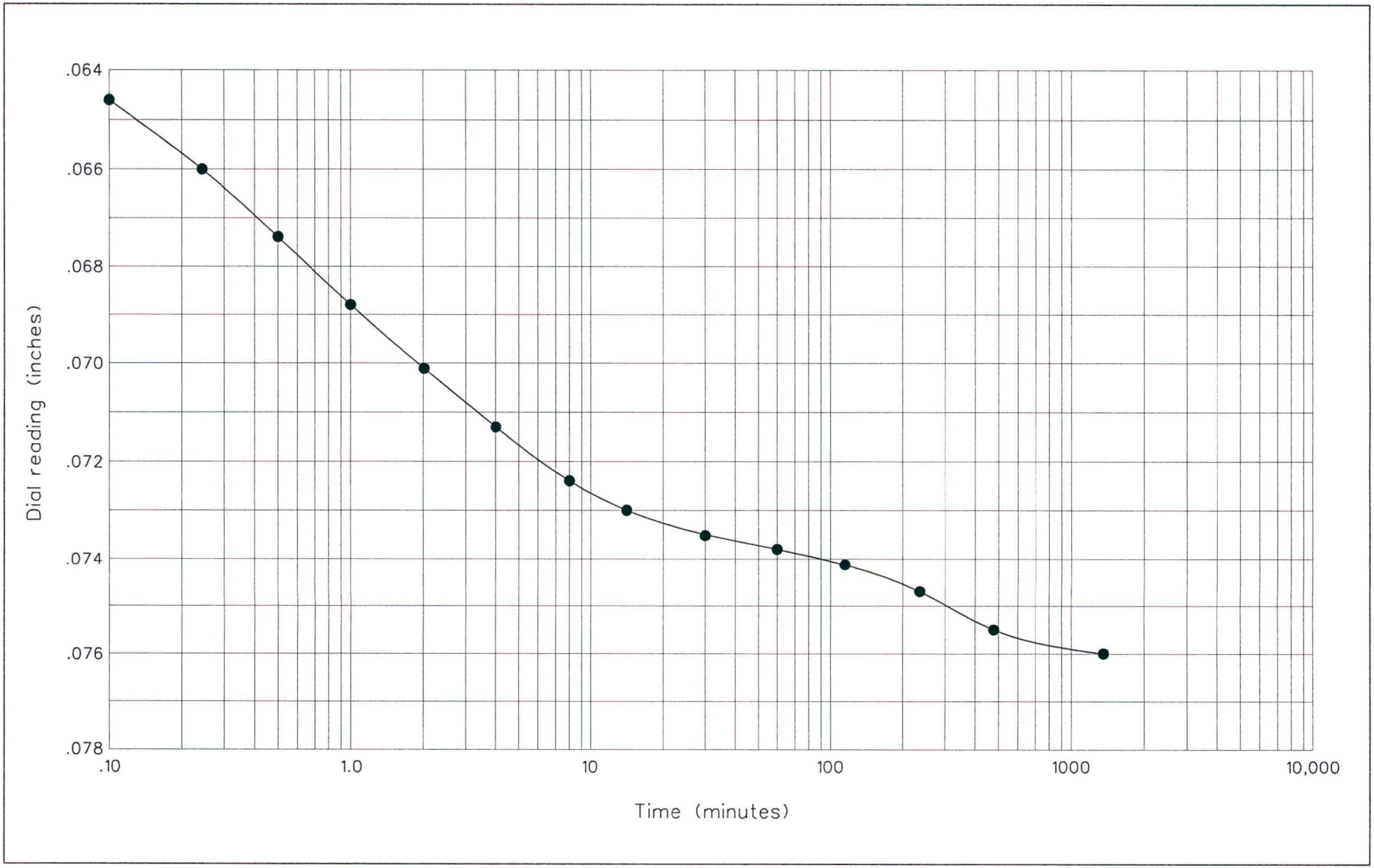
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 20'-21.5'
Load: 0.29 to 0.58 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



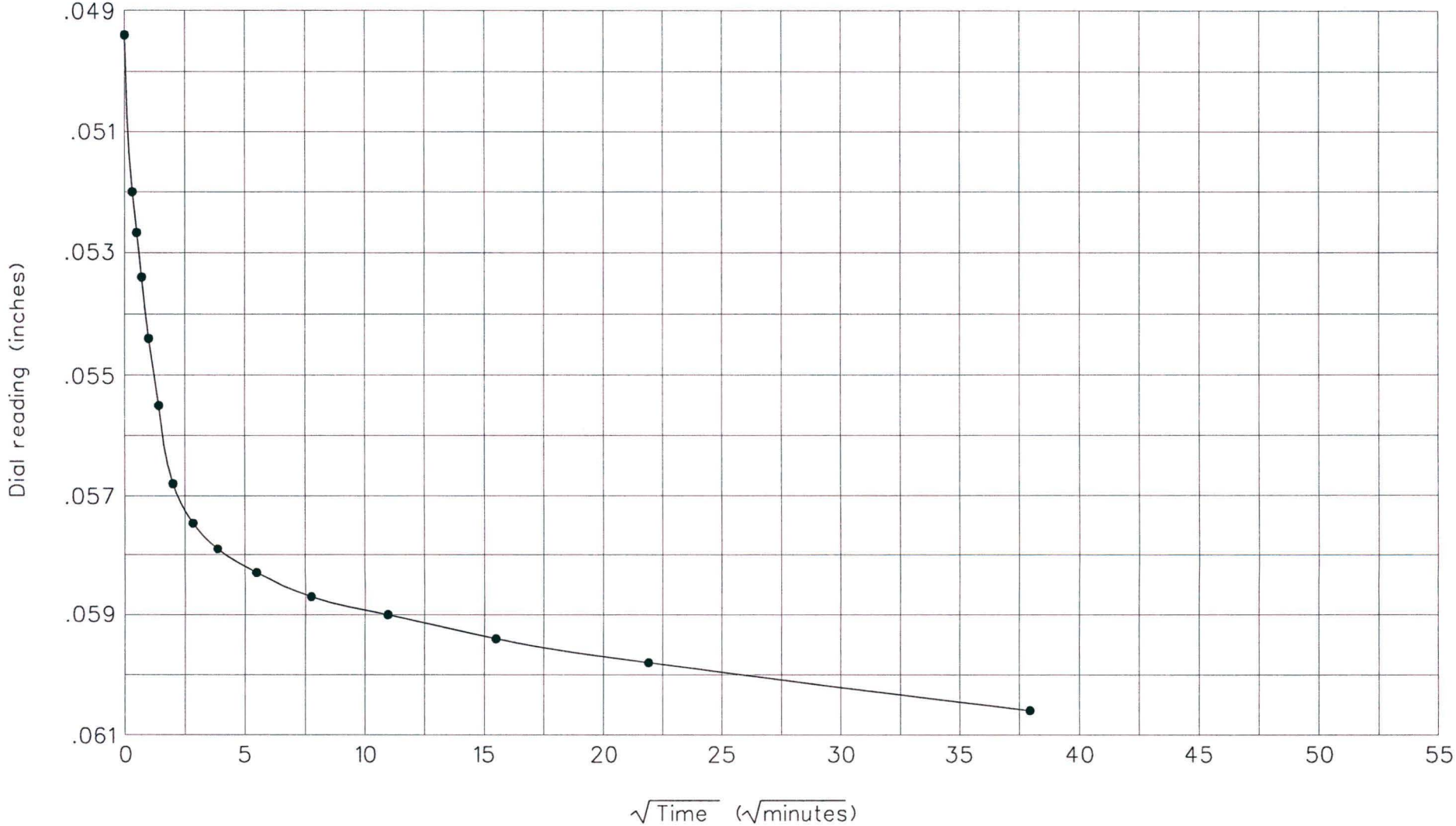
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 20'-21.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



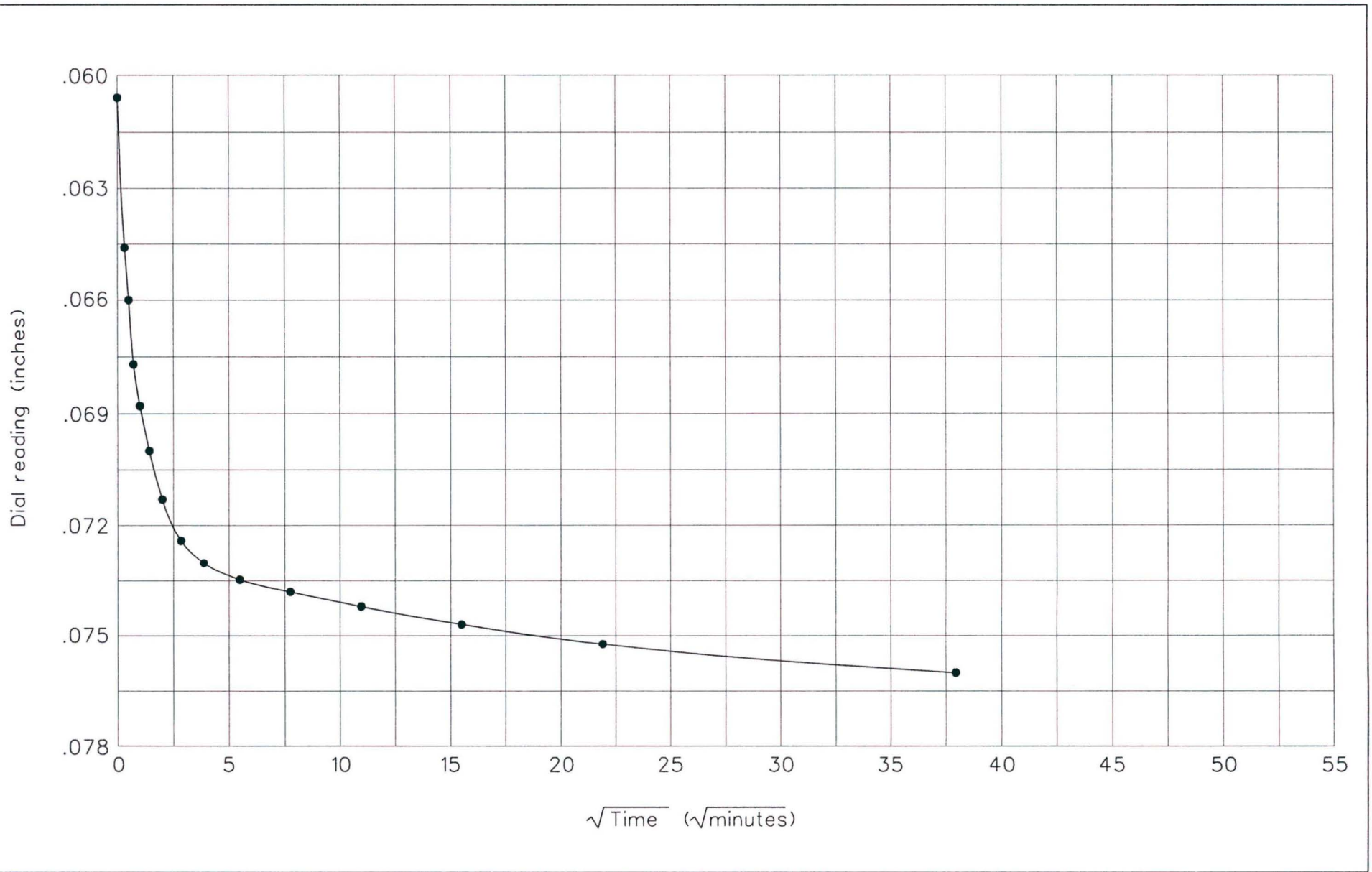
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 20'-21.5'
Load: 0.29 to 0.58 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



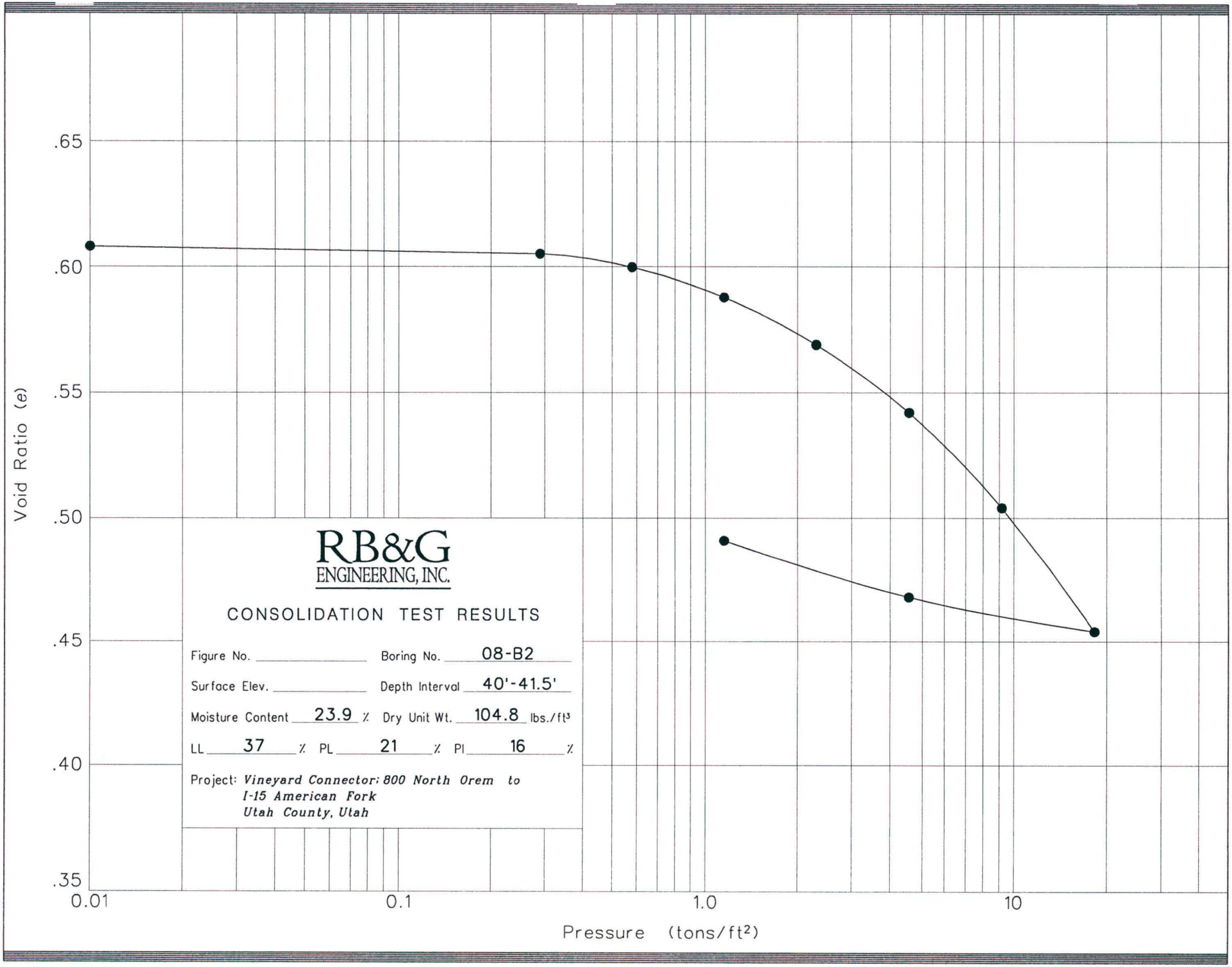
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 20'-21.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

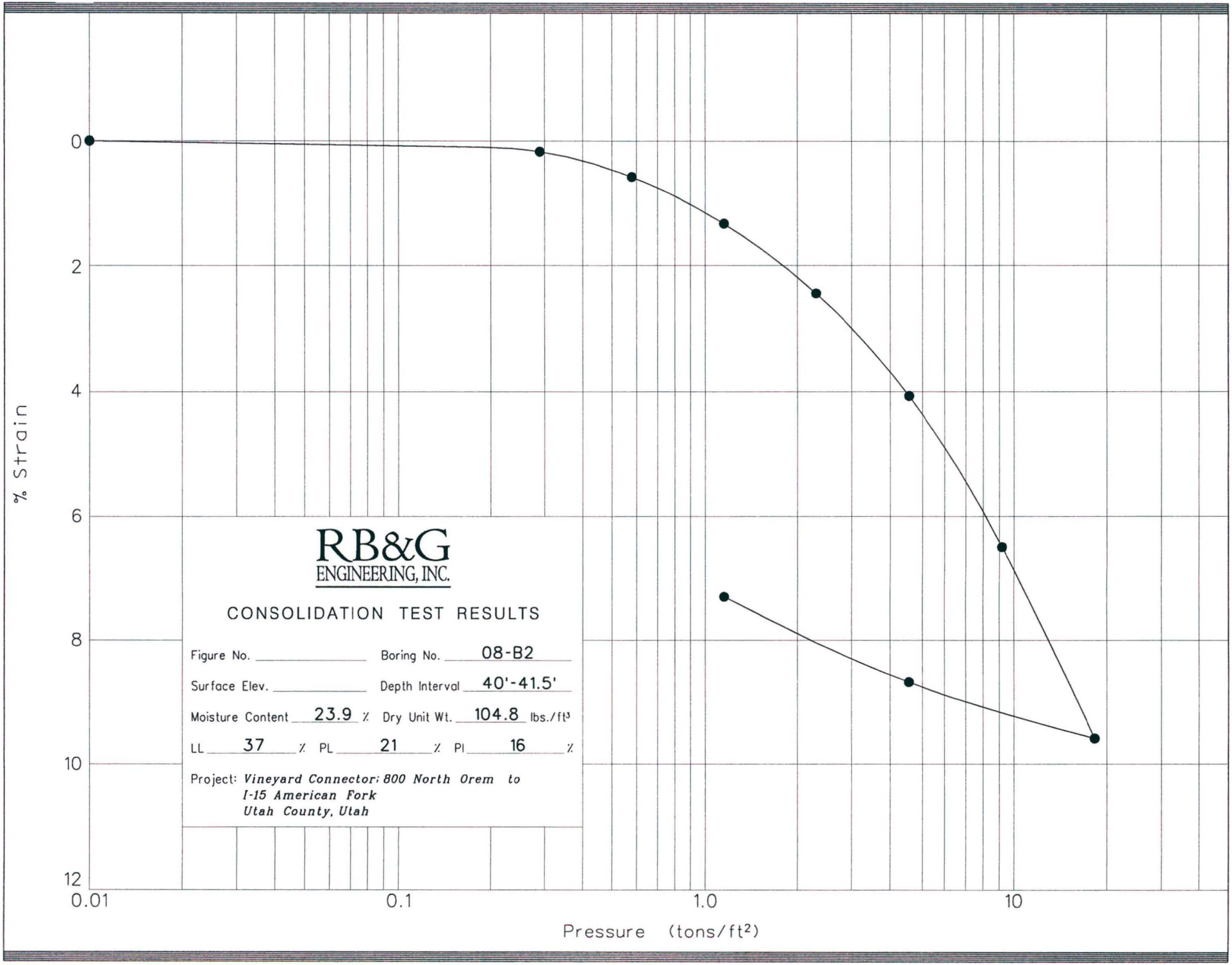
Figure No. _____ Boring No. 08-B2

Surface Elev. _____ Depth Interval 40'-41.5'

Moisture Content 23.9 % Dry Unit Wt. 104.8 lbs./ft³

LL 37 % PL 21 % PI 16 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

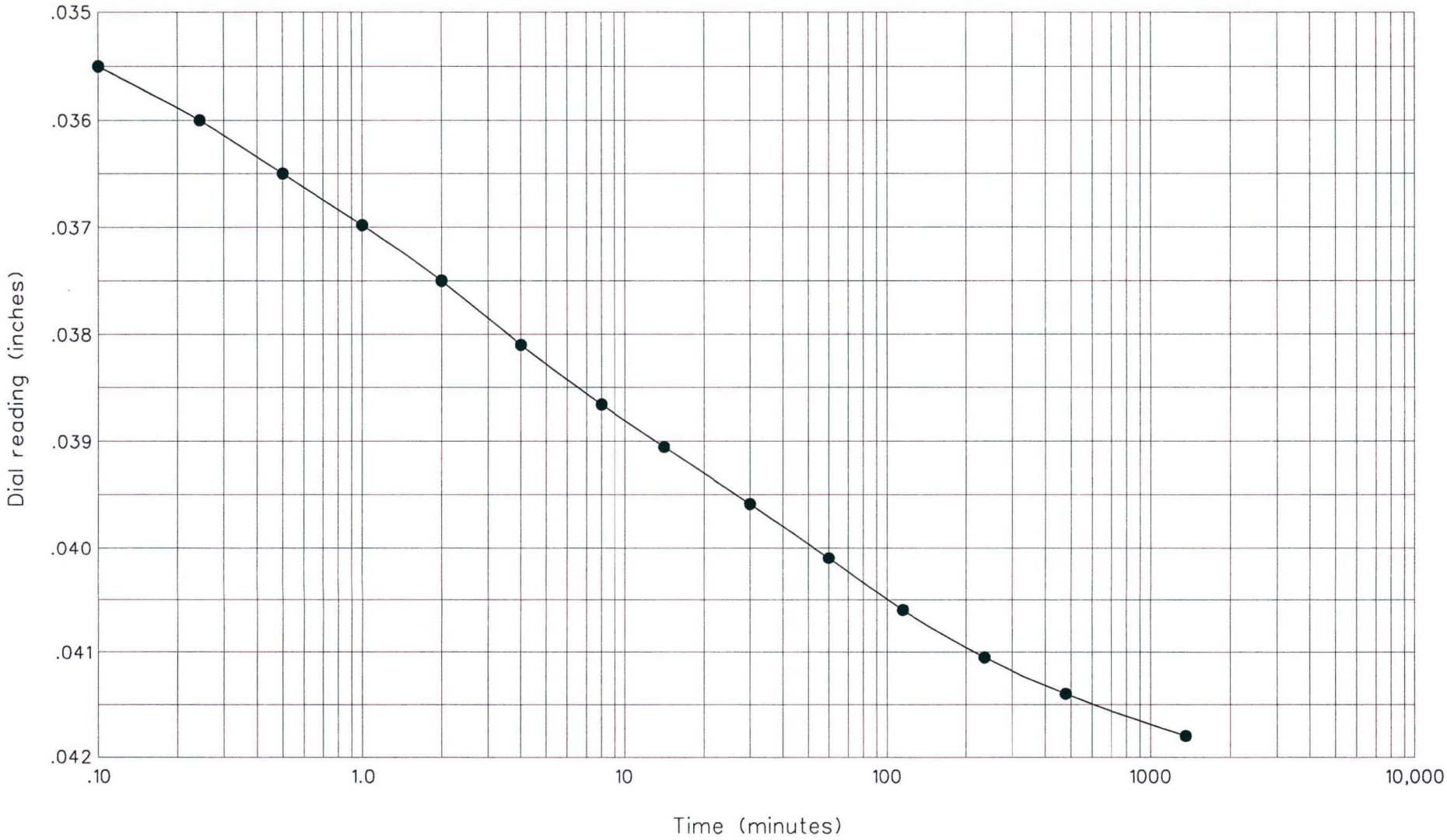
Figure No. _____ Boring No. 08-B2

Surface Elev. _____ Depth Interval 40'-41.5'

Moisture Content 23.9 % Dry Unit Wt. 104.8 lbs./ft³

LL 37 % PL 21 % PI 16 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*



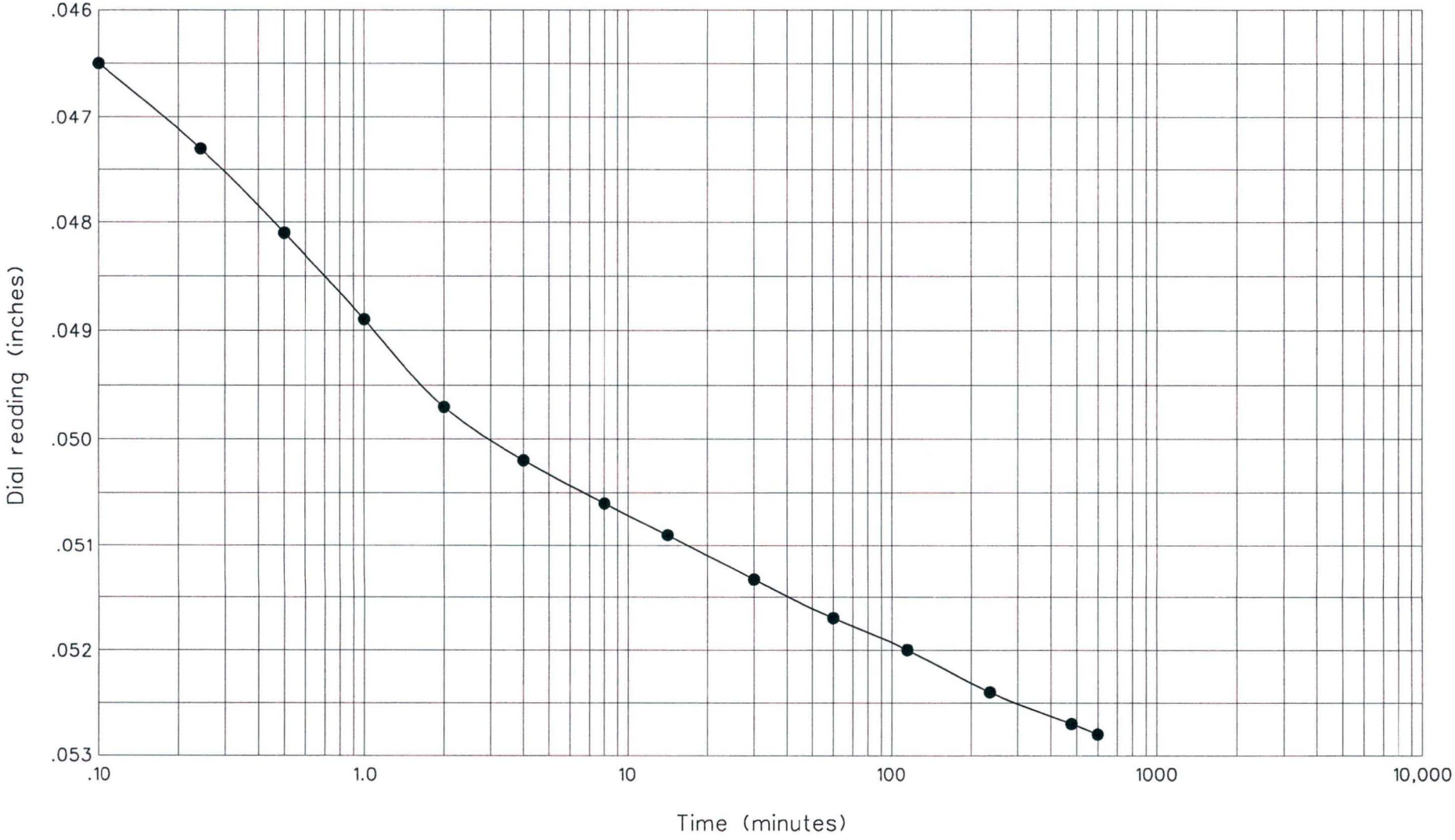
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 40'-41.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



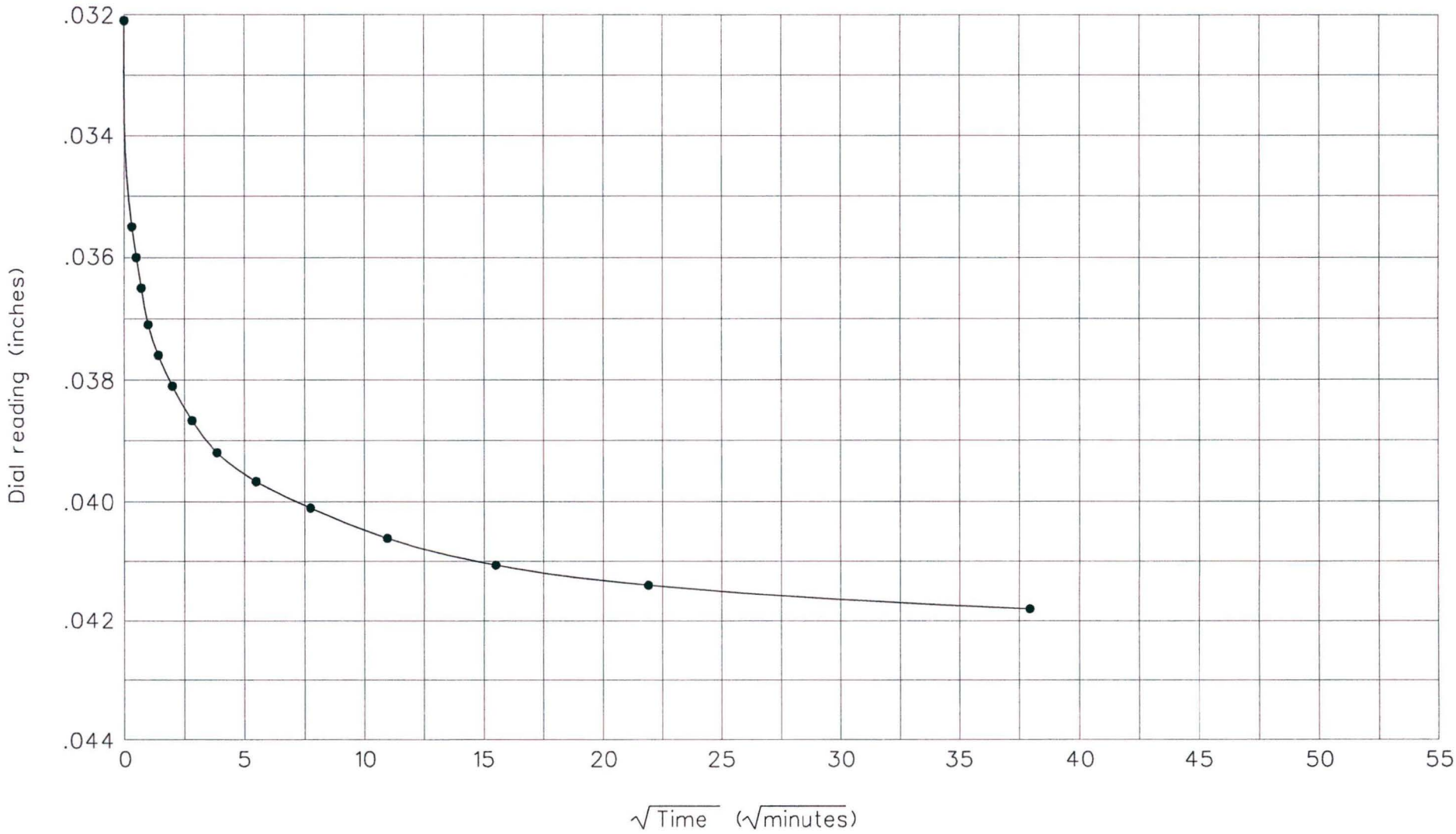
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 40'-41.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



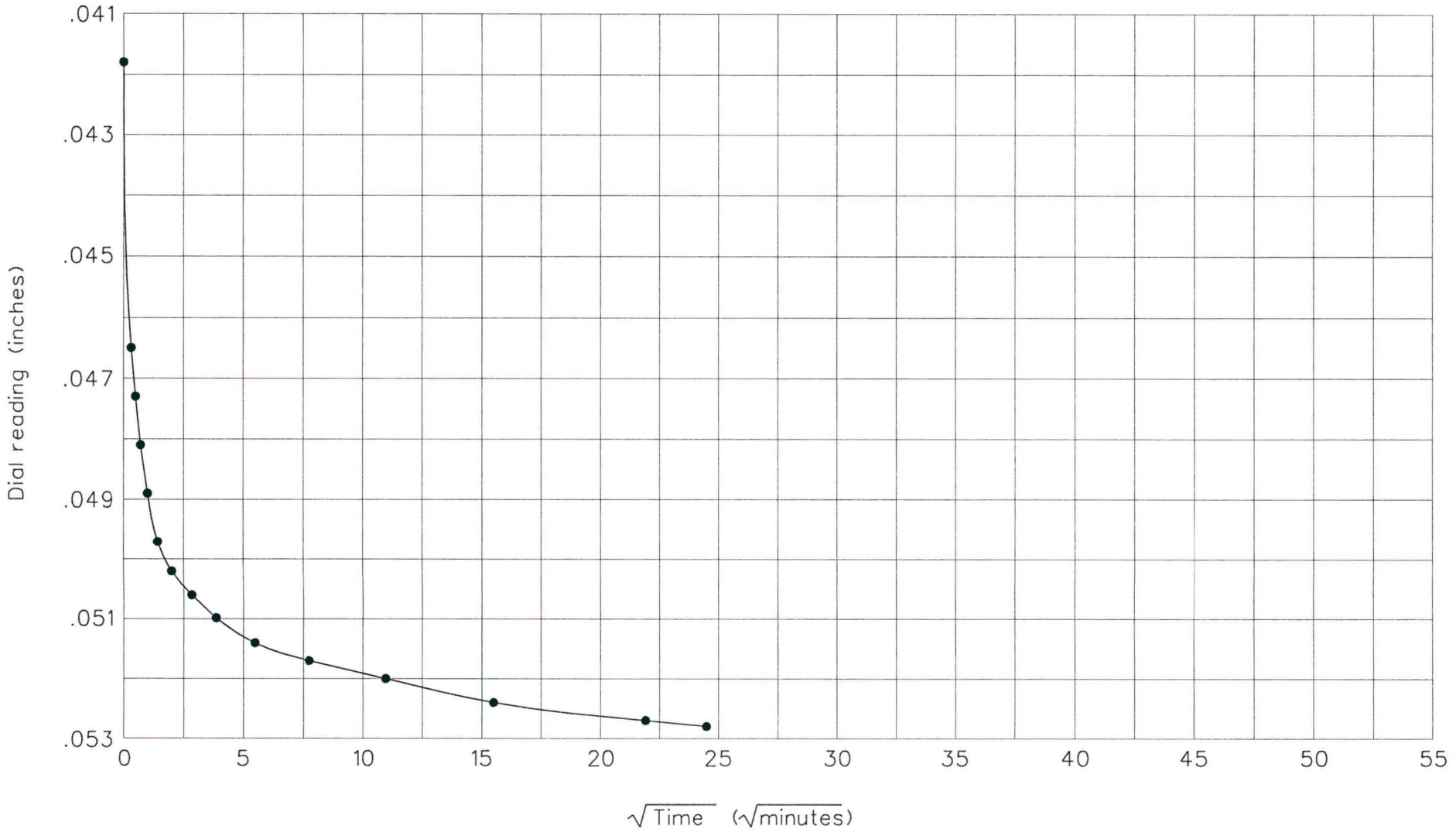
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 40'-41.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



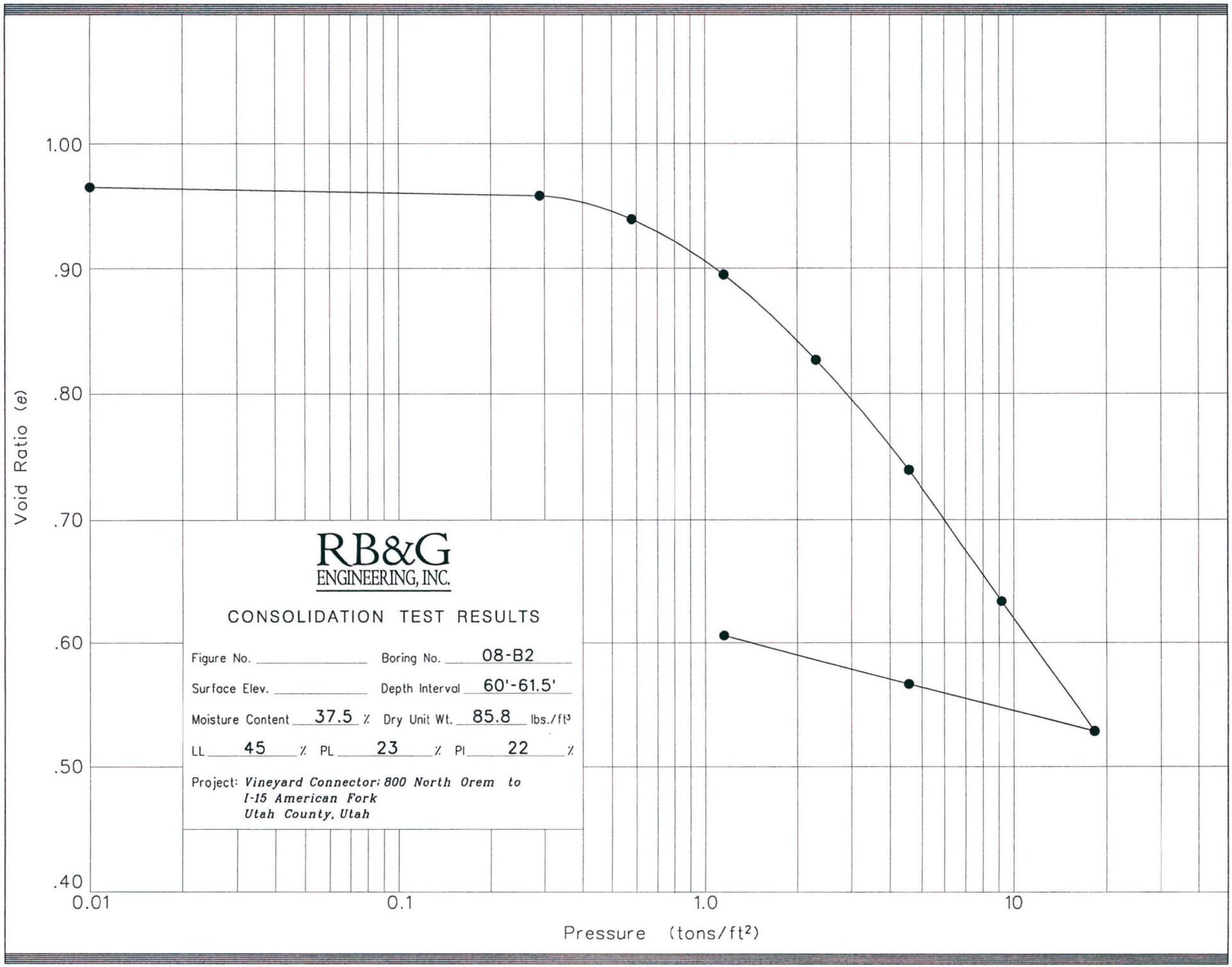
RB&G ENGINEERING, INC.

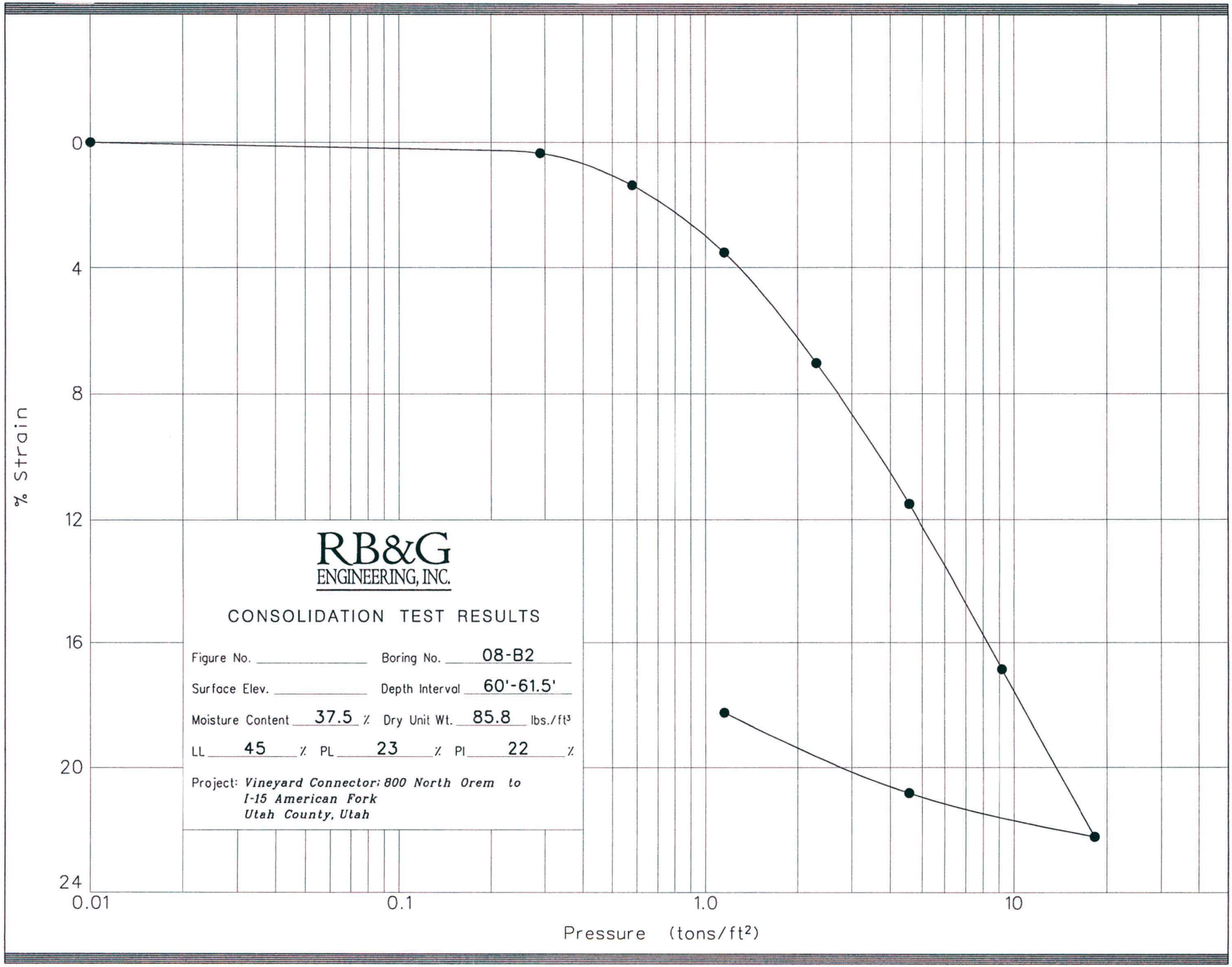
Hole no.: 08-B2
Depth: 40'-41.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure


1.00
.90
.80
.70
.60
.50
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B2
Surface Elev. _____ Depth Interval 60'-61.5'
Moisture Content 37.5 % Dry Unit Wt. 85.8 lbs./ft³
LL 45 % PL 23 % PI 22 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

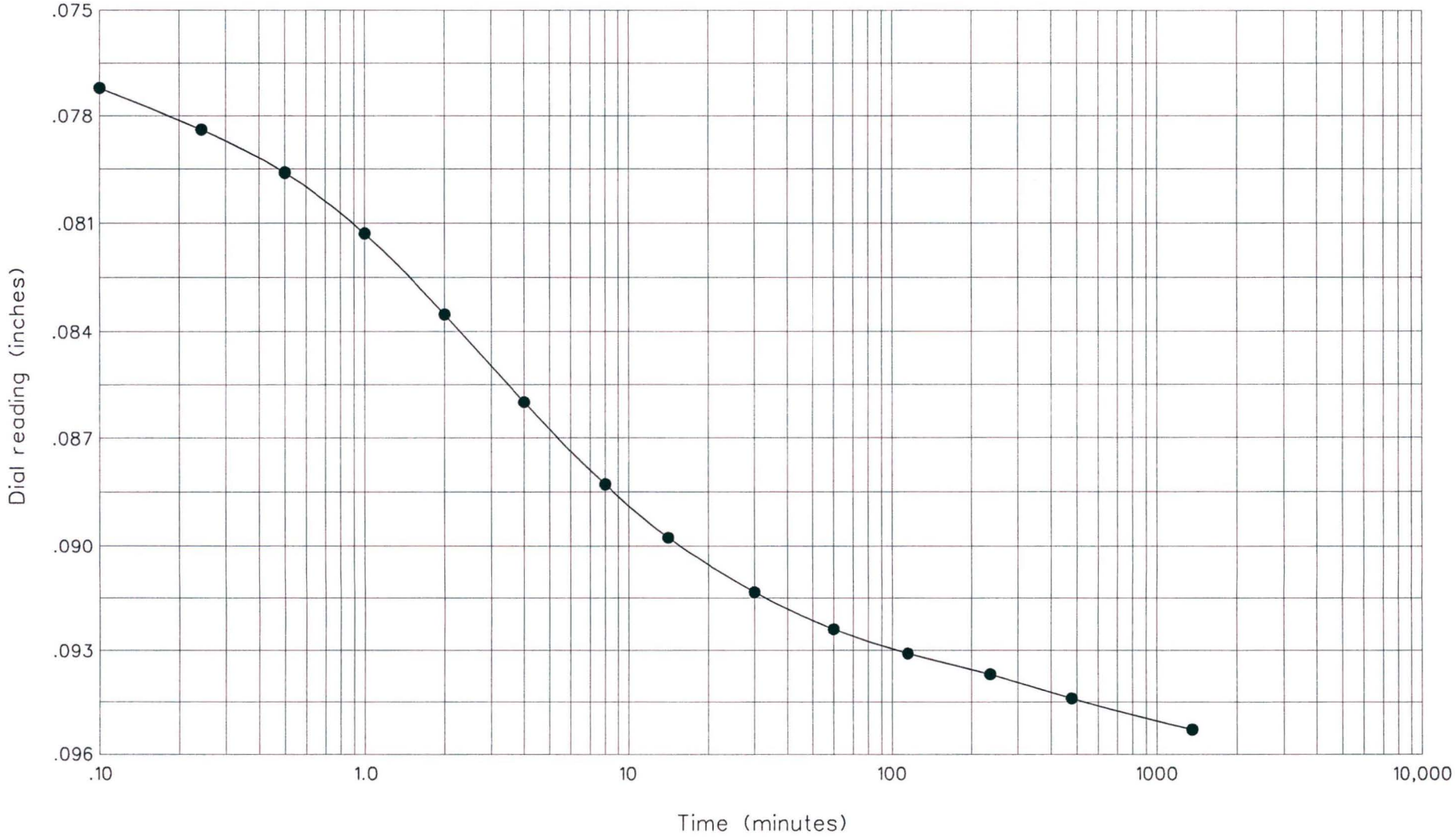
Figure No. _____ Boring No. 08-B2

Surface Elev. _____ Depth Interval 60'-61.5'

Moisture Content 37.5 % Dry Unit Wt. 85.8 lbs./ft³

LL 45 % PL 23 % PI 22 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*



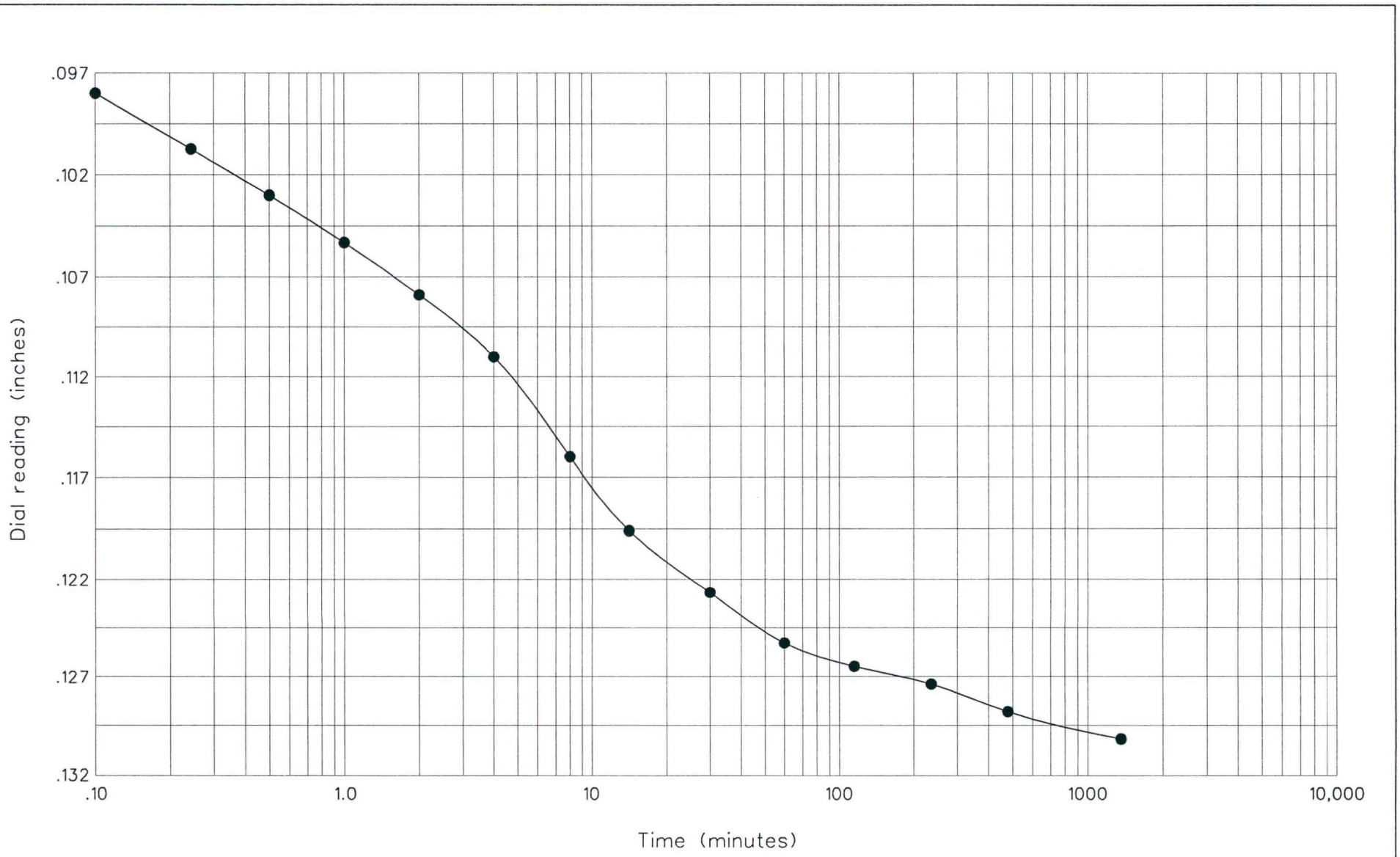
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 60'-61.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



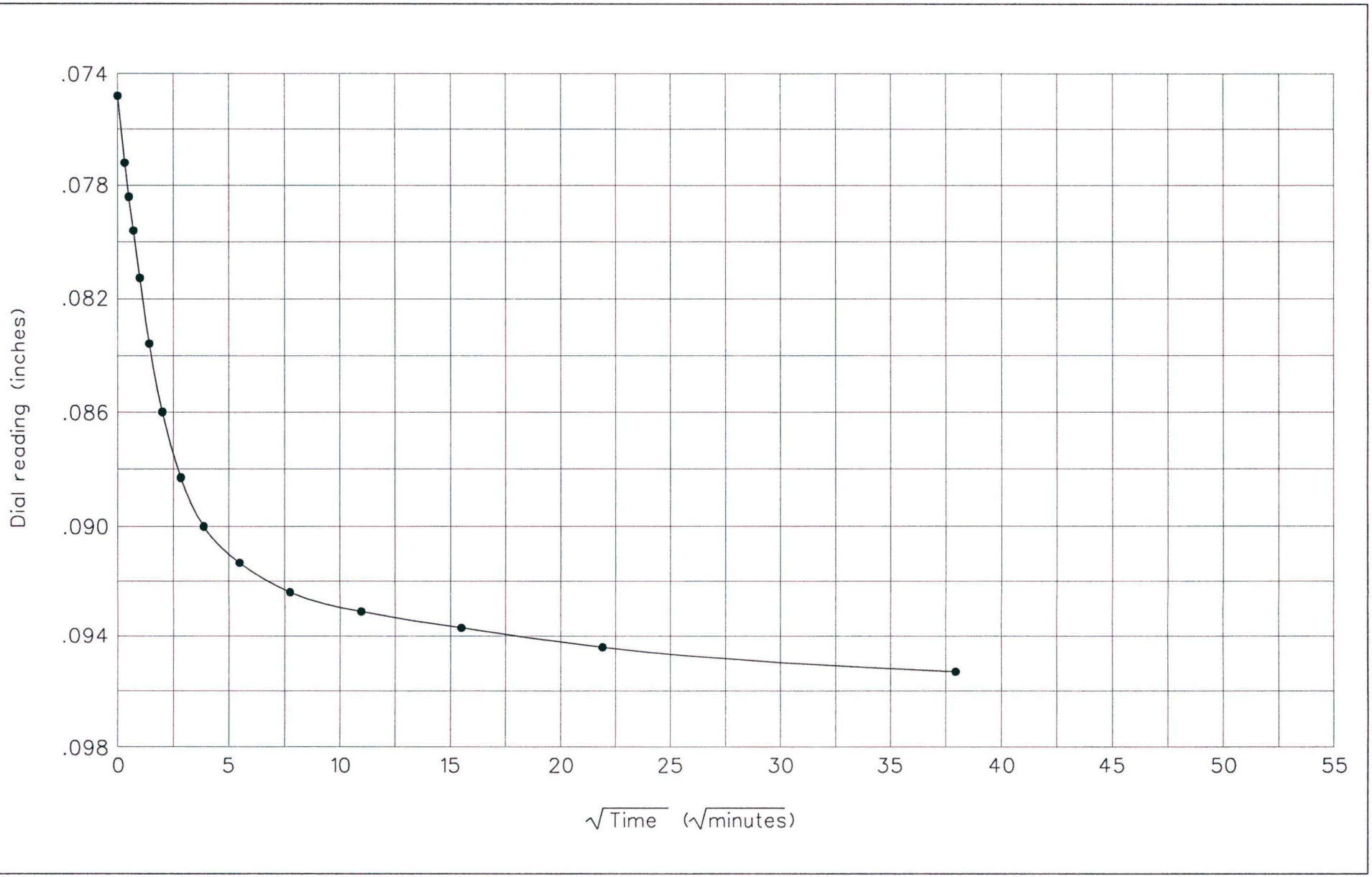
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 60'-61.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



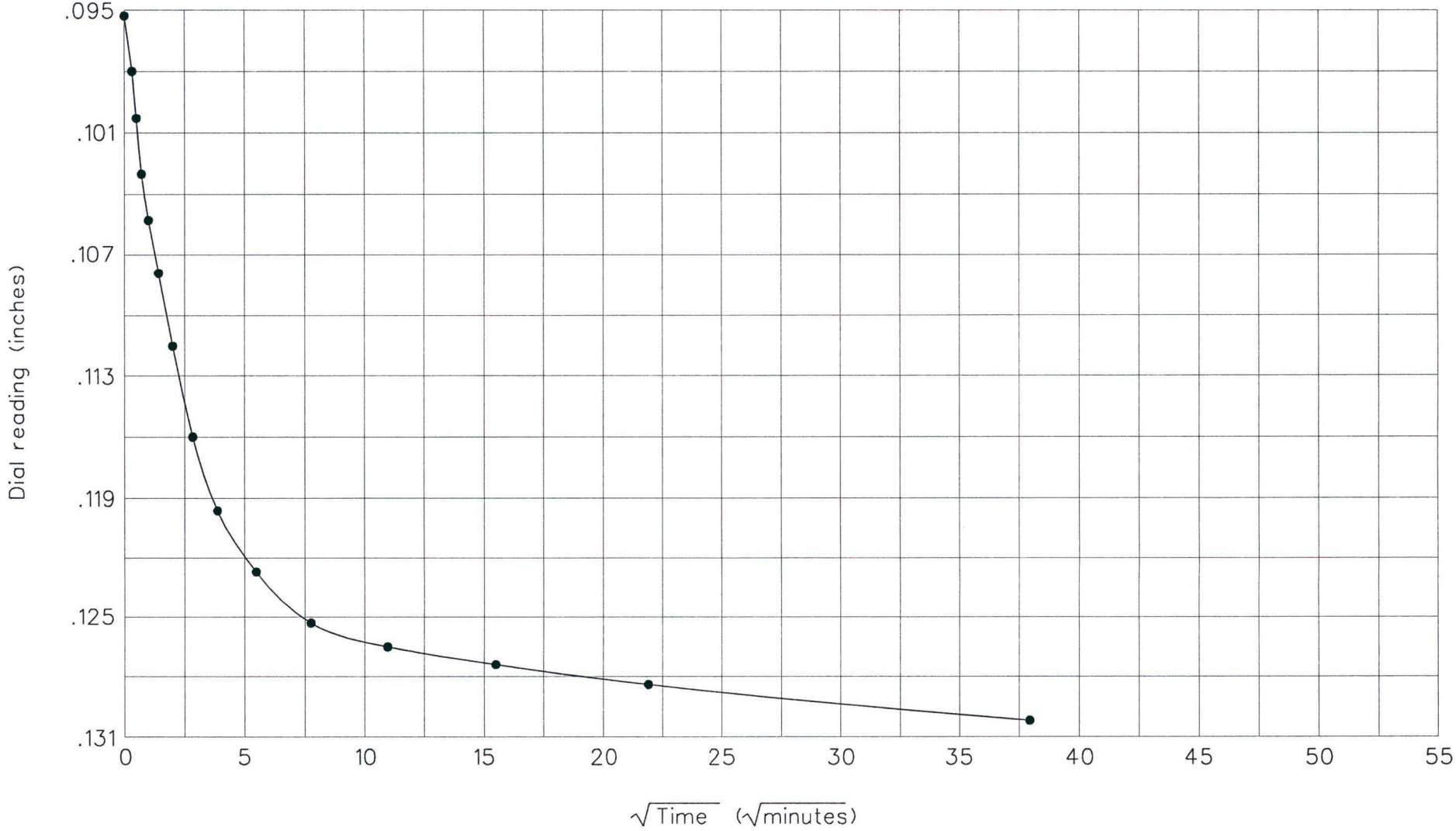
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 60'-61.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



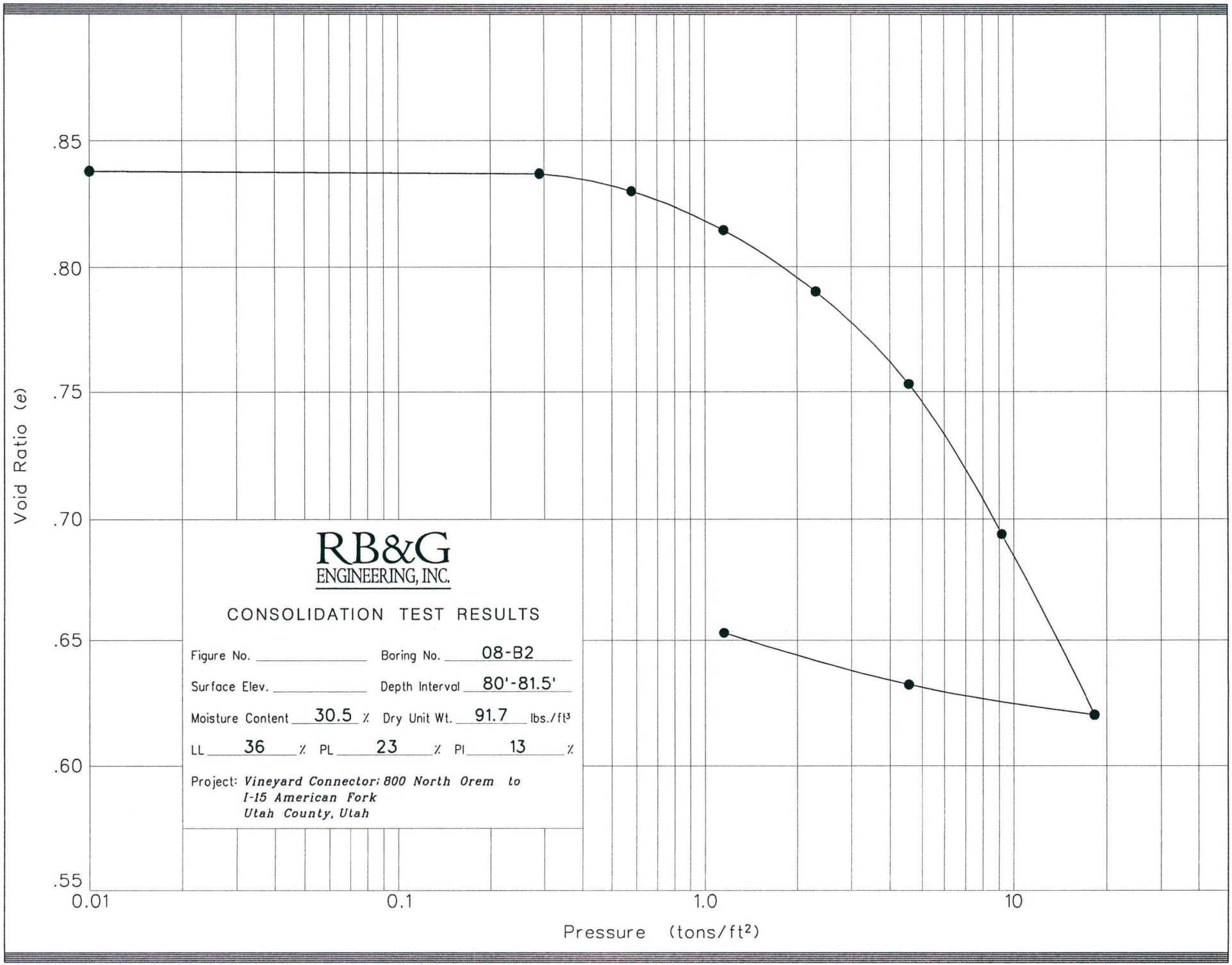
RB&G ENGINEERING, INC.

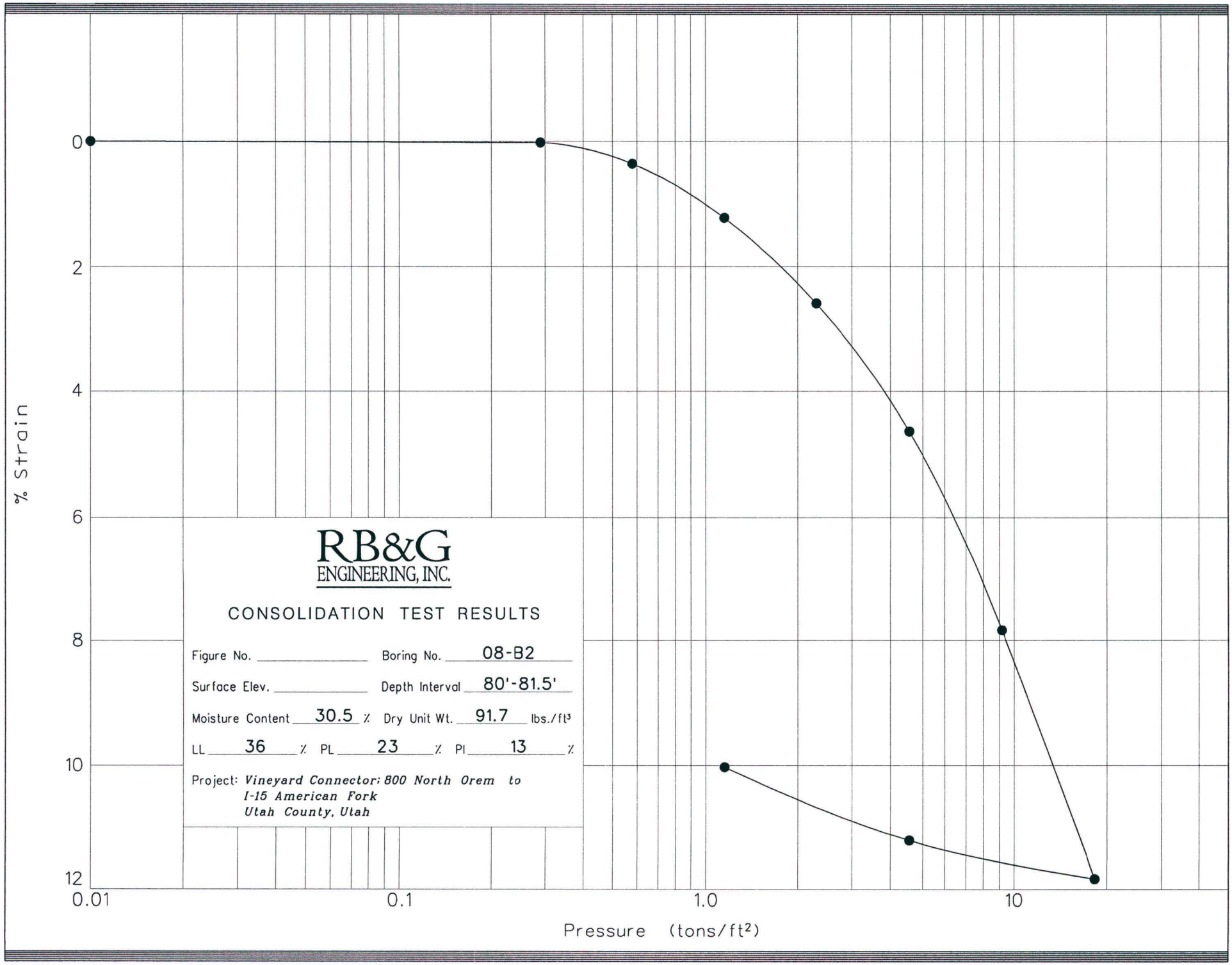
Hole no.: 08-B2
Depth: 60'-61.5'
Load: 1.15 to 2.30 tons

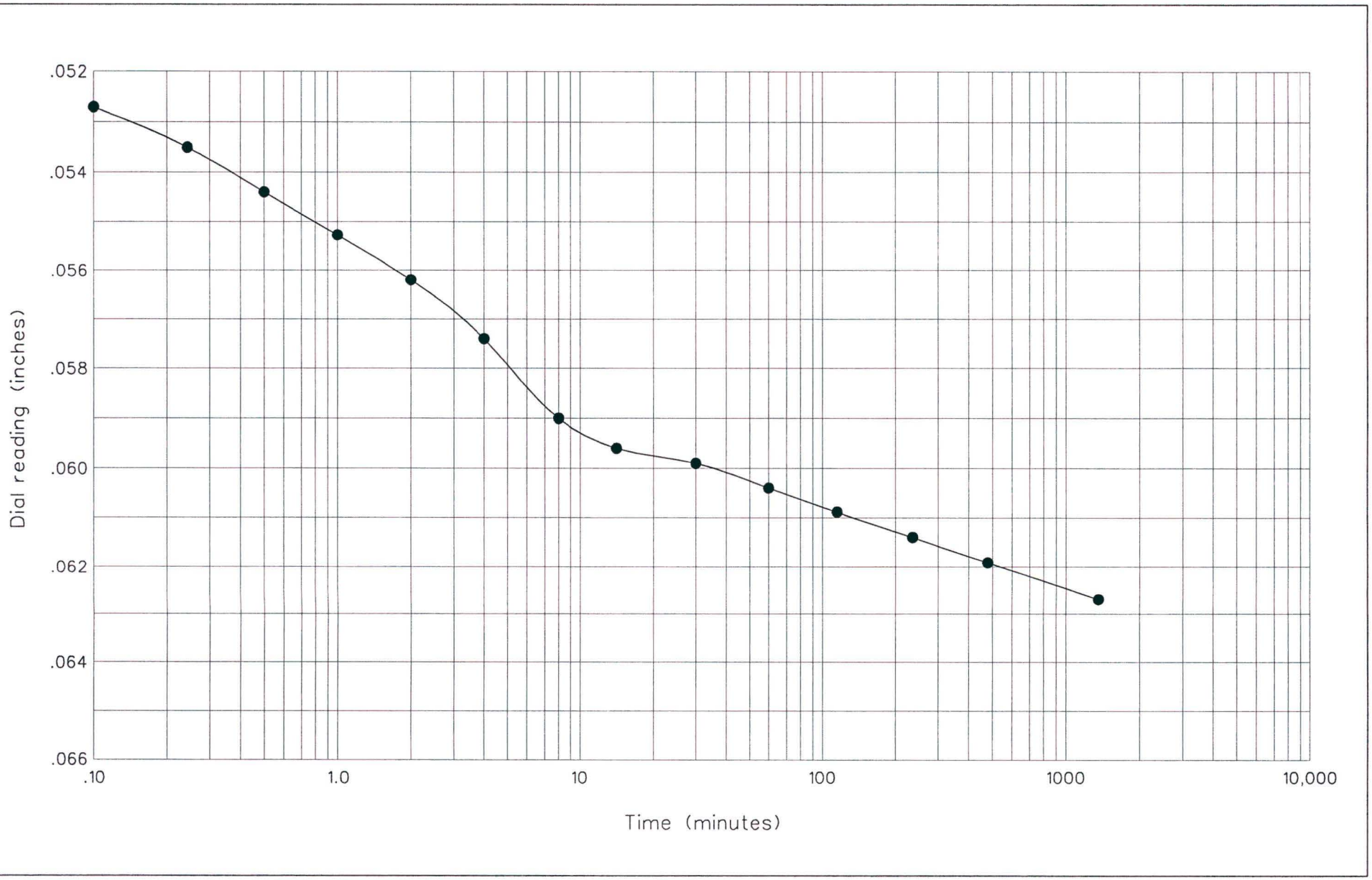
TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure


.85
.80
.75
.70
.65
.60
.55
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B2
Surface Elev. _____ Depth Interval 80'-81.5'
Moisture Content 30.5 % Dry Unit Wt. 91.7 lbs./ft³
LL 36 % PL 23 % PI 13 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah


% Strain
0
2
4
6
8
10
12
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B2
Surface Elev. _____ Depth Interval 80'-81.5'
Moisture Content 30.5 % Dry Unit Wt. 91.7 lbs./ft³
LL 36 % PL 23 % PI 13 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah



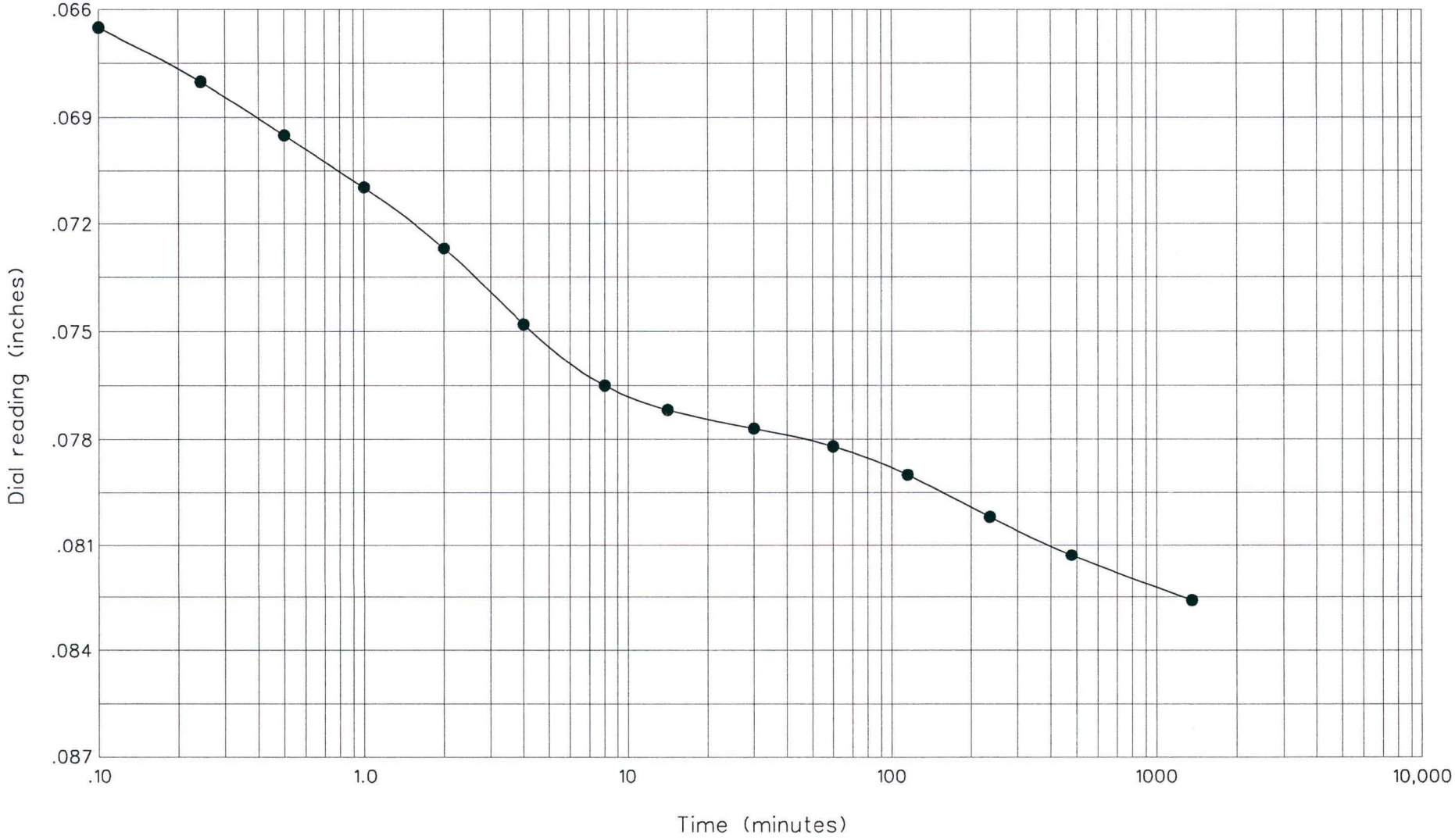
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 80'-81.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



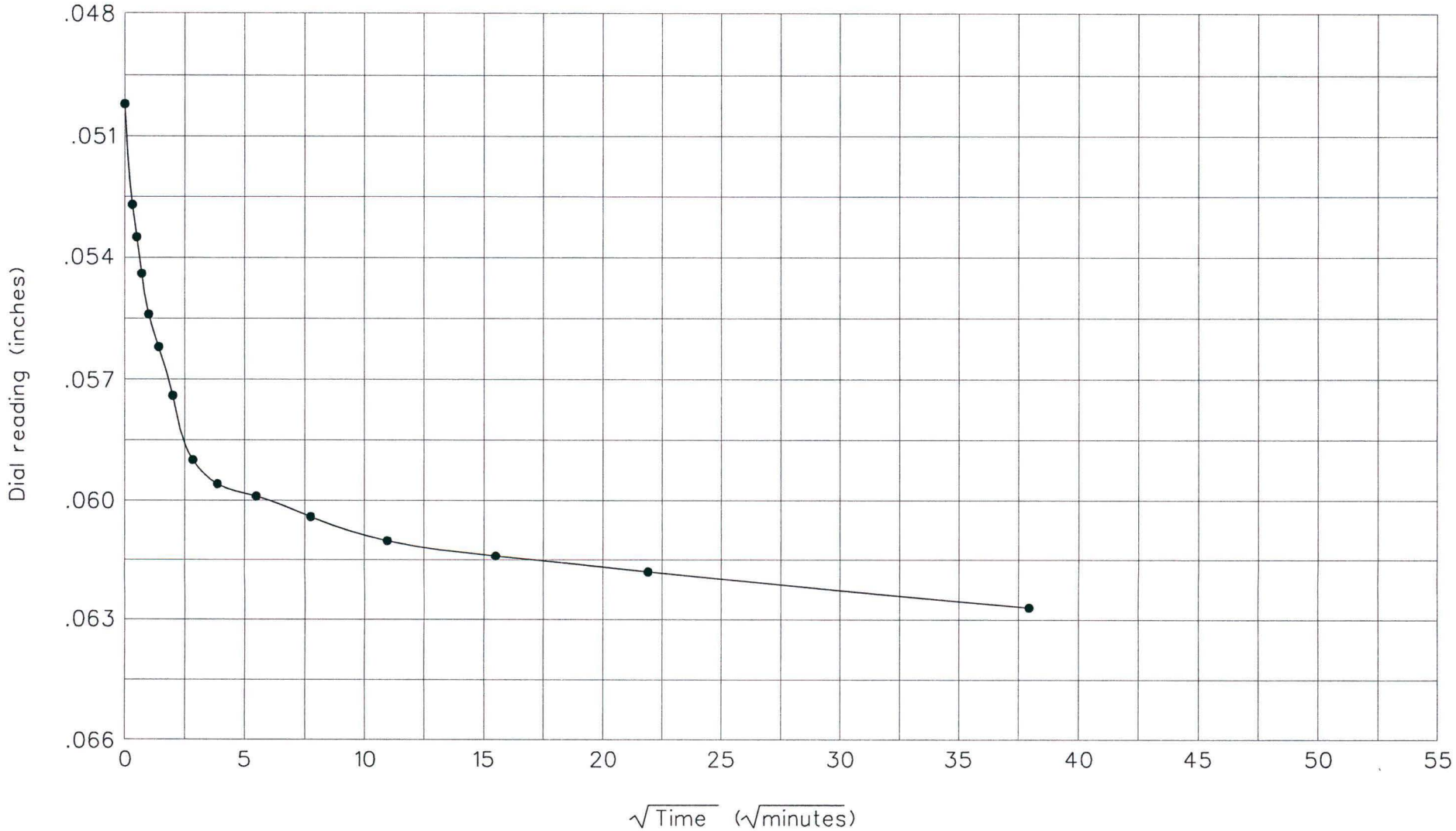
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 80'-81.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



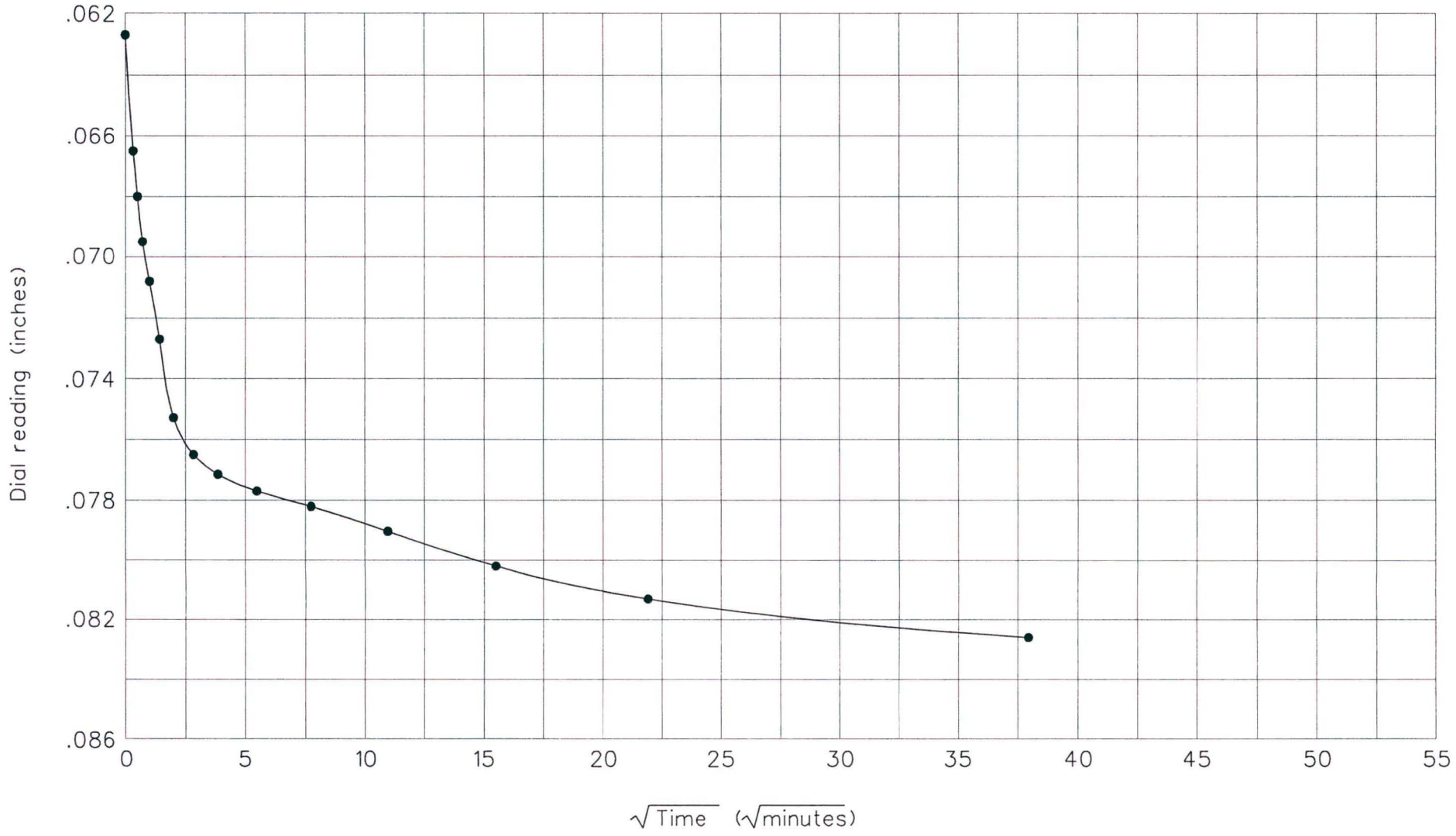
RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 80'-81.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G ENGINEERING, INC.

Hole no.: 08-B2
Depth: 80'-81.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure

Table 1

SUMMARY OF TEST DATA

PROJECT LOCATION: UDOT Vineyard Connector; 800 North to American Fork Near Timpanogos Wastewater Treatment Plant

PROJECT NO.: 200701-048

FEATURE: Foundations

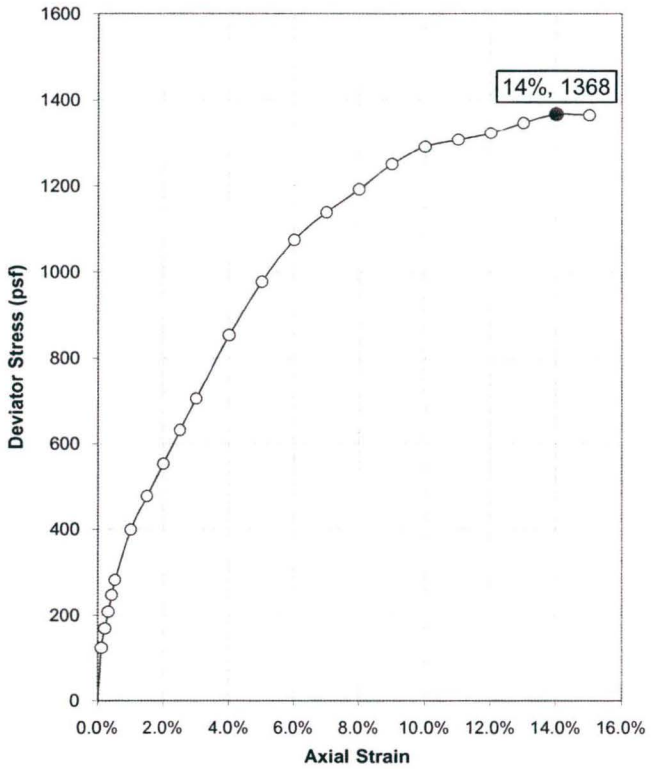
HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	STANDARD PENETRATION BLOWS PER FOOT Corrected $(N_1)60$	IN-PLACE		UNCONFINED COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO Classification)
			DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
08-B3	5-6.5	Shelby	97.8	28.4		38	21	17	2	24	74	CL (A-6(12))
	15-16.5	Shelby	95.3	27.4		42	21	21	0	7	93	CL (A-7-6(21))
	20-21.5	0		30.8		49	25	24	2	12	86	CL (A-7-6(22))
	25-26.5	0		21.3		46	22	24	0	0	100	CL (A-7-6(27))
	30-31.5	Shelby	107.8	23.7		39	21	18	0	3	97	CL (A-6(19))
	40-41.5	Shelby	80.5	40.1		58	26	32	0	0	100	CH (A-7-6(38))
	50-51.5	Shelby	77.0	40.9		46	23	23	0	0	100	CL (A-7-6(26))
	60-61.5	Shelby	74.9	50.0		53	24	29	0	0	100	CH (A-7-6(33))
	70-71.5	Shelby	68.0	50.6		57	25	32	0	0	100	CH (A-7-6(37))
	80-81.5	Shelby	74.7	43.8		51	27	24	0	1	99	CH (A-7-6(28))
	91.5-93	13		14.6				NP	12	72	16	SM (A-2-4(0))
	100-101.5	44		20.7				NP	0	54	46	SM (A-4(0))
	110-111.5	Shelby	90.4	30.2		34	24	10	0	2	98	ML (A-4(11))

NP=Nonplastic

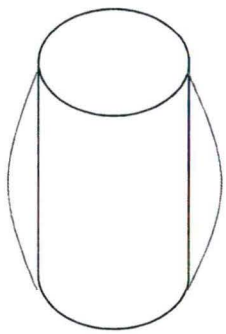
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B3
Project No.	200701-048	**Sample**	
Location	Near Timpanogos Wastewater Treatment Plan	**Depth / Elev. (ft)**	5-6.5'
Date	October 21, 2008	**Sample Description**	CL (A-6 (12))
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	-3	-2	
0.1%	123	62	
0.2%	170	85	
0.3%	208	104	
0.4%	247	124	
0.5%	282	141	
1.0%	399	199	
1.5%	478	239	
2.0%	554	277	
2.5%	632	316	
3.0%	705	353	
4.0%	853	427	
5.0%	978	489	
6.0%	1075	538	
7.0%	1140	570	
8.0%	1193	596	
9.0%	1251	626	
10.0%	1291	646	
11.0%	1308	654	
12.0%	1323	661	
13.0%	1348	674	
14.0%	1368	684	
15.0%	1366	683	



Initial Sample Data

Initial height of specimen	L_o	5.14	(in)	**Moisture content***	w	28.4%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	97.8	(pcf)
Height-to-diameter ratio	L_o / D_o	1.98		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	38		**Initial void ratio**	e_o	0.723	
Plastic index	PI	17		**Saturation**	S	1.00	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	1368	(psf)	**Major principal stress at failure****	σ_1	1942	(psf)
Shear stress at failure**	q_f	684	(psf)	**Minor principal stress at failure****	σ_3	574	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		14%					

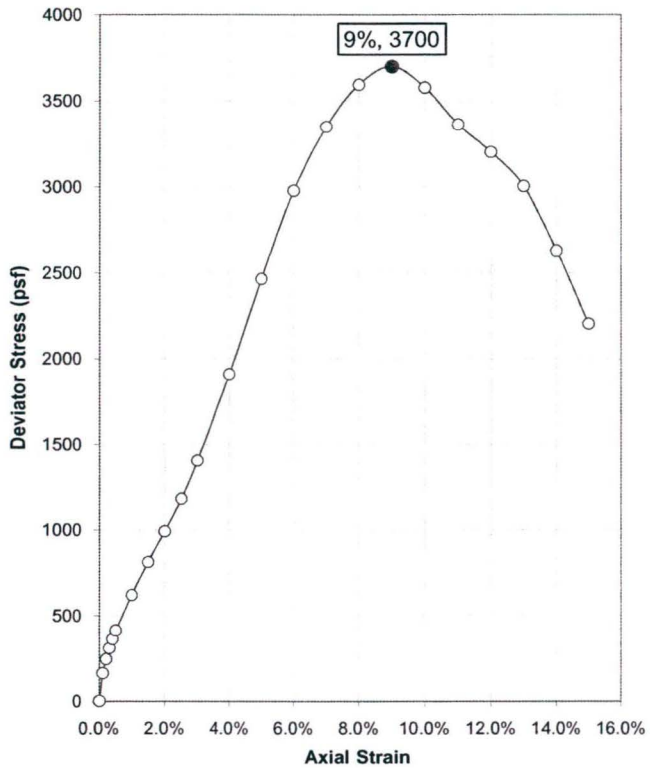
Remarks

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

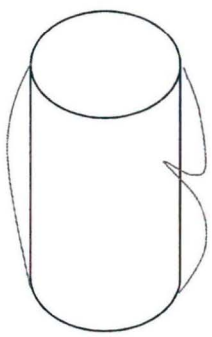
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B3
Project No.	200701-048	**Sample**	
Location	Near Timpanogos Wastewater Treatment Plan	**Depth / Elev. (ft)**	30-31.5'
Date	October 21, 2008	**Sample Description**	CL (A-6 (19))
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	3	1	
0.1%	166	83	
0.2%	248	124	
0.3%	313	156	
0.4%	366	183	
0.5%	415	207	
1.0%	622	311	
1.5%	815	408	
2.0%	992	496	
2.5%	1186	593	
3.0%	1408	704	
4.0%	1913	957	
5.0%	2467	1233	
6.0%	2981	1490	
7.0%	3351	1675	
8.0%	3595	1797	
9.0%	3700	1850	
10.0%	3578	1789	
11.0%	3365	1682	
12.0%	3203	1602	
13.0%	3006	1503	
14.0%	2631	1316	
15.0%	2205	1103	



Initial Sample Data

Initial height of specimen	L_o	5.23	(in)	**Moisture content***	w	23.7%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	107.8	(pcf)
Height-to-diameter ratio	L_o / D_o	2.02		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	39		**Initial void ratio**	e_o	0.563	
Plastic index	PI	18		**Saturation**	S	1.00	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	3700	(psf)	**Major principal stress at failure****	σ_1	6723	(psf)
Shear stress at failure**	q_f	1850	(psf)	**Minor principal stress at failure****	σ_3	3023	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		9%					

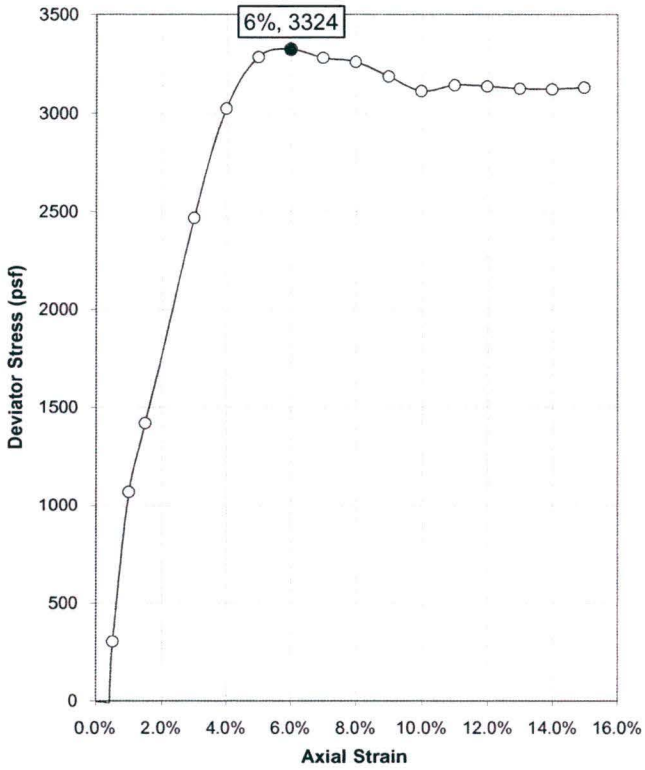
Remarks

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

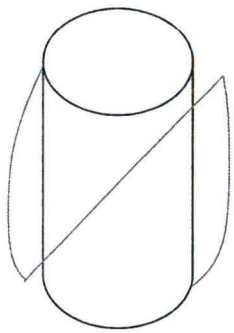
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B3
Project No.	200701-048	**Sample**	
Location	Near Timpanogos Wastewater Treatment Plan	**Depth / Elev. (ft)**	40-41.5'
Date	October 27, 2008	**Sample Description**	CH (A-7-6 (38))
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	-4	-2	
0.1%	-5	-3	
0.2%	-6	-3	
0.3%	-7	-4	
0.4%	-12	-6	
0.5%	303	152	
1.0%	1070	535	
1.5%	1419	710	
3.0%	2467	1234	
4.0%	3024	1512	
5.0%	3285	1642	
6.0%	3324	1662	
7.0%	3280	1640	
8.0%	3260	1630	
9.0%	3186	1593	
10.0%	3113	1556	
11.0%	3142	1571	
12.0%	3137	1568	
13.0%	3125	1562	
14.0%	3122	1561	
15.0%	3130	1565	



Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	40.1%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	80.5	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	58		**Initial void ratio**	e_o	1.093	
Plastic index	PI	32		**Saturation**	S	0.99	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	3324	(psf)	**Major principal stress at failure****	σ_1	7332	(psf)
Shear stress at failure**	q_f	1662	(psf)	**Minor principal stress at failure****	σ_3	4008	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		6%					

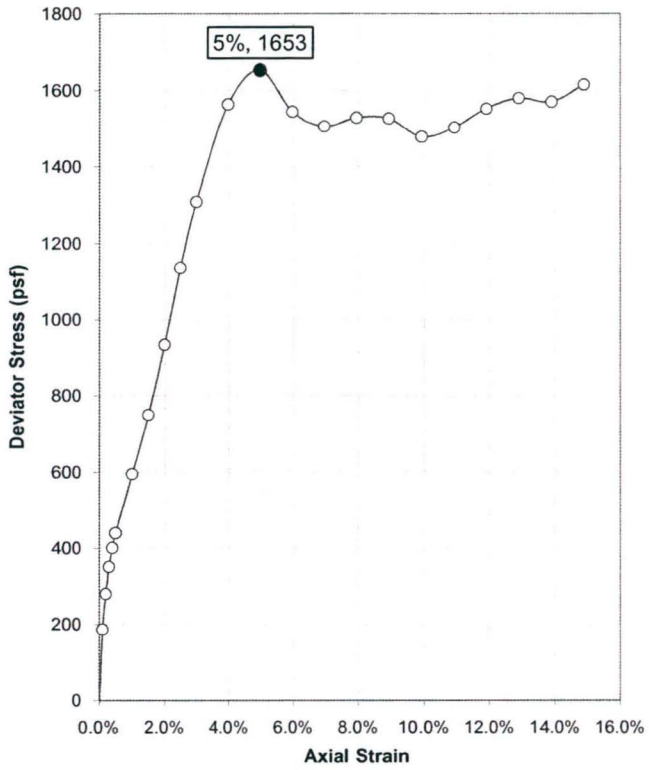
Remarks

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

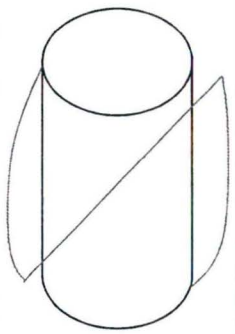
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B3
Project No.	200701-048	**Sample**	
Location	Near Timpanogos Wastewater Treatment Plan	**Depth / Elev. (ft)**	60-61.5'
Date	October 27, 2008	**Sample Description**	CH (A-7-6 (33))
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	-5	-3	
0.1%	187	94	
0.2%	281	140	
0.3%	352	176	
0.4%	402	201	
0.5%	440	220	
1.0%	596	298	
1.5%	750	375	
2.0%	935	468	
2.5%	1135	568	
3.0%	1309	655	
4.0%	1564	782	
5.0%	1653	826	
6.0%	1544	772	
6.9%	1506	753	
7.9%	1528	764	
8.9%	1527	763	
9.9%	1479	739	
10.9%	1503	752	
11.9%	1552	776	
12.9%	1580	790	
13.9%	1570	785	
14.9%	1615	808	



Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	50.0%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	74.9	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	53		**Initial void ratio**	e_o	1.249	
Plastic index	PI	29		**Saturation**	S	1.00	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	1653	(psf)	**Major principal stress at failure****	σ_1	7702	(psf)
Shear stress at failure**	q_f	826	(psf)	**Minor principal stress at failure****	σ_3	6049	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		5%					

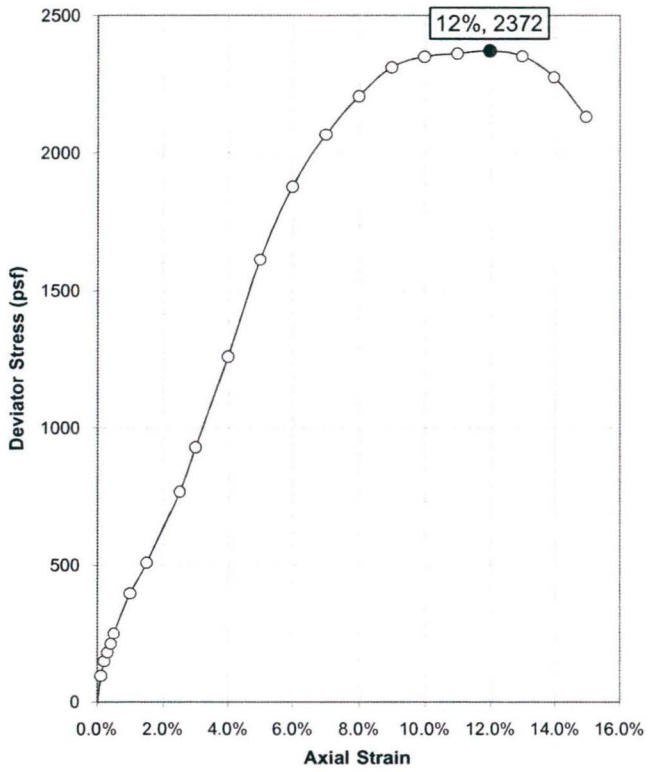
Remarks

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

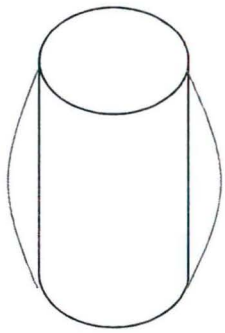
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B3
Project No.	200701-048	**Sample**	
Location	Near Timpanogos Wastewater Treatment Plan	**Depth / Elev. (ft)**	80-81.5'
Date	October 21, 2008	**Sample Description**	CH (A-7-6 (28))
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	-5	-3	
0.1%	96	48	
0.2%	149	75	
0.3%	181	90	
0.4%	212	106	
0.5%	251	125	
1.0%	397	198	
1.5%	509	254	
2.5%	769	384	
3.0%	930	465	
4.0%	1261	631	
5.0%	1614	807	
6.0%	1879	940	
7.0%	2068	1034	
8.0%	2208	1104	
9.0%	2312	1156	
10.0%	2351	1175	
11.0%	2362	1181	
12.0%	2372	1186	
13.0%	2353	1176	
14.0%	2277	1139	
14.9%	2134	1067	



Initial Sample Data

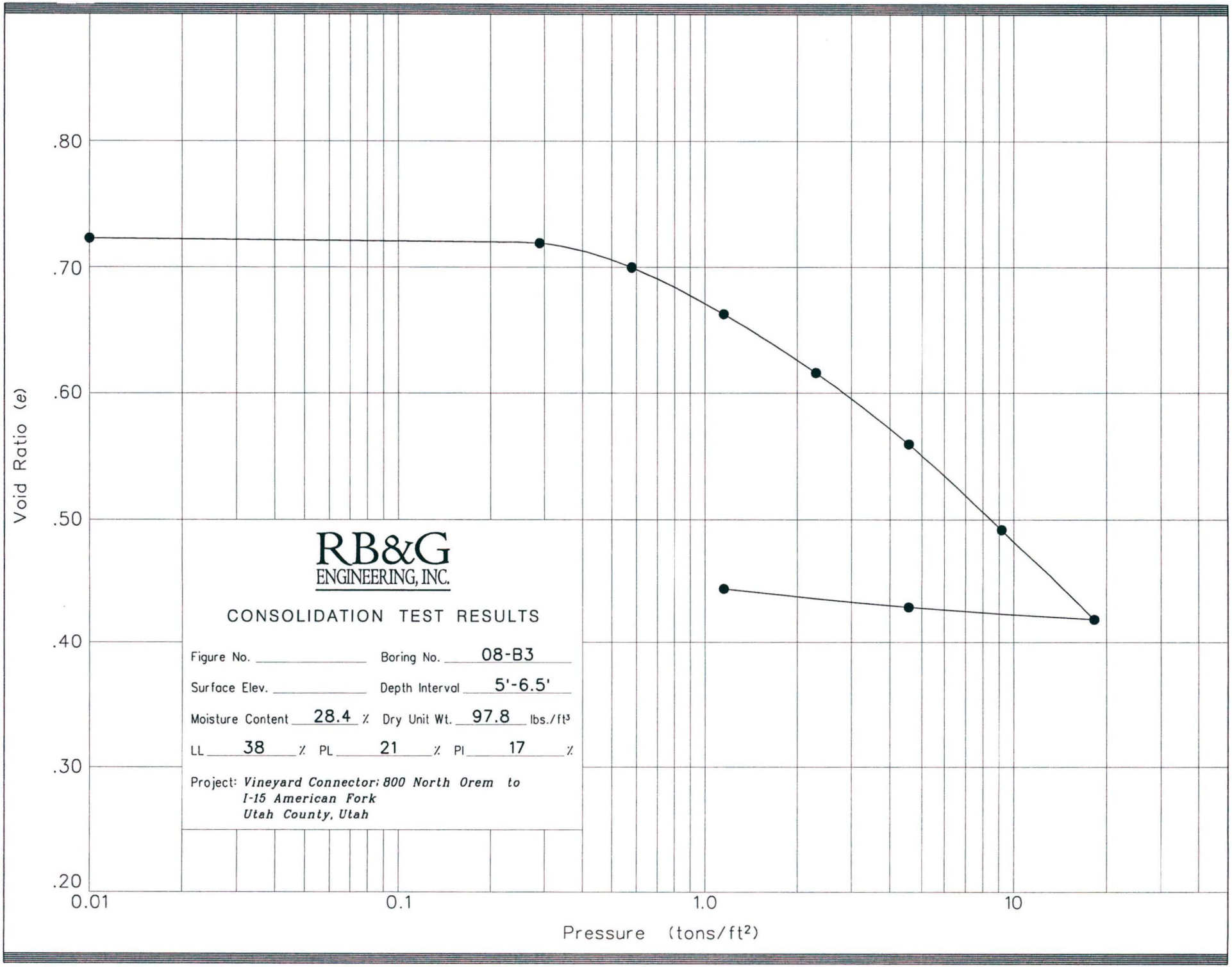
Initial height of specimen	L_o	5.3	(in)	**Moisture content***	w	43.8%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	74.7	(pcf)
Height-to-diameter ratio	L_o / D_o	2.05		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	51		**Initial void ratio**	e_o	1.255	
Plastic index	PI	24		**Saturation**	S	0.94	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	2372	(psf)	**Major principal stress at failure****	σ_1	10432	(psf)
Shear stress at failure**	q_f	1186	(psf)	**Minor principal stress at failure****	σ_3	8060	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		12%					

Remarks

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

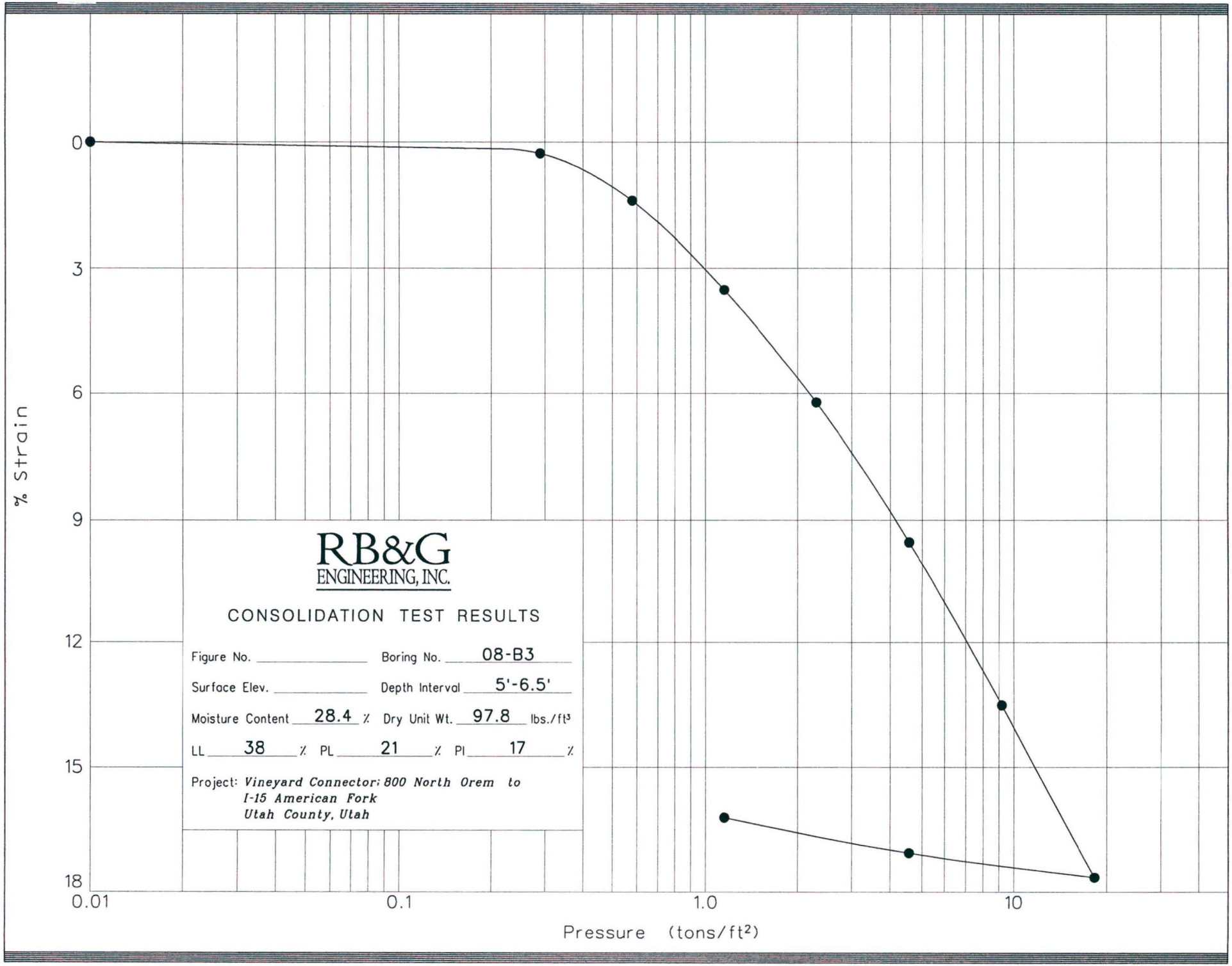
Figure No. _____ Boring No. 08-B3

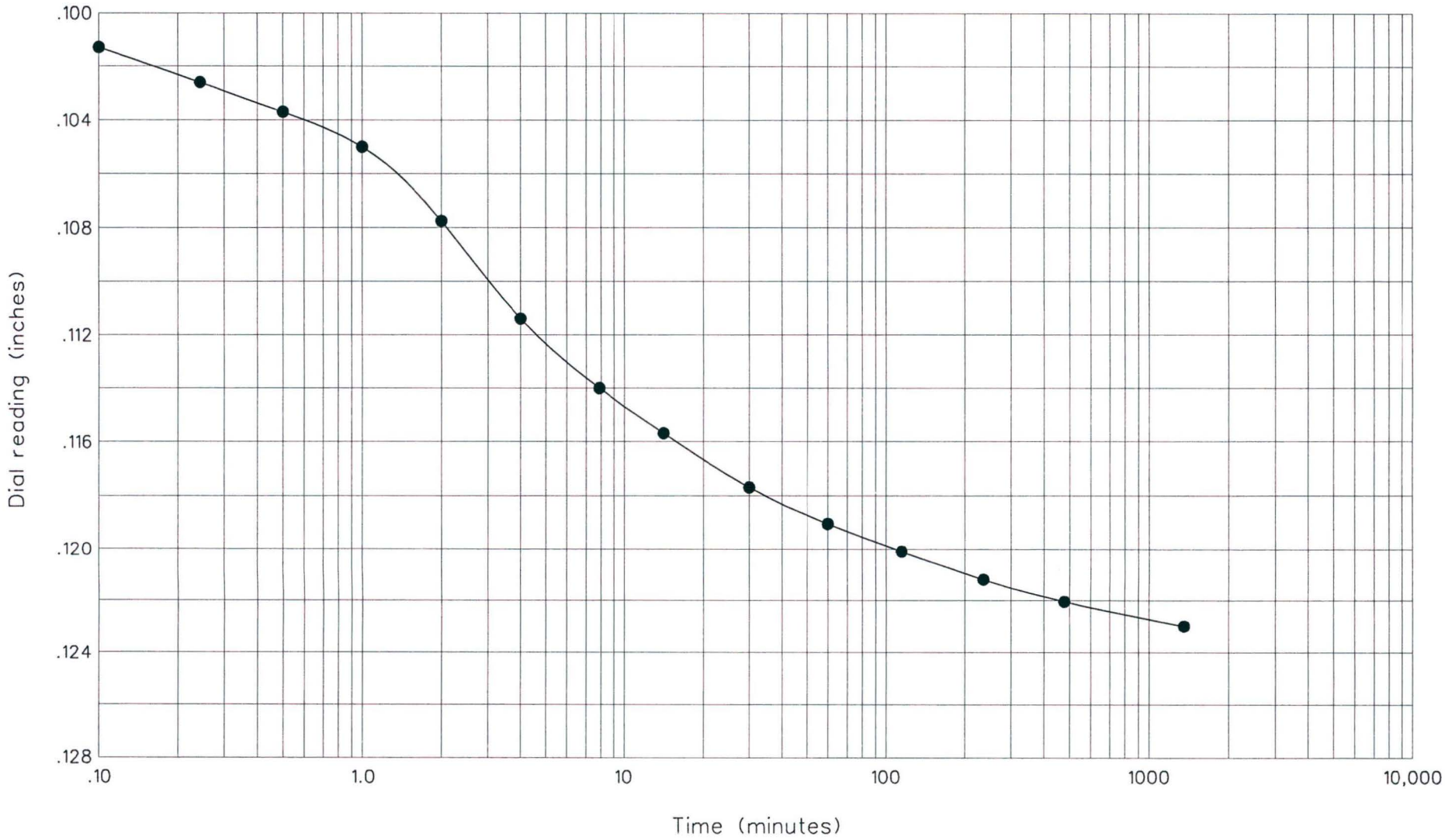
Surface Elev. _____ Depth Interval 5'-6.5'

Moisture Content 28.4 % Dry Unit Wt. 97.8 lbs./ft³

LL 38 % PL 21 % PI 17 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B3
Surface Elev. _____ Depth Interval 5'-6.5'
Moisture Content 28.4 % Dry Unit Wt. 97.8 lbs./ft³
LL 38 % PL 21 % PI 17 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah



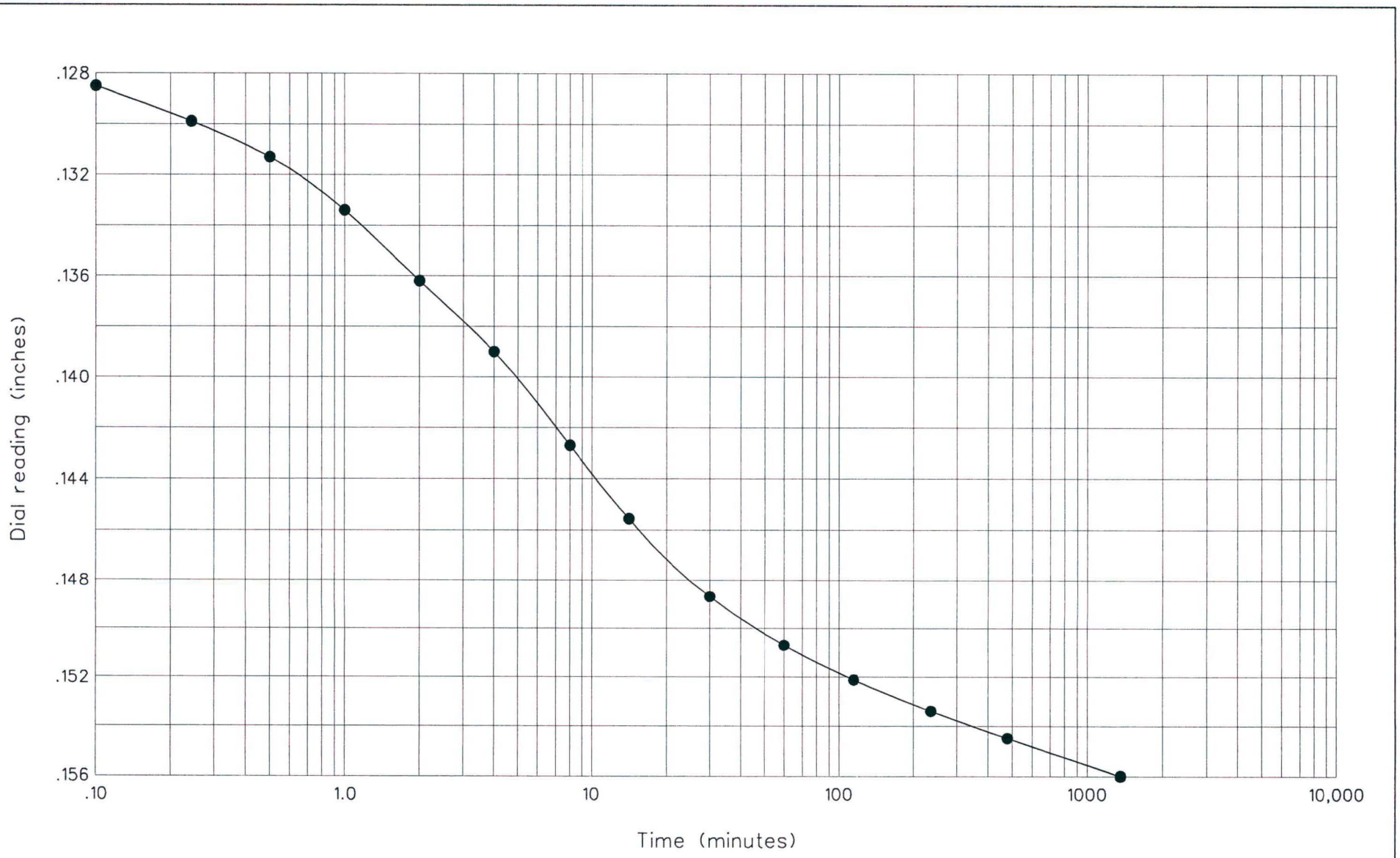
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 5'-6.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



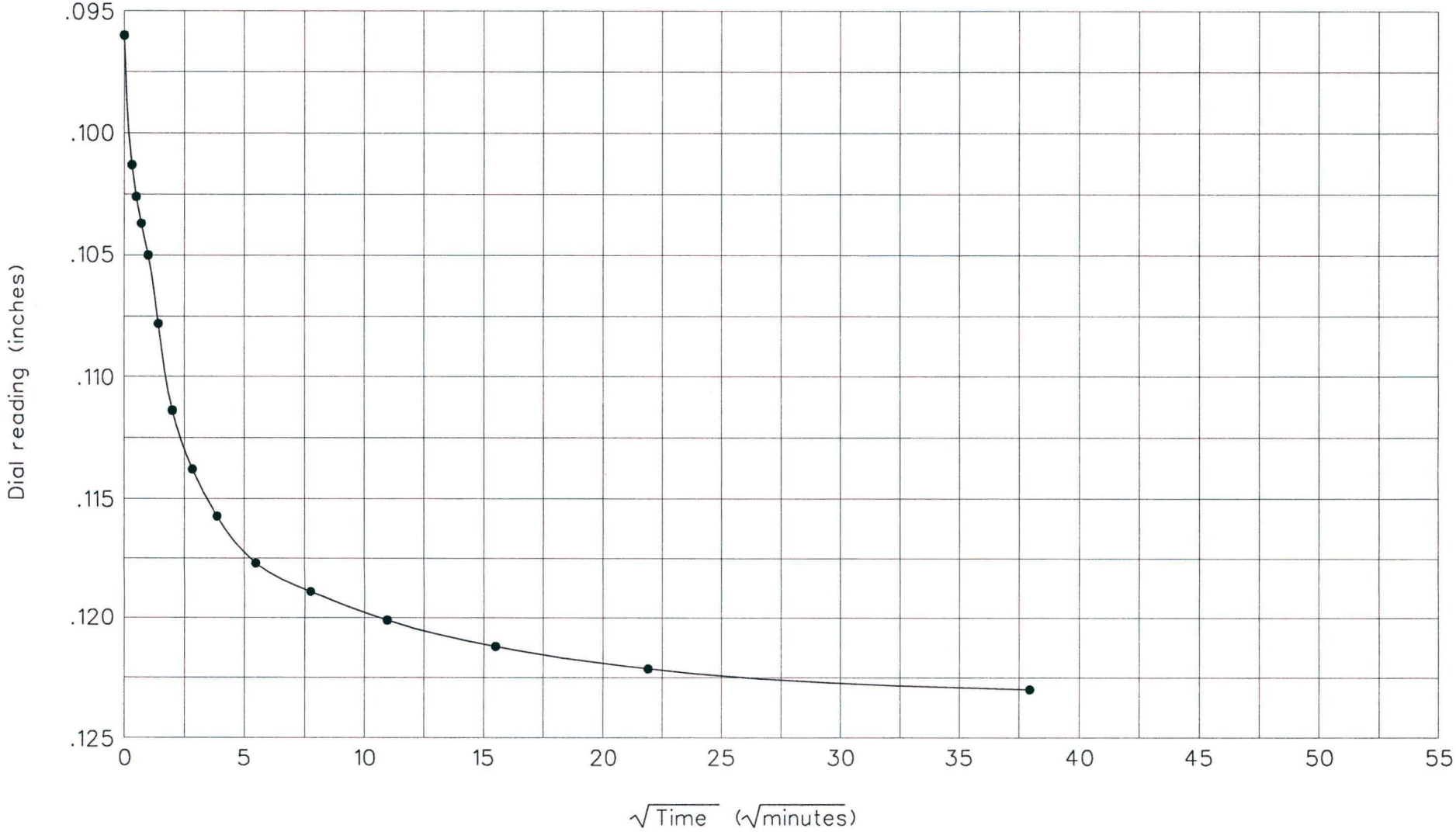
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 5'-6.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



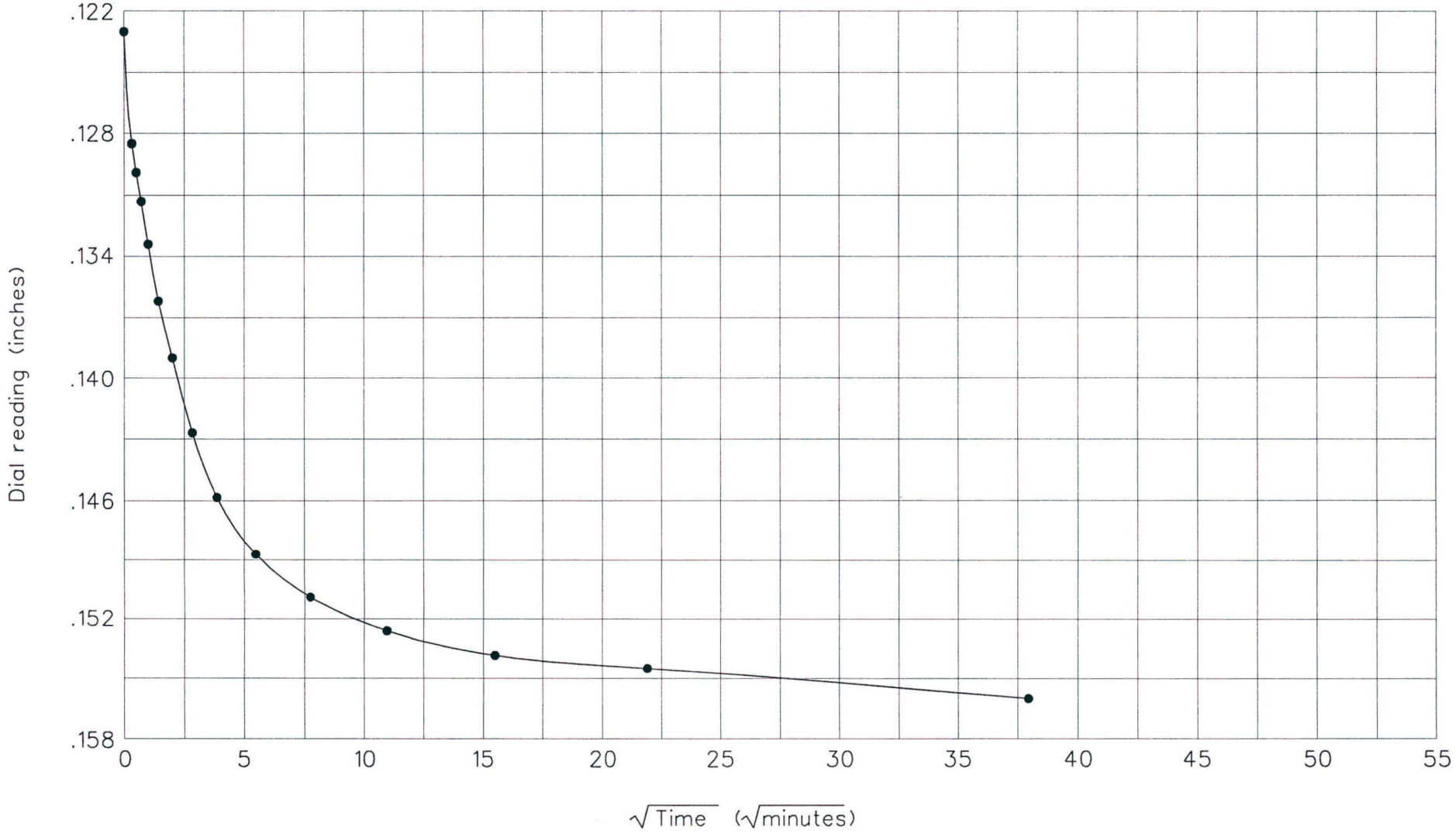
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 5'-6.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



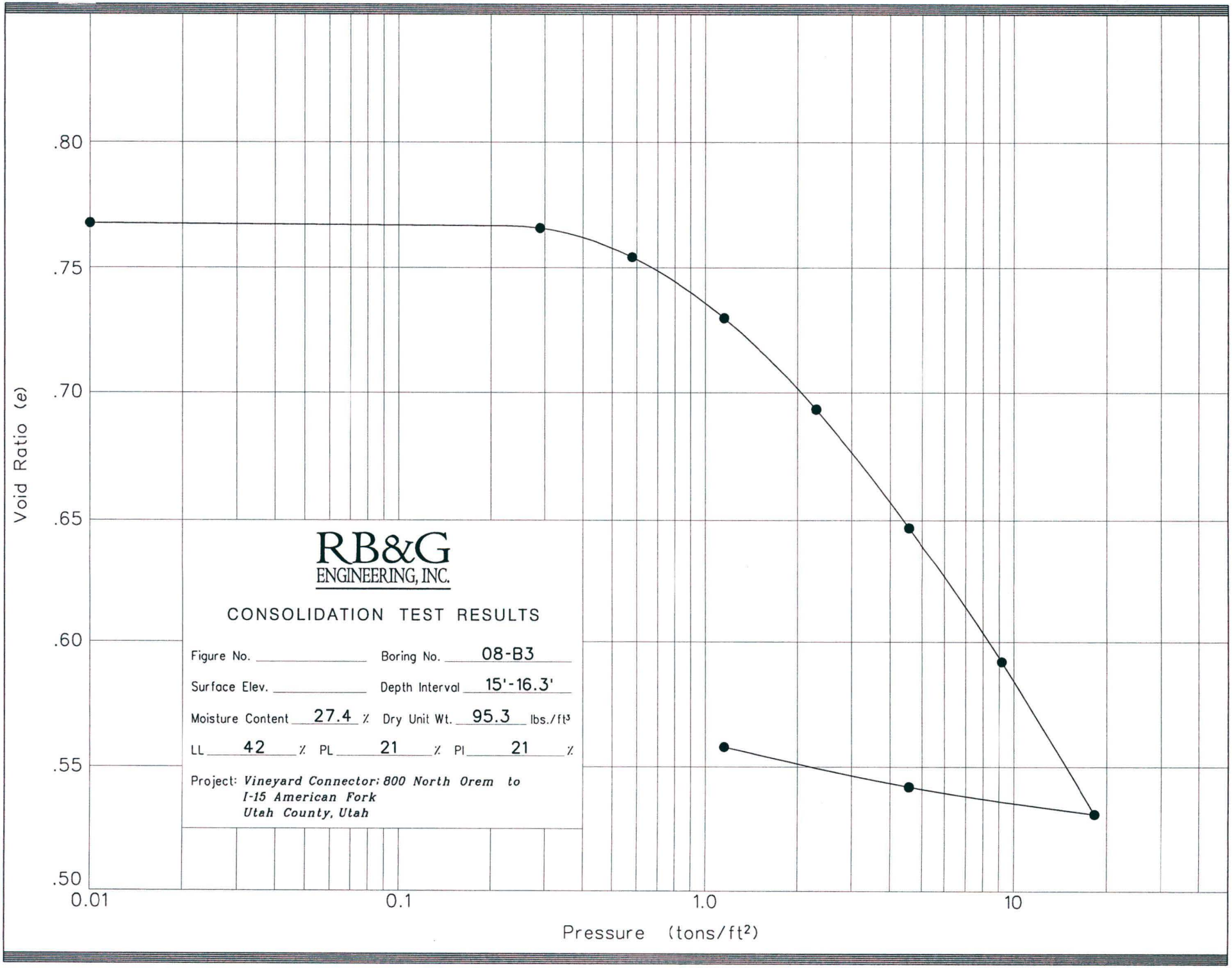
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 5'-6.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

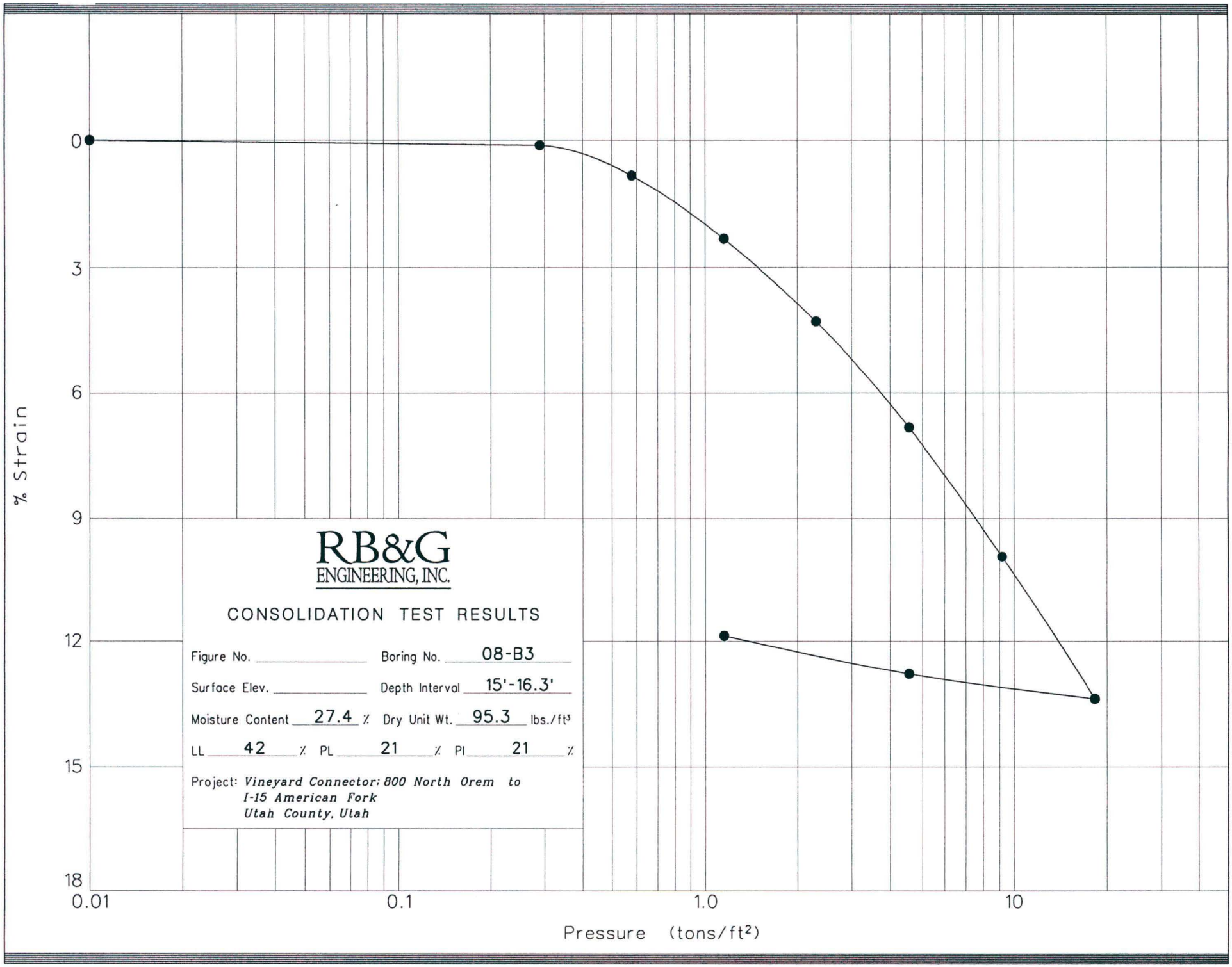
Figure No. _____ Boring No. 08-B3

Surface Elev. _____ Depth Interval 15'-16.3'

Moisture Content 27.4 % Dry Unit Wt. 95.3 lbs./ft³

LL 42 % PL 21 % PI 21 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

Figure No. _____ Boring No. 08-B3

Surface Elev. _____ Depth Interval 15'-16.3'

Moisture Content 27.4 % Dry Unit Wt. 95.3 lbs./ft³

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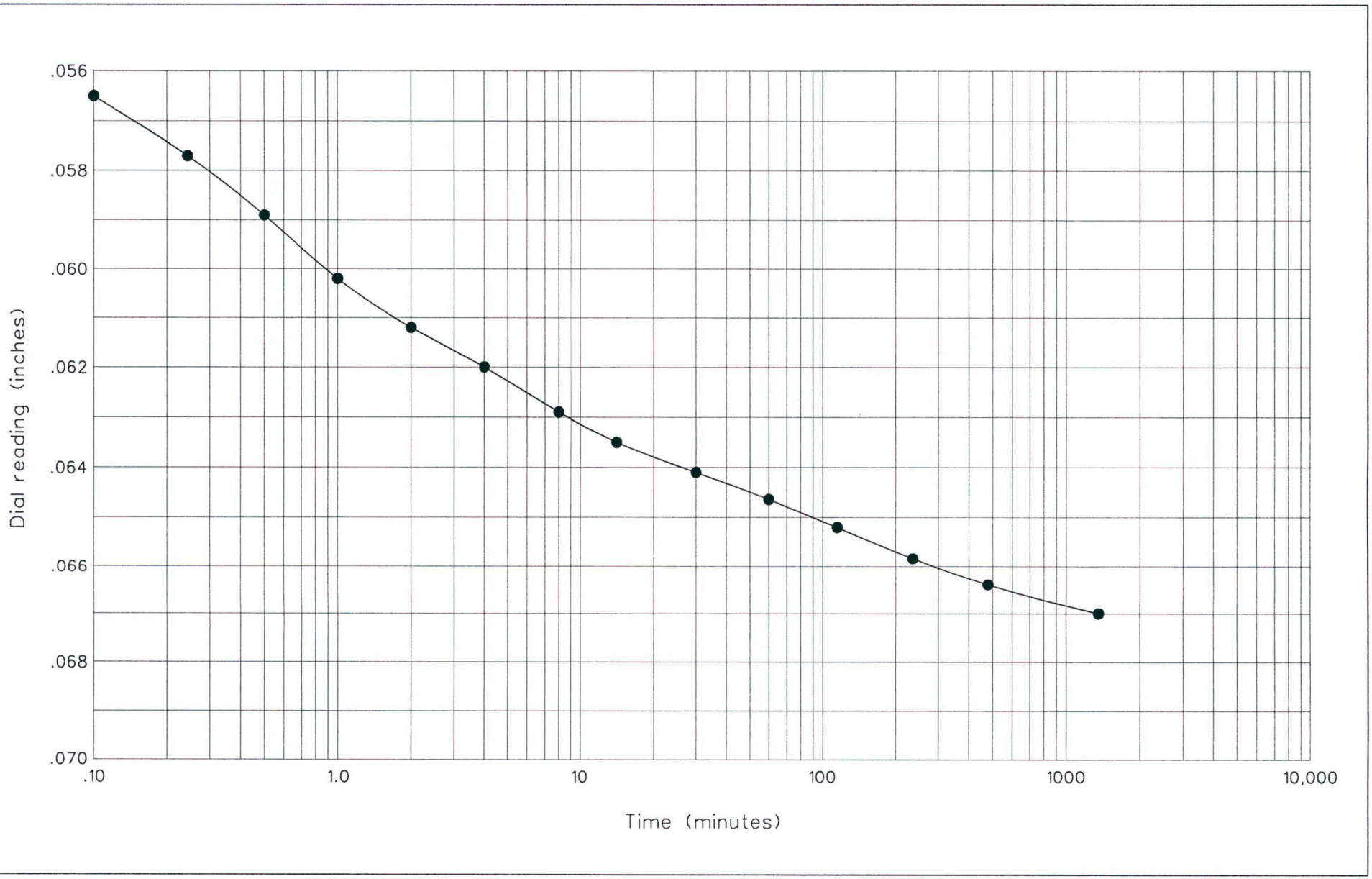
Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*



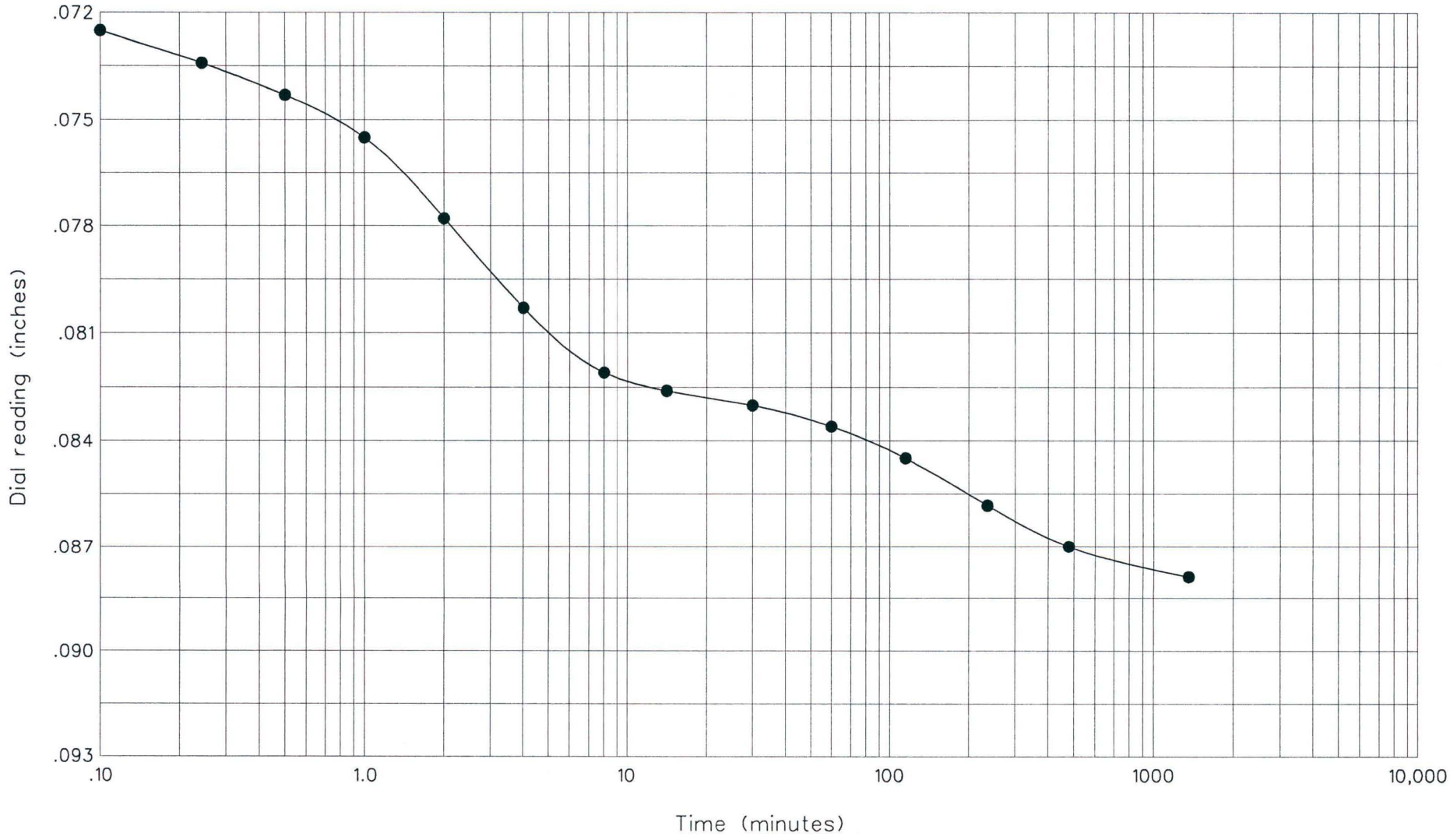
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 15'-16.3'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



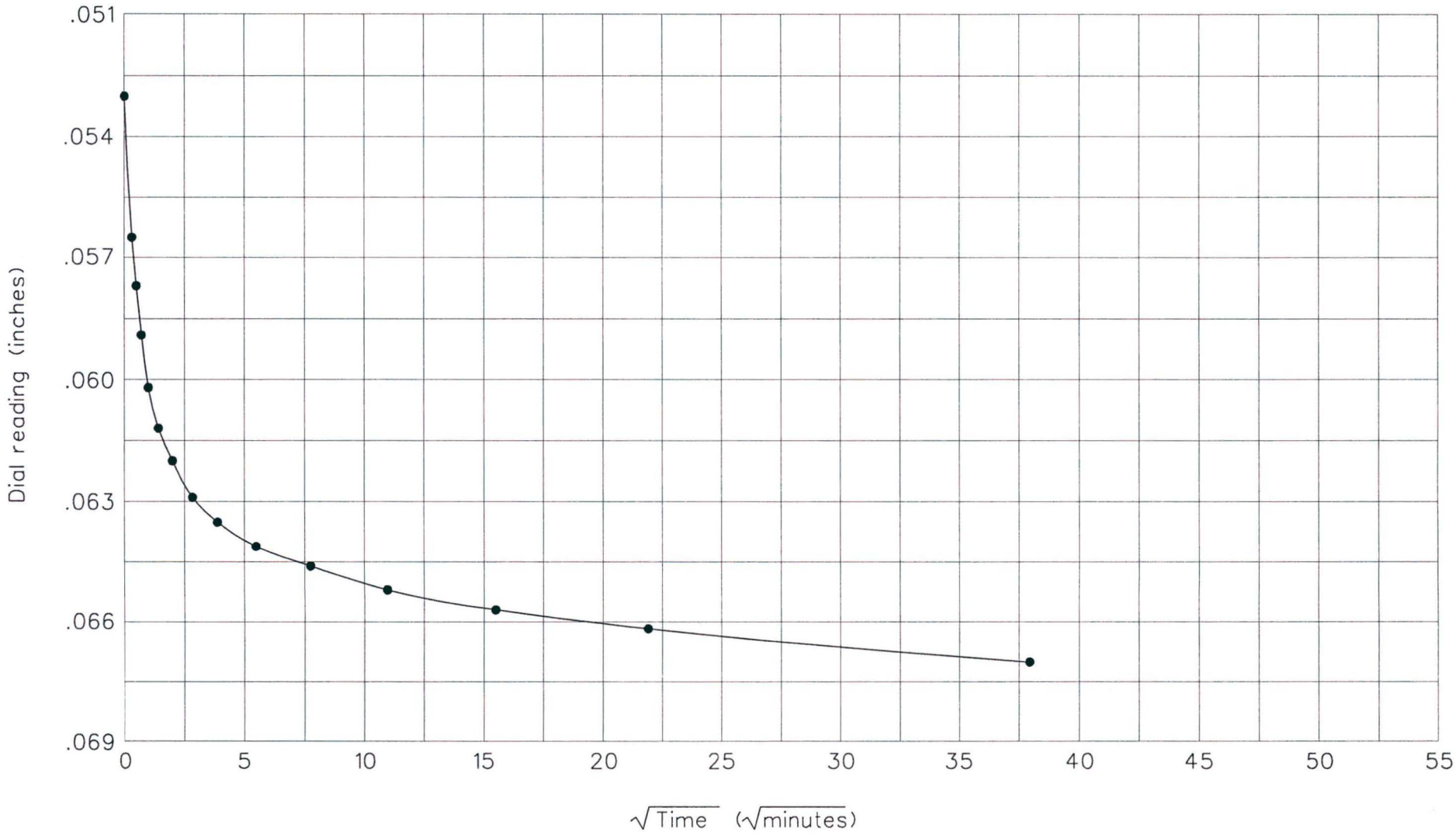
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 15'-16.3'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



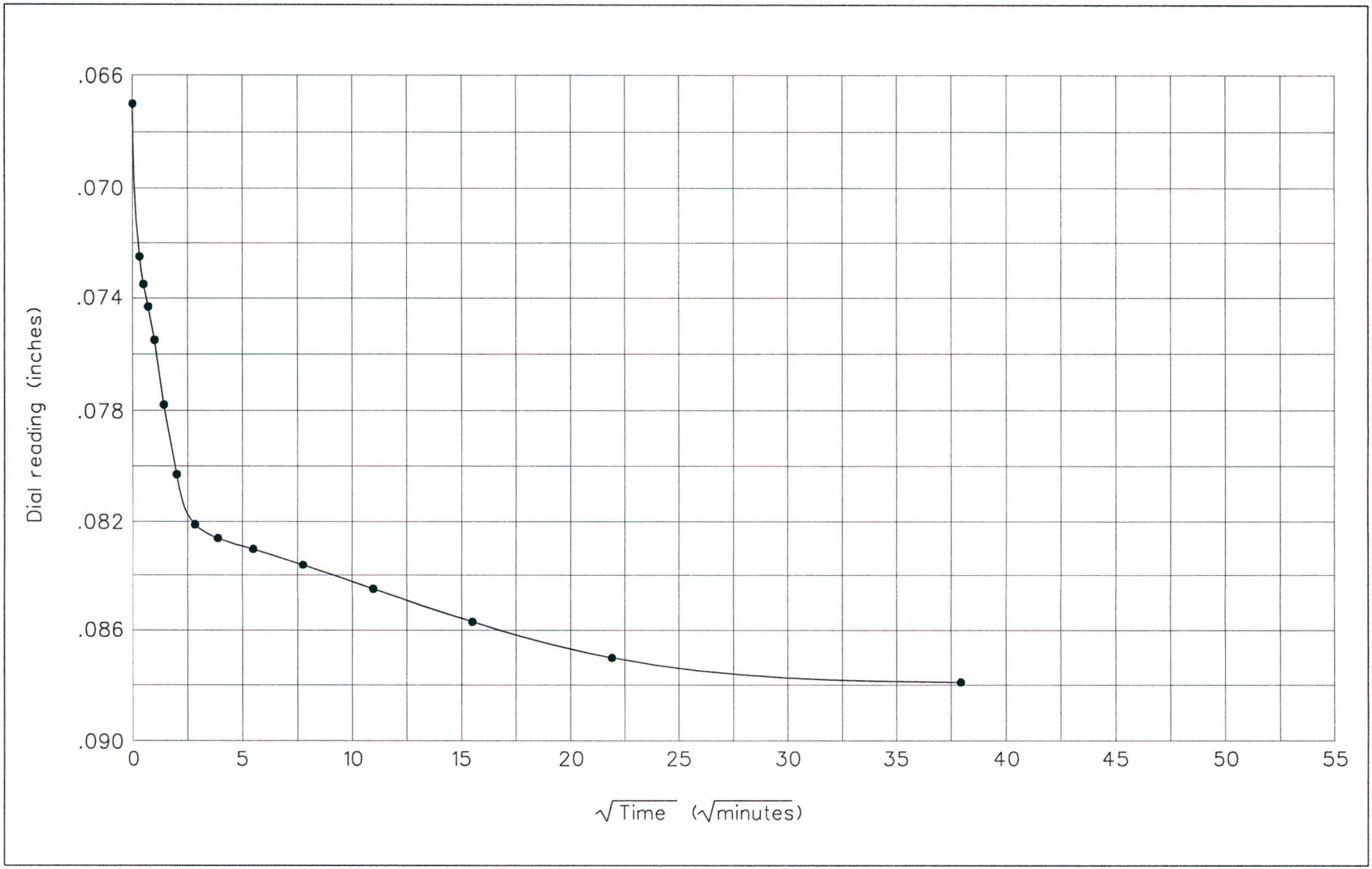
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 15'-16.3'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



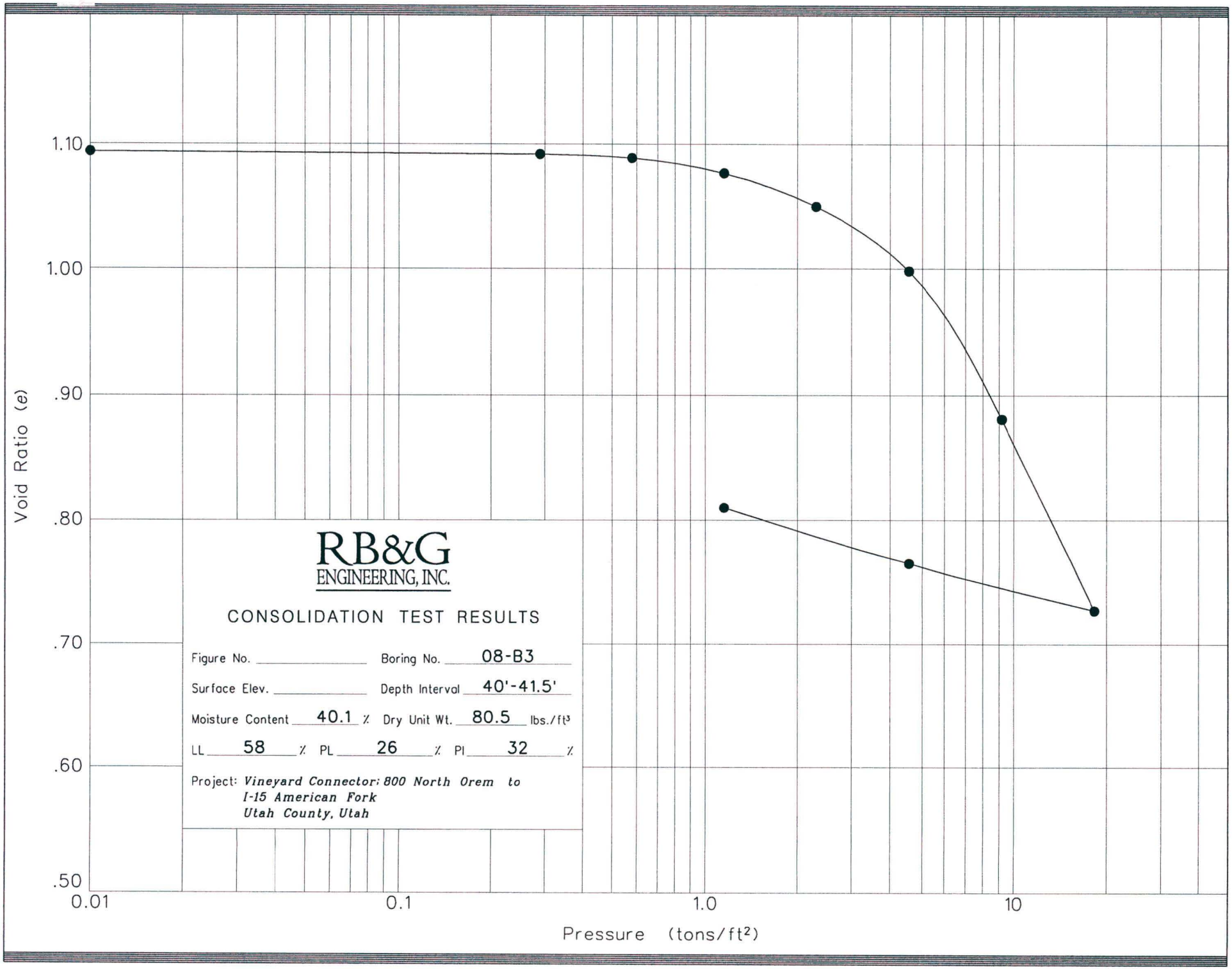
RB&G ENGINEERING, INC.

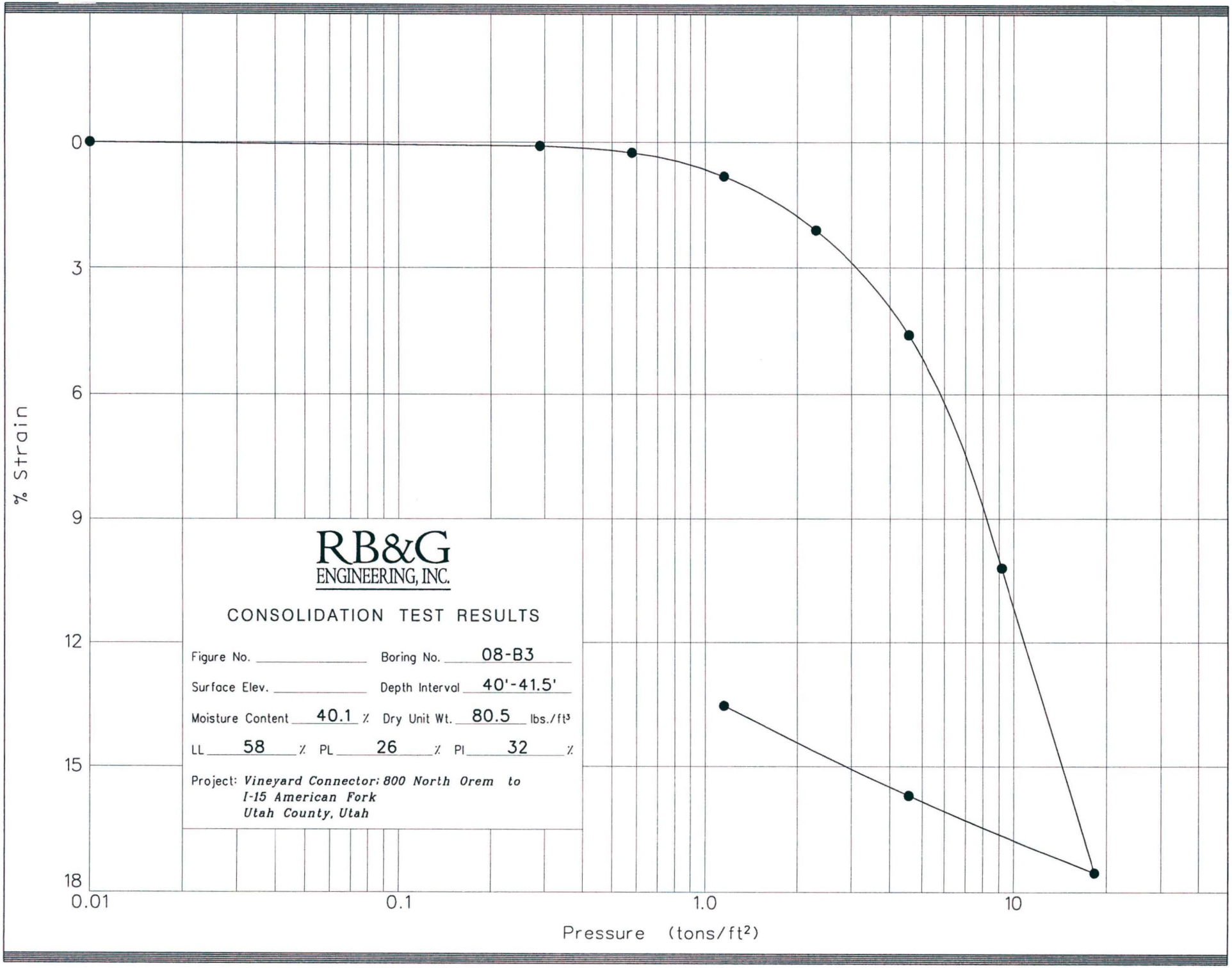
Hole no.: 08-B3
Depth: 15'-16.3'
Load: 1.15 to 2.30 tons

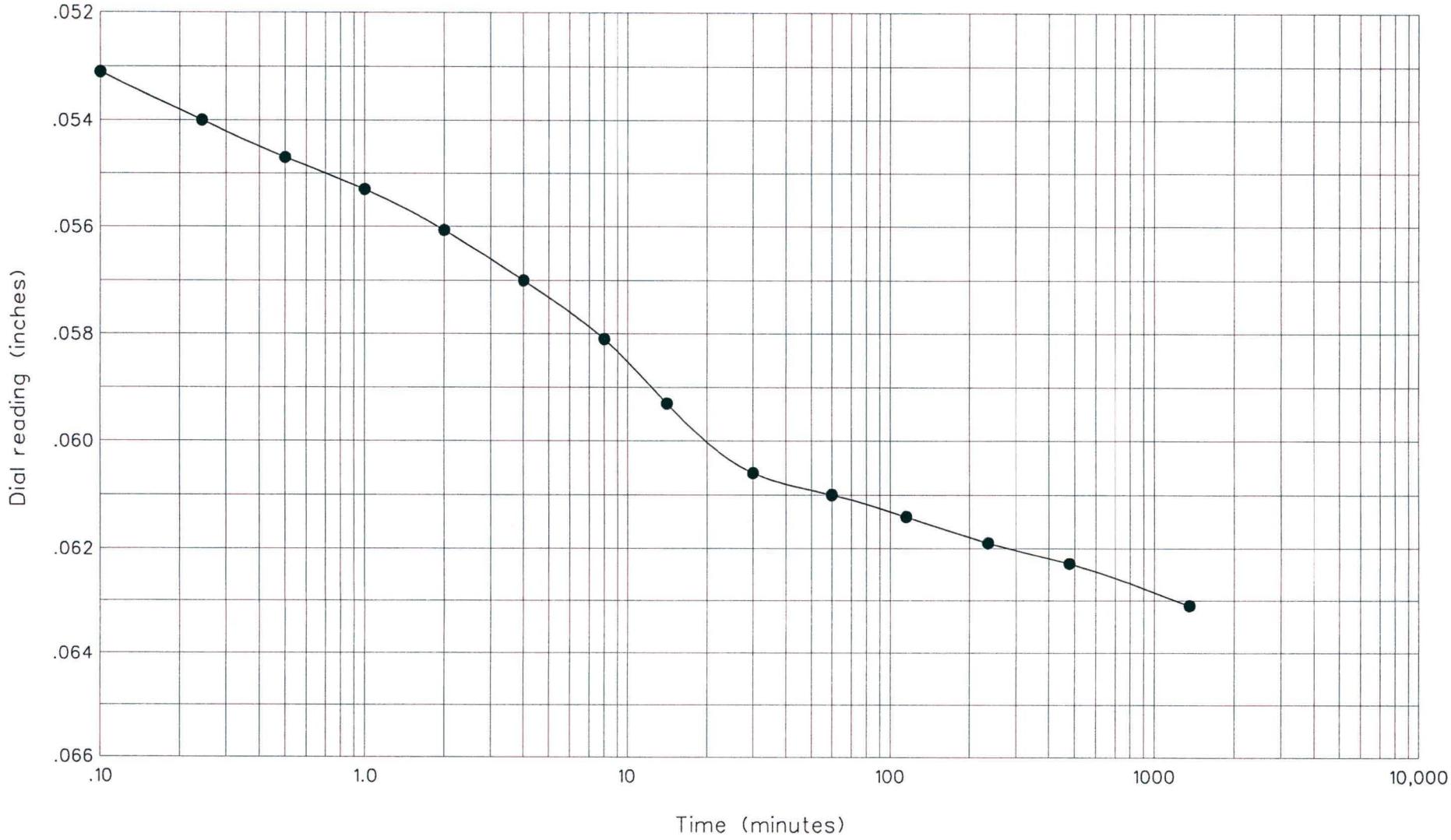
TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure


1.10
1.00
.90
.80
.70
.60
.50
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B3
Surface Elev. _____ Depth Interval 40'-41.5'
Moisture Content 40.1 % Dry Unit Wt. 80.5 lbs./ft³
LL 58 % PL 26 % PI 32 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B3
Surface Elev. _____ Depth Interval 40'-41.5'
Moisture Content 40.1 % Dry Unit Wt. 80.5 lbs./ft³
LL 58 % PL 26 % PI 32 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah



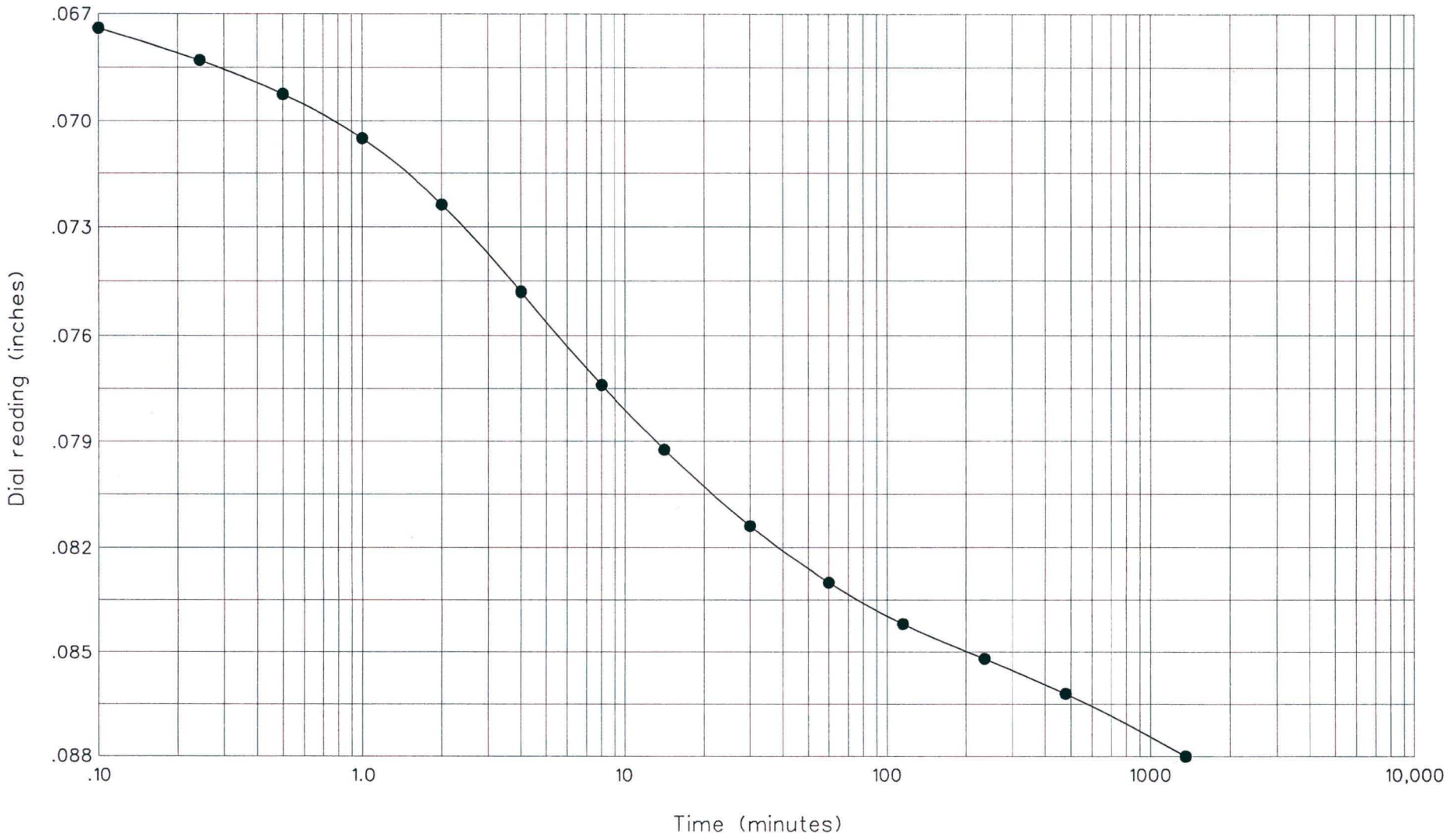
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 40'-41.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



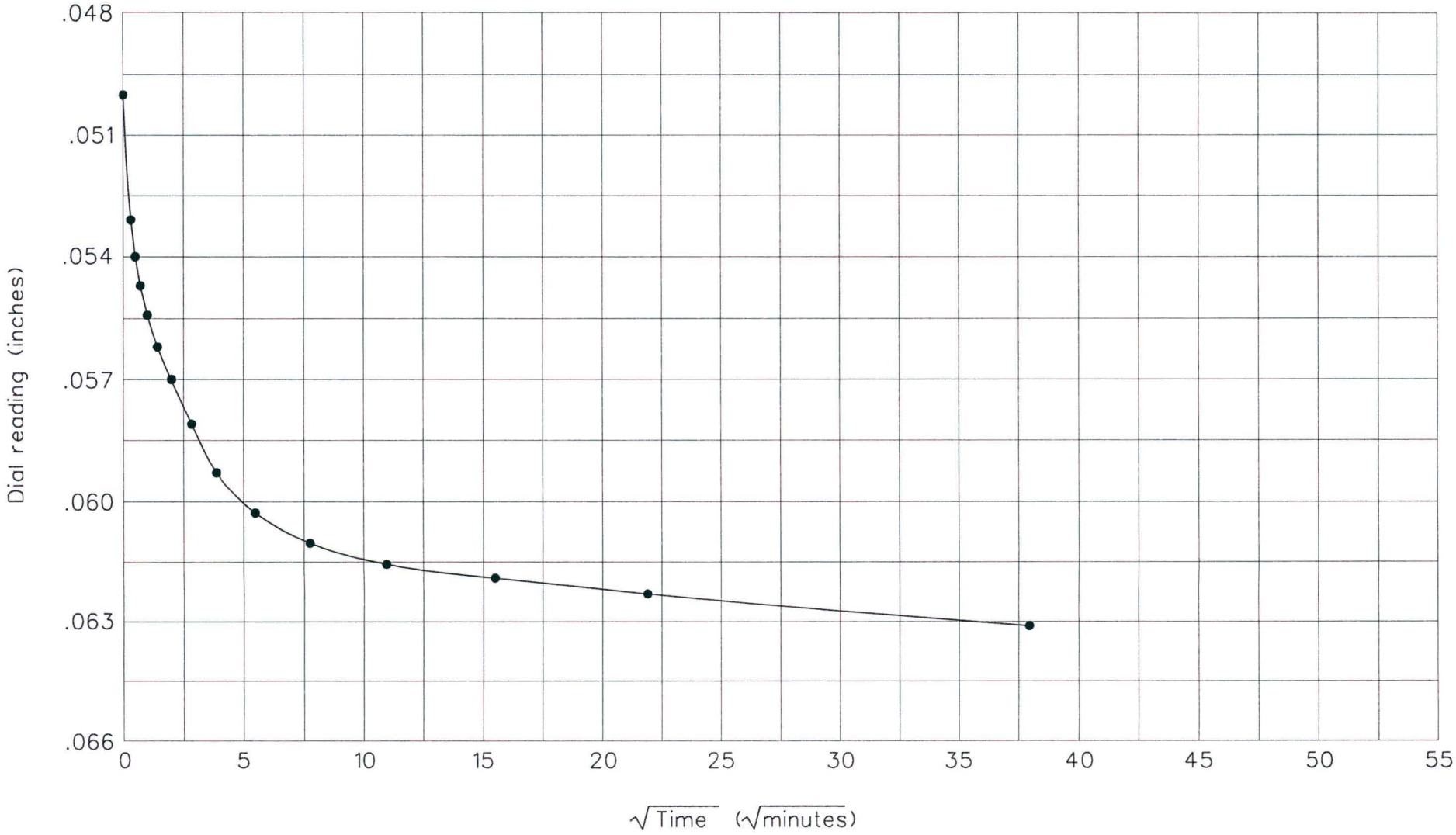
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 40'-41.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



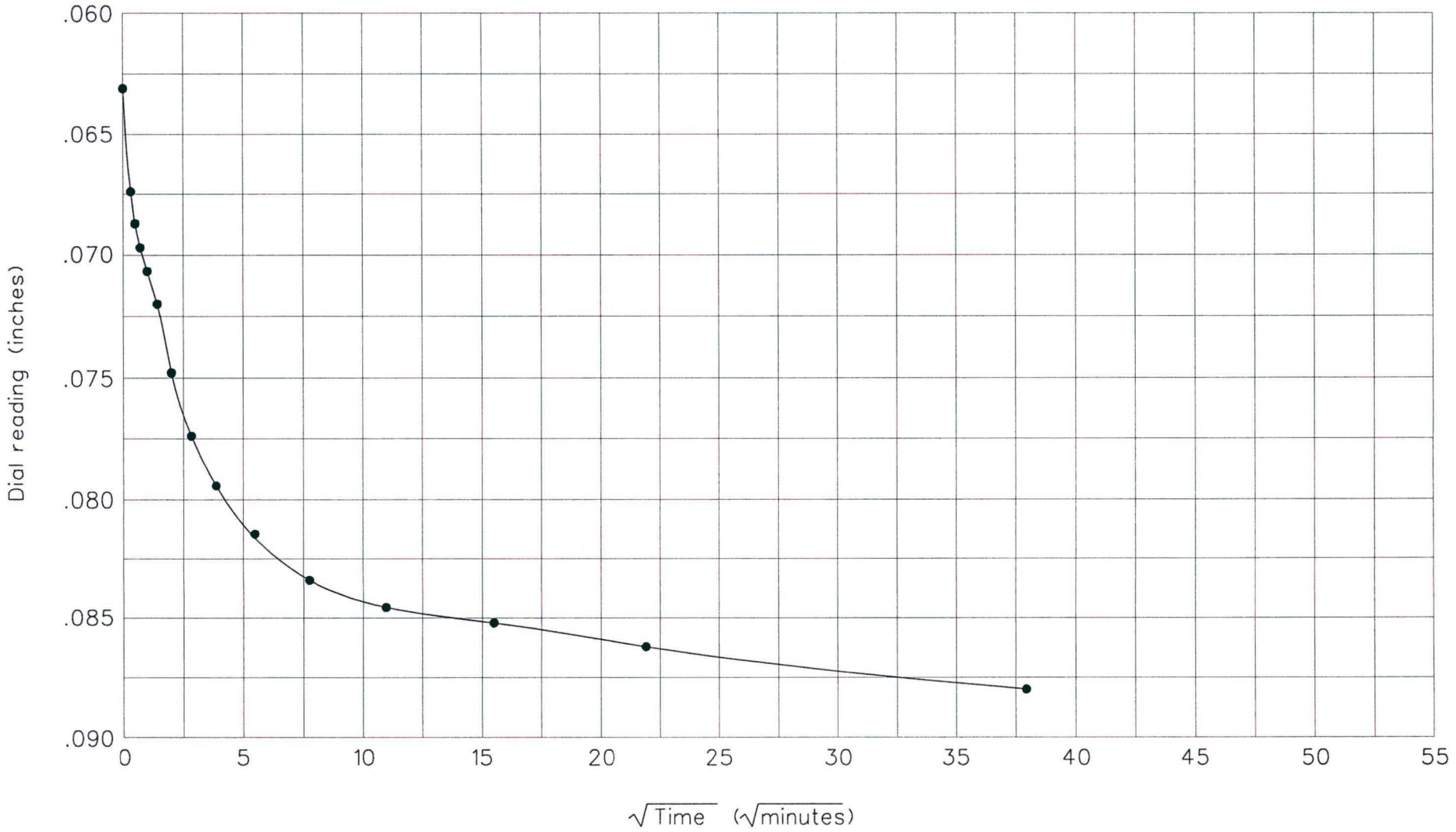
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 40'-41.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



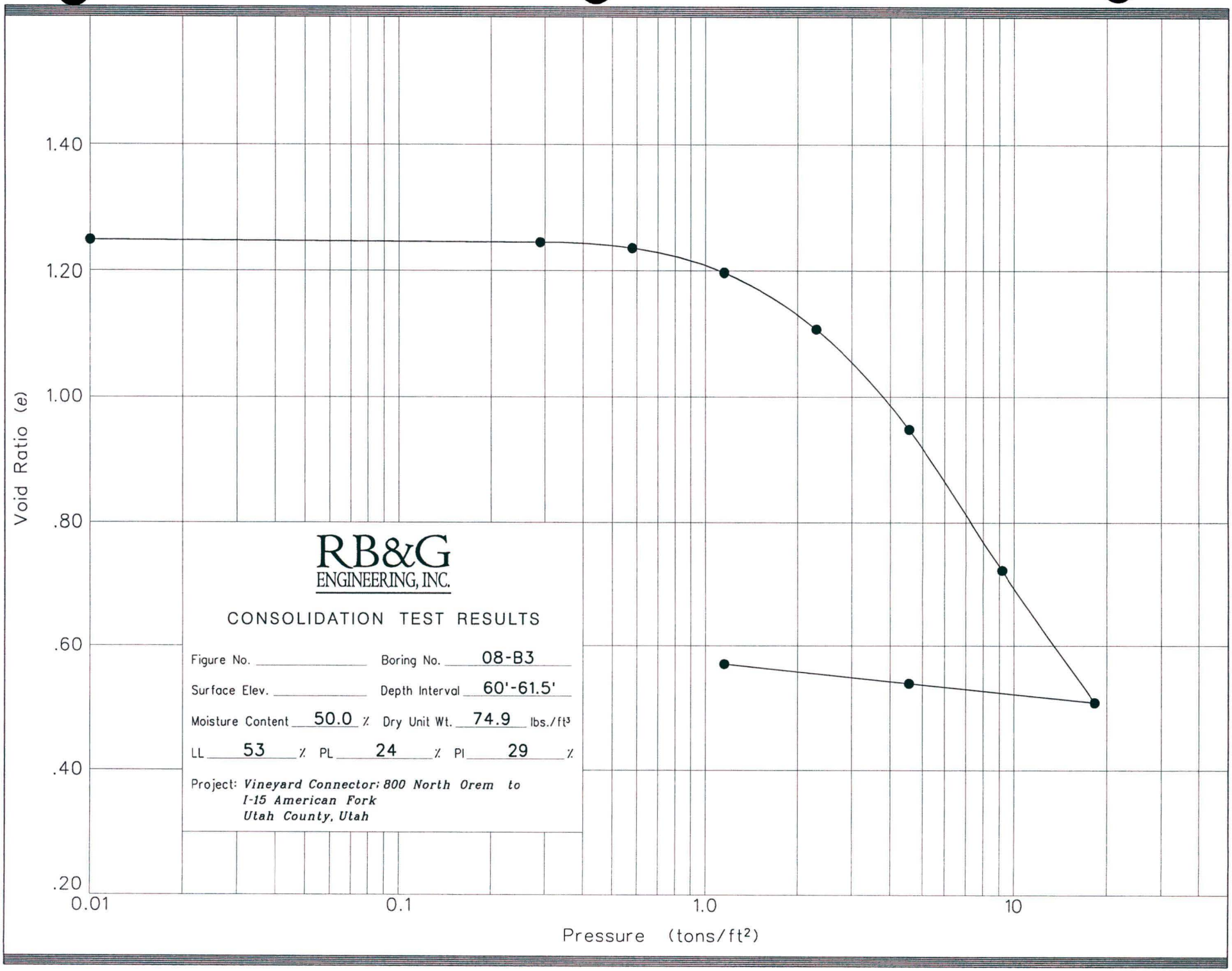
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 40'-41.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

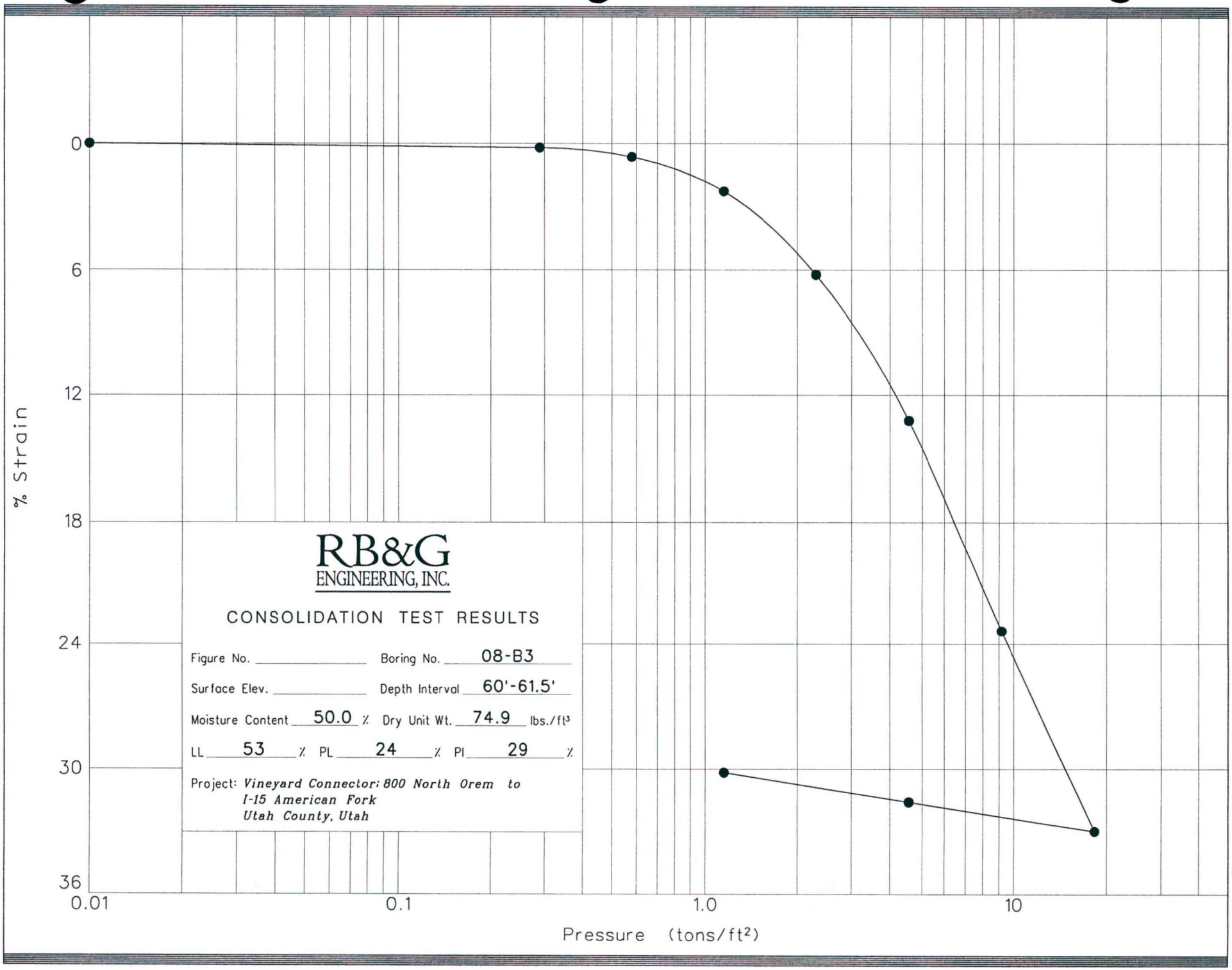
Figure No. _____ Boring No. 08-B3

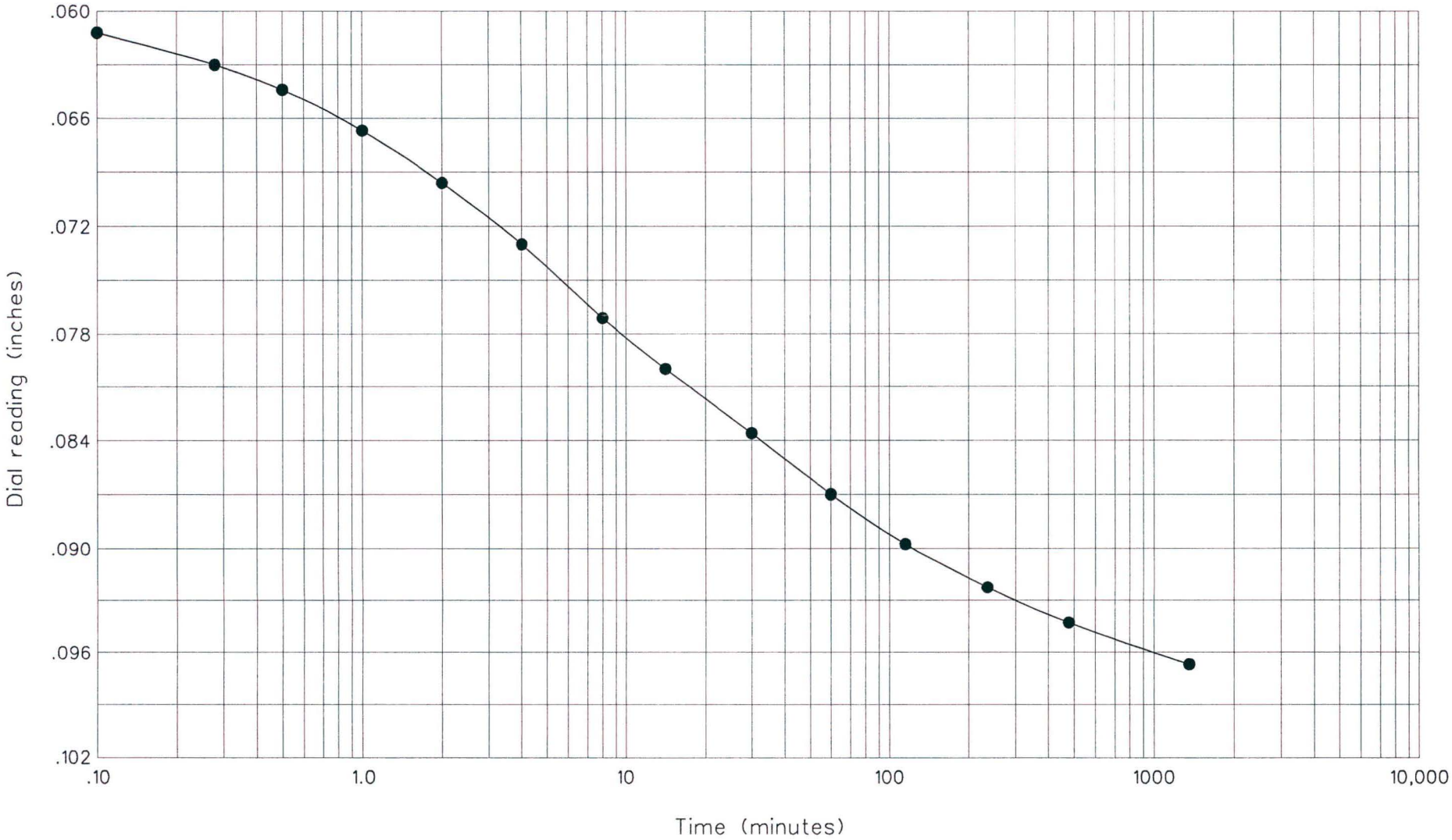
Surface Elev. _____ Depth Interval 60'-61.5'

Moisture Content 50.0 % Dry Unit Wt. 74.9 lbs./ft³

LL 53 % PL 24 % PI 29 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*


% Strain
0
6
12
18
24
30
36
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No.
Boring No. 08-B3
Surface Elev.
Depth Interval 60'-61.5'
Moisture Content 50.0 % Dry Unit Wt. 74.9 lbs./ft³
LL 53 % PL 24 % PI 29 %
Project: Vineyard Connector: 800 North Orem to
I-15 American Fork
Utah County, Utah



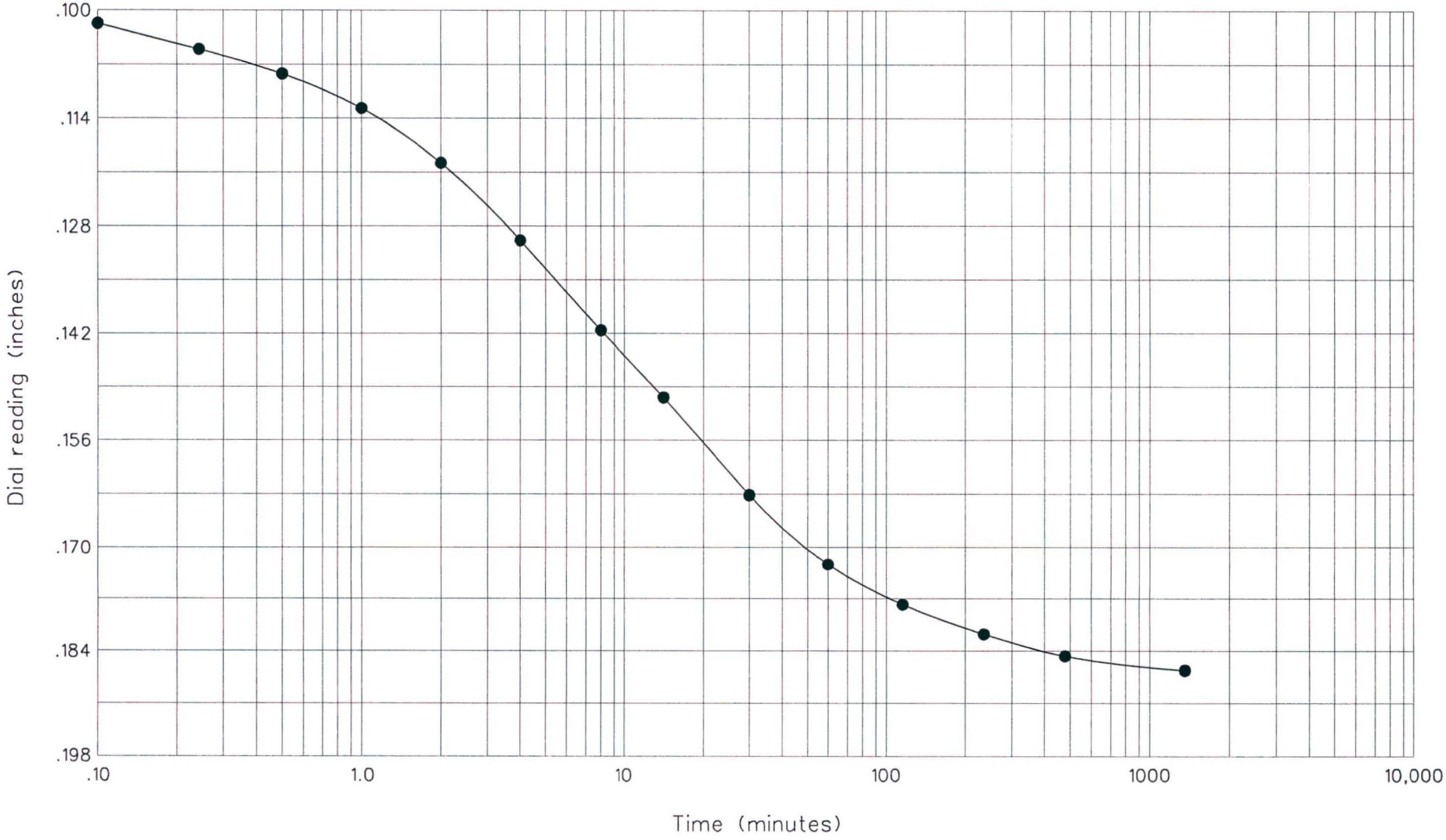
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 60'-61.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



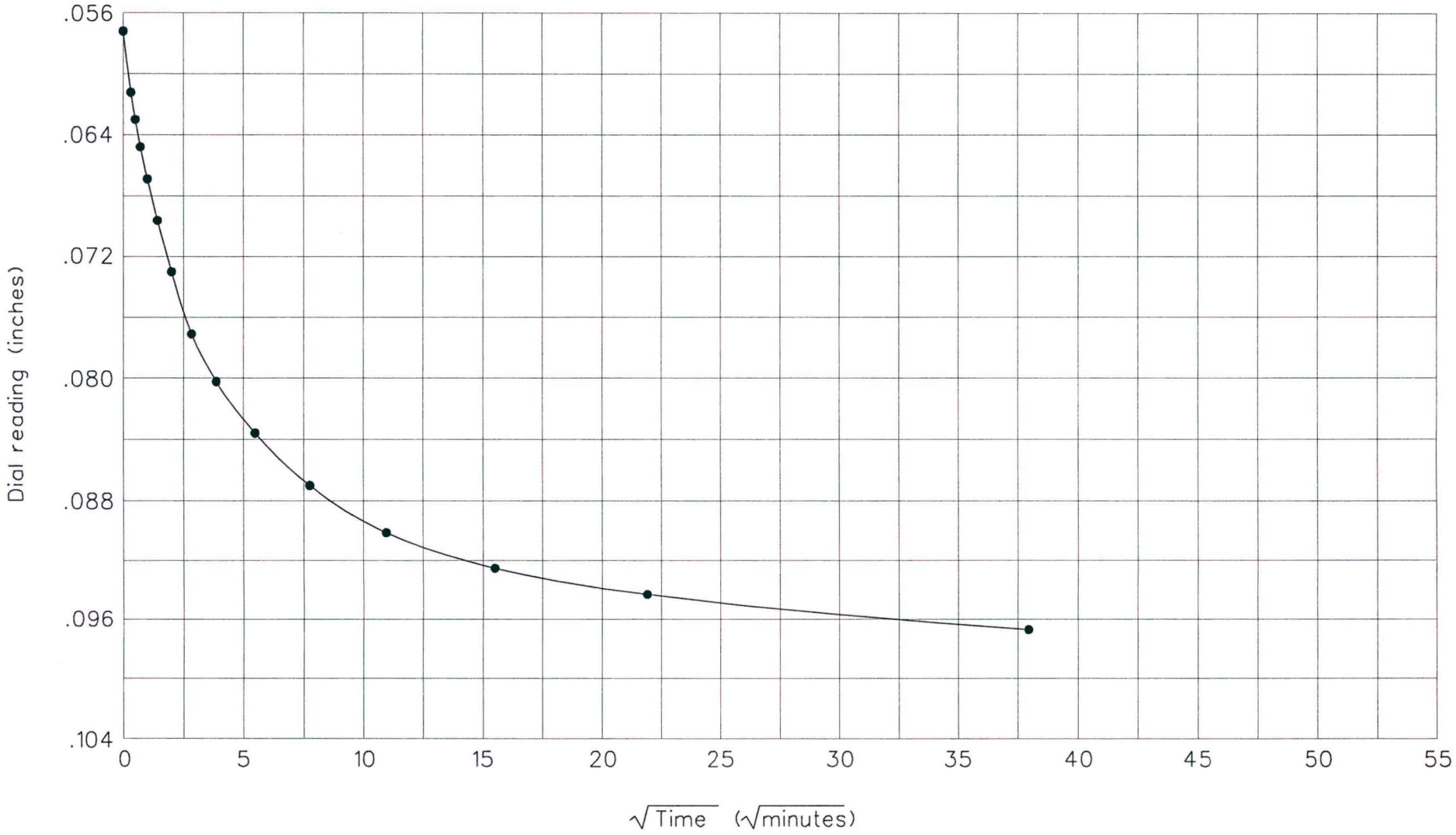
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 60'-61.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



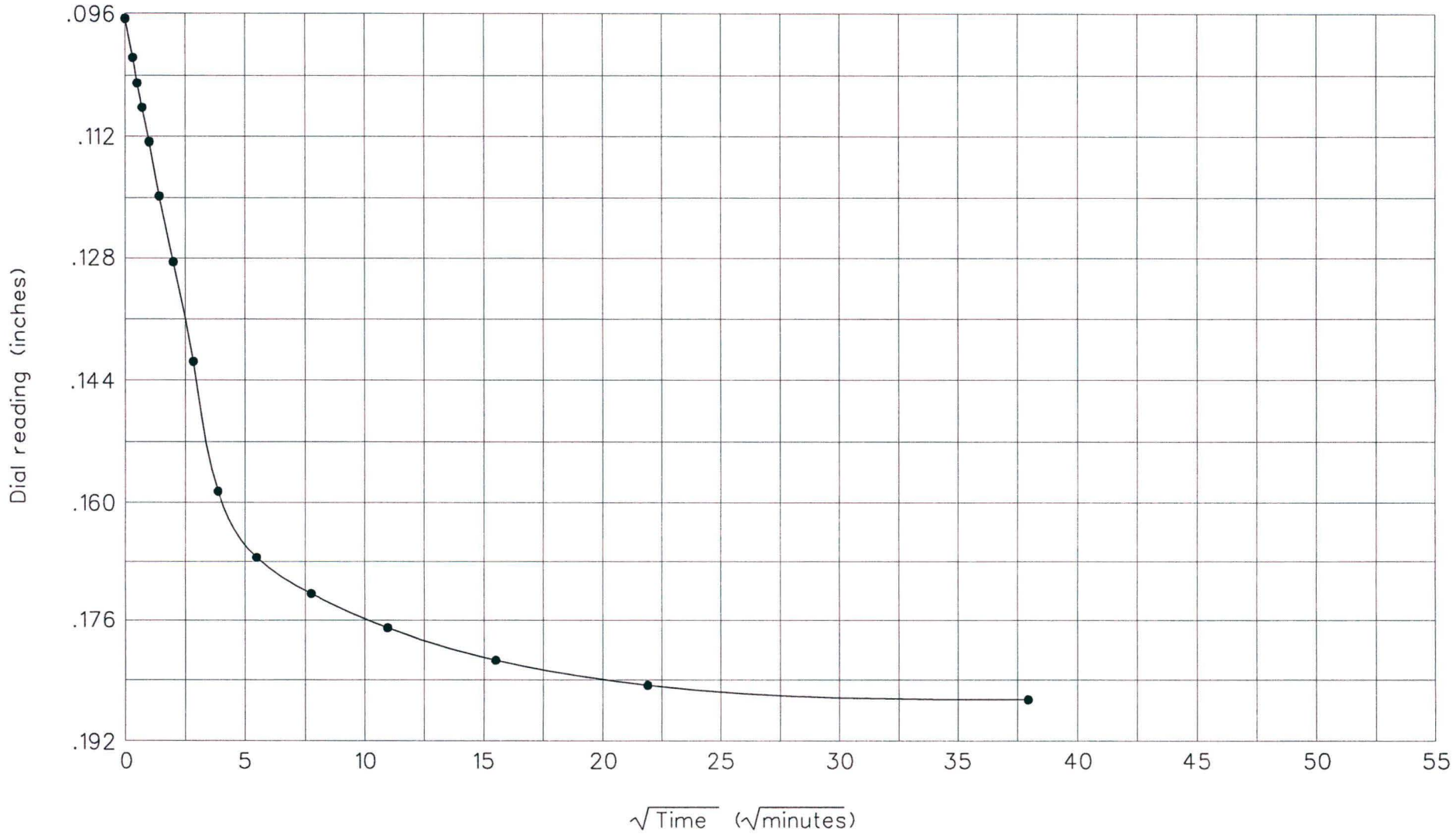
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 60'-61.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



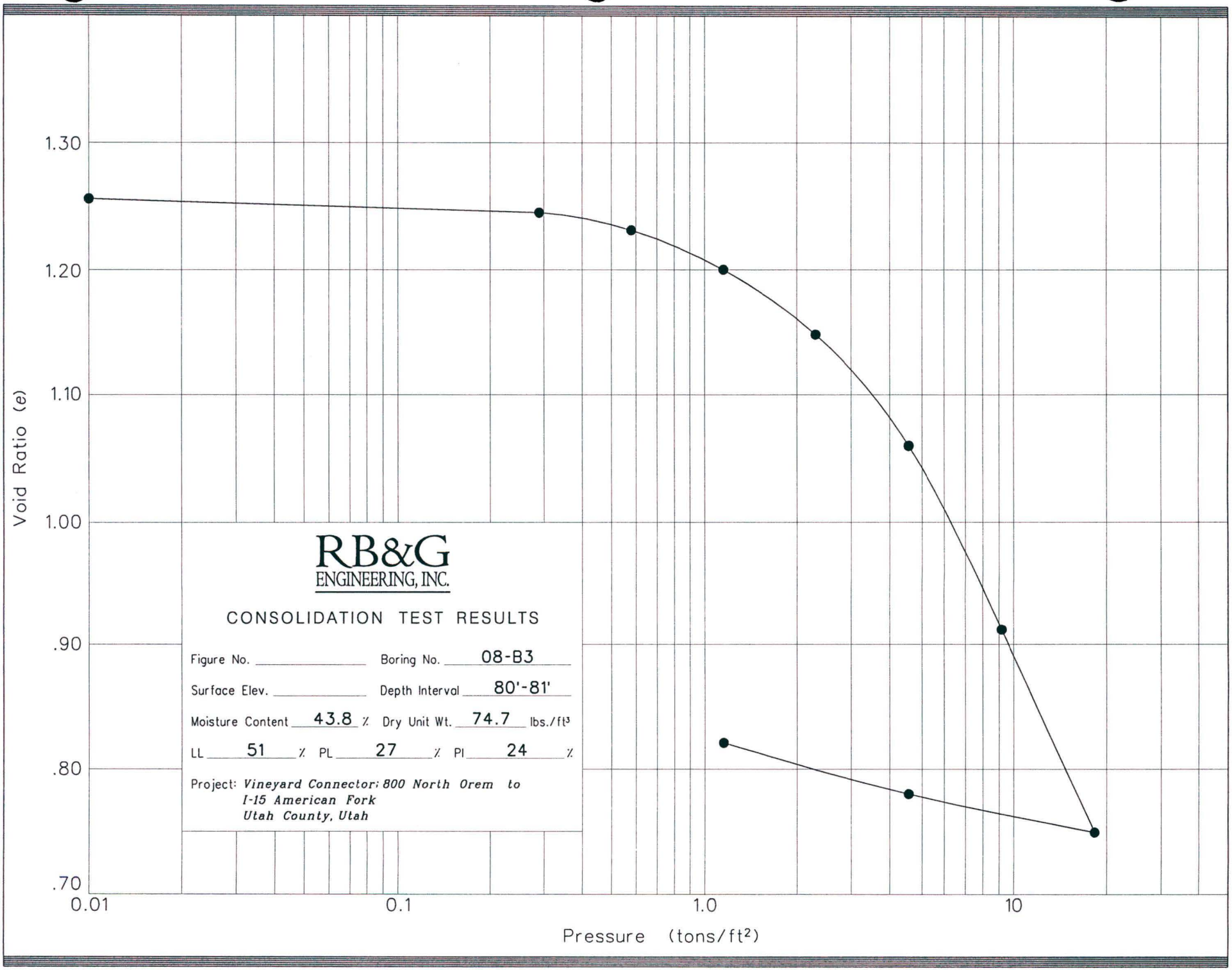
RB&G ENGINEERING, INC.

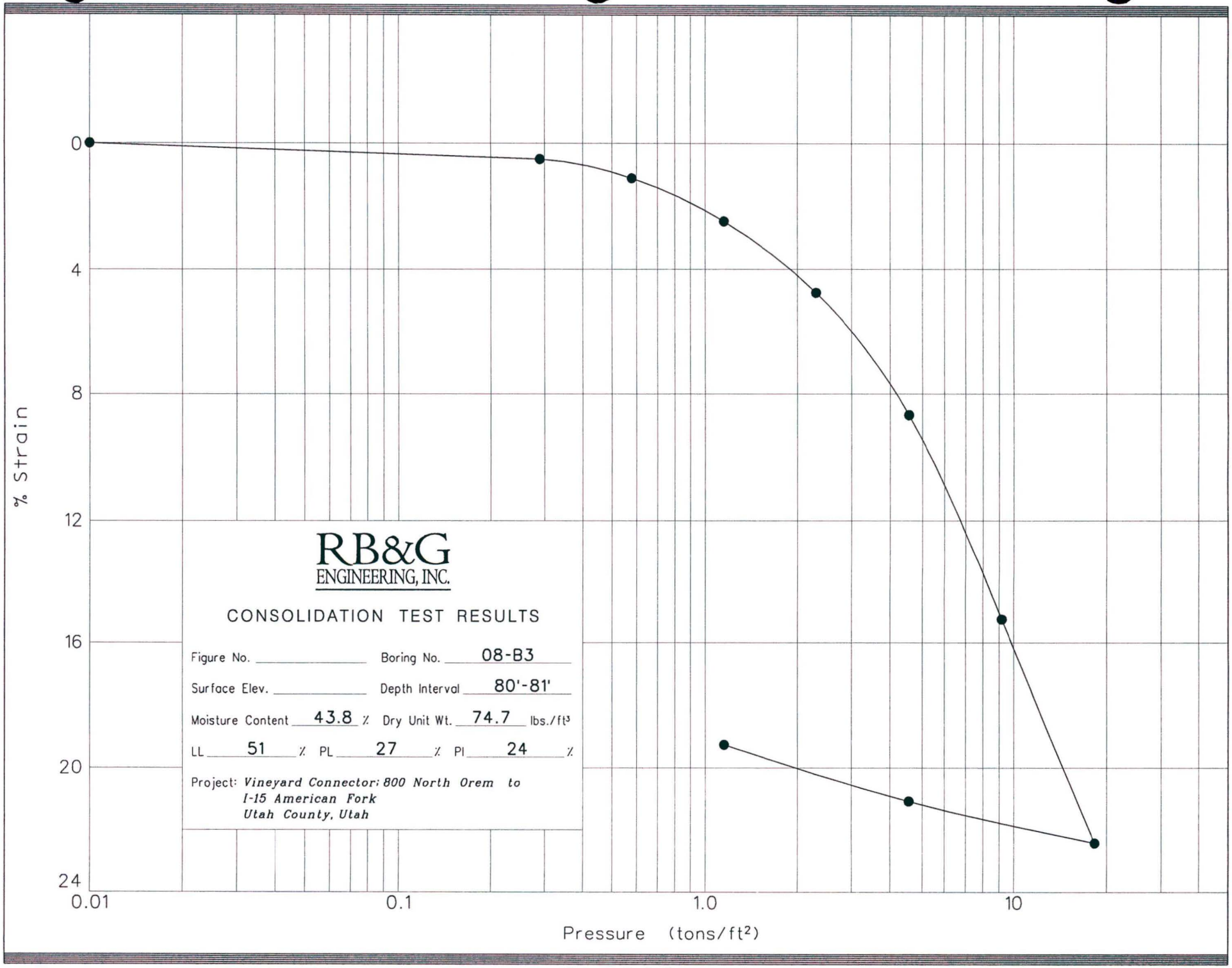
Hole no.: 08-B3
Depth: 60'-61.5'
Load: 2.30 to 4.60 tons

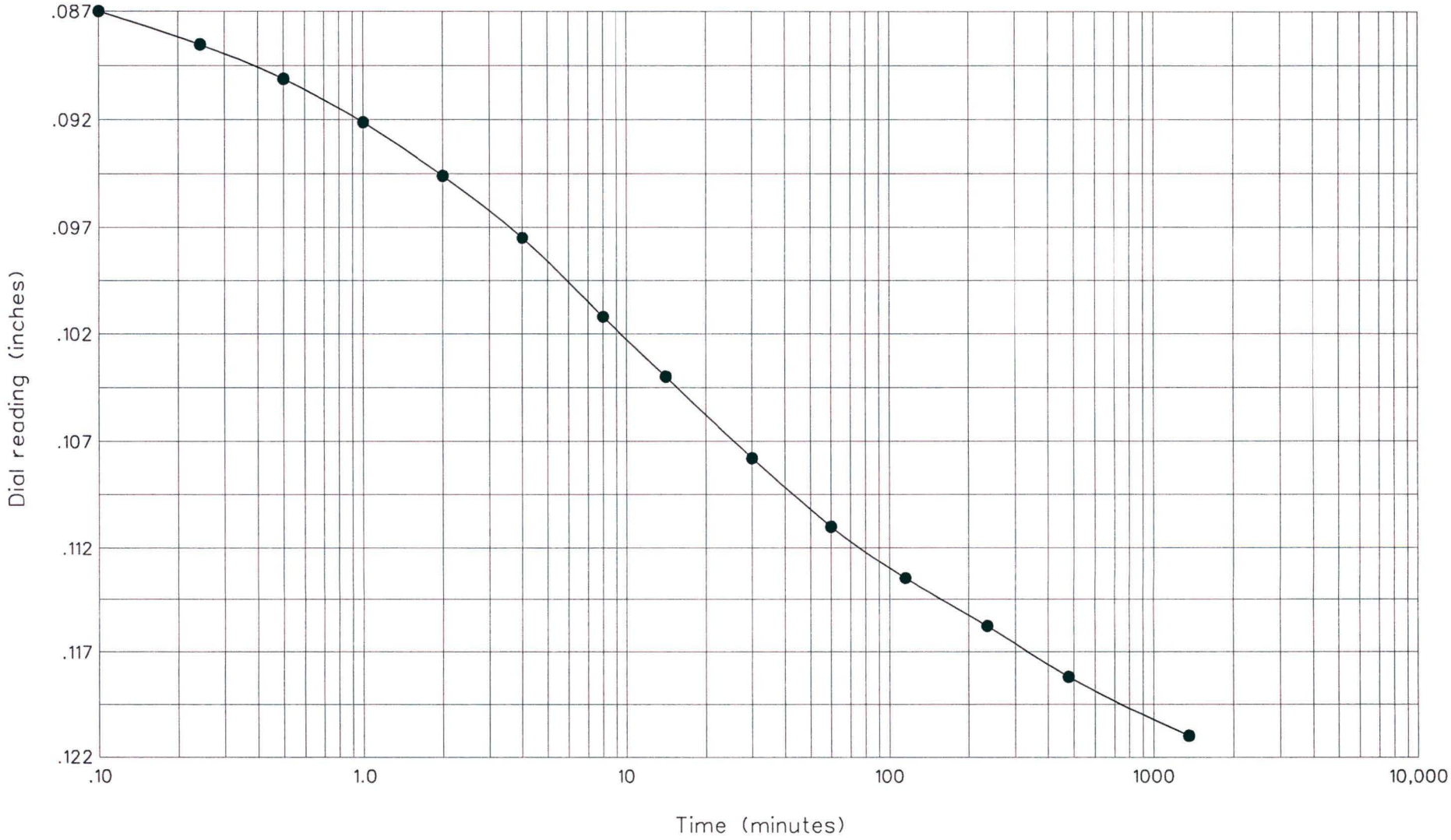
TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure


1.30
1.20
1.10
1.00
.90
.80
.70
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B3
Surface Elev. _____ Depth Interval 80'-81'
Moisture Content 43.8 % Dry Unit Wt. 74.7 lbs./ft³
LL 51 % PL 27 % PI 24 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah


0
4
8
12
16
20
24
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B3
Surface Elev. _____ Depth Interval 80'-81'
Moisture Content 43.8 % Dry Unit Wt. 74.7 lbs./ft³
LL 51 % PL 27 % PI 24 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah



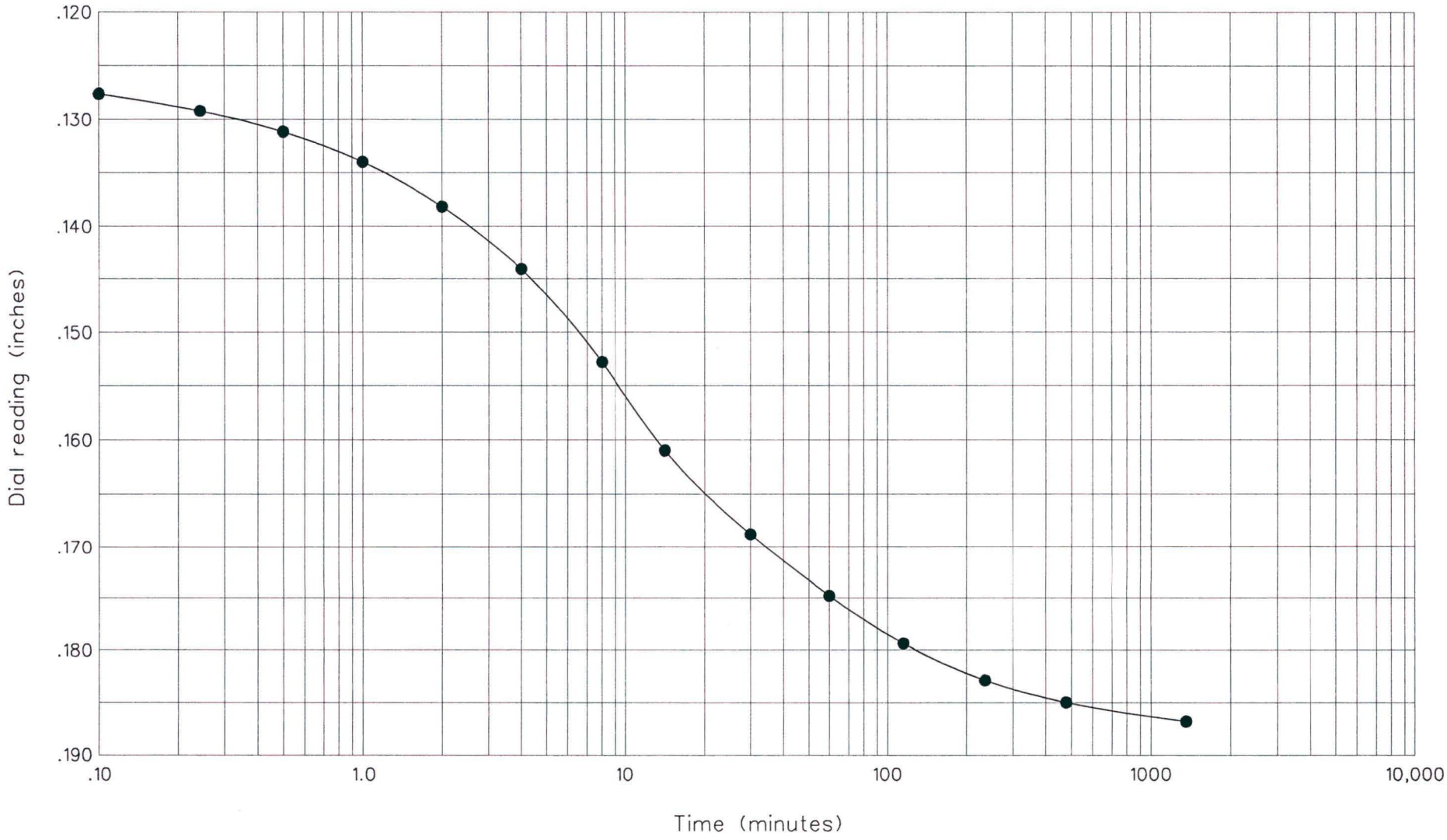
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 80'-81.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



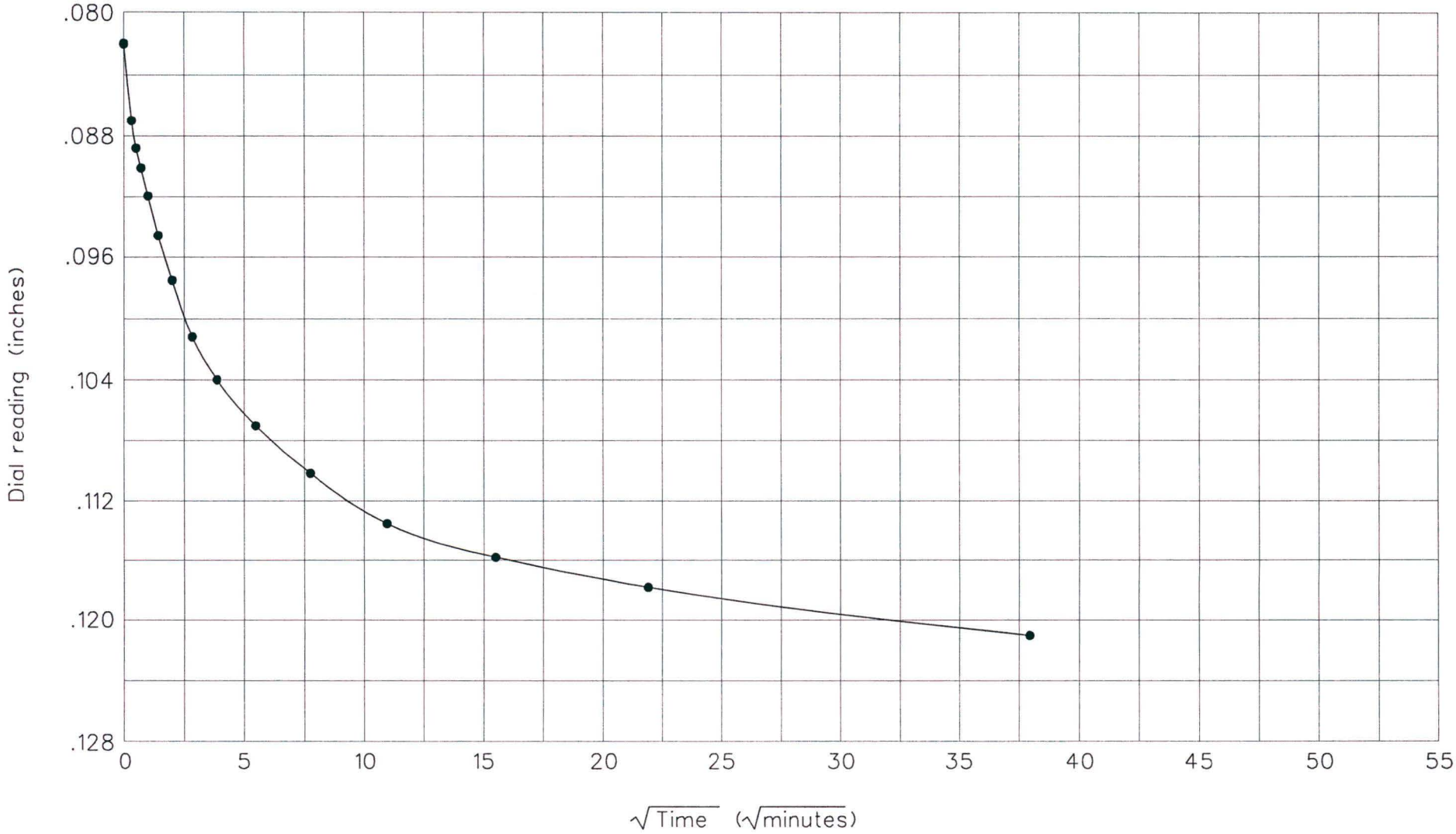
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 80'-81.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



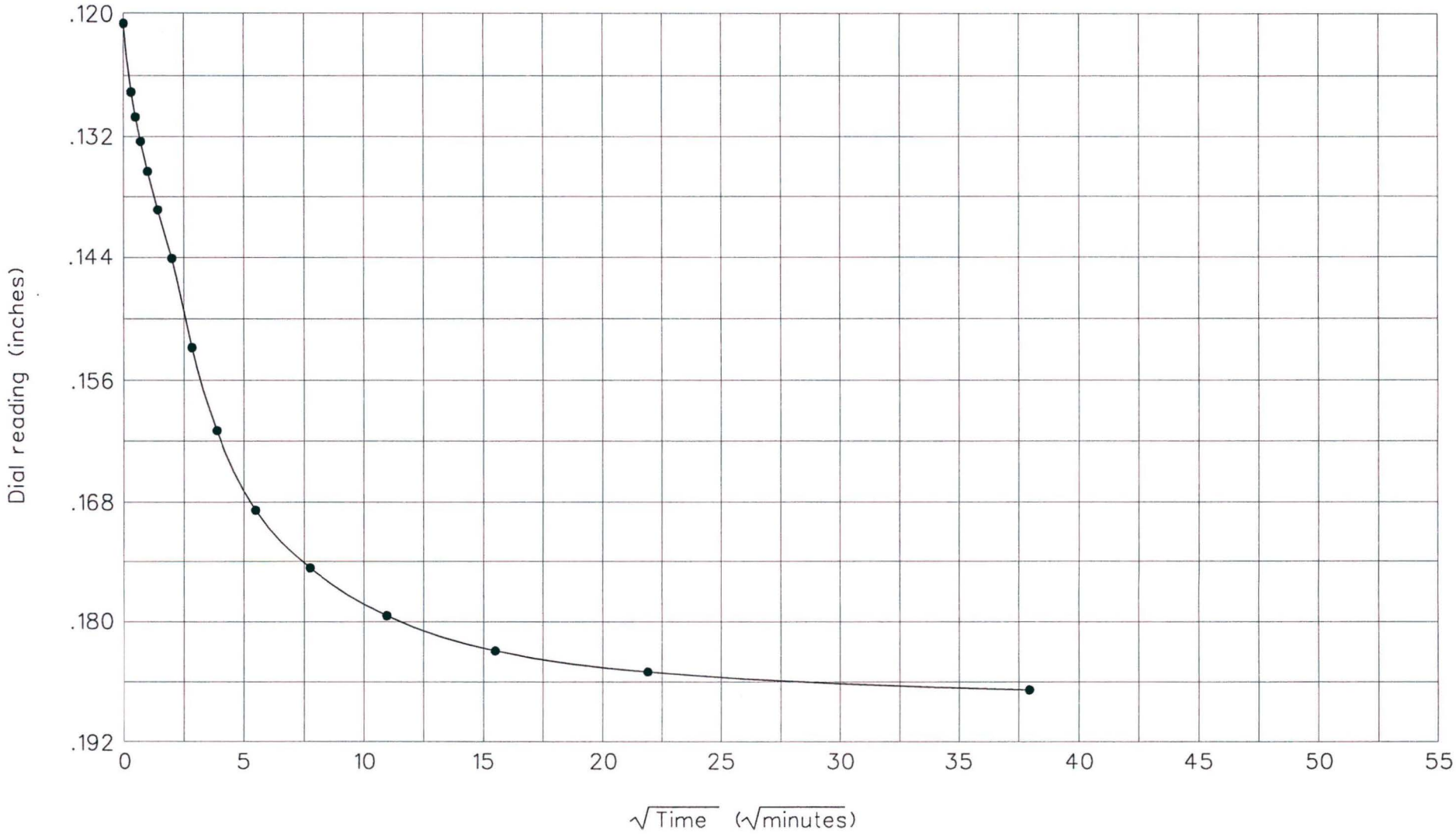
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 80'-81.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



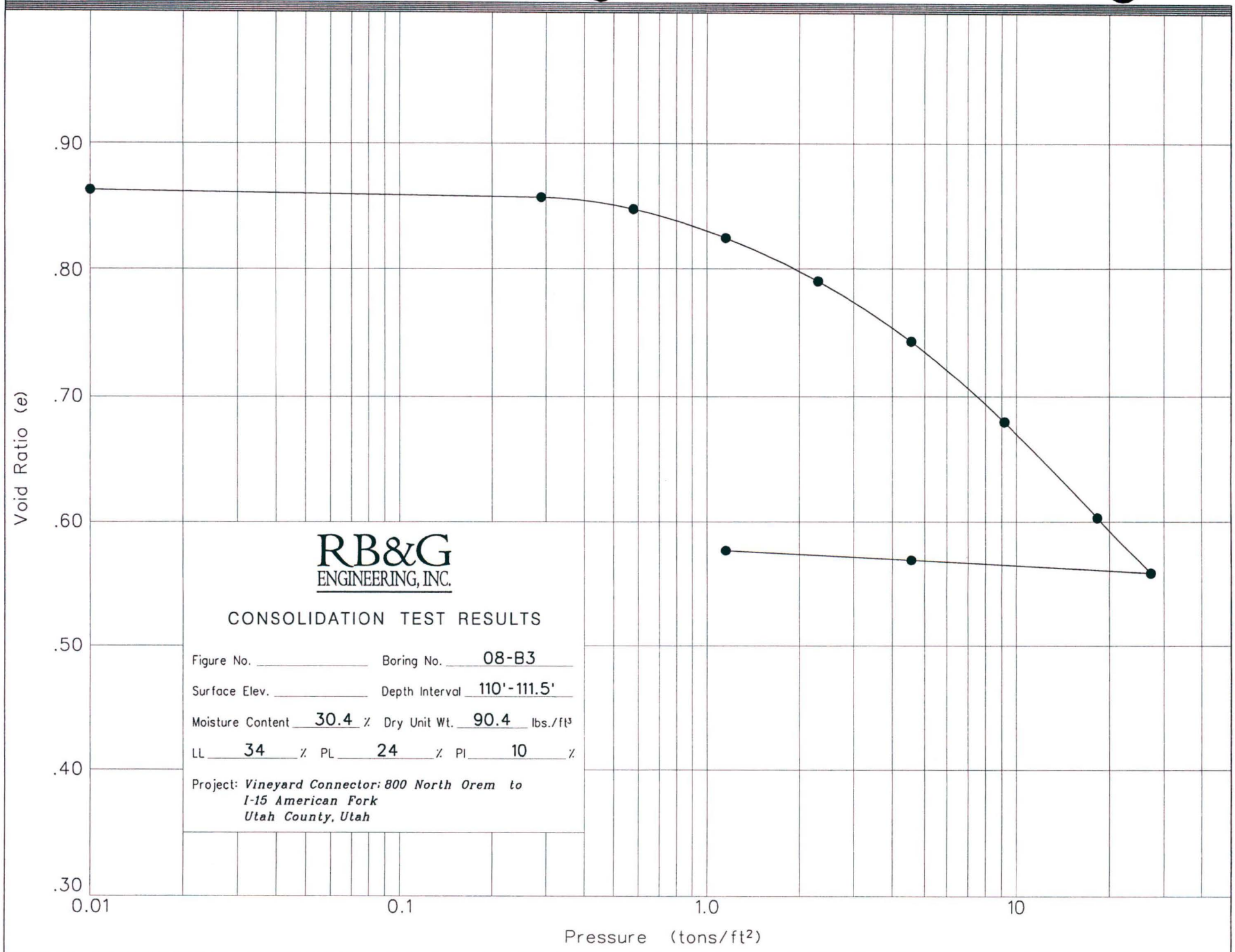
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 80'-81.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

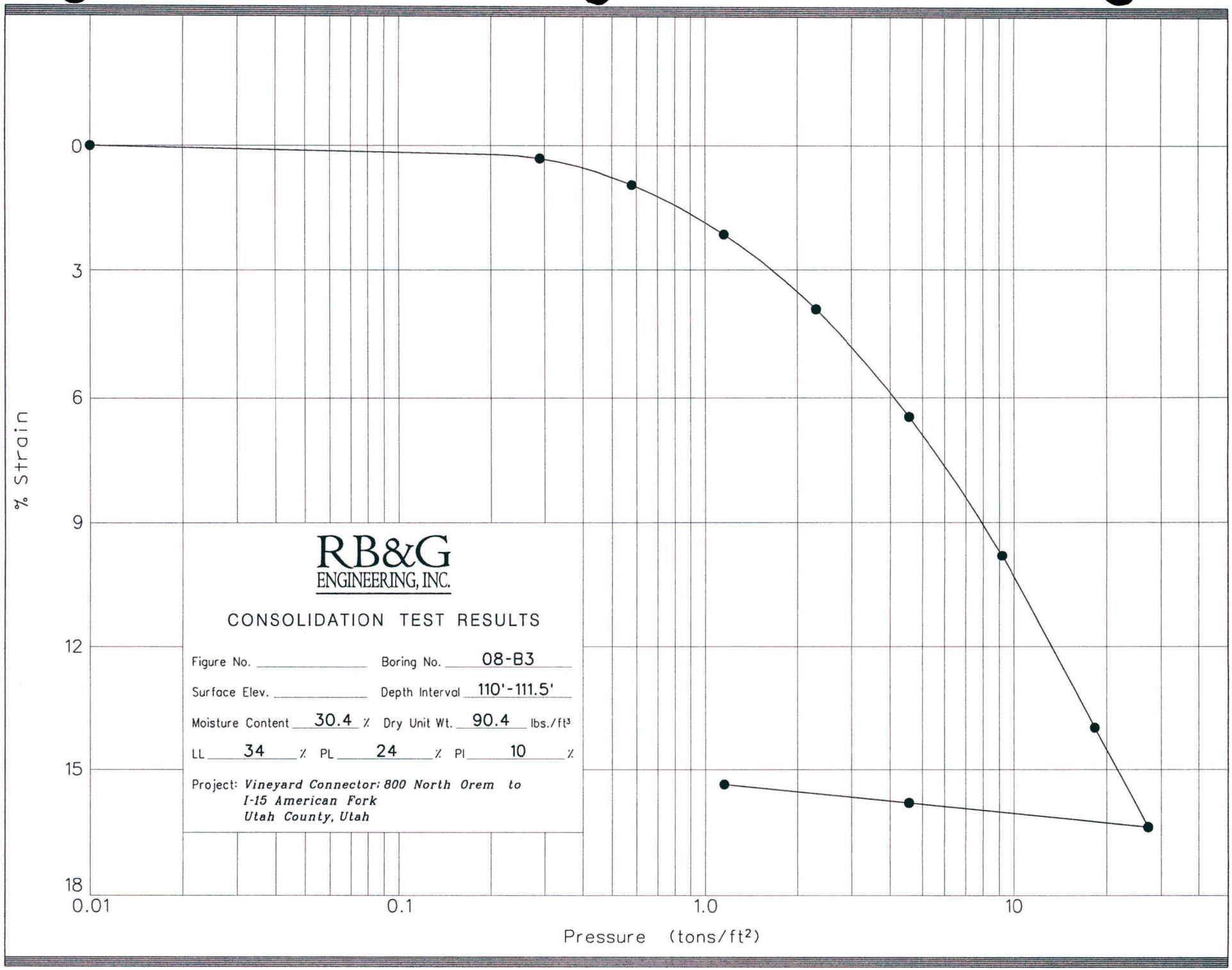
Figure No. _____ Boring No. 08-B3

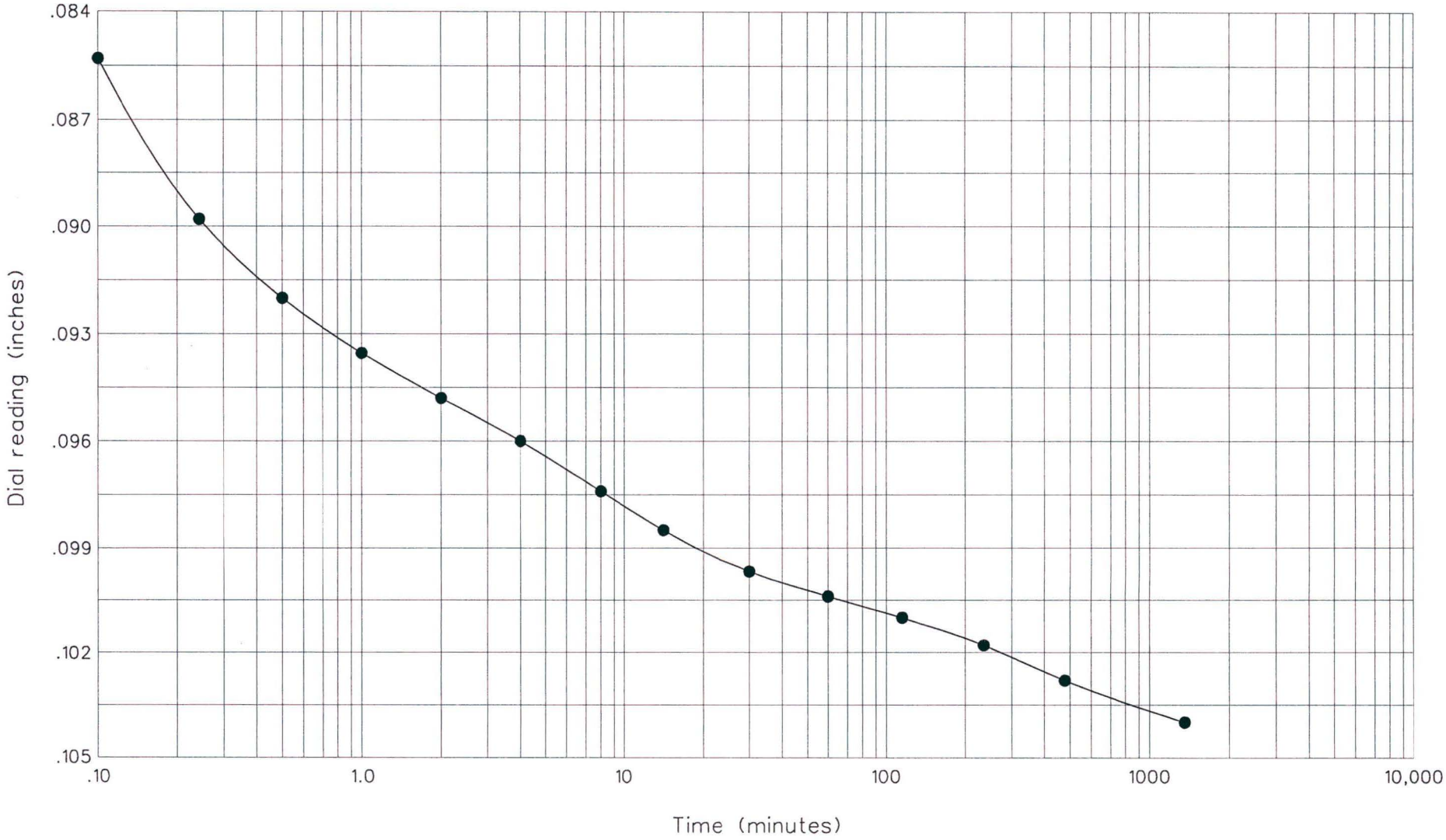
Surface Elev. _____ Depth Interval 110'-111.5'

Moisture Content 30.4 % Dry Unit Wt. 90.4 lbs./ft³

LL 34 % PL 24 % PI 10 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B3
Surface Elev. _____ Depth Interval 110'-111.5'
Moisture Content 30.4 % Dry Unit Wt. 90.4 lbs./ft³
LL 34 % PL 24 % PI 10 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah



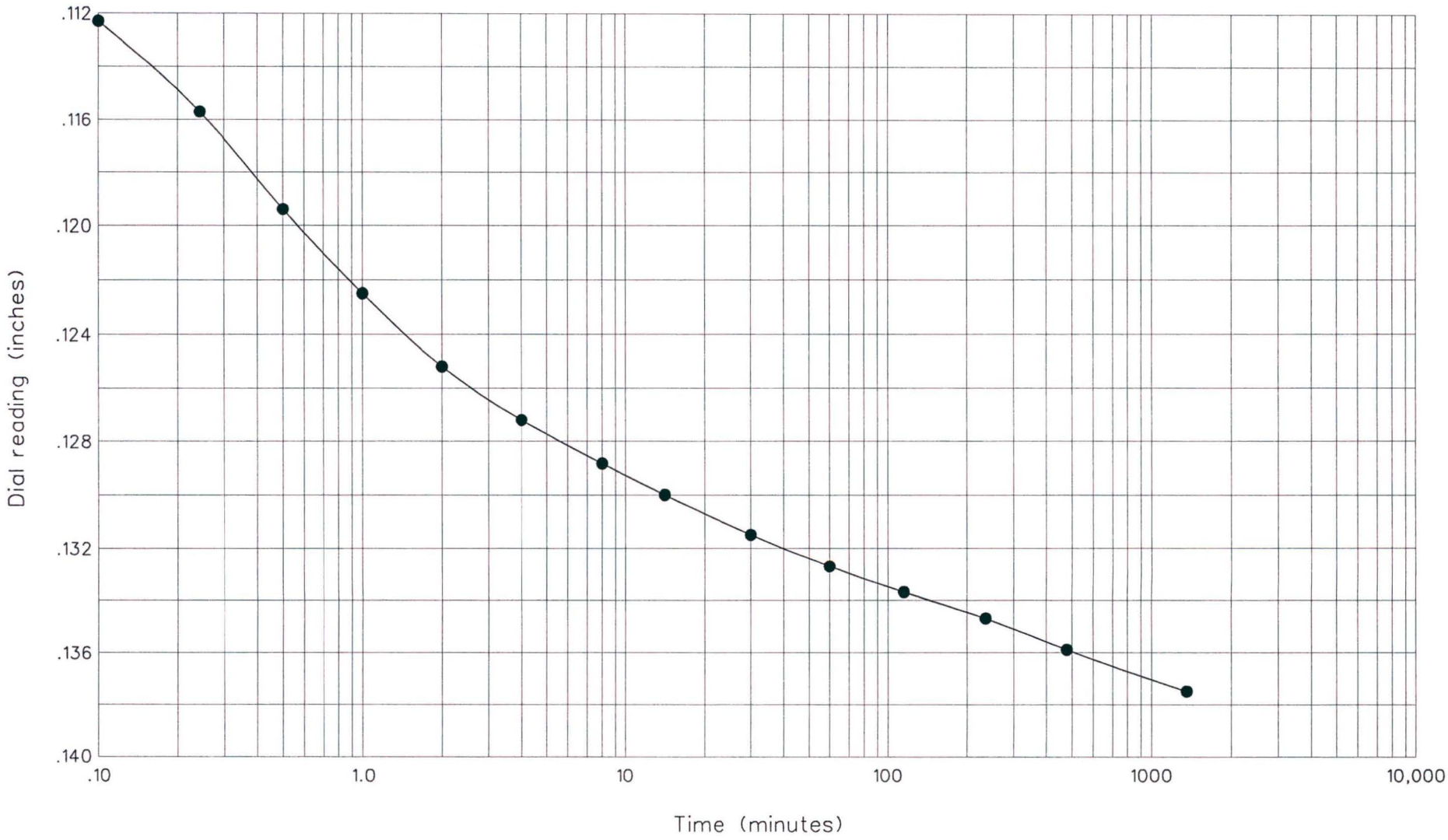
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 110'-111.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



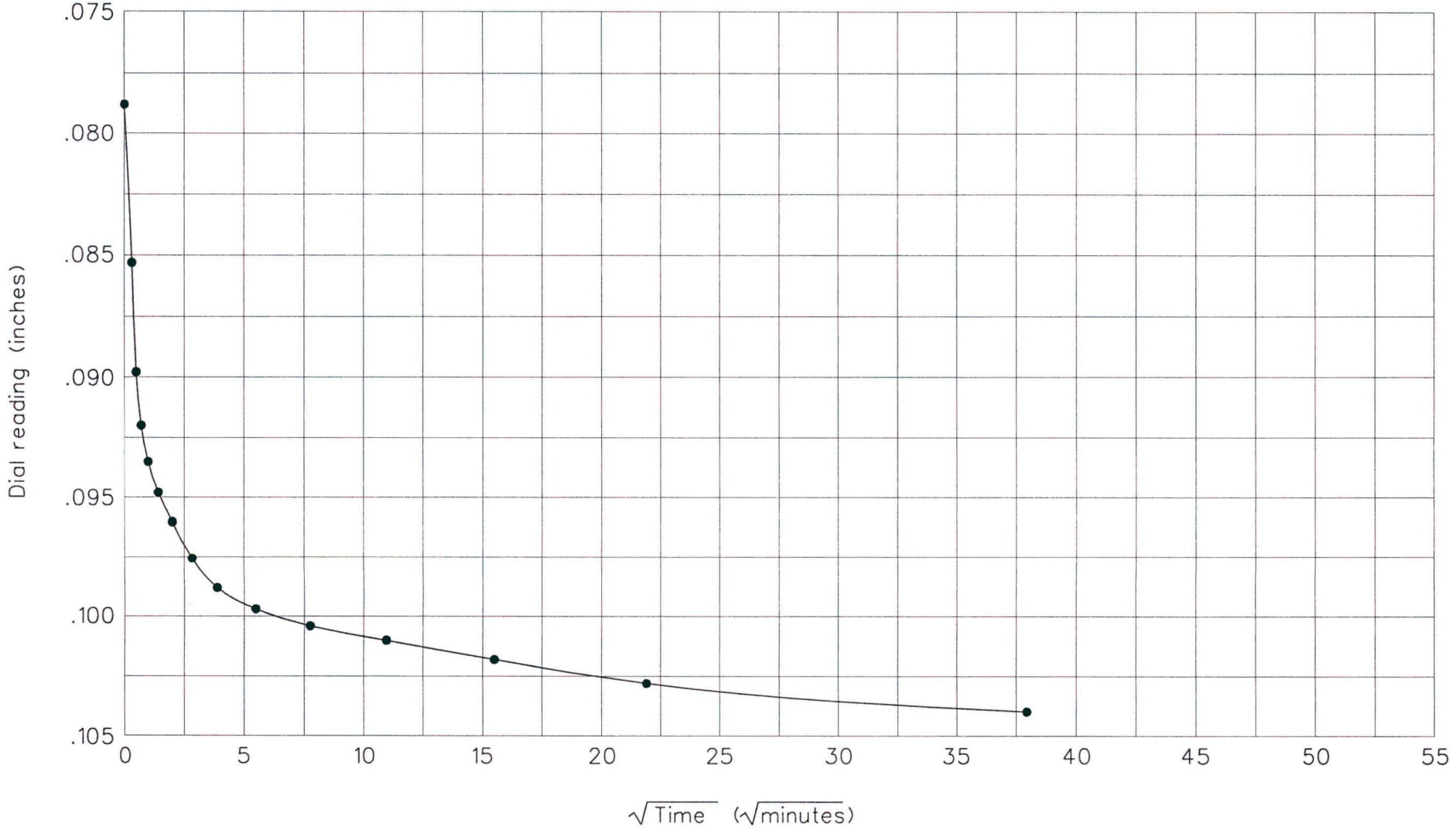
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 110'-111.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



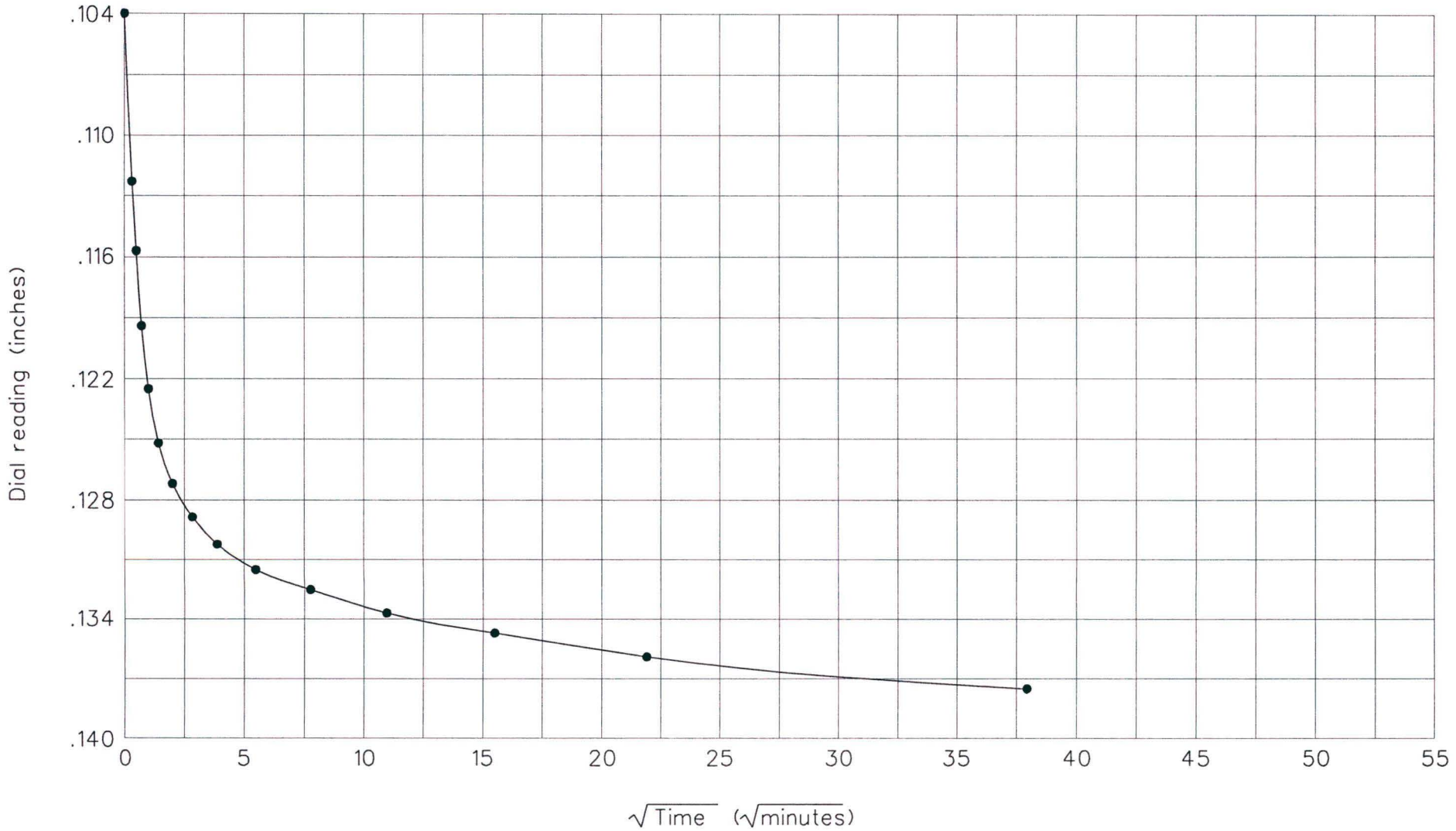
RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 110'-111.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G ENGINEERING, INC.

Hole no.: 08-B3
Depth: 110'-111.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure

Table 1

SUMMARY OF TEST DATA

PROJECT LOCATION: UDOT Vineyard Connector; 800 North to American Fork Bridges West of Geneva Road near Lindon, Utah

PROJECT NO.: 200701-048

FEATURE: Foundations

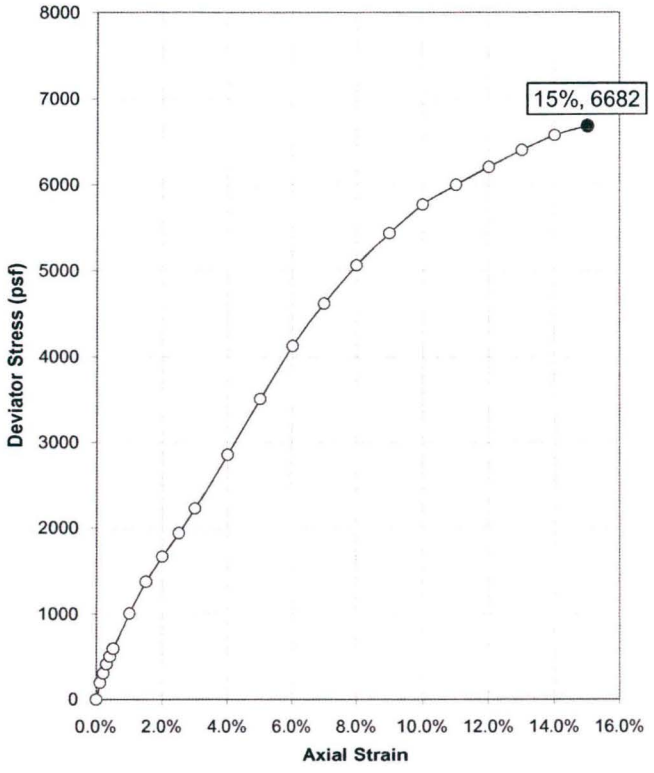
HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	STANDARD PENETRATION BLOWS PER FOOT Corrected (N_1)60	IN-PLACE		UNCONFINED COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO Classification)
			DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
08-B4	5-6.5	Shelby	100.1	23.9		44	21	23	0	3	97	CL (A-7-6(24))
	10-11.5	21		25.0				NP	1	32	67	ML (A-4(0))
	12.5-14	37		22.3				NP	0	75	25	SM (A-2-4(0))
	20-21.5	Shelby	104.5	23.8		31	17	14	0	5	95	CL (A-6(13))
	27.5-29	23		27.9				NP	0	93	7	SP-SM (A-3(0))
	32.5-34	31		24.3		22	21	1	0	28	72	ML (A-4(0))
	35-36.5	Shelby	82.9	37.6		40	22	18	0	0	100	CL (A-6(20))
	45-46.5	Shelby	89.1	34.6		37	21	16	0	2	98	CL (A-6(17))
	55-56.5	Shelby	85.3	38.0		46	23	23	0	0	100	CL (A-7-6(26))
	65-66.5	Shelby	91.9	29.5		37	22	15	0	1	99	CL (A-6(16))
	75-76.5	Shelby	88.1	37.7		40	23	17	0	1	99	CL (A-6(19))
	85-86.5	Shelby		26.0		28	18	10	0	12	88	CL (A-4(7))
	95-96.5	Shelby	100.1	25.8		27	21	6	0	6	94	CL-ML (A-4(5))
	105-106.5	26		22.9				NP	0	82	18	SM (A-2-4(0))
	120-121.5	Shelby	43.0	75.2		44	22	22	0	0	100	CL (A-7-6(25))

NP=Nonplastic

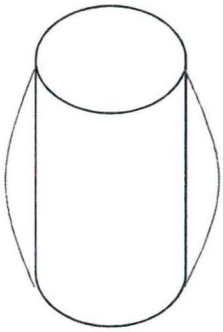
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B4
Project No.	200701-048	**Sample**	
Location	Bridges West of Geneva Road near Lindon, UT	**Depth / Elev. (ft)**	5-6.5
Date	October 20, 2008	**Sample Description**	CL (A-7-6 (24))
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	0	0	
0.1%	196	98	
0.2%	304	152	
0.3%	412	206	
0.4%	502	251	
0.5%	591	295	
1.0%	1006	503	
1.5%	1377	688	
2.0%	1669	834	
2.5%	1940	970	
3.0%	2226	1113	
4.0%	2860	1430	
5.0%	3507	1753	
6.0%	4129	2065	
7.0%	4623	2312	
8.0%	5065	2532	
9.0%	5442	2721	
10.0%	5775	2887	
11.0%	6001	3000	
12.0%	6207	3104	
13.0%	6402	3201	
14.0%	6574	3287	
15.0%	6682	3341	



Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	23.9%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	100.1	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	44		**Initial void ratio**	e_o	0.683	
Plastic index	PI	23		**Saturation**	S	0.94	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	6682	(psf)	**Major principal stress at failure****	σ_1	7257	(psf)
Shear stress at failure**	q_f	3341	(psf)	**Minor principal stress at failure****	σ_3	576	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

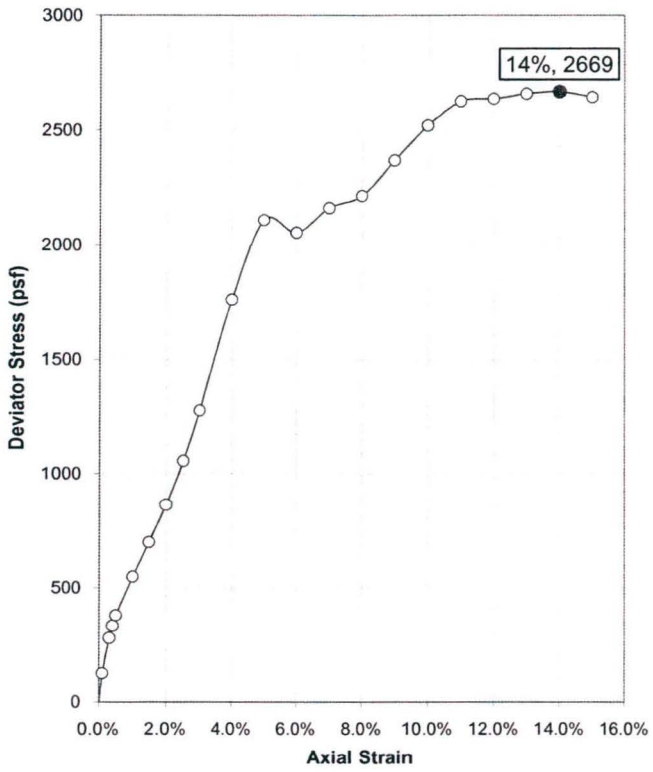
Remarks

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

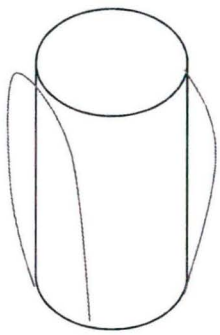
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B4
Project No.	200701-048	**Sample**	
Location	Bridges West of Geneva Road near Lindon, UT	**Depth / Elev. (ft)**	20-21.5
Date	October 20, 2008	**Sample Description**	CL (A-6 (13))
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	0	0	
0.1%	127	63	
0.3%	281	140	
0.4%	334	167	
0.5%	380	190	
1.0%	550	275	
1.5%	701	350	
2.0%	864	432	
2.5%	1057	529	
3.0%	1277	639	
4.0%	1763	881	
5.0%	2110	1055	
6.0%	2054	1027	
7.0%	2163	1081	
8.0%	2215	1108	
9.0%	2368	1184	
10.0%	2521	1261	
11.0%	2628	1314	
12.0%	2638	1319	
13.0%	2660	1330	
14.0%	2669	1334	
15.0%	2645	1323	



Initial Sample Data

Initial height of specimen	L_o	5.1	(in)	**Moisture content***	w	23.8%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	104.5	(pcf)
Height-to-diameter ratio	L_o / D_o	1.97		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	31		**Initial void ratio**	e_o	0.612	
Plastic index	PI	14		**Saturation**	S	1.00	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	2669	(psf)	**Major principal stress at failure****	σ_1	4682	(psf)
Shear stress at failure**	q_f	1334	(psf)	**Minor principal stress at failure****	σ_3	2013	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		14%					

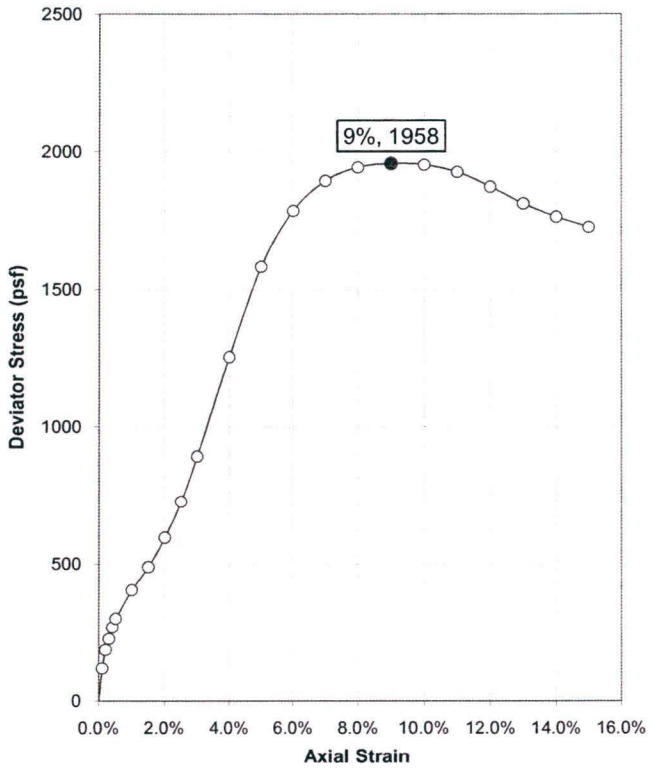
Remarks

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B4
Project No.	200701-048	**Sample**	
Location	Bridges West of Geneva Road near Lindon, UT	**Depth / Elev. (ft)**	35-36.5
Date	October 20, 2008	**Sample Description**	CL (A-6 (20))
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	0	0	
0.1%	119	60	
0.2%	187	93	
0.3%	226	113	
0.4%	269	134	
0.5%	300	150	
1.0%	406	203	
1.5%	489	244	
2.0%	596	298	
2.5%	727	364	
3.0%	892	446	
4.0%	1256	628	
5.0%	1583	792	
6.0%	1788	894	
7.0%	1896	948	
8.0%	1944	972	
9.0%	1958	979	
10.0%	1954	977	
11.0%	1927	964	
12.0%	1875	937	
13.0%	1814	907	
14.0%	1766	883	
15.0%	1728	864	

Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	37.6%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	82.9	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	40		**Initial void ratio**	e_o	1.032	
Plastic index	PI	18		**Saturation**	S	0.98	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	1958	(psf)	**Major principal stress at failure****	σ_1	5554	(psf)
Shear stress at failure**	q_f	979	(psf)	**Minor principal stress at failure****	σ_3	3597	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		9%					

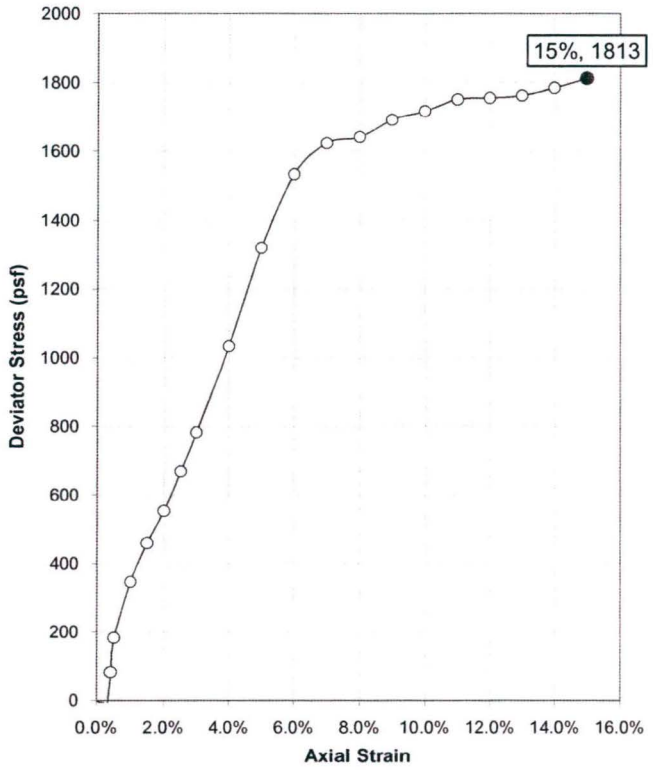
Remarks

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

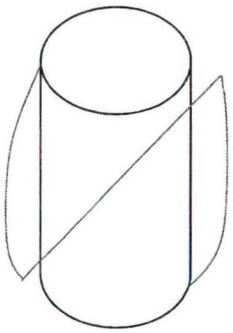
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B4
Project No.	200701-048	**Sample**	
Location	Bridges West of Geneva Road near Lindon, UT	**Depth / Elev. (ft)**	55-56.5'
Date	October 17, 2008	**Sample Description**	CL (A-7-6 (26))
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	-1	0	
0.1%	-5	-3	
0.2%	-6	-3	
0.3%	-11	-6	
0.4%	83	41	
0.5%	183	92	
1.0%	347	174	
1.5%	460	230	
2.0%	553	276	
2.5%	670	335	
3.0%	782	391	
4.0%	1035	517	
5.0%	1320	660	
6.0%	1534	767	
7.0%	1624	812	
8.0%	1642	821	
9.0%	1692	846	
10.0%	1718	859	
11.0%	1752	876	
12.0%	1756	878	
13.0%	1763	882	
14.0%	1785	893	
15.0%	1813	906	



Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	38.0%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	85.3	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	46		**Initial void ratio**	e_o	0.975	
Plastic index	PI	23		**Saturation**	S	1.00	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	1813	(psf)	**Major principal stress at failure****	σ_1	7427	(psf)
Shear stress at failure**	q_f	906	(psf)	**Minor principal stress at failure****	σ_3	5615	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

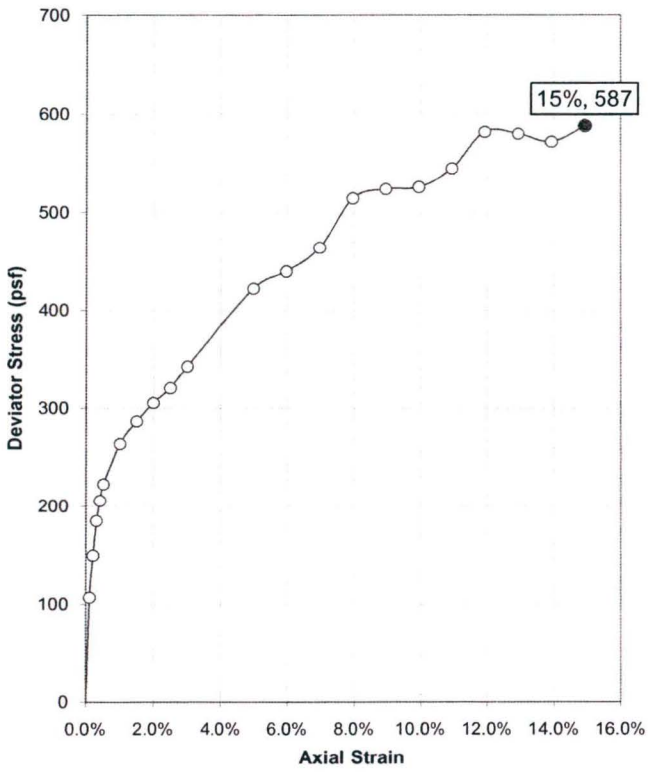
Remarks

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

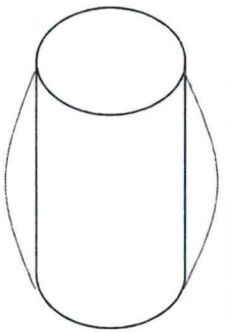
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	Vineyard Connector	**Boring No.**	08-B4
Project No.	200701-048	**Sample**	
Location	Bridges West of Geneva Road near Lindon, UT	**Depth / Elev. (ft)**	75-76.5'
Date	October 17, 2008	**Sample Description**	CL (A-6 (19))
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q σ_d / 2 (psi)	Sketch of Specimen After Failure
0.0%	-1	-1	
0.1%	107	54	
0.2%	150	75	
0.3%	185	93	
0.4%	206	103	
0.5%	223	111	
1.0%	264	132	
1.5%	287	143	
2.0%	306	153	
2.5%	321	160	
3.0%	343	172	
5.0%	422	211	
6.0%	440	220	
7.0%	464	232	
8.0%	514	257	
9.0%	524	262	
9.9%	526	263	
10.9%	544	272	
11.9%	581	291	
12.9%	579	290	
13.9%	571	286	
14.9%	587	294	



Initial Sample Data

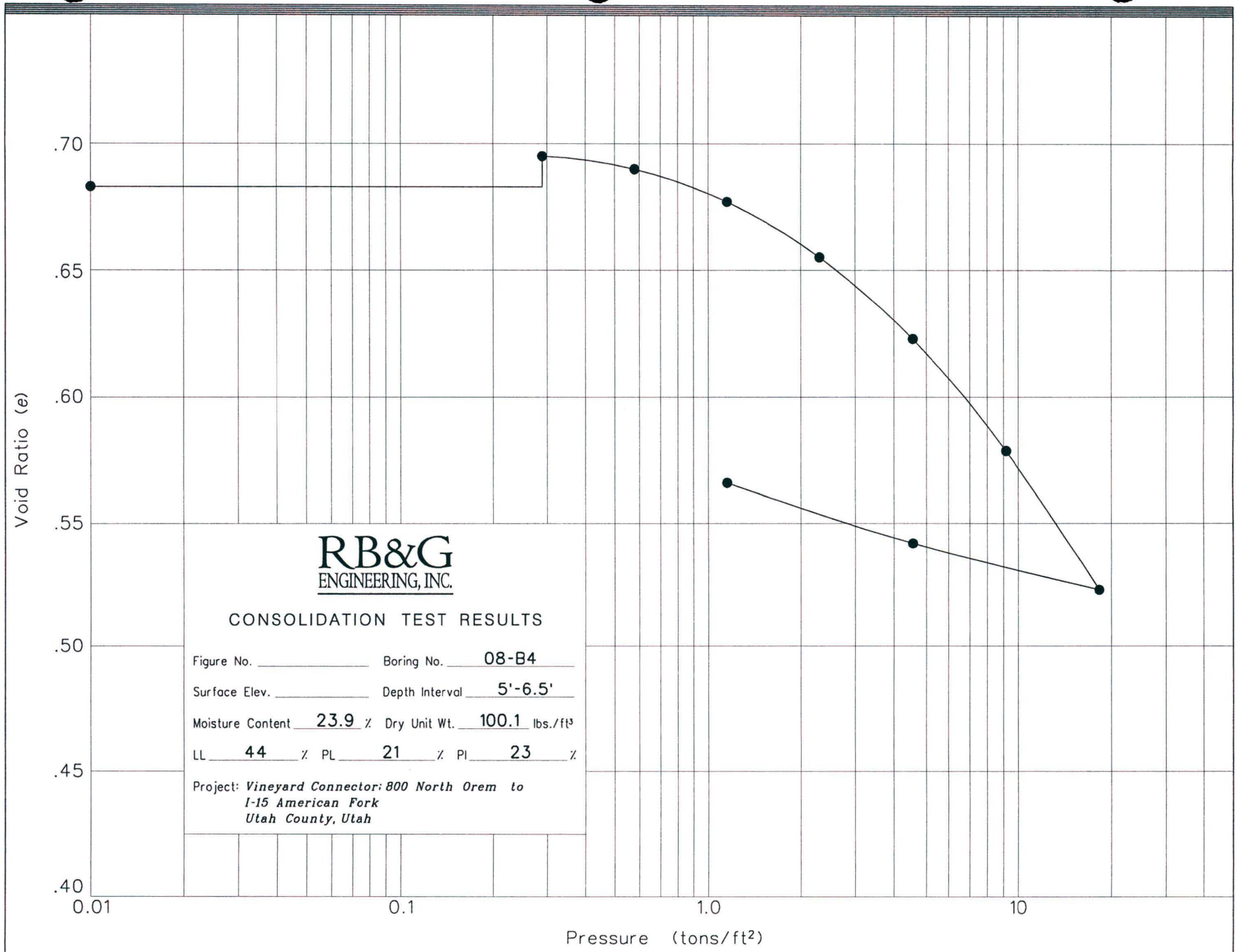
Initial height of specimen	L_o	5.1	(in)	**Moisture content***	w	37.7%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	79.4	(pcf)
Height-to-diameter ratio	L_o / D_o	1.97		**Specific gravity of soil solids**	G_s	2.7	*[Estimated value]*
Liquid limit	LL	40		**Initial void ratio**	e_o	1.122	
Plastic index	PI	17		**Saturation**	S	0.91	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	587	(psf)	**Major principal stress at failure****	σ_1	8216	(psf)
Shear stress at failure**	q_f	294	(psf)	**Minor principal stress at failure****	σ_3	7629	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

Remarks Section of sample used for UU test was much softer than the section used for the consolidation test.

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

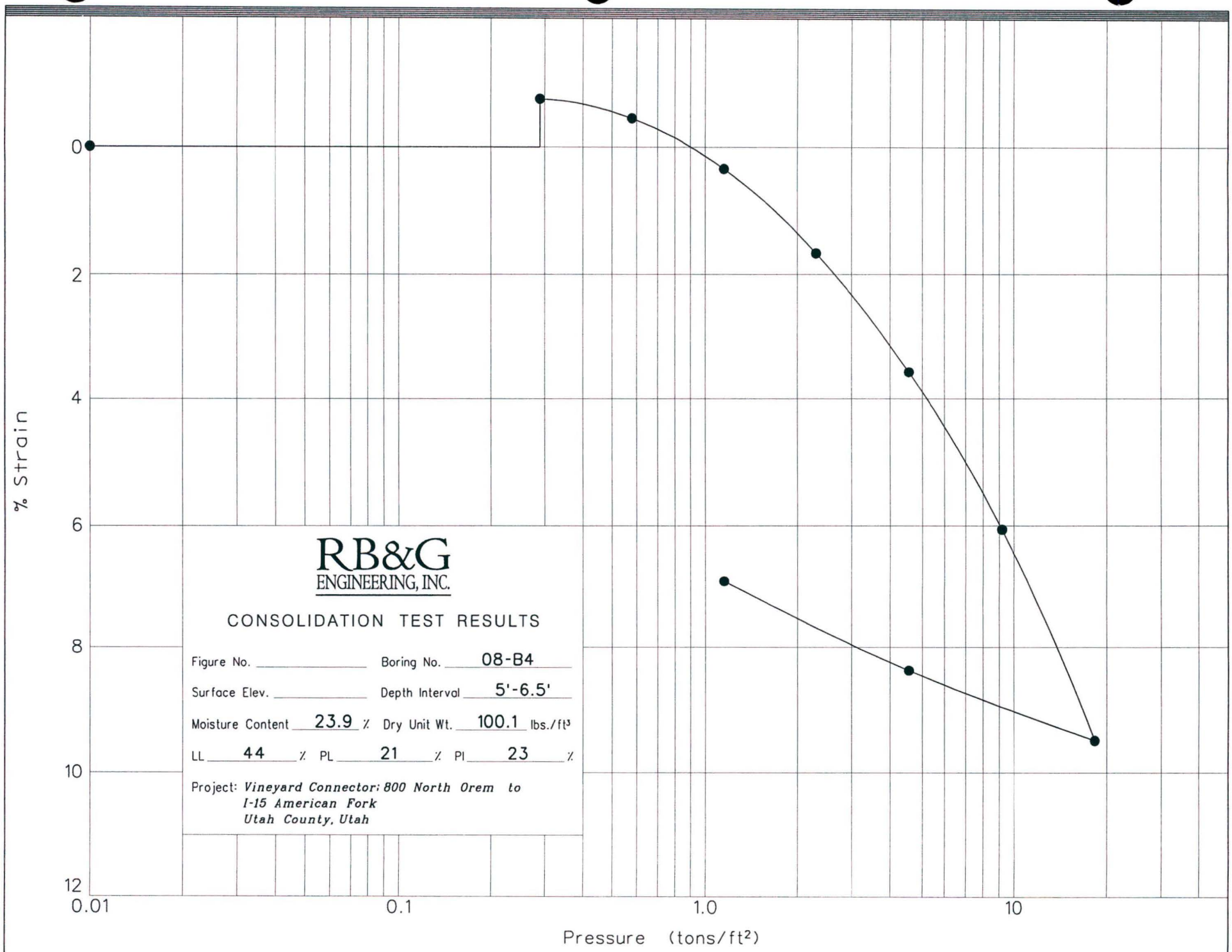
Figure No. _____ Boring No. 08-B4

Surface Elev. _____ Depth Interval 5'-6.5'

Moisture Content 23.9 % Dry Unit Wt. 100.1 lbs./ft³

LL 44 % PL 21 % PI 23 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork*
Utah County, Utah



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

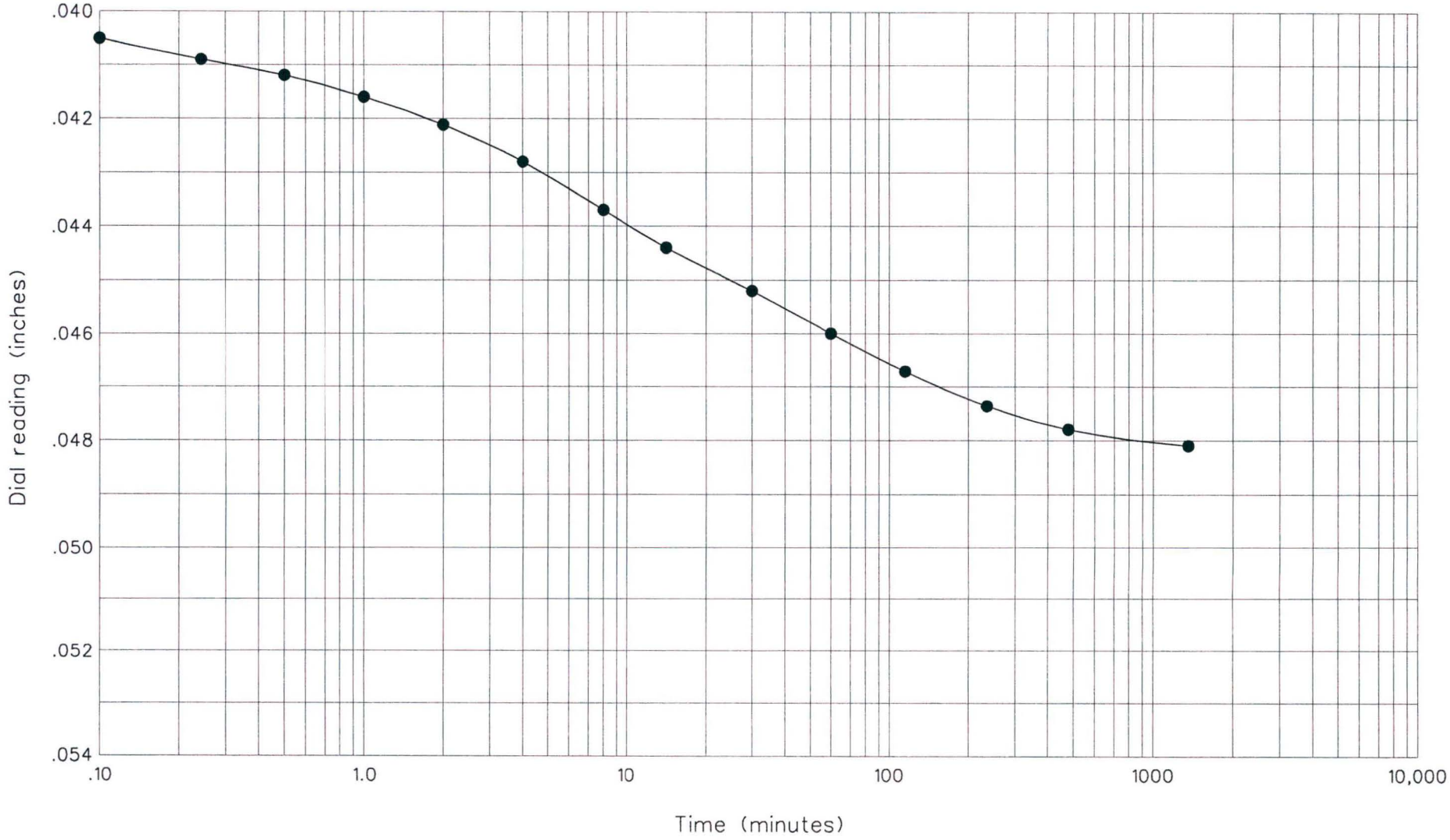
Figure No. _____ Boring No. 08-B4

Surface Elev. _____ Depth Interval 5'-6.5'

Moisture Content 23.9 % Dry Unit Wt. 100.1 lbs./ft³

LL 44 % PL 21 % PI 23 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*



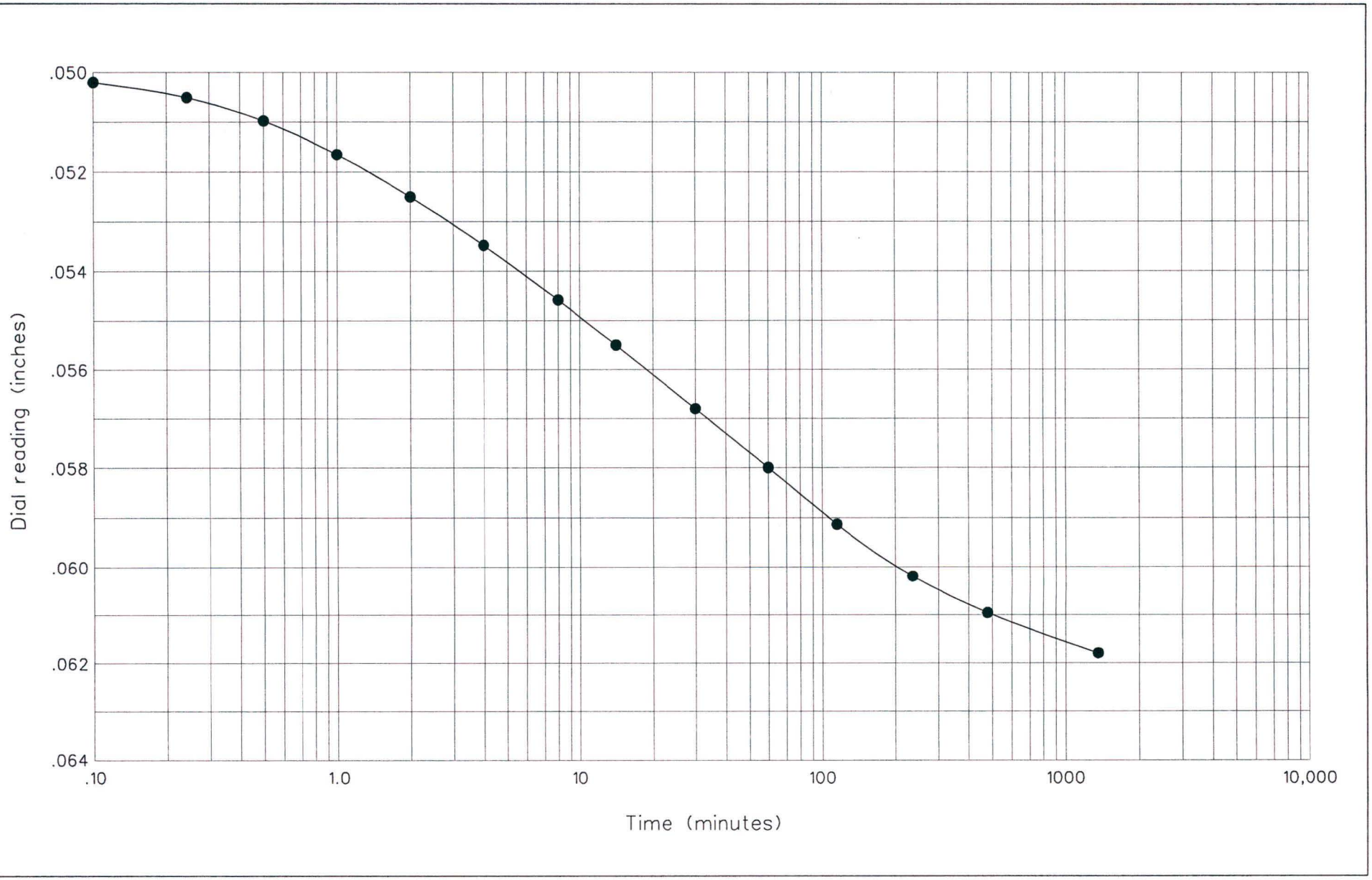
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 5'-6.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



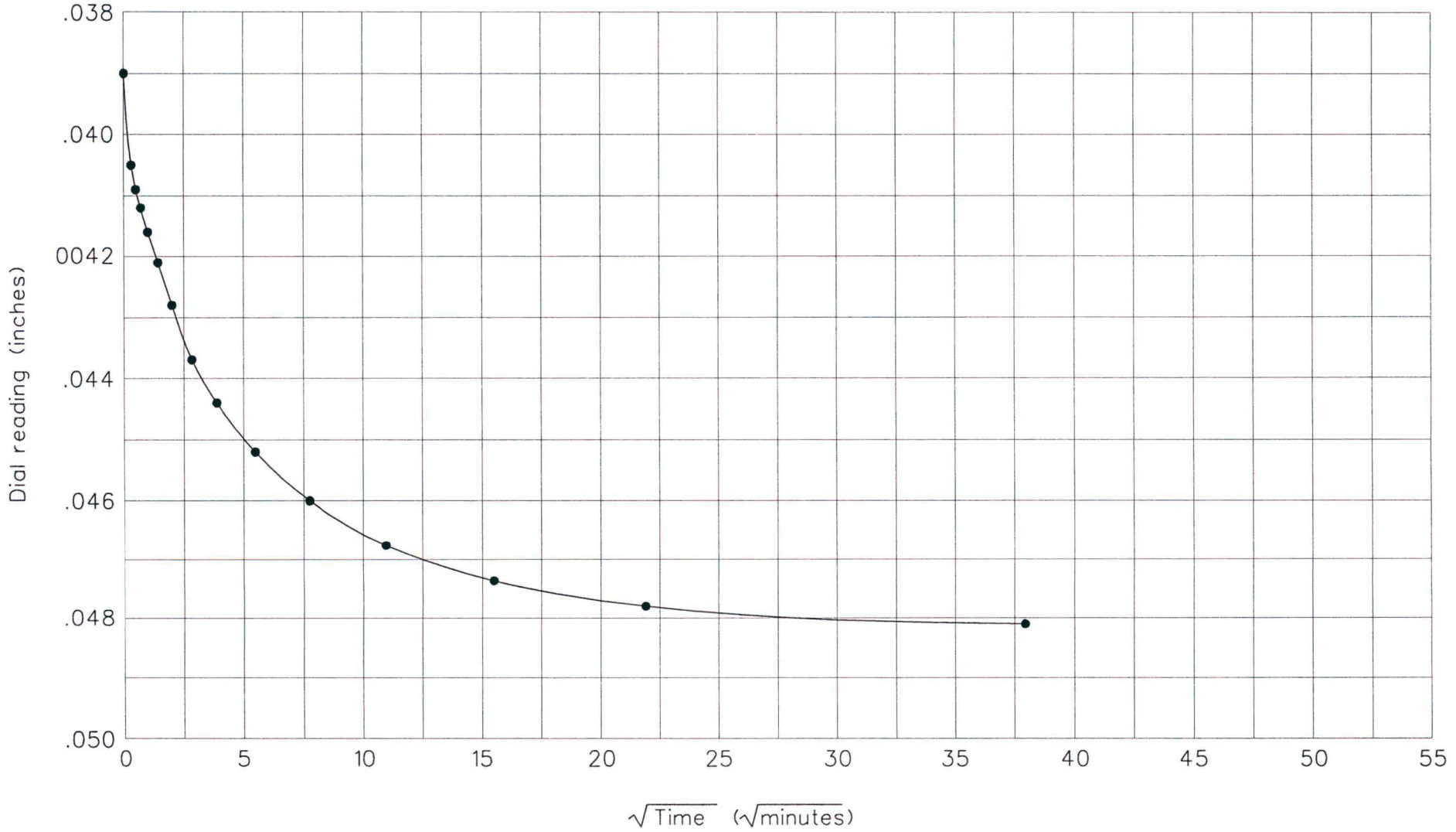
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 5'-6.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



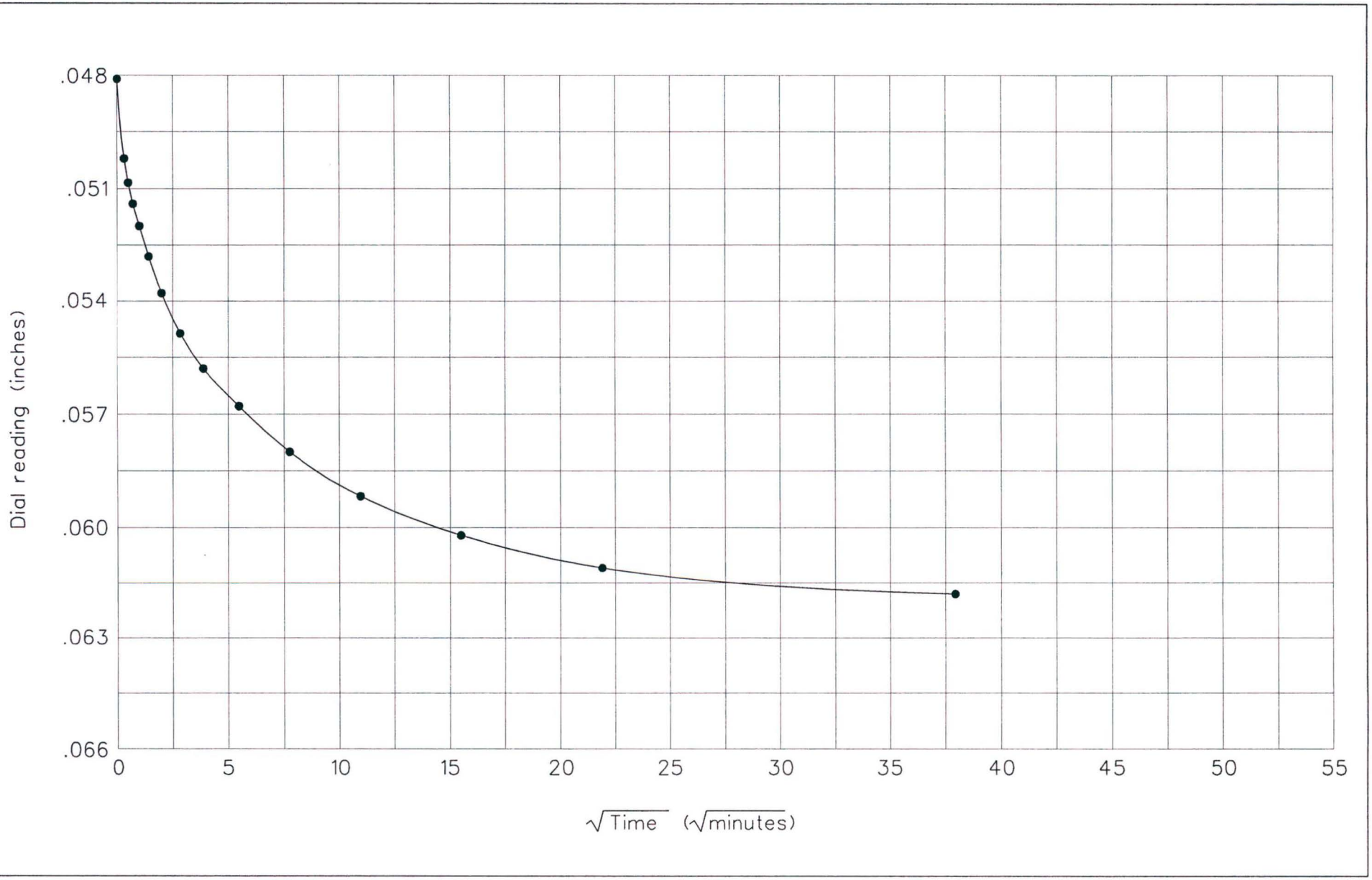
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 5'-6.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



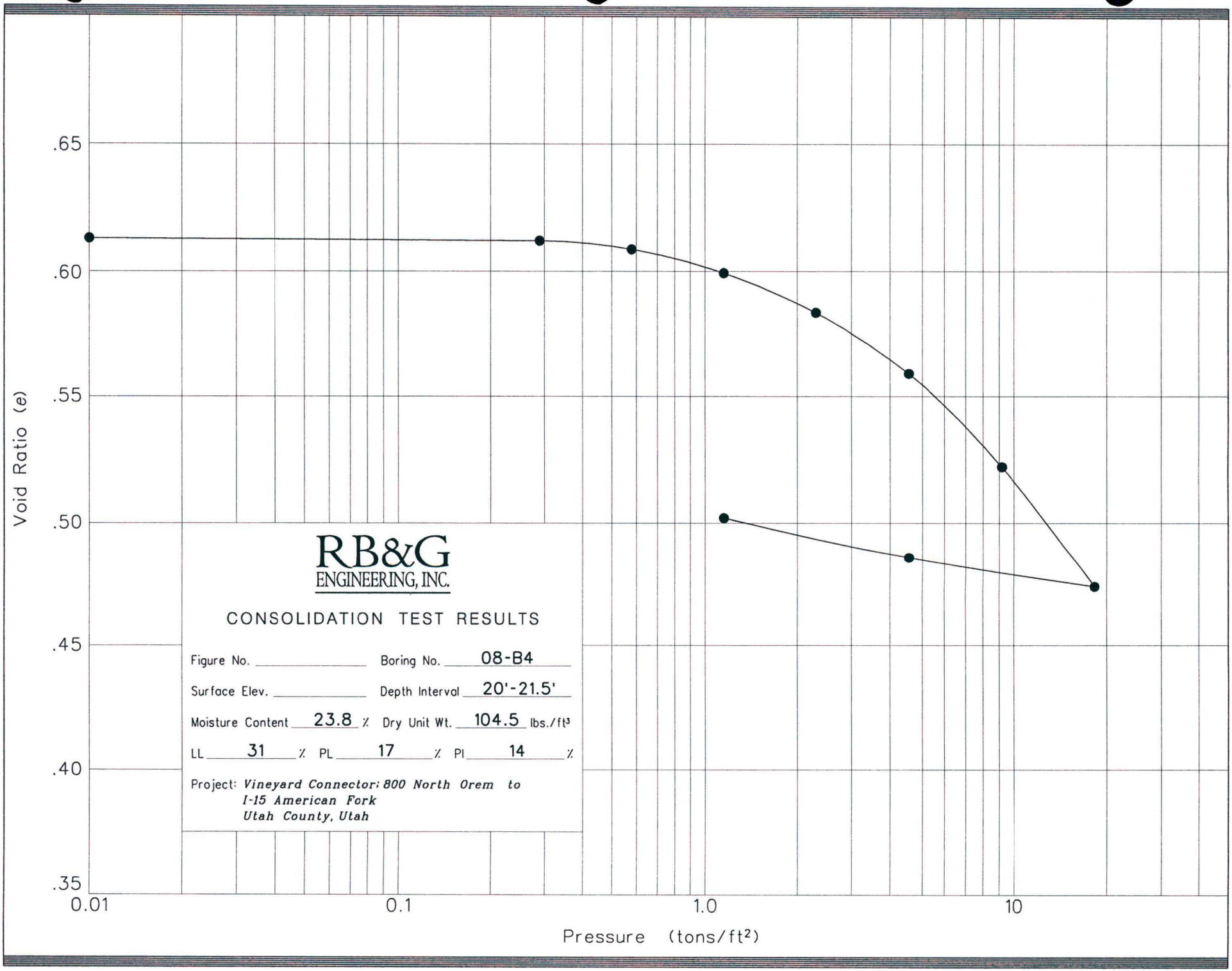
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 5'-6.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

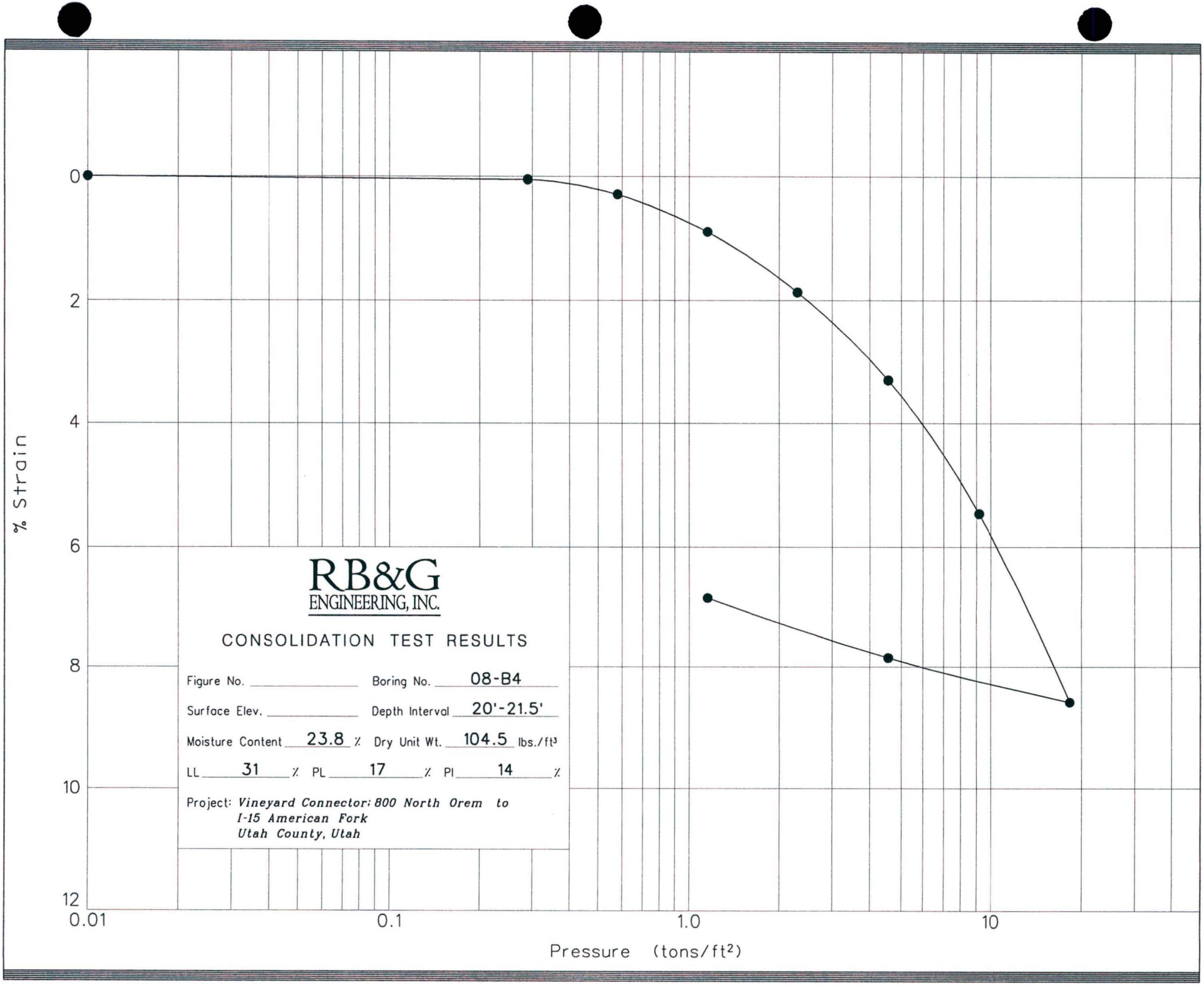
Figure No. _____ Boring No. 08-B4

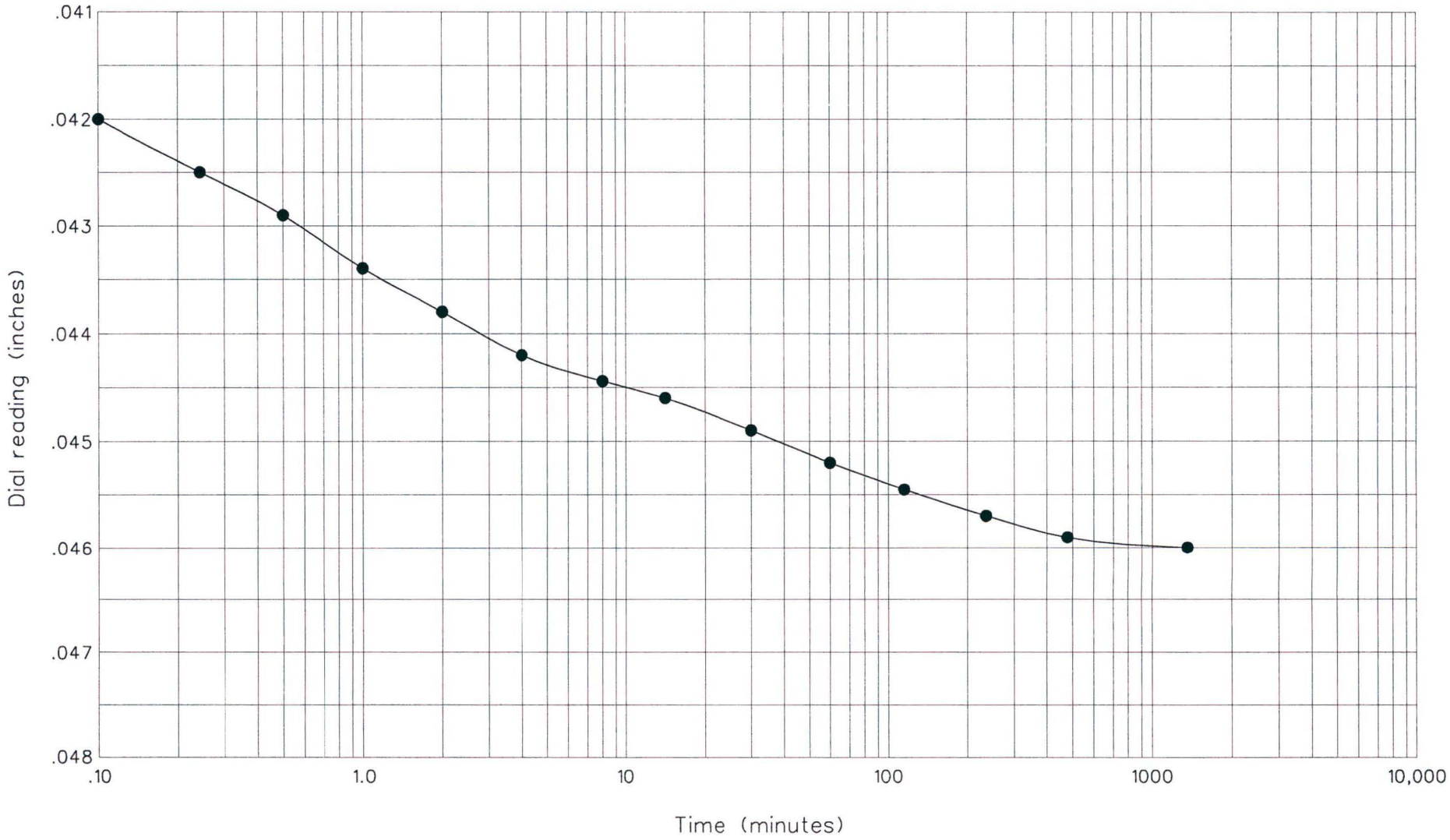
Surface Elev. _____ Depth Interval 20'-21.5'

Moisture Content 23.8 % Dry Unit Wt. 104.5 lbs./ft³

LL 31 % PL 17 % PI 14 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*


0
2
4
6
8
10
12
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B4
Surface Elev. _____ Depth Interval 20'-21.5'
Moisture Content 23.8 % Dry Unit Wt. 104.5 lbs./ft³
LL 31 % PL 17 % PI 14 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah



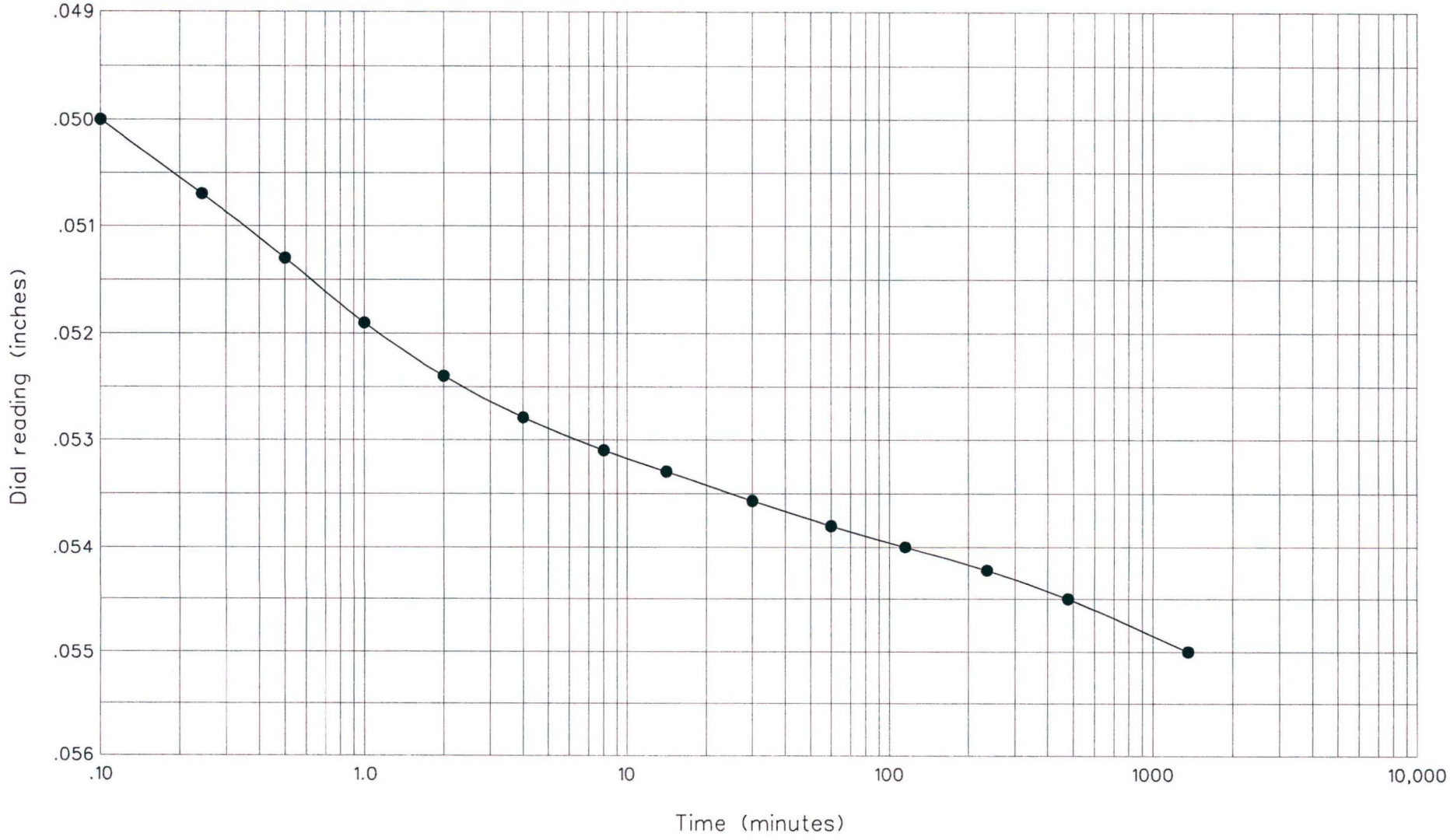
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 20'-21.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



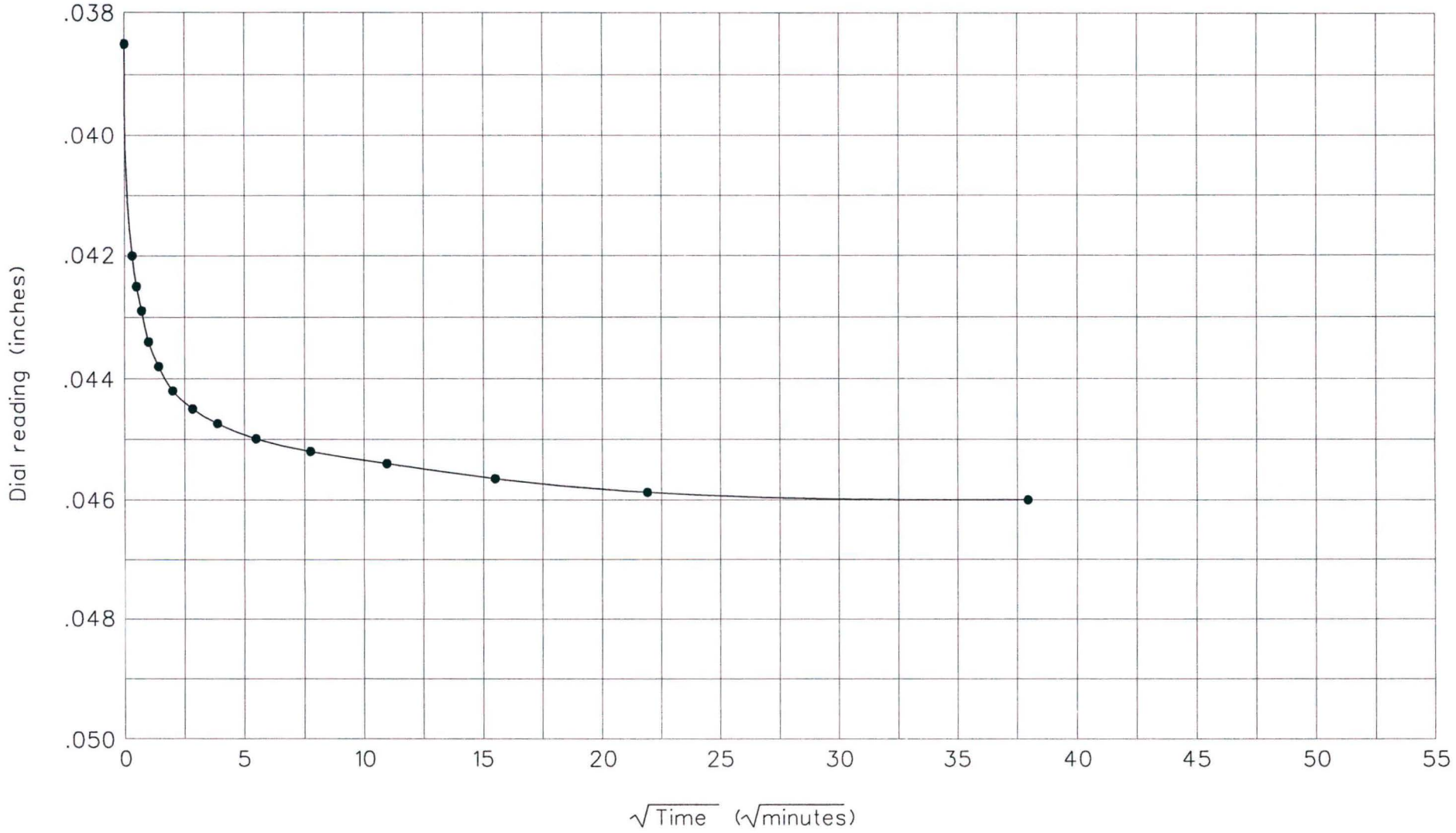
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 20'-21.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



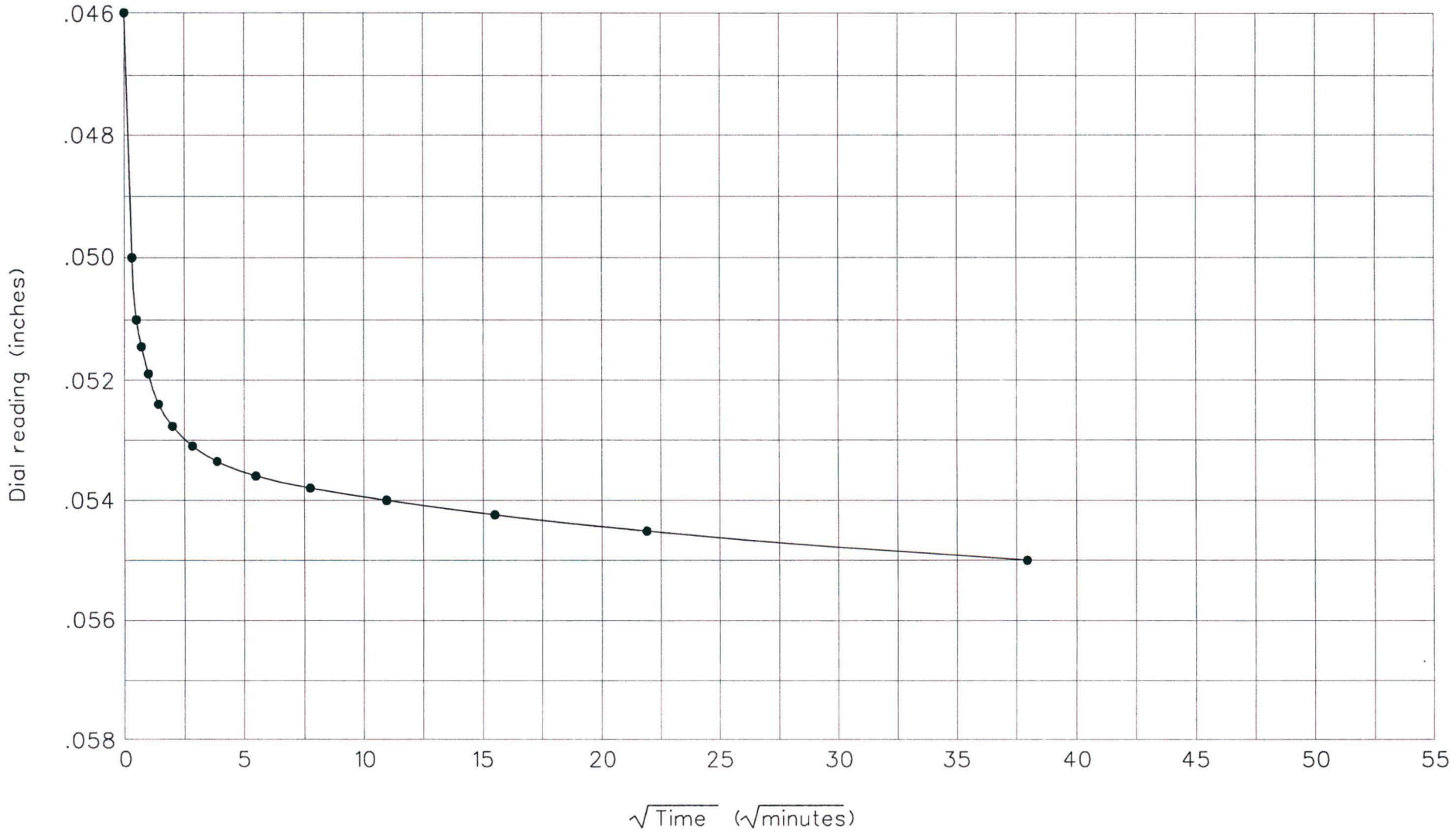
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 20'-21.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



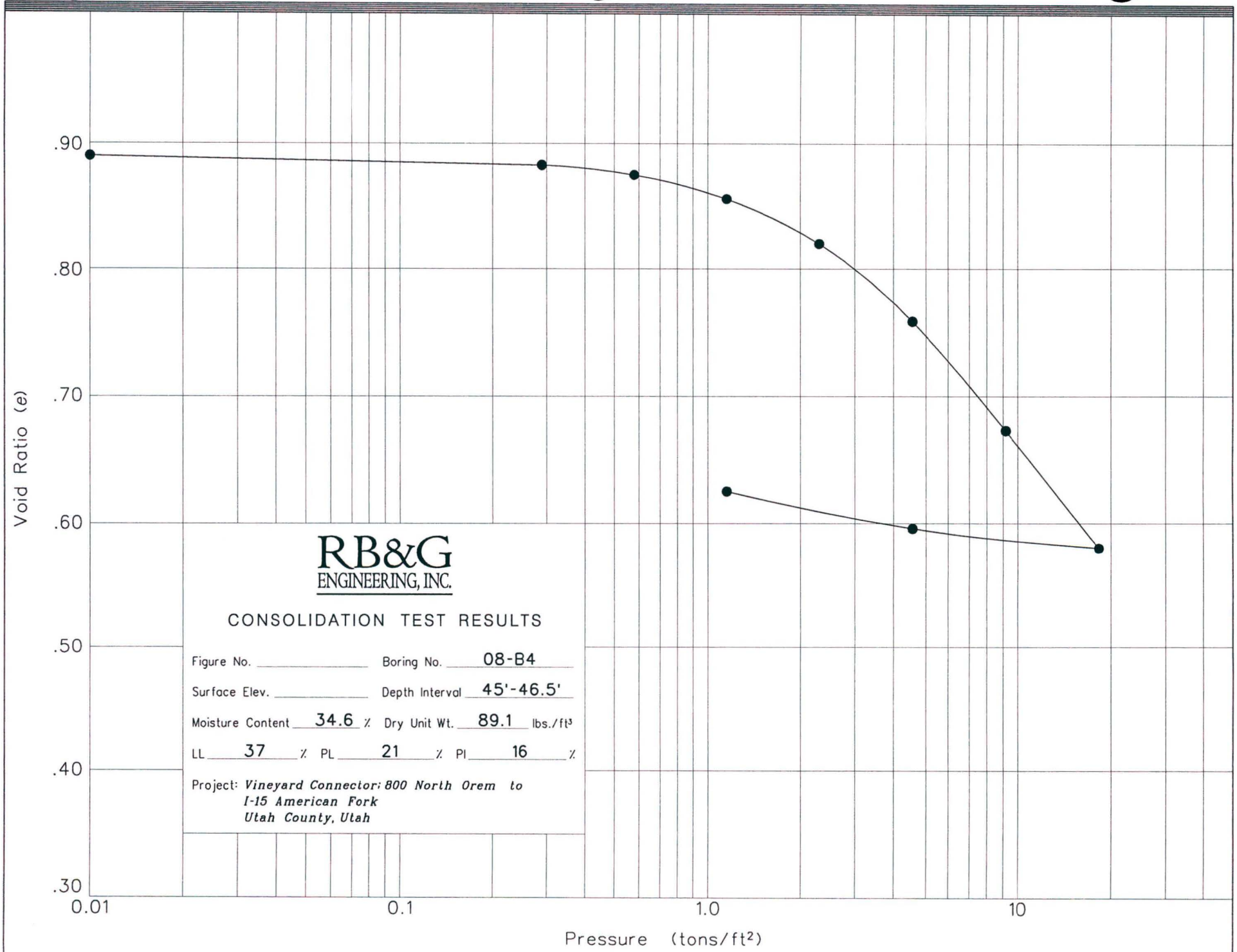
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 20'-21.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

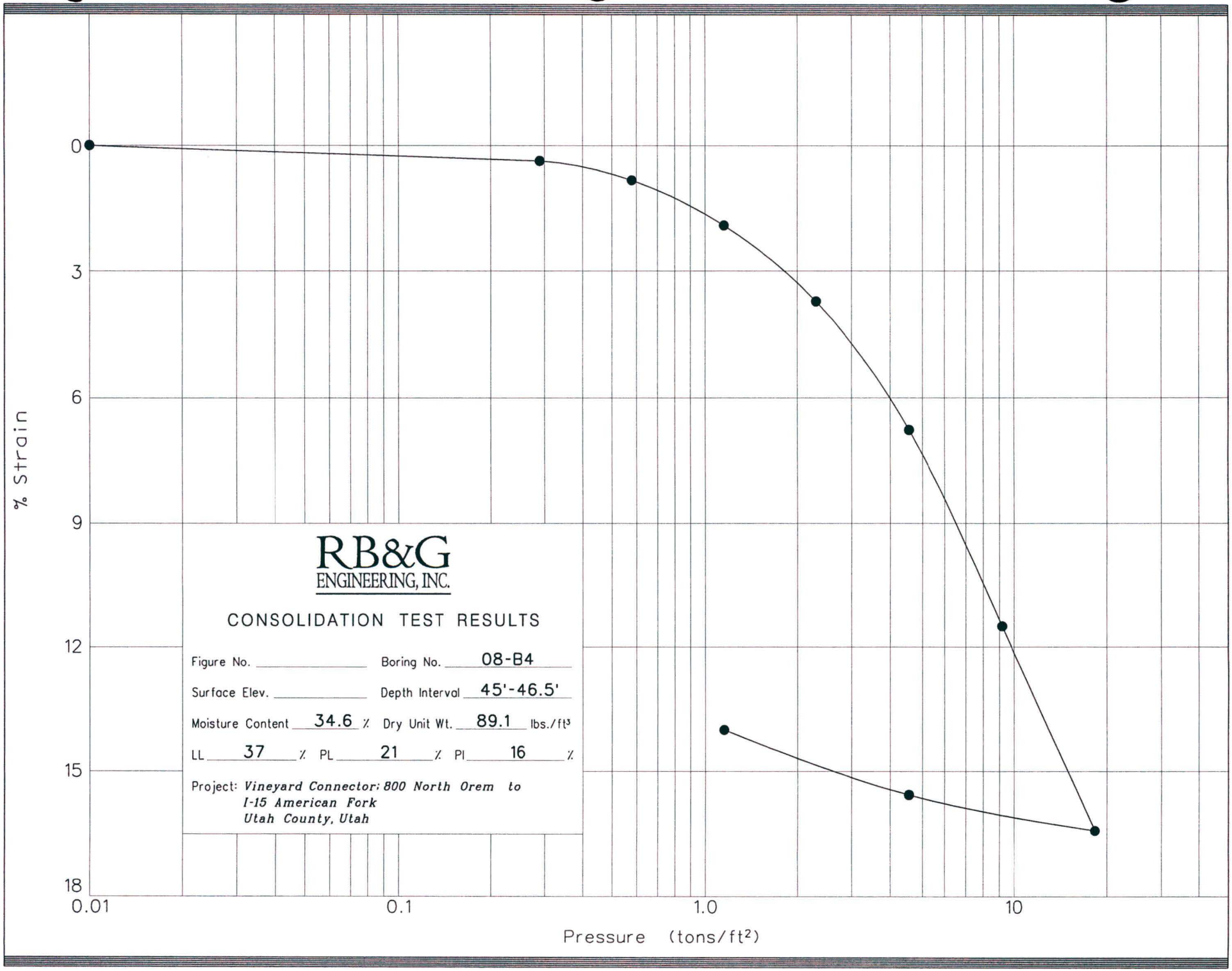
Figure No. _____ Boring No. 08-B4

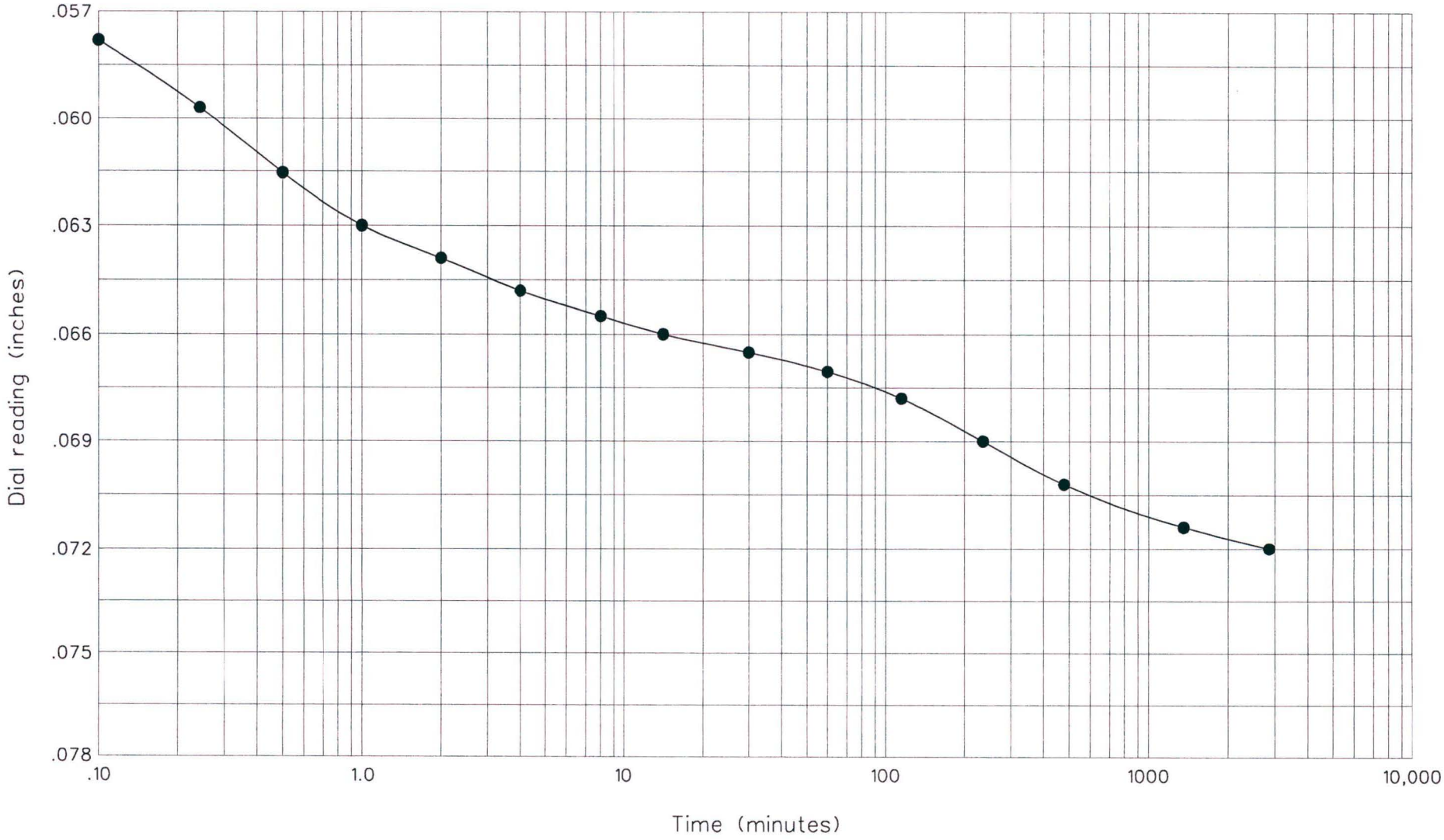
Surface Elev. _____ Depth Interval 45'-46.5'

Moisture Content 34.6 % Dry Unit Wt. 89.1 lbs./ft³

LL 37 % PL 21 % PI 16 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B4
Surface Elev. _____ Depth Interval 45'-46.5'
Moisture Content 34.6 % Dry Unit Wt. 89.1 lbs./ft³
LL 37 % PL 21 % PI 16 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah



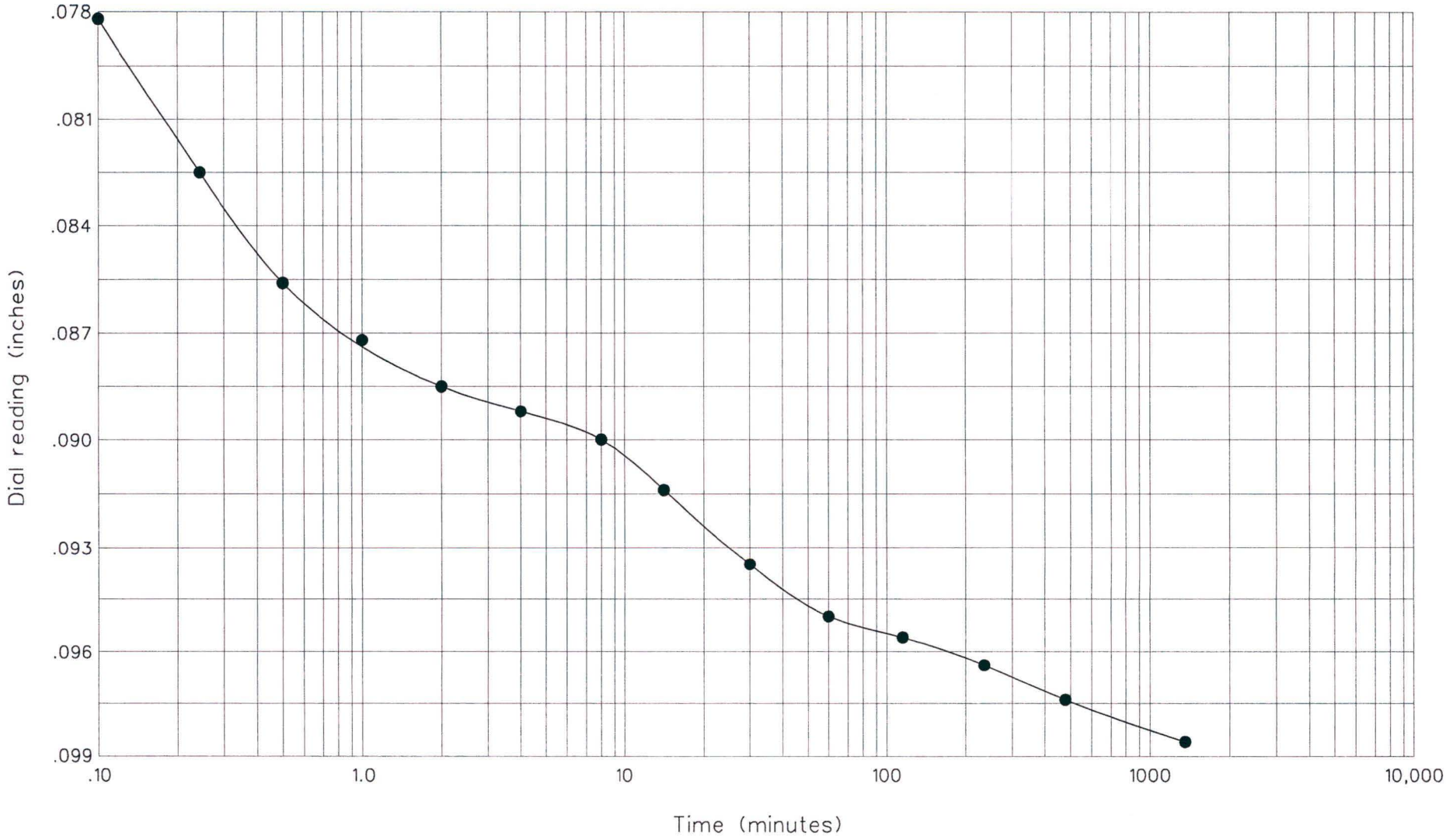
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 45'-46.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



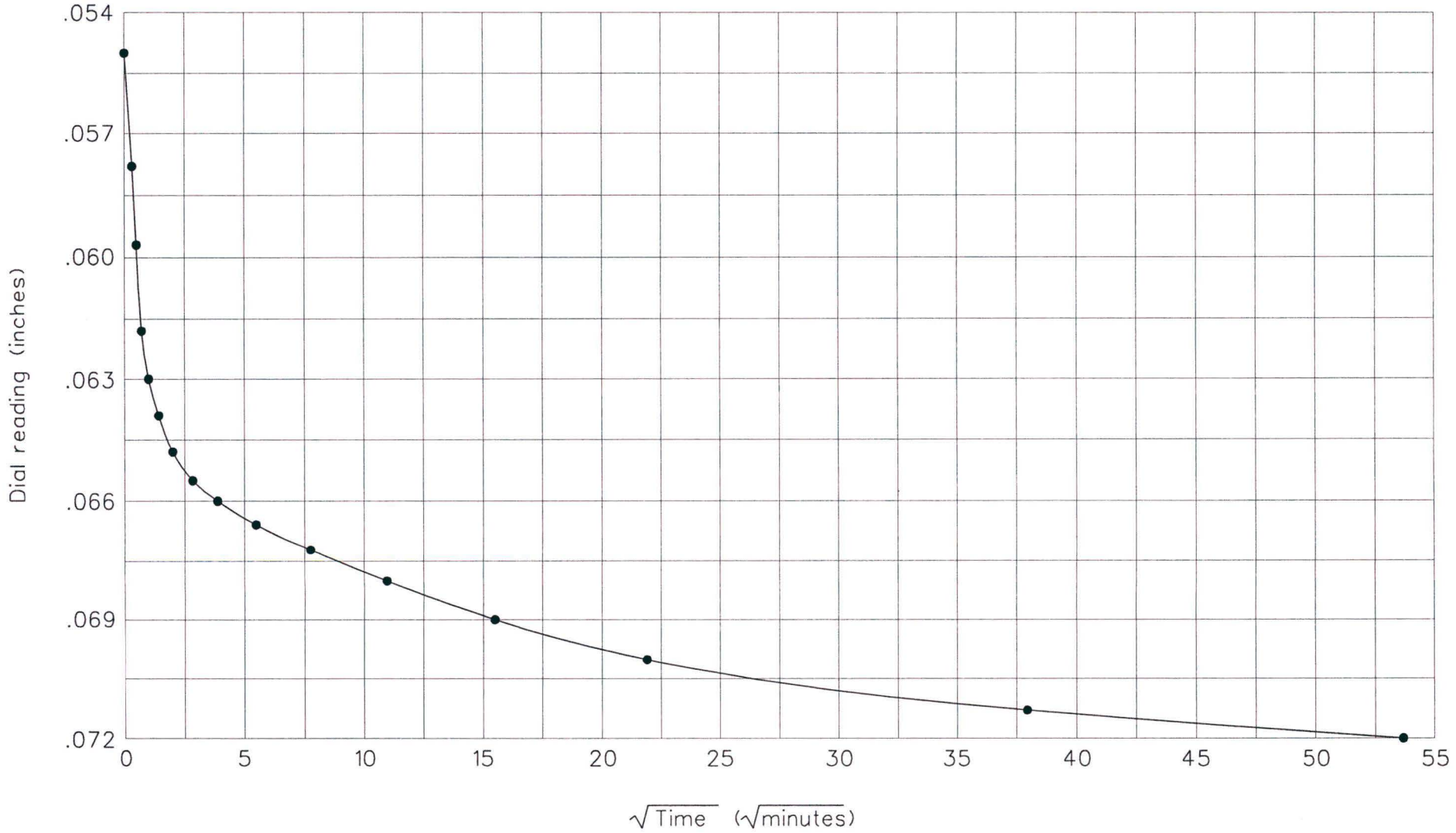
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 45'-46.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



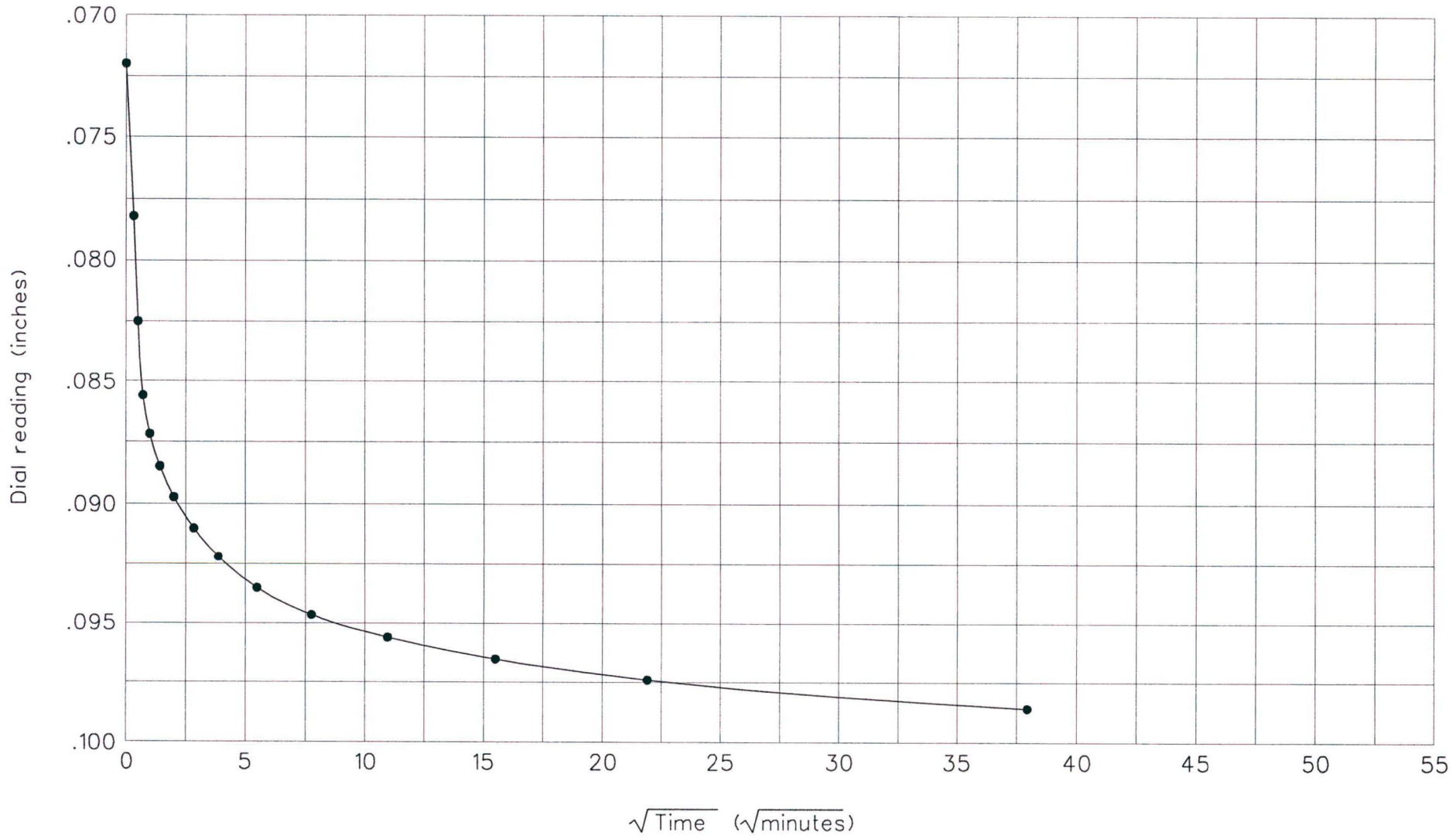
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 45'-46.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



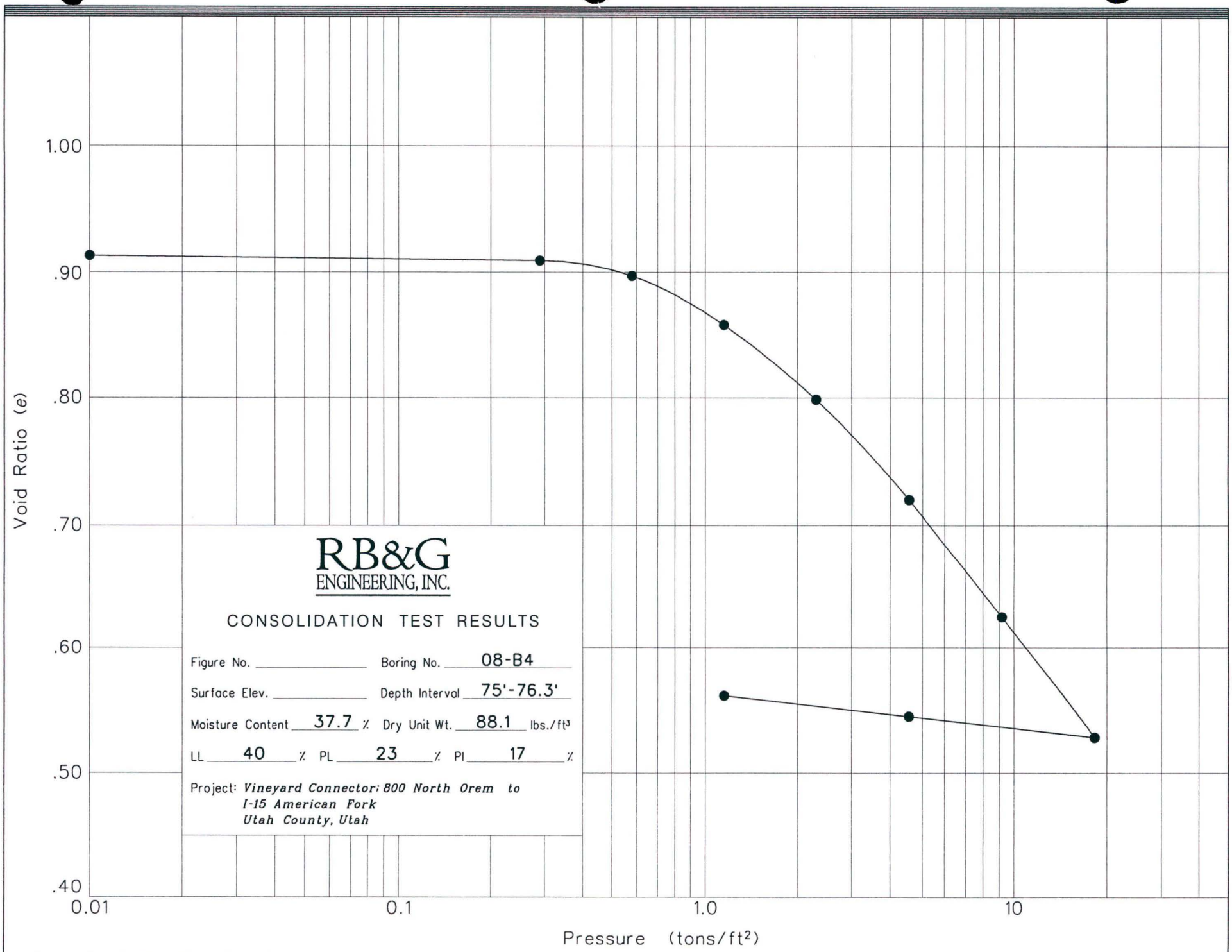
RB&G ENGINEERING, INC.

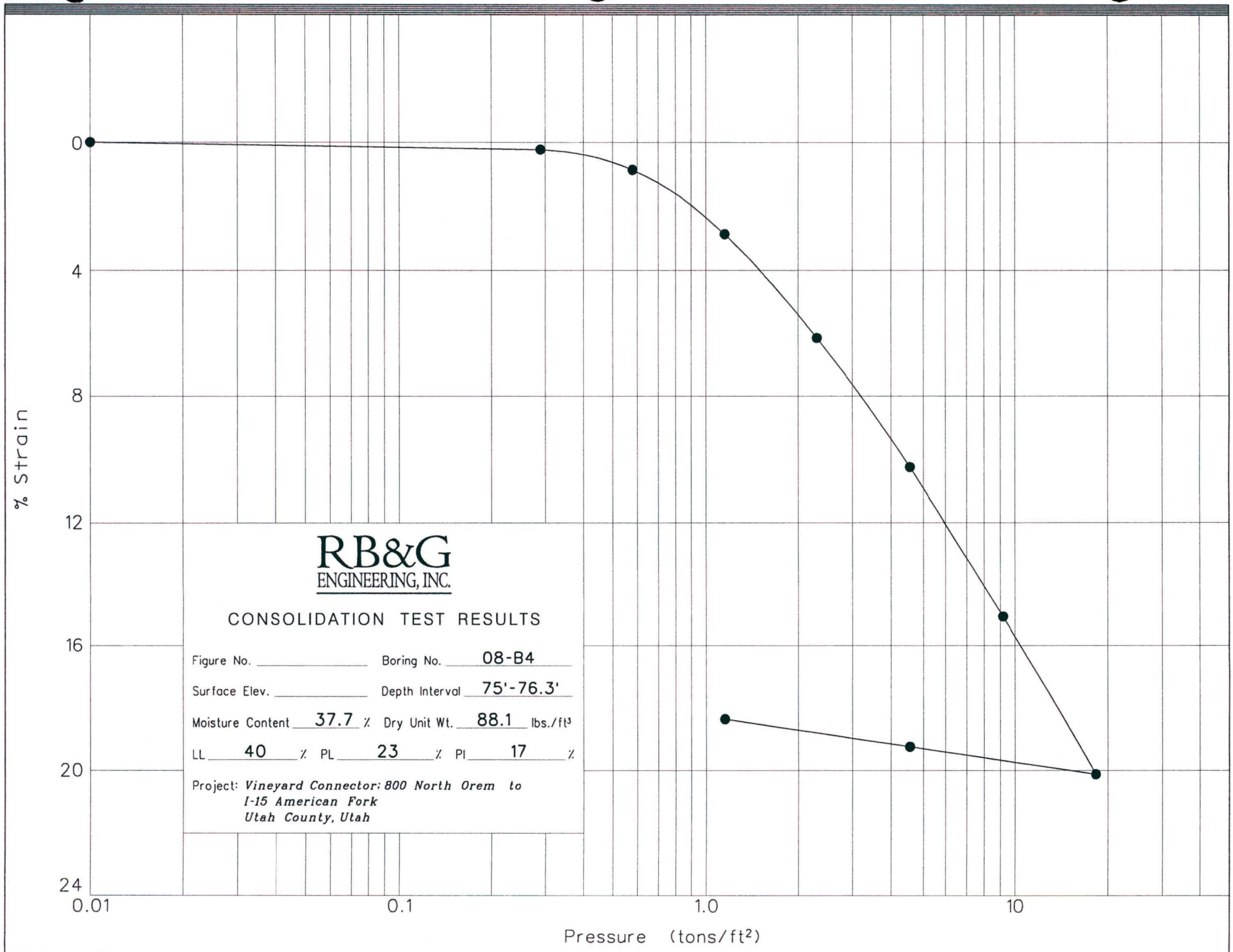
Hole no.: 08-B4
Depth: 45'-46.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure


1.00
.90
.80
.70
.60
.50
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-B4
Surface Elev. _____ Depth Interval 75'-76.3'
Moisture Content 37.7 % Dry Unit Wt. 88.1 lbs./ft³
LL 40 % PL 23 % PI 17 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

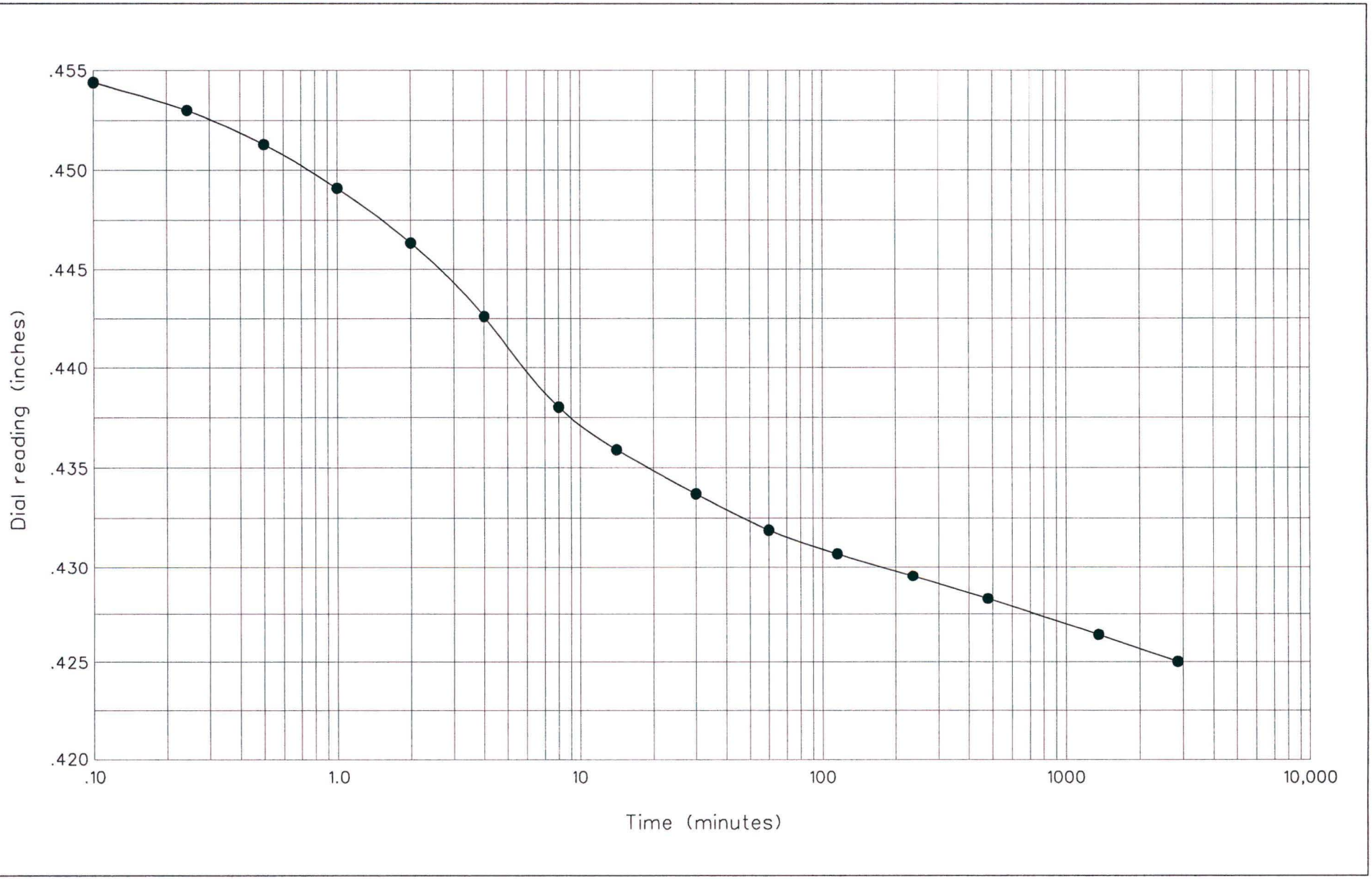
Figure No. _____ Boring No. 08-B4

Surface Elev. _____ Depth Interval 75'-76.3'

Moisture Content 37.7 % Dry Unit Wt. 88.1 lbs./ft³

LL 40 % PL 23 % PI 17 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*



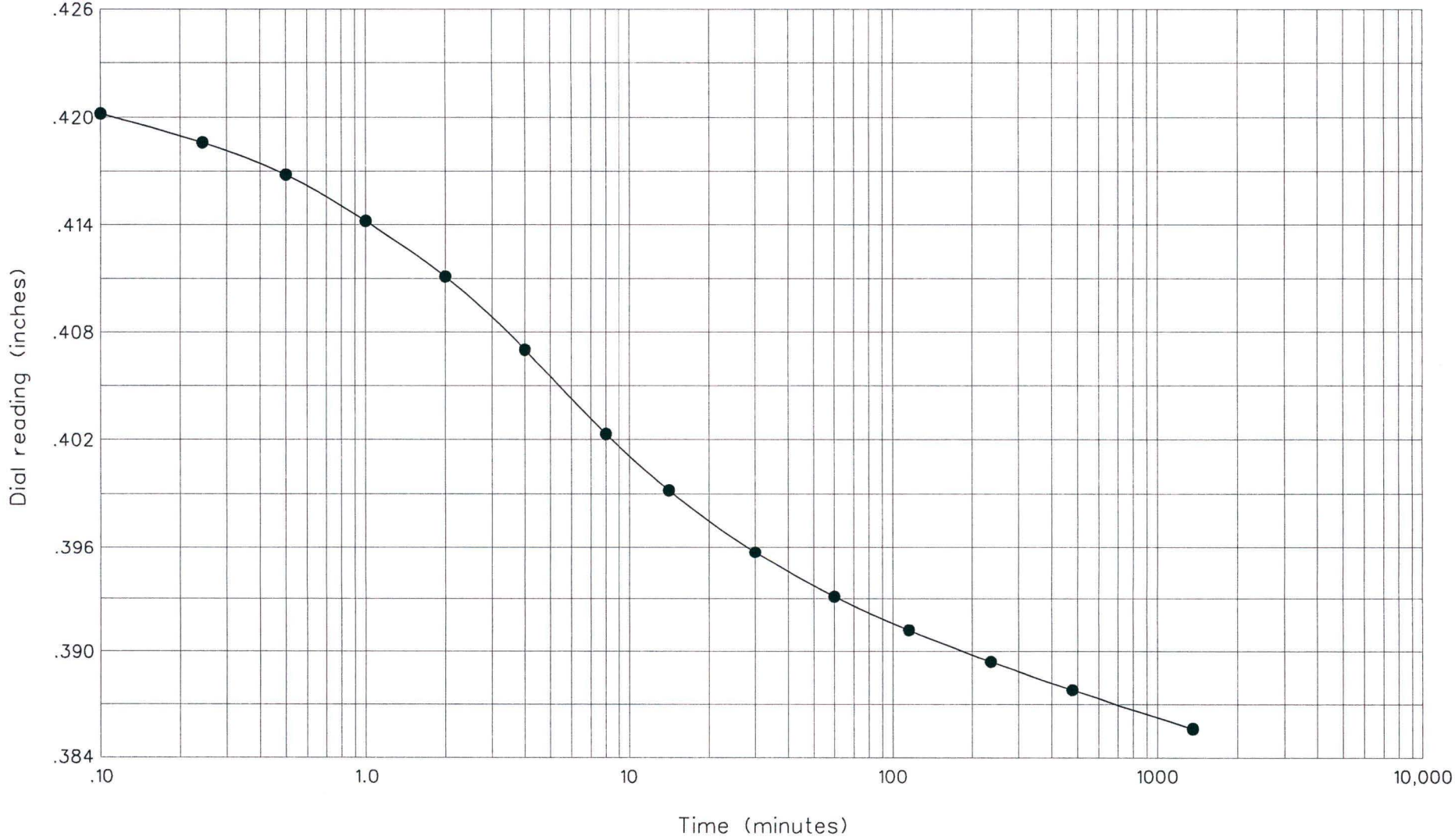
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 75'-76.3'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



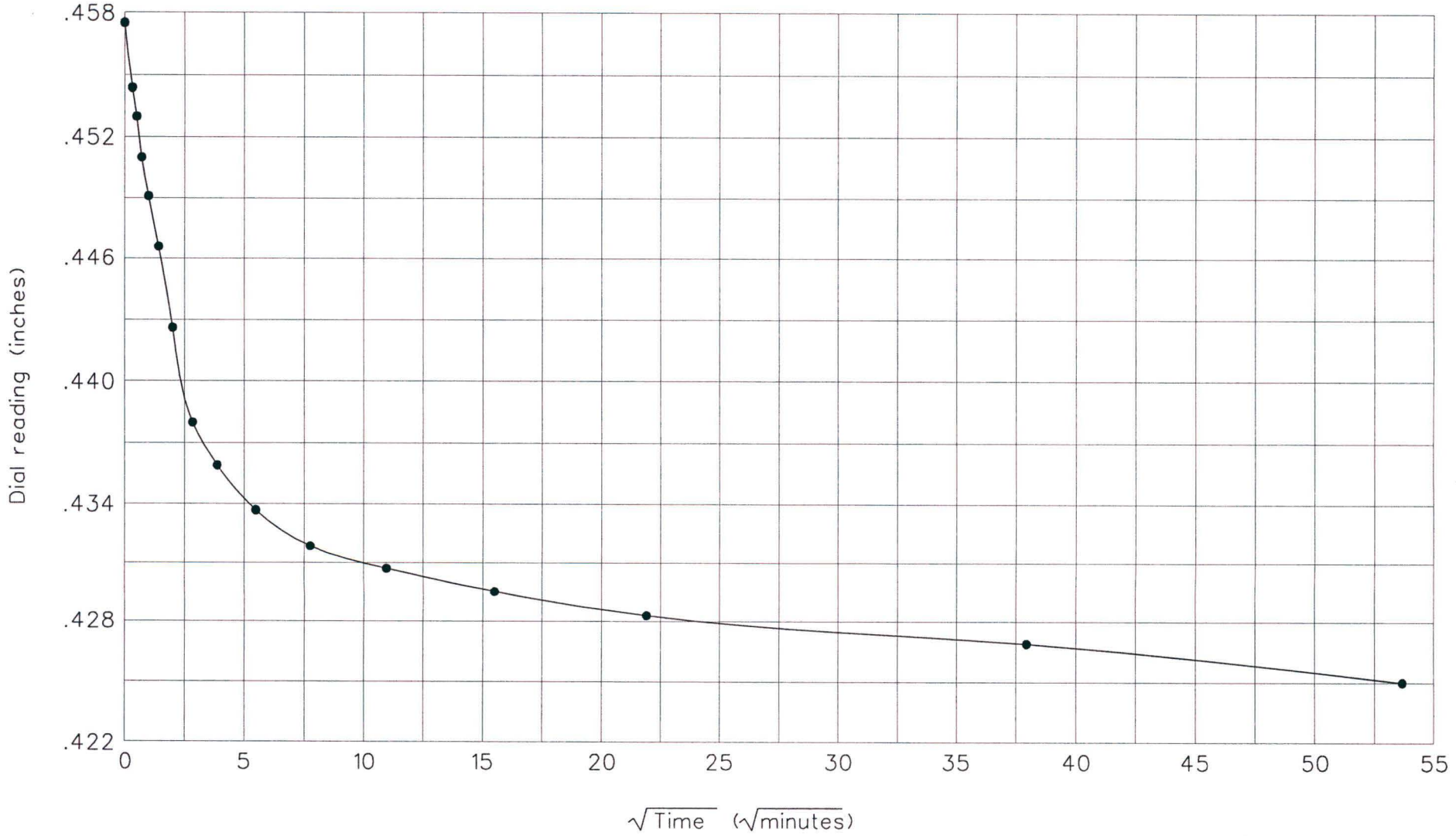
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 75'-76.3'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



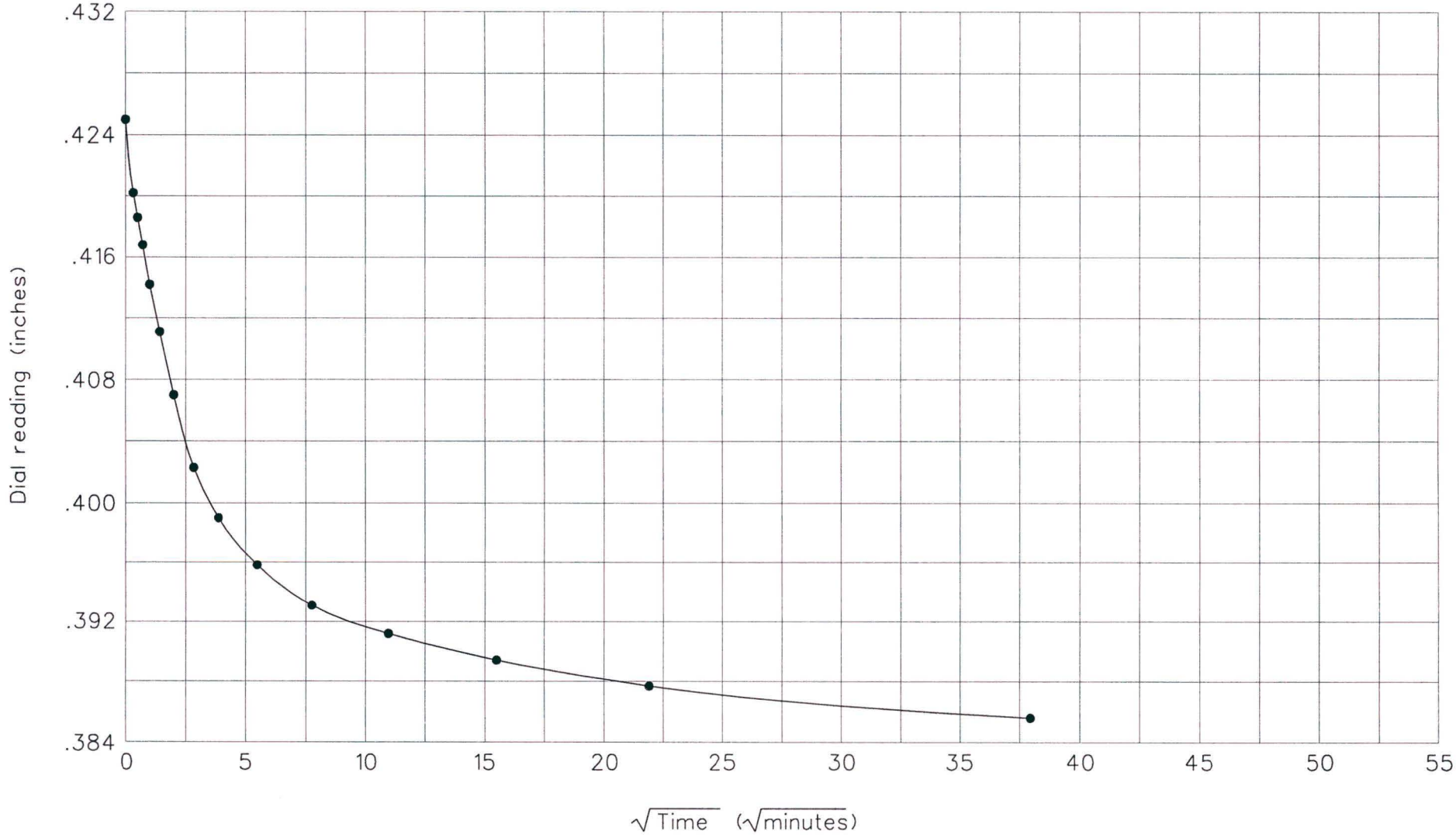
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 75'-76.3'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



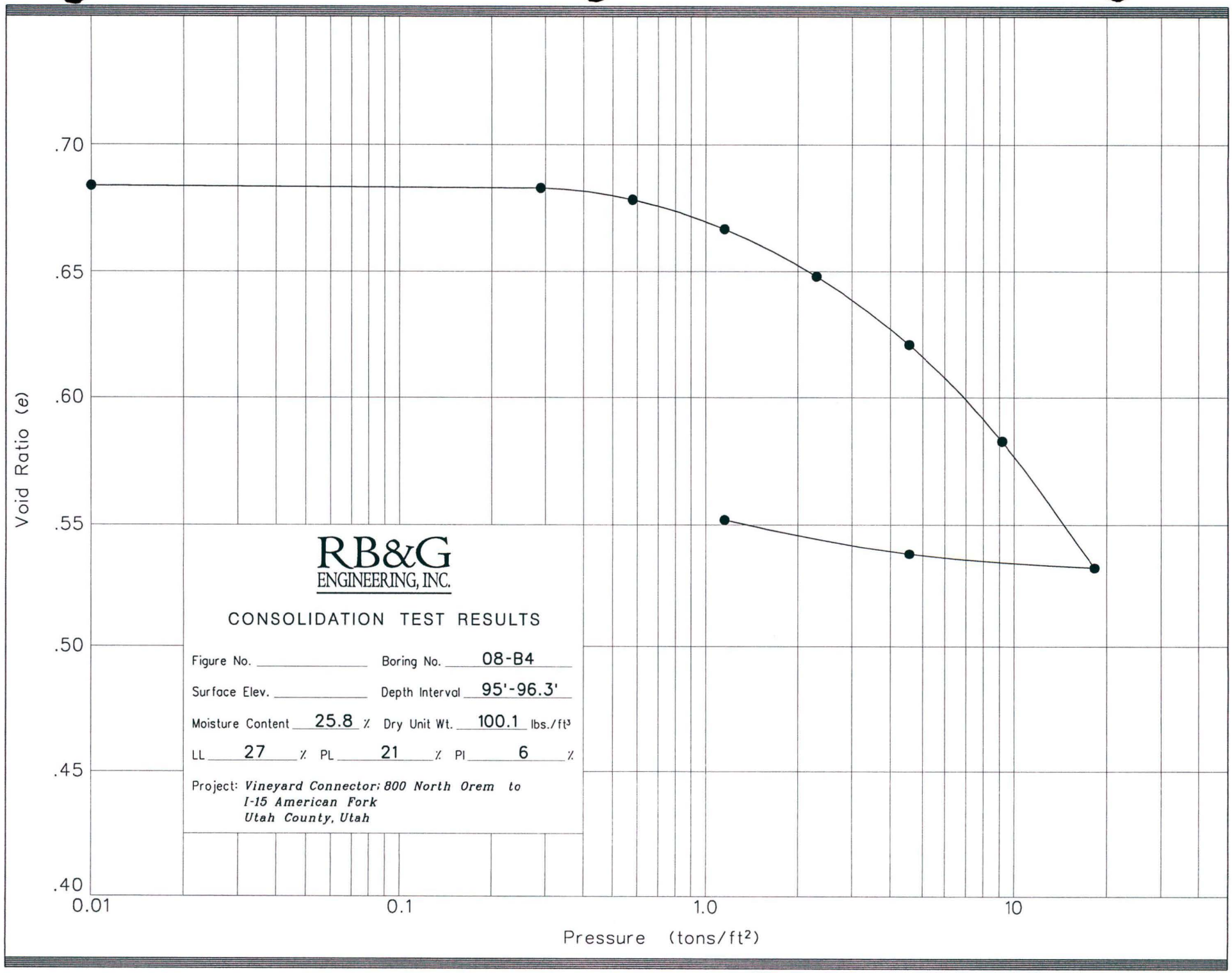
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 75'-76.3'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

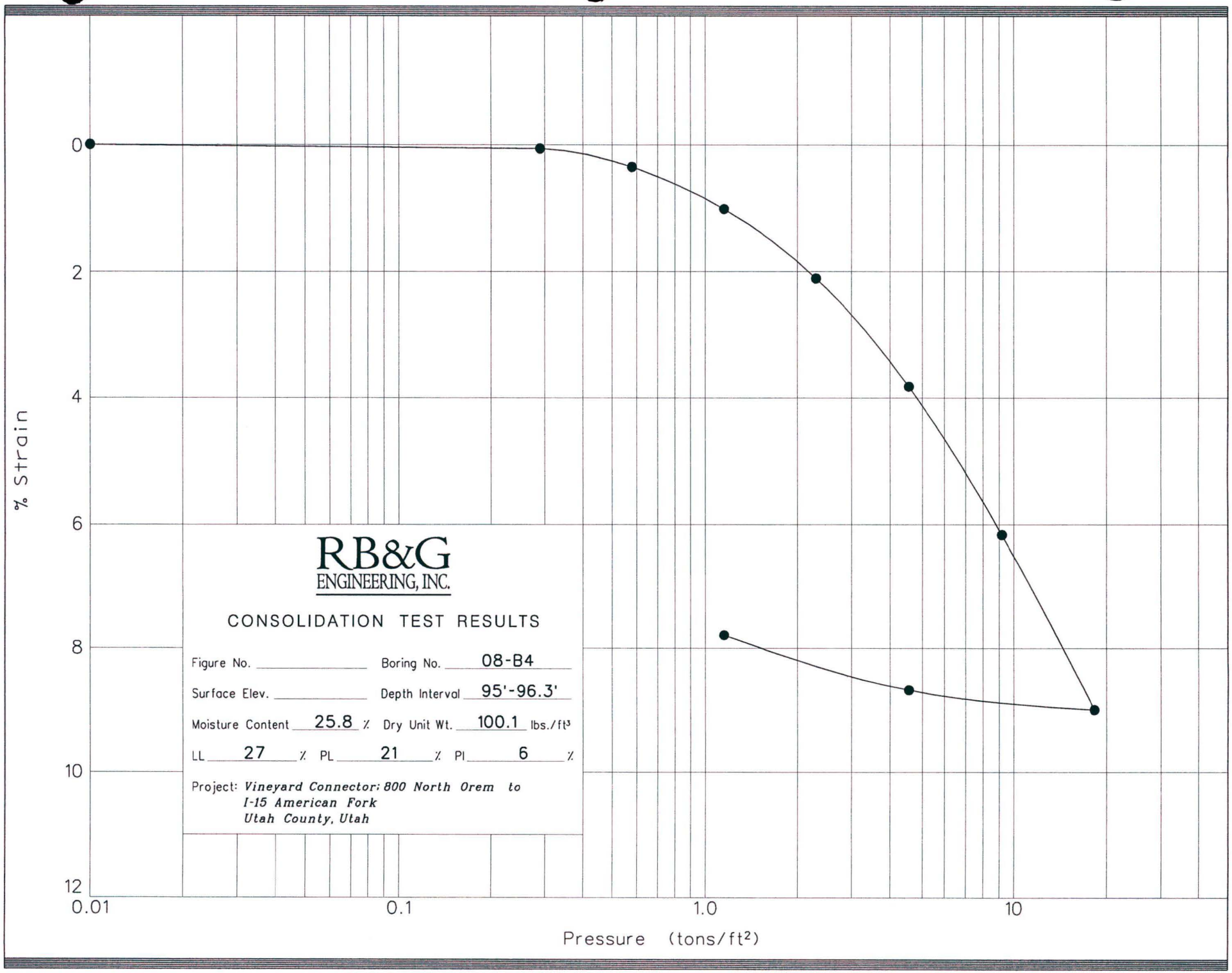
Figure No. _____ Boring No. 08-B4

Surface Elev. _____ Depth Interval 95'-96.3'

Moisture Content 25.8 % Dry Unit Wt. 100.1 lbs./ft³

LL 27 % PL 21 % PI 6 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

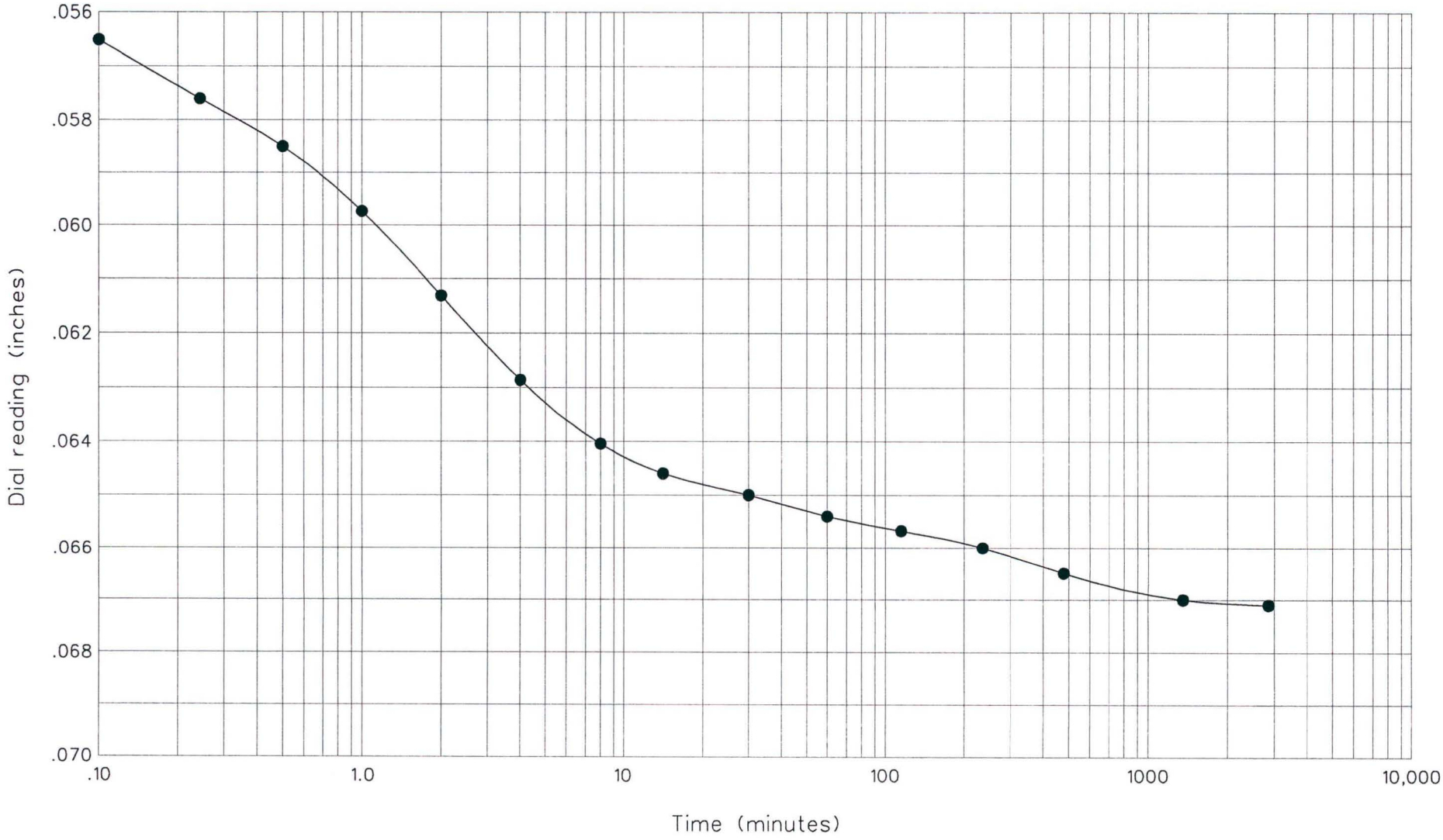
Figure No. _____ Boring No. 08-B4

Surface Elev. _____ Depth Interval 95'-96.3'

Moisture Content 25.8 % Dry Unit Wt. 100.1 lbs./ft³

LL 27 % PL 21 % PI 6 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*



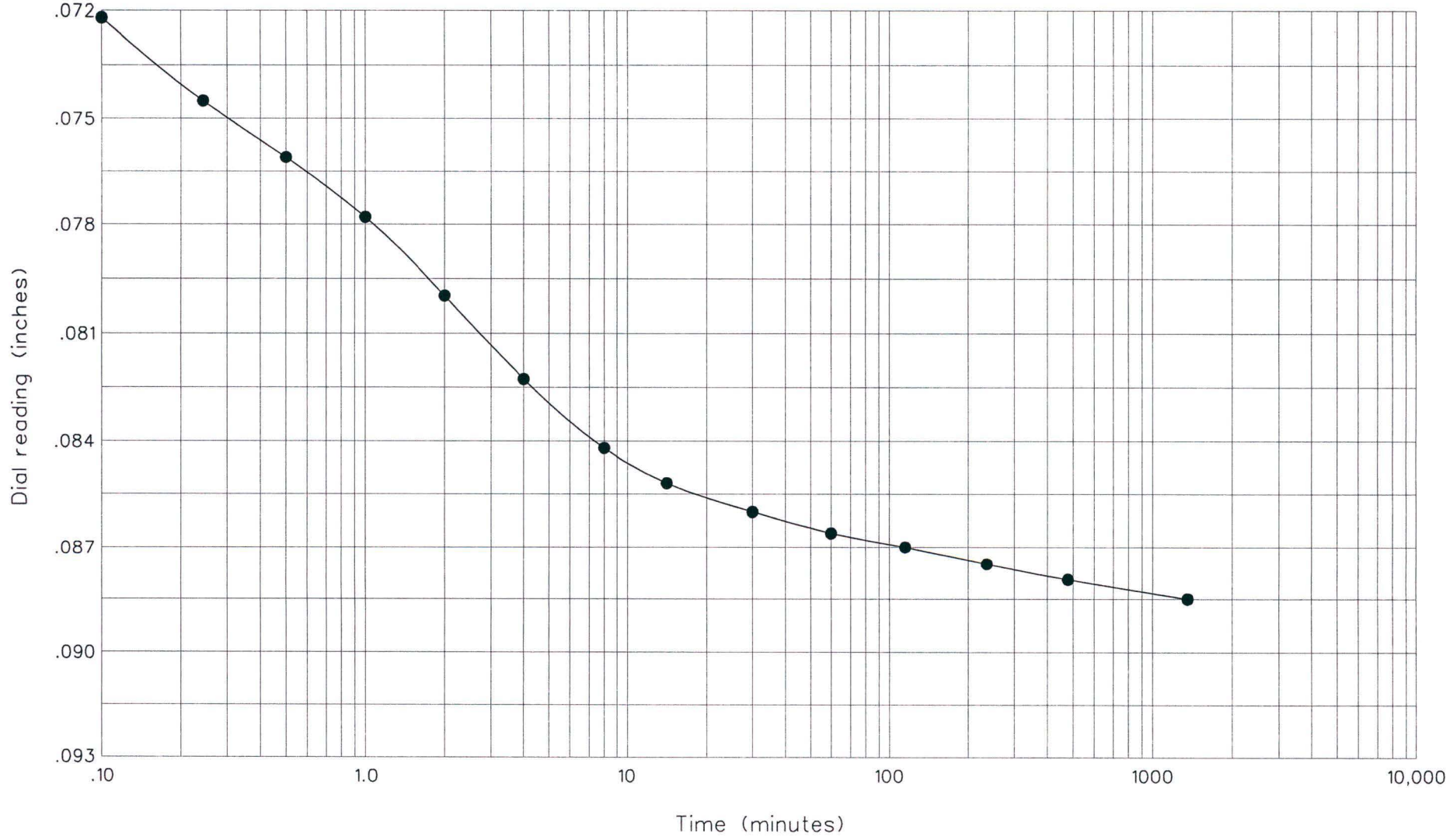
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 95'-96.3'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



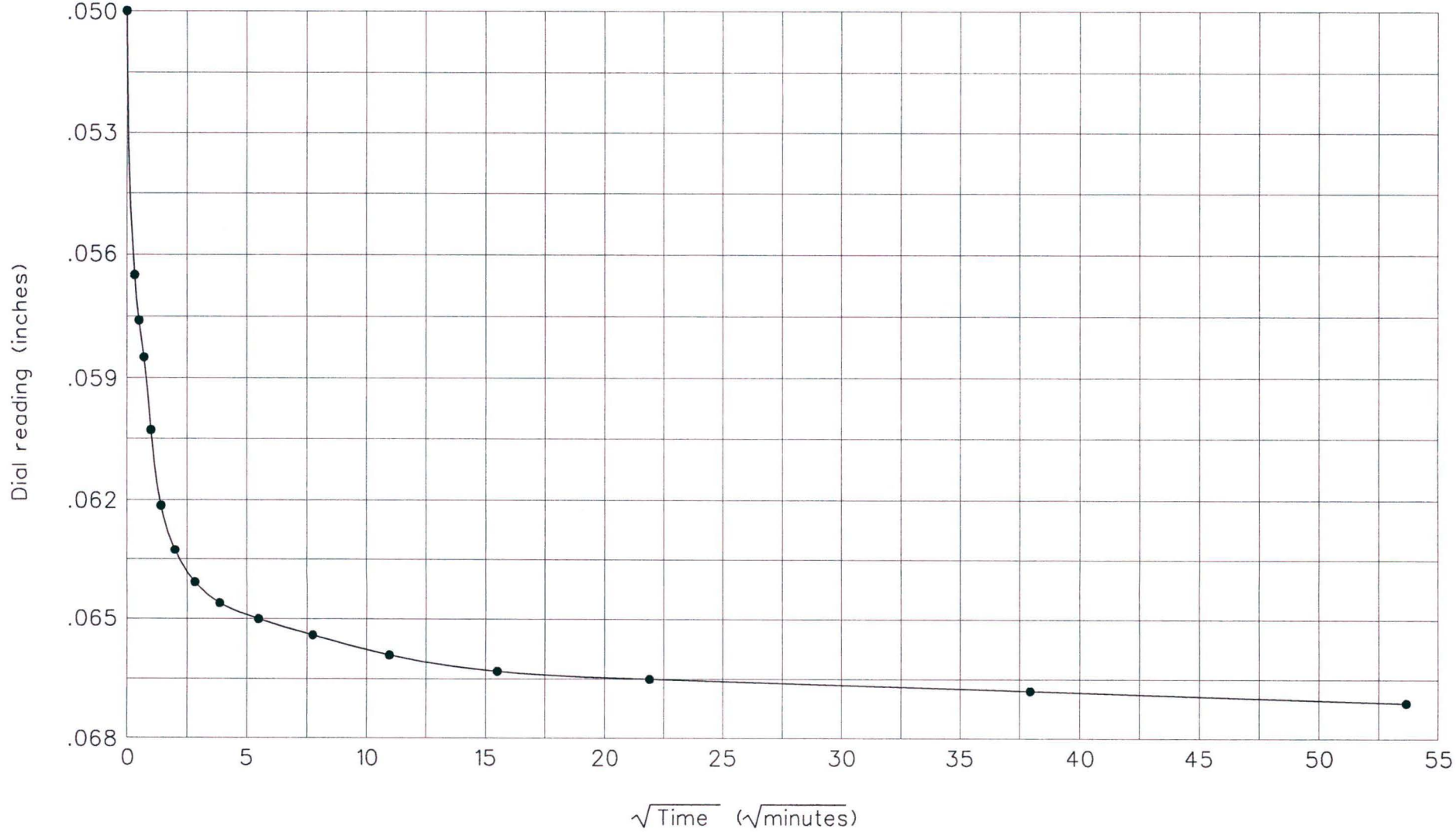
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 95'-96.3'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



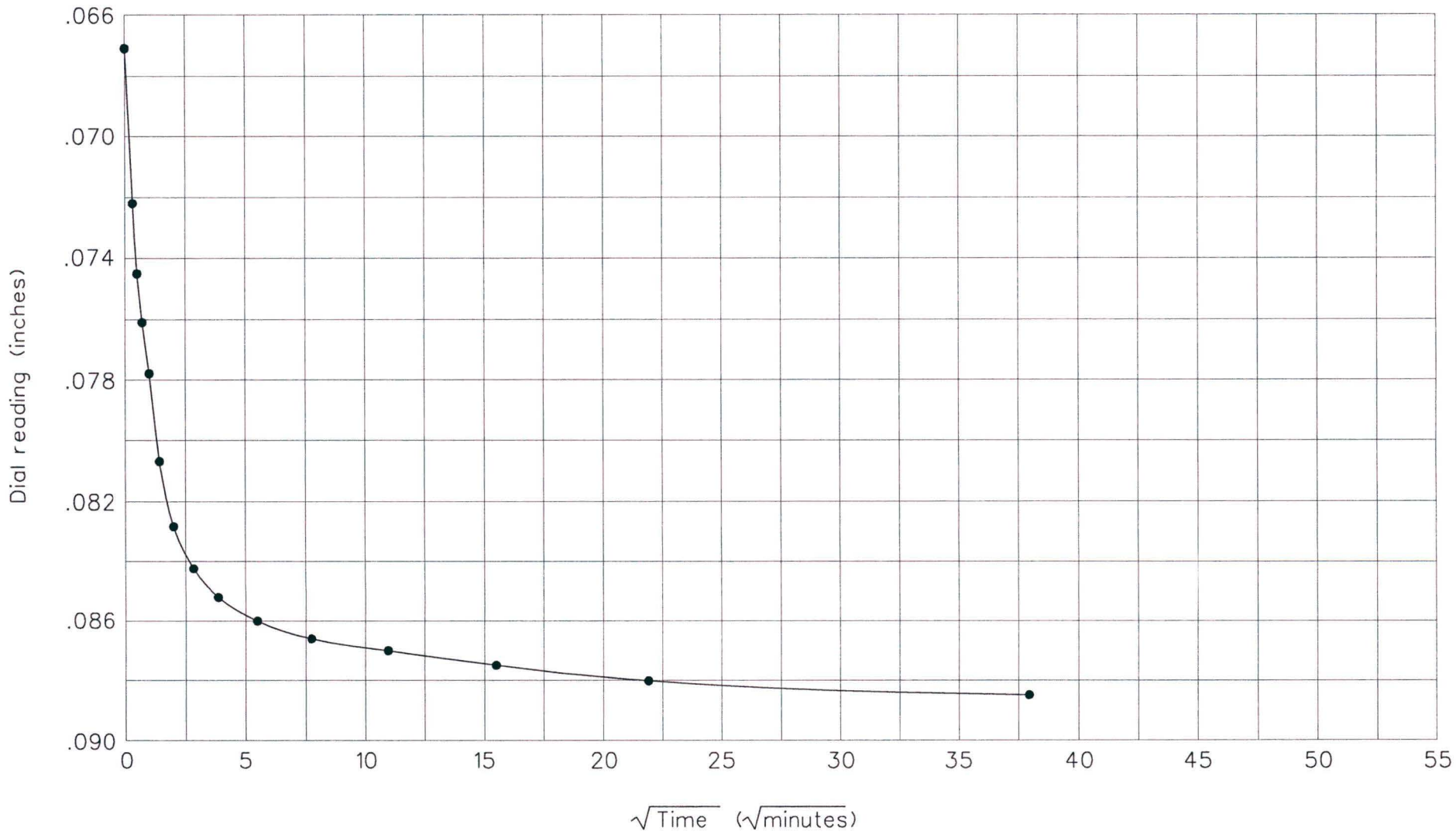
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 95'-96.3'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



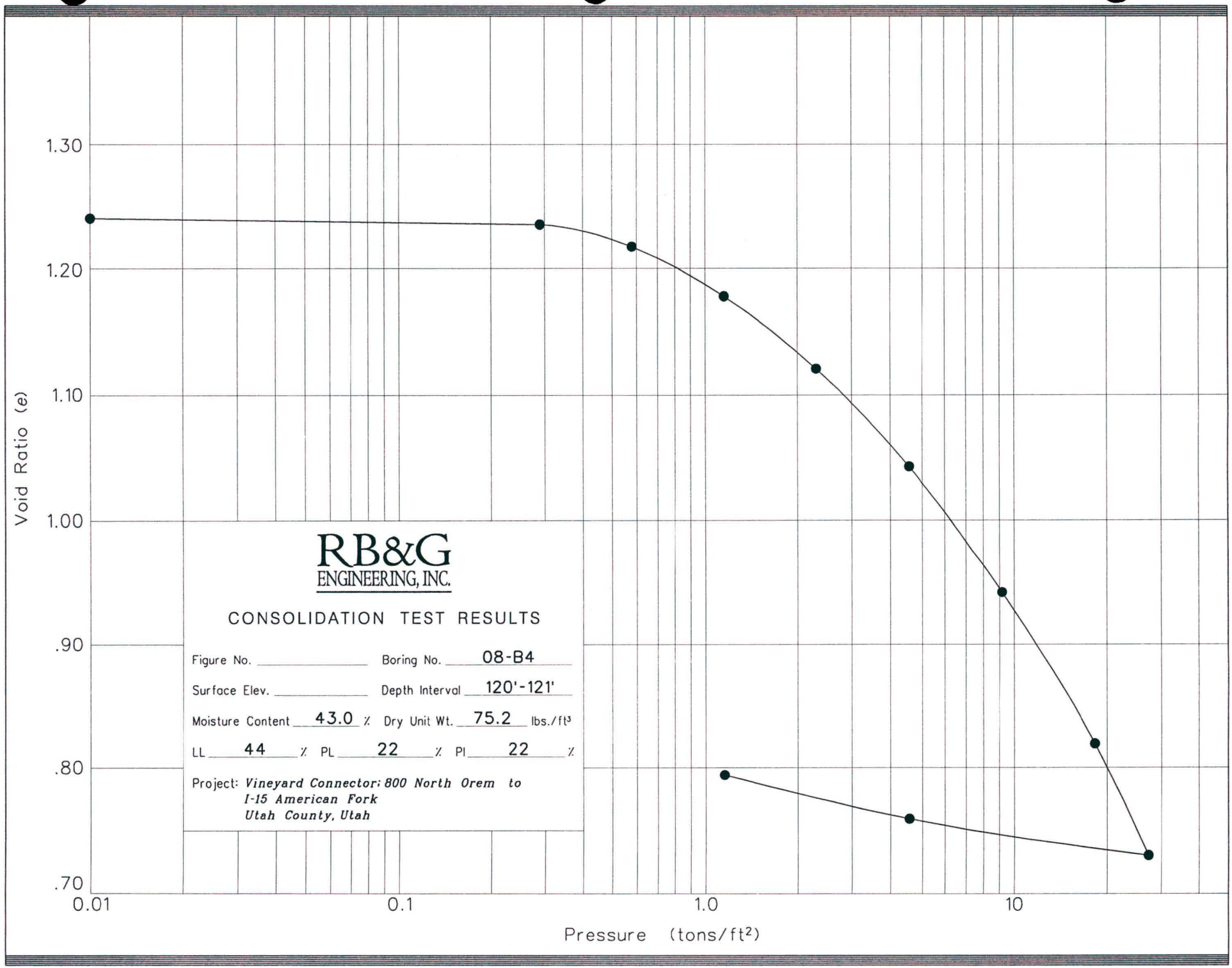
RB&G ENGINEERING, INC.

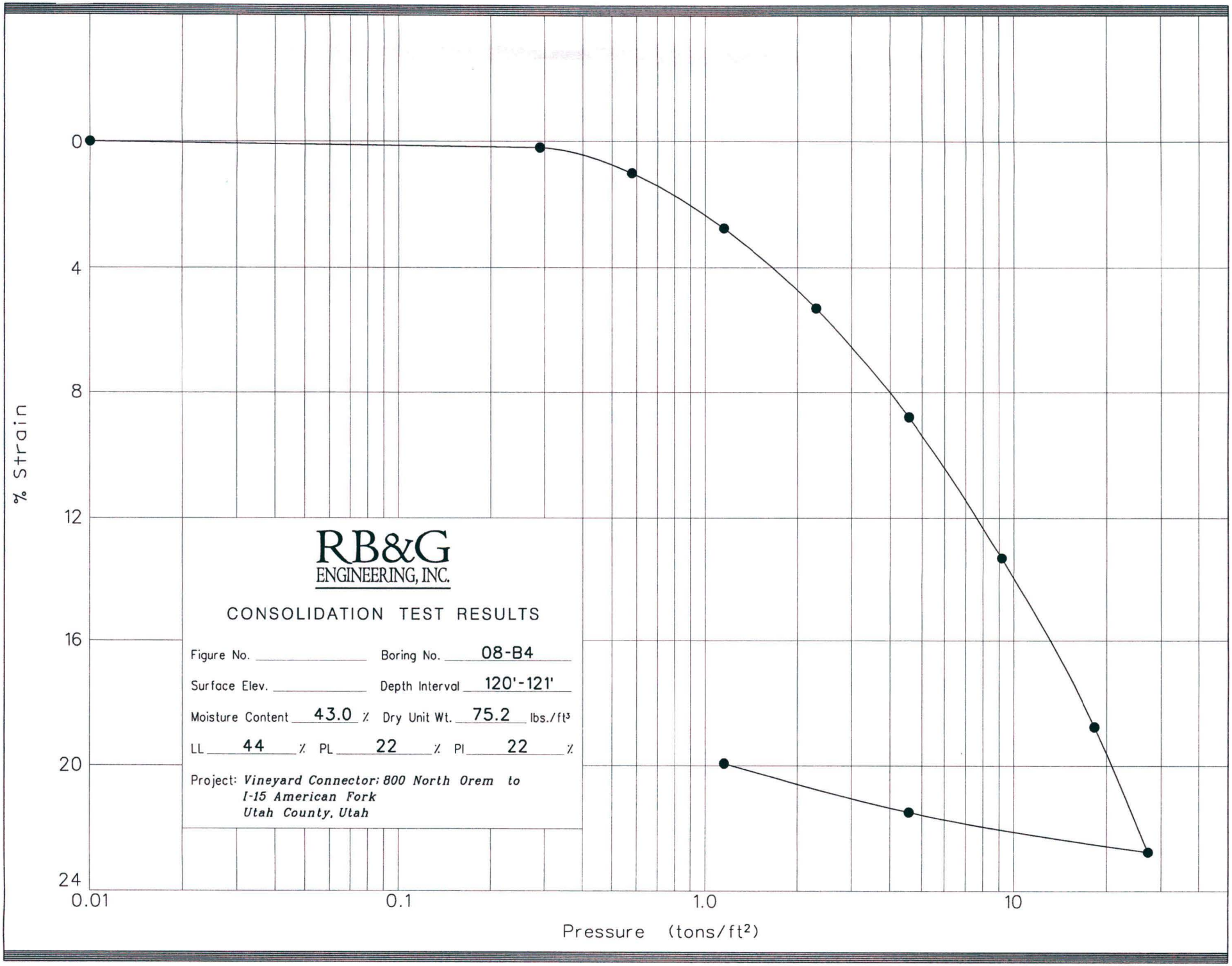
Hole no.: 08-B4
Depth: 95'-96.3'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure


1.30
1.20
1.10
1.00
.90
.80
.70
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No.
Boring No. 08-B4
Surface Elev.
Depth Interval 120'-121'
Moisture Content 43.0 % Dry Unit Wt. 75.2 lbs./ft³
LL 44 % PL 22 % PI 22 %
Project: Vineyard Connector; 800 North Orem to
I-15 American Fork
Utah County, Utah



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

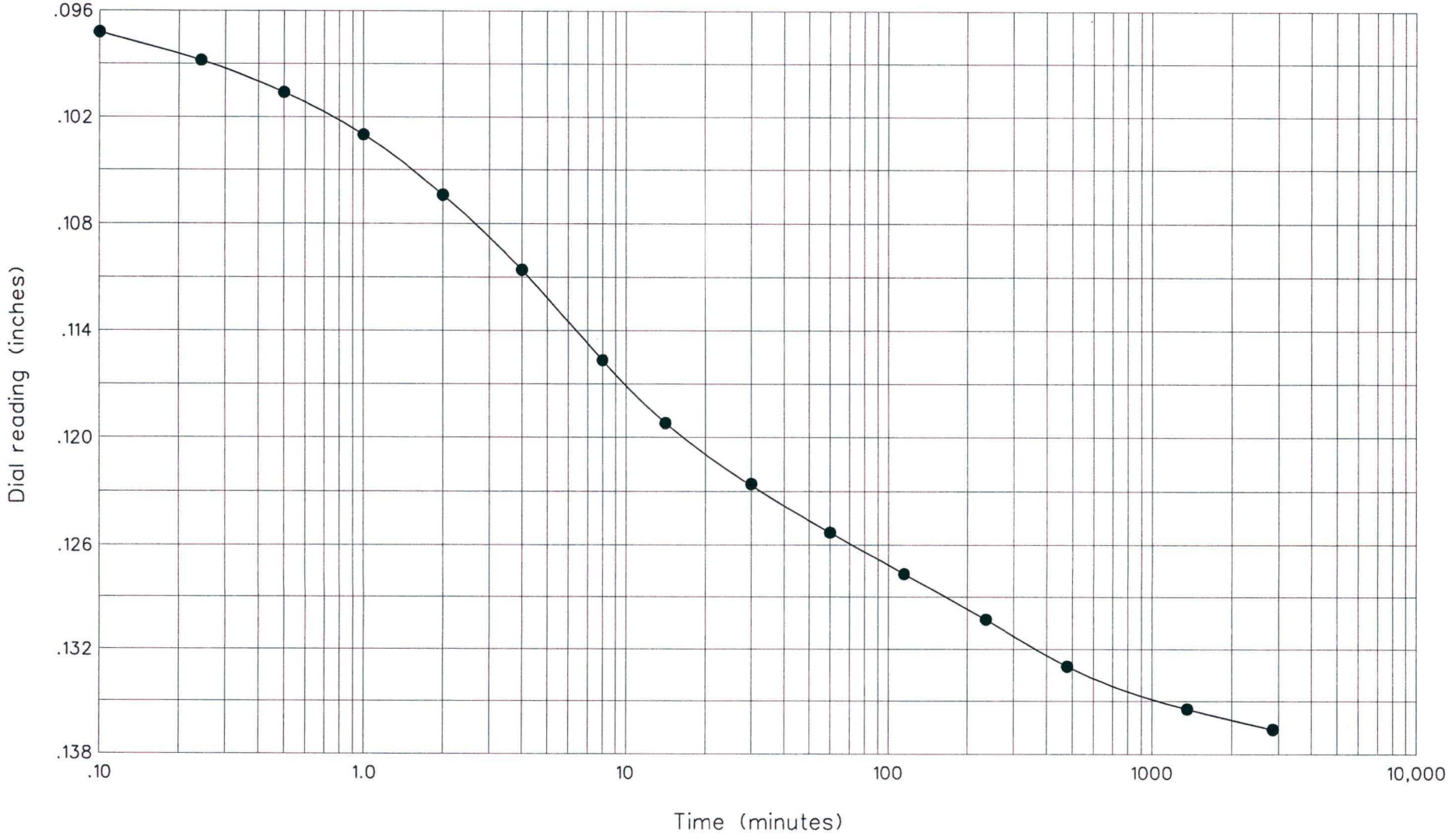
Figure No. _____ Boring No. 08-B4

Surface Elev. _____ Depth Interval 120'-121'

Moisture Content 43.0 % Dry Unit Wt. 75.2 lbs./ft³

LL 44 % PL 22 % PI 22 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*



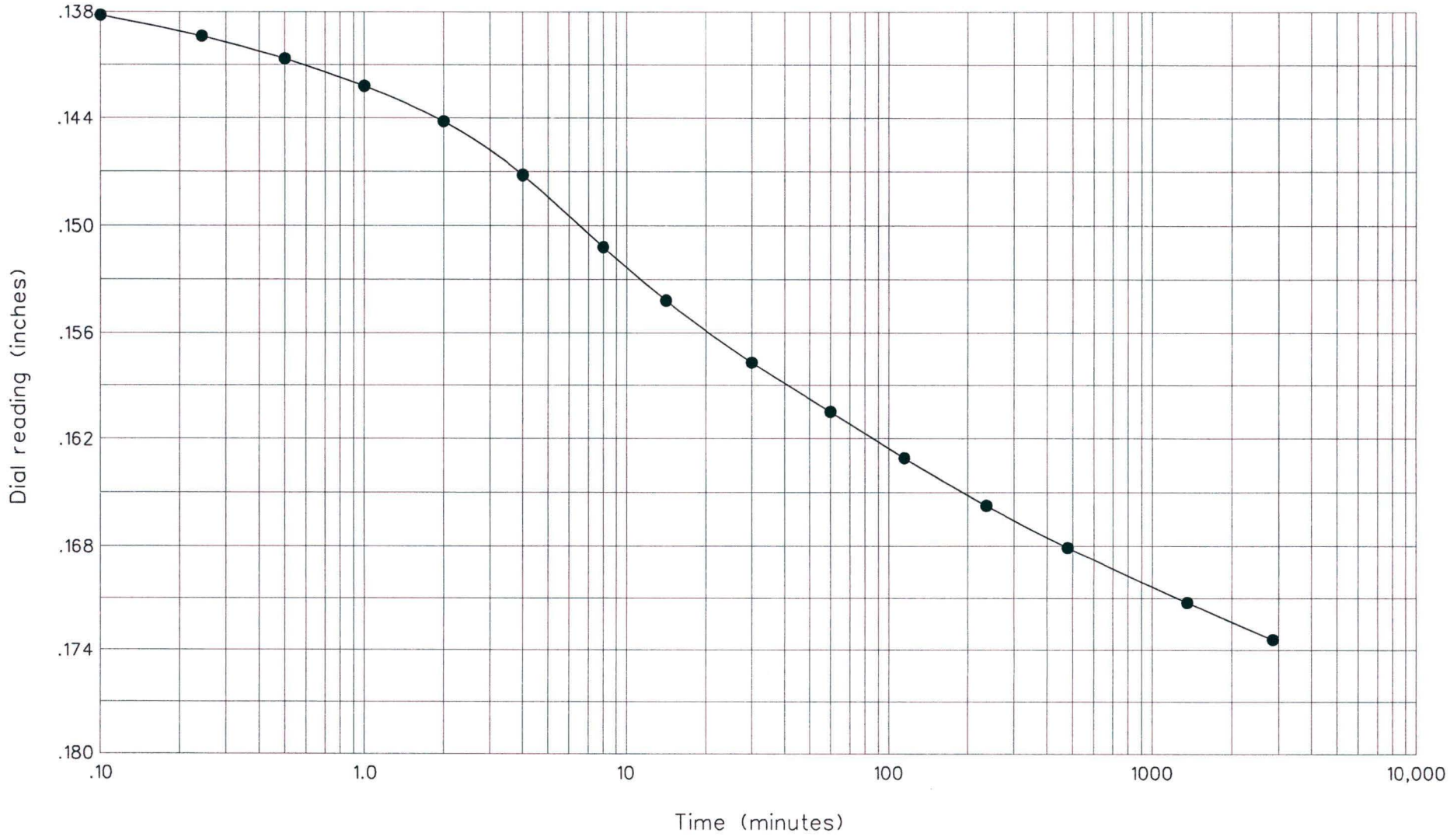
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 120'-121'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



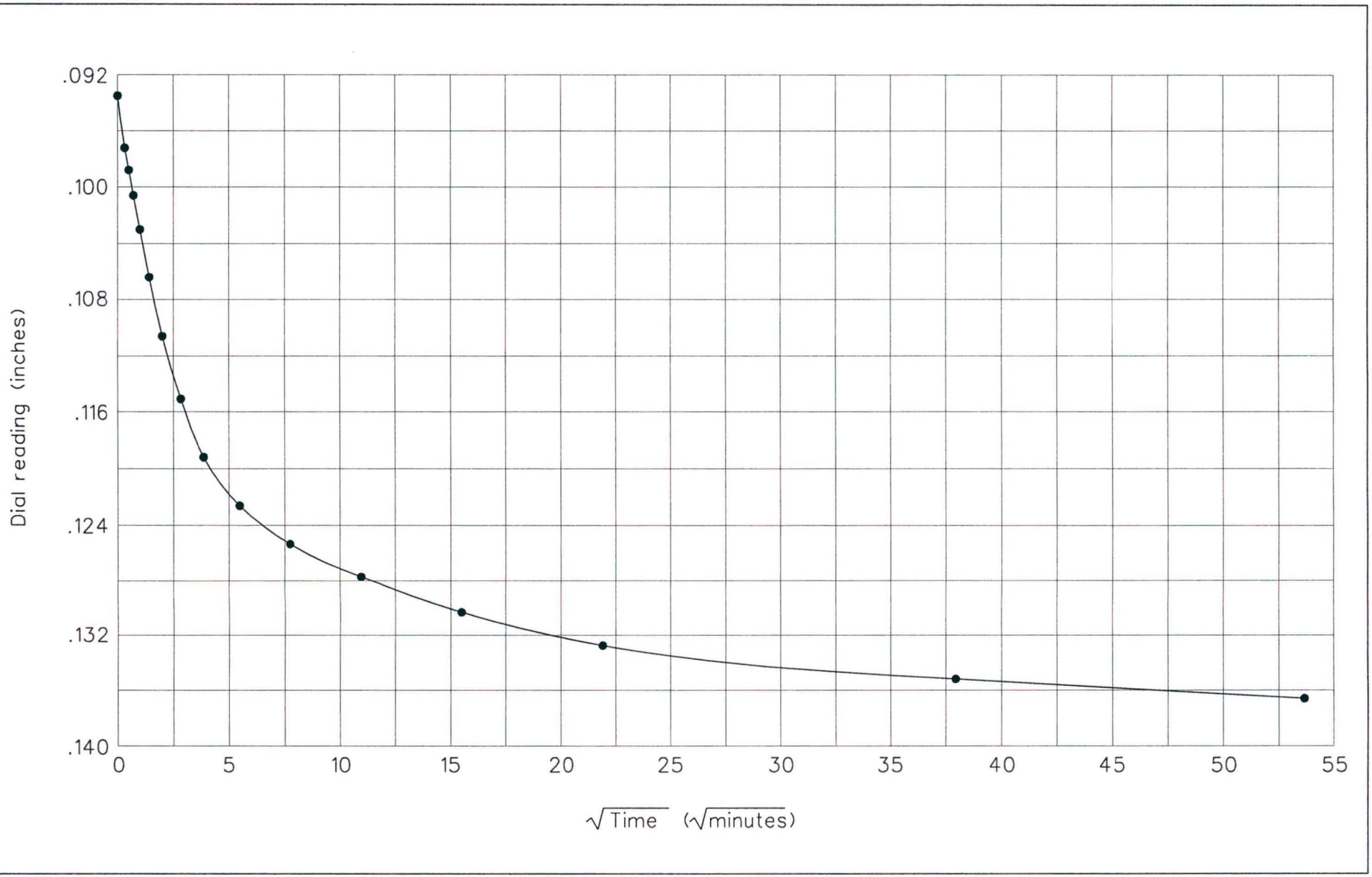
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 120'-121'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



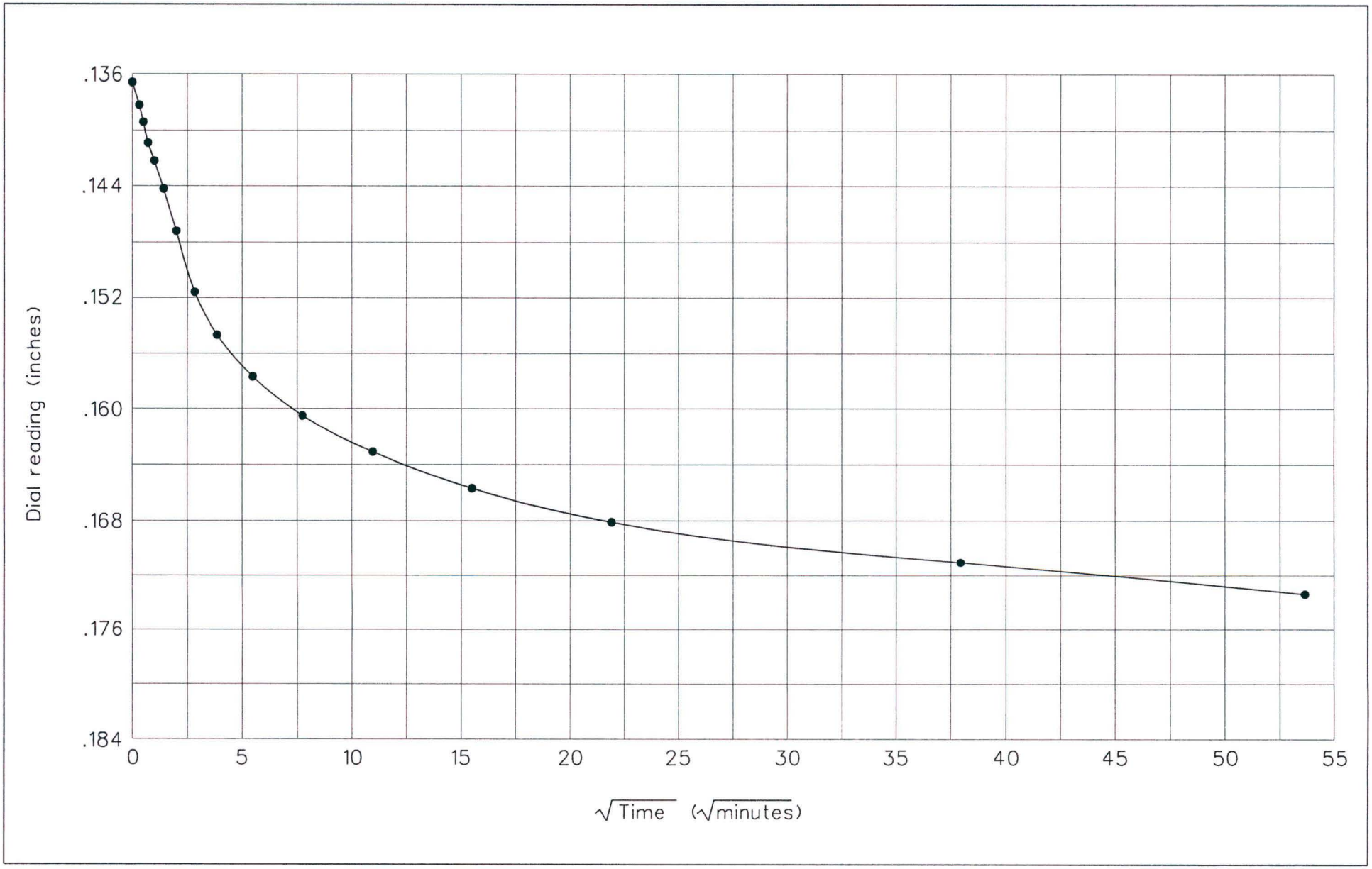
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 120'-121'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 120'-121'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure

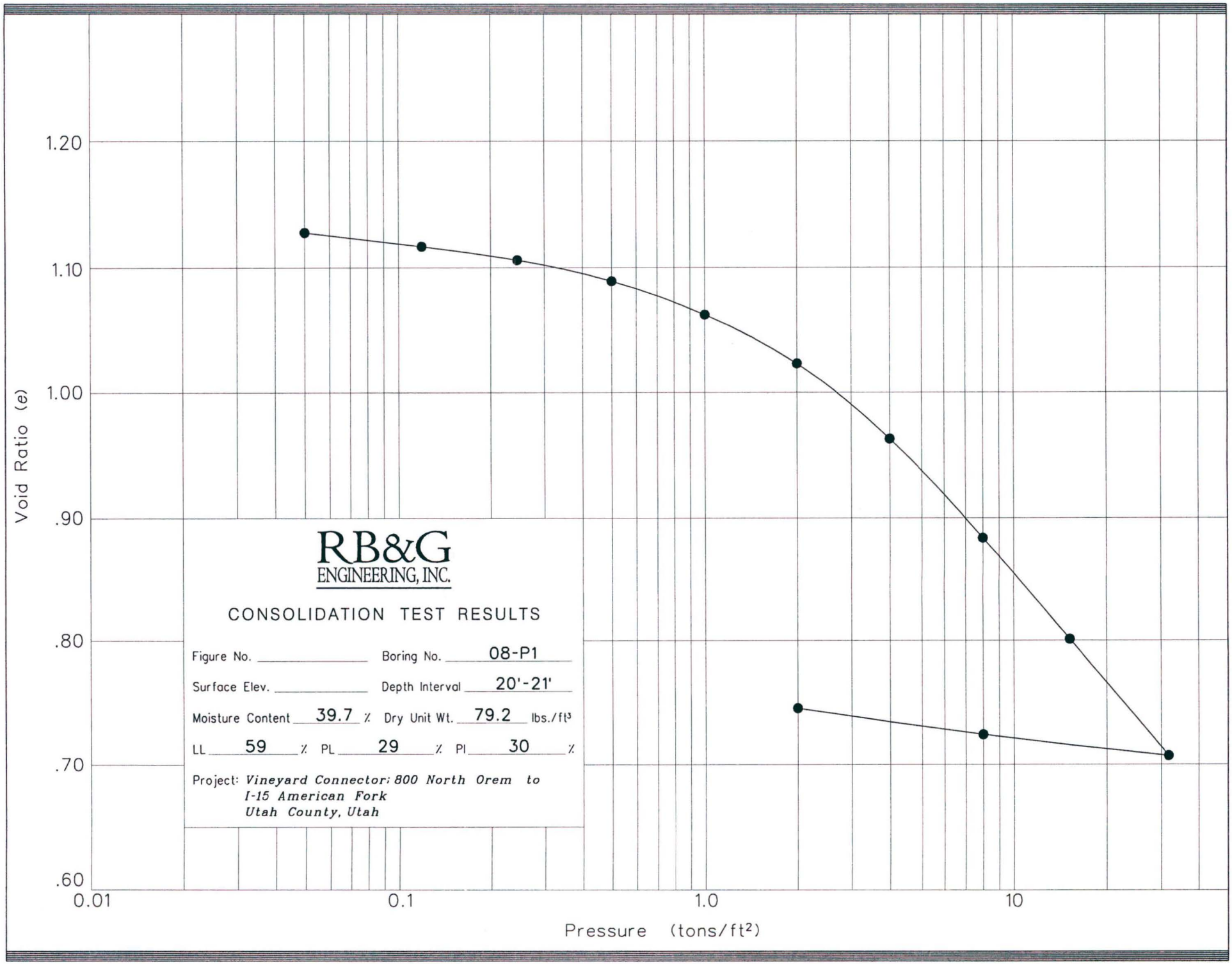
Table 1

SUMMARY OF TEST DATA

PROJECT Vineyard Connector; 800 North Orem to I-15 American Fork
PROJECT NO. 200701-048
LOCATION Utah County, Utah
FEATURE Foundations

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	STANDARD PENETRATION BLOWS PER FOOT	IN-PLACE		UNCONFINED COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO Classification)
			DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
08-P1	6-7.5	19		9.5				NP	59	34	7	GP-GM (A-1-a)
	15-16.5	11		12.8				NP	52	37	11	GP-GM (A-1-a)
	20-21.5	Shelby	79.2	39.7	2013	59	29	30	0	6	94	CH (A-7-6(33))
	30-31.5	7		27.1		27	23	4	0	20	80	ML (A-4(2))
	40-41.5	Shelby	100.5	23.9	4026	41	19	22	0	0	100	CL (A-7-6(24))
	50-51.5	Shelby	100.3	26.4	4092	38	20	18	0	0	100	CL (A-6(19))
	60-61.5	Shelby	85.5	33.9		39	22	17	0	1	99	CL (A-6(18))
	70-71.5	Shelby	89.2	35.2	2663	46	22	24	0	1	99	CL (A-7-6(27))

NP=Nonplastic



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

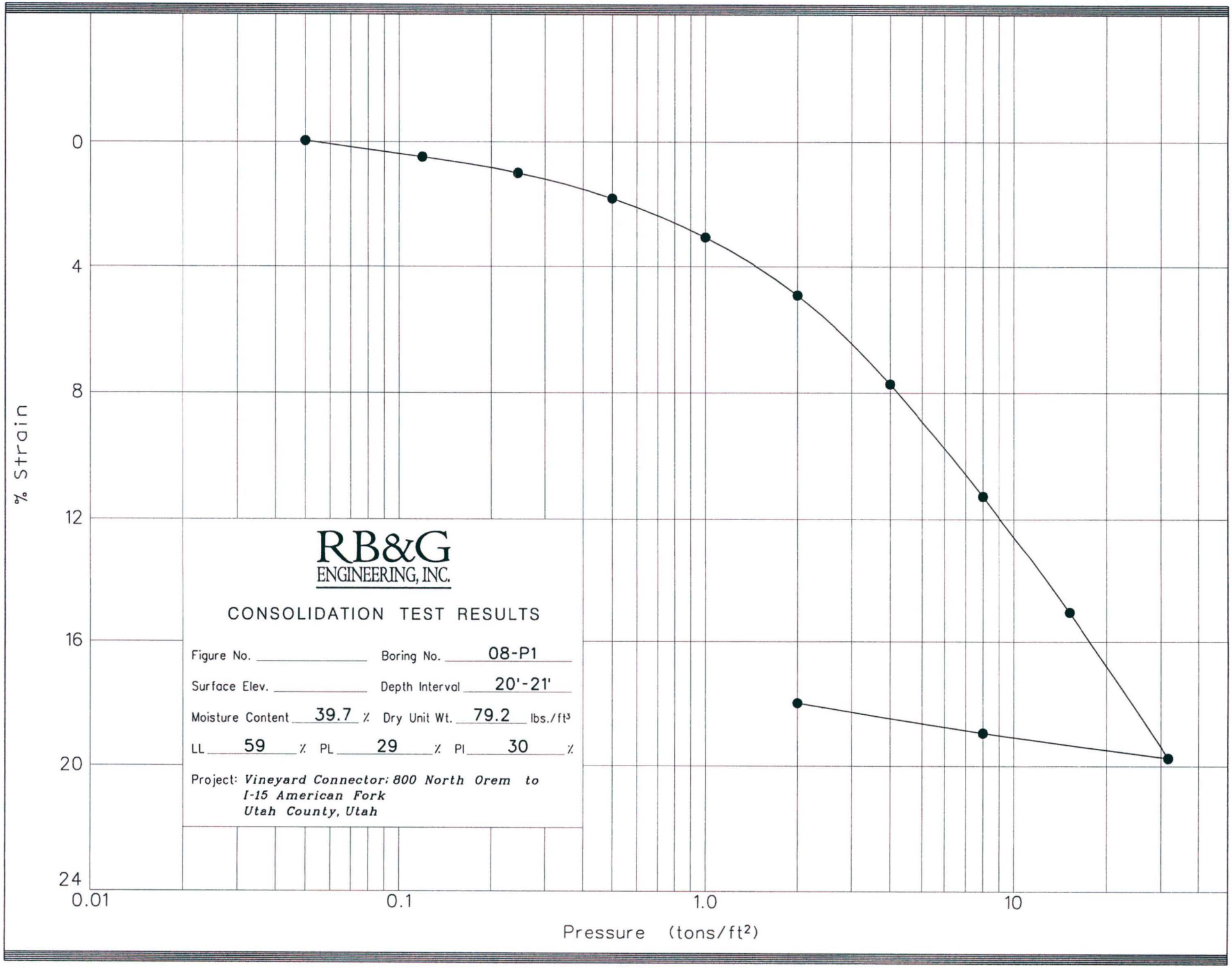
Figure No. _____ Boring No. 08-P1

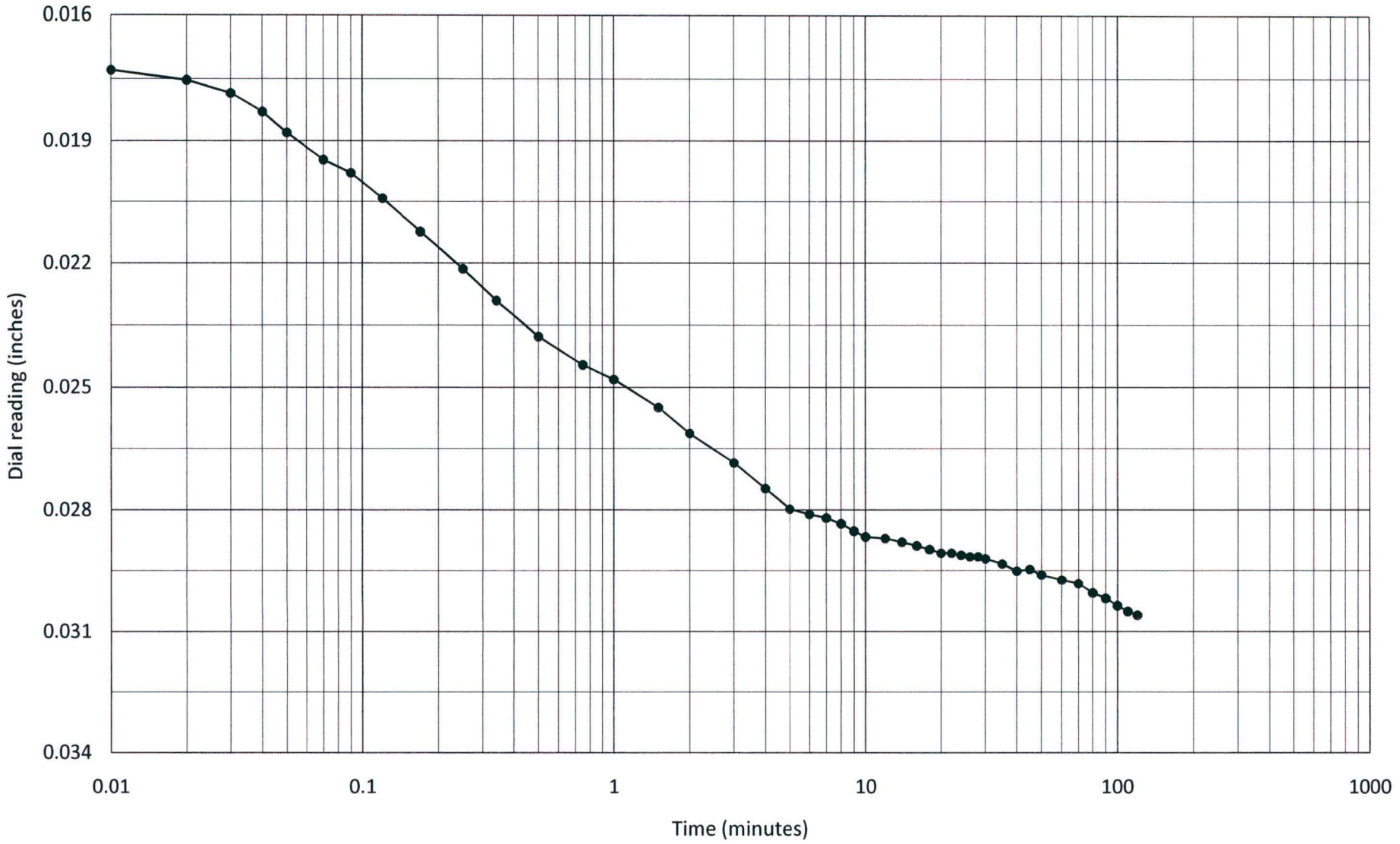
Surface Elev. _____ Depth Interval 20'-21'

Moisture Content 39.7 % Dry Unit Wt. 79.2 lbs./ft³

LL 59 % PL 29 % PI 30 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*


% Strain
0
4
8
12
16
20
24
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P1
Surface Elev. _____ Depth Interval 20'-21'
Moisture Content 39.7 % Dry Unit Wt. 79.2 lbs./ft³
LL 59 % PL 29 % PI 30 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah

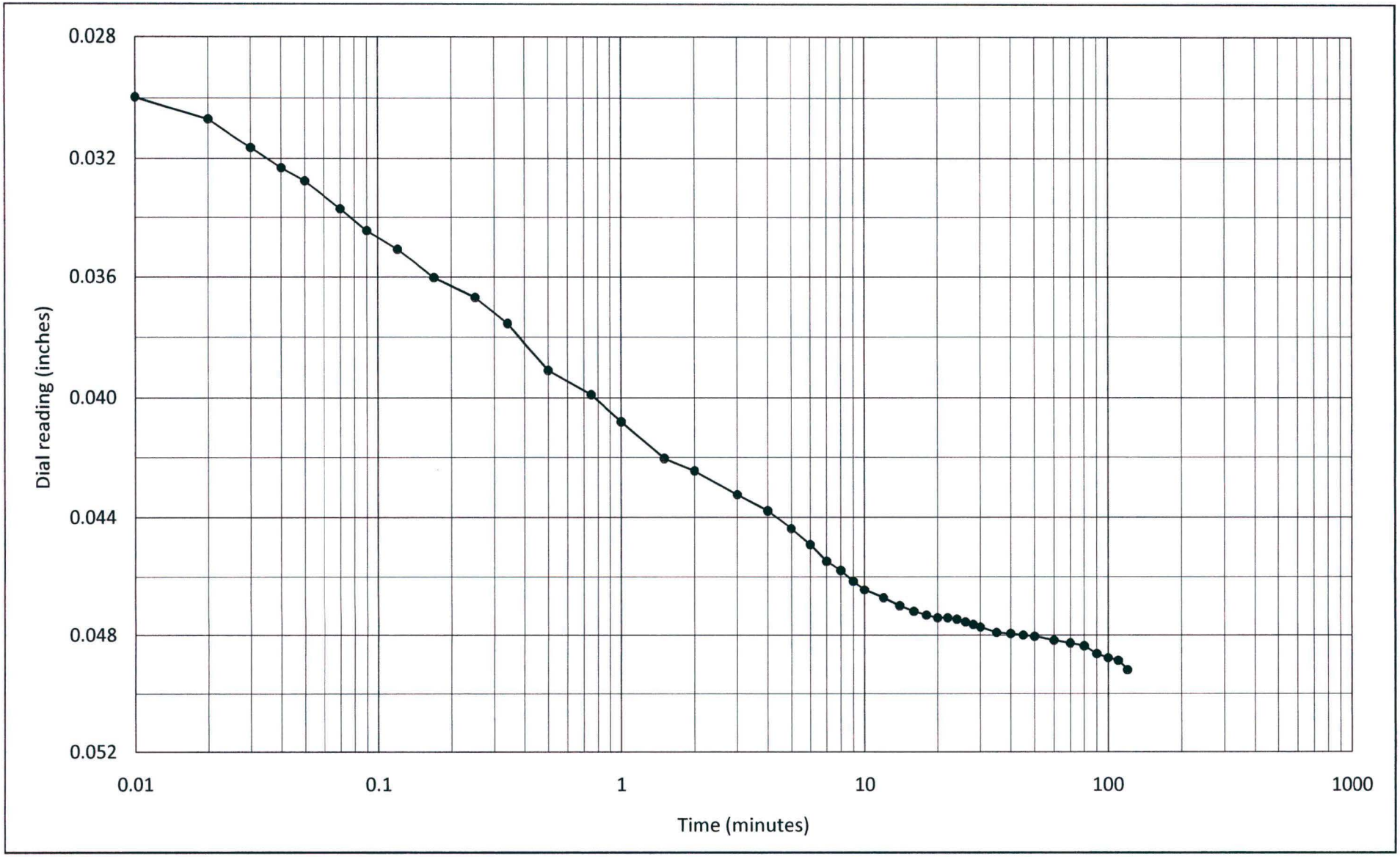


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 20'-21'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

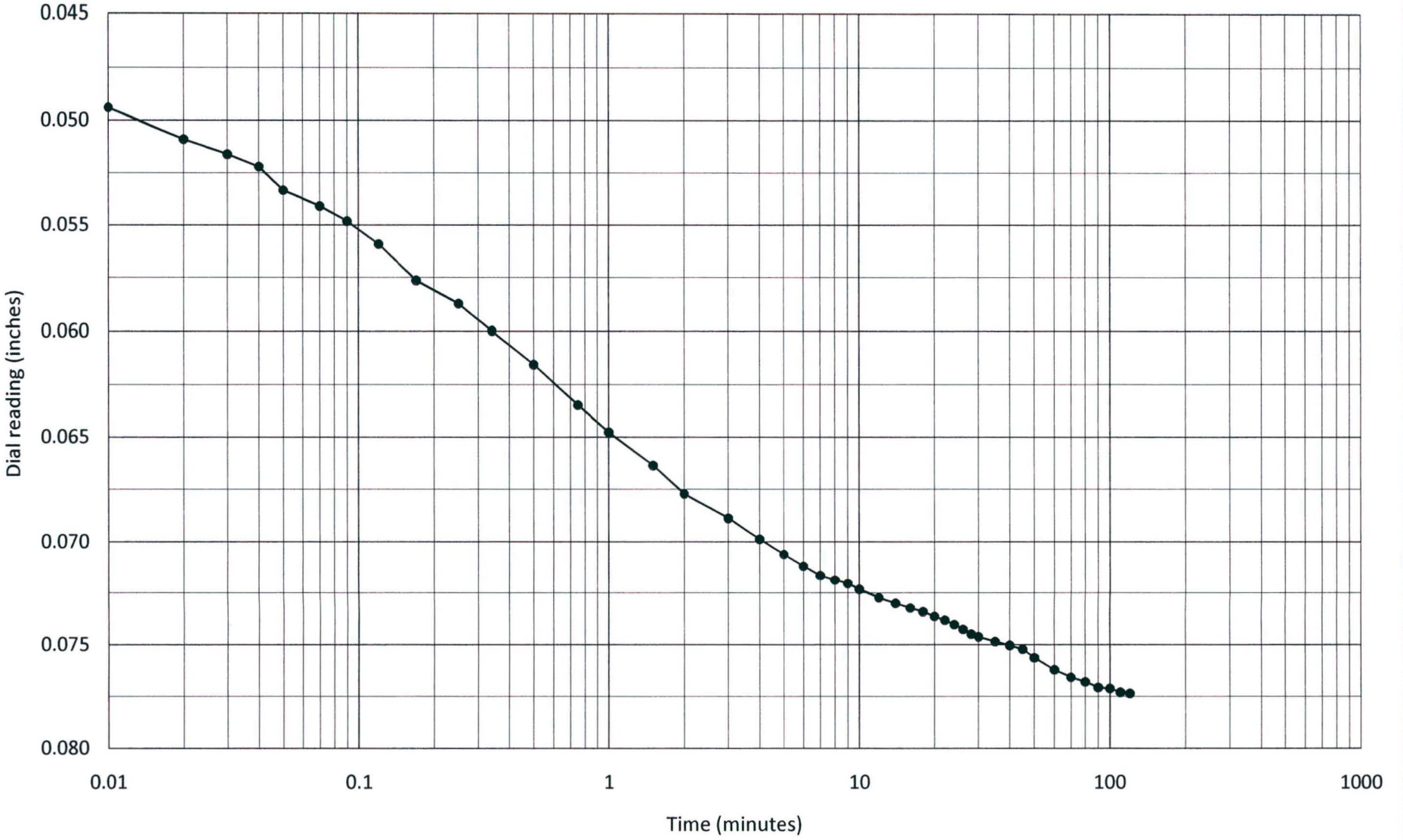


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 20'-21'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

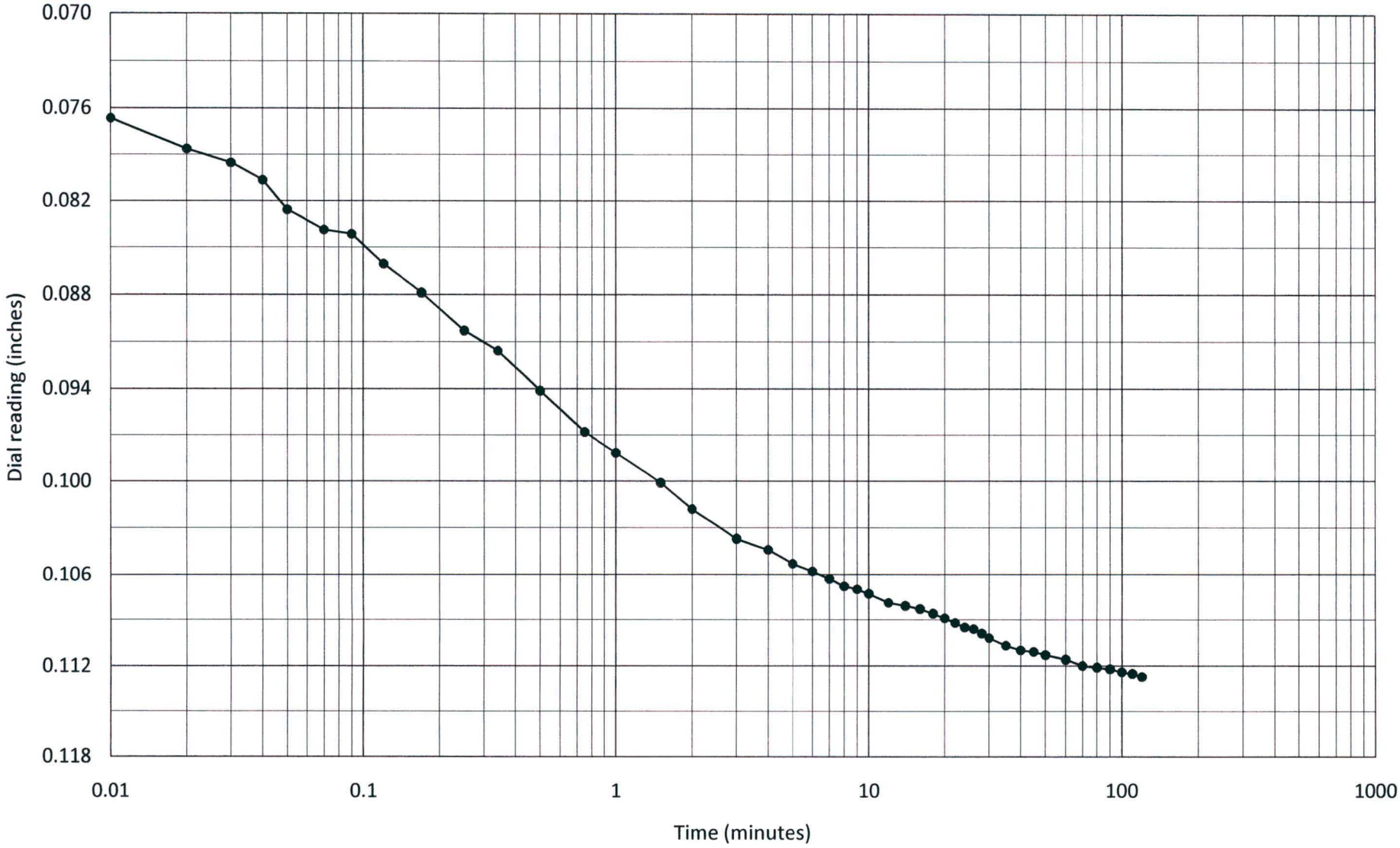


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 20'-21'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

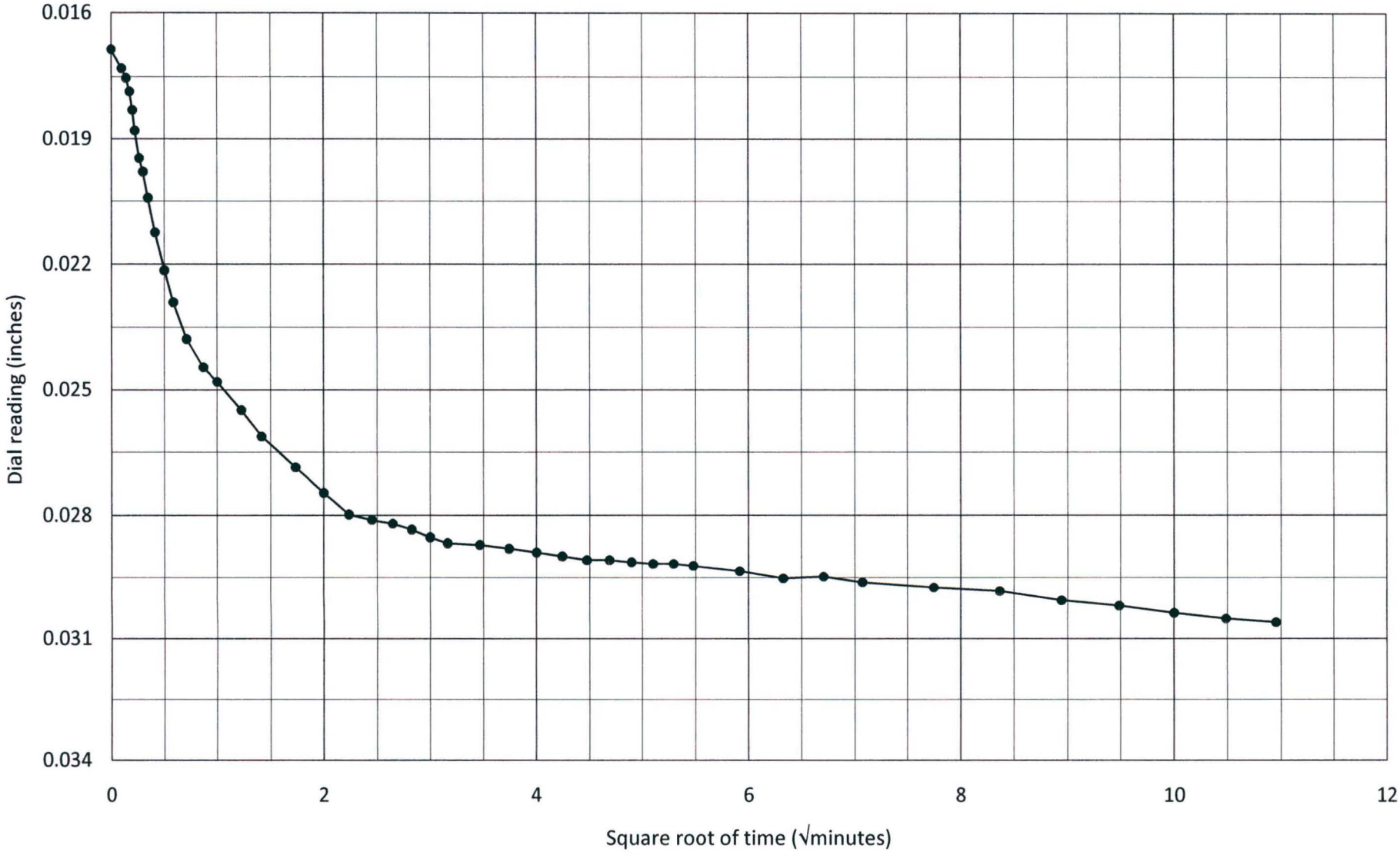


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 20'-21'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

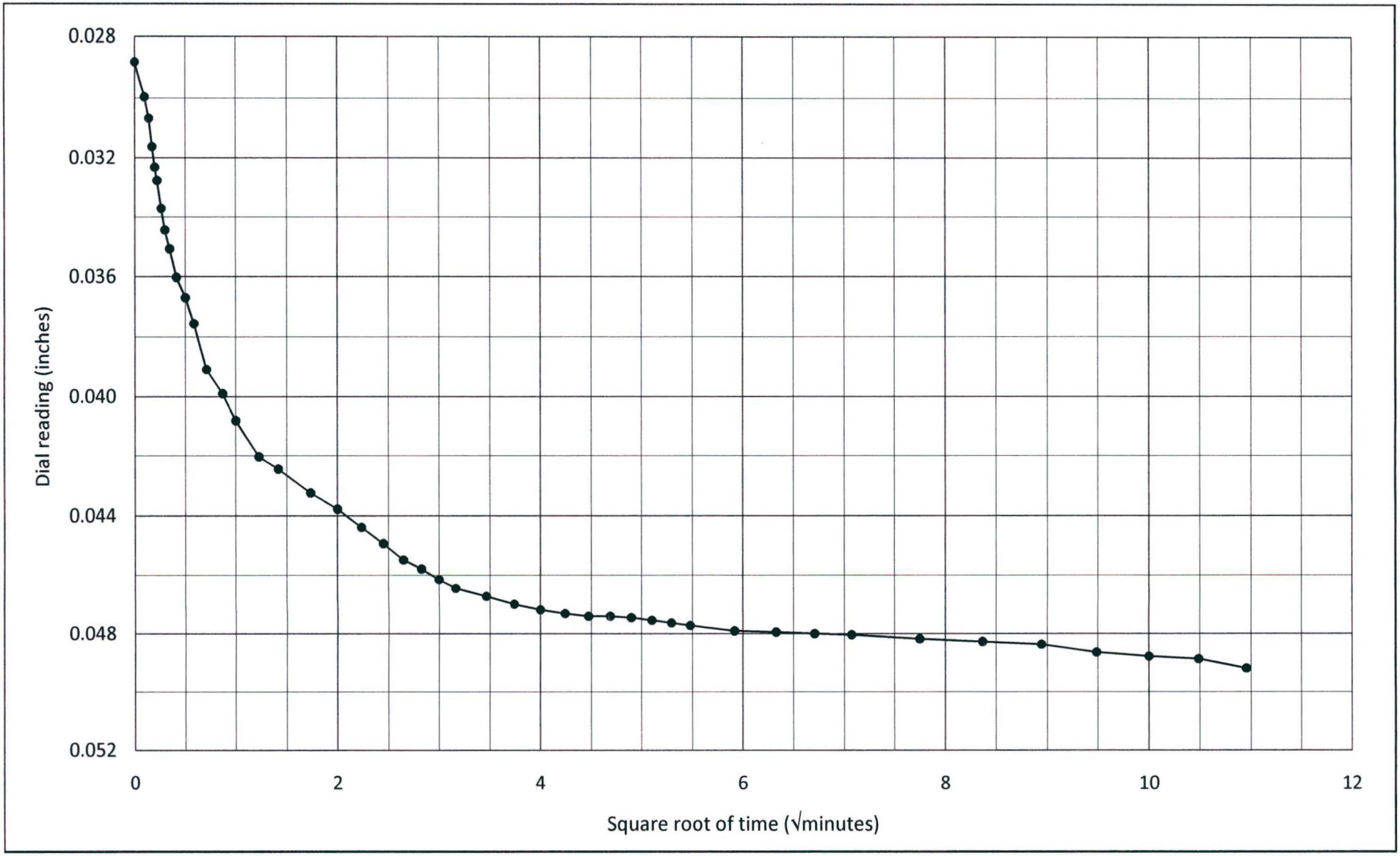


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 20'-21'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

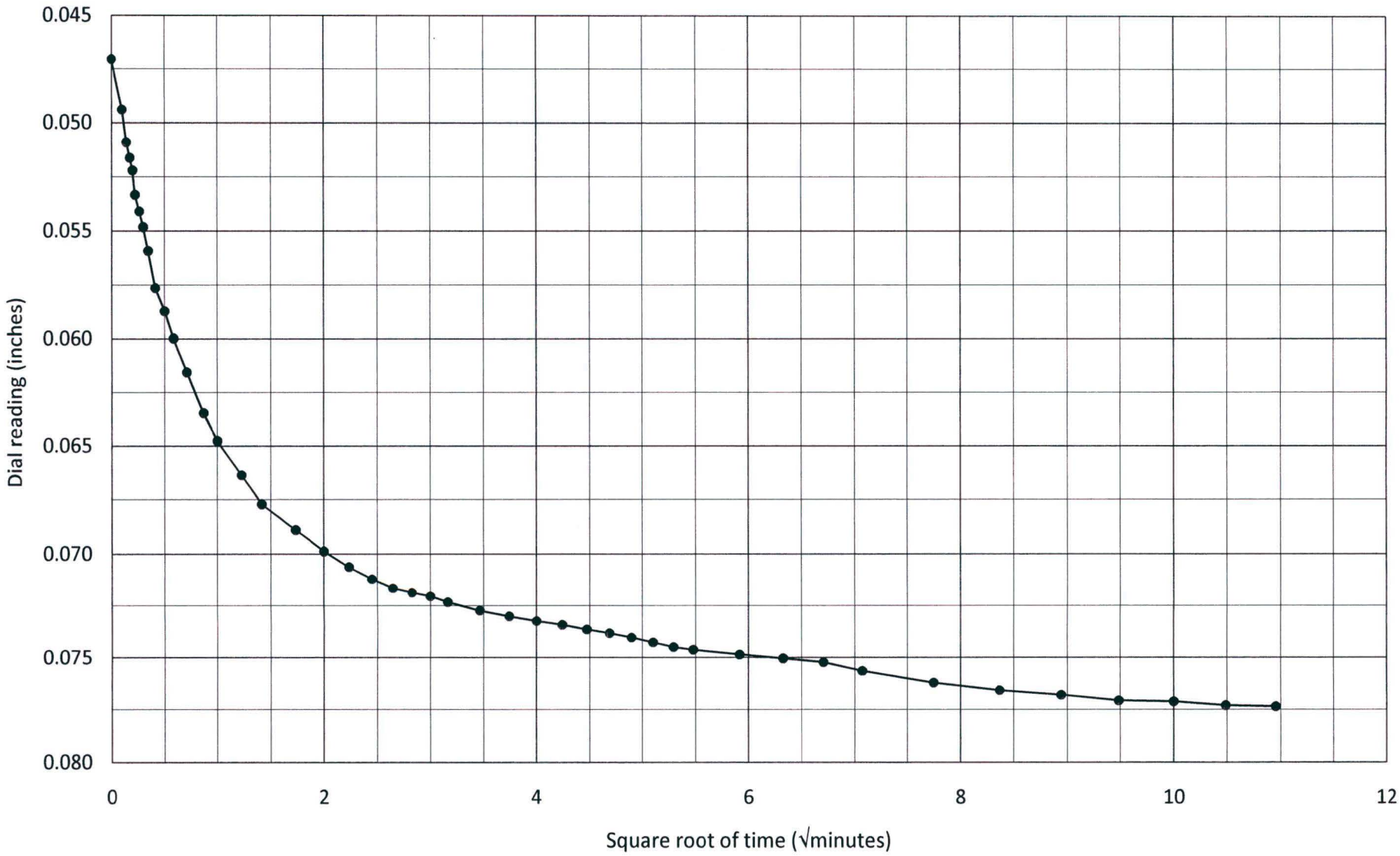


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 20'-21'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

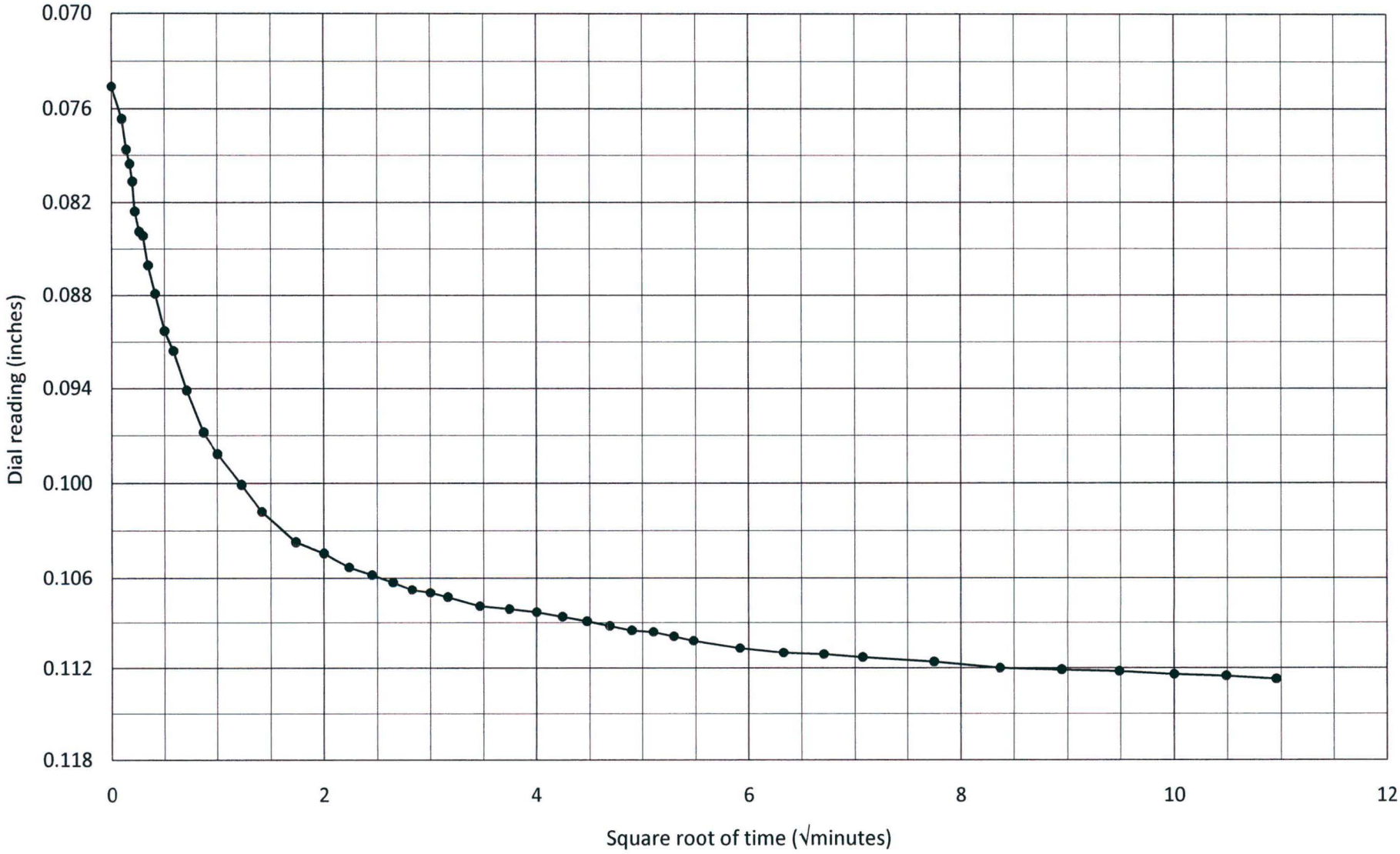


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 20'-21'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

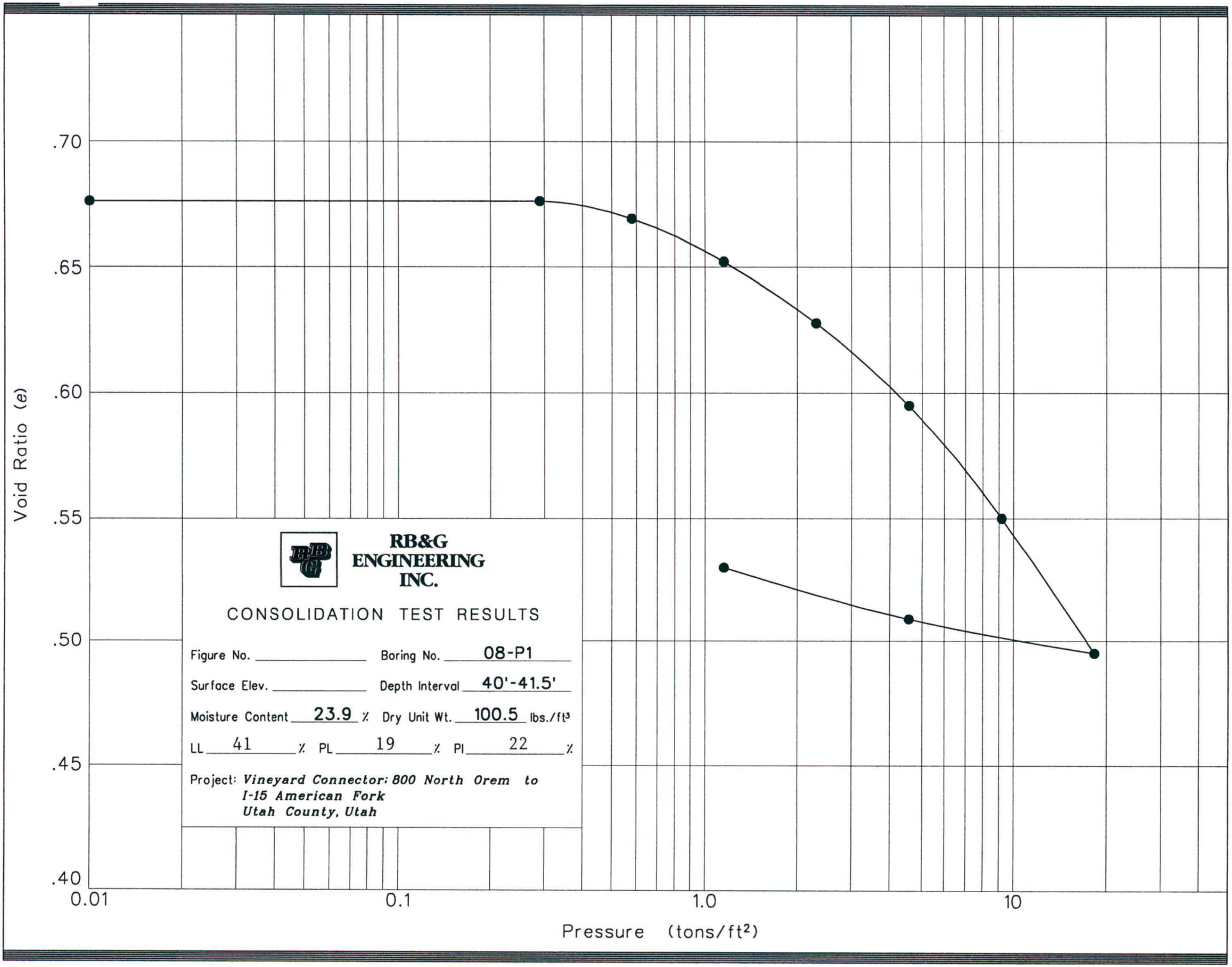


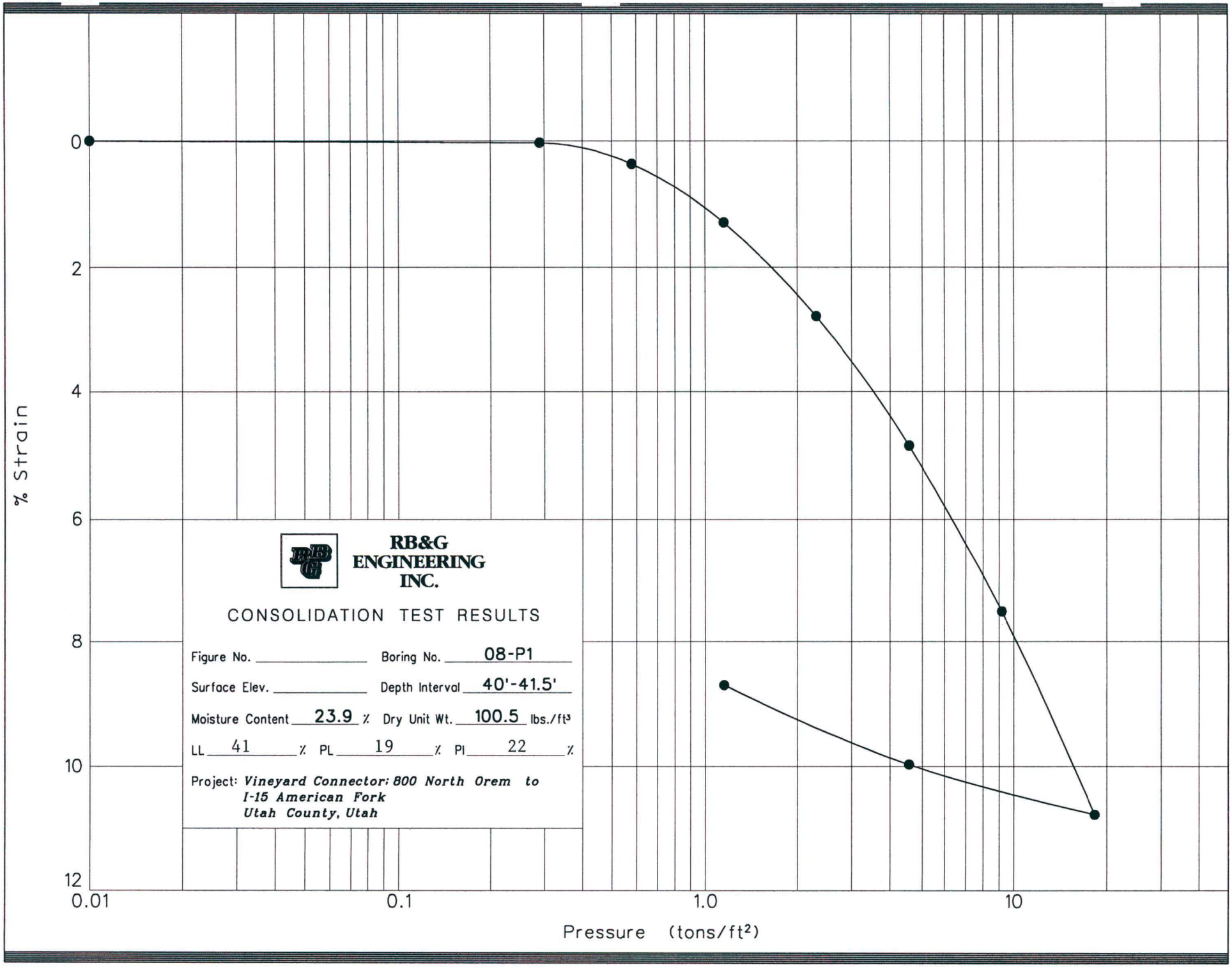
RB&G ENGINEERING, INC.

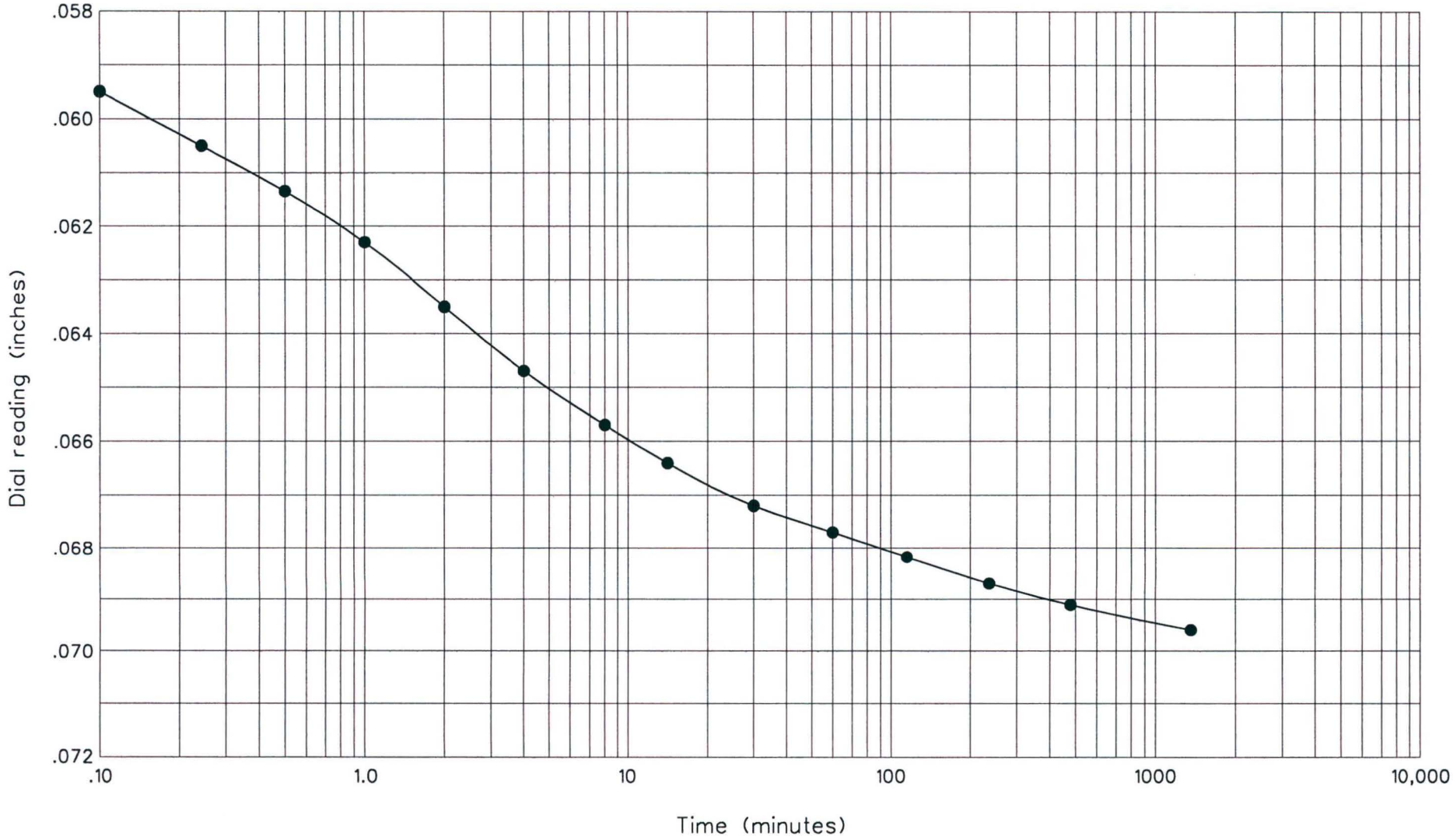
Hole no.: 08-P1
Depth: 20'-21'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah


.70
.65
.60
.55
.50
.45
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P1
Surface Elev. _____ Depth Interval 40'-41.5'
Moisture Content 23.9 % Dry Unit Wt. 100.5 lbs./ft³
LL 41 % PL 19 % PI 22 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah


% Strain
0
2
4
6
8
10
12
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No.
Boring No. 08-P1
Surface Elev.
Depth Interval 40'-41.5'
Moisture Content 23.9 % Dry Unit Wt. 100.5 lbs./ft³
LL 41 % PL 19 % PI 22 %
Project: Vineyard Connector: 800 North Orem to I-15 American Fork
Utah County, Utah



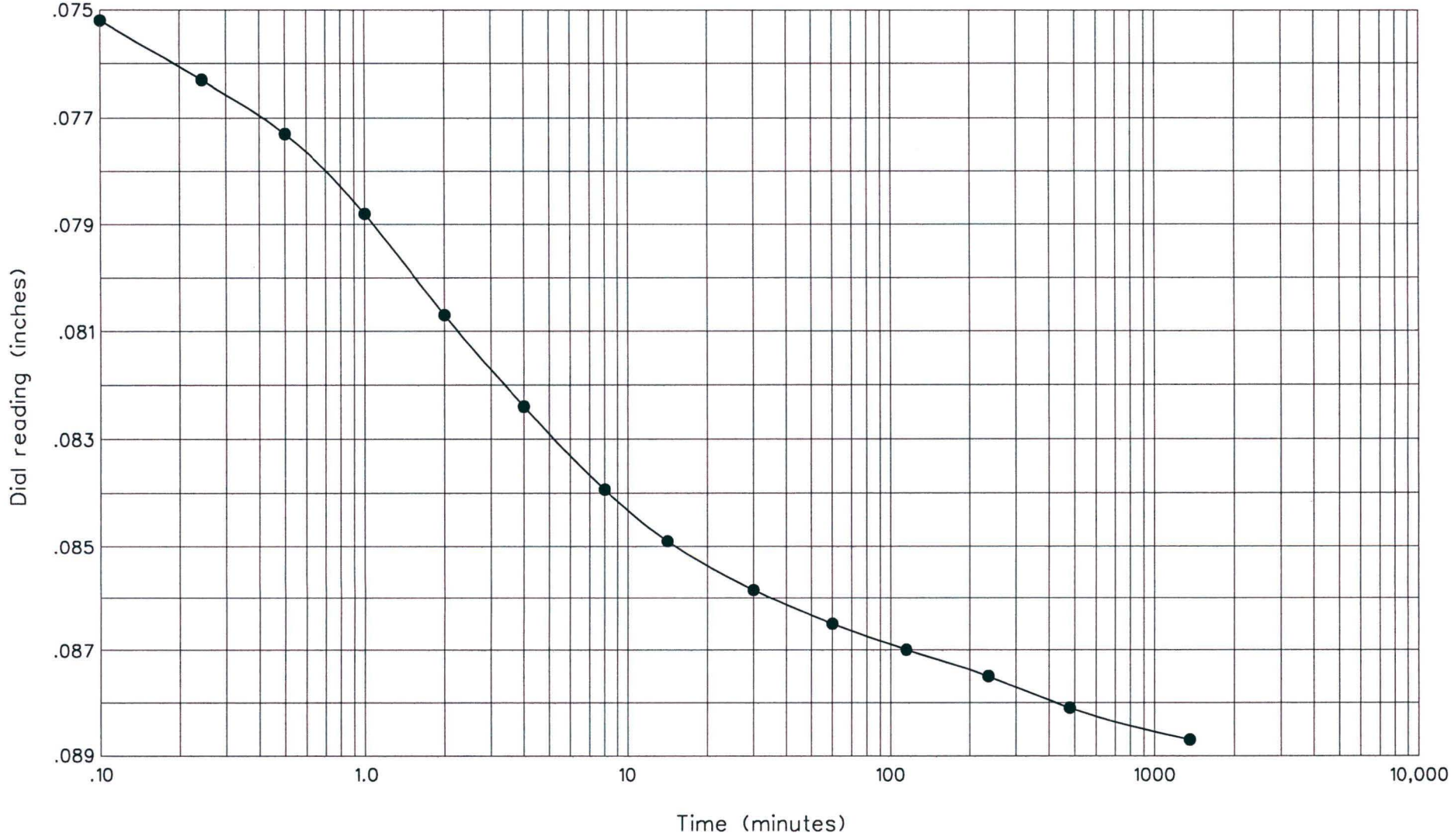
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P1
Depth: 40'-41.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



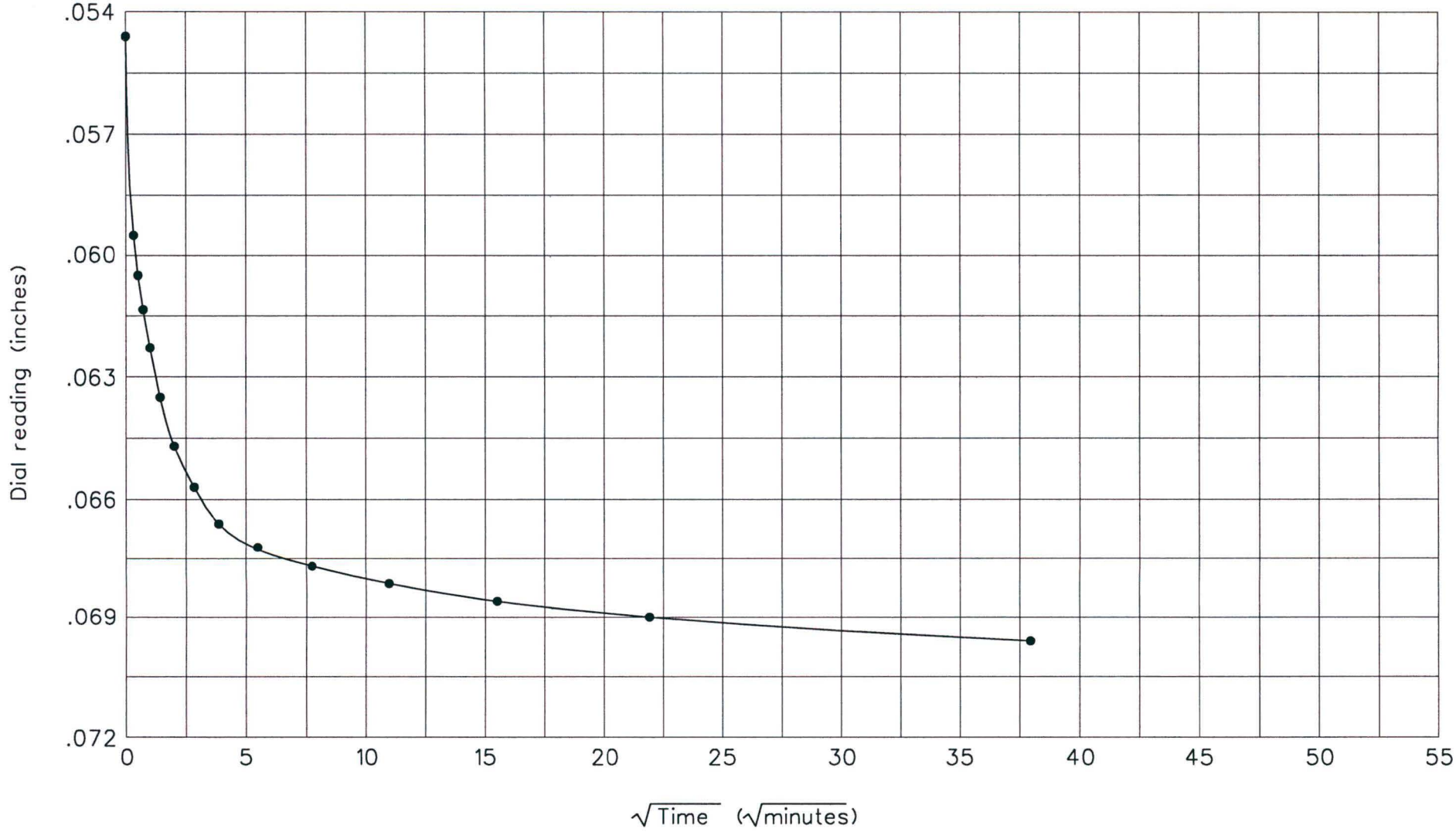
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P1
Depth: 40'-41.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



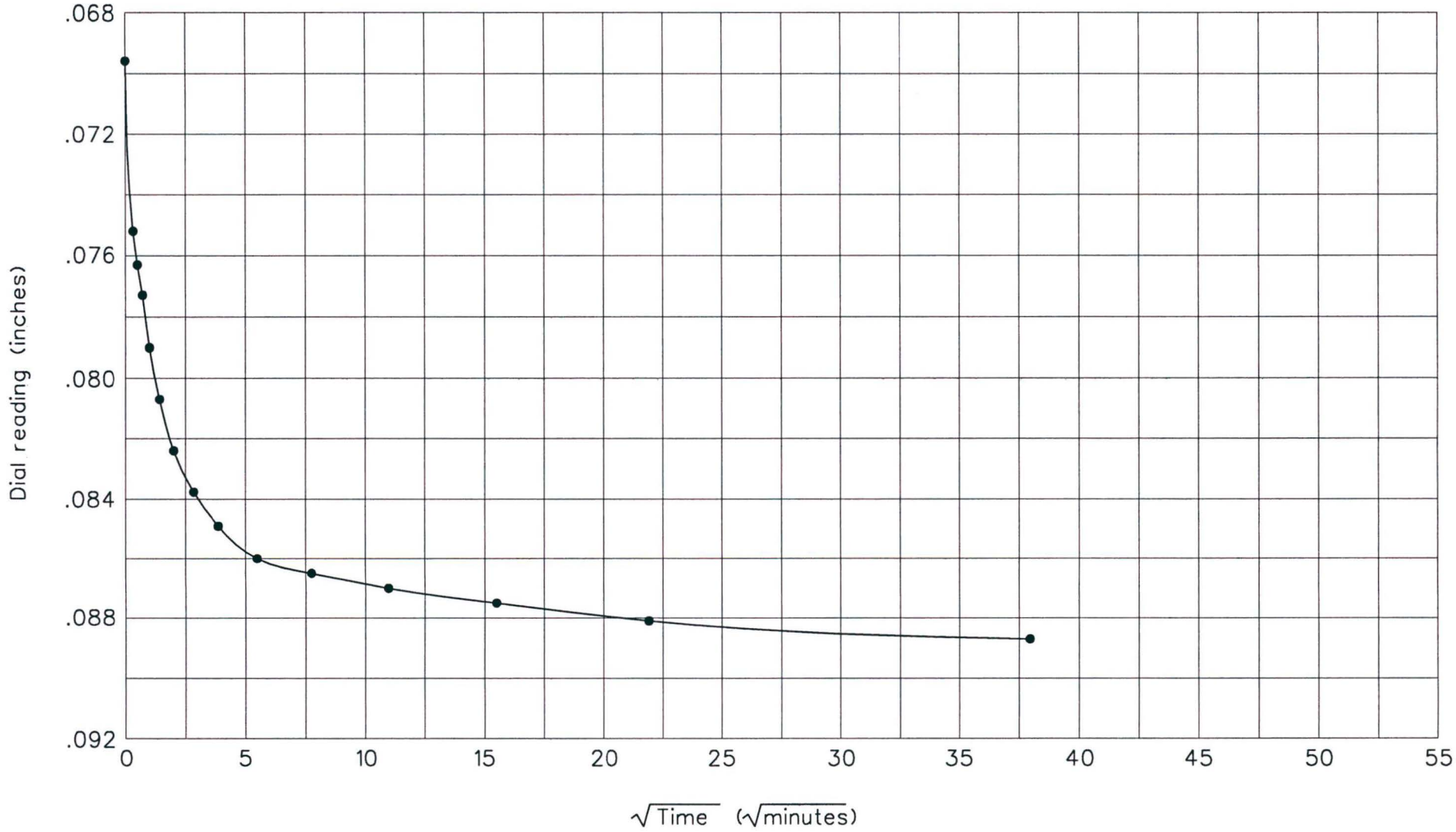
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P1
Depth: 40'-41.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



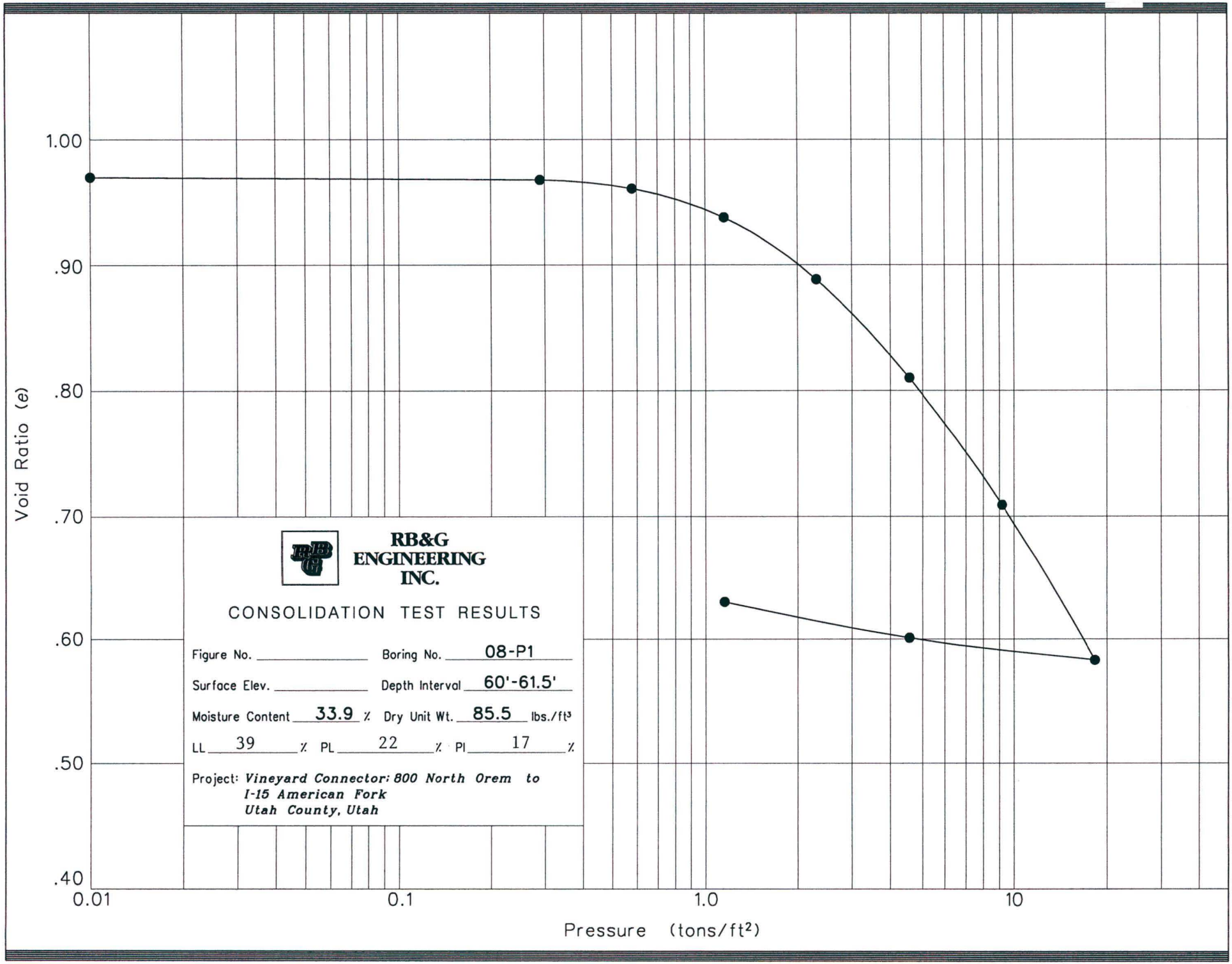
RB&G ENGINEERING INC.
Provo, Utah

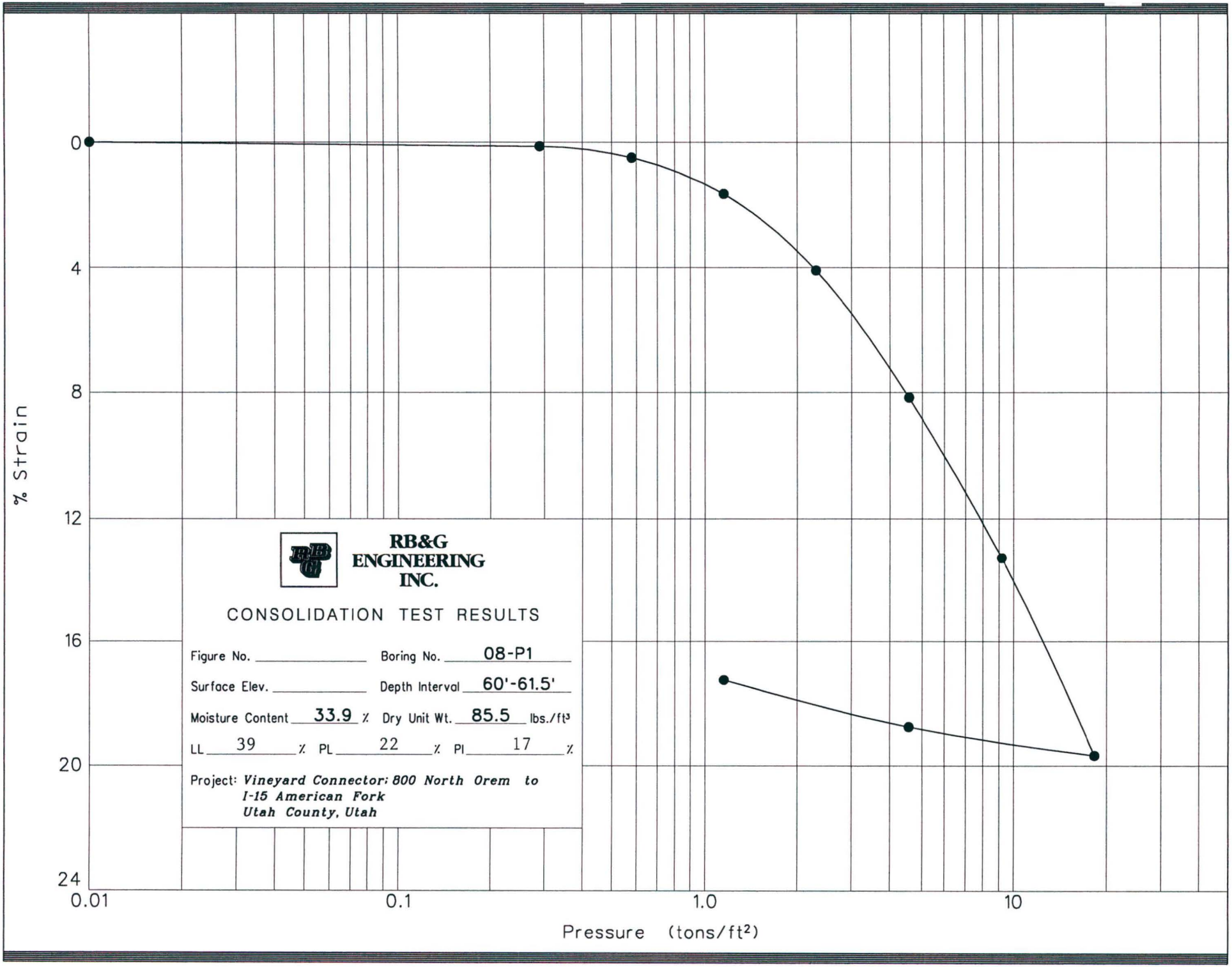
Hole no.: 08-P1
Depth: 40'-41.5'
Load: 2.30 to 4.60 tons

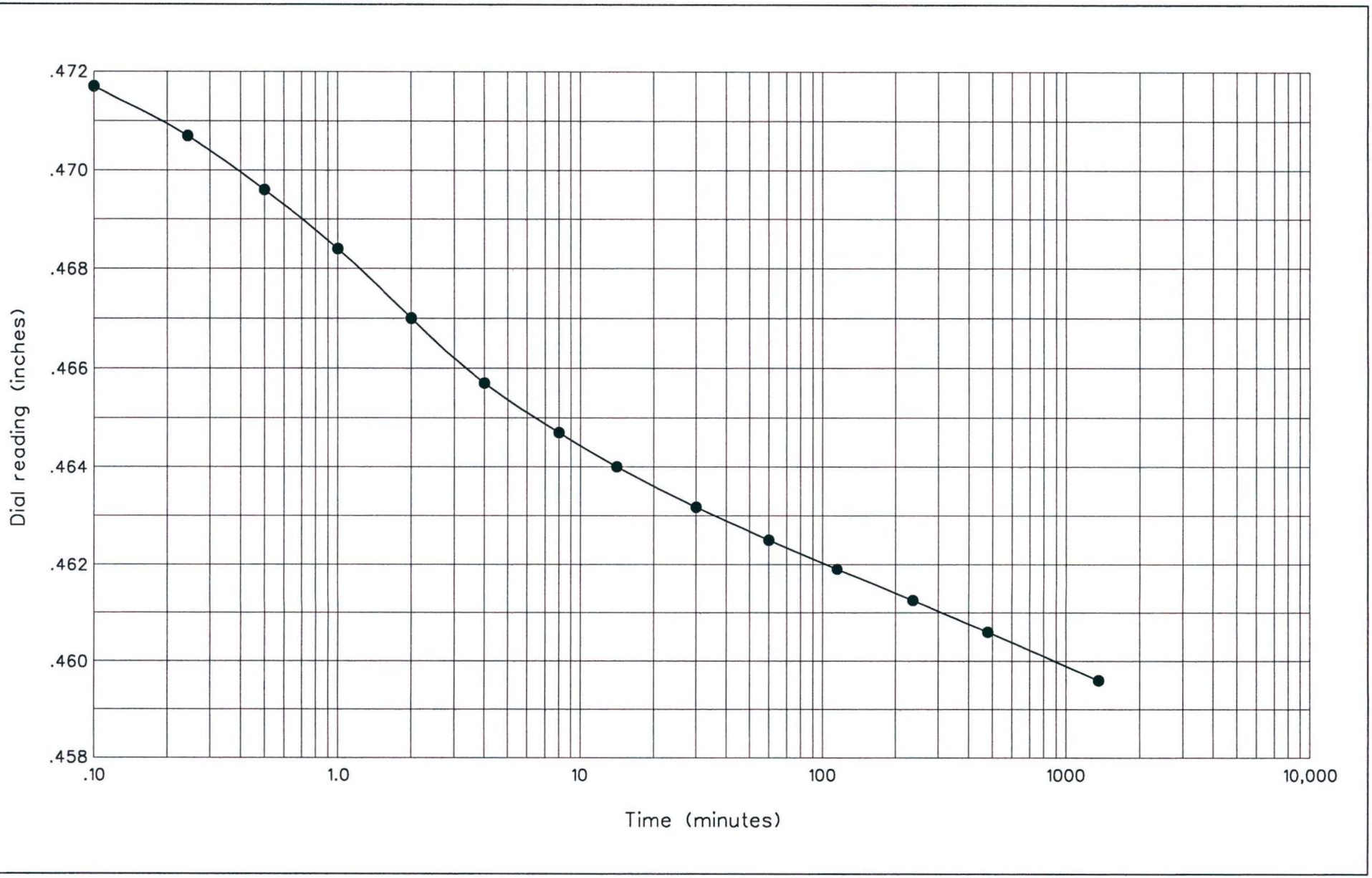
TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure


1.00
.90
.80
.70
.60
.50
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P1
Surface Elev. _____ Depth Interval 60'-61.5'
Moisture Content 33.9 % Dry Unit Wt. 85.5 lbs./ft³
LL 39 % PL 22 % PI 17 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah


0
4
8
12
16
20
24
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No.
Boring No. 08-P1
Surface Elev.
Depth Interval 60'-61.5'
Moisture Content 33.9 % Dry Unit Wt. 85.5 lbs./ft³
LL 39 % PL 22 % PI 17 %
Project: Vineyard Connector: 800 North Orem to I-15 American Fork
Utah County, Utah



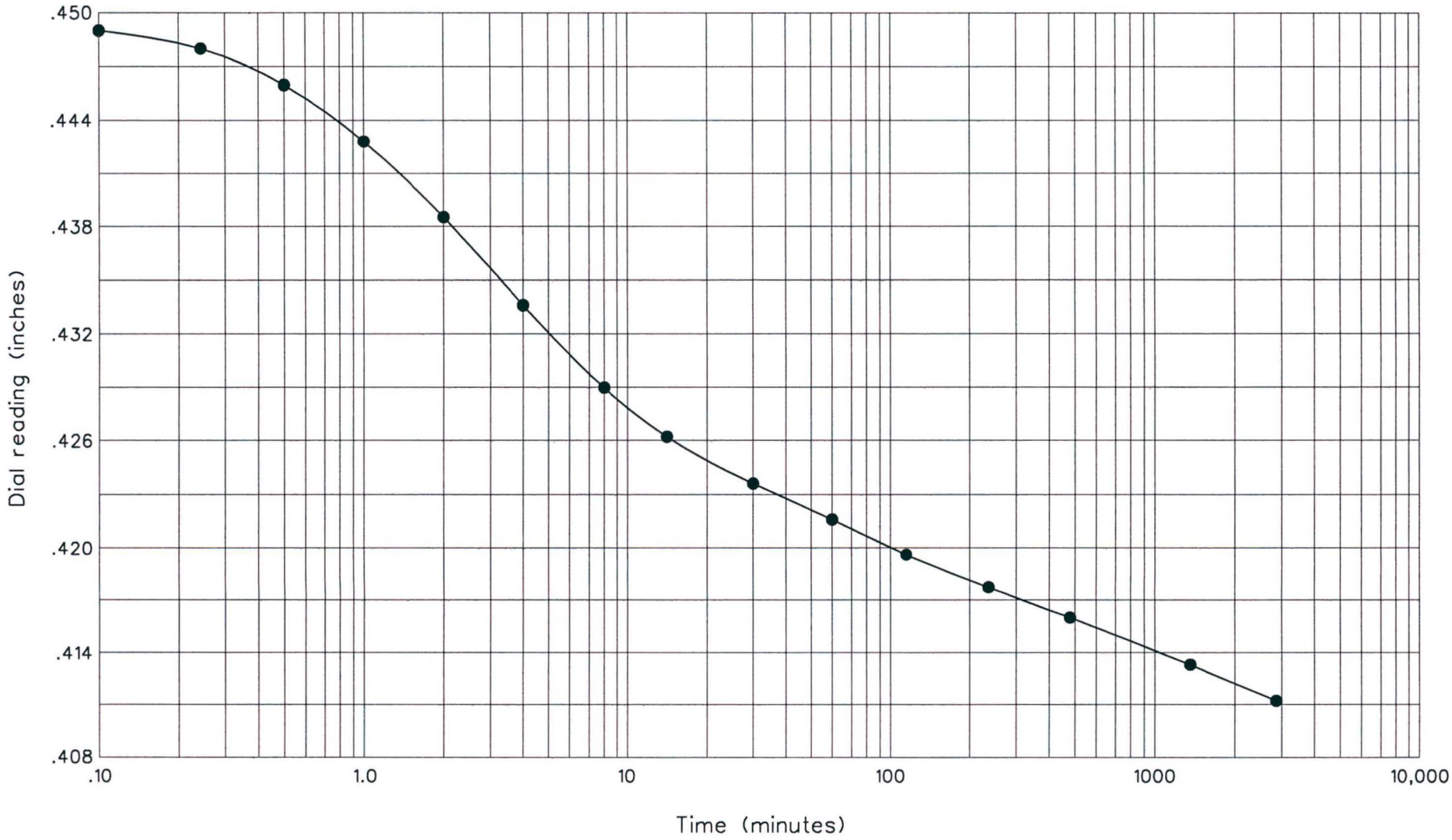
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P1
Depth: 60'-61.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



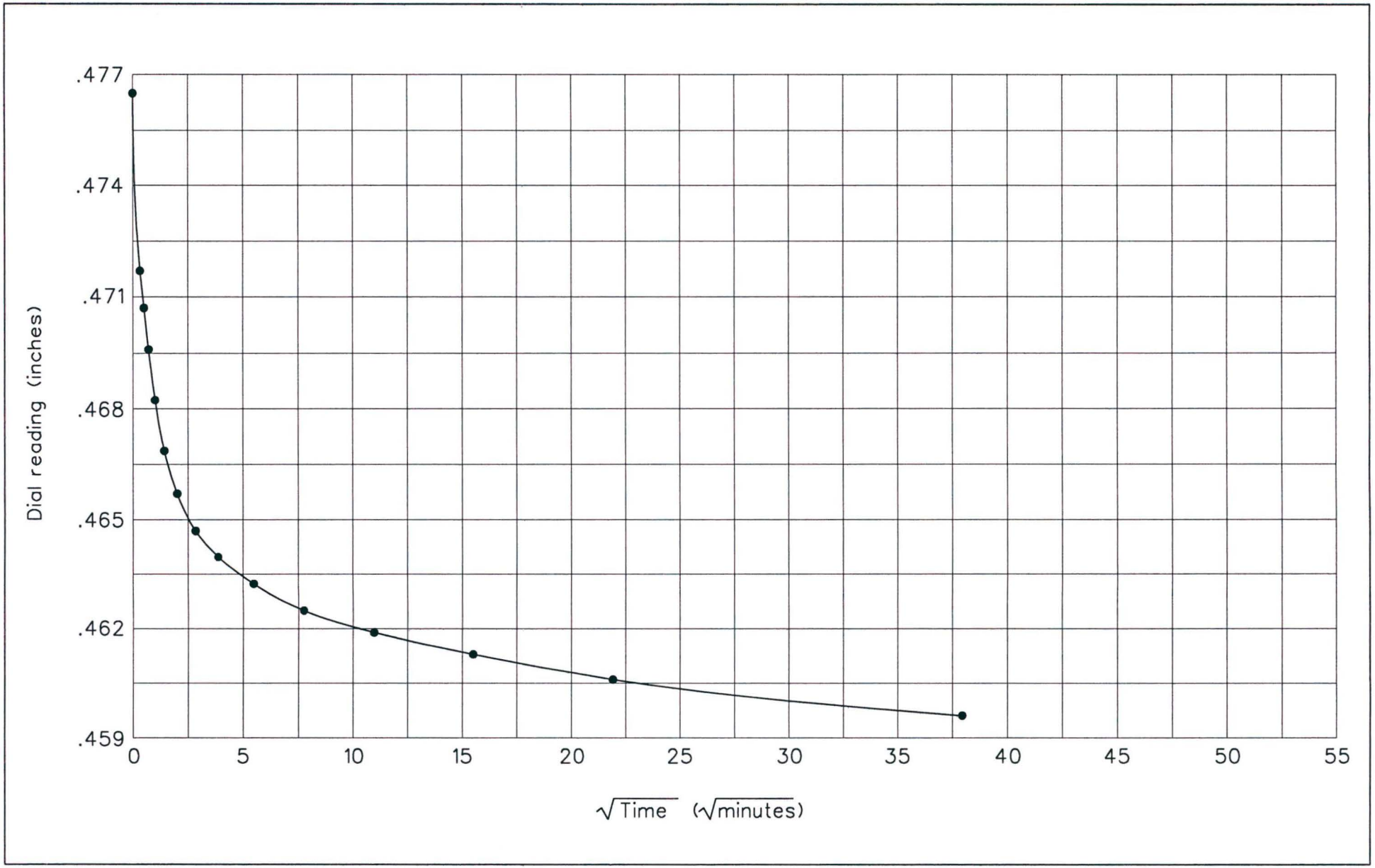
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P1
Depth: 60'-61.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



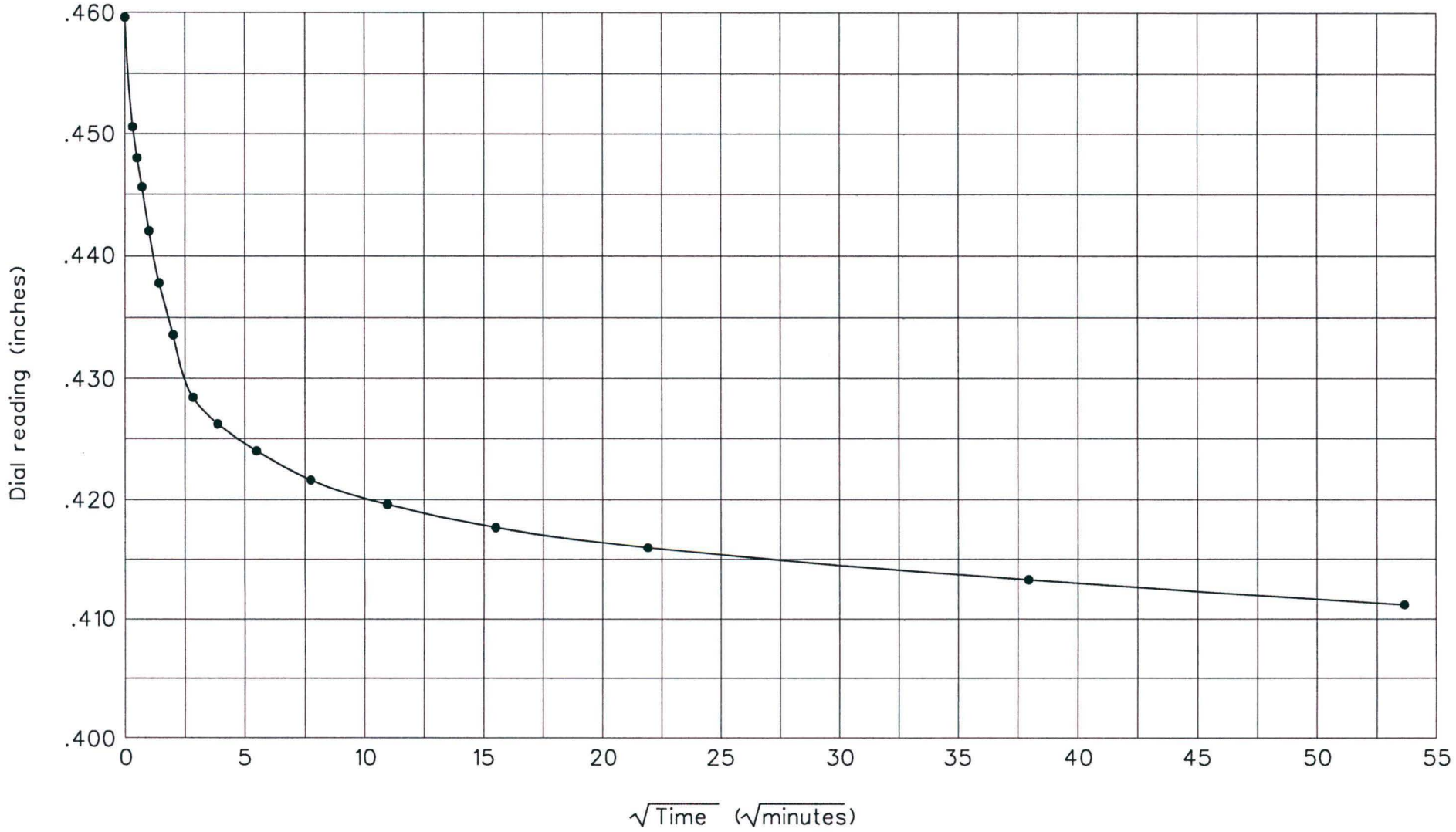
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P1
Depth: 60'-61.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



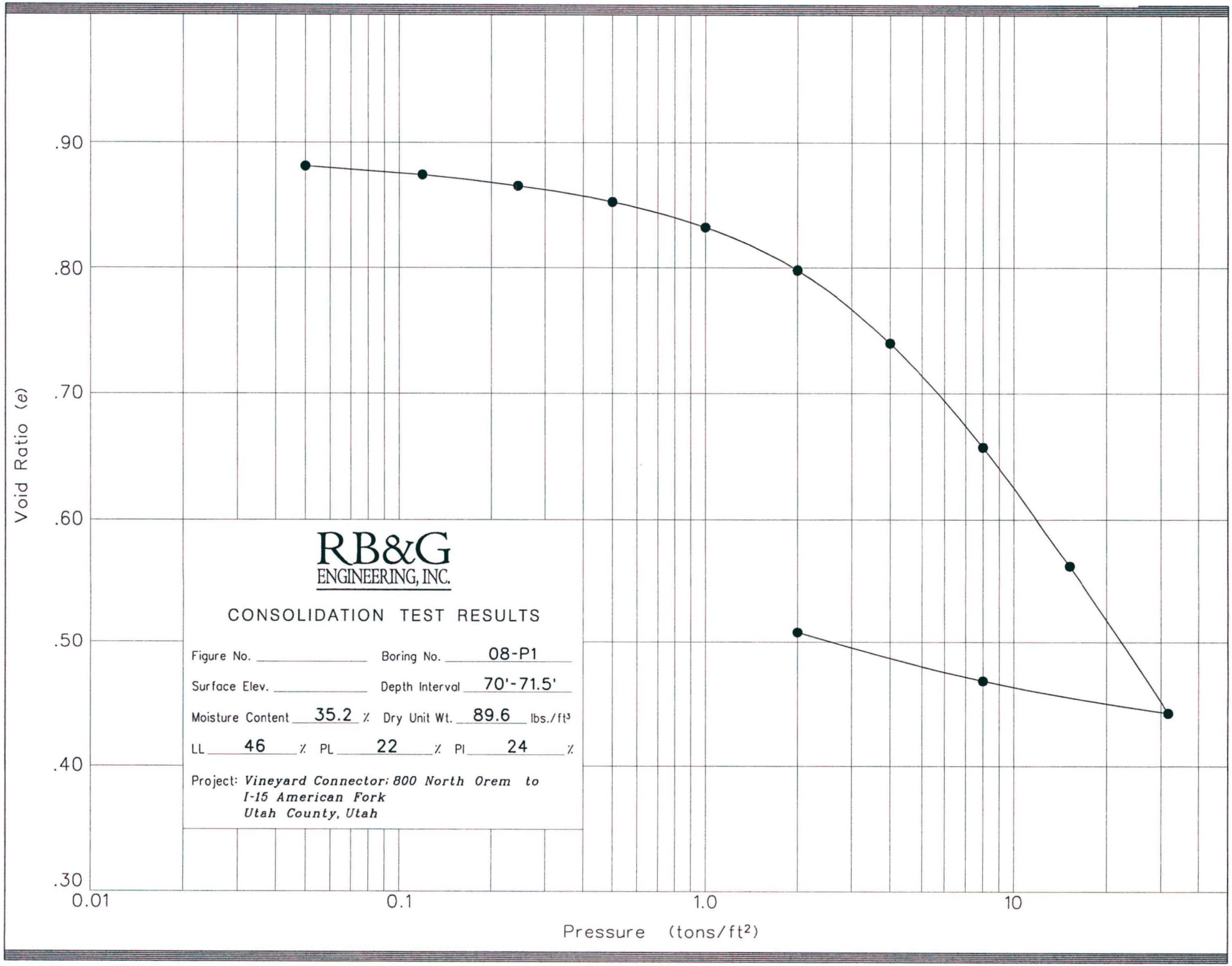
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P1
Depth: 60'-61.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

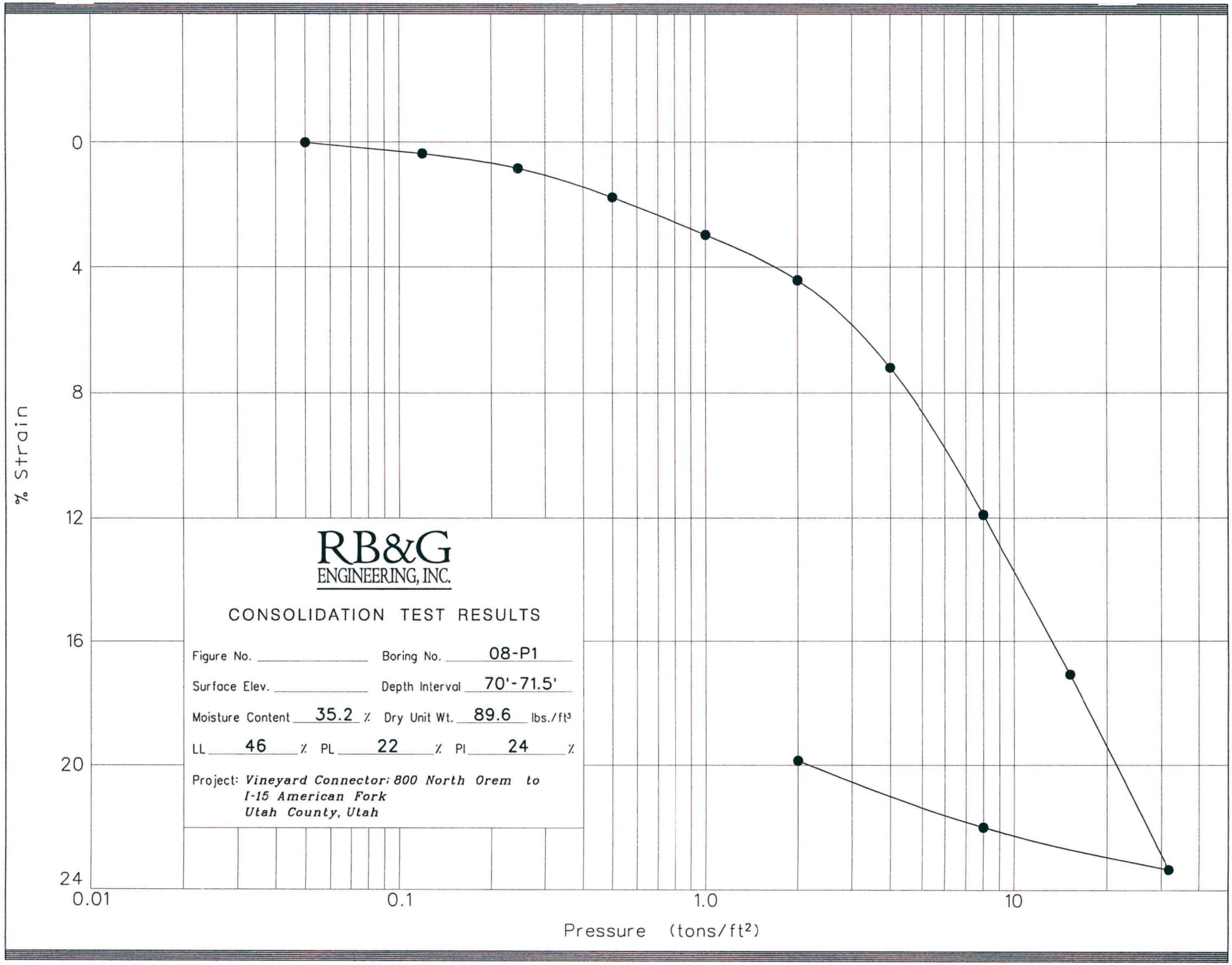
Figure No. _____ Boring No. 08-P1

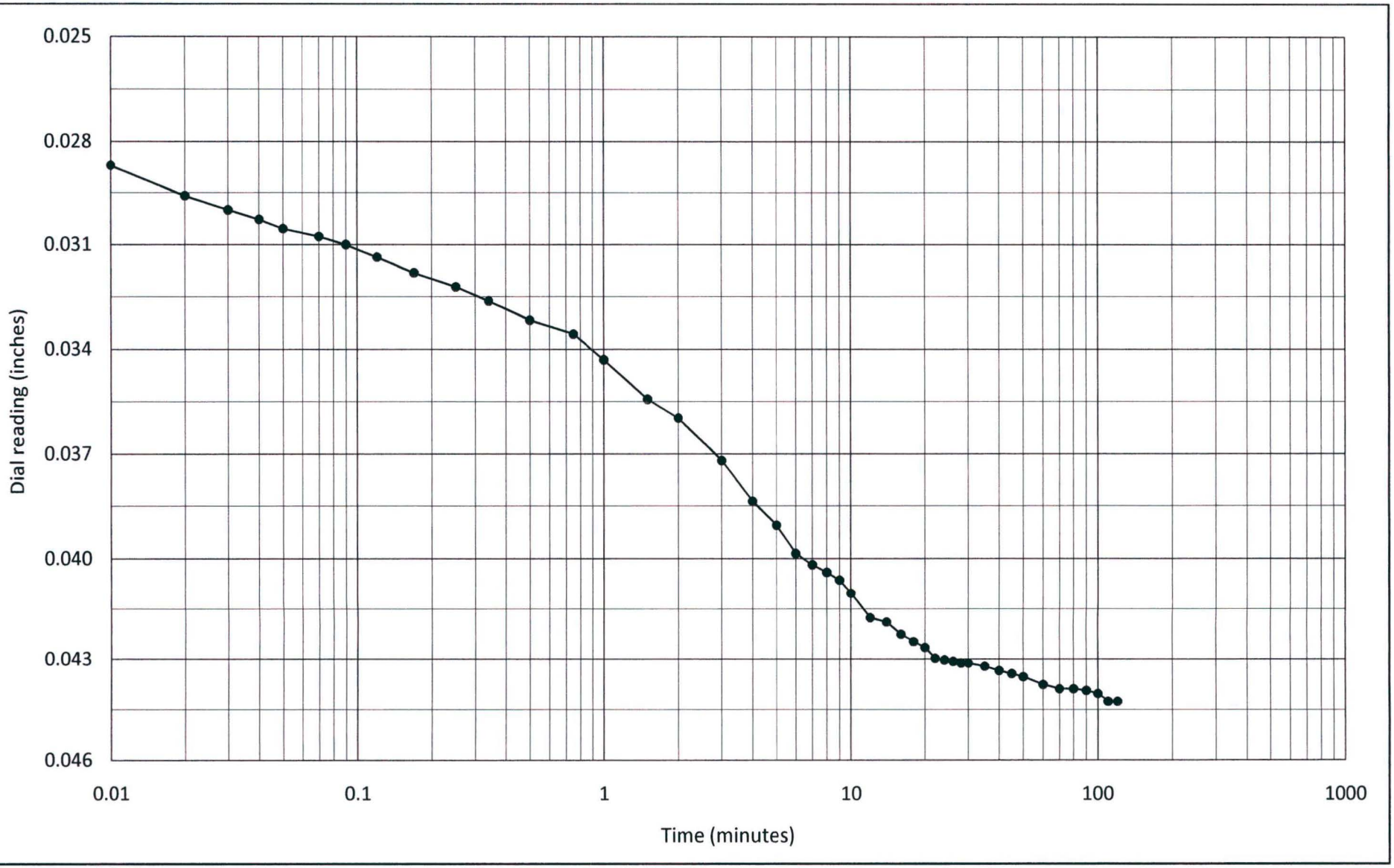
Surface Elev. _____ Depth Interval 70'-71.5'

Moisture Content 35.2 % Dry Unit Wt. 89.6 lbs./ft³

LL 46 % PL 22 % PI 24 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*


% Strain
0
4
8
12
16
20
24
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P1
Surface Elev. _____ Depth Interval 70'-71.5'
Moisture Content 35.2 % Dry Unit Wt. 89.6 lbs./ft³
LL 46 % PL 22 % PI 24 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah

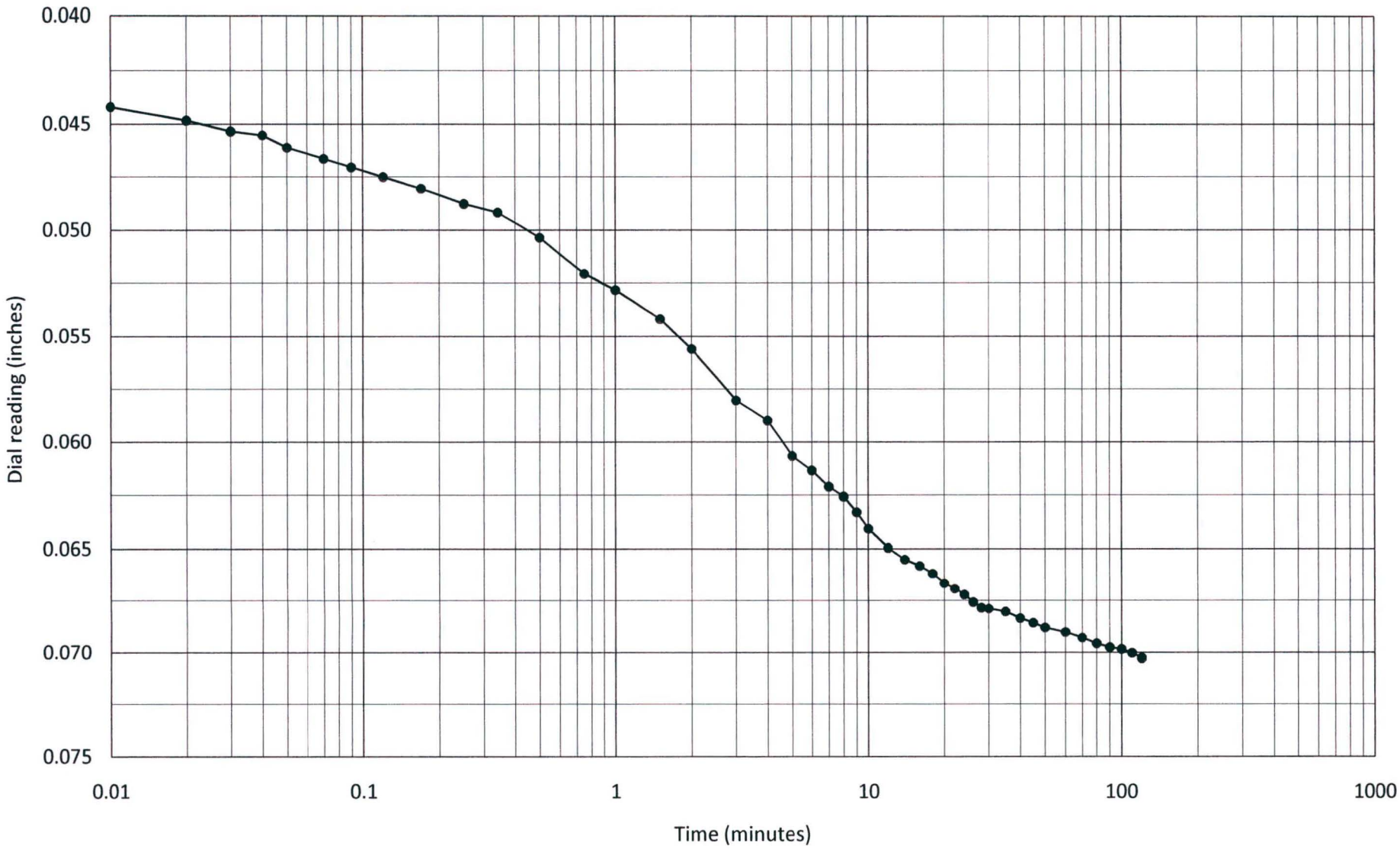


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

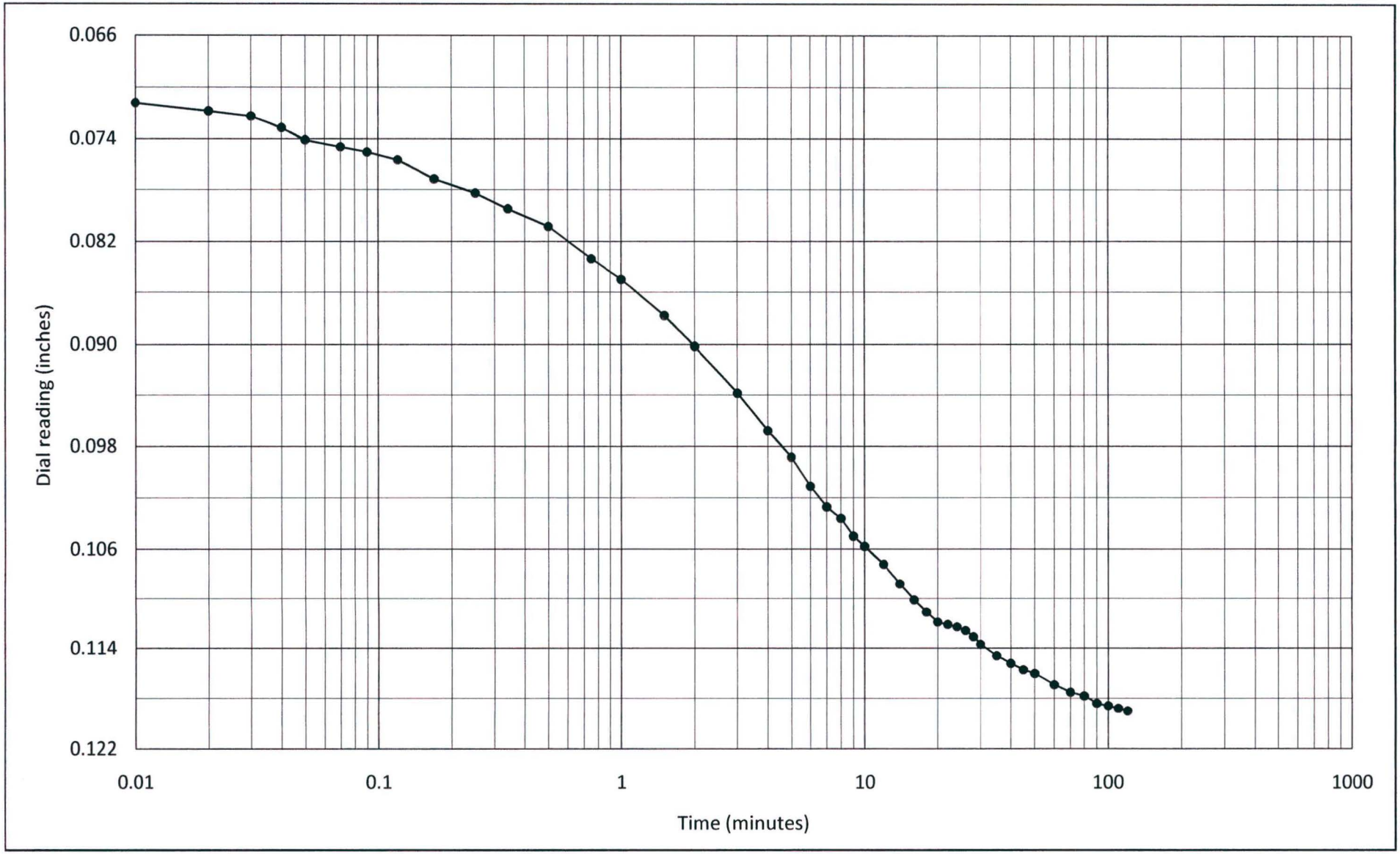


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

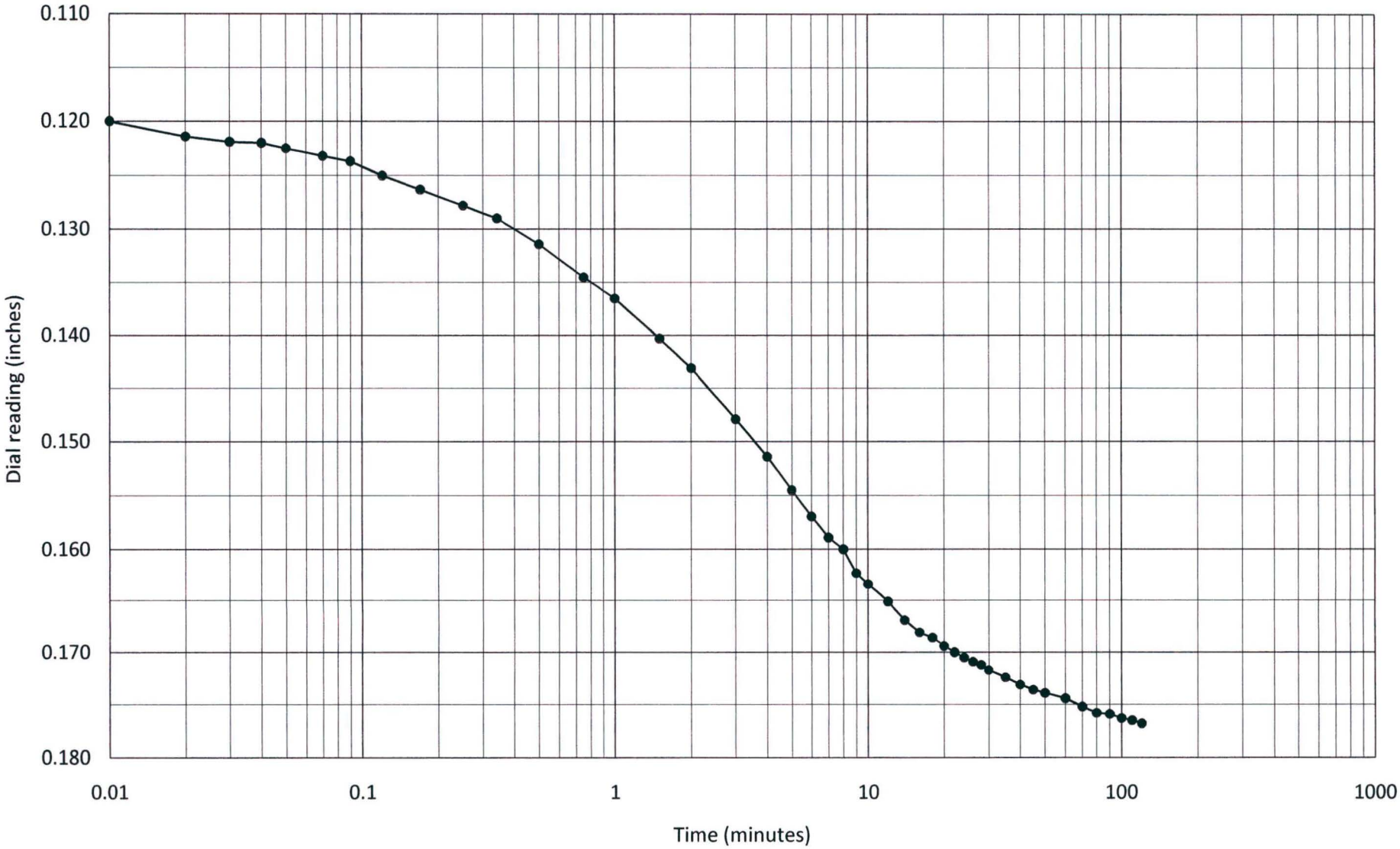


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

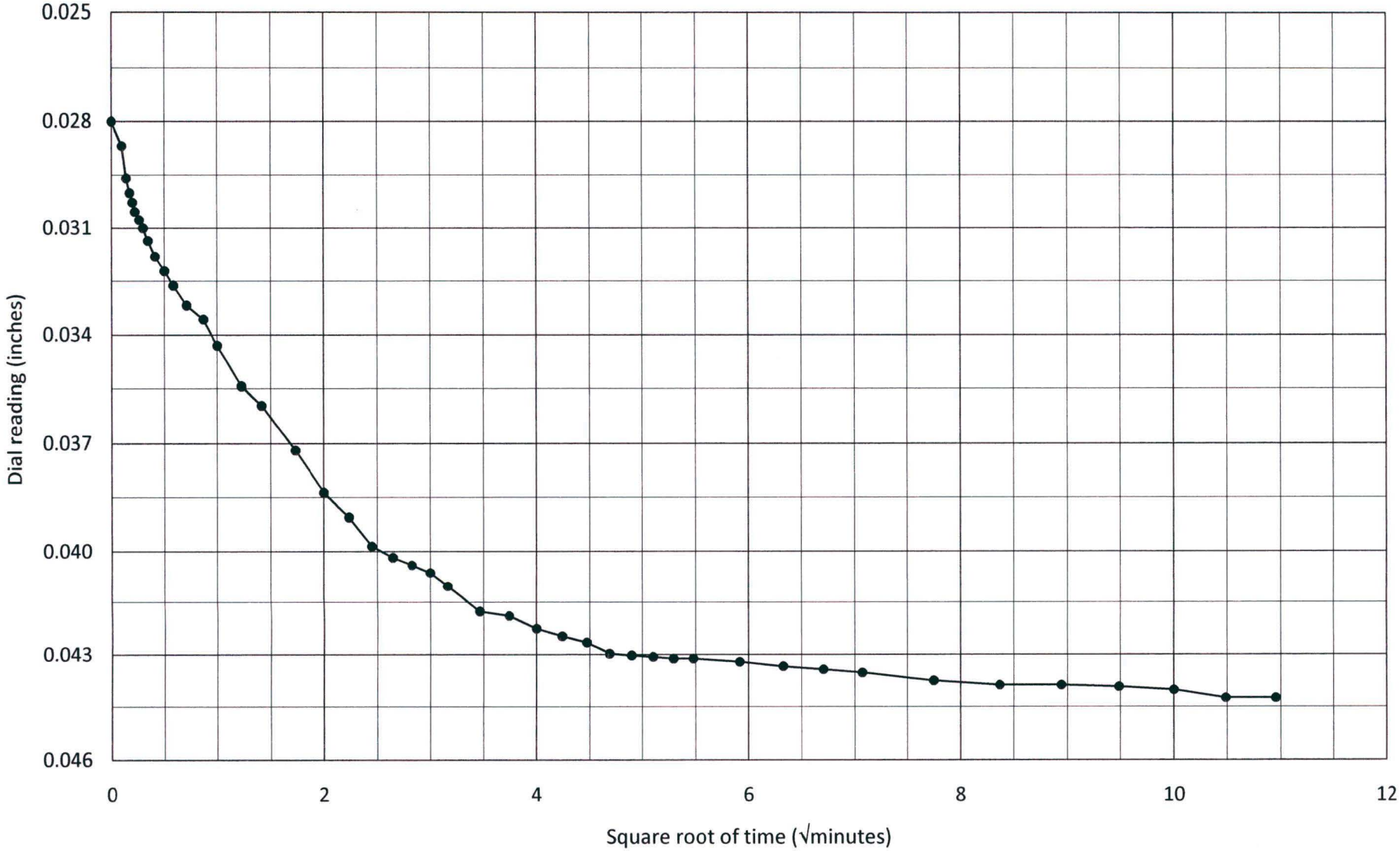


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

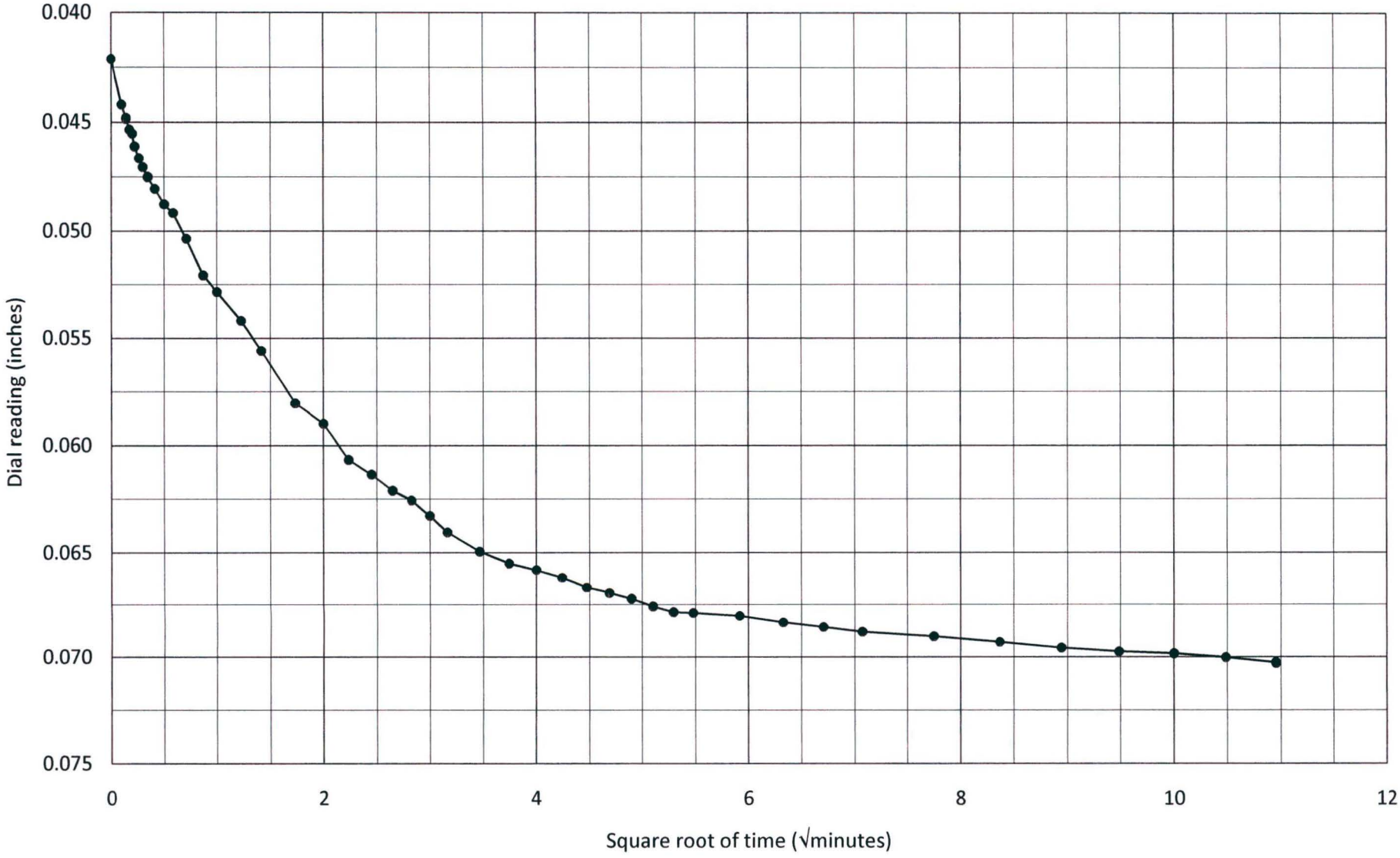


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

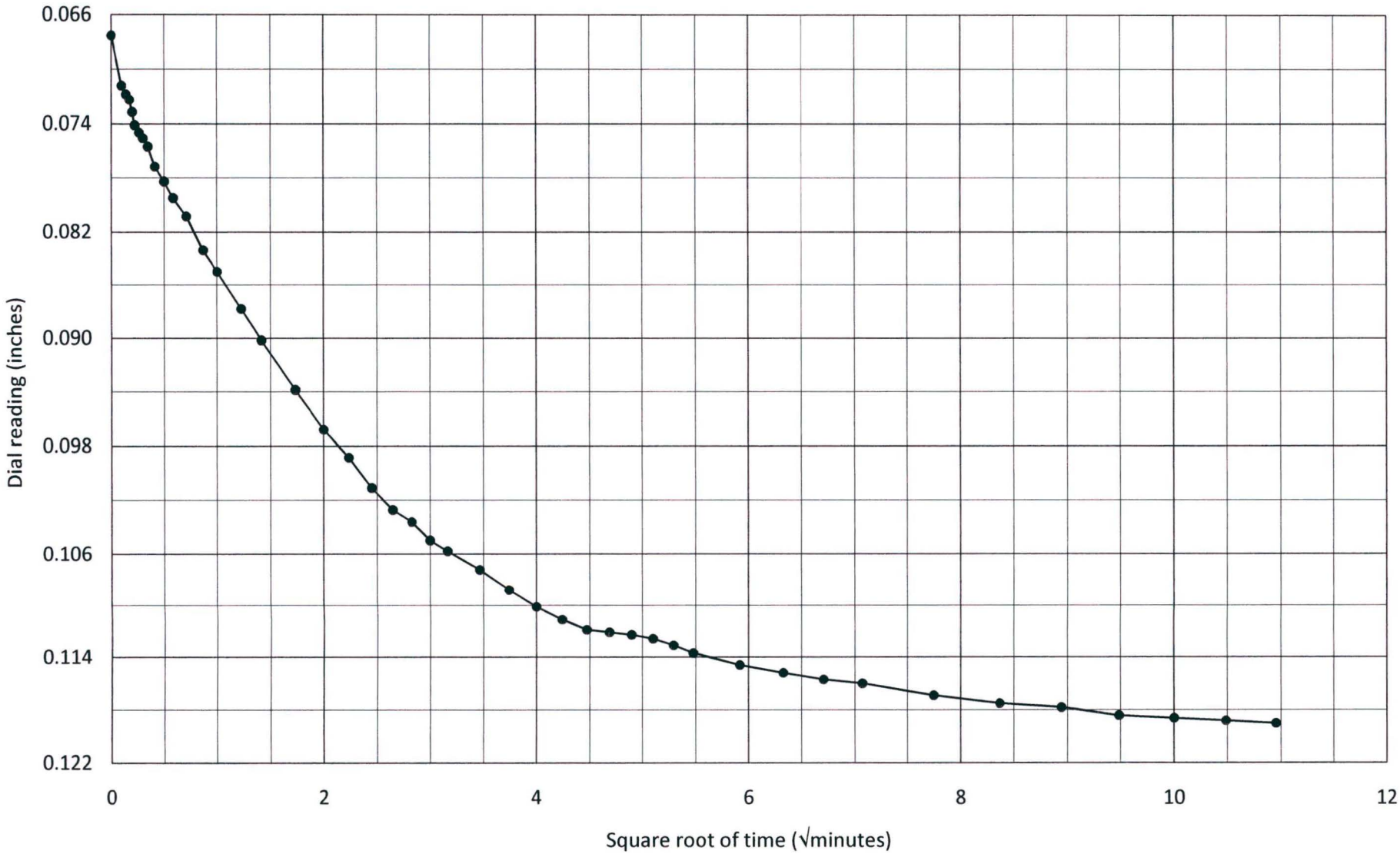


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

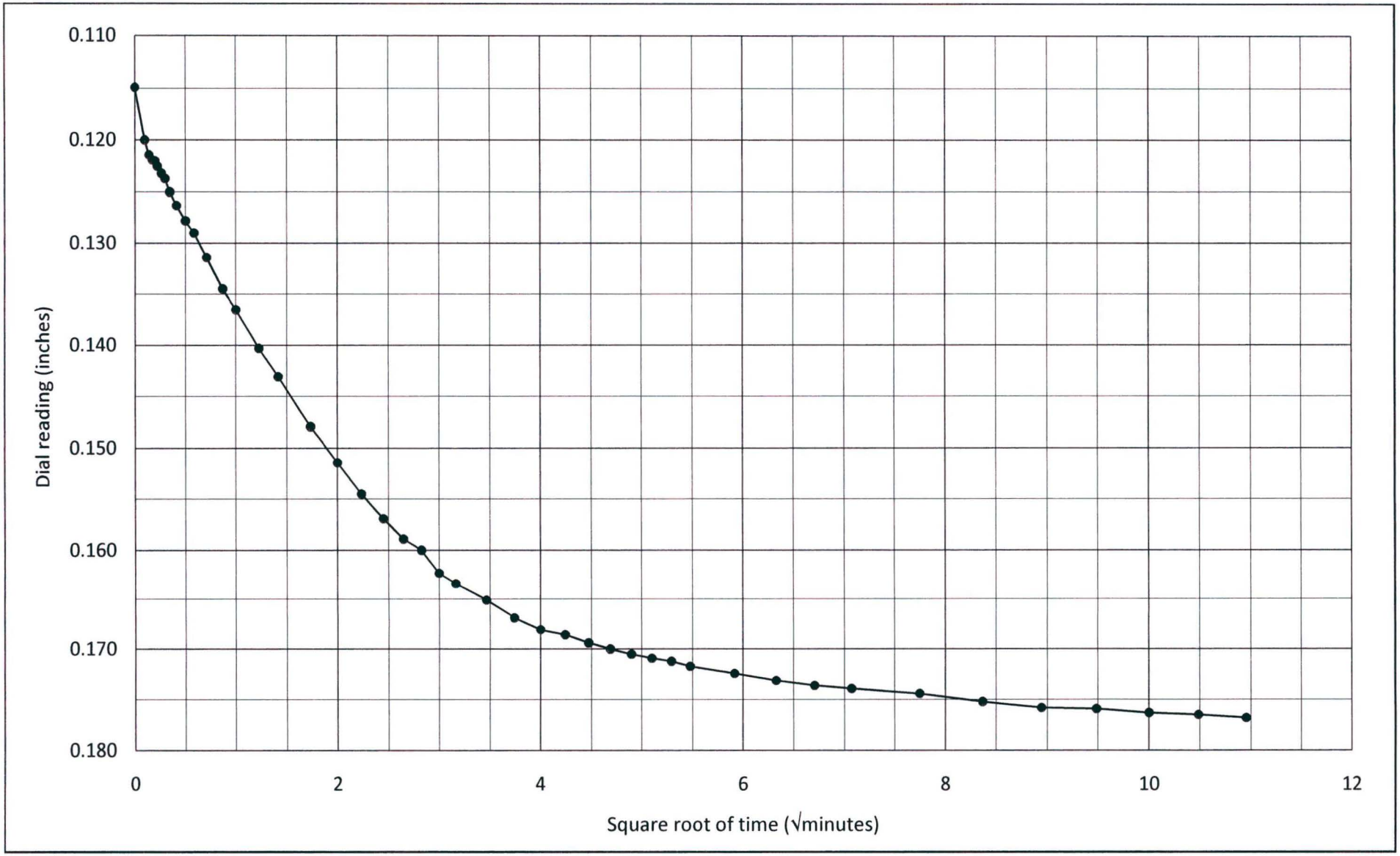


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah



RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Table 1

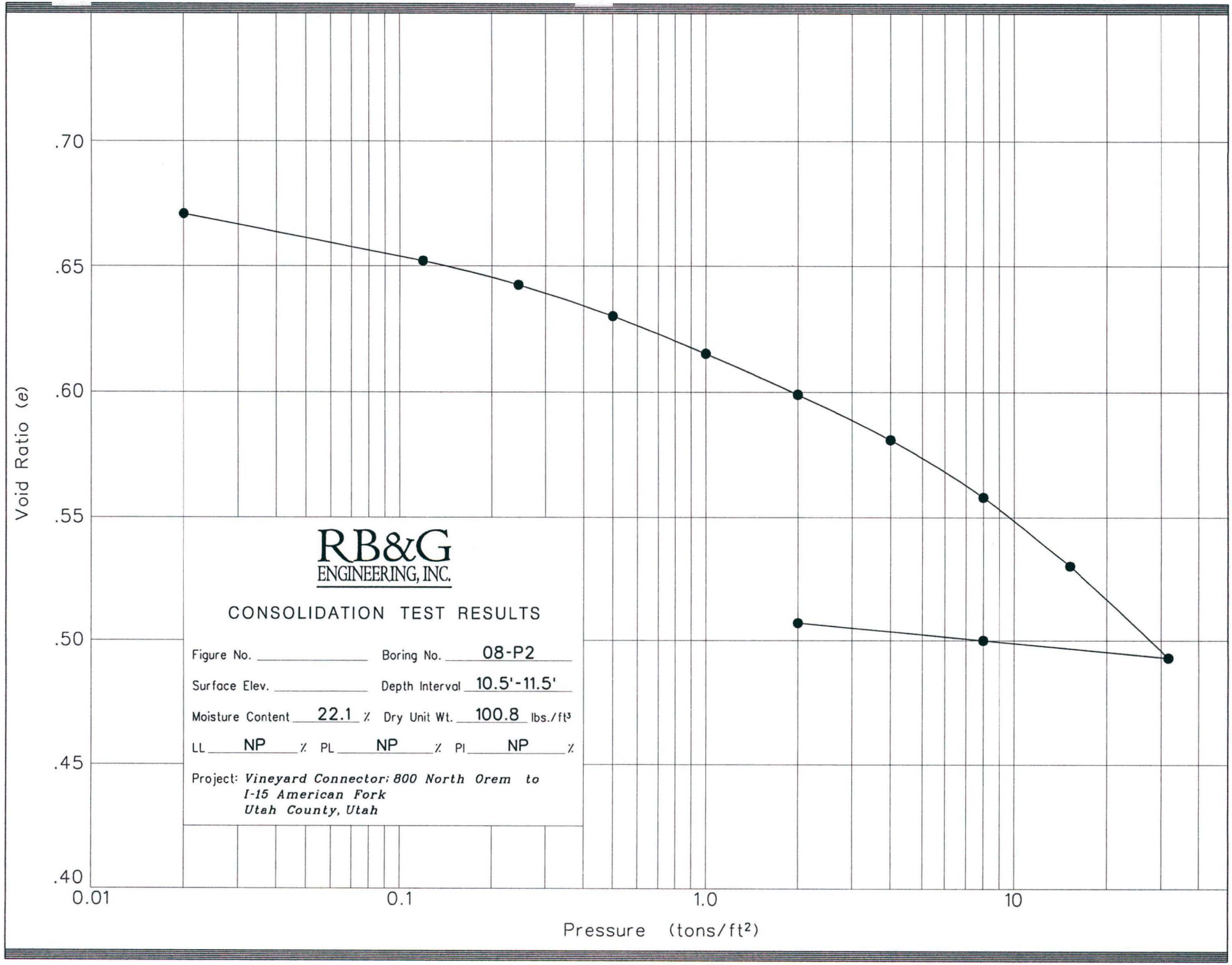
SUMMARY OF TEST DATA

PROJECT Vineyard Connector; 800 North Orem to I-15 American Fork — PROJECT NO. 200701-048

LOCATION Utah County, Utah — FEATURE Foundations

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	STANDARD PENETRATION BLOWS PER FOOT	IN-PLACE		UNCONFINED COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO Classification)
			DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
08-P2	5.1-5.6	Shelby		25.4		40	18	22	0	2	98	CL (A-6(23))
	5.6-6.5	Shelby		24.0				NP	0	72	28	SM (A-2-4(0))
	10-10.7	Shelby		20.1				NP	0	64	36	SM (A-4(0))
	10.7-11.5	Shelby	100.8	22.1				NP	0	34	66	ML (A-4(0))
	11.5-13	11		26.9				NP	0	86	14	SM (A-2-4(0))
	20-20.6	Shelby		19.2				NP	0	61	39	SM (A-4(0))
	20.6-21.5	Shelby	96.5	27.5	1963	32	18	14	0	2	98	CL (A-6(13))
	30-31.5	Shelby	97.4	22.0	1720	27	16	11	0	20	80	CL (A-6(7))
	35-36.5	23		23.9				NP	0	75	25	SM (A-2-4(0))
	40-41.5	Shelby		21.7				NP	0	72	28	SM (A-2-4(0))
	50-51.5	Shelby	79.4	41.3		46	22	24	0	0	100	CL (A-7-6(27))
	60-61.5	Shelby	78.1	41.4	2326	48	22	26	0	1	99	CL (A-7-6(29))
	70-71.5	Shelby	75.4	43.3		58	25	33	0	0	100	CH (A-7-6(38))

NP=Nonplastic



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

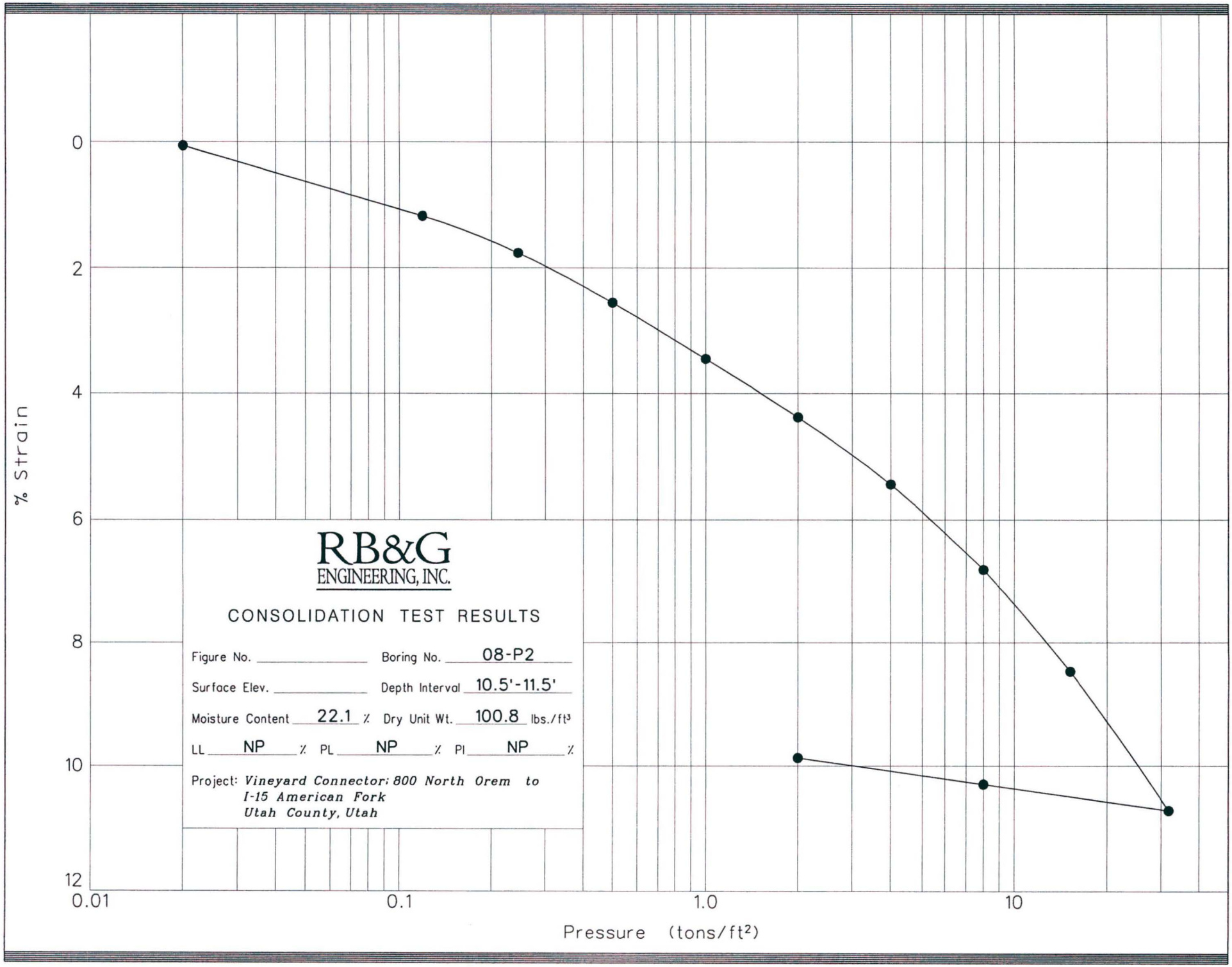
Figure No. _____ Boring No. 08-P2

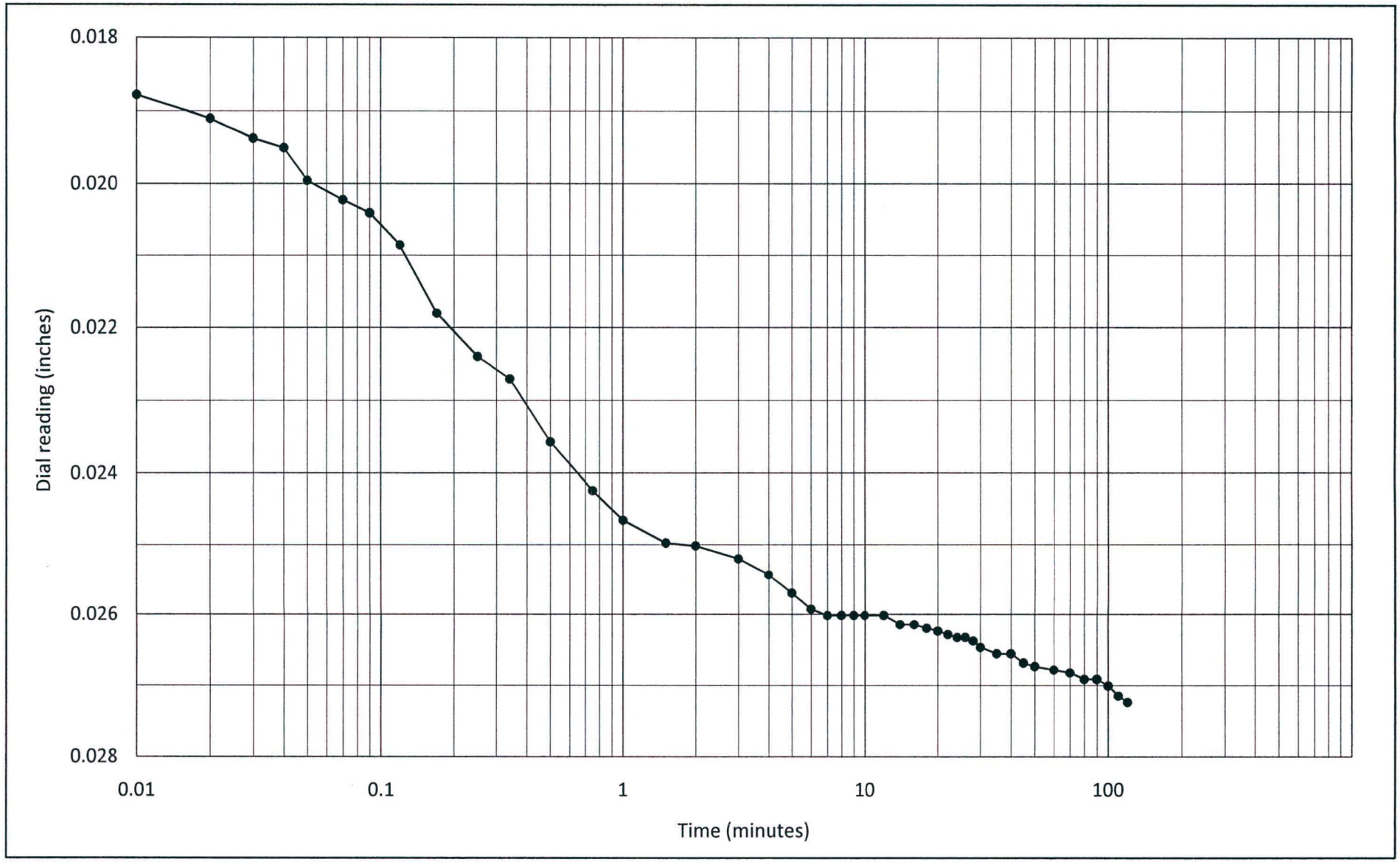
Surface Elev. _____ Depth Interval 10.5'-11.5'

Moisture Content 22.1 % Dry Unit Wt. 100.8 lbs./ft³

LL NP % PL NP % PI NP %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*


% Strain
0
2
4
6
8
10
12
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P2
Surface Elev. _____ Depth Interval 10.5'-11.5'
Moisture Content 22.1 % Dry Unit Wt. 100.8 lbs./ft³
LL NP % PL NP % PI NP %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah

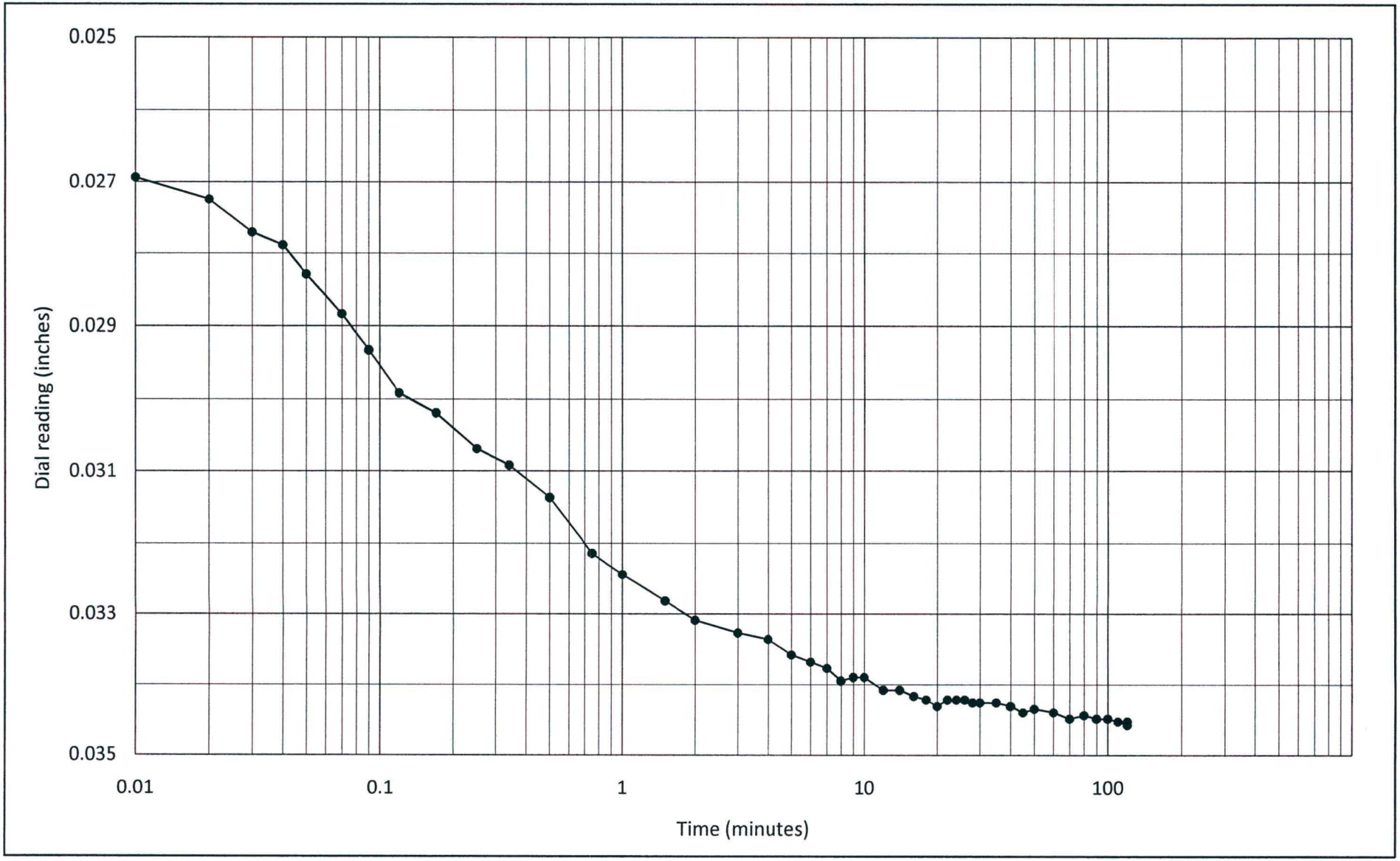


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 0.25 to 0.5 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

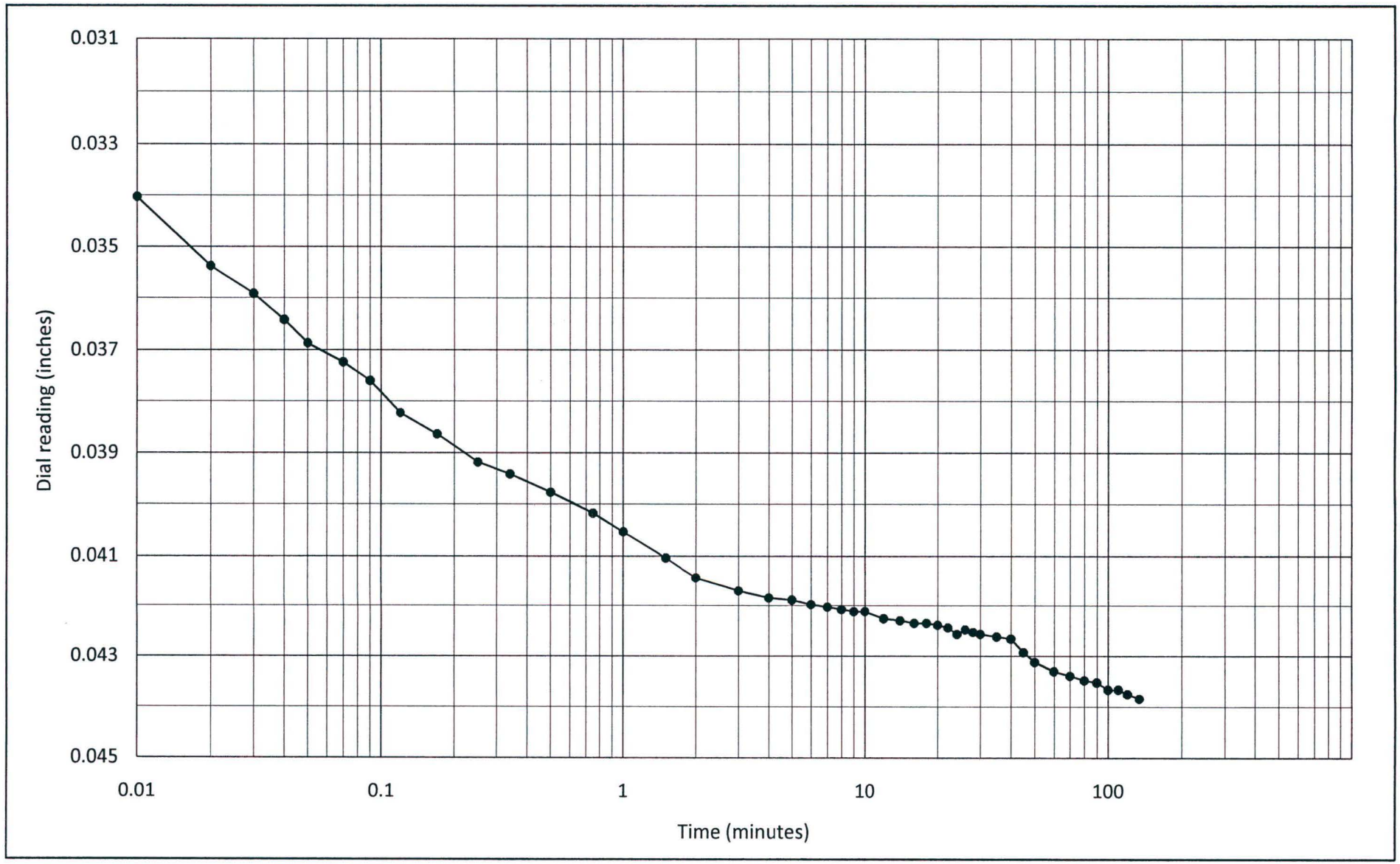


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

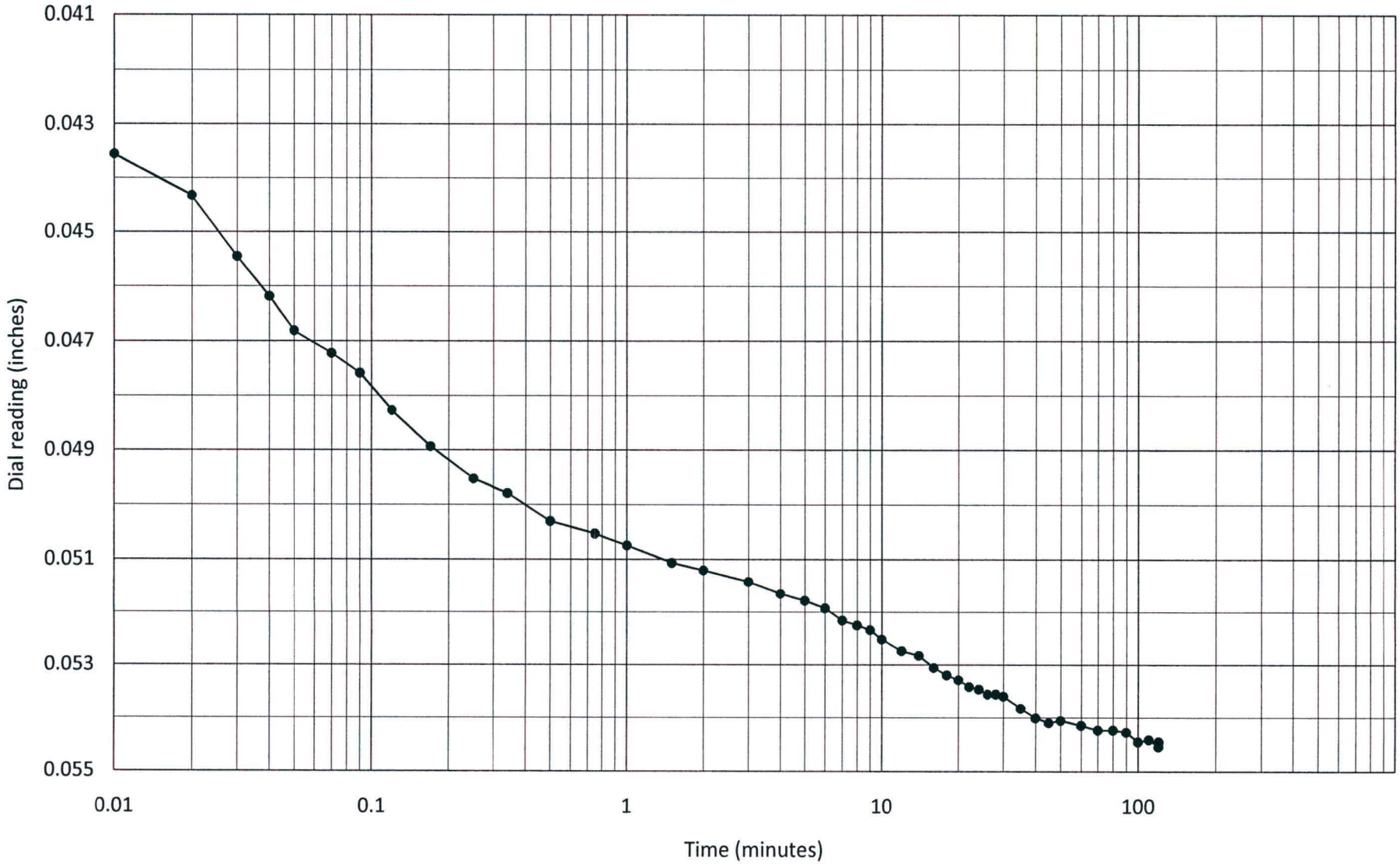


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

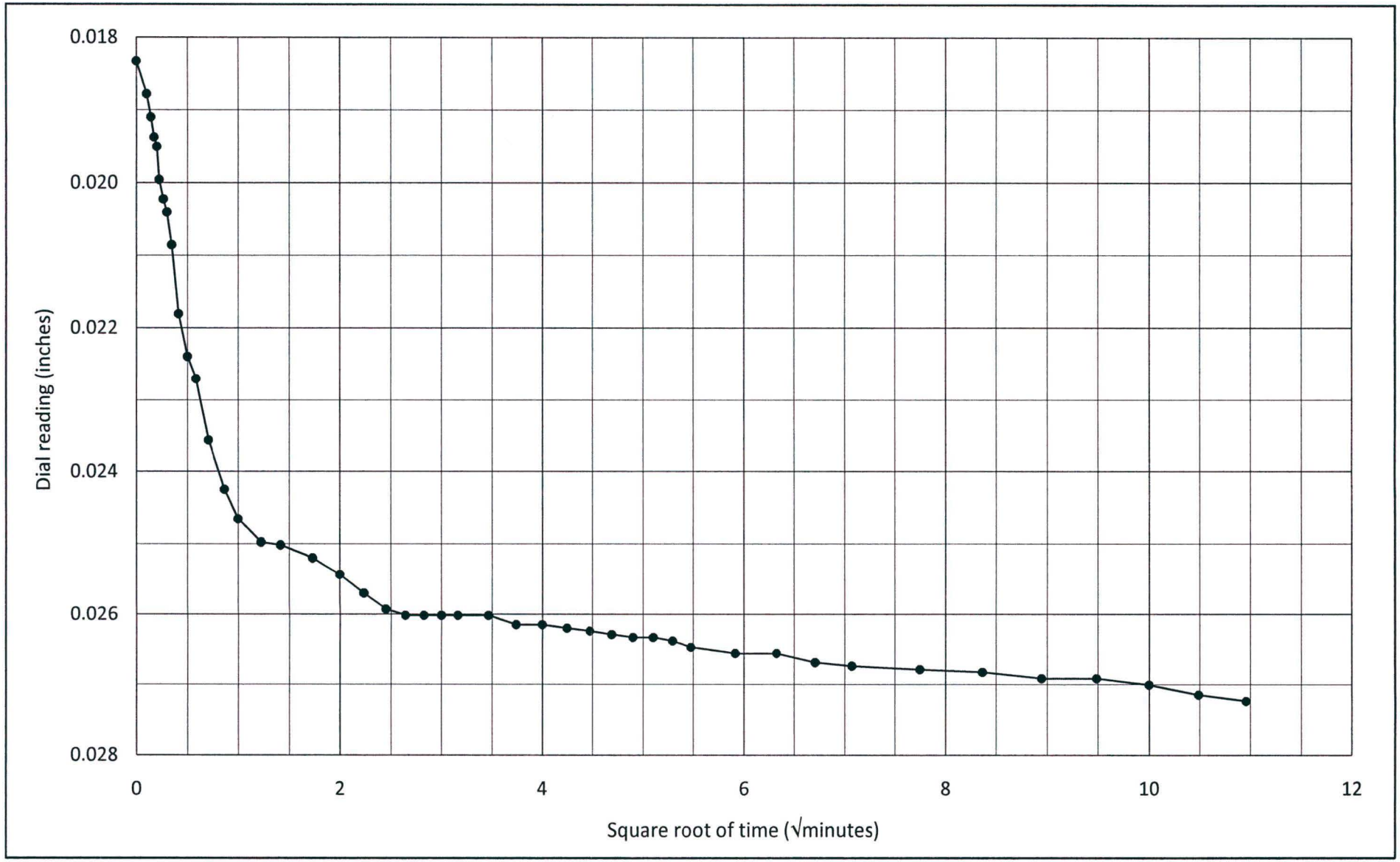


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

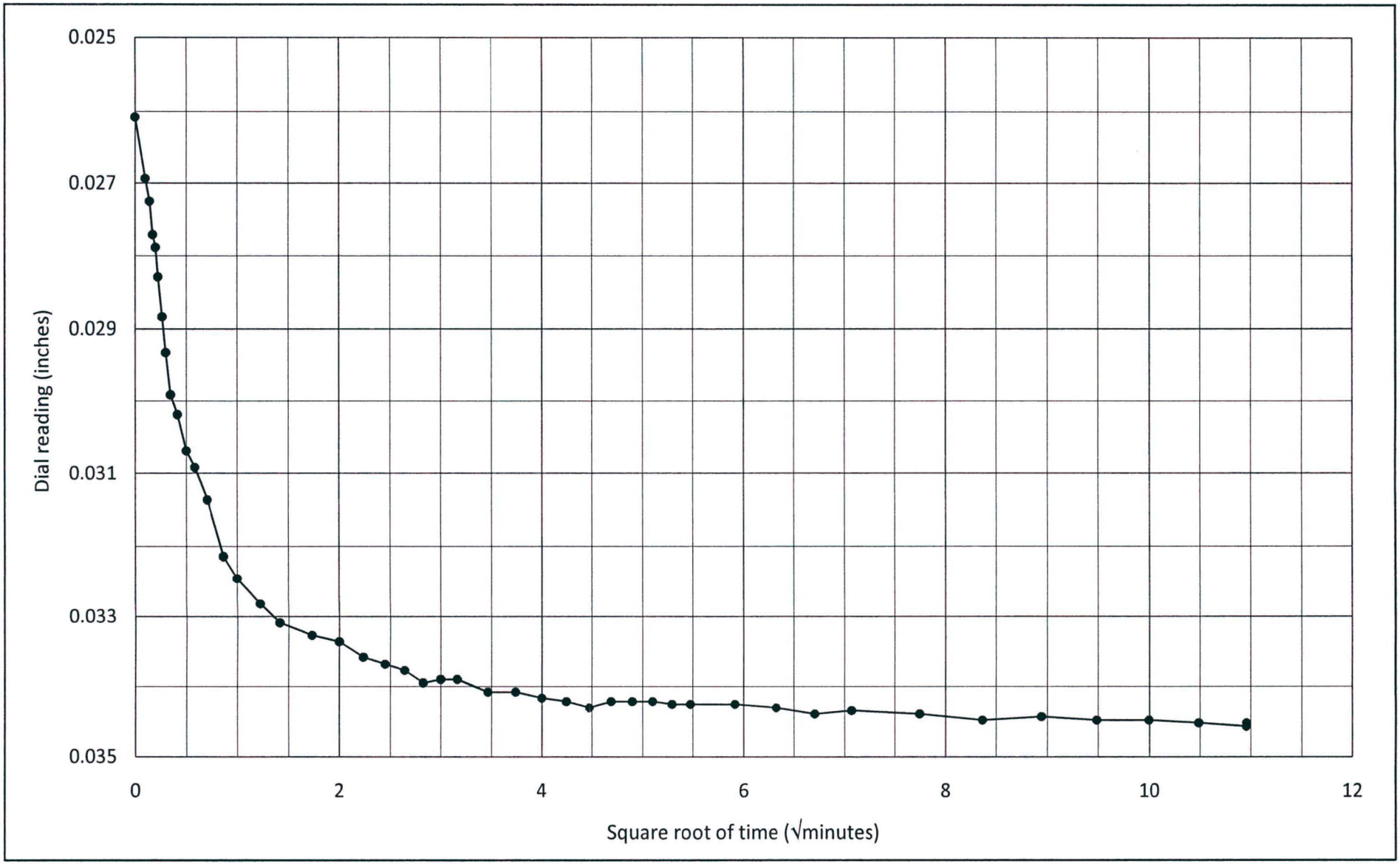


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 0.25 to 0.5 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

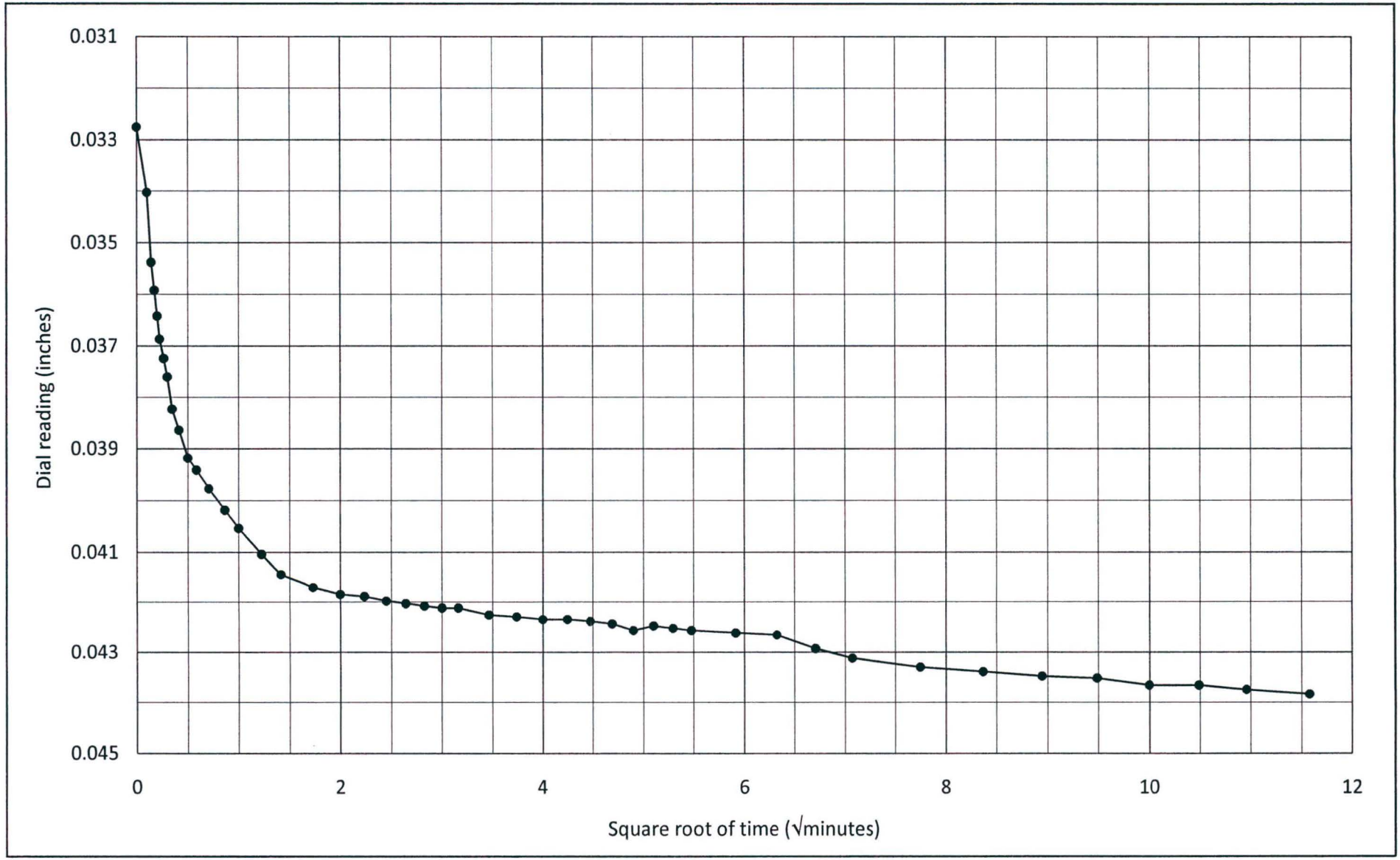


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

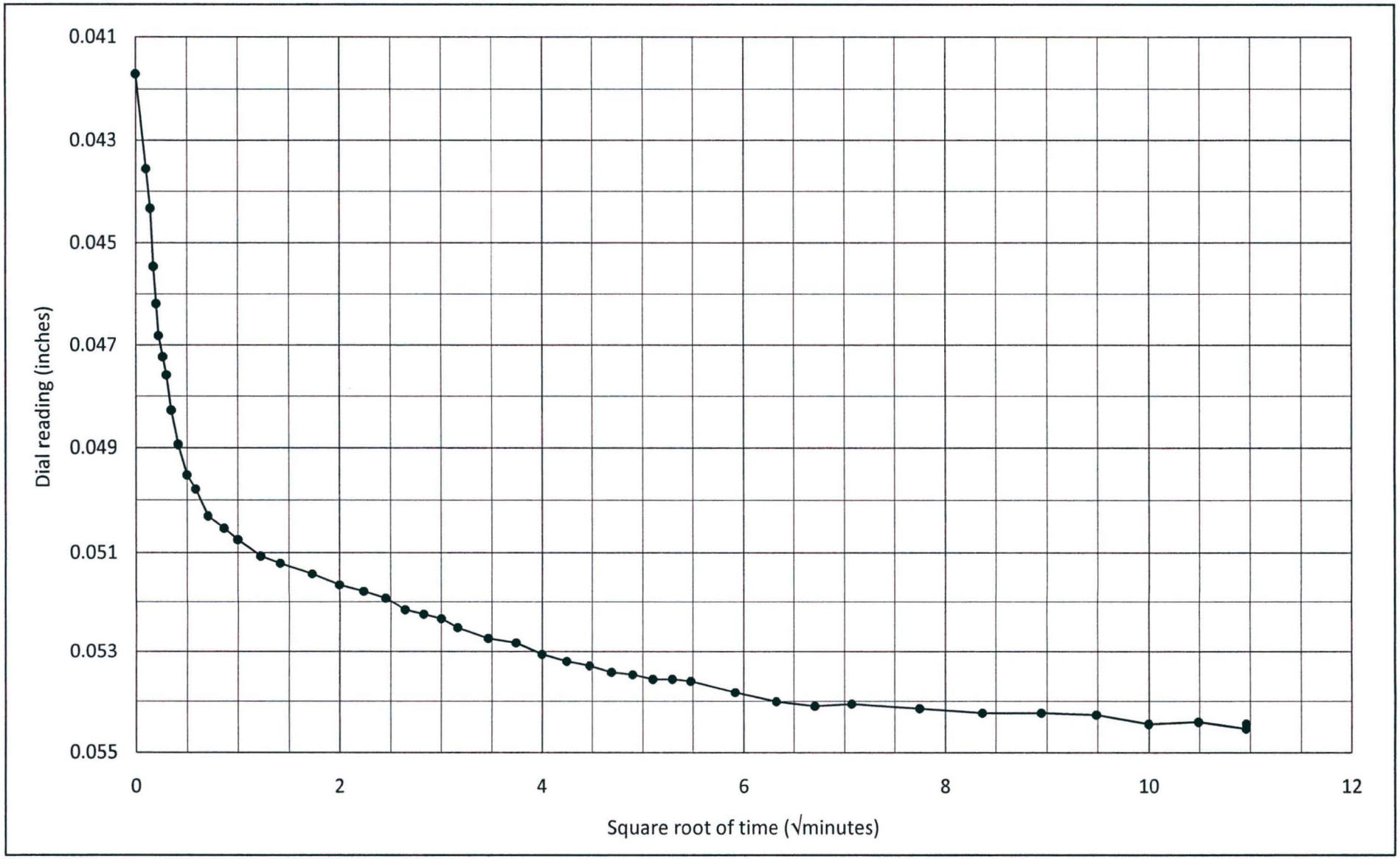


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

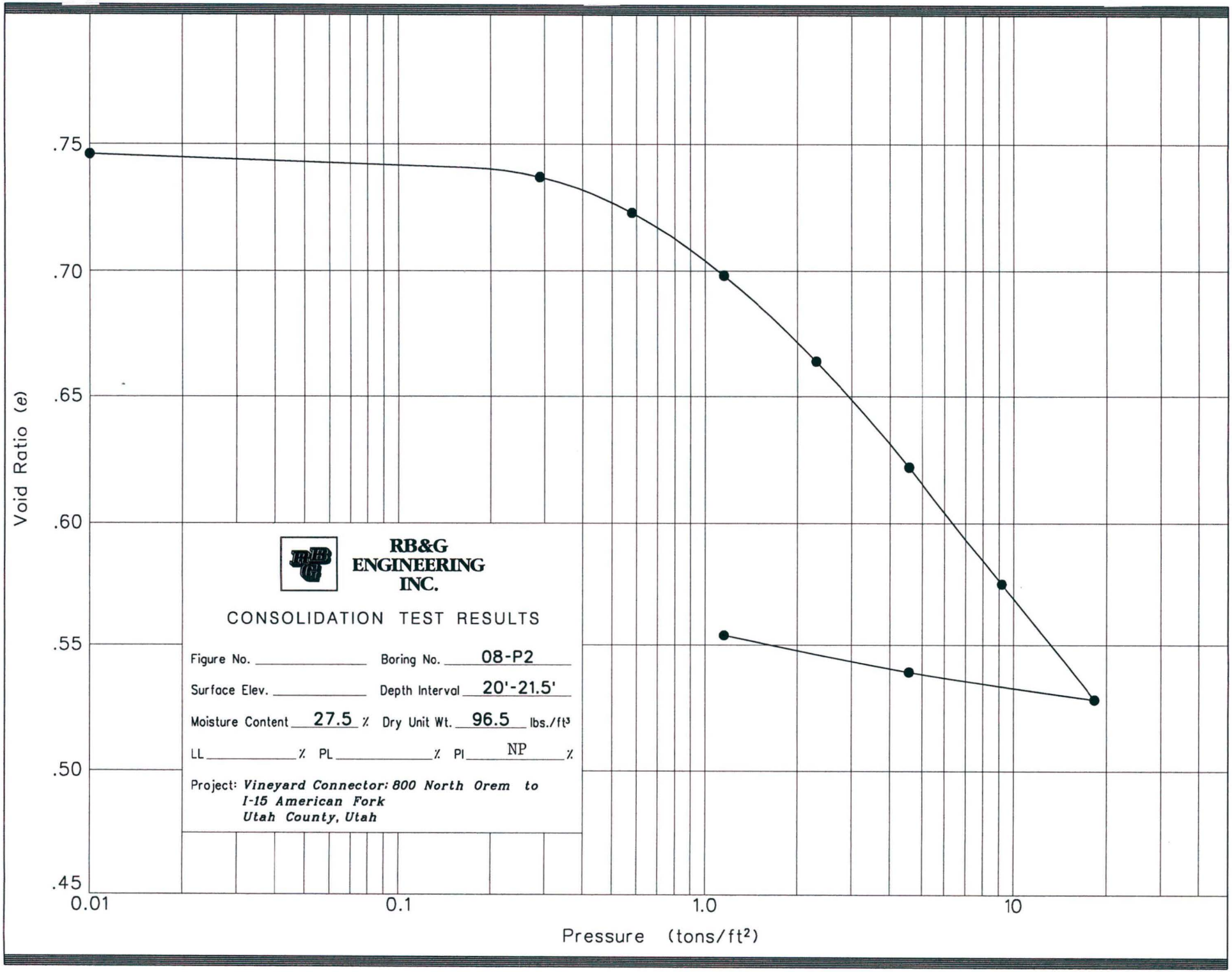


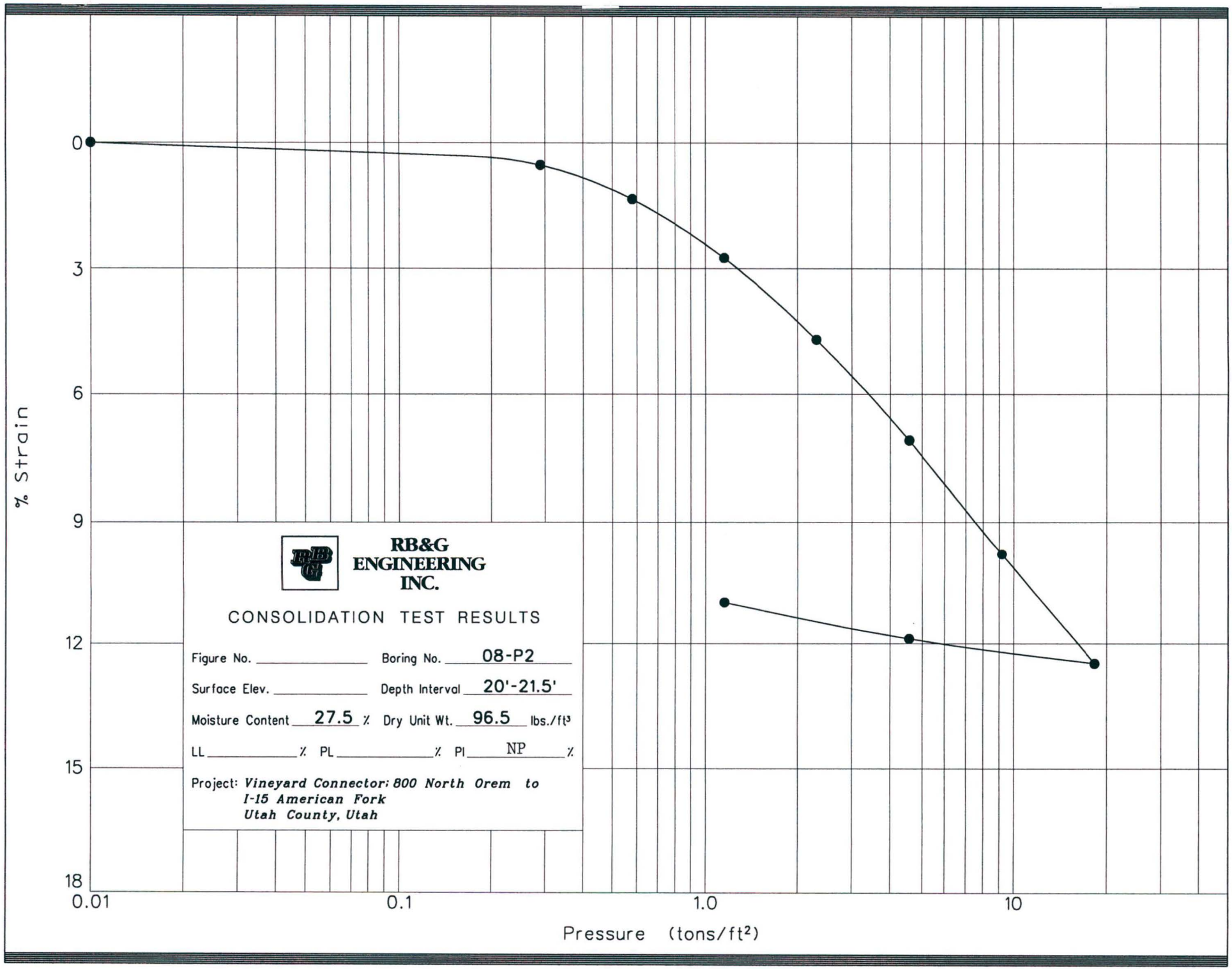
RB&G ENGINEERING, INC.

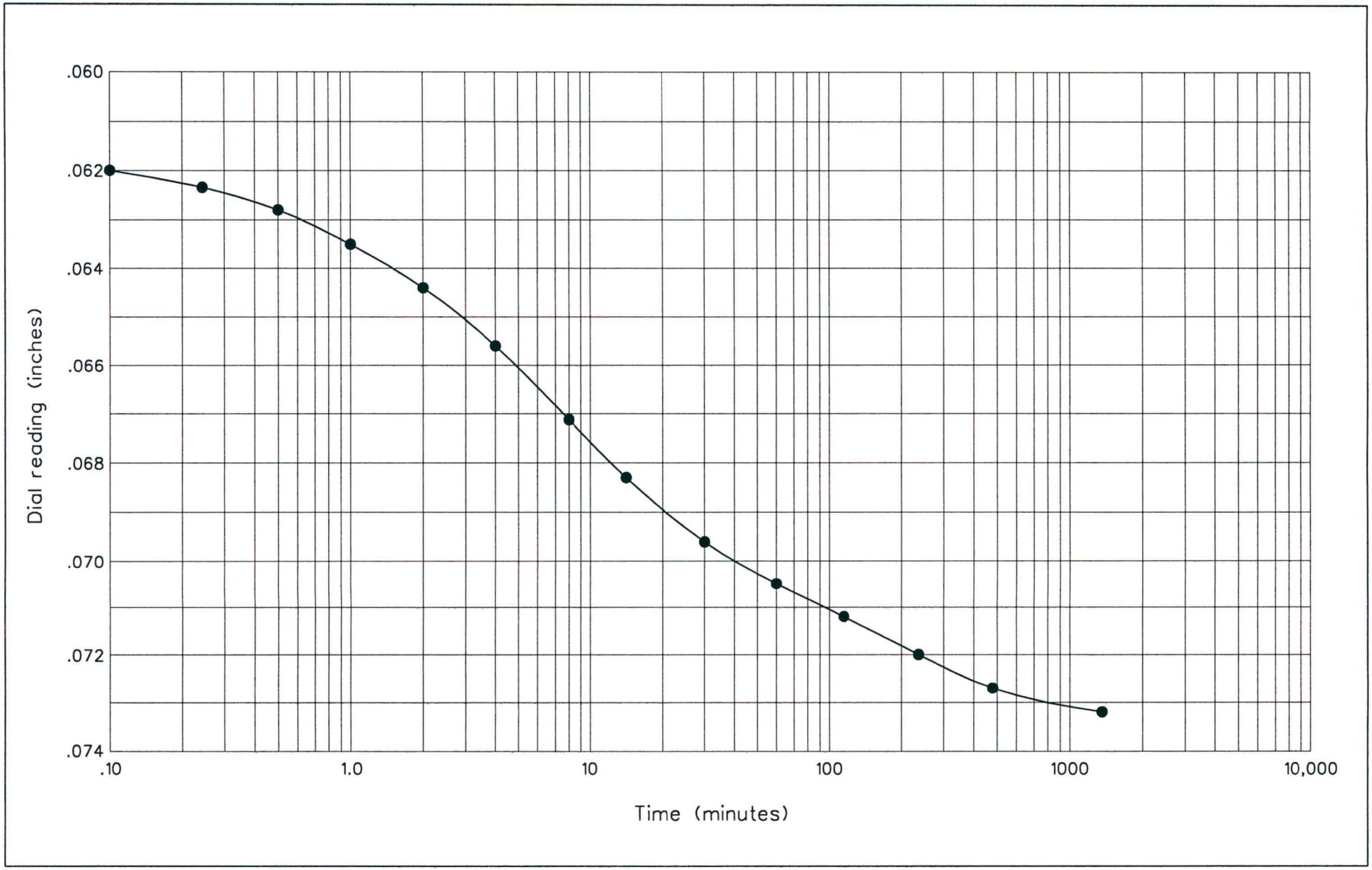
Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah


.75
.70
.65
.60
.55
.50
.45
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P2
Surface Elev. _____ Depth Interval 20'-21.5'
Moisture Content 27.5 % Dry Unit Wt. 96.5 lbs./ft³
LL _____ % PL _____ % PI NP %
Project: Vineyard Connector: 800 North Orem to I-15 American Fork
Utah County, Utah


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P2
Surface Elev. _____ Depth Interval 20'-21.5'
Moisture Content 27.5 % Dry Unit Wt. 96.5 lbs./ft³
LL _____ % PL _____ % PI NP %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah



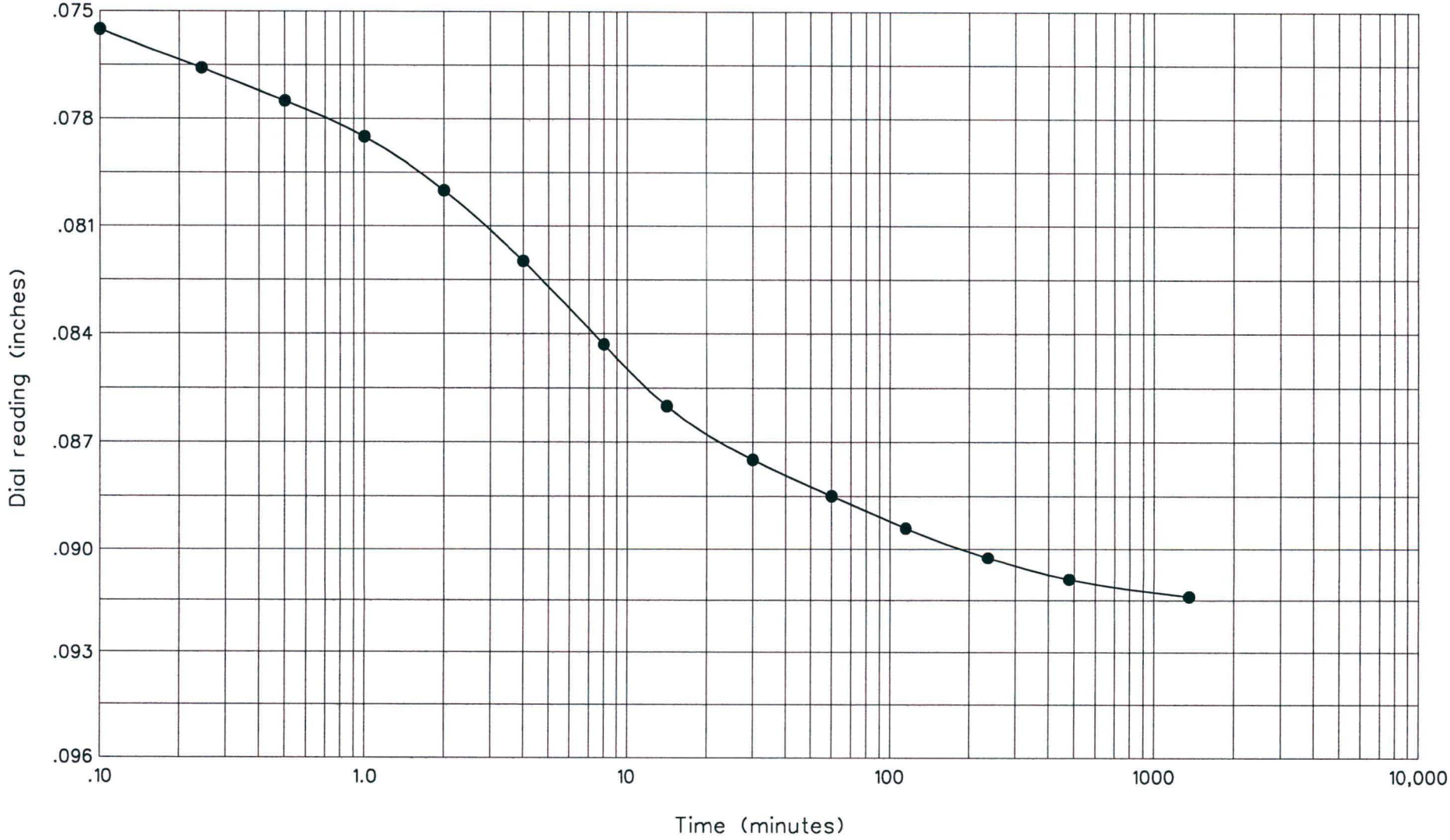
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 20'-21.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



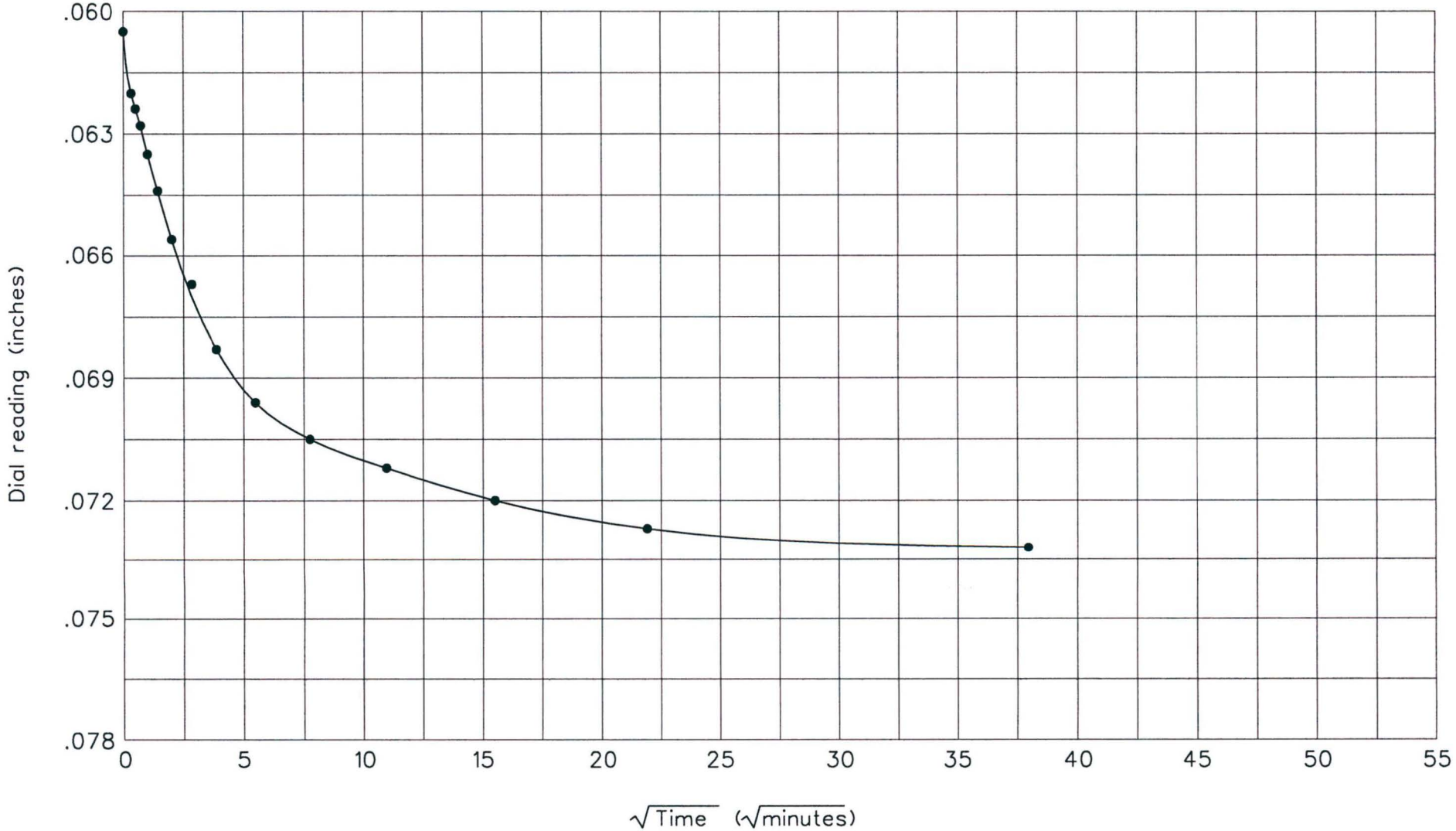
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 20'-21.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



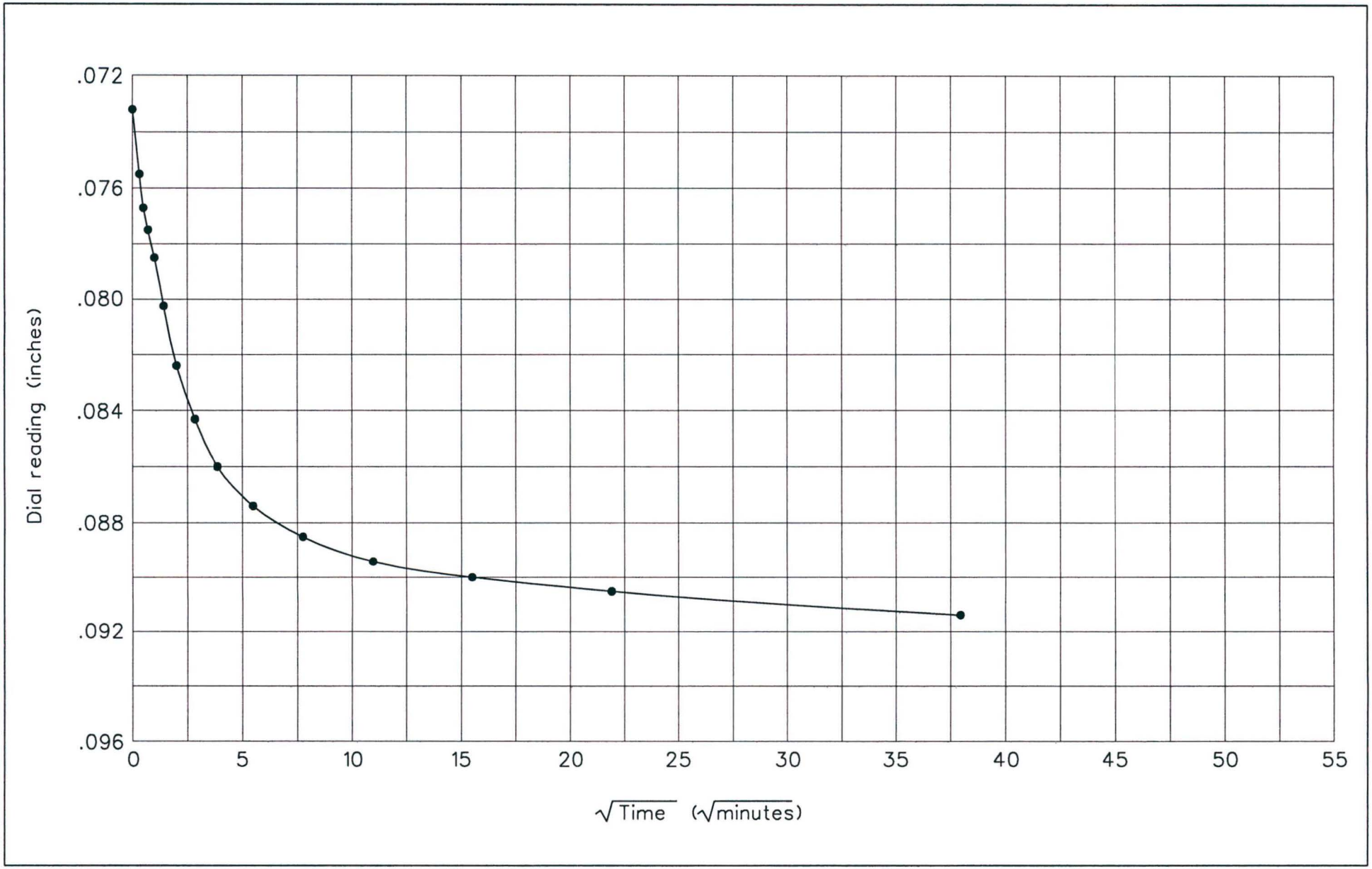
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 20'-21.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



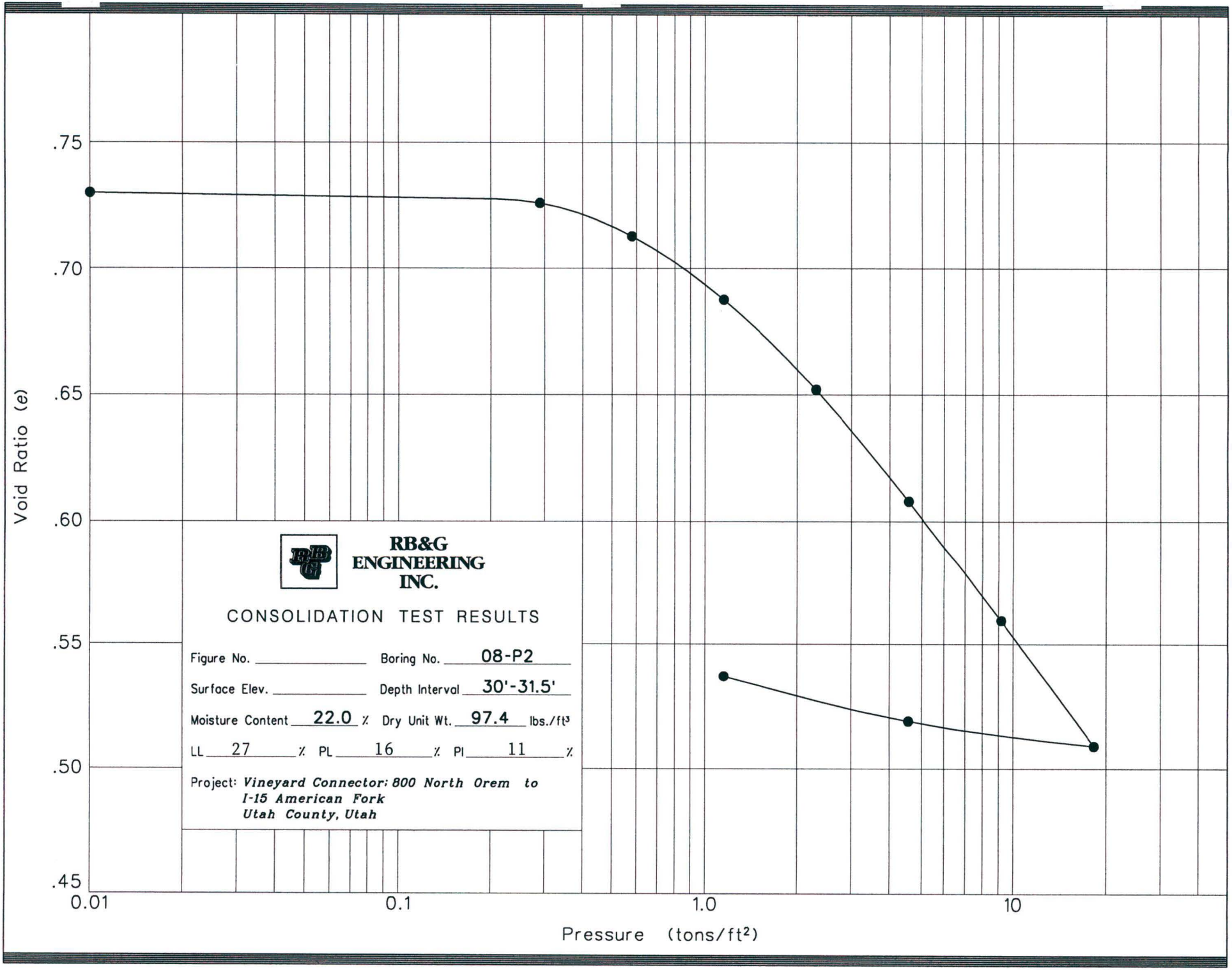
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 20'-21.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G ENGINEERING INC.

CONSOLIDATION TEST RESULTS

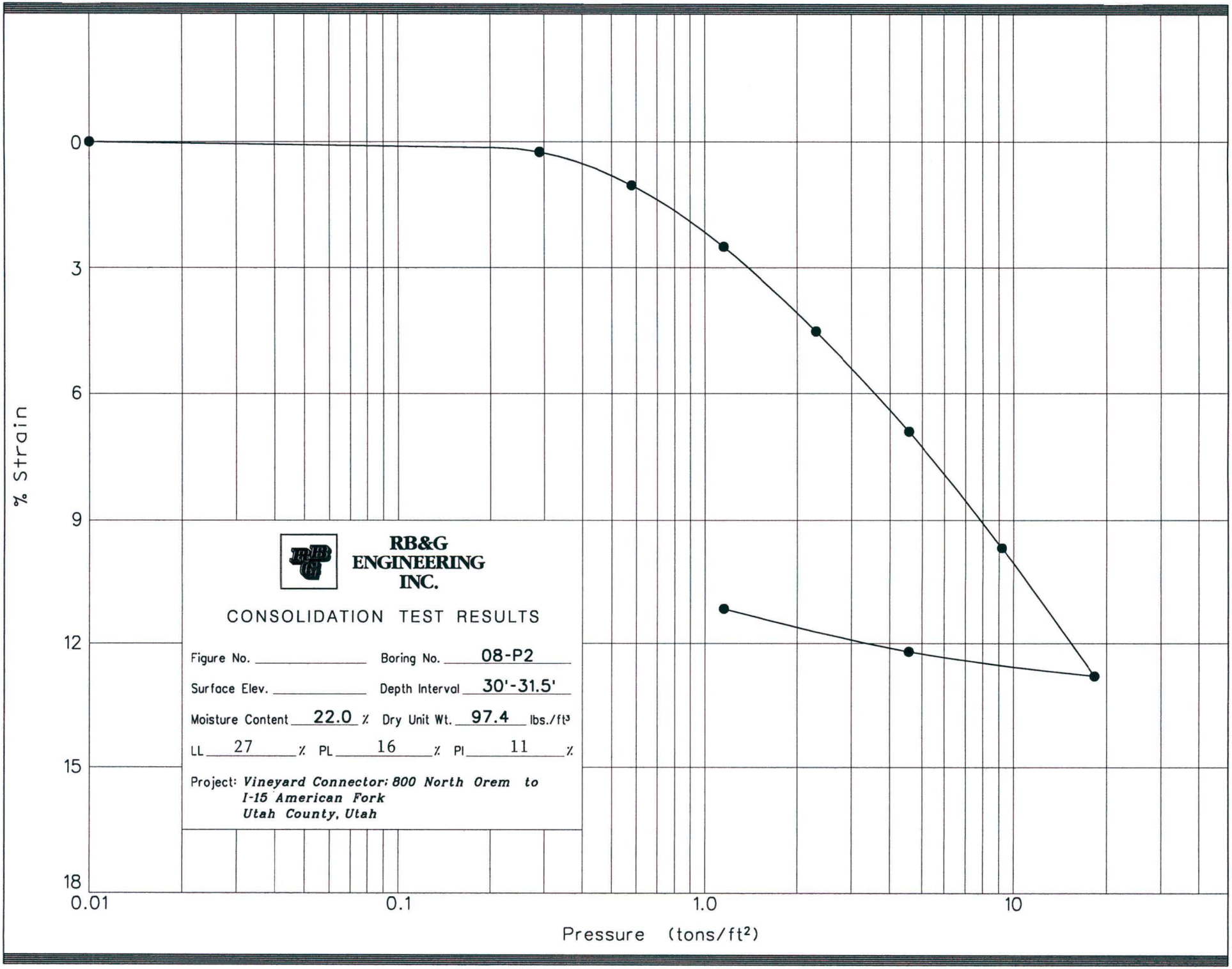
Figure No. _____ Boring No. 08-P2

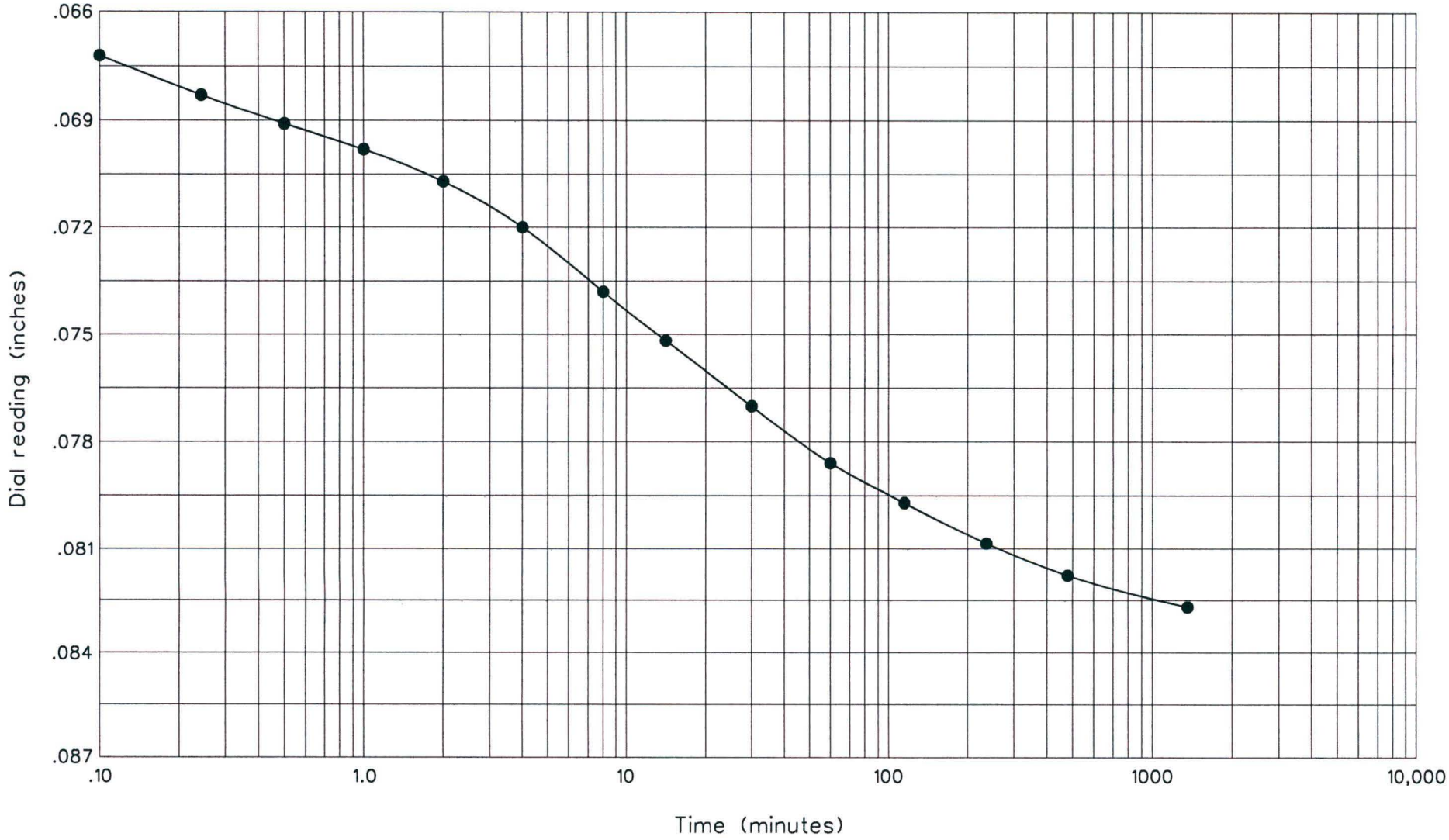
Surface Elev. _____ Depth Interval 30'-31.5'

Moisture Content 22.0 % Dry Unit Wt. 97.4 lbs./ft³

LL 27 % PL 16 % PI 11 %

Project: *Vineyard Connector: 800 North Orem to I-15 American Fork Utah County, Utah*


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P2
Surface Elev. _____ Depth Interval 30'-31.5'
Moisture Content 22.0 % Dry Unit Wt. 97.4 lbs./ft³
LL 27 % PL 16 % PI 11 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah



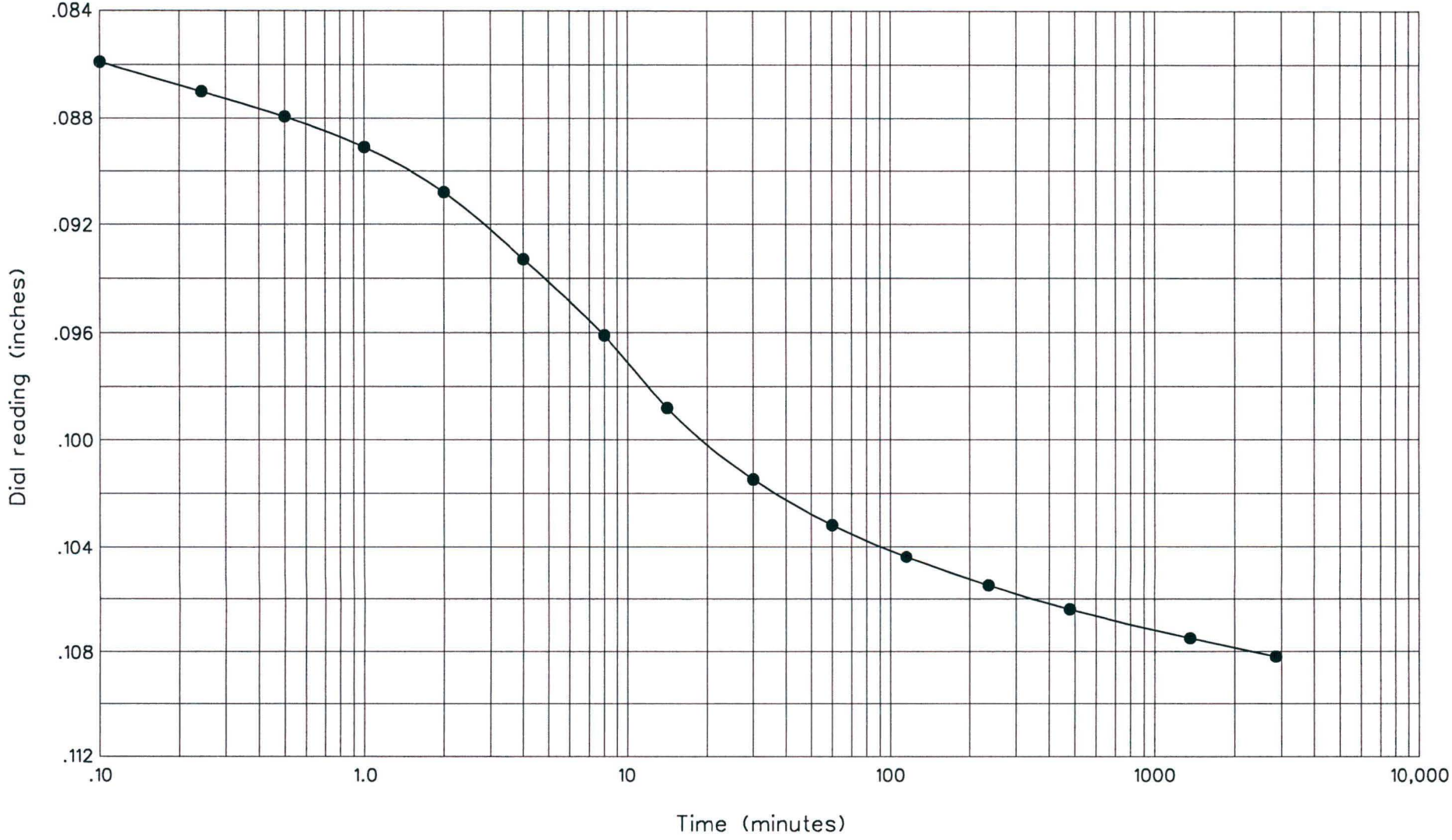
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 30'-31.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



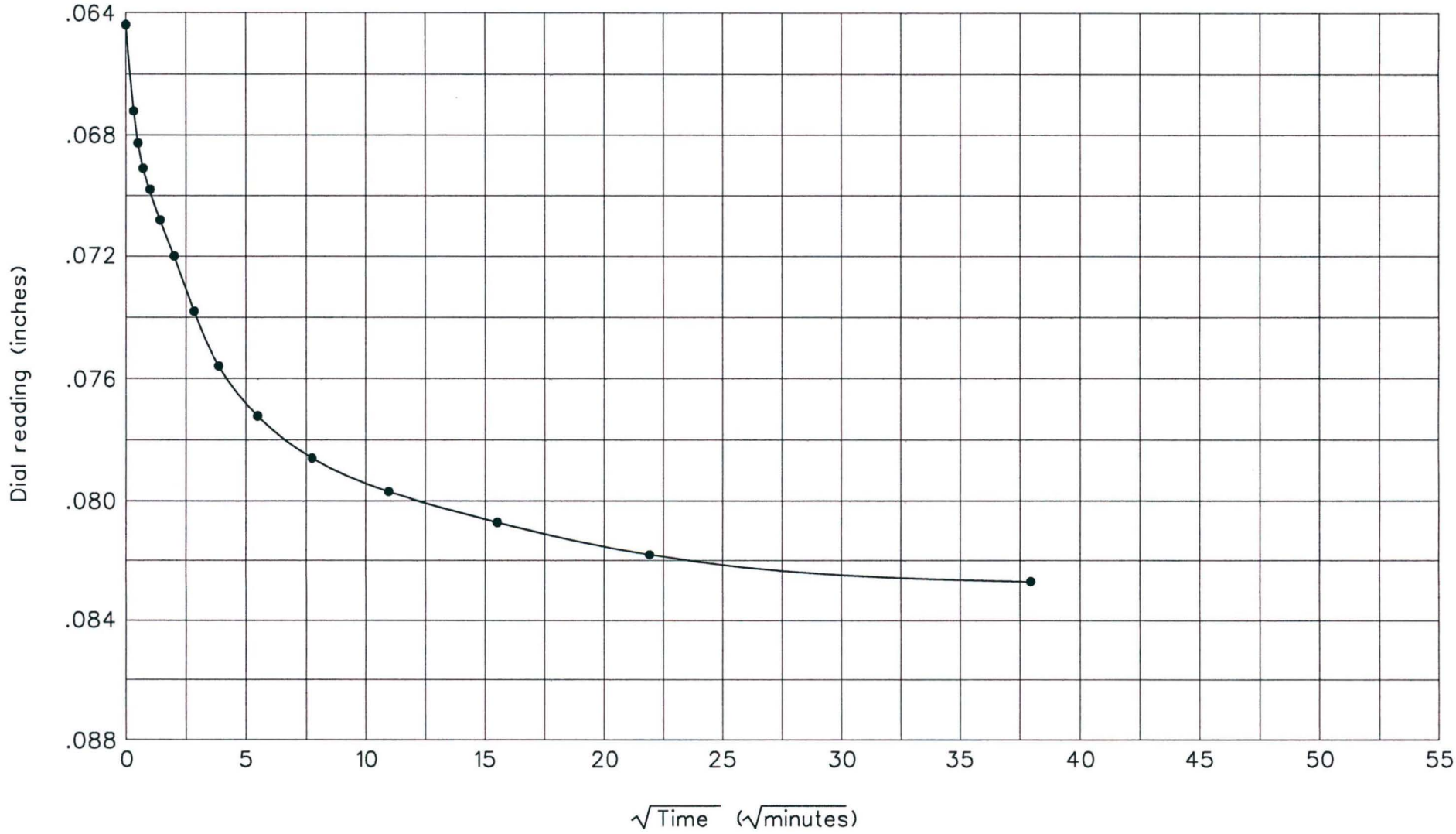
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 30'-31.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



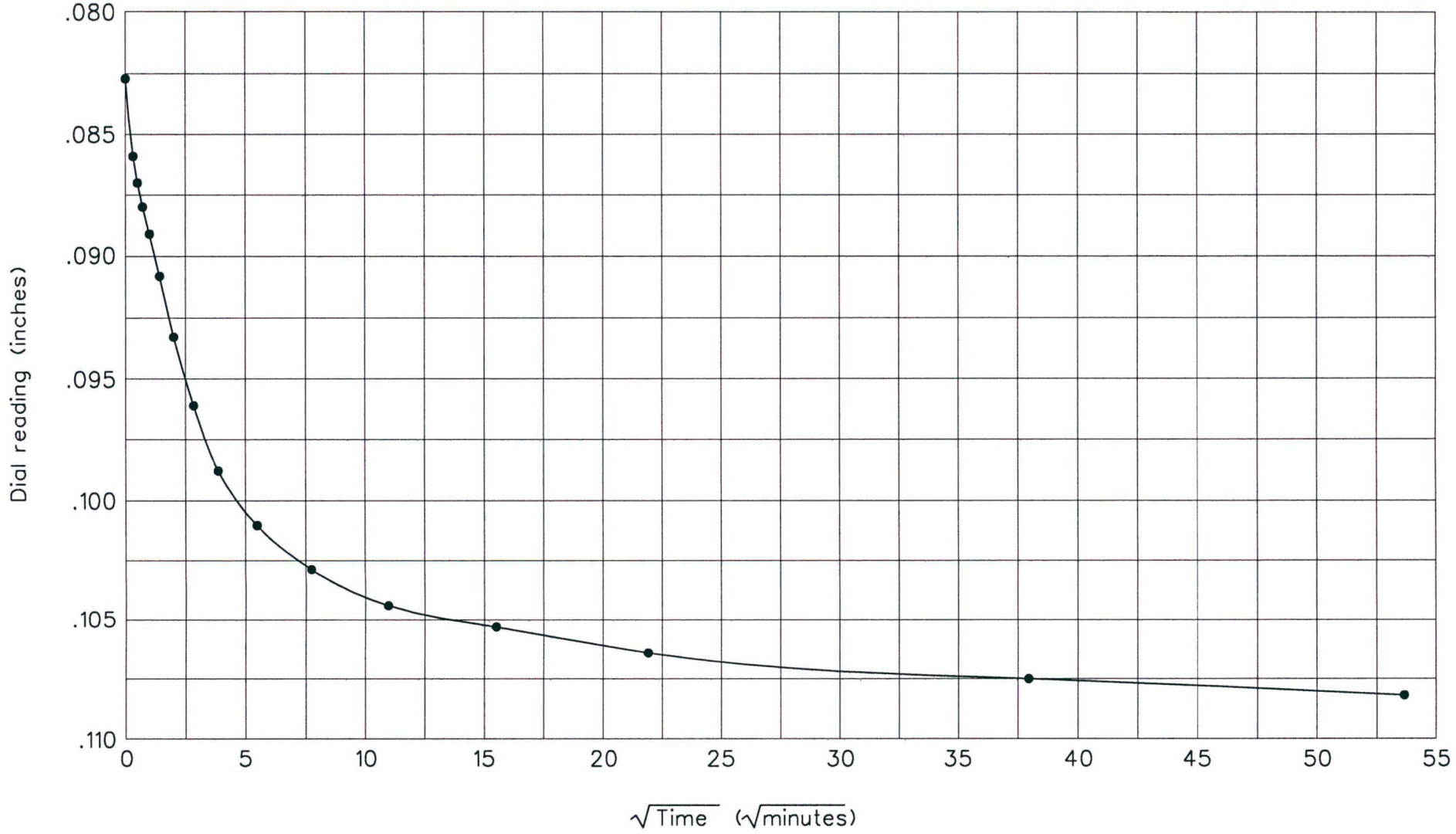
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 30'-31.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



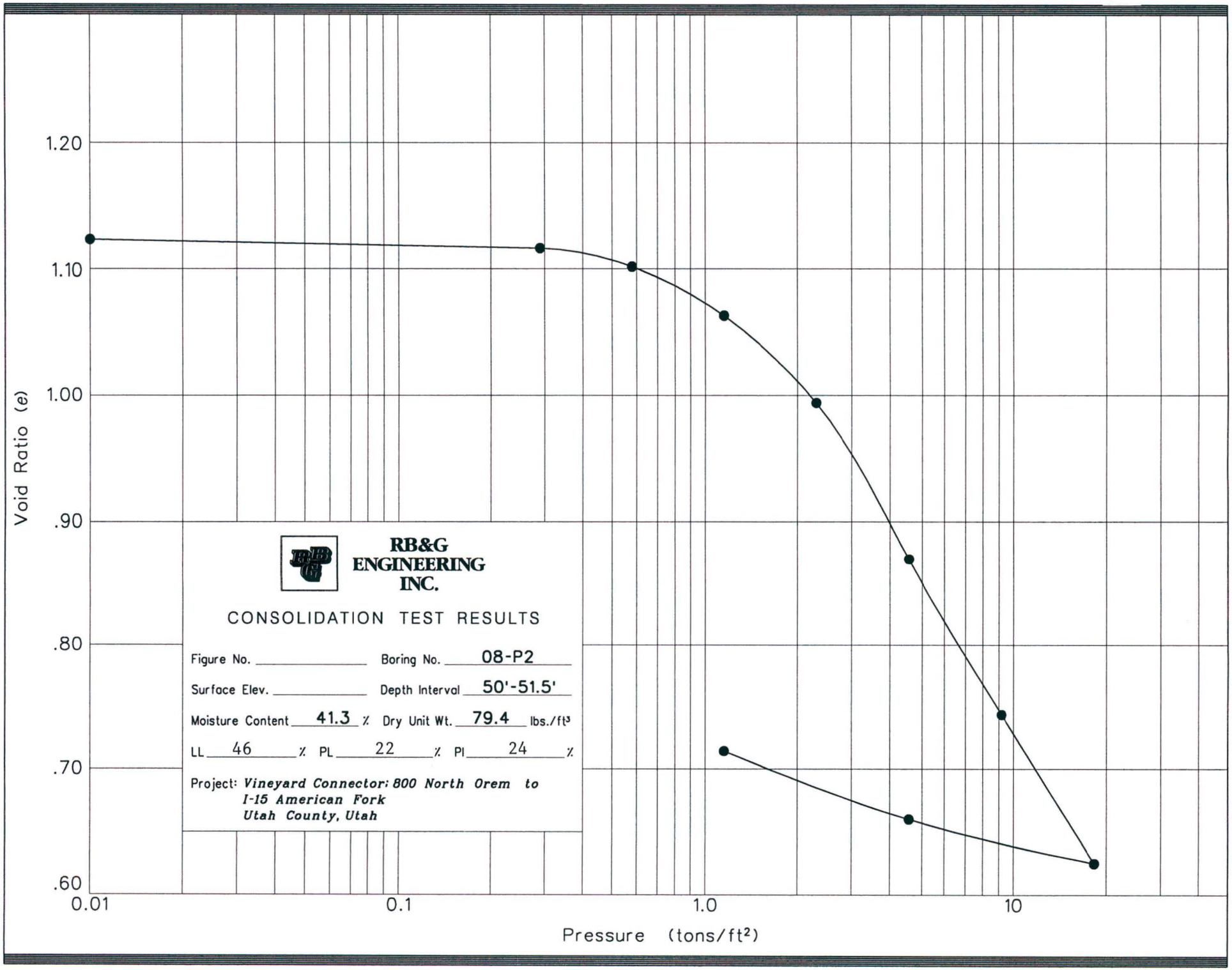
RB&G ENGINEERING INC.
Provo, Utah

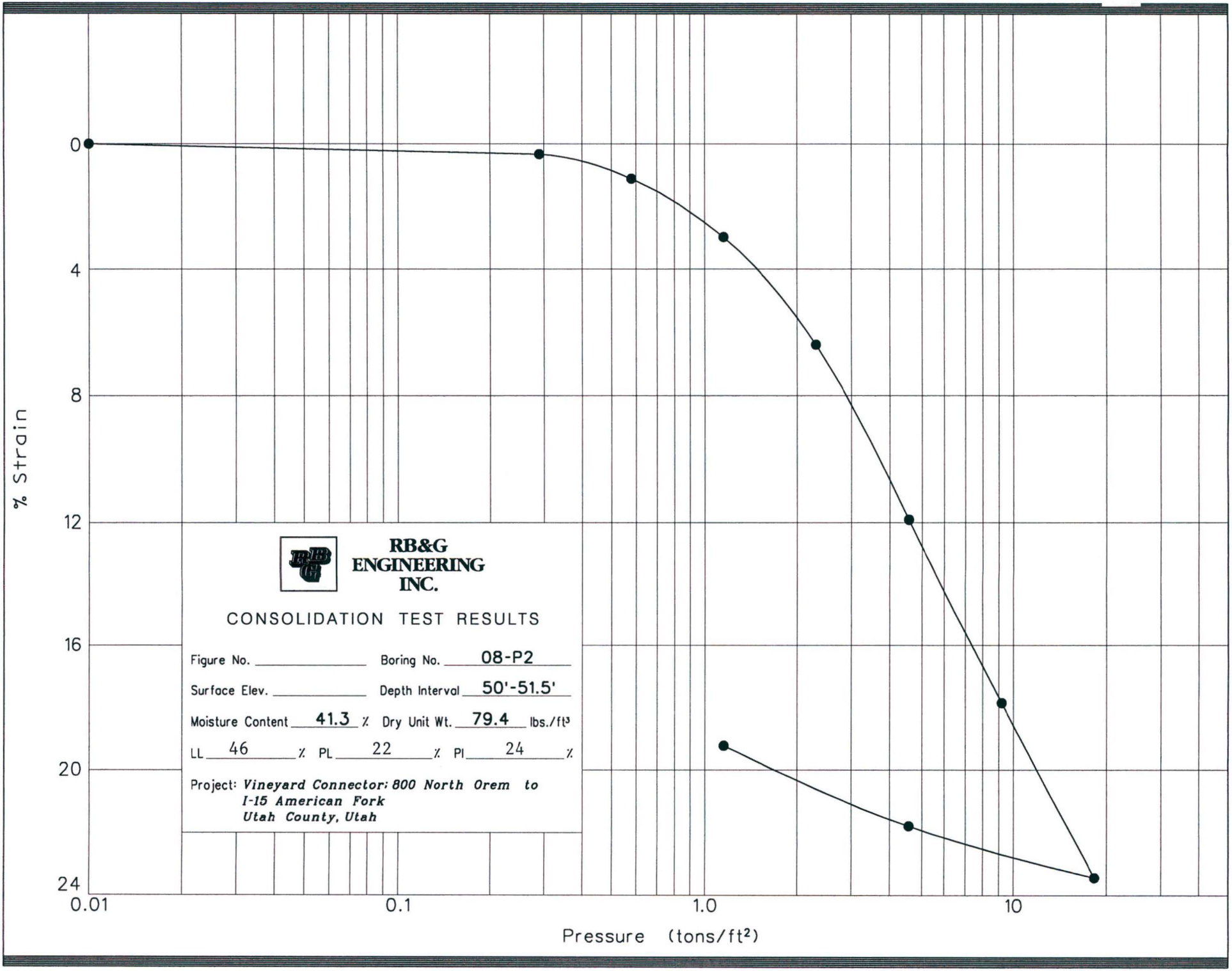
Hole no.: 08-P2
Depth: 30'-31.5'
Load: 2.30 to 4.60 tons

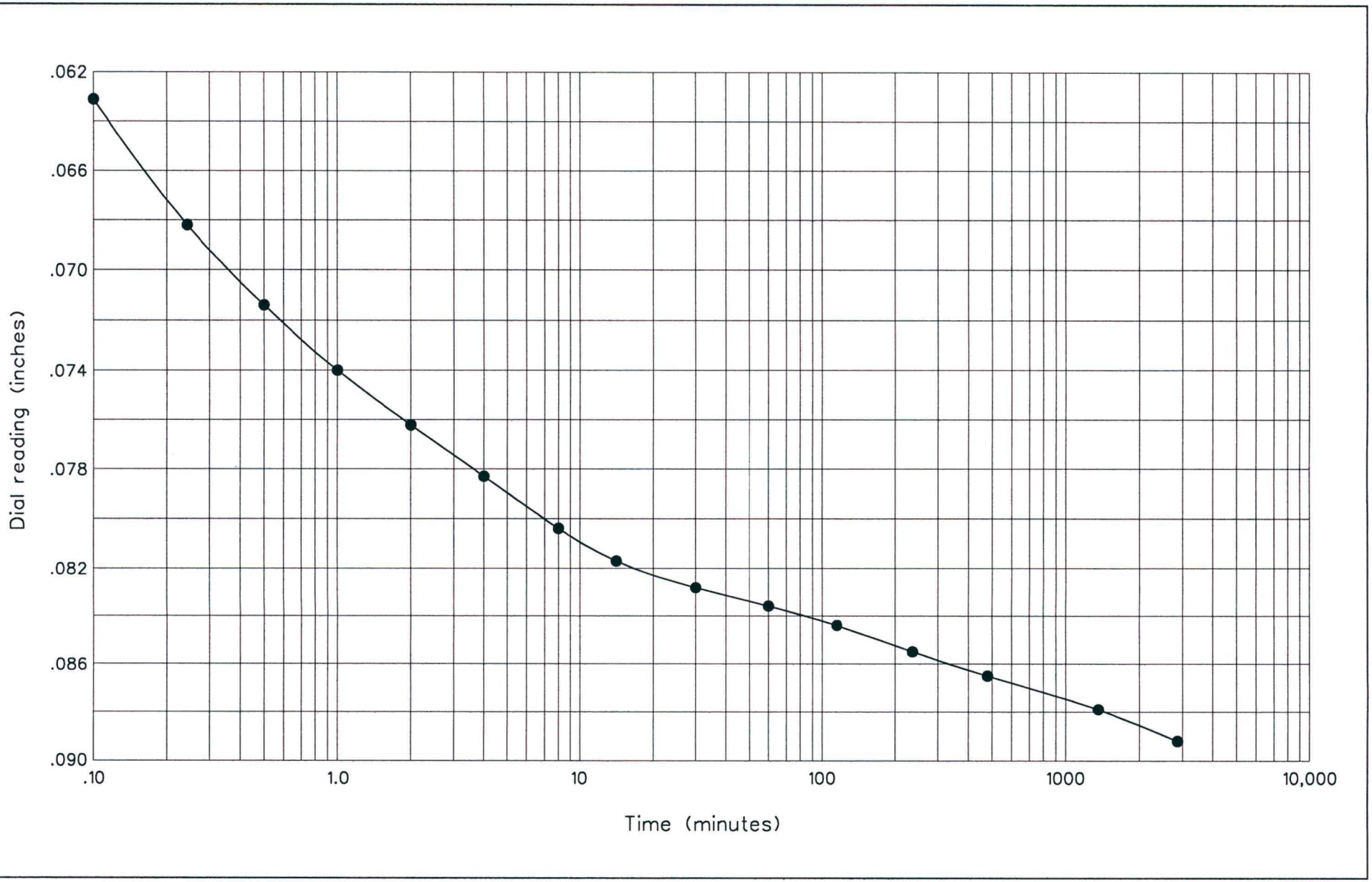
TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure


1.20
1.10
1.00
.90
.80
.70
.60
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING
INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P2
Surface Elev. _____ Depth Interval 50'-51.5'
Moisture Content 41.3 % Dry Unit Wt. 79.4 lbs./ft³
LL 46 % PL 22 % PI 24 %
Project: Vineyard Connector: 800 North Orem to
I-15 American Fork
Utah County, Utah


0
4
8
12
16
20
24
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P2
Surface Elev. _____ Depth Interval 50'-51.5'
Moisture Content 41.3 % Dry Unit Wt. 79.4 lbs./ft³
LL 46 % PL 22 % PI 24 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah



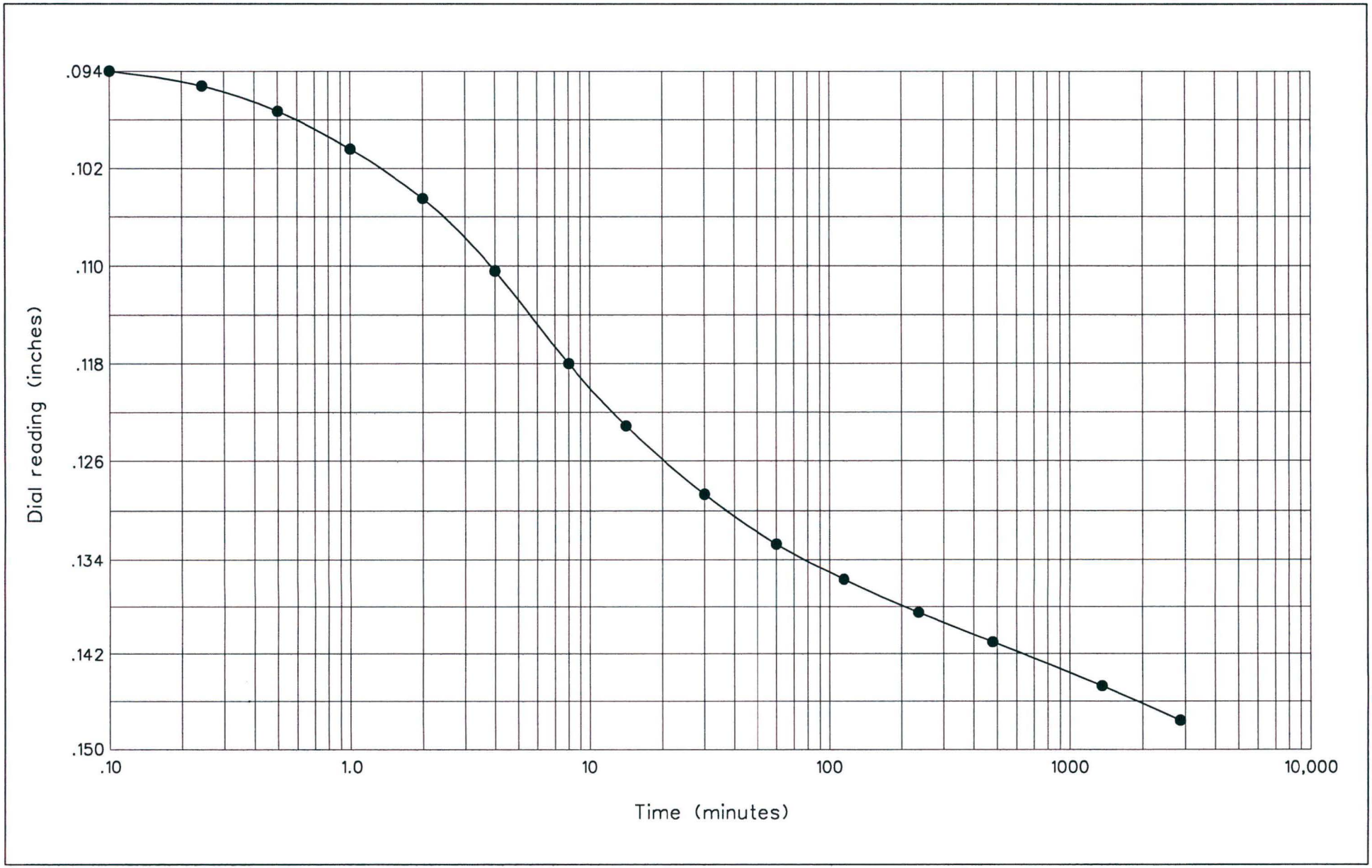
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 50'-51.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



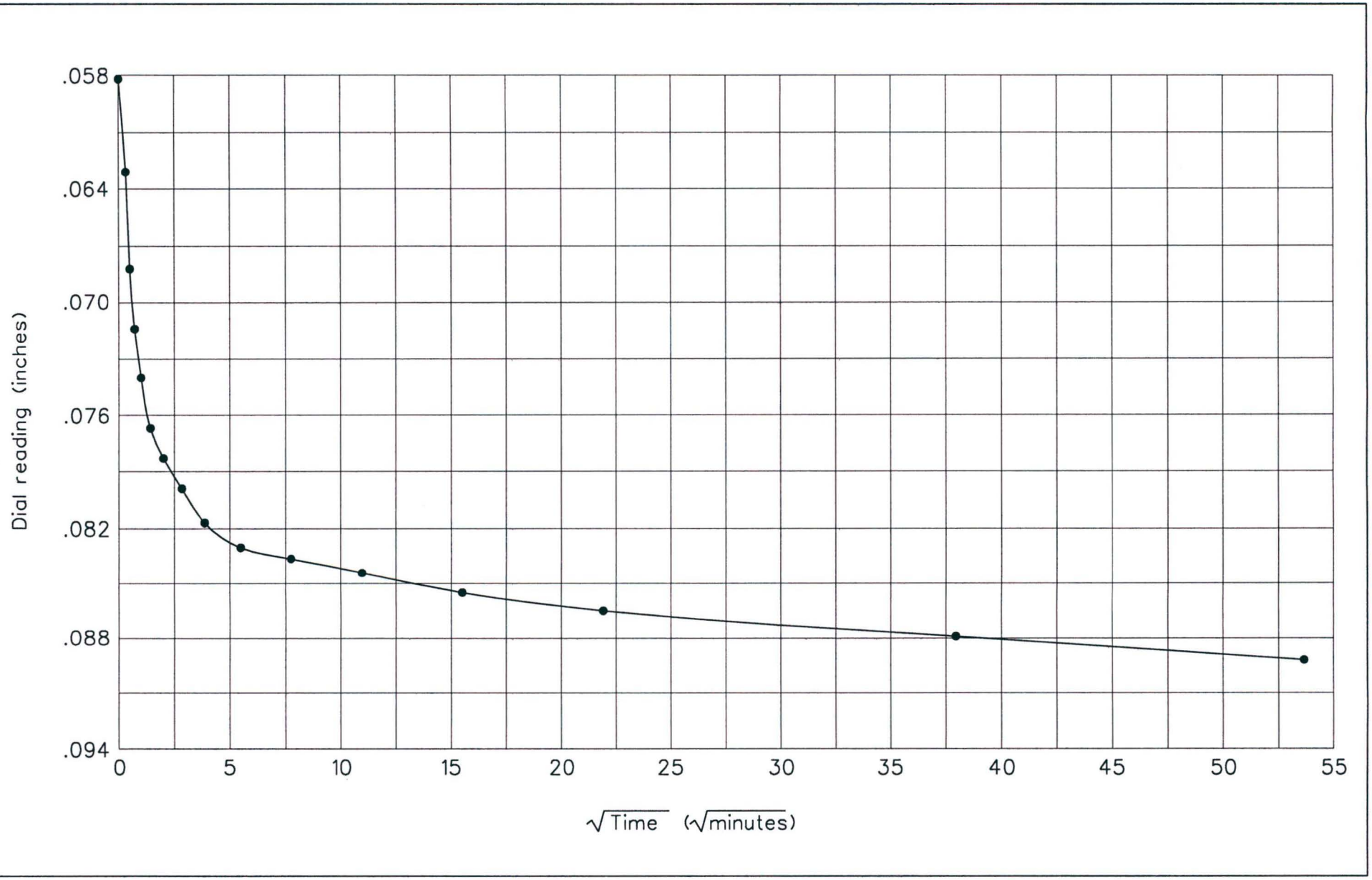
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 50'-51.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



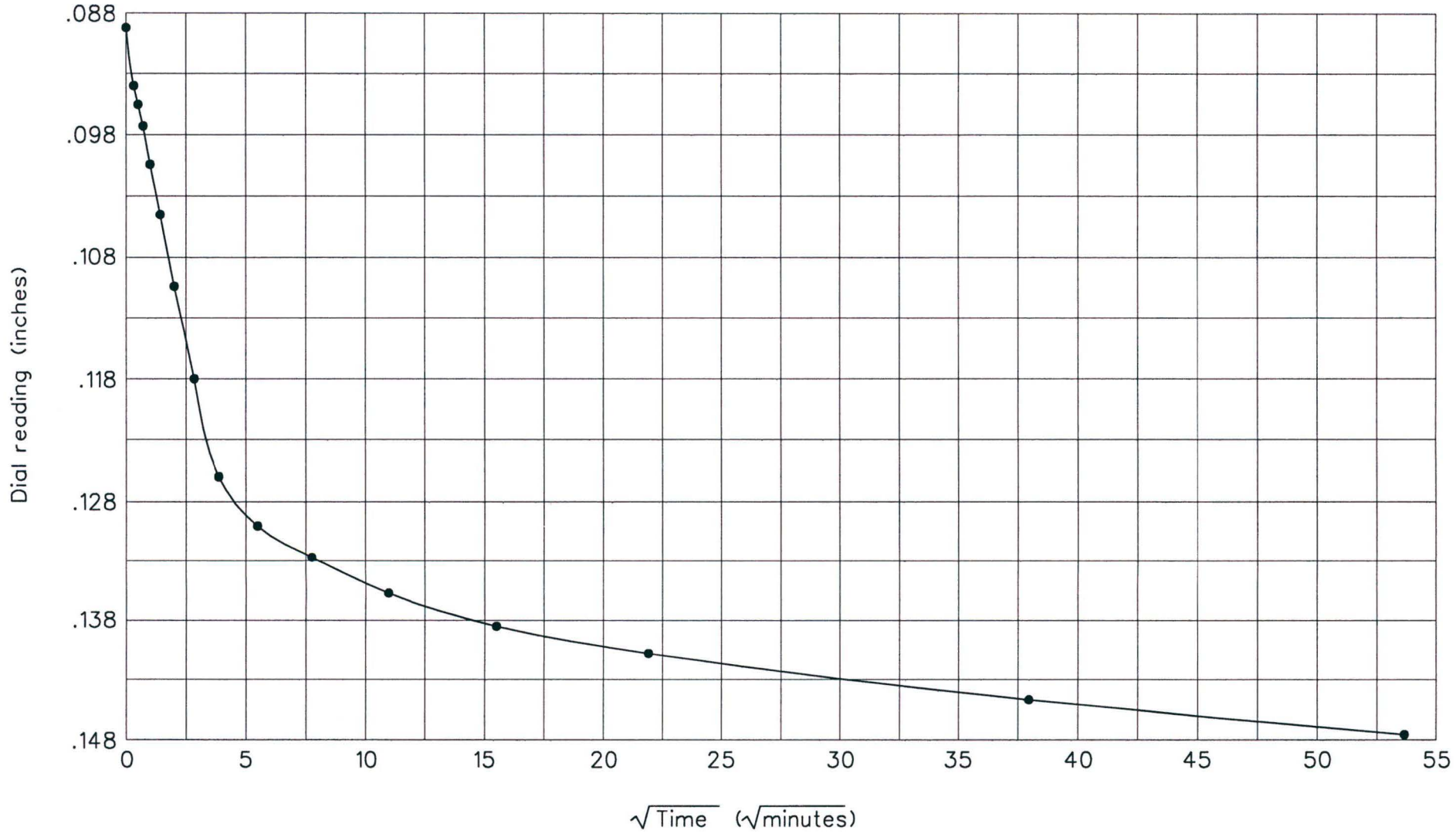
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 50'-51.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



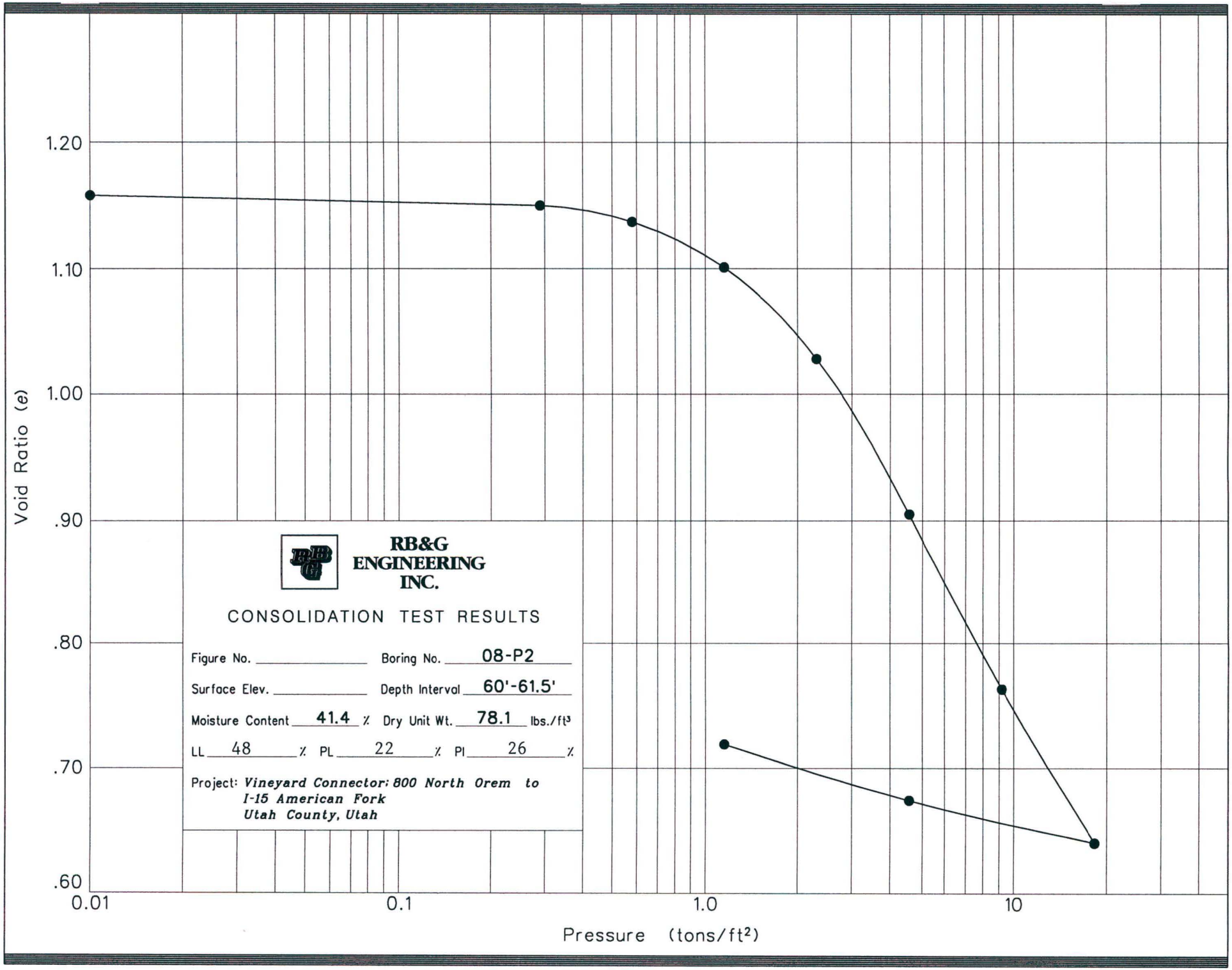
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 50'-51.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G ENGINEERING INC.

CONSOLIDATION TEST RESULTS

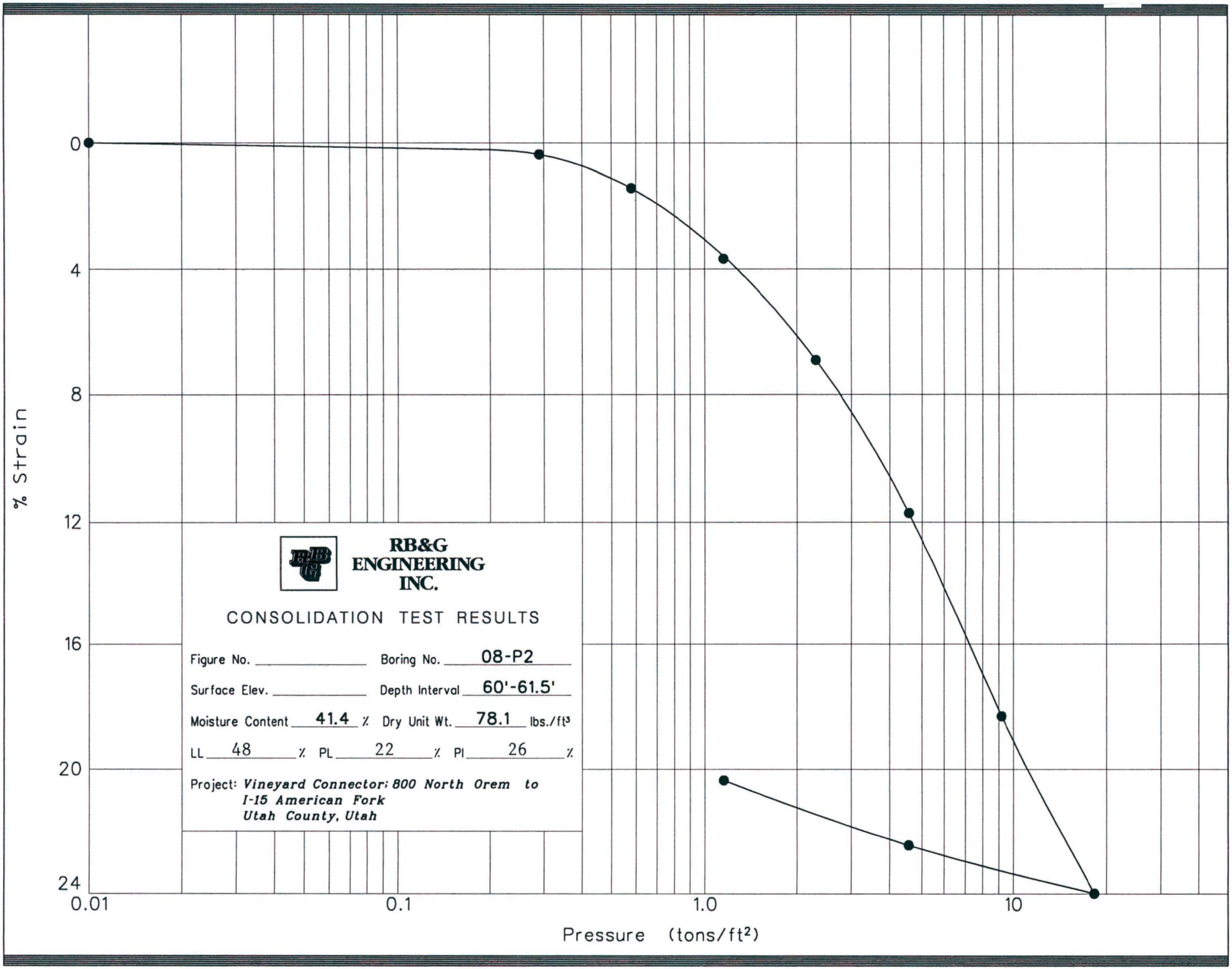
Figure No. _____ Boring No. 08-P2

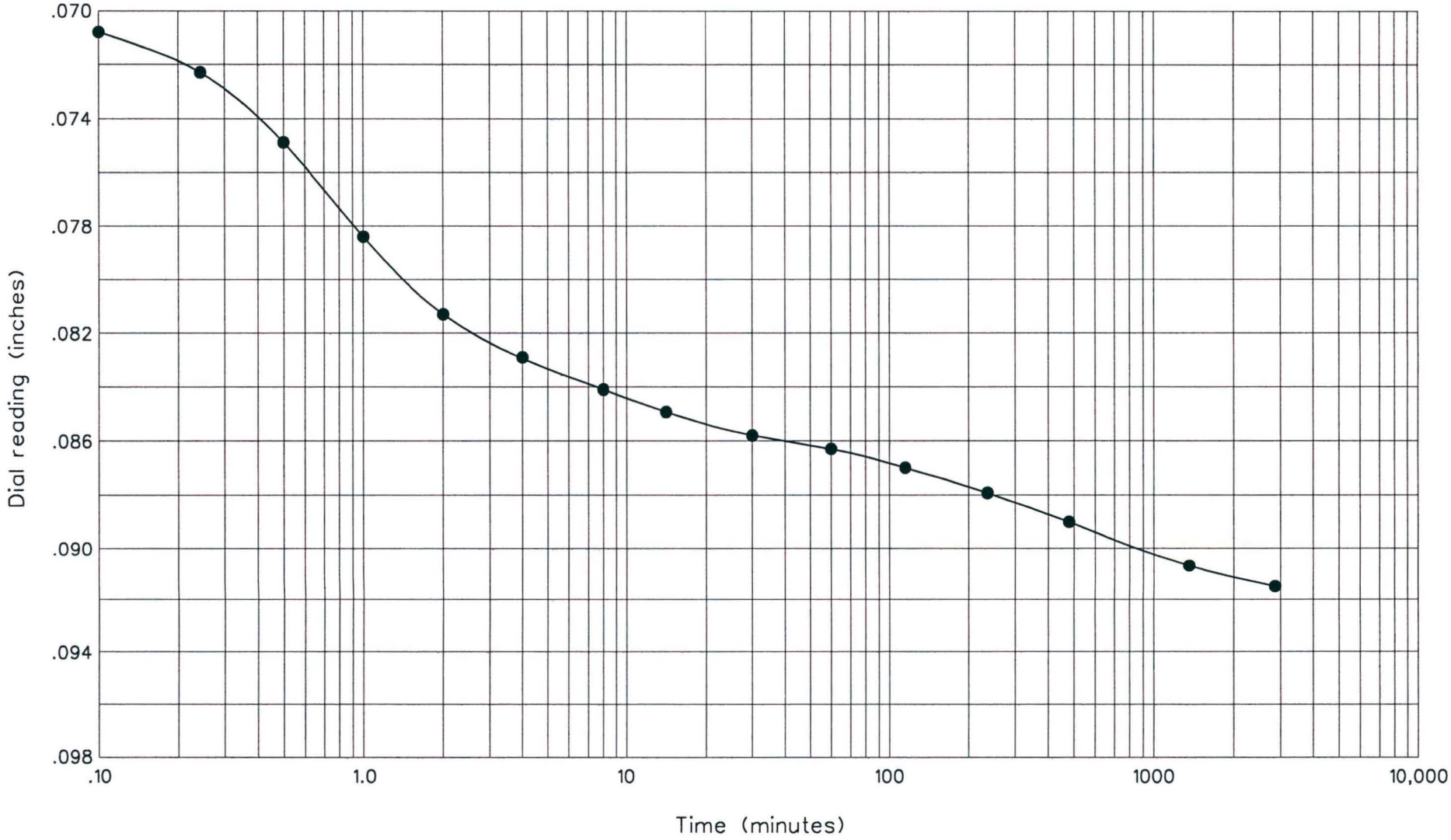
Surface Elev. _____ Depth Interval 60'-61.5'

Moisture Content 41.4 % Dry Unit Wt. 78.1 lbs./ft³

LL 48 % PL 22 % PI 26 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*


0
4
8
12
16
20
24
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P2
Surface Elev. _____ Depth Interval 60'-61.5'
Moisture Content 41.4 % Dry Unit Wt. 78.1 lbs./ft³
LL 48 % PL 22 % PI 26 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah



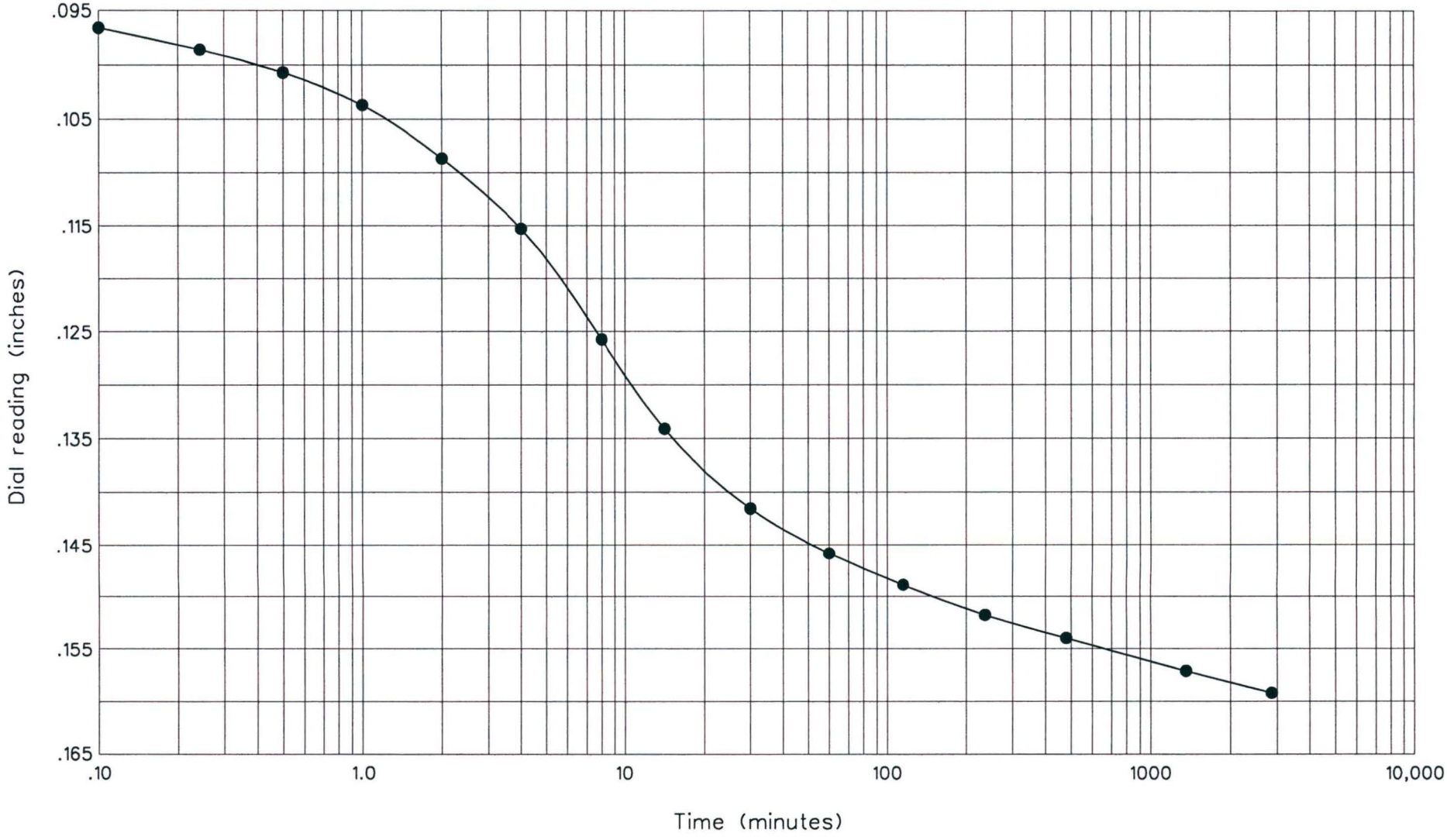
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 60'-61.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



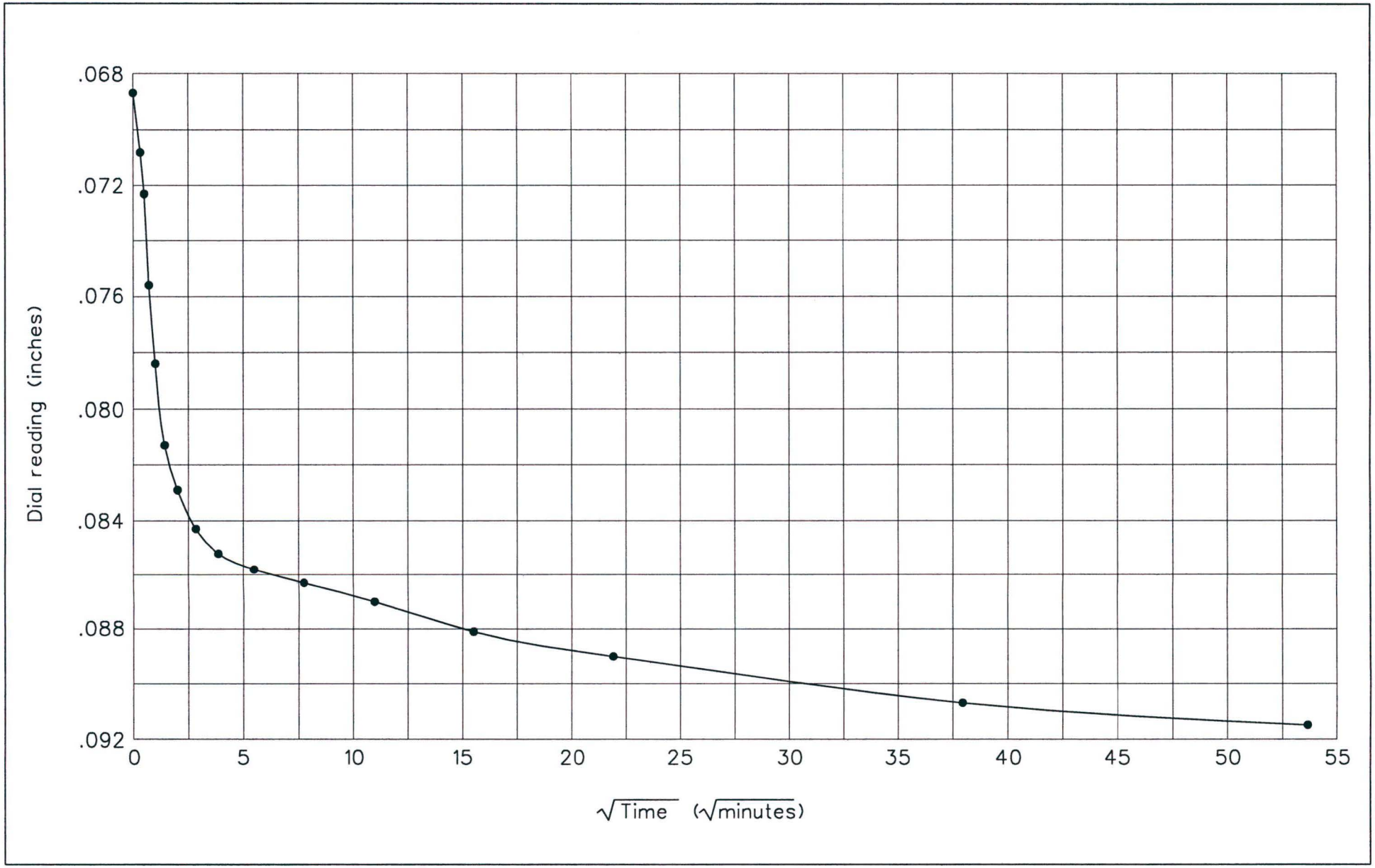
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 60'-61.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



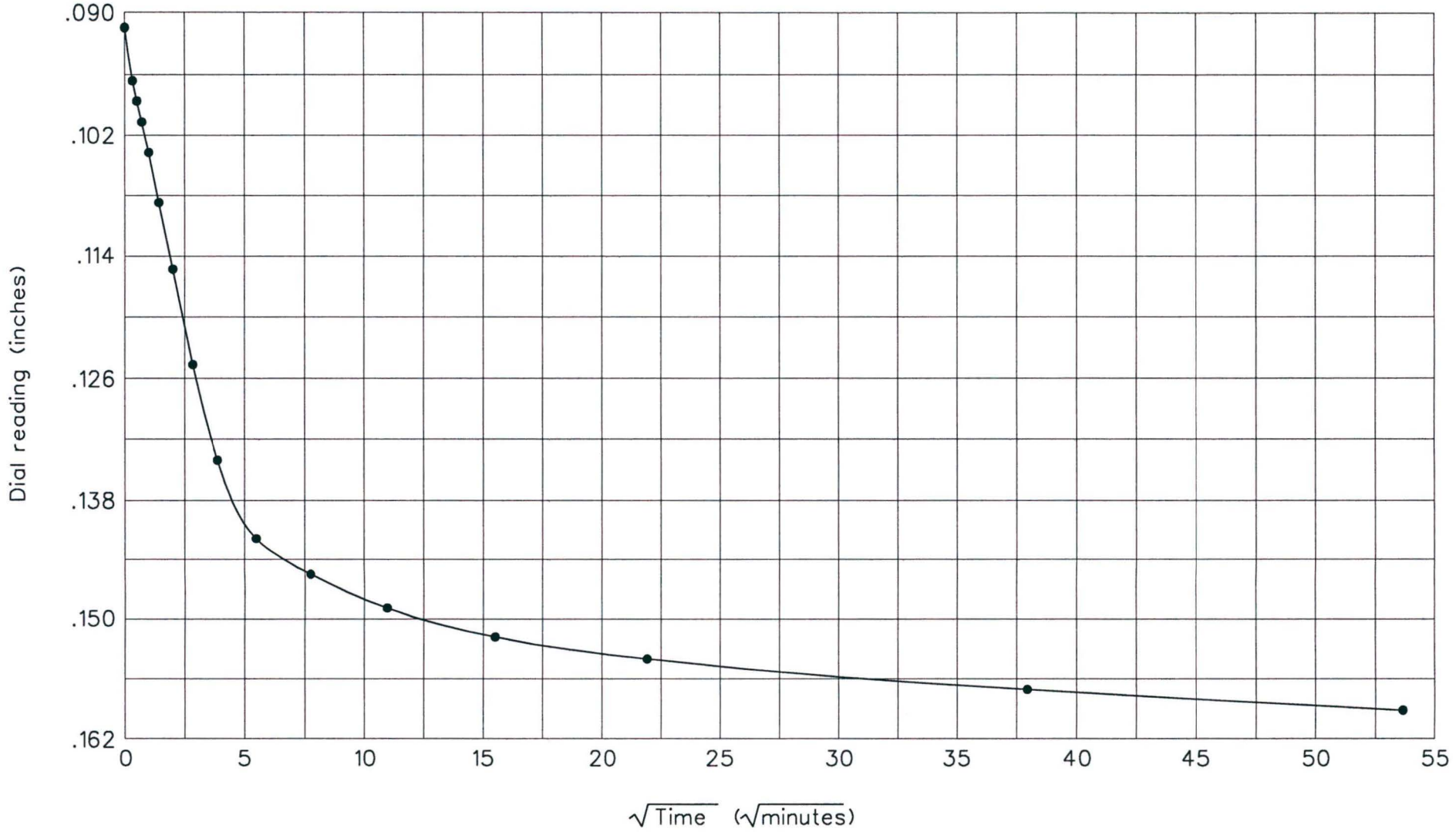
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 60'-61.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

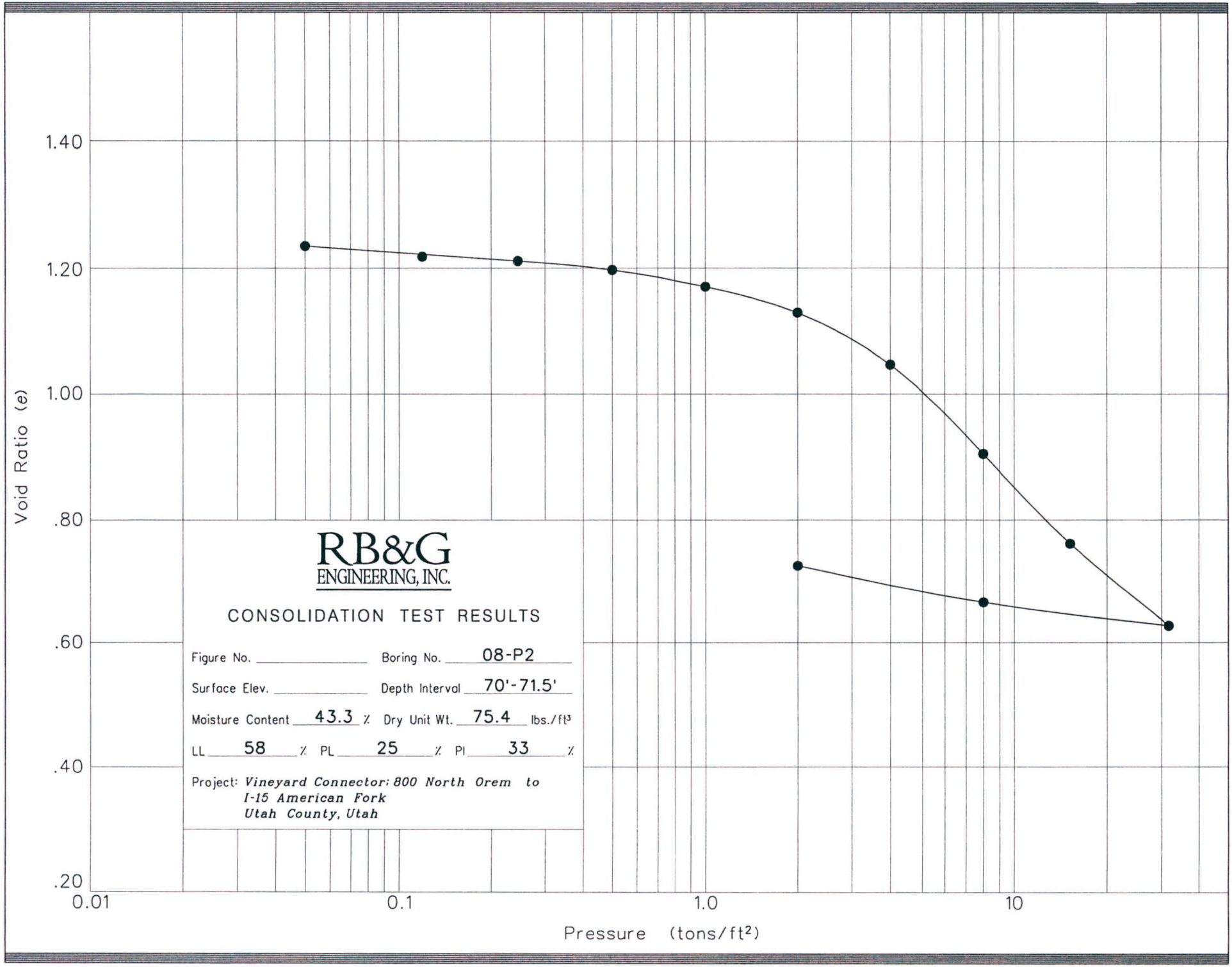
Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G ENGINEERING INC. Provo, Utah	Hole no.: 08-P2 Depth: 60'-61.5' Load: 2.30 to 4.60 tons	TIME CONSOLIDATION *Vineyard Connector;* *800 North Orem to I-15 American Fork* *Utah County, Utah*

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

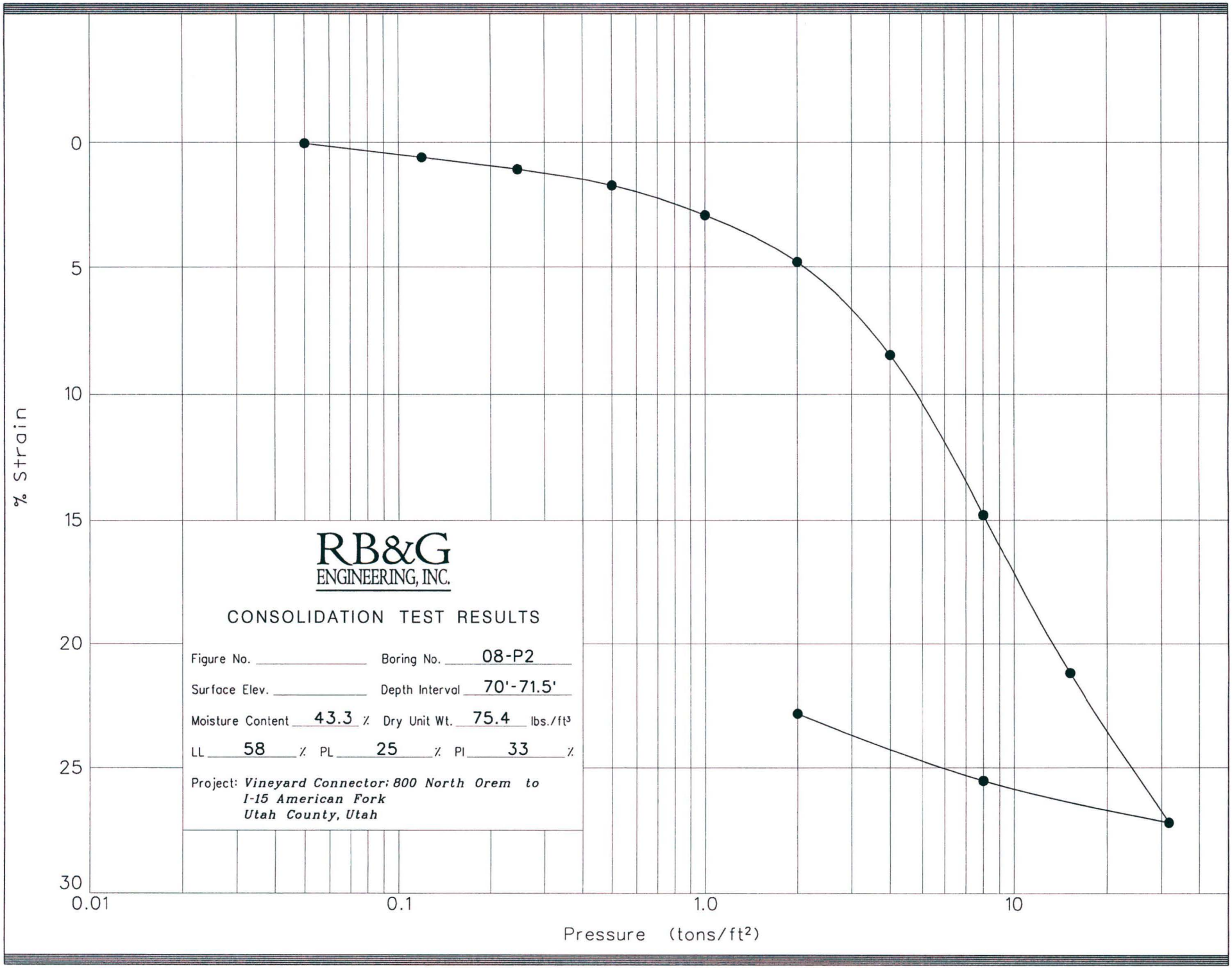
Figure No. _____ Boring No. 08-P2

Surface Elev. _____ Depth Interval 70'-71.5'

Moisture Content 43.3 % Dry Unit Wt. 75.4 lbs./ft³

LL 58 % PL 25 % PI 33 %

Project: *Vineyard Connector: 800 North Orem to I-15 American Fork Utah County, Utah*



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

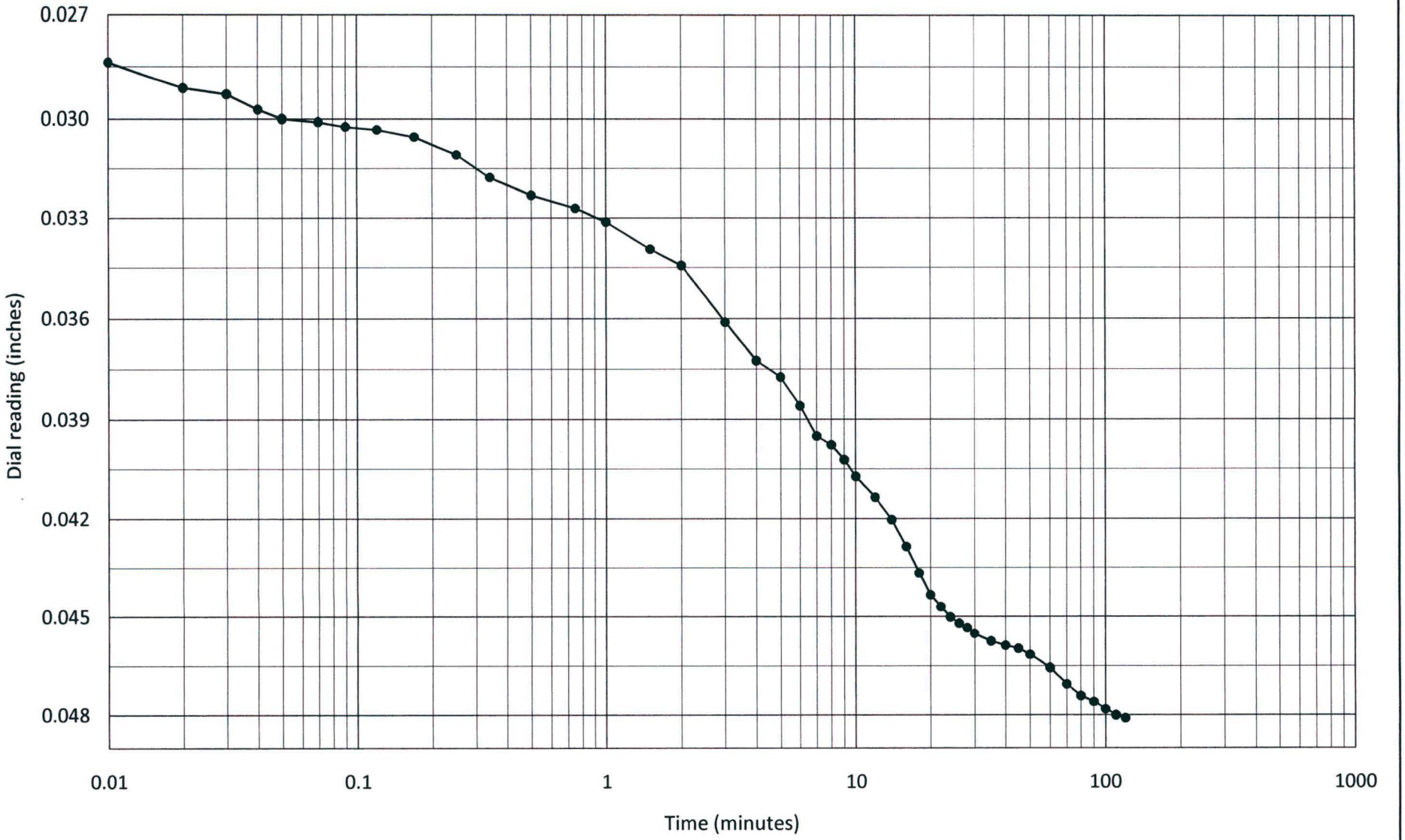
Figure No. _____ Boring No. 08-P2

Surface Elev. _____ Depth Interval 70'-71.5'

Moisture Content 43.3 % Dry Unit Wt. 75.4 lbs./ft³

LL 58 % PL 25 % PI 33 %

Project: *Vineyard Connector: 800 North Orem to I-15 American Fork Utah County, Utah*

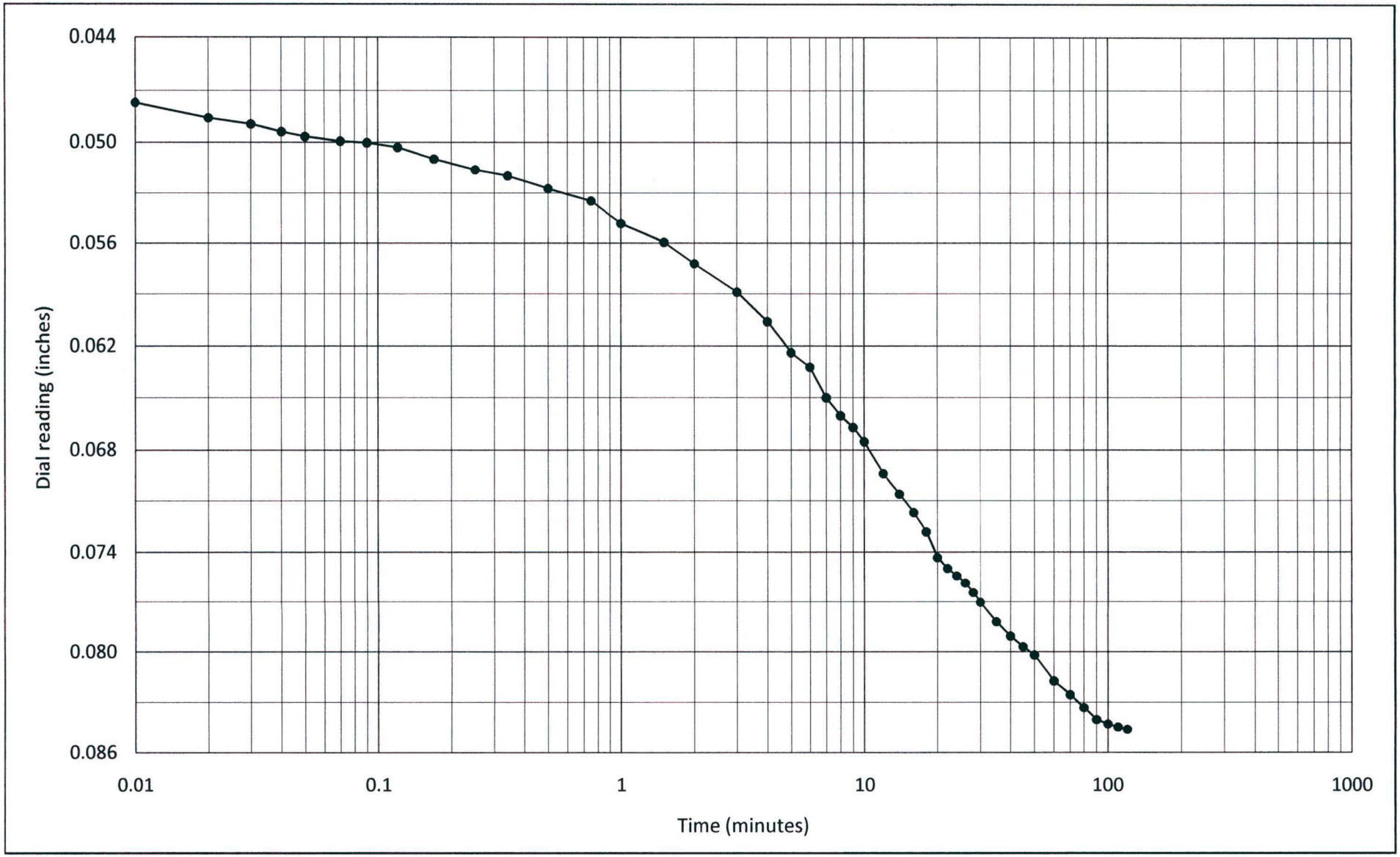


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

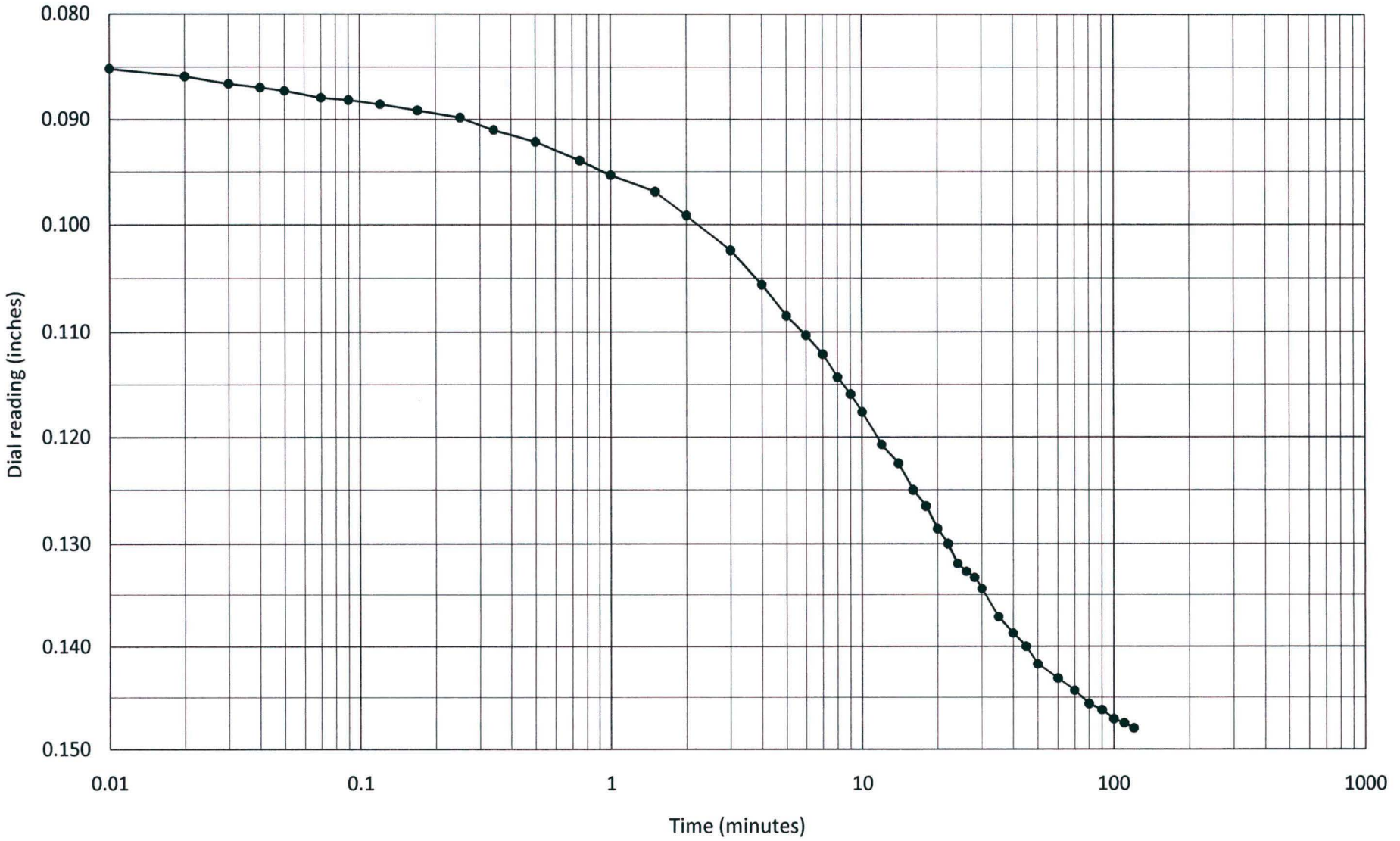


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

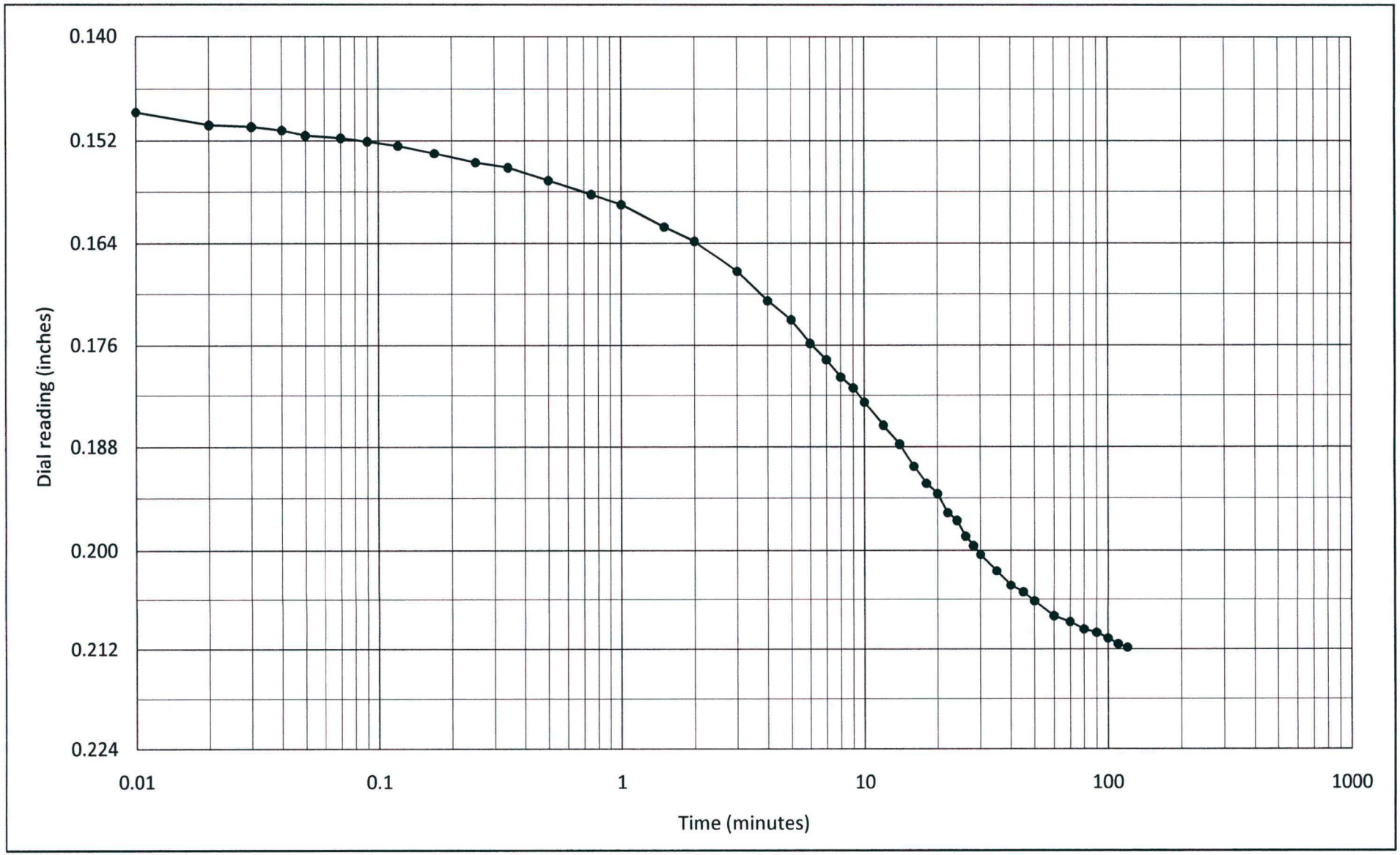


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

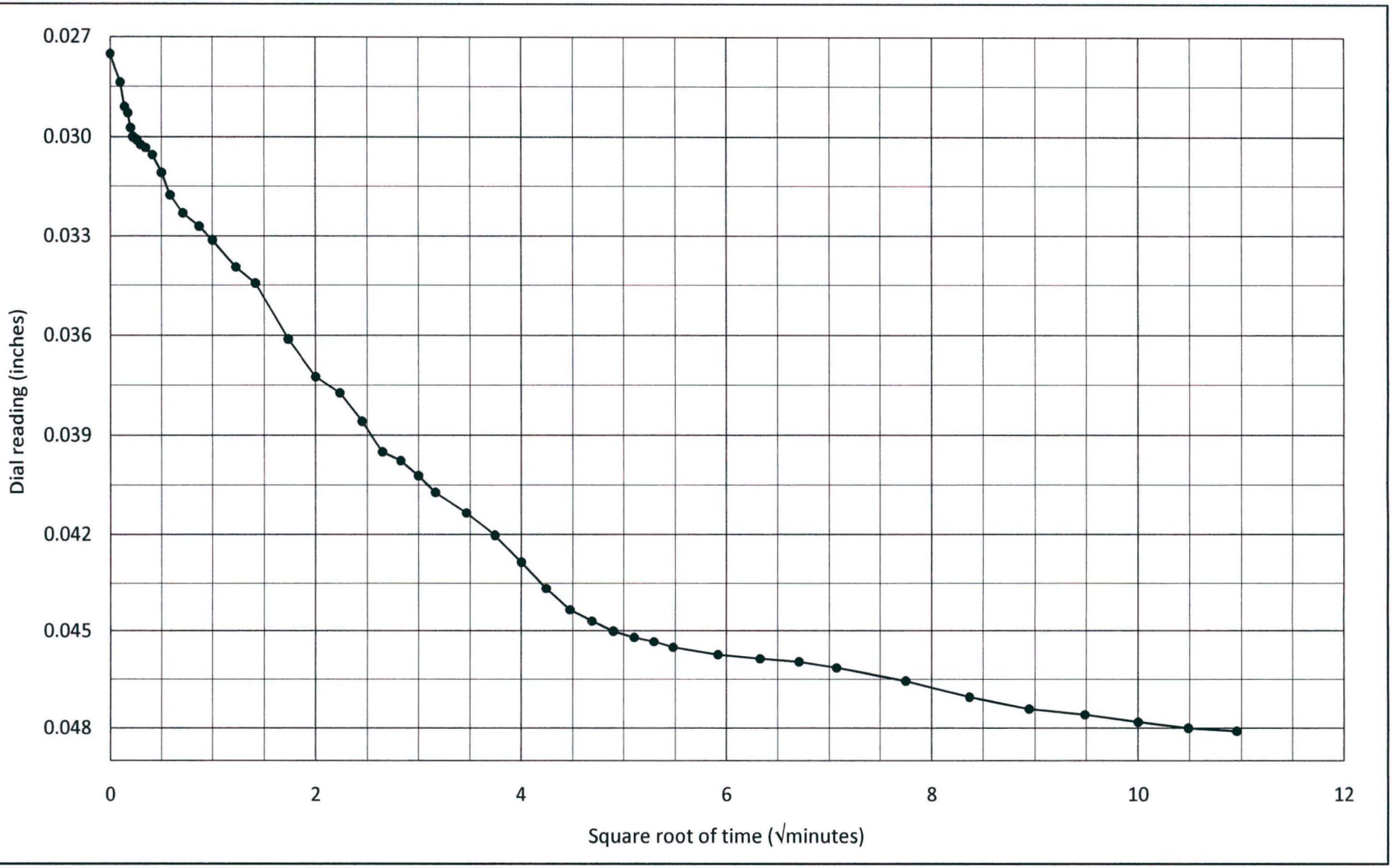


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

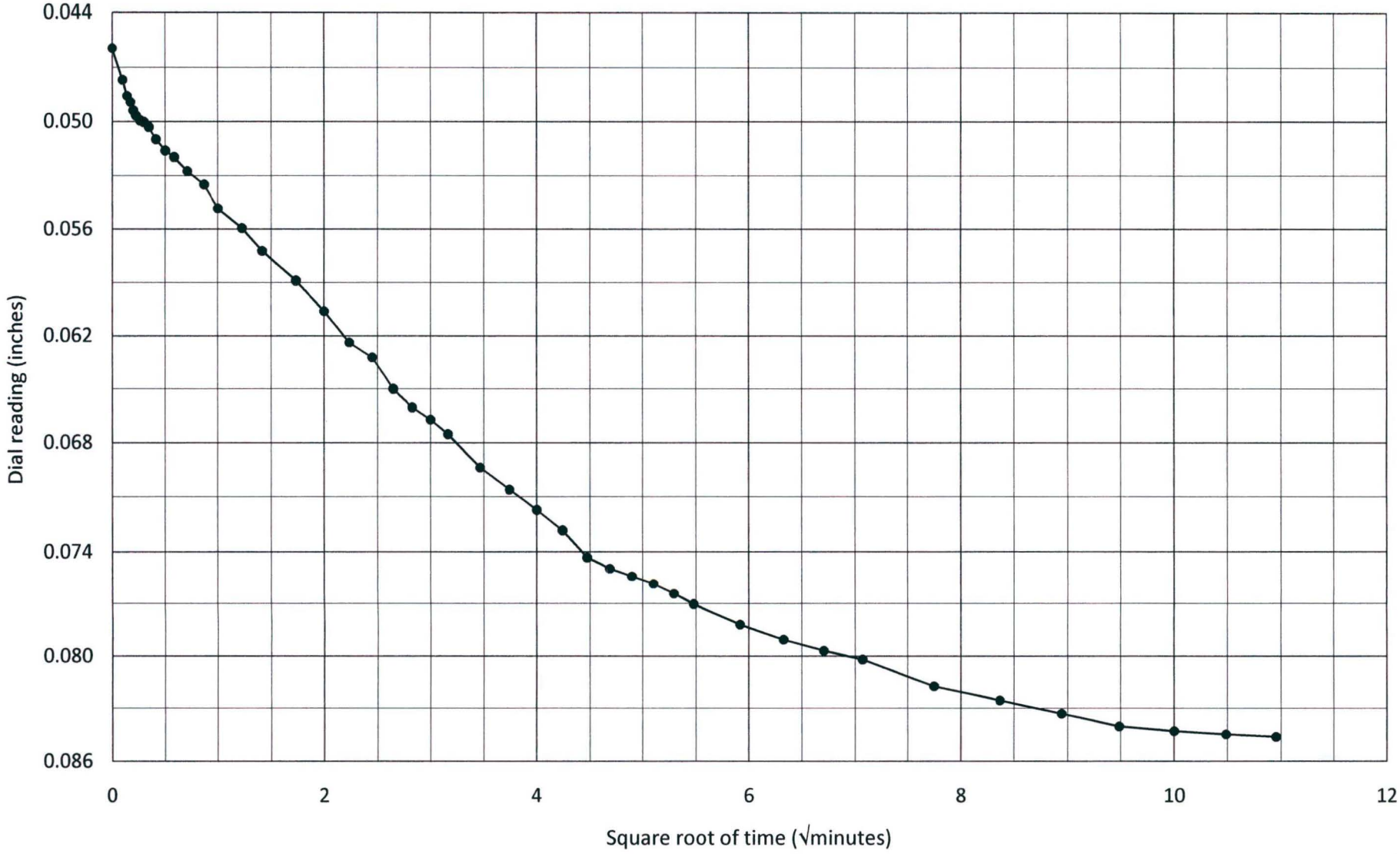


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

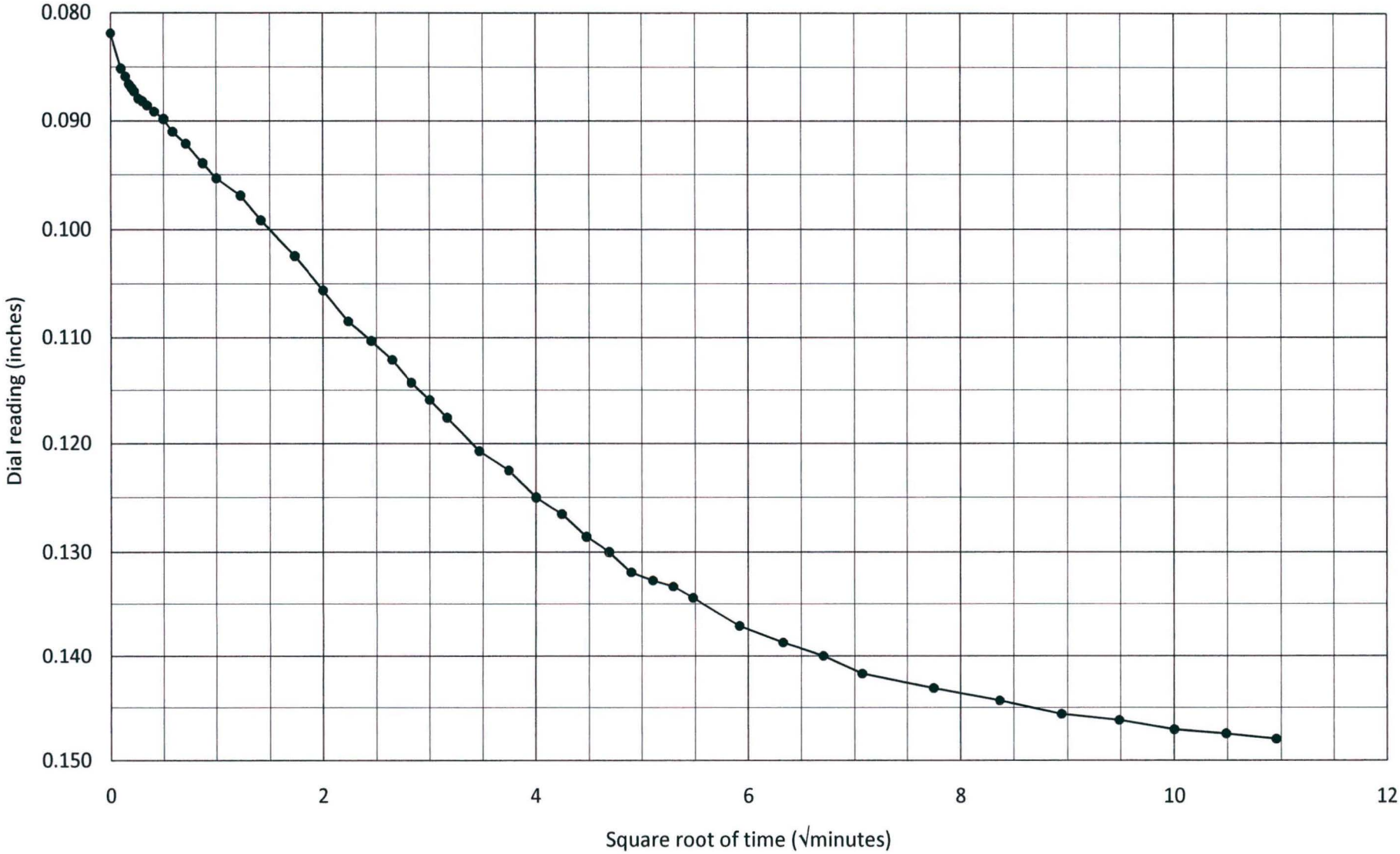


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

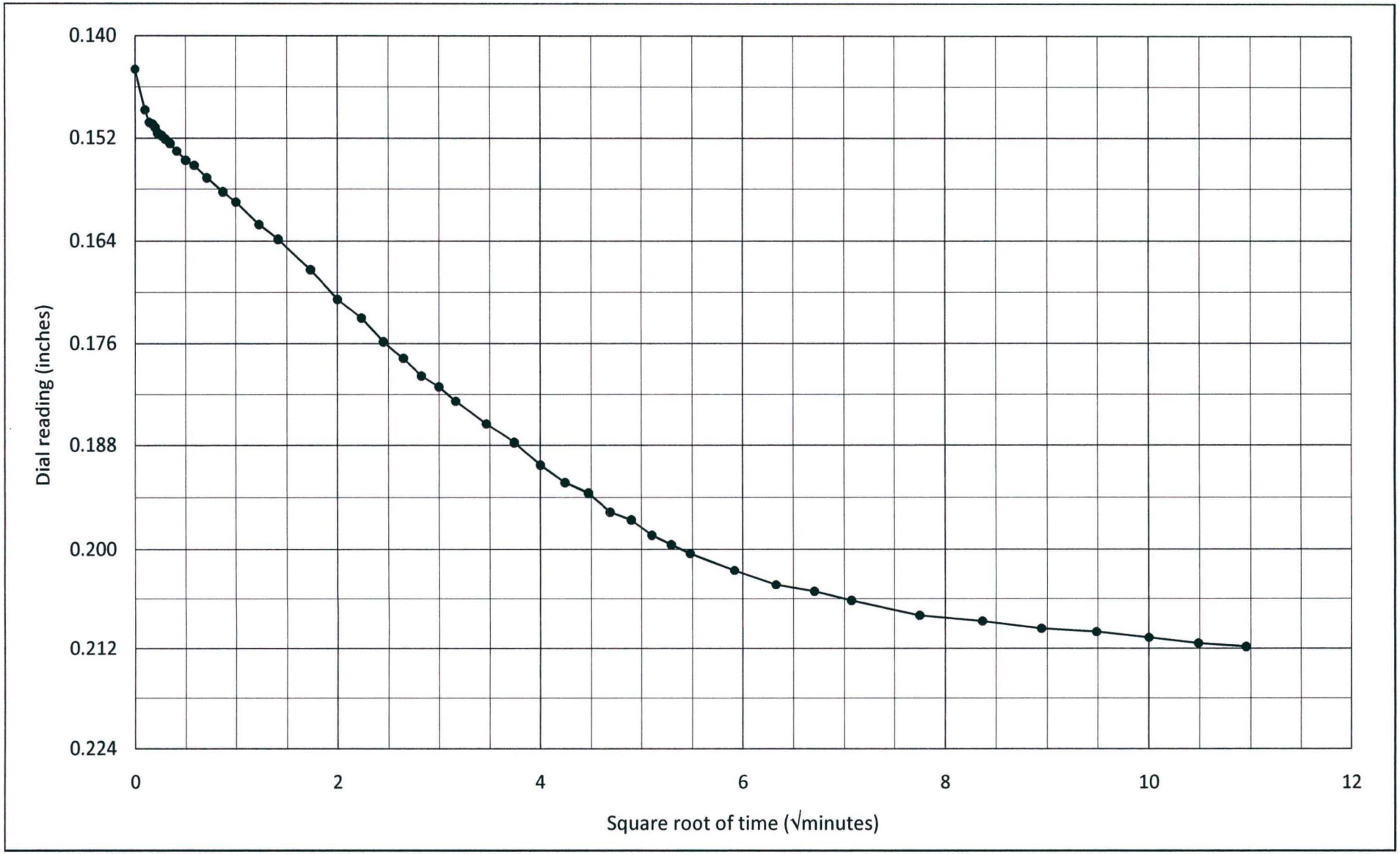


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah



RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

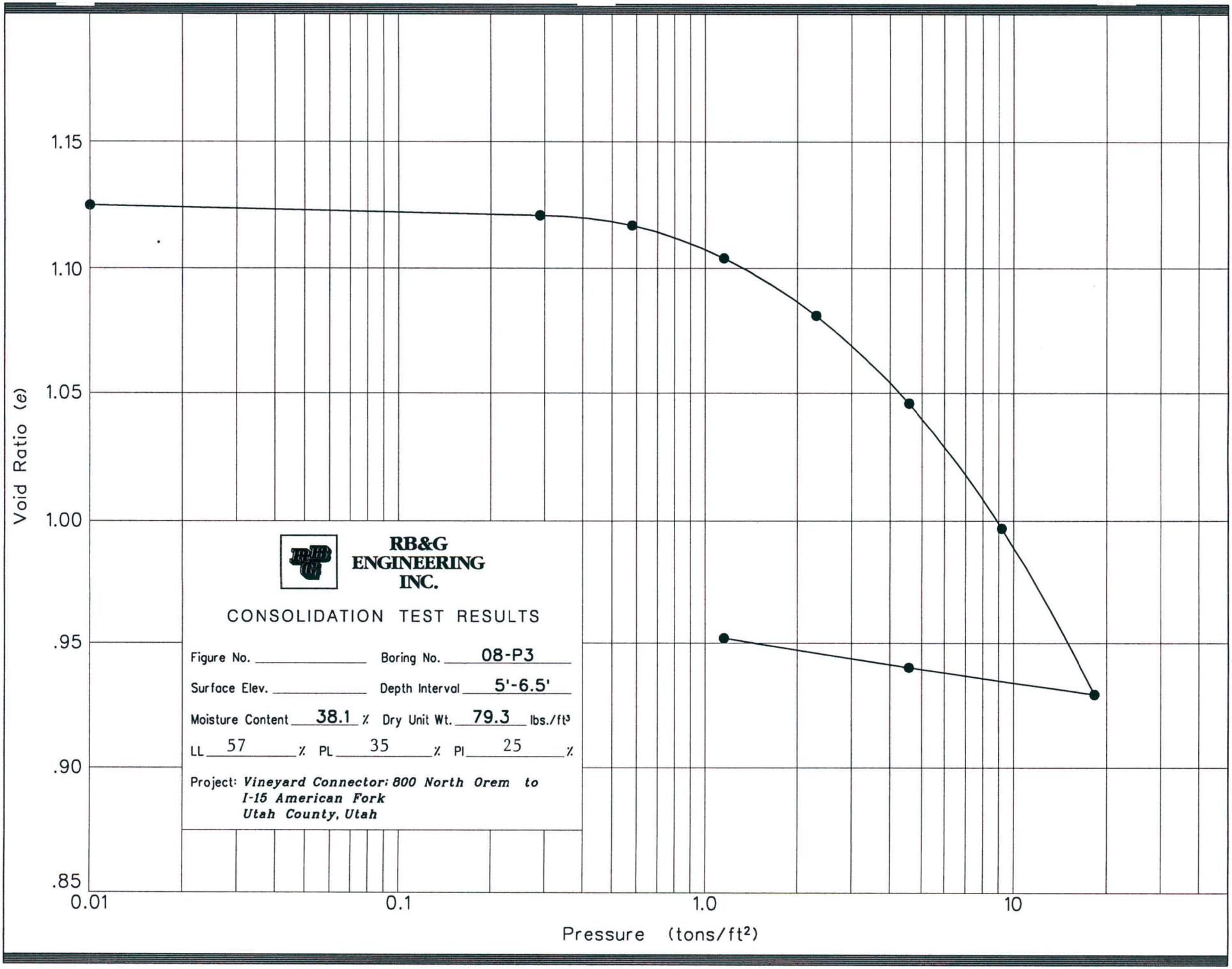
Table 1

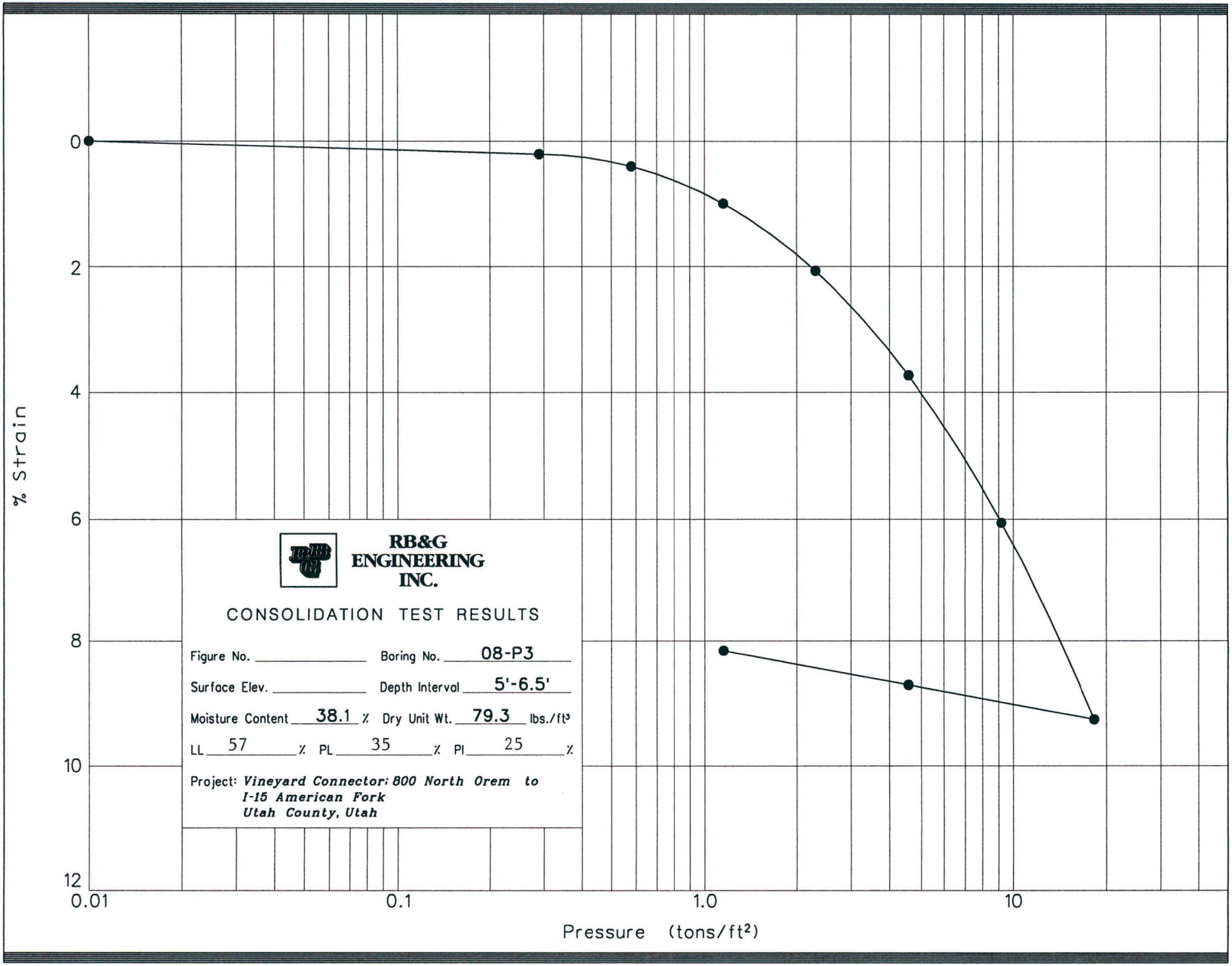
SUMMARY OF TEST DATA

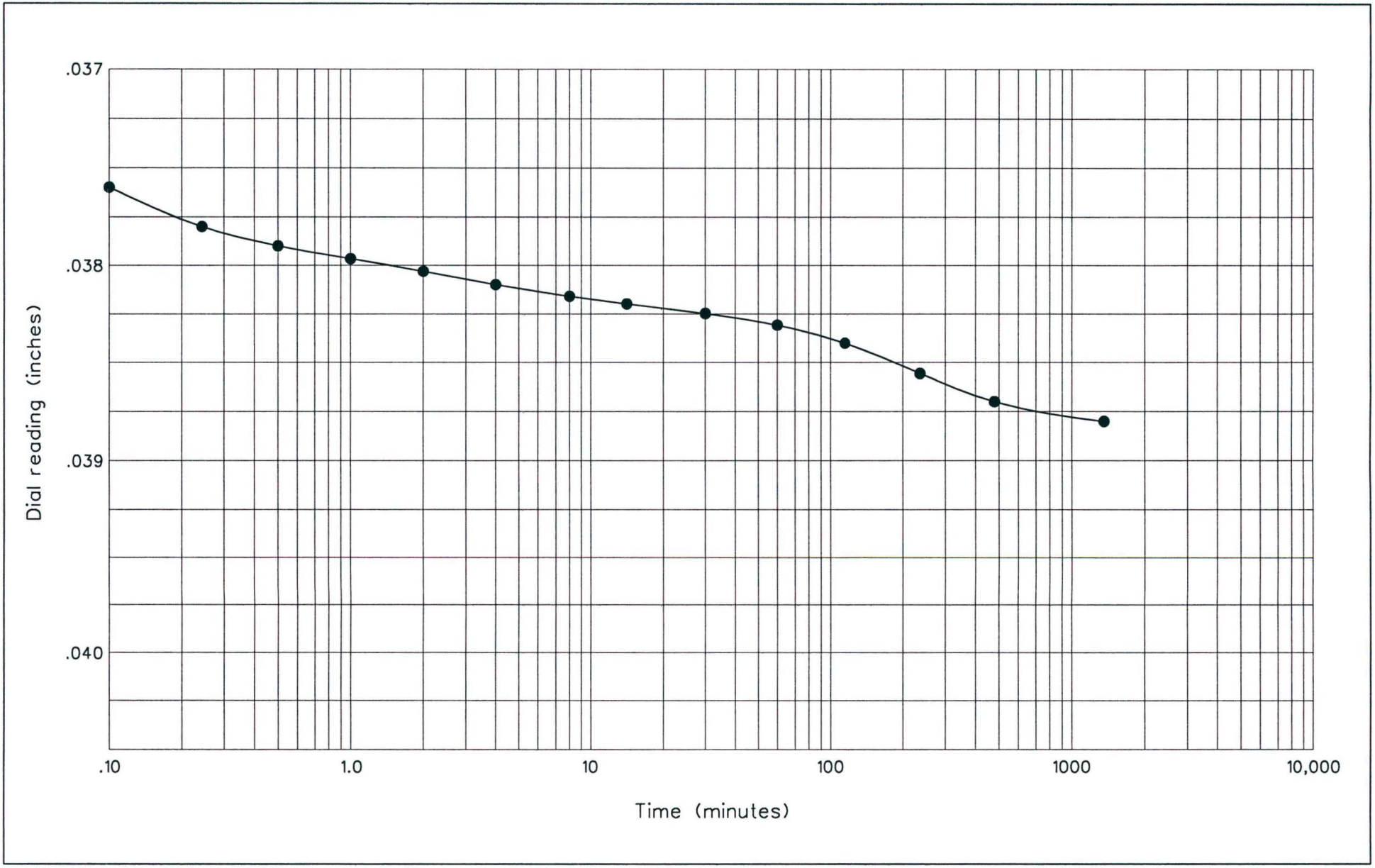
PROJECT Vineyard Connector; 800 North Orem to I-15 American Fork
PROJECT NO. 200701-048
LOCATION Utah County, Utah
FEATURE Foundations

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	STANDARD PENETRATION BLOWS PER FOOT	IN-PLACE		UNCONFINED COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO Classification)
			DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
08-P3	5-6.5	Shelby	79.3	38.1		57	35	25	0	13	87	MH (A-7-5(26))
	16.5-18	14		21.8				NP	0	80	20	SM (A-2-4(0))
	26.5-28	9		22.8				NP	0	74	26	SM (A-2-4(0))
	30-31.5	Shelby		23.7				NP	0	74	26	SM (A-2-4(0))
	31.5-33	12		25.5				NP	0	76	24	SM (A-2-4(0))
	45-46.5	Shelby		21.5				NP	0	34	66	ML (A-4(0))
	55-56.5	Shelby	93.2	26.2	1868	26	15	11	0	6	94	CL (A-6(9))
	65-66.5	78		20.1				NP	0	84	16	SM (A-2-4(0))

NP=Nonplastic


1.15
1.10
1.05
1.00
.95
.90
.85
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P3
Surface Elev. _____ Depth Interval 5'-6.5'
Moisture Content 38.1 % Dry Unit Wt. 79.3 lbs./ft³
LL 57 % PL 35 % PI 25 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah


% Strain
0
2
4
6
8
10
12
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P3
Surface Elev. _____ Depth Interval 5'-6.5'
Moisture Content 38.1 % Dry Unit Wt. 79.3 lbs./ft³
LL 57 % PL 35 % PI 25 %
Project: Vineyard Connector: 800 North Orem to I-15 American Fork Utah County, Utah



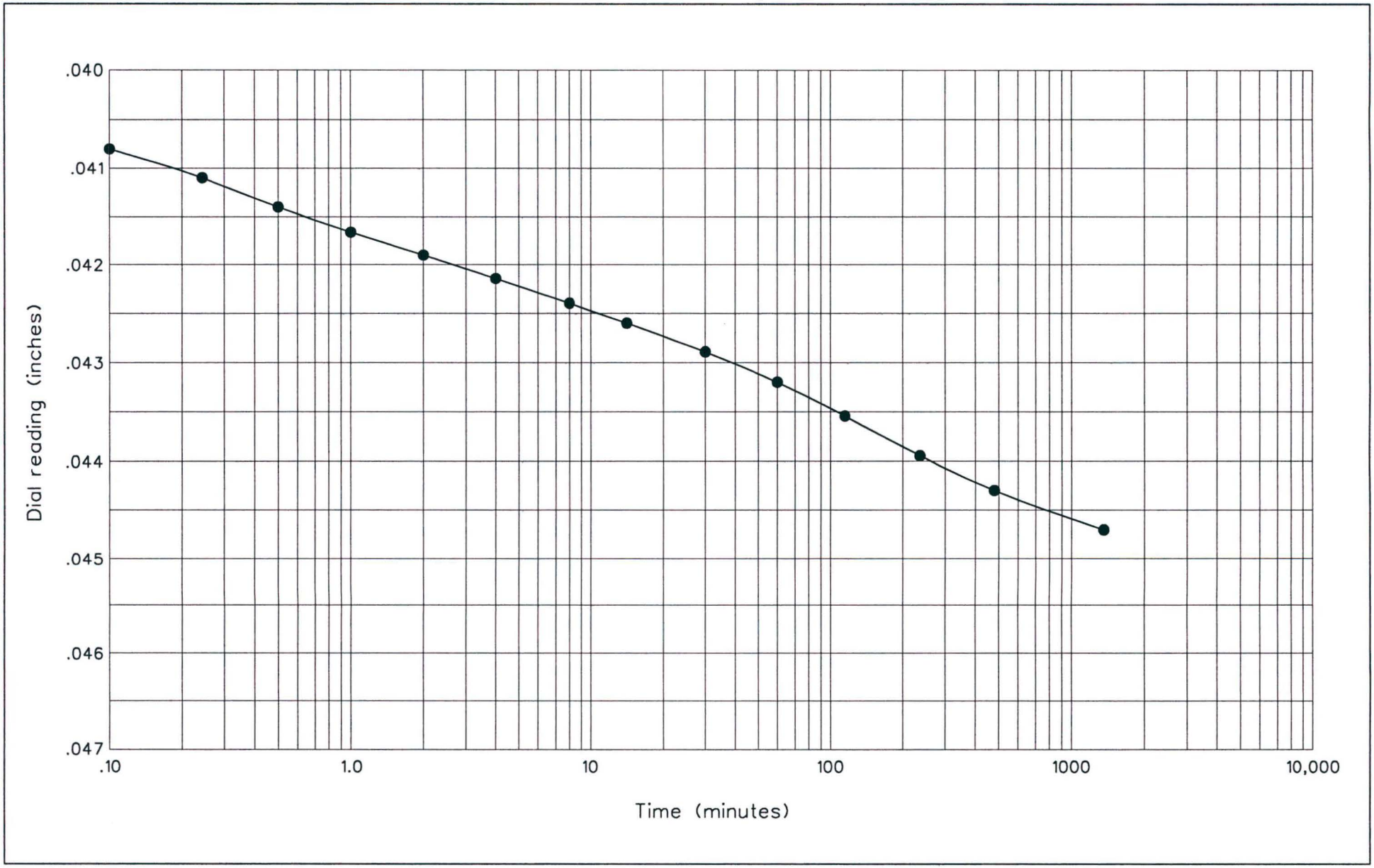
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P3
Depth: 5'-6.5'
Load: 0.29 to 0.58 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



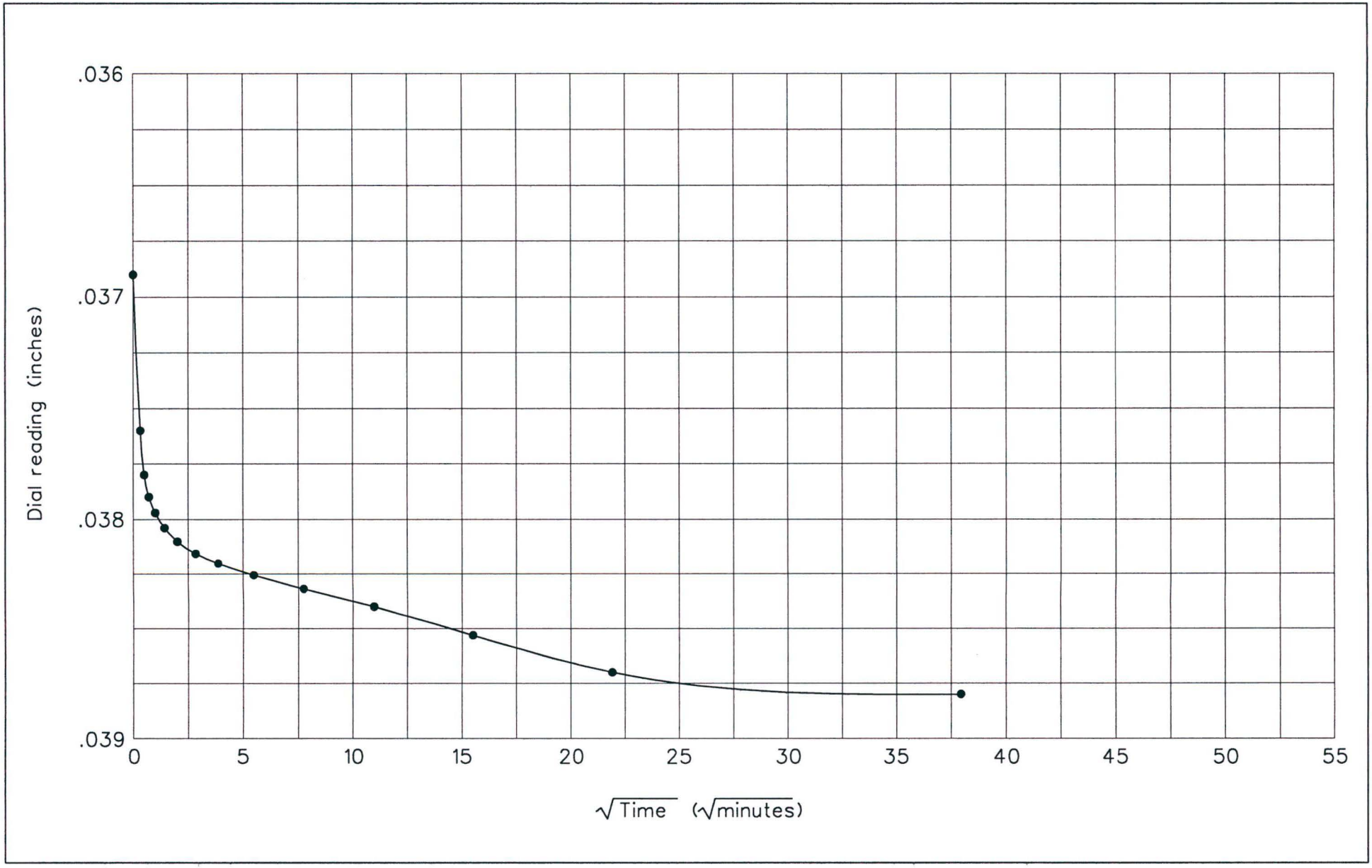
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P3
Depth: 5'-6.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



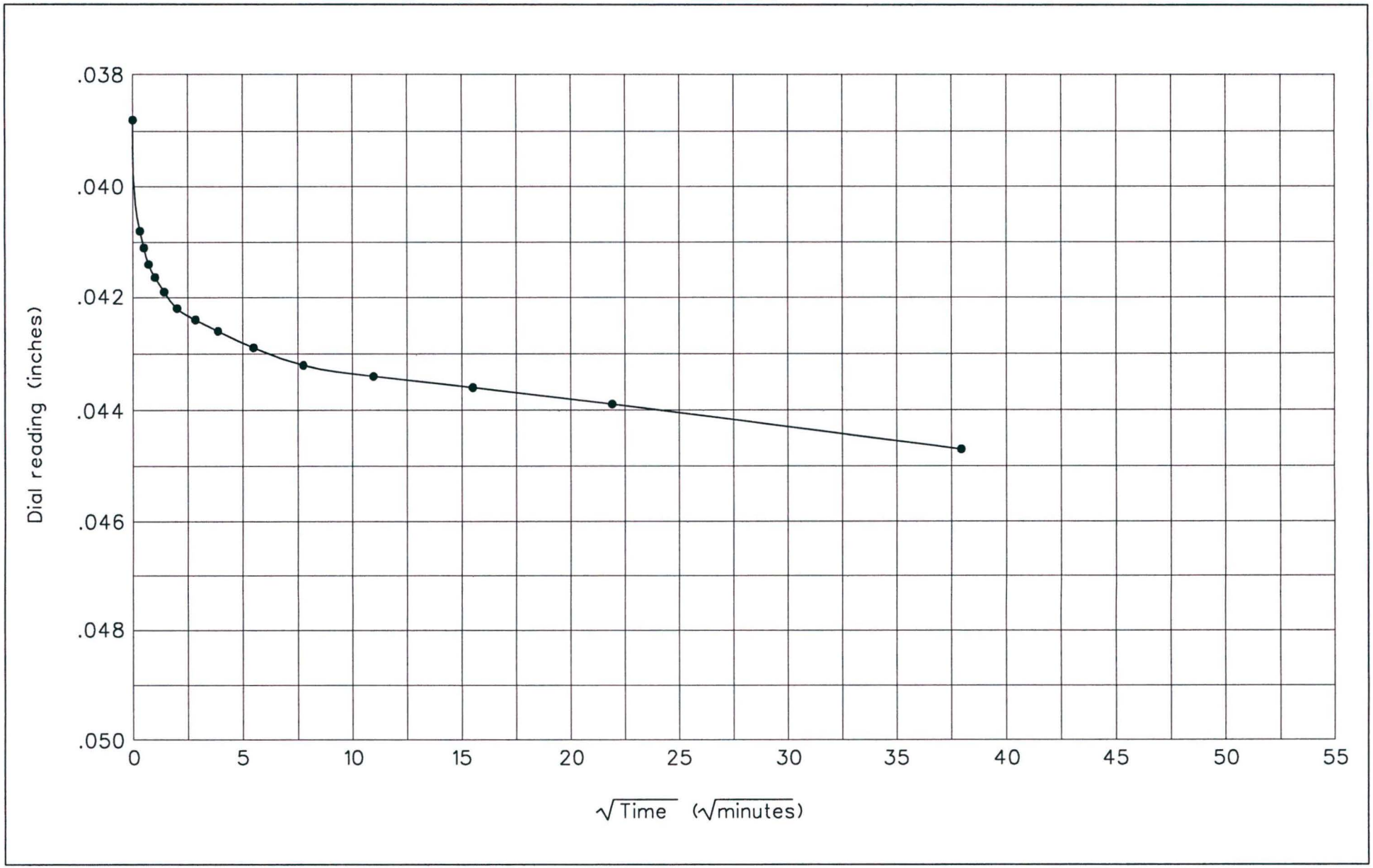
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P3
Depth: 5'-6.5'
Load: 0.29 to 0.58 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



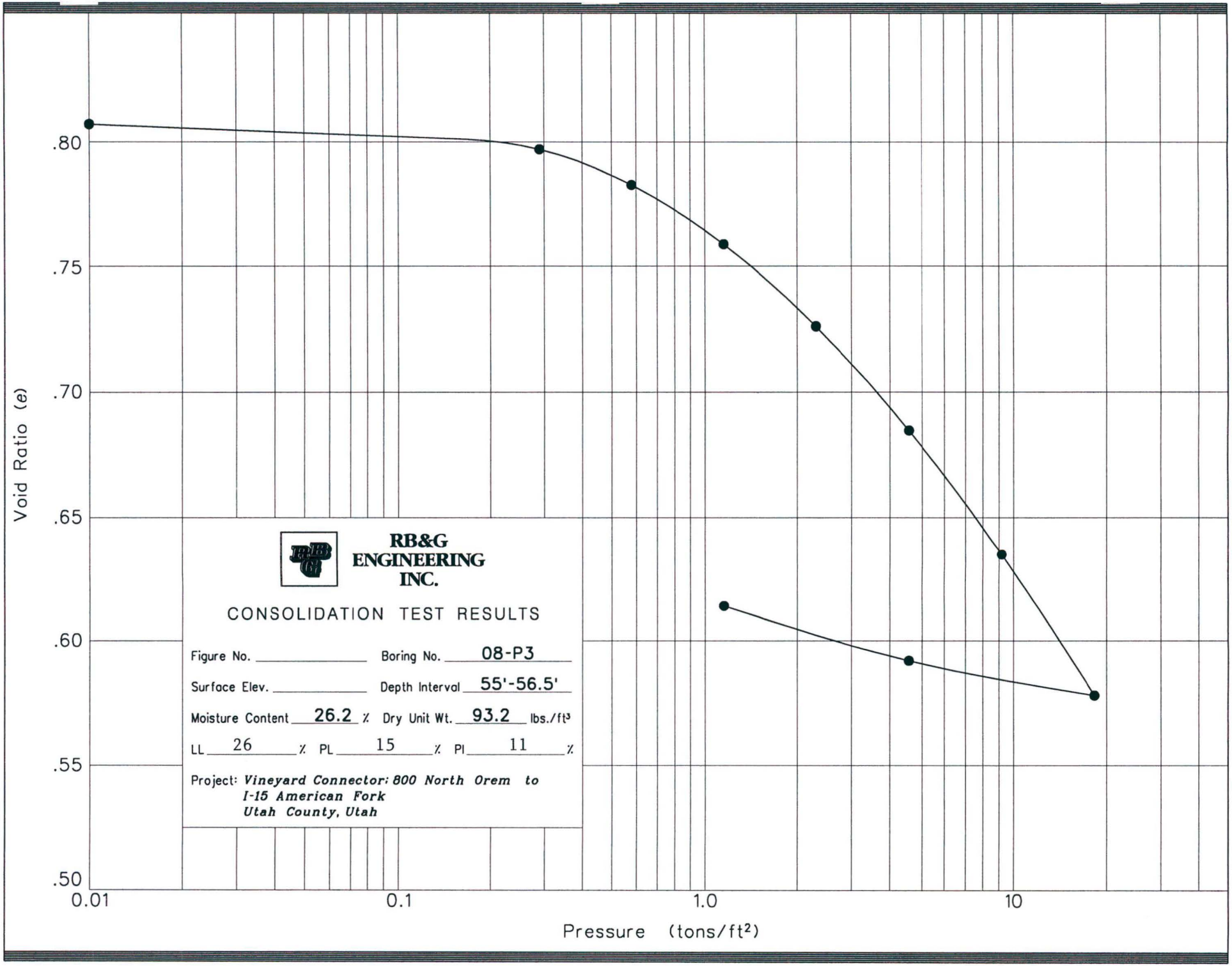
RB&G ENGINEERING INC.
Provo, Utah

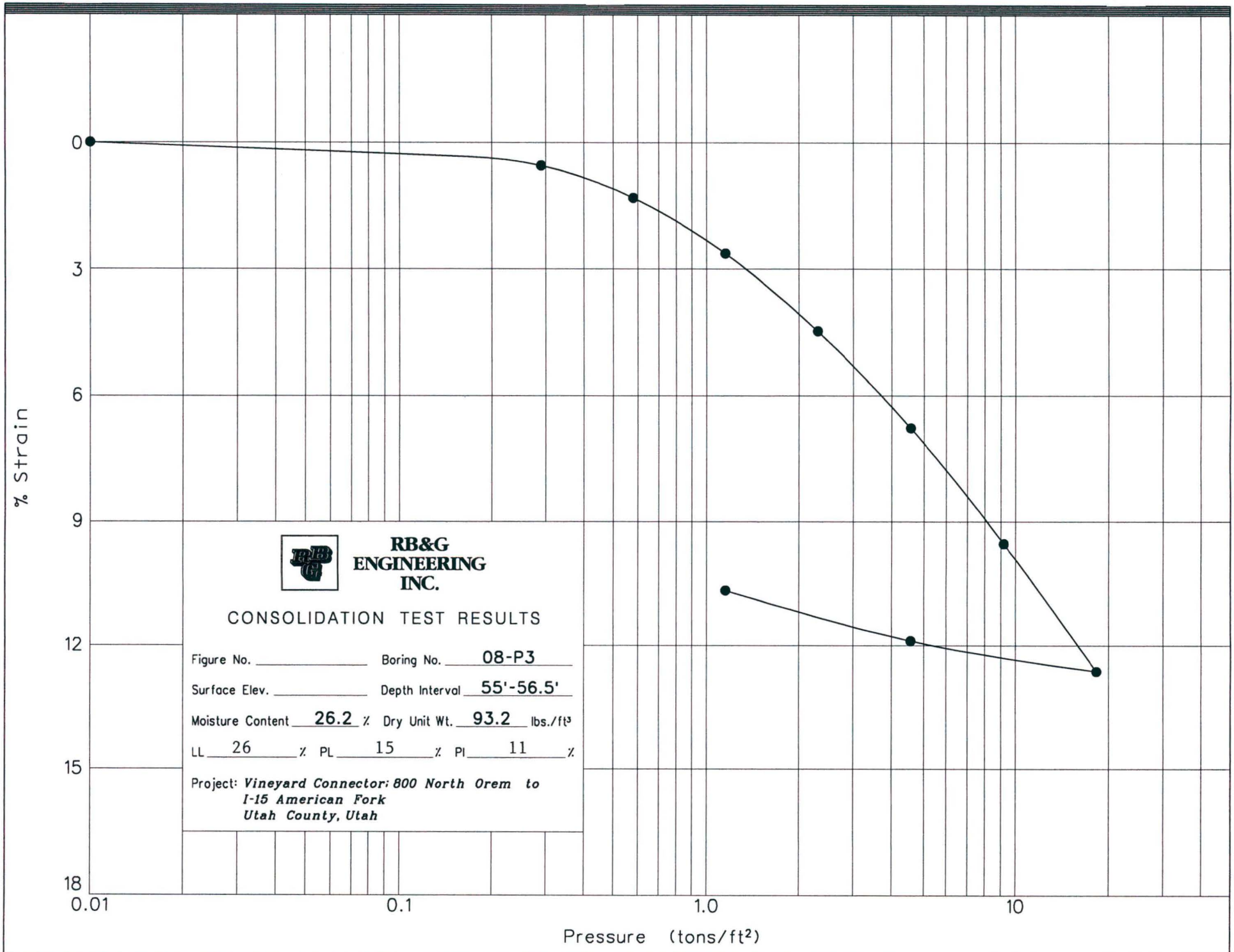
Hole no.: 08-P3
Depth: 5'-6.5'
Load: 0.58 to 1.15 tons

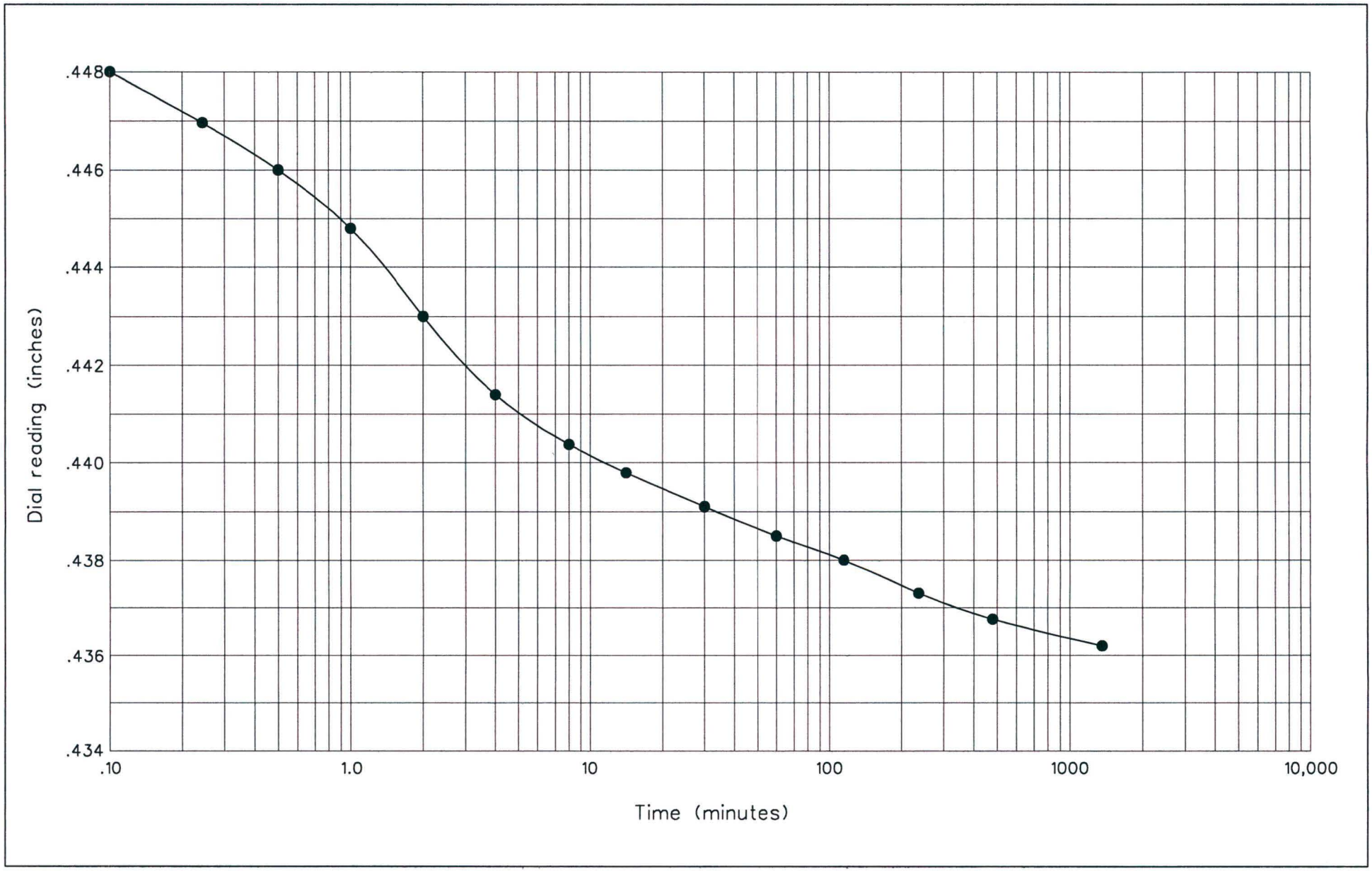
TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure


.80
.75
.70
.65
.60
.55
.50
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P3
Surface Elev. _____ Depth Interval 55'-56.5'
Moisture Content 26.2 % Dry Unit Wt. 93.2 lbs./ft³
LL 26 % PL 15 % PI 11 %
Project: Vineyard Connector: 800 North Orem to I-15 American Fork
Utah County, Utah


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P3
Surface Elev. _____ Depth Interval 55'-56.5'
Moisture Content 26.2 % Dry Unit Wt. 93.2 lbs./ft³
LL 26 % PL 15 % PI 11 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah



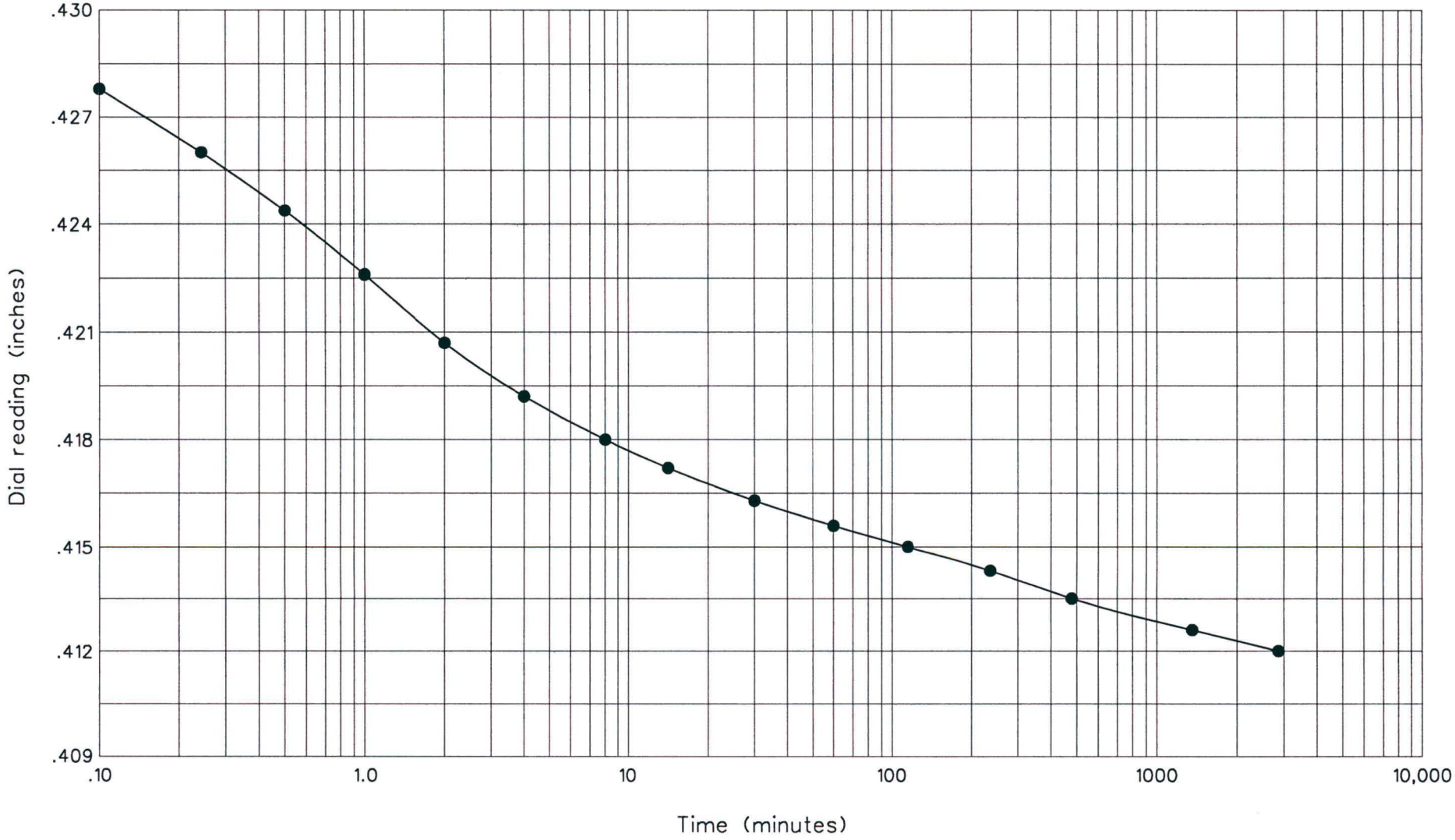
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P3
Depth: 55'-56.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



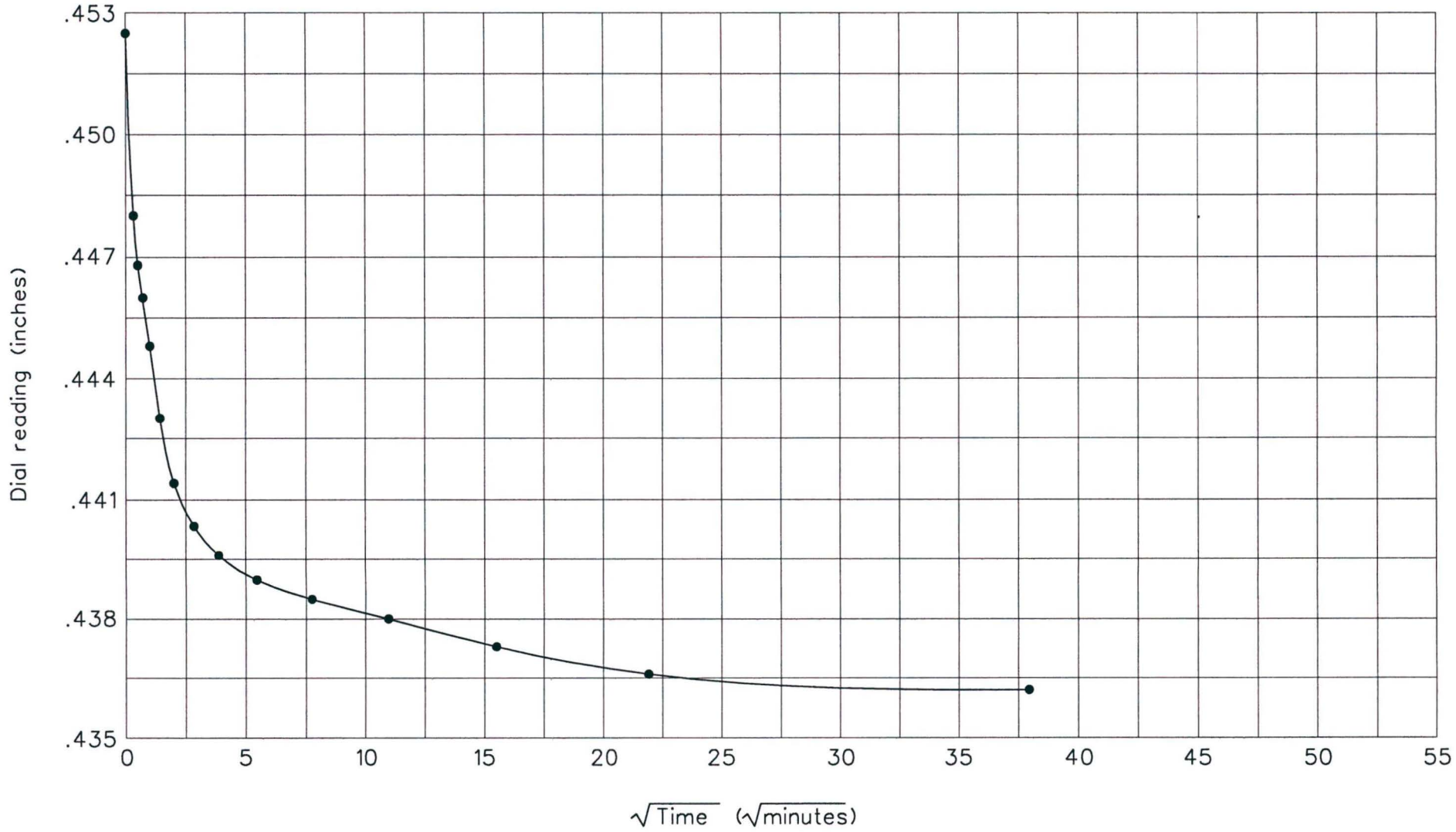
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P3
Depth: 55'-56.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



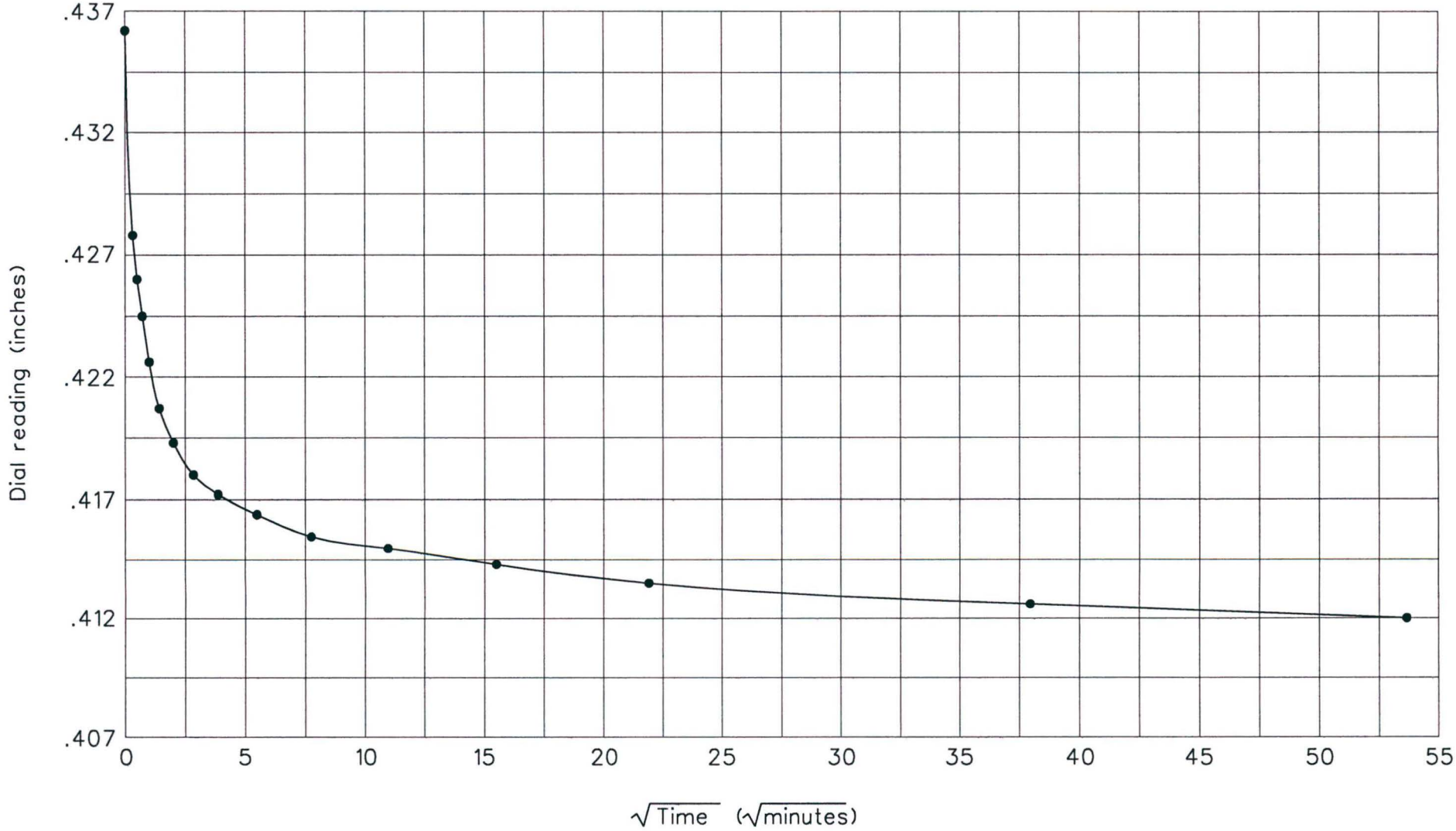
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P3
Depth: 55'-56.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P3
Depth: 55'-56.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure

Table 1
SUMMARY OF TEST DATA

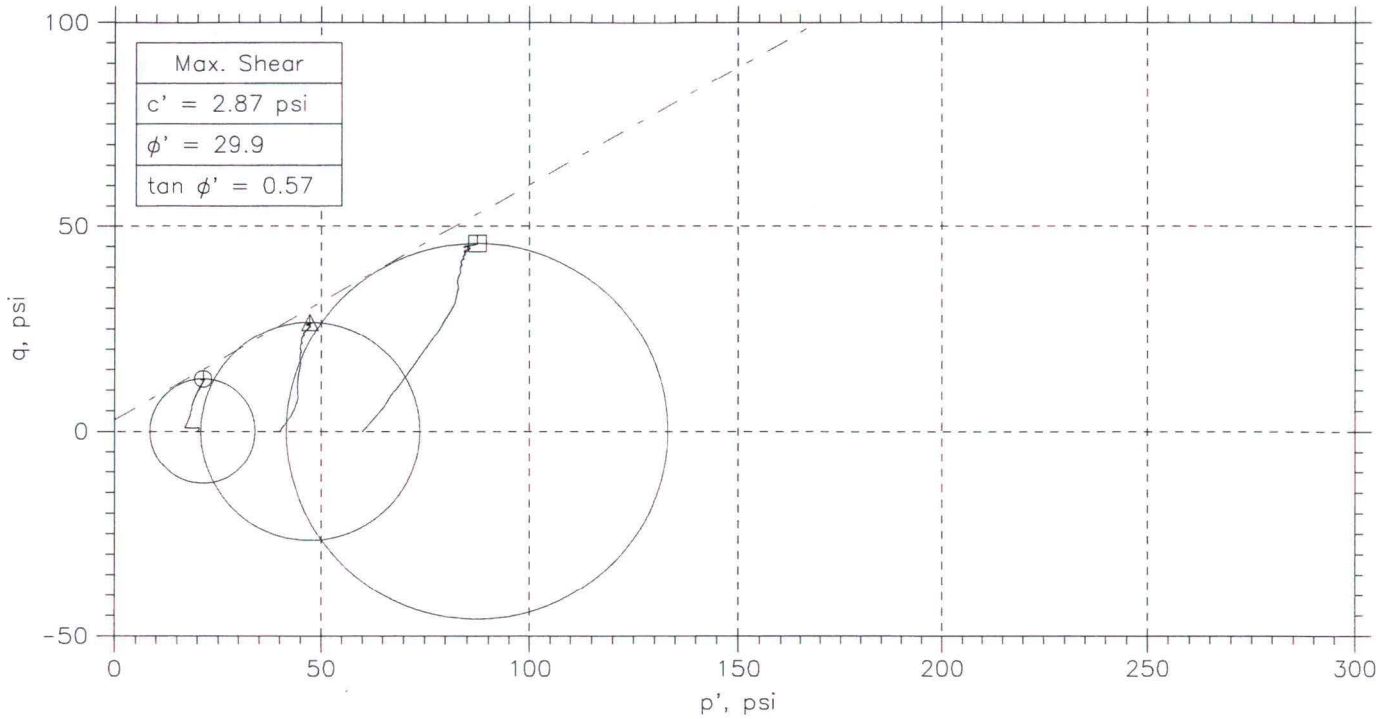
PROJECT I-15 Utah County Corridor — PROJECT NO. 200801-200
LOCATION Proctor Road Over I-15, Pleasant Grove, Utah — FEATURE Foundations

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	STANDARD PENETRATION BLOWS PER FOOT Corrected $(N1)_{60}$	IN-PLACE		UNCONFINED COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS				UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO Classification)
			DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTIC. INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT& CLAY	PERCENT FINER THAN 0.005 mm	
08-PG2-B1	5-6.5	9		21.1		35	21	14	13	19	68		CL (A-6(8))
	11.5-13	Shelby	90.5	33.5		54	25	29	0	1	99		CH (A-7-6(33))
	20-21.5	Shelby	91.1	34.2	3742	53	22	31	0	0	100		CH (A-7-6(35))
	30-31.5	Shelby	103.4	23.6	4977	35	18	17	0	13	87		CL (A-6(14))
	41-42.5	28		22.4				NP	5	50	45		SM (A-4(0))
	45-46.5	Shelby	86.0	35.5		47	24	23	0	0	100		CL (A-7-6(26))
	55-56.5	Shelby	75.2	46.2	1601	47	23	24	0	0	100		CL (A-7-6(27))
	65-66.5	Shelby	75.6	41.7		51	23	28	0	0	100		CH (A-7-6(32))
	75-76.5	Shelby	75.1	46.3	1496	51	23	28	0	0	100		CH (A-7-6(32))
	85-86.5	Shelby	87.7	35.5									
	90-91.5	53		18.4				NP	0	79	21		SM (A-2-4(0))
	95-96.5	11		21.3				NP	0	78	22		SM (A-2-4(0))
	105-106.5	Shelby	97.3	26.7		33	24	9	0	6	94		ML (A-4(9))
	110-111.5	Shelby	94.7	30.2		31	25	6	0	5	95		ML (A-4(6))
	123-124.5	Shelby	93.8	31.0		40	25	15	0	0	100		CL (A-6(17))
	126.5-128	65		16.7		28	21	7	38	31	31		GC (A-2-4(0))

		Resistivity (ohm cm)	pH	Sulfate (mg/kg-dry)	Chloride (mg/kg-dry)
08-PG2-B1	5-6.5	1466	8.0	190	130

NP=Nonplastic

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol		⏲	△	⏍	
Sample No.		1	1	1	
Test No.		20 psi	40 psi	60 psi	
Depth		11.5-13'	11.5-13'	11.5-13'	
Initial	Diameter, in	1.4	1.4	1.4	
	Height, in	2.84	2.84	2.84	
	Water Content, %	33.5	33.5	33.5	
	Dry Density, pcf	90.88	90.88	90.88	
	Saturation, %	106.8	106.8	106.8	
	Void Ratio	0.841	0.841	0.841	
Before Shear	Water Content, %	30.8	32.1	32.1	
	Dry Density, pcf	91.66	89.94	89.94	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	0.825	0.86	0.86	
	Back Press., psi	28.01	5.011	1.586	
Ver. Eff. Cons. Stress, psi		19.98	40.	60.	
Shear Strength, psi		12.74	26.59	45.82	
Strain at Failure, %		5.13	4.44	6.45	
Strain Rate, %/min		0.01	0.01	0.01	
B-Value		1.12	---	---	
Estimated Specific Gravity		2.68	2.68	2.68	
Liquid Limit		54	54	54	
Plastic Limit		29	29	29	

Project: I-15 UCC

Location: PG 2

Project No.: 200801-200

Boring No.: 08-PG2-B1

Sample Type: shelby

Description: gray brown clay, stiff

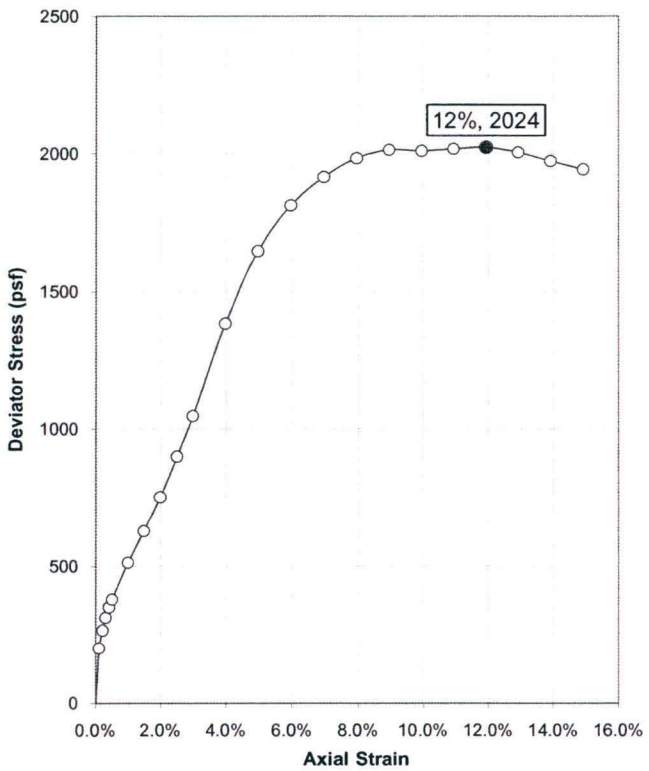
Remarks: multi-stage

Phase calculations based on start and end of test.

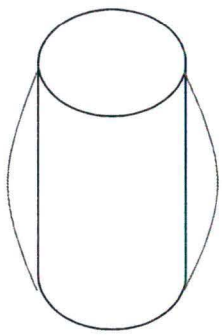
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B1
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	45-46.5'
Date	November 13, 2008	**Sample Description**	Lean clay
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-1	0	
0.1%	202	101	
0.2%	267	133	
0.3%	313	156	
0.4%	351	176	
0.5%	380	190	
1.0%	514	257	
1.5%	629	314	
2.0%	753	377	
2.5%	901	451	
3.0%	1048	524	
4.0%	1385	693	
5.0%	1650	825	
6.0%	1816	908	
7.0%	1917	959	
8.0%	1985	993	
8.9%	2016	1008	
9.9%	2011	1006	
10.9%	2019	1010	
11.9%	2024	1012	
12.9%	2006	1003	
13.9%	1975	987	
14.9%	1945	972	



Initial Sample Data

Initial height of specimen	L_o	5.24	(in)	**Moisture content***	w	36%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	86.0	(pcf)
Height-to-diameter ratio	L_o / D_o	2.02		**Initial void ratio**	e_o	0.960	
Initial weight of specimen		844.2	(g)	**Saturation**	S	1.00	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	47	
				Plastic index	PI	23	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	2024	(psf)	**Major principal stress at failure****	σ_1	6631	(psf)
Shear stress at failure**	q_f	1012	(psf)	**Minor principal stress at failure****	σ_3	4607	(psf)

Average strain rate to failure	1%	/ min
Strain at failure	12%	

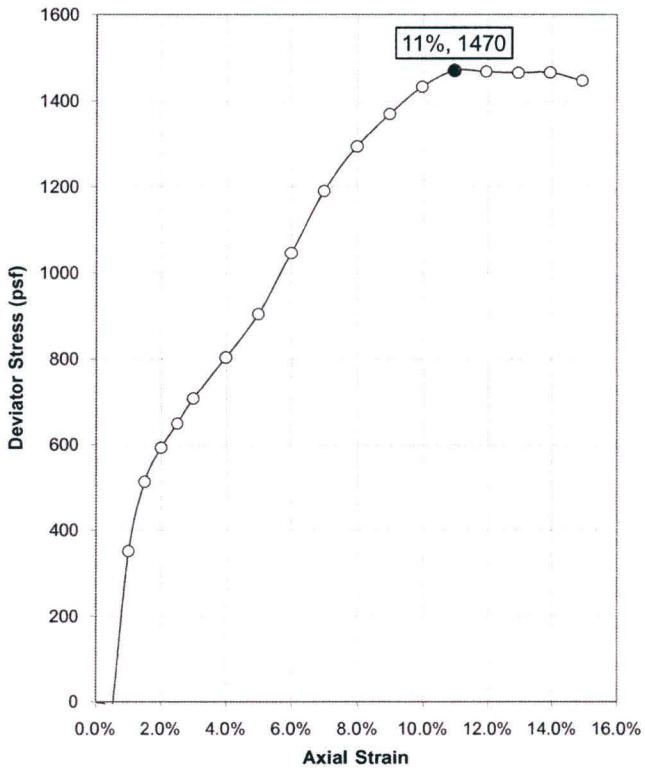
Remarks CL / A-7-6(26)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B1
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	65-66.5'
Date	November 13, 2008	**Sample Description**	Fat Clay, gray
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	0	0	
0.1%	-2	-1	
0.2%	-3	-1	
0.3%	-6	-3	
0.4%	-11	-5	
0.5%	-13	-7	
1.0%	352	176	
1.5%	514	257	
2.0%	593	297	
2.5%	649	325	
3.0%	708	354	
4.0%	804	402	
5.0%	905	452	
6.0%	1047	524	
7.0%	1191	595	
8.0%	1294	647	
9.0%	1370	685	
10.0%	1433	716	
11.0%	1470	735	
11.9%	1468	734	
12.9%	1465	733	
13.9%	1466	733	
14.9%	1447	724	

Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	42%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	75.6	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Initial void ratio**	e_o	1.229	
Initial weight of specimen		770.2	(g)	**Saturation**	S	0.92	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	51	
				Plastic index	PI	28	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	1470	(psf)	**Major principal stress at failure****	σ_1	8077	(psf)
Shear stress at failure**	q_f	735	(psf)	**Minor principal stress at failure****	σ_3	6607	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		11%					

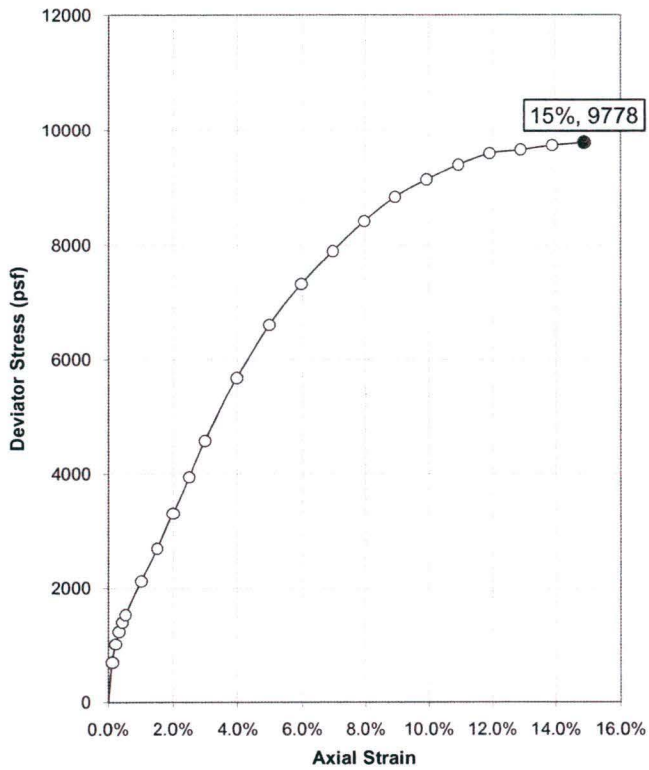
Remarks CH / A-7-6(32)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

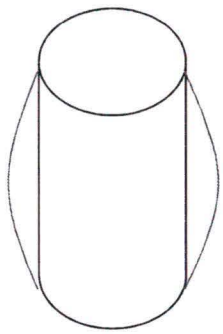
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B1
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	105-106.5
Date	November 13, 2008	**Sample Description**	Silt
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-7	-3	
0.1%	699	350	
0.2%	1022	511	
0.3%	1245	622	
0.4%	1406	703	
0.5%	1536	768	
1.0%	2122	1061	
1.5%	2693	1346	
2.0%	3307	1653	
2.5%	3947	1974	
3.0%	4577	2289	
4.0%	5687	2844	
5.0%	6608	3304	
6.0%	7319	3660	
6.9%	7894	3947	
7.9%	8419	4209	
8.9%	8839	4420	
9.9%	9139	4569	
10.9%	9390	4695	
11.9%	9589	4794	
12.9%	9654	4827	
13.9%	9728	4864	
14.9%	9778	4889	



Initial Sample Data

Initial height of specimen	L_o	5.33	(in)	**Moisture content***	w	27%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	97.3	(pcf)
Height-to-diameter ratio	L_o / D_o	2.06		**Initial void ratio**	e_o	0.731	
Initial weight of specimen		909.0	(g)	**Saturation**	S	0.99	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	33	
				Plastic index	PI	9	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	9778	(psf)	**Major principal stress at failure****	σ_1	20288	(psf)
Shear stress at failure**	q_f	4889	(psf)	**Minor principal stress at failure****	σ_3	10509	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

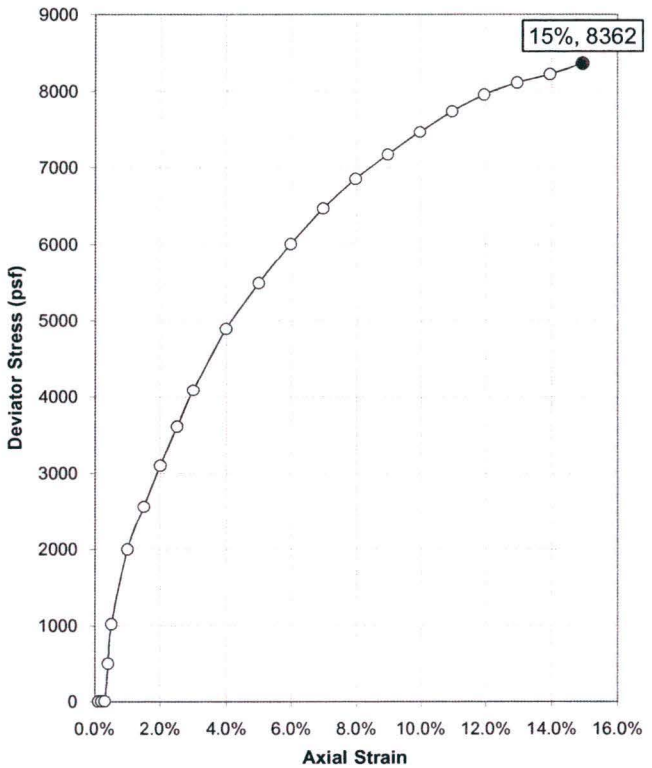
Remarks ML / A-4(9)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

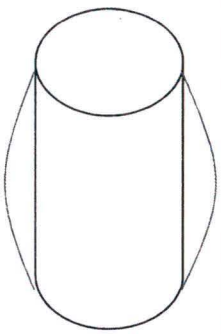
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B1
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	123-124.5
Date	November 13, 2008	**Sample Description**	Lean clay W/ silt lenses
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-4	-2	
0.1%	9	5	
0.2%	8	4	
0.3%	11	5	
0.4%	504	252	
0.5%	1026	513	
1.0%	2006	1003	
1.5%	2565	1282	
2.0%	3105	1552	
2.5%	3614	1807	
3.0%	4094	2047	
4.0%	4897	2448	
5.0%	5495	2748	
6.0%	6008	3004	
7.0%	6472	3236	
8.0%	6854	3427	
9.0%	7170	3585	
10.0%	7469	3734	
11.0%	7741	3870	
11.9%	7957	3978	
12.9%	8113	4057	
13.9%	8223	4112	
14.9%	8362	4181	



Initial Sample Data

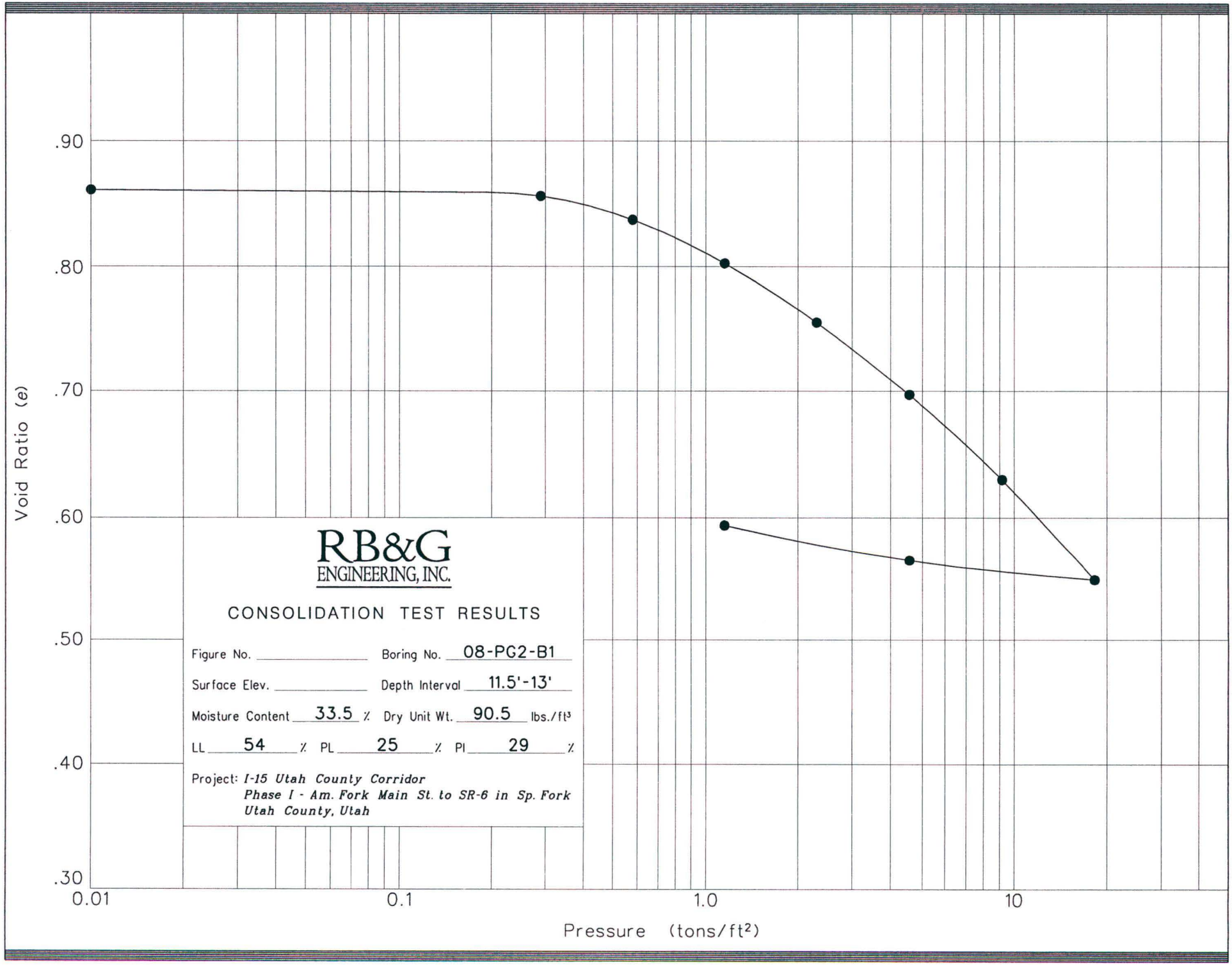
Initial height of specimen	L_o	5.33	(in)	**Moisture content***	w	31%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	92.3	(pcf)
Height-to-diameter ratio	L_o / D_o	2.06		**Initial void ratio**	e_o	0.825	
Initial weight of specimen		891.3	(g)	**Saturation**	S	1.01	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	40	
				Plastic index	PI	15	

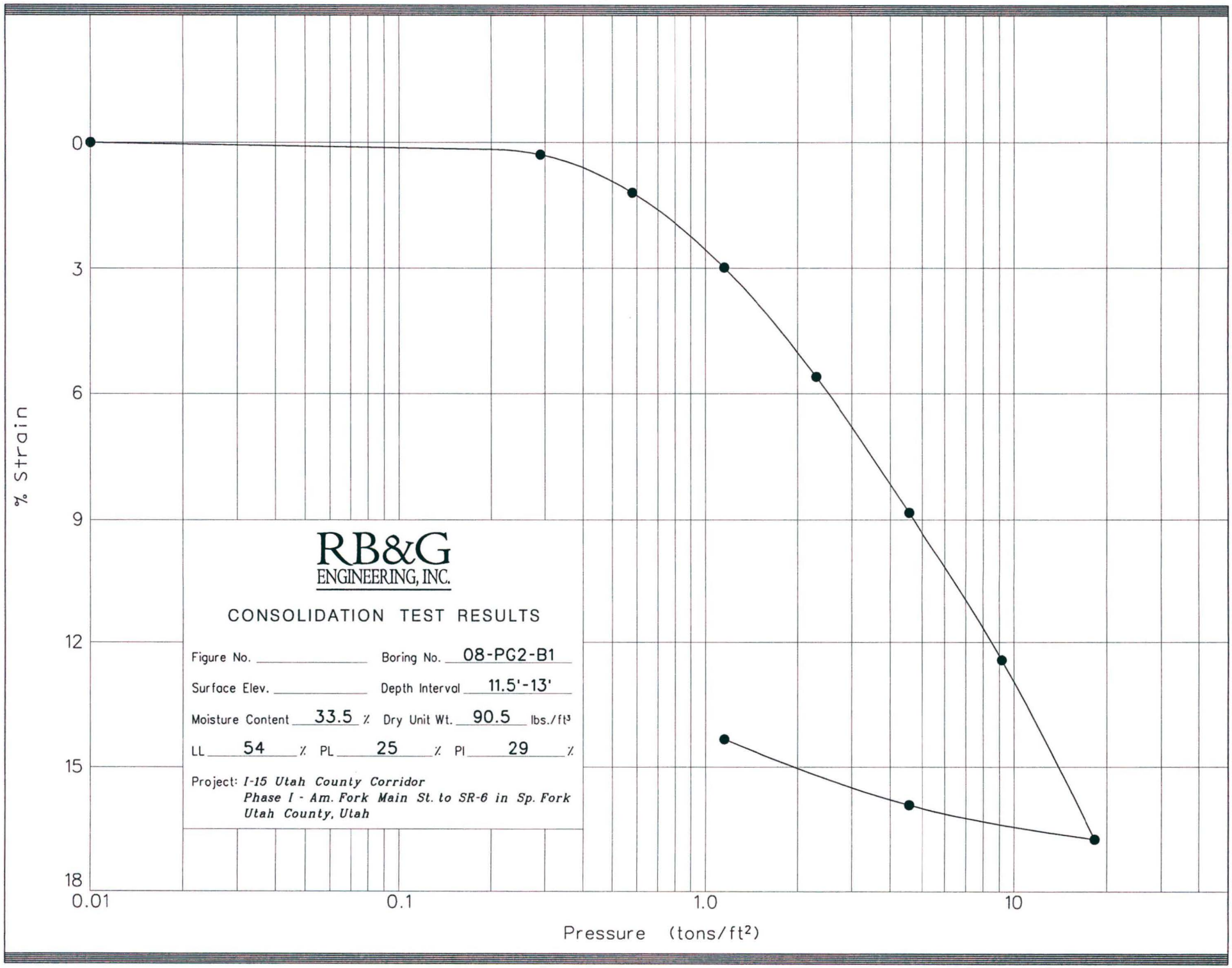
Test Results

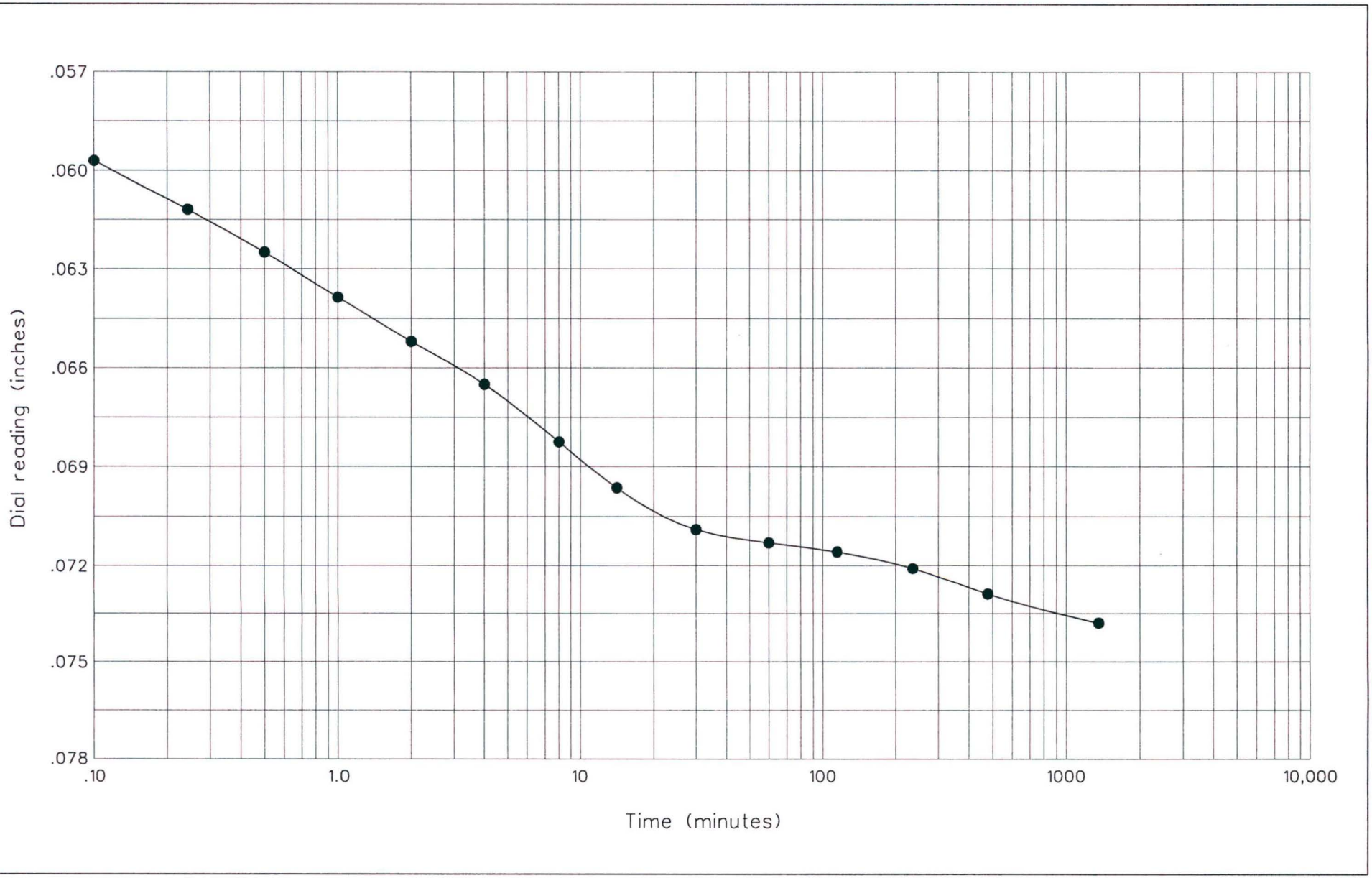
Deviator stress at failure**	$\sigma_{d,f}$	8362	(psf)	**Major principal stress at failure****	σ_1	20745	(psf)
Shear stress at failure**	q_f	4181	(psf)	**Minor principal stress at failure****	σ_3	12383	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

Remarks CL / A-6(17)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects


.90
.80
.70
.60
.50
.40
.30
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B1
Surface Elev. _____ Depth Interval 11.5'-13'
Moisture Content 33.5 % Dry Unit Wt. 90.5 lbs./ft³
LL 54 % PL 25 % PI 29 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


% Strain
0
3
6
9
12
15
18
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B1
Surface Elev. _____ Depth Interval 11.5'-13'
Moisture Content 33.5 % Dry Unit Wt. 90.5 lbs./ft³
LL 54 % PL 25 % PI 29 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



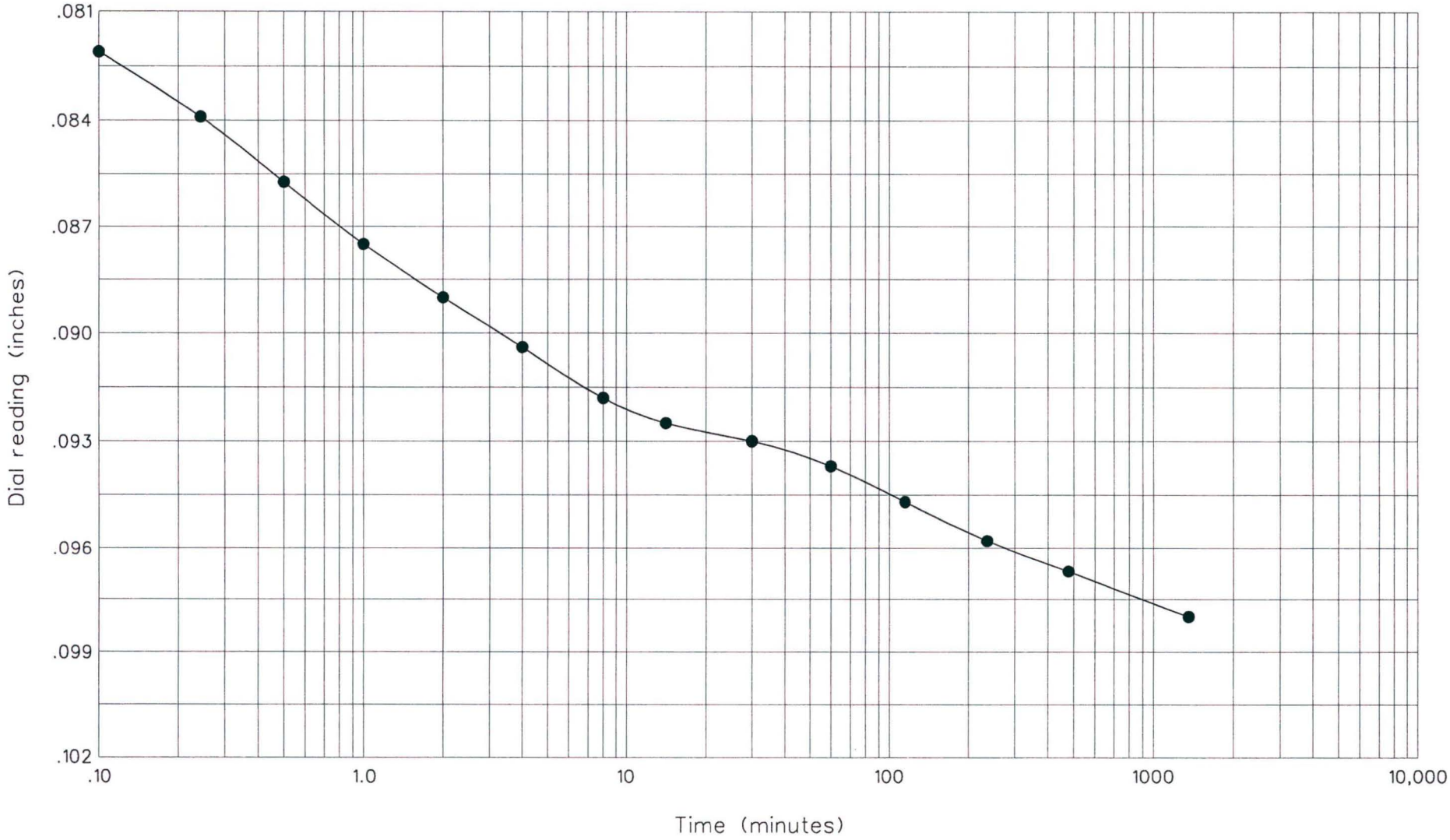
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 11.5'-13'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



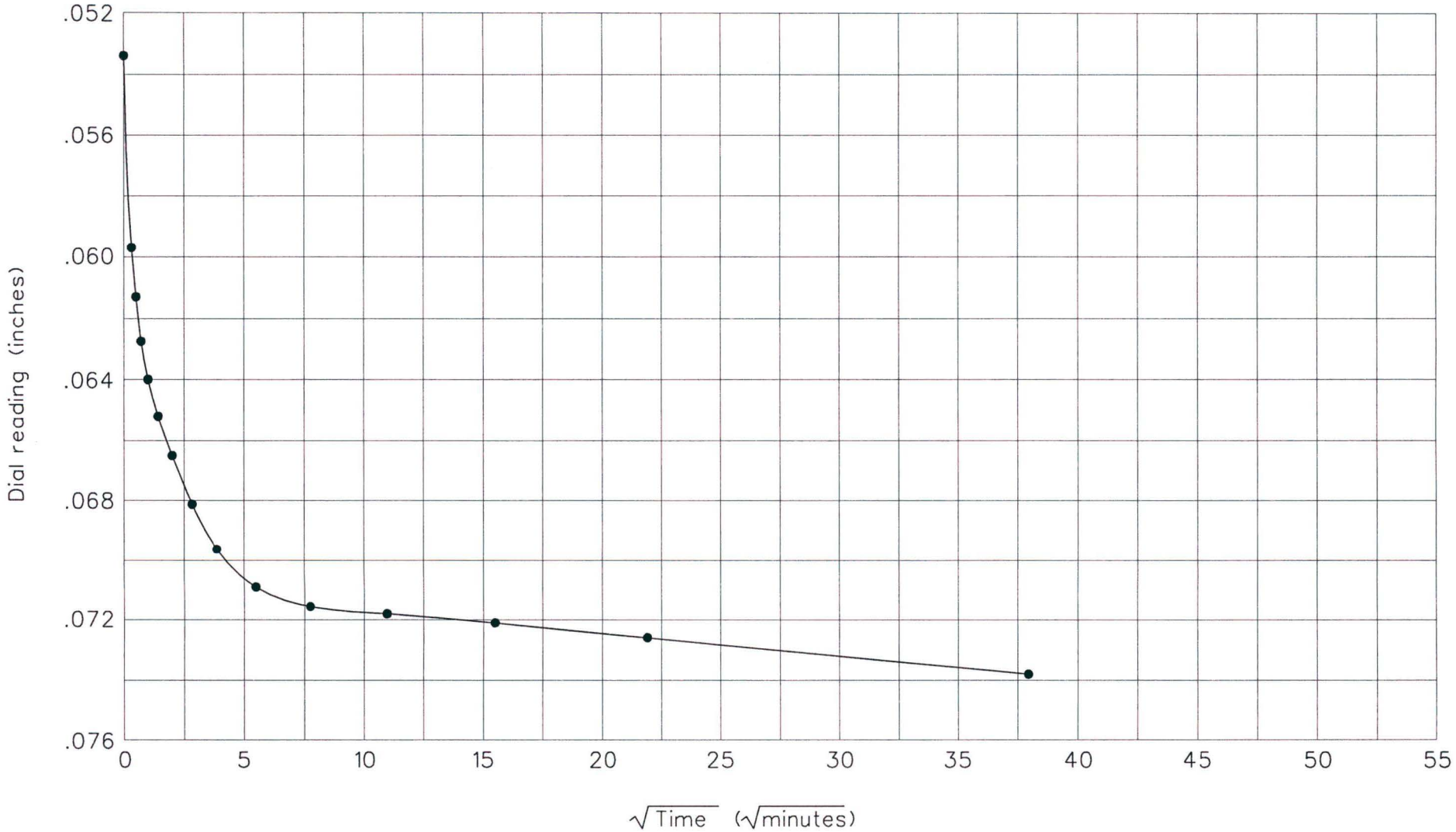
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 11.5'-13'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



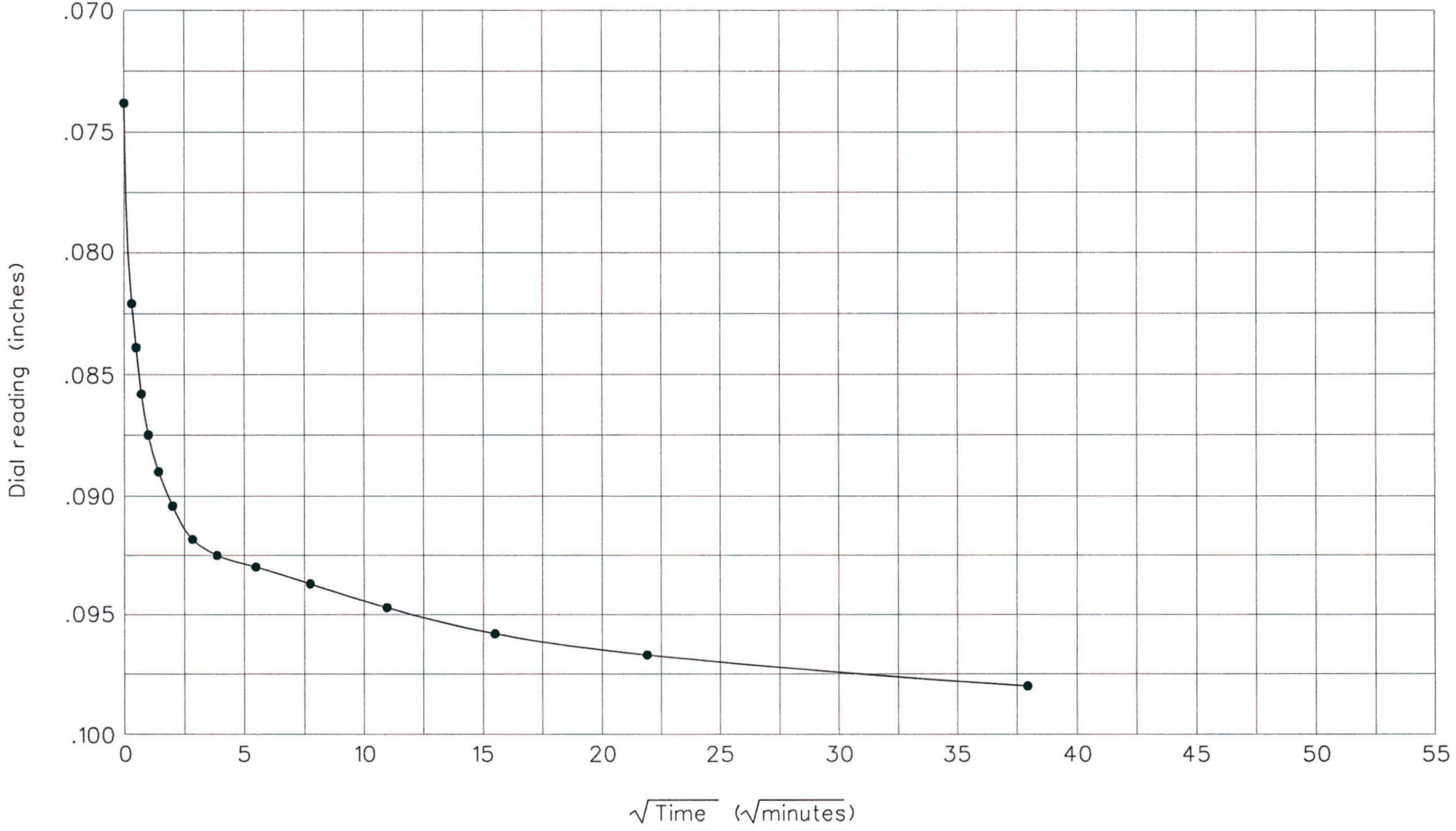
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 11.5'-13'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



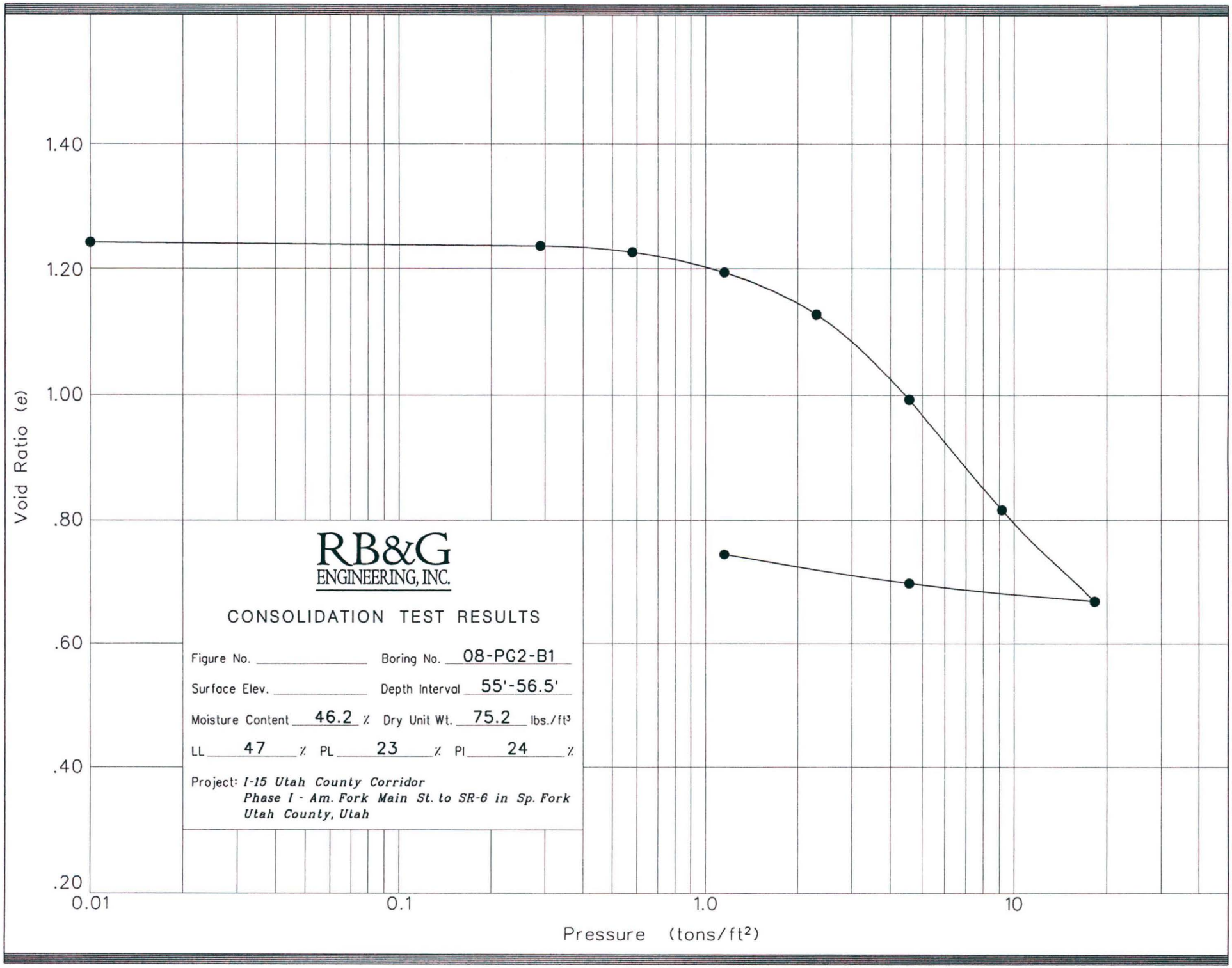
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 11.5'-13'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

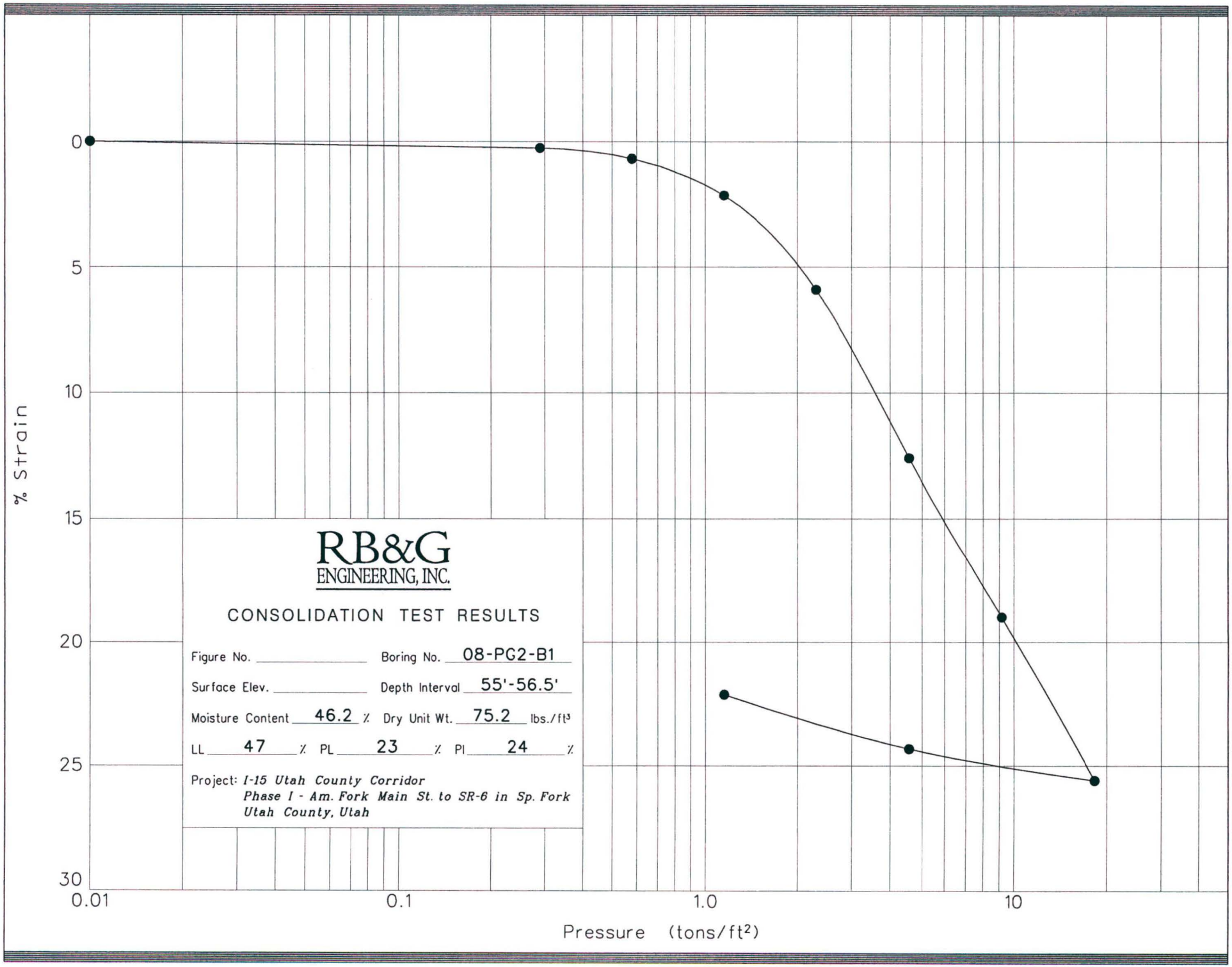
Figure No. _____ Boring No. 08-PG2-B1

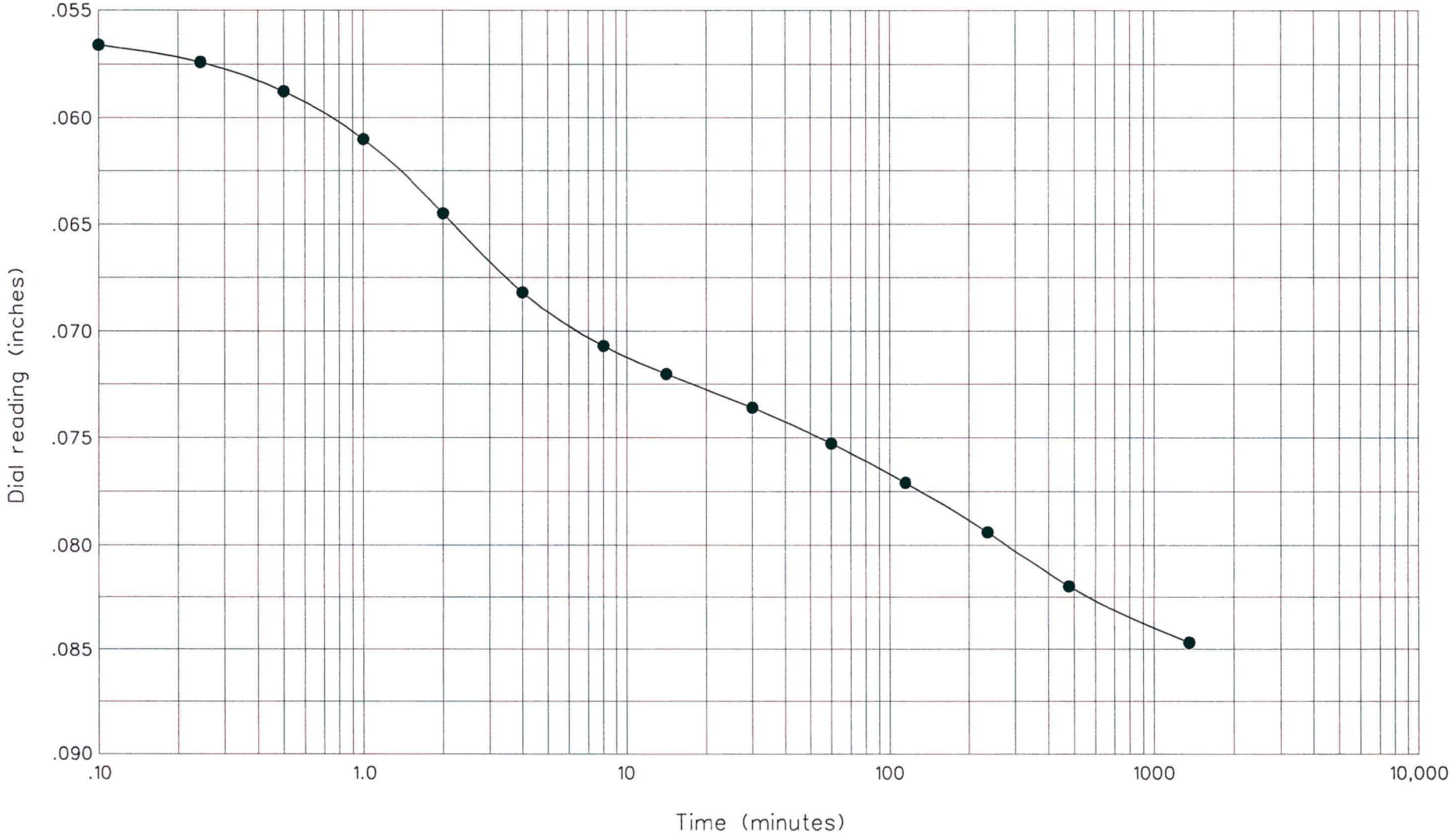
Surface Elev. _____ Depth Interval 55'-56.5'

Moisture Content 46.2 % Dry Unit Wt. 75.2 lbs./ft³

LL 47 % PL 23 % PI 24 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


0
5
10
15
20
25
30
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B1
Surface Elev. _____ Depth Interval 55'-56.5'
Moisture Content 46.2 % Dry Unit Wt. 75.2 lbs./ft³
LL 47 % PL 23 % PI 24 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



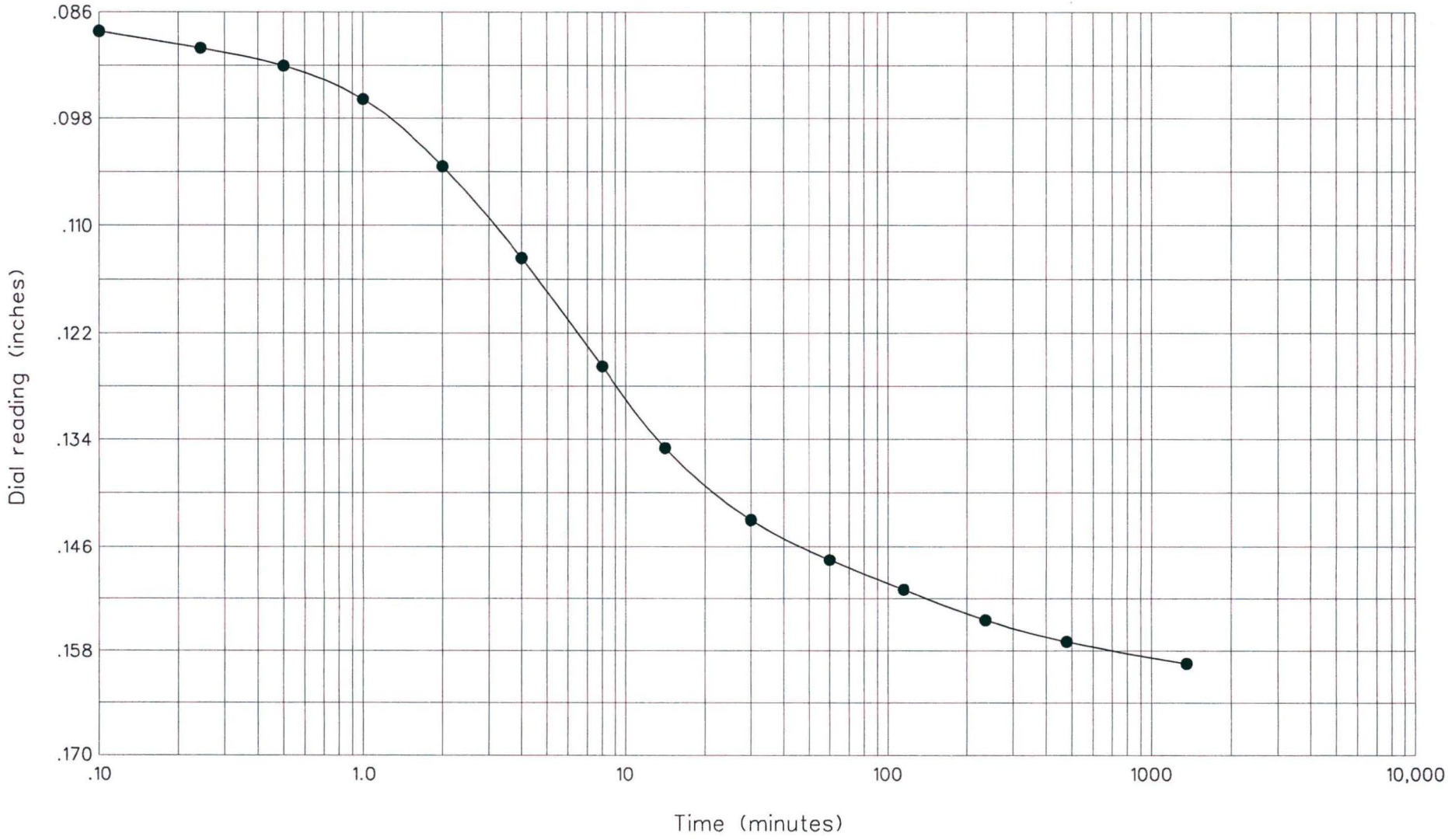
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 55'-56.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



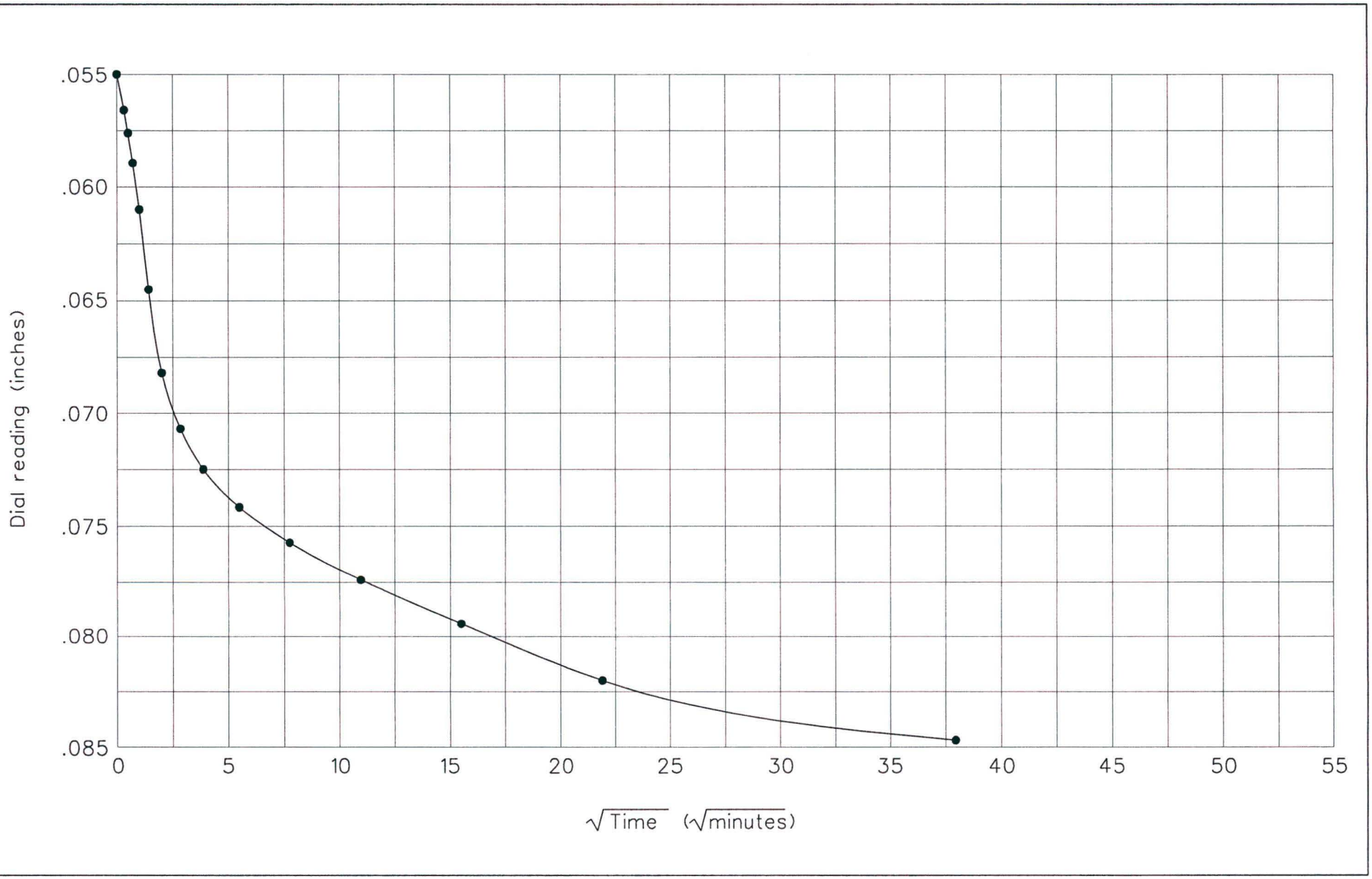
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 55'-56.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



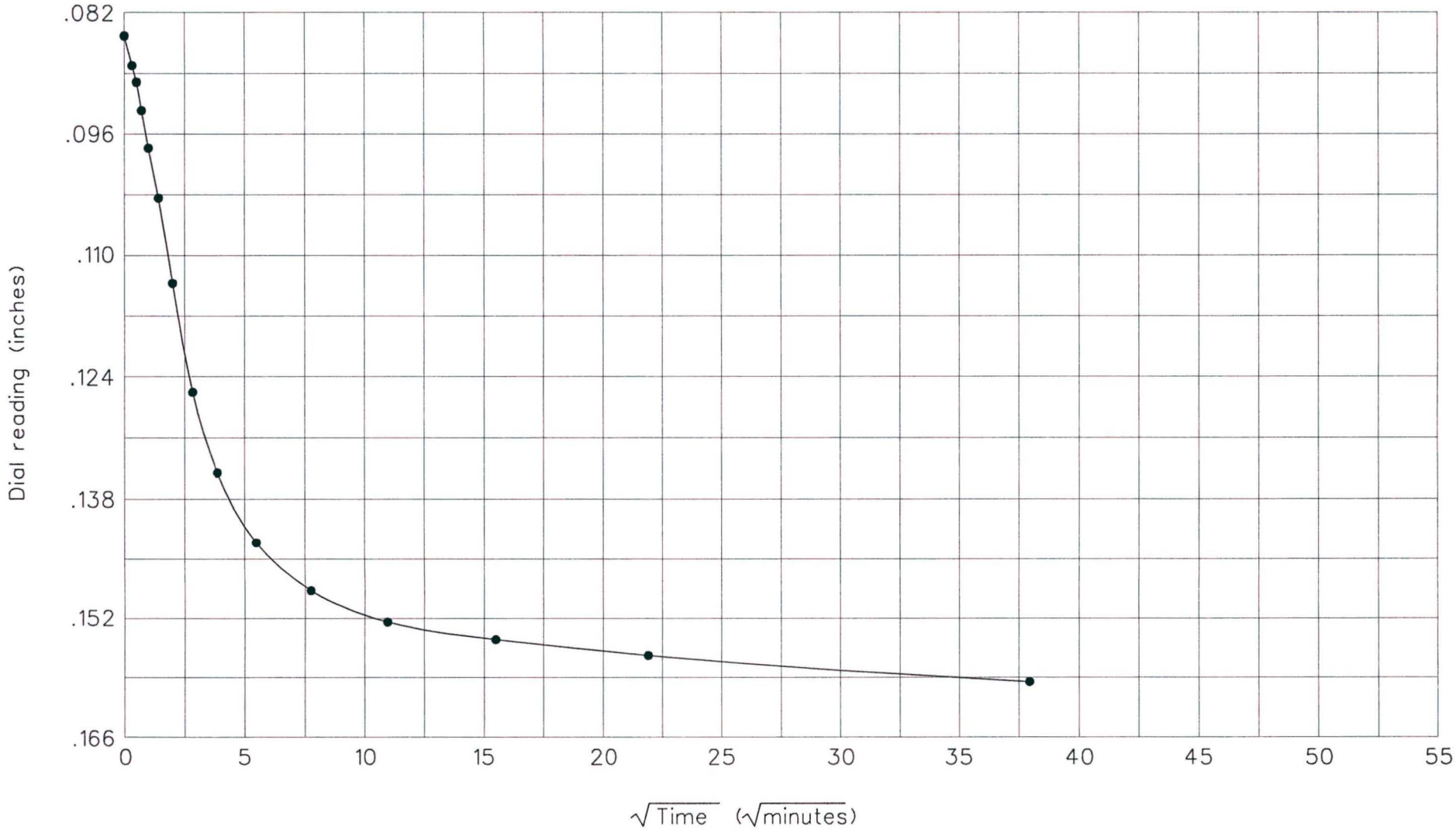
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 55'-56.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



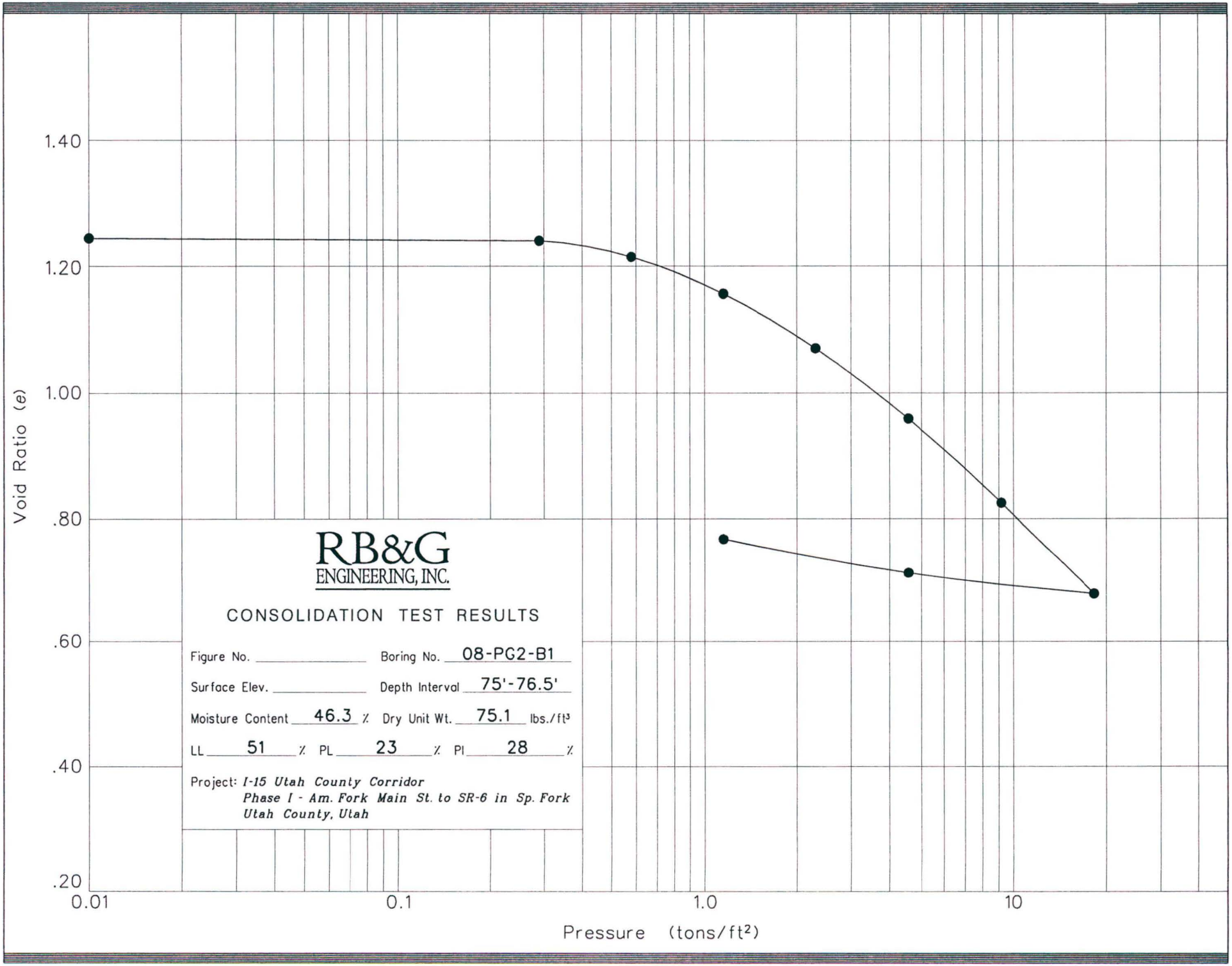
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 55'-56.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

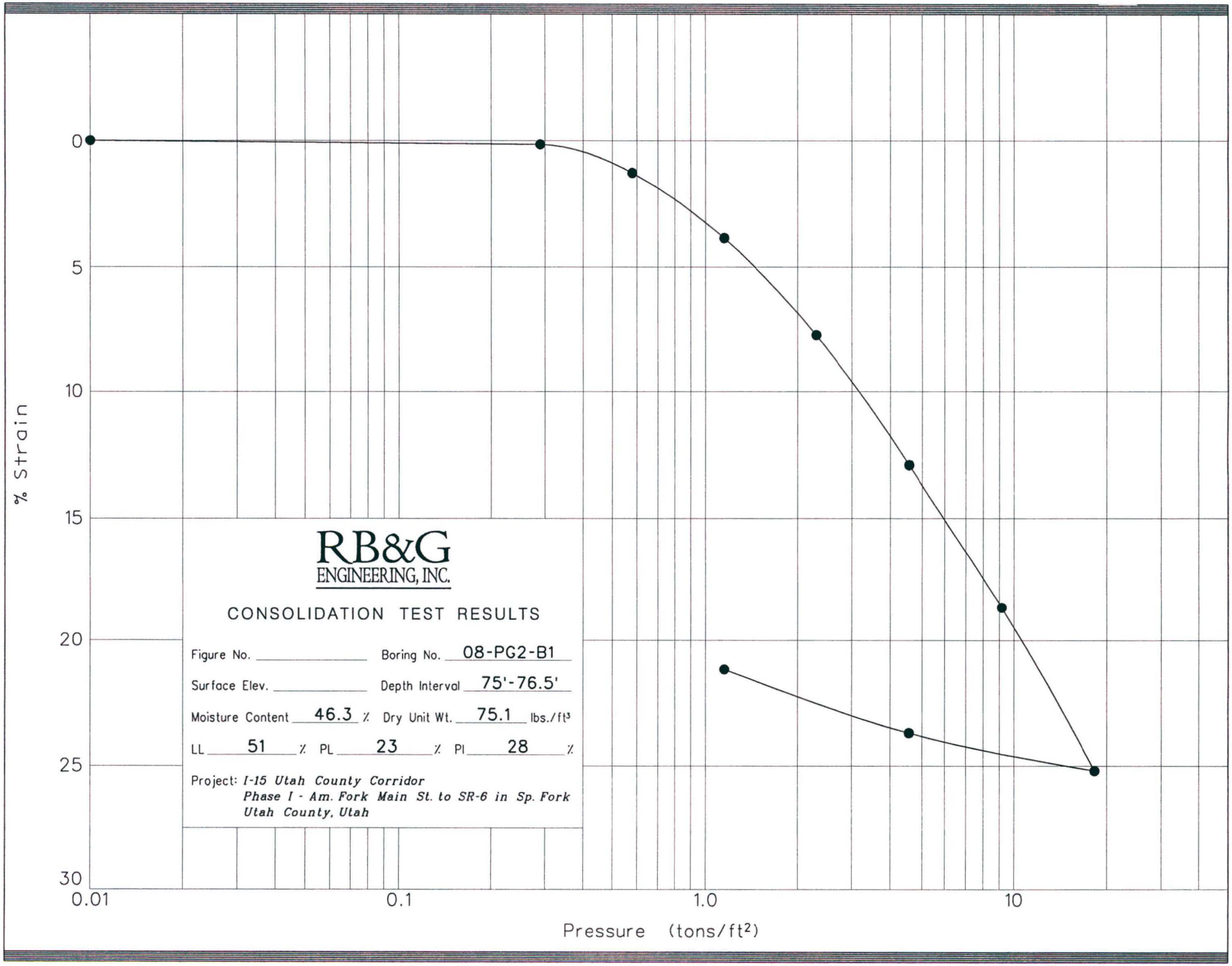
Figure No. _____ Boring No. 08-PG2-B1

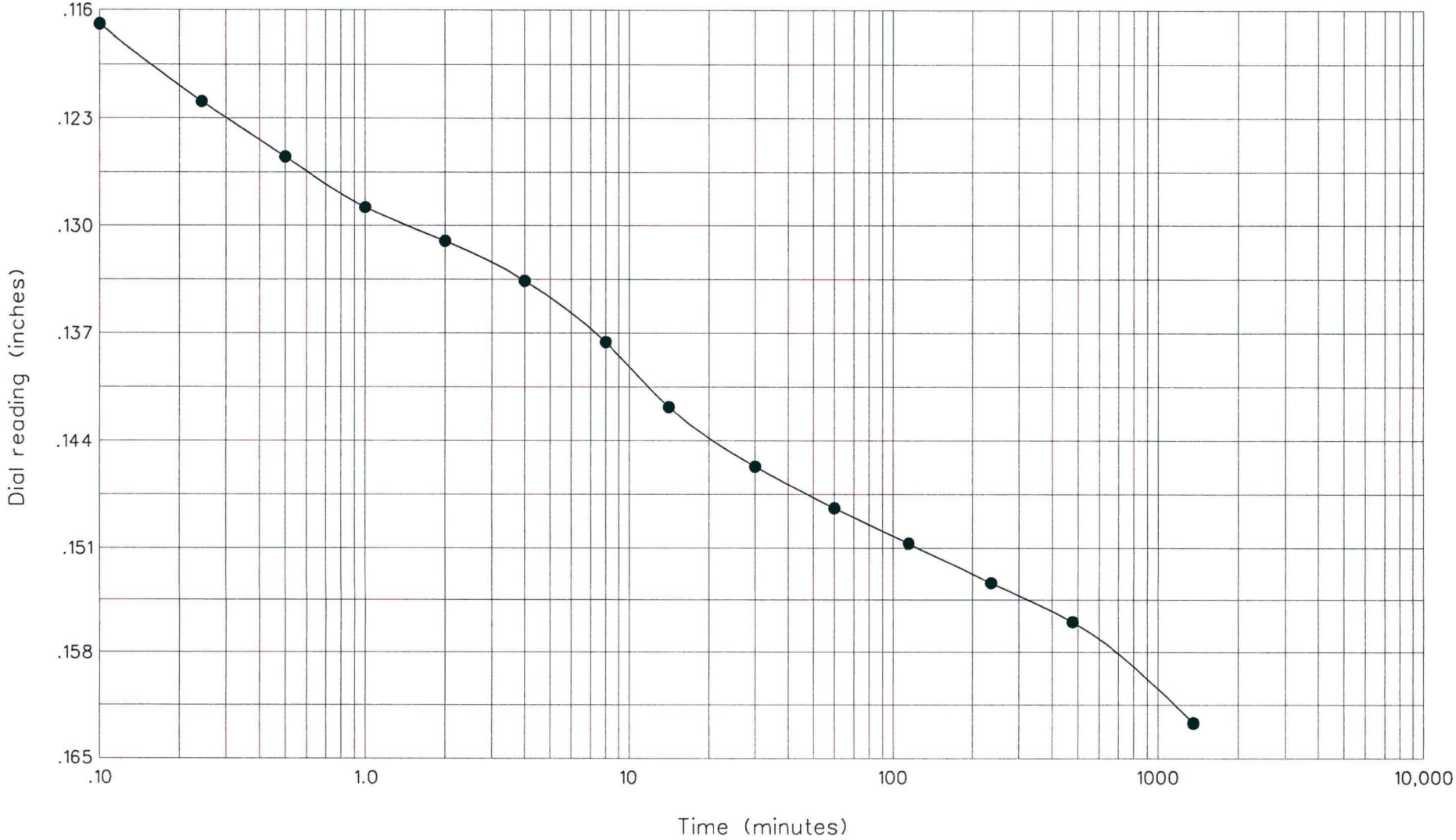
Surface Elev. _____ Depth Interval 75'-76.5'

Moisture Content 46.3 % Dry Unit Wt. 75.1 lbs./ft³

LL 51 % PL 23 % PI 28 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


0
5
10
15
20
25
30
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B1
Surface Elev. _____ Depth Interval 75'-76.5'
Moisture Content 46.3 % Dry Unit Wt. 75.1 lbs./ft³
LL 51 % PL 23 % PI 28 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



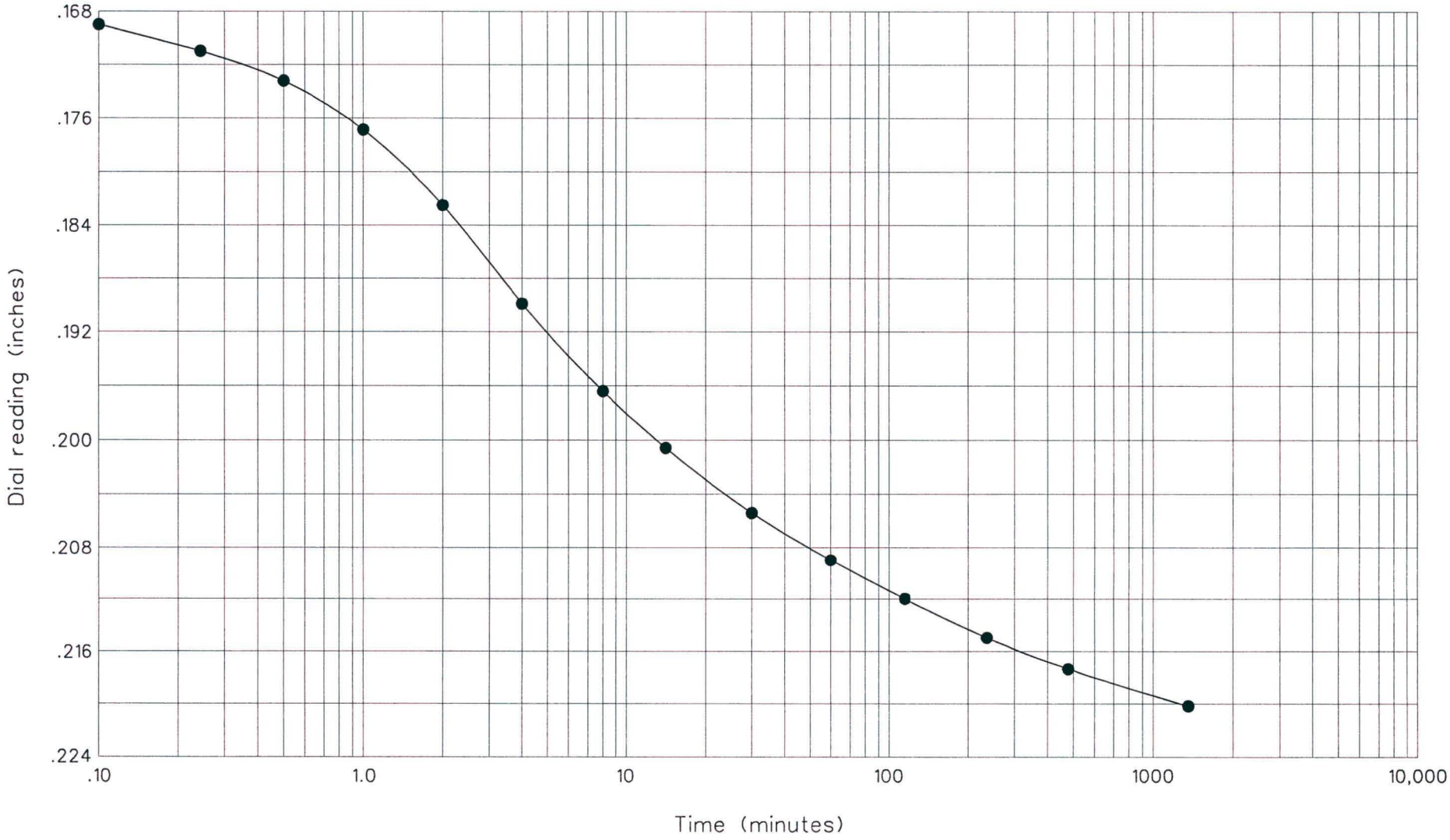
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 75'-76.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



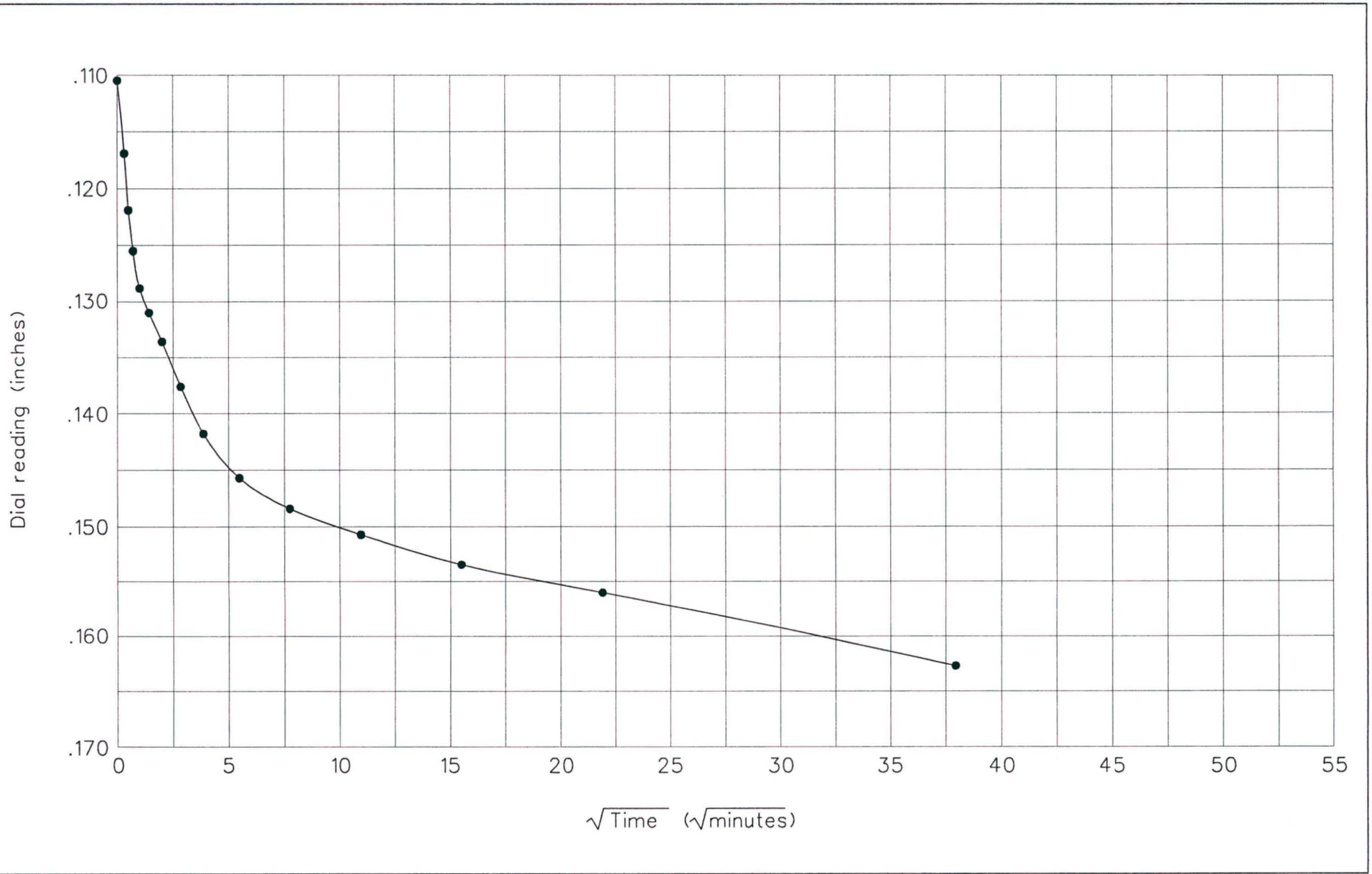
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 75'-76.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



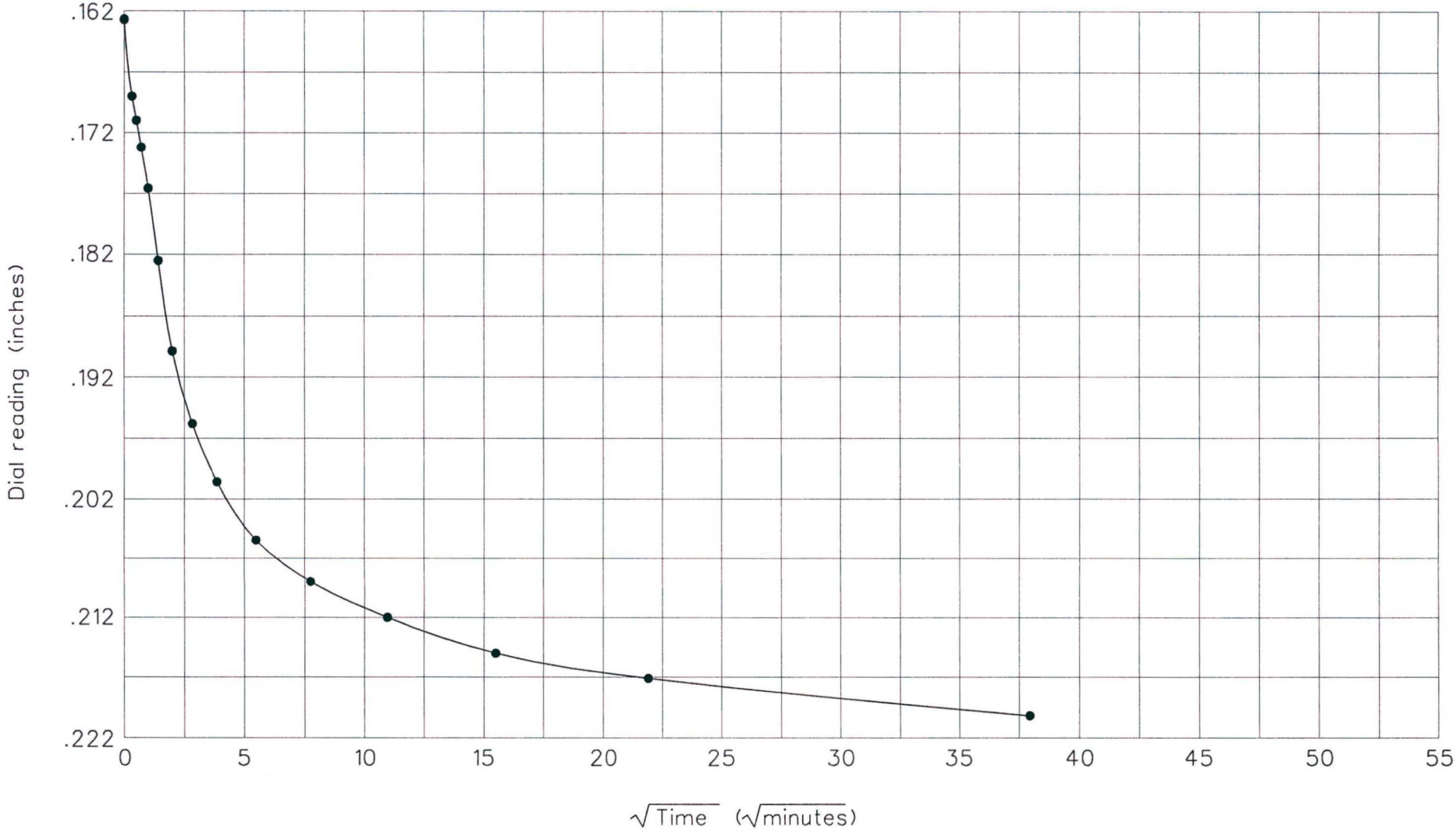
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 75'-76.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



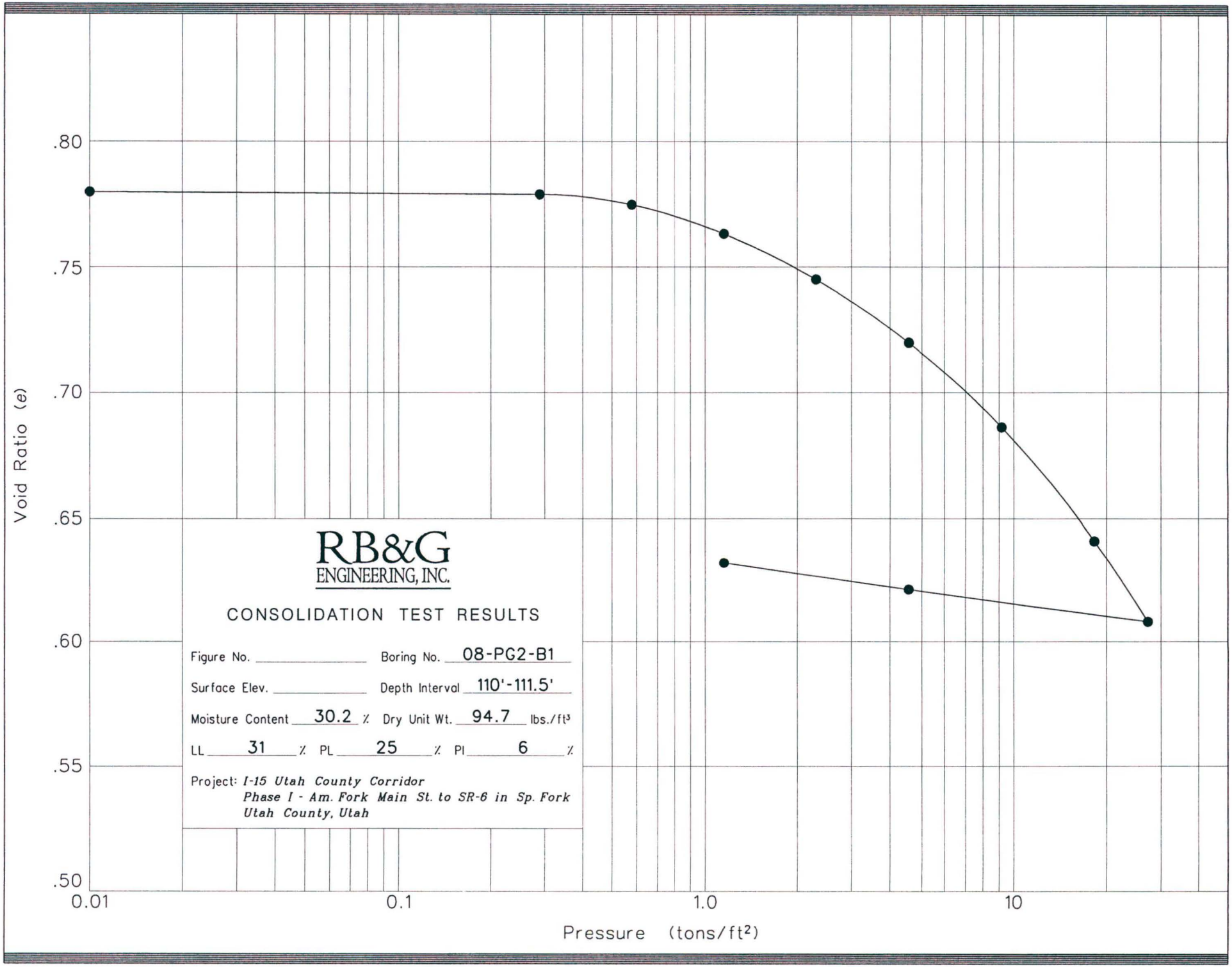
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 75'-76.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

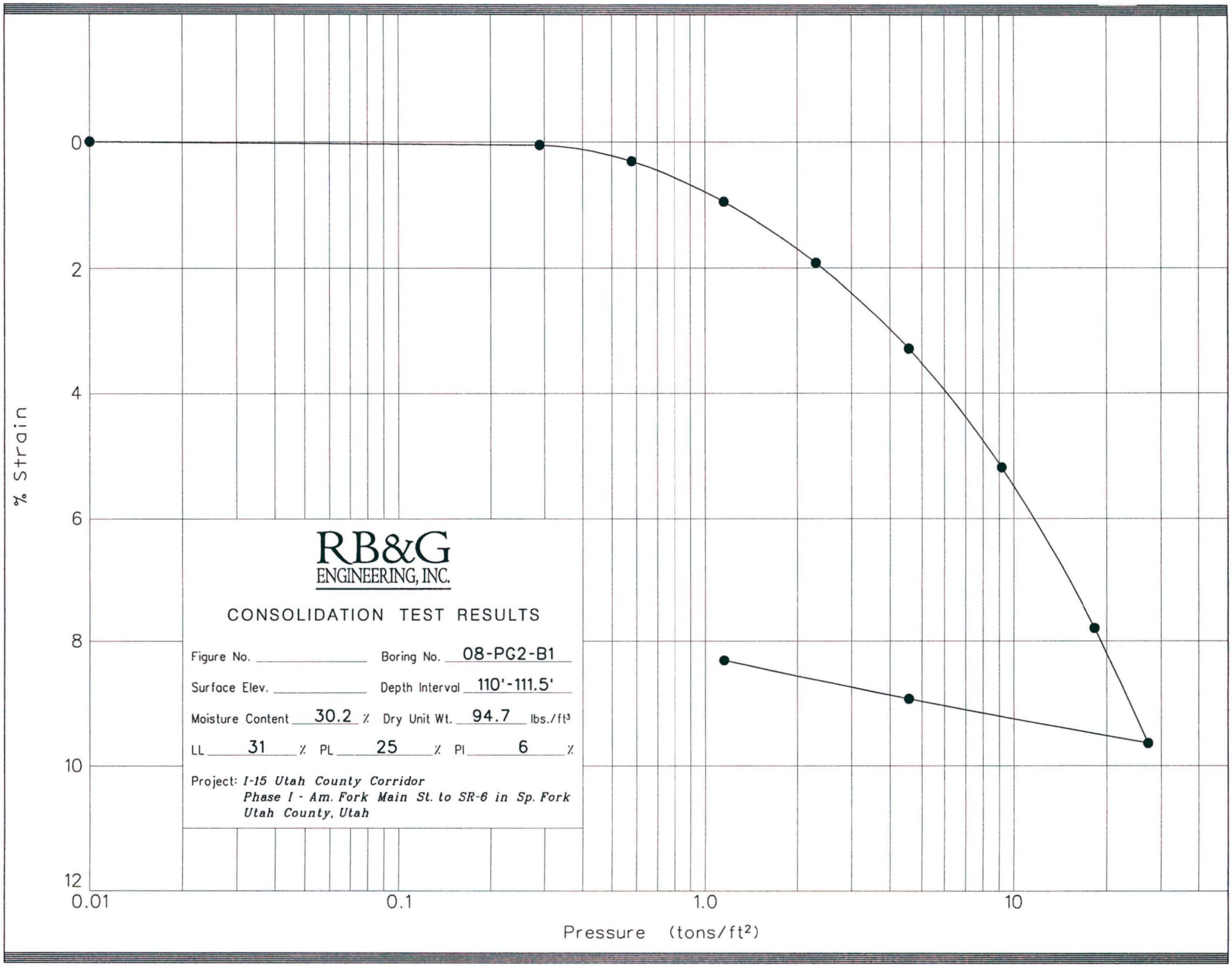
Figure No. _____ Boring No. 08-PG2-B1

Surface Elev. _____ Depth Interval 110'-111.5'

Moisture Content 30.2 % Dry Unit Wt. 94.7 lbs./ft³

LL 31 % PL 25 % PI 6 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

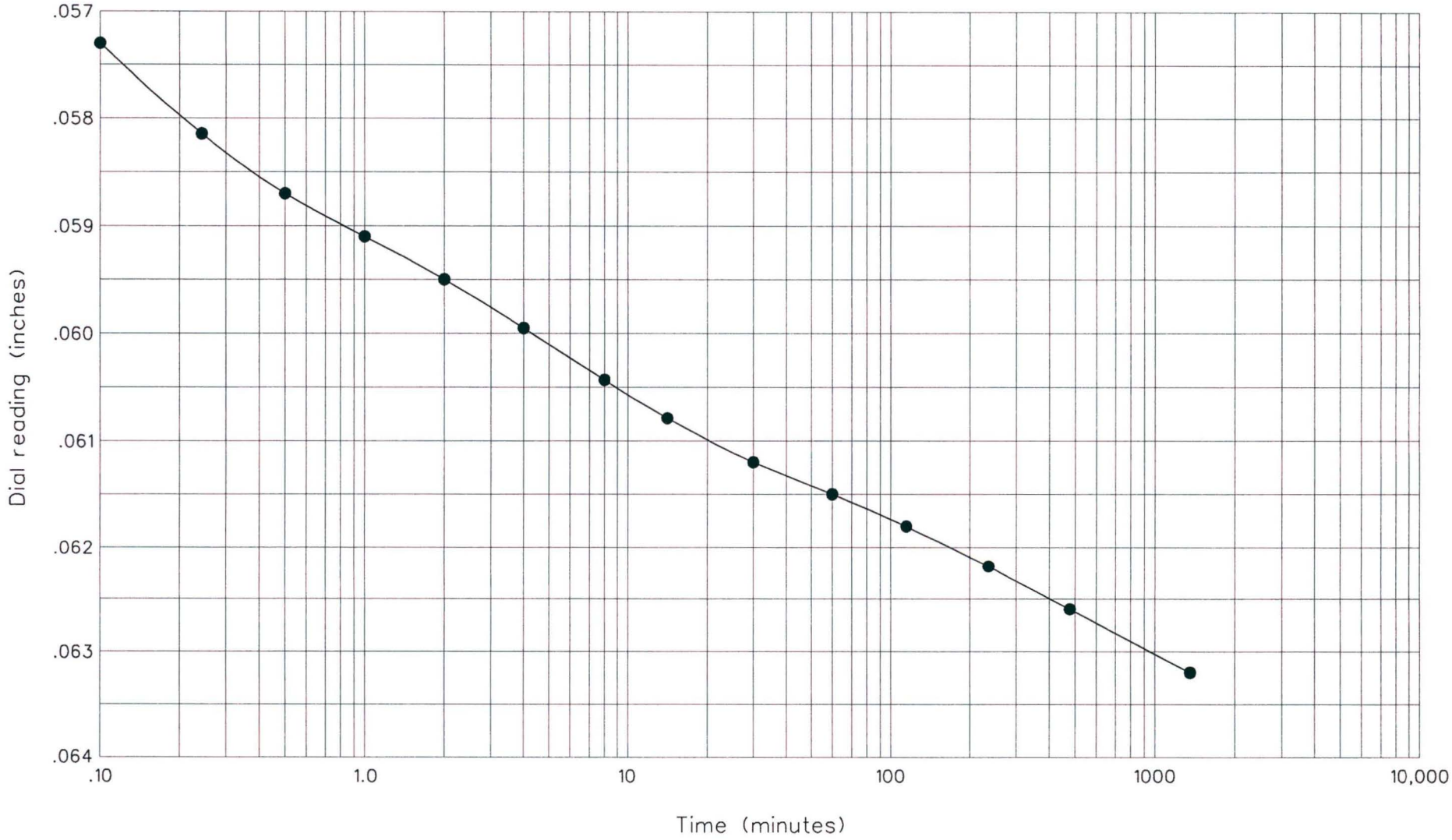
Figure No. _____ Boring No. 08-PG2-B1

Surface Elev. _____ Depth Interval 110'-111.5'

Moisture Content 30.2 % Dry Unit Wt. 94.7 lbs./ft³

LL 31 % PL 25 % PI 6 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



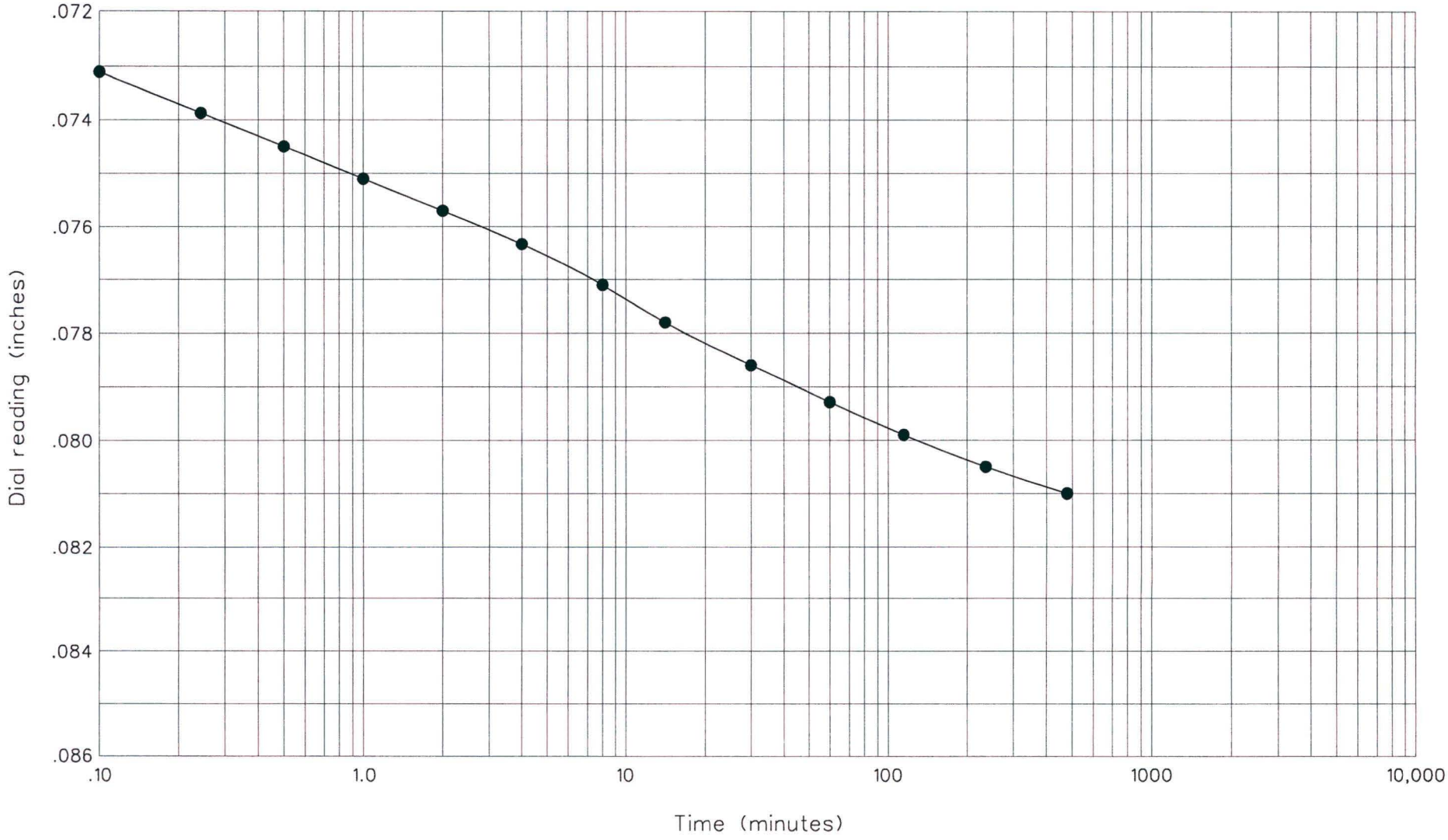
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 110'-111.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



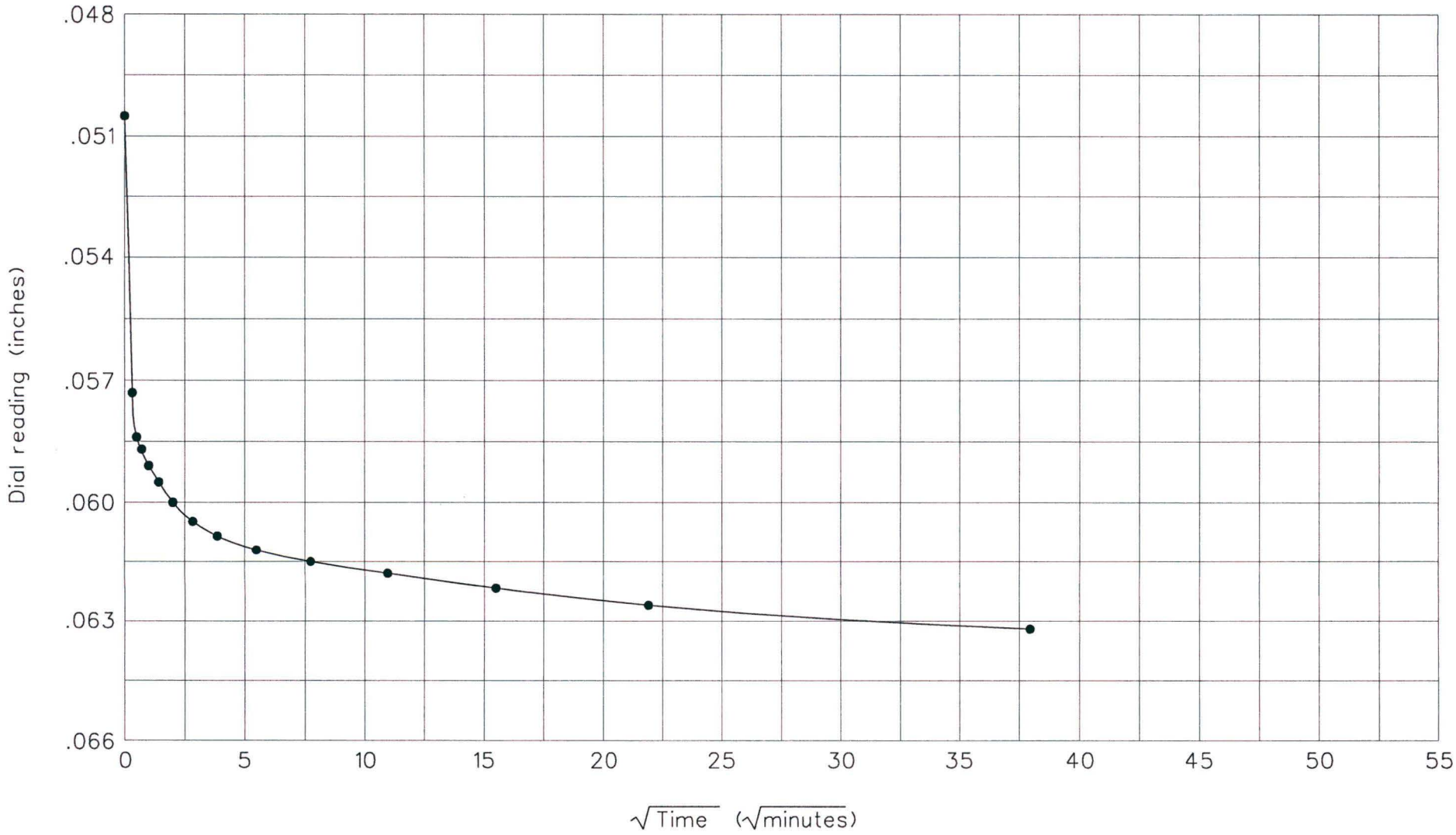
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 110'-111.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



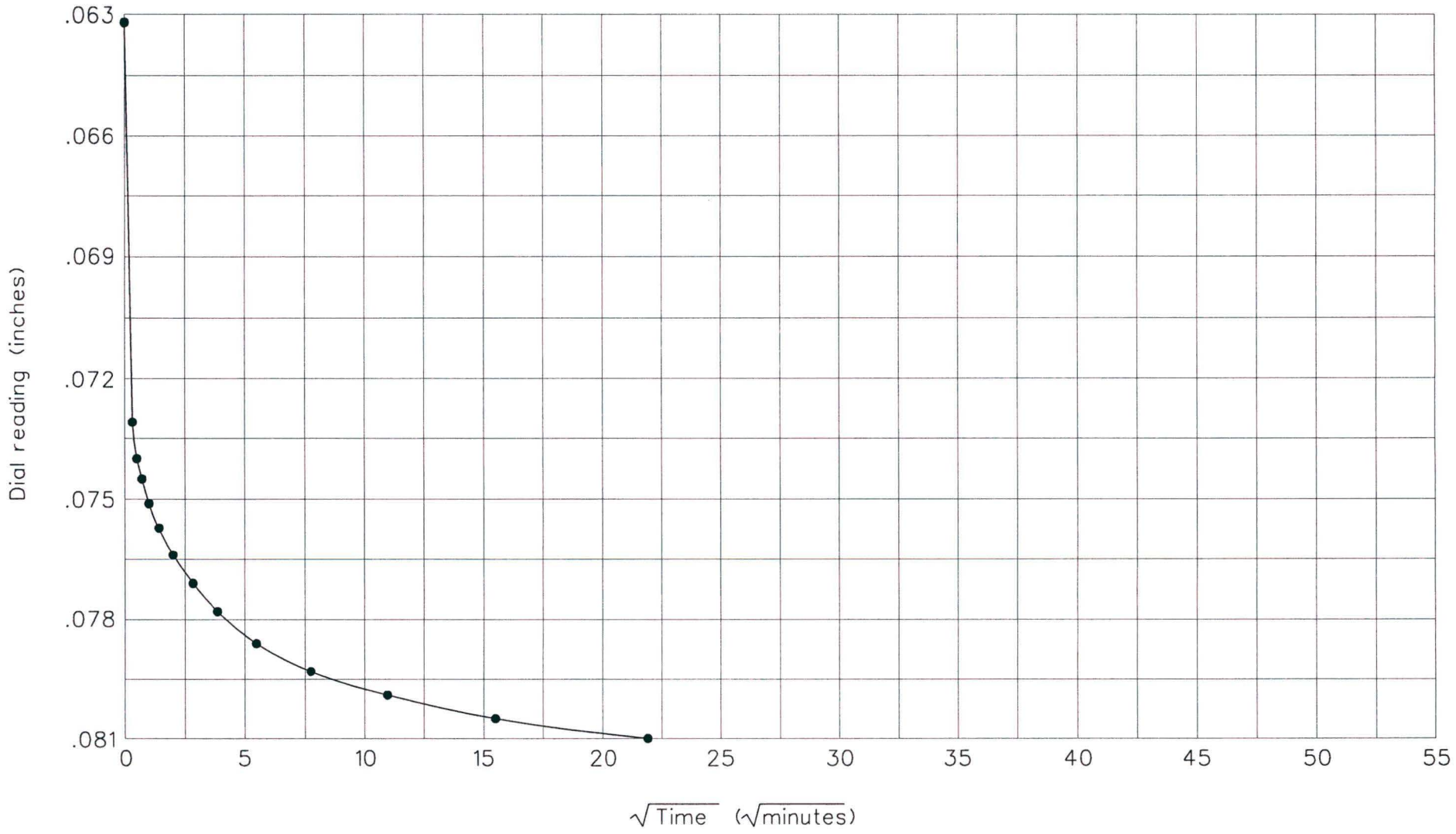
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 110'-111.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



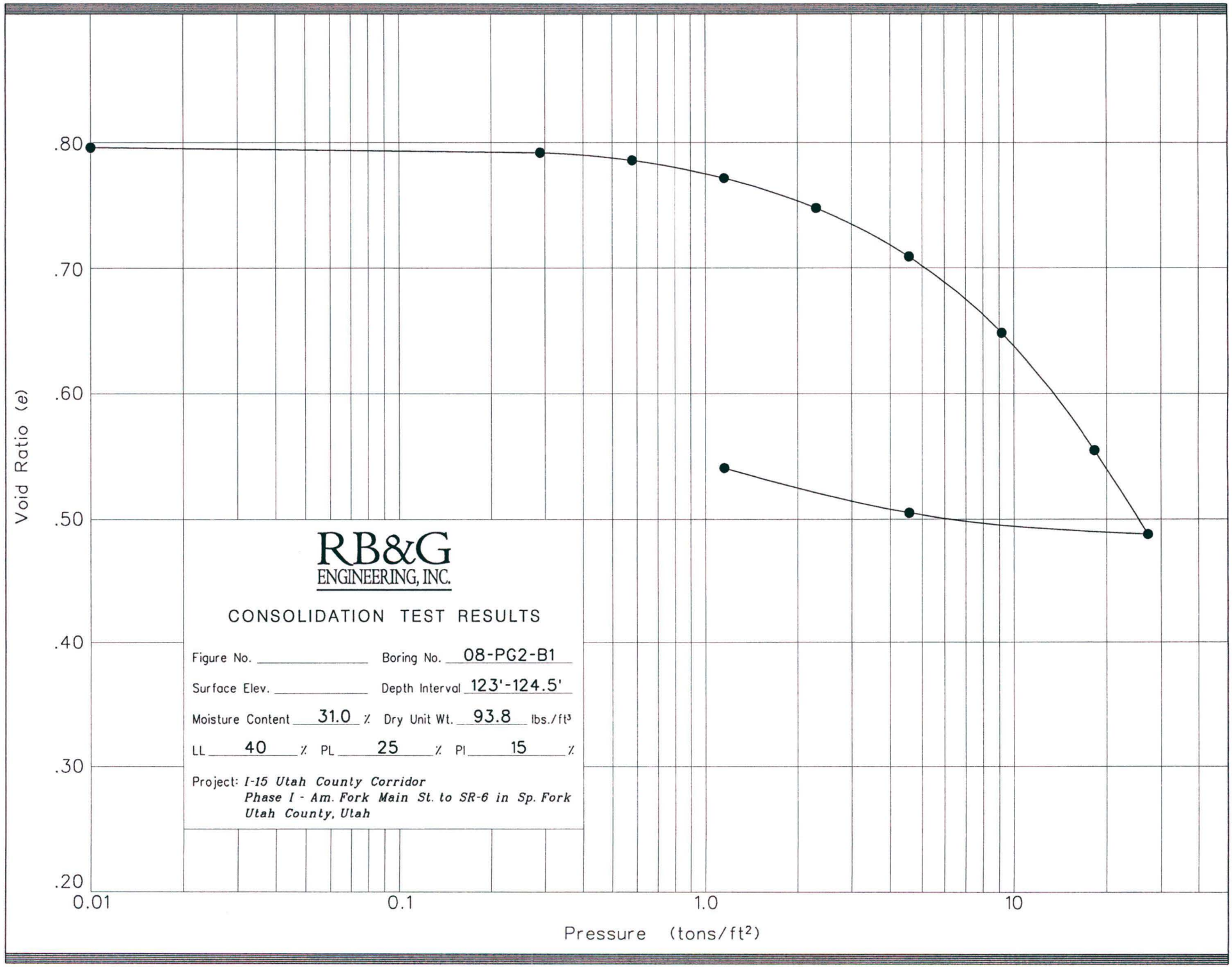
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 110'-111.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

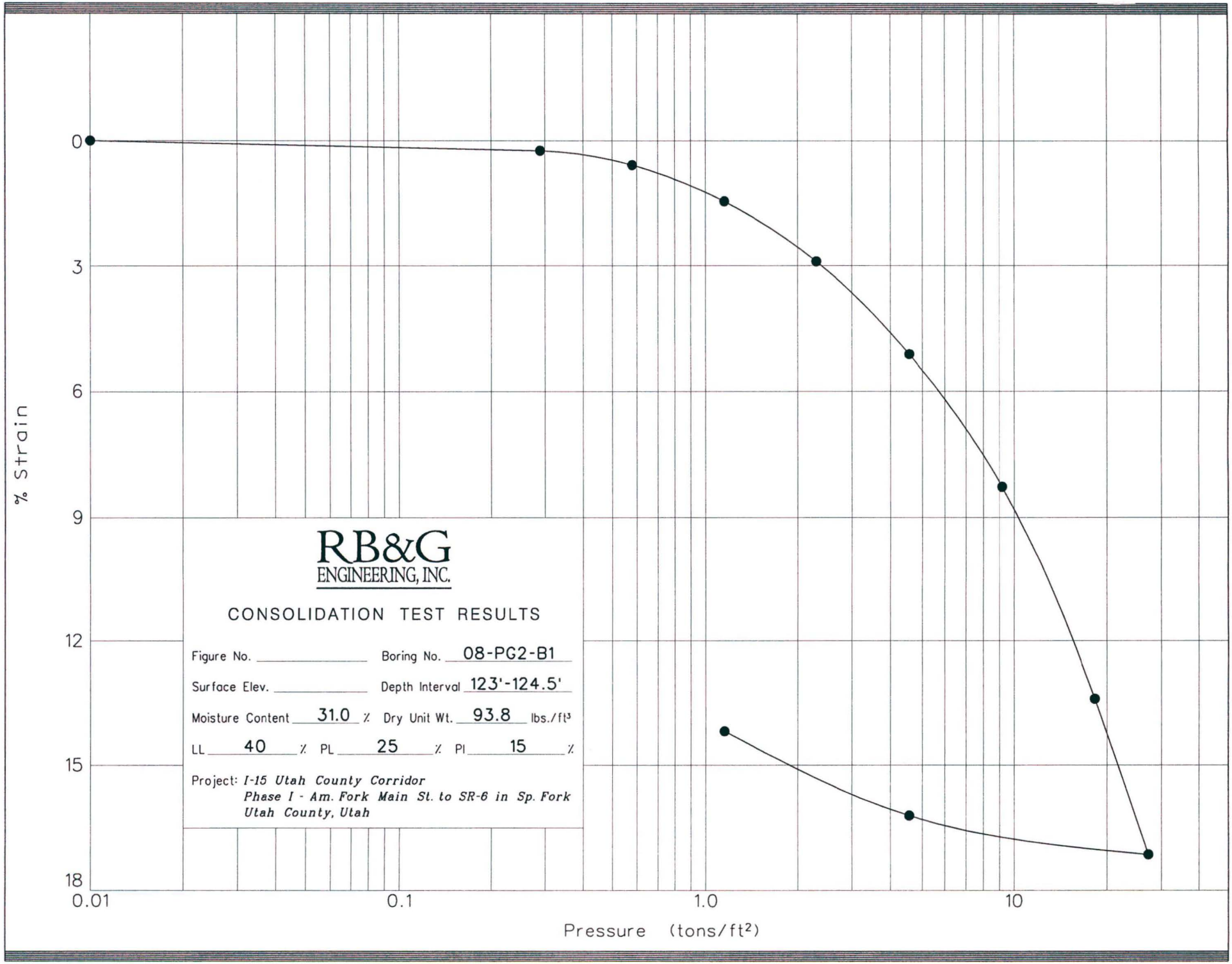
Figure No. _____ Boring No. 08-PG2-B1

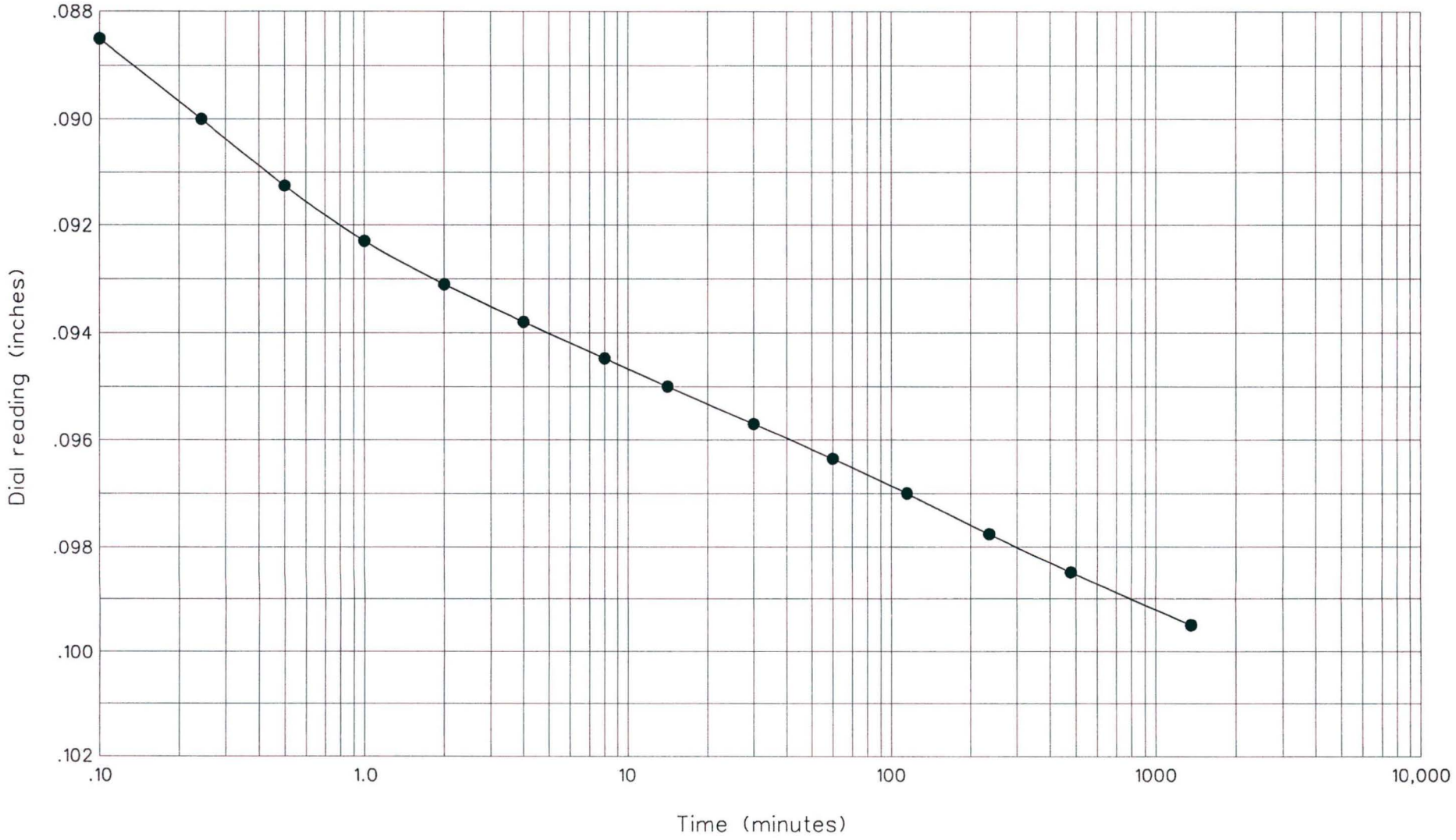
Surface Elev. _____ Depth Interval 123'-124.5'

Moisture Content 31.0 % Dry Unit Wt. 93.8 lbs./ft³

LL 40 % PL 25 % PI 15 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B1
Surface Elev. _____ Depth Interval 123'-124.5'
Moisture Content 31.0 % Dry Unit Wt. 93.8 lbs./ft³
LL 40 % PL 25 % PI 15 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



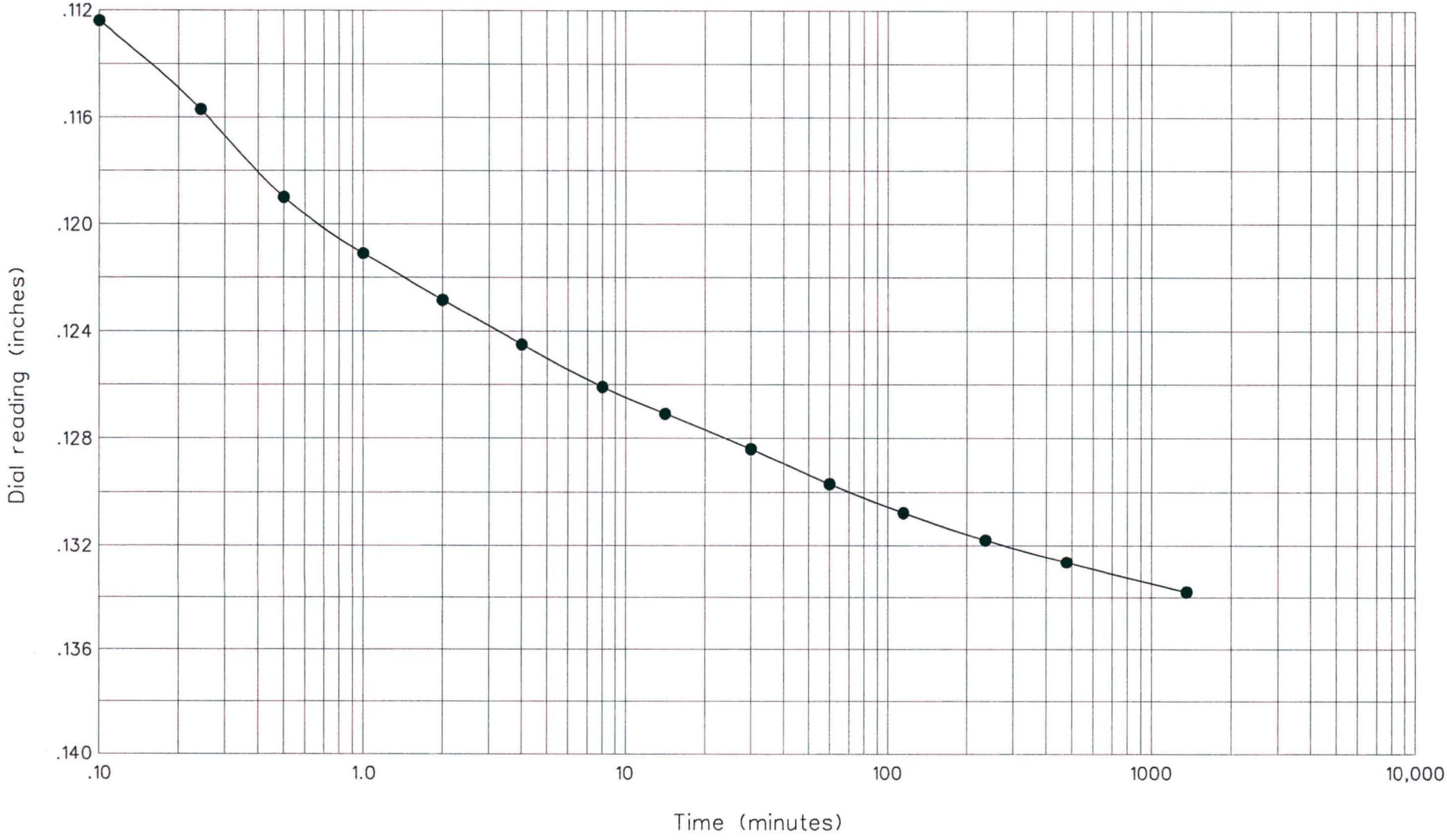
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 123'-124.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



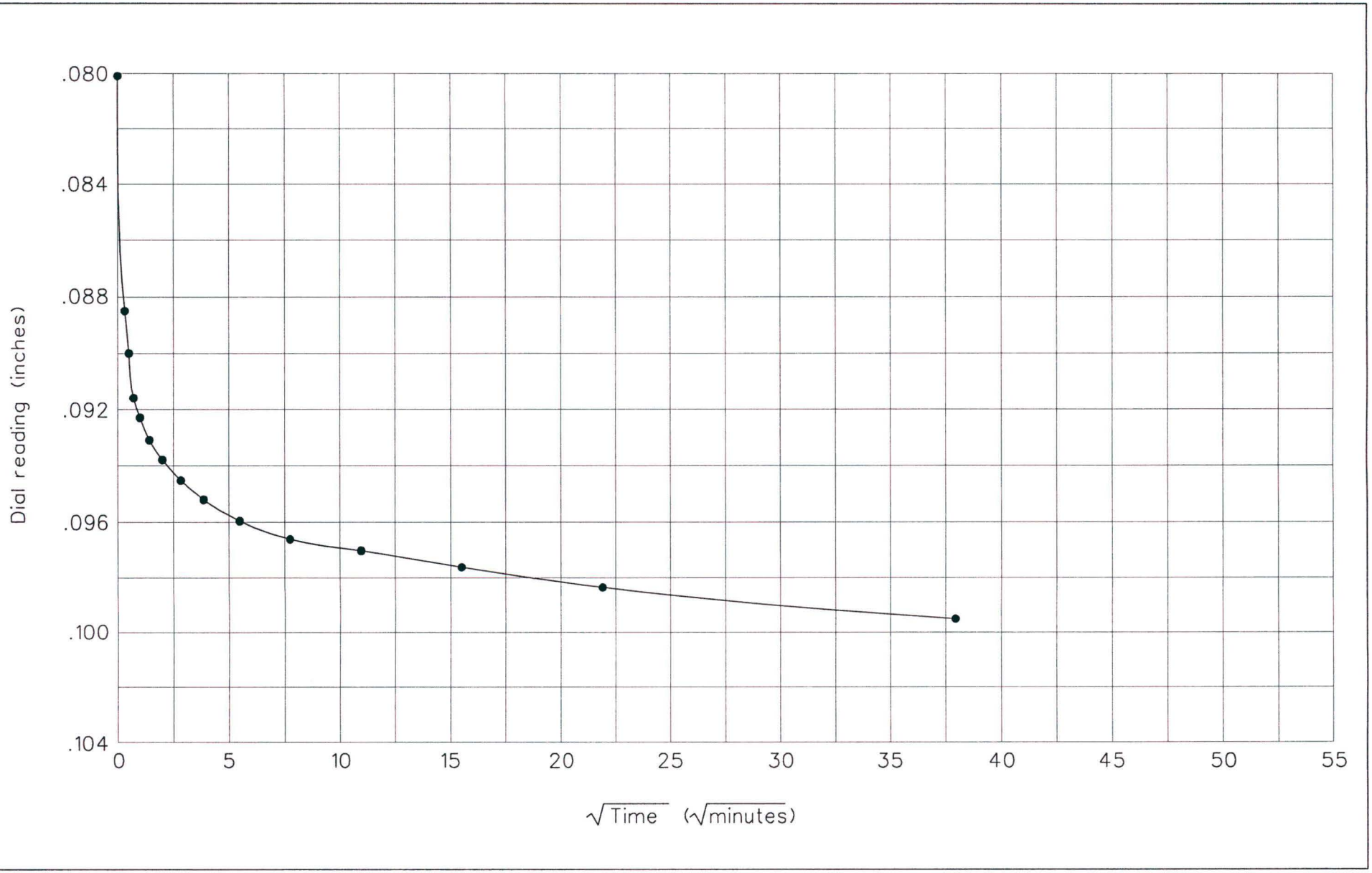
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 123'-124.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



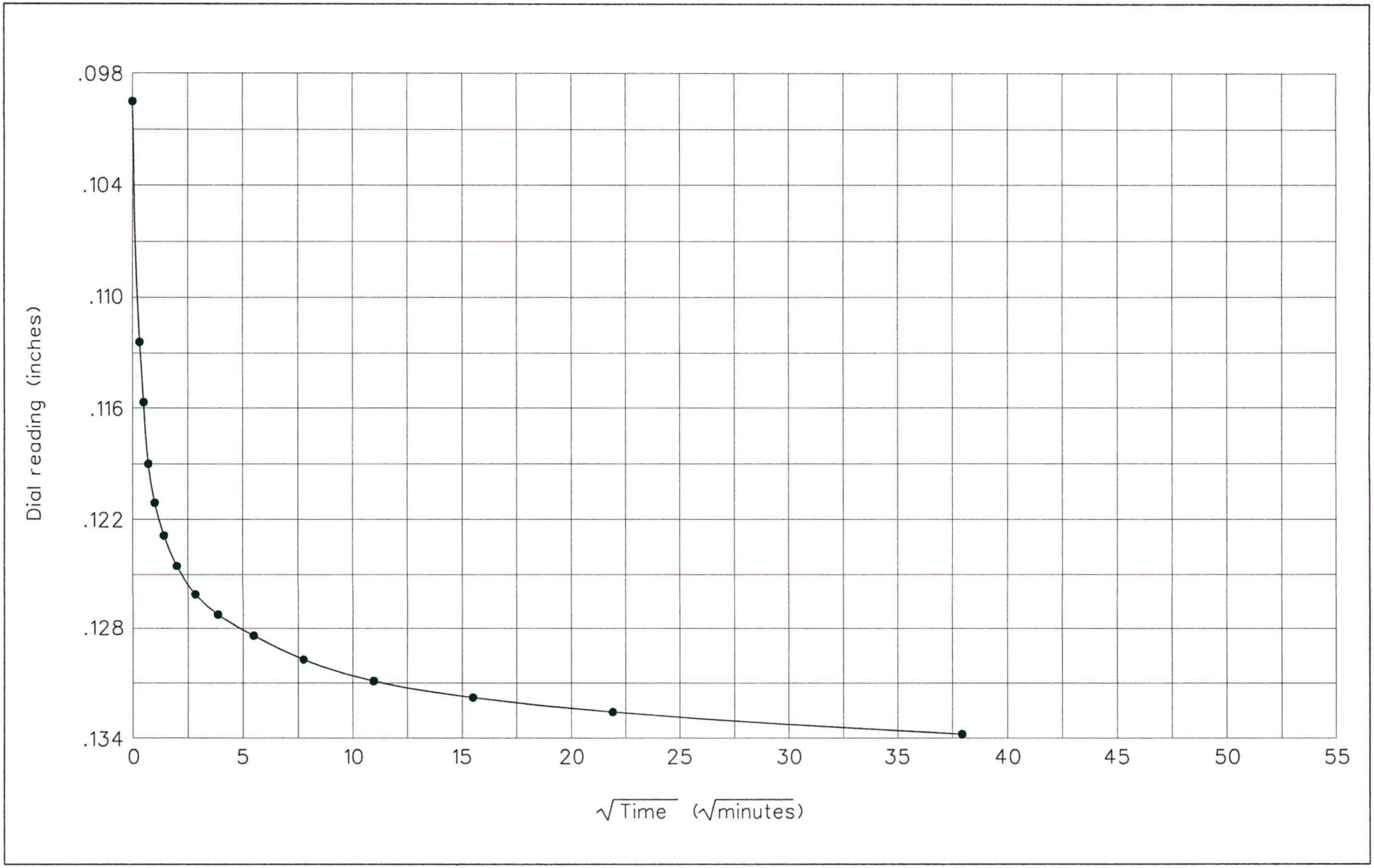
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 123'-124.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 123'-124.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure

Table 1
SUMMARY OF TEST DATA

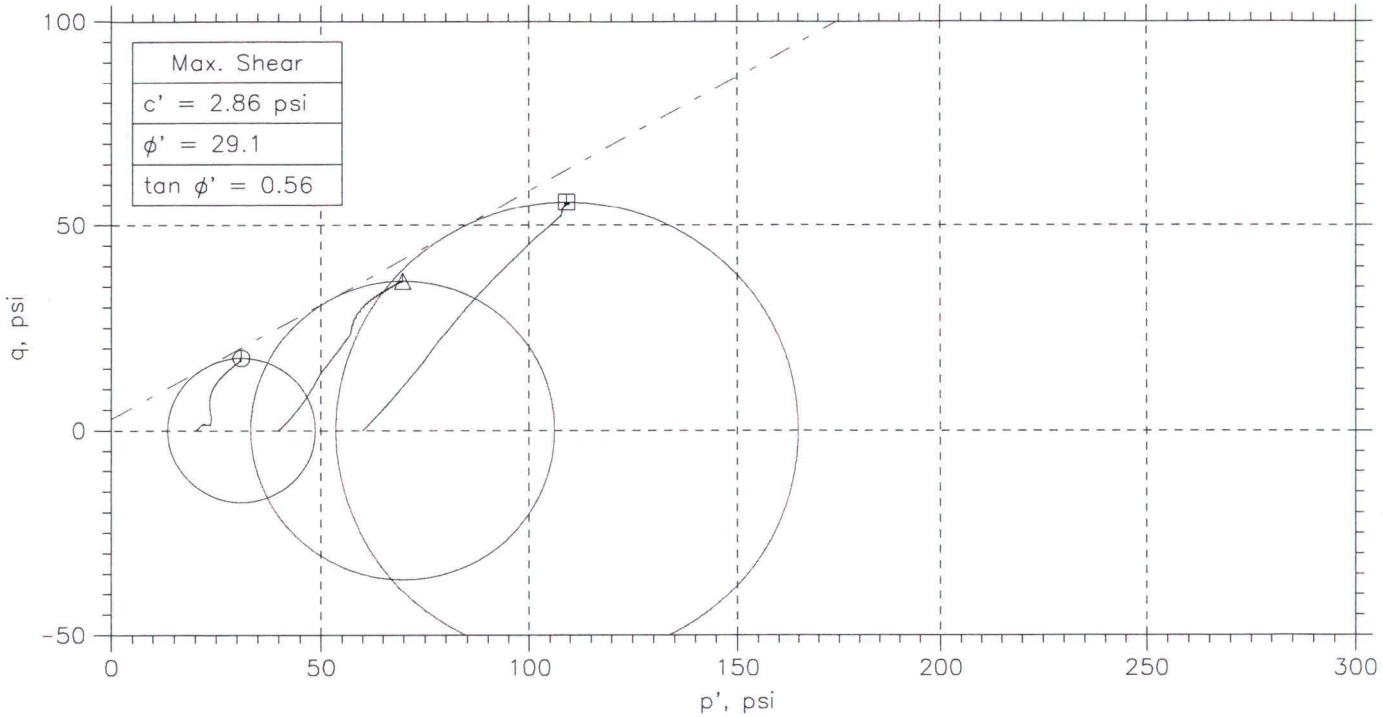
PROJECT LOCATION: I-15 Utah County Corridor; Proctor Road Over I-15, Pleasant Grove, Utah
PROJECT NO.: 200801-200
FEATURE: Foundations

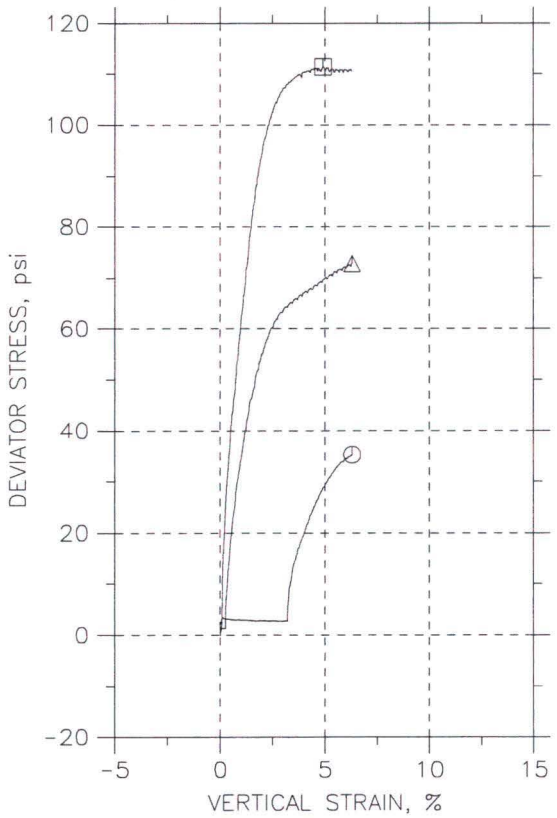
HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	STANDARD PENETRATION BLOWS PER FOOT Corrected $(N1)_{60}$	IN-PLACE		UNCONFINED COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS				UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO Classification)
			DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT& CLAY	PERCENT FINER THAN 0.005 mm	
08-PG2-B2	0-1.5	43		2.7				NP	46	43	11		GP-GM (A-1-a)
	5-6.5	2		27.8		36	20	16	9	15	76		CL (A-6(11))
	10-11.5	Shelby	96.8	24.1		38	18	20	25	10	65		CL (A-6(11))
	20-21.5	Shelby	97.4	22.5		47	20	27	0	0	100		CL (A-7-6(30))
	30-31.5	Shelby	95.1	25.0		40	17	23	0	4	96		CL (A-6(23))
	40-40.8	Shelby		19.6				NP	0	63	37		SM (A-4(0))
	40.8-41.5	Shelby	95.8	30.9		35	18	17	0	14	86		CL (A-6(14))
	50-51.5	Shelby	77.4	42.2		47	19	28	0	0	100		CL (A-7-6(31))
	60-61.5	Shelby	73.6	43.0	1122	49	22	27	0	2	98		CL (A-7-6(30))
	70-71.5	Shelby	78.4	46.0		55	23	32	0	0	100		CH (A-7-6(37))
	80-81.5	Shelby	80.3	43.4	3689	55	24	31	0	0	100		CH (A-7-6(36))
	90-91.5	Shelby	99.4	25.6		28	22	6	0	1	99		CL-ML (A-4(6))
	100-100.8	Shelby		21.5				NP	0	71	29		SM (A-2-4(0))
	100.8-101.3	Shelby	95.0	27.8		26	23	3	1	8	91		ML (A-4(2))
	110-111.5	Shelby	97.2	26.9		27	25	2	0	10	90		ML (A-4(1))
	120-121.5	Shelby	87.8	31.0	3794	39	20	19	0	3	97		CL (A-6(20))
	130-131.5	53		8.5				NP	36	44	20		SM (A-1-b)

		Resistivity (ohm cm)	pH	Sulfate (mg/kg-dry)	Chloride (mg/kg-dry)
08-PG2-B2	5-6.5	2115	8.1	150	140
	15-16.5	1466	7.4	110	94

NP=Nonplastic

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⏲	△	⏍	
Sample No.		1	1	1	
Test No.		20 psi	40 psi	60 psi	
Depth		20-21.5	20-21.5'	20-21.5'	
Initial	Diameter, in	1.42	1.42	1.42	
	Height, in	2.86	2.86	2.86	
	Water Content, %	22.5	22.5	22.5	
	Dry Density, pcf	98.31	98.31	98.31	
	Saturation, %	85.9	85.9	85.9	
	Void Ratio	0.702	0.702	0.702	
Before Shear	Water Content, %	29.2	29.2	29.2	
	Dry Density, pcf	93.85	93.85	93.85	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	0.783	0.783	0.783	
	Back Press., psi	76.	2.992	2.117	
Ver. Eff. Cons. Stress, psi		20.	39.99	60.	
Shear Strength, psi		17.62	36.41	55.66	
Strain at Failure, %		6.28	6.27	4.9	
Strain Rate, %/min		0.01	0.01	0.01	
B-Value		0.96	---	---	
Estimated Specific Gravity		2.68	2.68	2.68	
Liquid Limit		47	47	47	
Plastic Limit		27	27	27	

Project: I-15 UCC

Location: PG 2

Project No.: 200801-200

Boring No.: 08-PG2-B2

Sample Type: shelby

Description: gray brown clay, very stiff

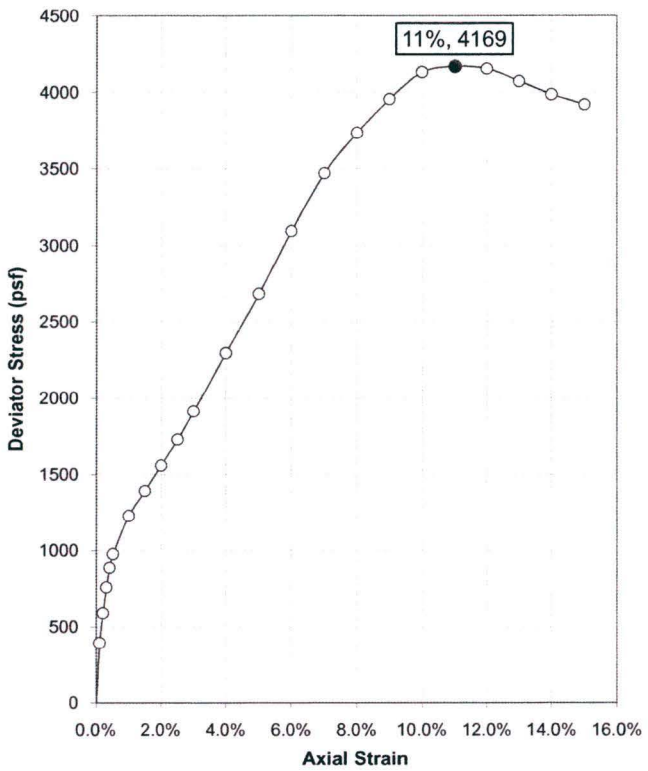
Remarks: multi-stage

Phase calculations based on start and end of test.

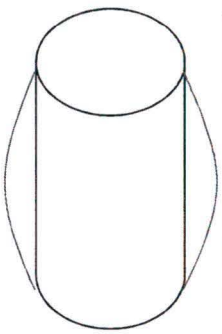
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B2
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	30-31.5
Date	November 13, 2008	**Sample Description**	Lean clay w/ silt lenses, gray/brown
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-1	0	
0.1%	396	198	
0.2%	591	295	
0.3%	760	380	
0.4%	889	445	
0.5%	978	489	
1.0%	1228	614	
1.5%	1393	696	
2.0%	1560	780	
2.5%	1729	865	
3.0%	1914	957	
4.0%	2299	1149	
5.0%	2685	1342	
6.0%	3097	1548	
7.0%	3472	1736	
8.0%	3738	1869	
9.0%	3958	1979	
10.0%	4133	2066	
11.0%	4169	2085	
12.0%	4155	2078	
13.0%	4075	2037	
14.0%	3988	1994	
15.0%	3922	1961	



Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	25%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	95.1	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Initial void ratio**	e_o	0.772	
Initial weight of specimen		854.5	(g)	**Saturation**	S	0.87	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	40	
				Plastic index	PI	23	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	4169	(psf)	**Major principal stress at failure****	σ_1	7195	(psf)
Shear stress at failure**	q_f	2085	(psf)	**Minor principal stress at failure****	σ_3	3026	(psf)

Average strain rate to failure	1%	/ min
Strain at failure	11%	

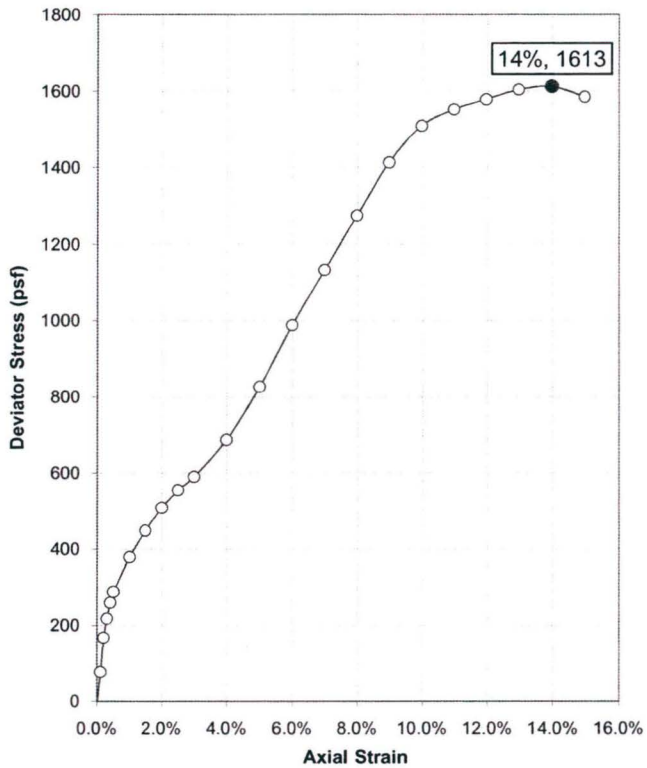
Remarks CL / A-6(23)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B2
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	50-51.5'
Date	November 13, 2008	**Sample Description**	Lean clay, gray
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-1	-1	
0.1%	77	39	
0.2%	168	84	
0.3%	218	109	
0.4%	260	130	
0.5%	288	144	
1.0%	380	190	
1.5%	448	224	
2.0%	509	255	
2.5%	556	278	
3.0%	591	295	
4.0%	687	344	
5.0%	828	414	
6.0%	989	494	
7.0%	1133	566	
8.0%	1275	638	
9.0%	1413	707	
10.0%	1510	755	
11.0%	1554	777	
12.0%	1580	790	
13.0%	1605	802	
14.0%	1613	806	
15.0%	1586	793	

Initial Sample Data

Initial height of specimen	L_o	5.22	(in)	**Moisture content***	w	42%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	77.4	(pcf)
Height-to-diameter ratio	L_o / D_o	2.02		**Initial void ratio**	e_o	1.176	
Initial weight of specimen		794.8	(g)	**Saturation**	S	0.97	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	47	
				Plastic index	PI	28	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	1613	(psf)	**Major principal stress at failure****	σ_1	6649	(psf)
Shear stress at failure**	q_f	806	(psf)	**Minor principal stress at failure****	σ_3	5036	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		14%					

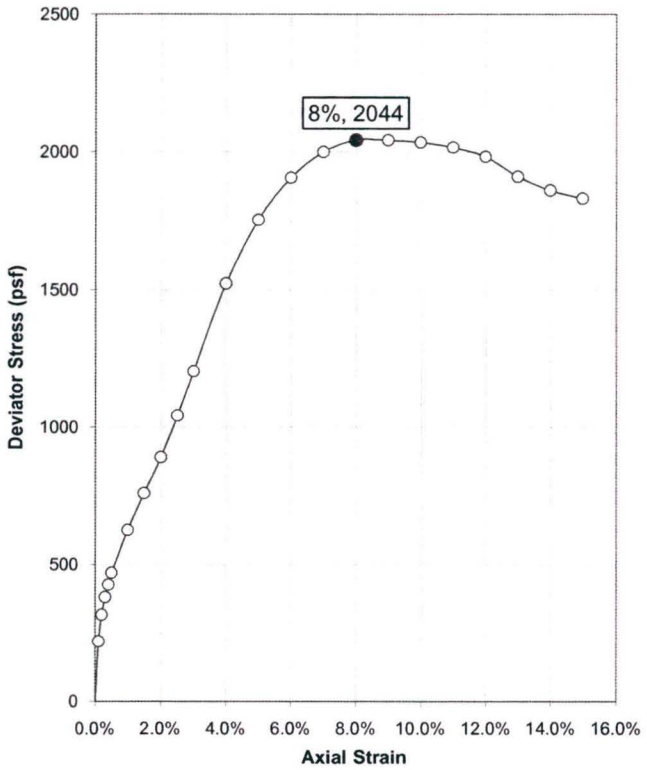
Remarks CL / A-7-6(31)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

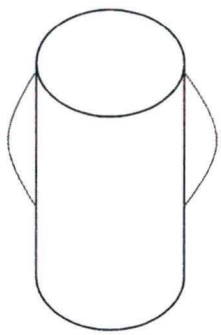
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B2
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	70-71.5'
Date	November 13, 2008	**Sample Description**	Fat Clay, gray
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-1	-1	
0.1%	220	110	
0.2%	317	158	
0.3%	381	190	
0.4%	427	213	
0.5%	470	235	
1.0%	625	312	
1.5%	760	380	
2.0%	891	446	
2.5%	1042	521	
3.0%	1206	603	
4.0%	1524	762	
5.0%	1756	878	
6.0%	1907	954	
7.0%	2000	1000	
8.0%	2044	1022	
9.0%	2043	1022	
10.0%	2035	1018	
11.0%	2017	1008	
12.0%	1983	991	
13.0%	1912	956	
14.0%	1862	931	
15.0%	1833	917	



Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	46%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	78.4	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Initial void ratio**	e_o	1.148	
Initial weight of specimen		823.5	(g)	**Saturation**	S	1.00	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	55	
				Plastic index	PI	32	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	2044	(psf)	**Major principal stress at failure****	σ_1	9094	(psf)
Shear stress at failure**	q_f	1022	(psf)	**Minor principal stress at failure****	σ_3	7050	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		8%					

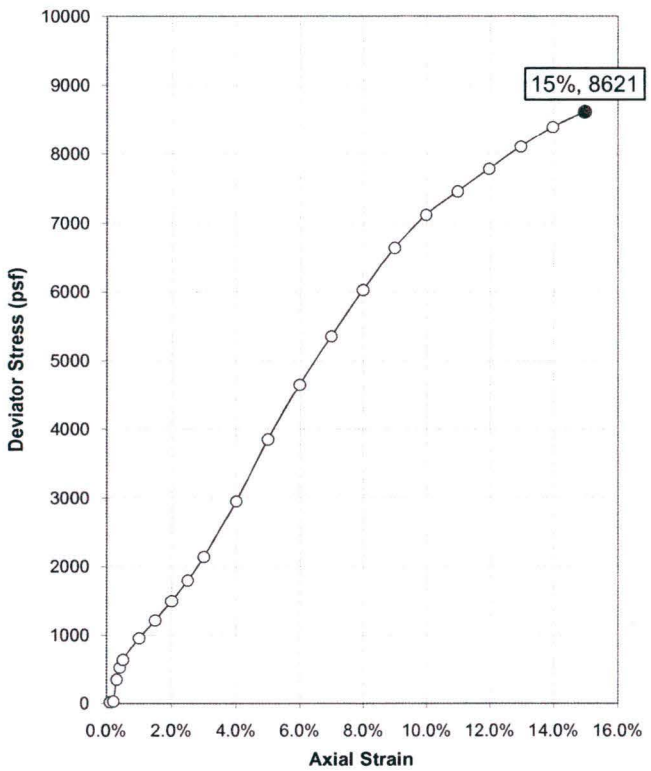
Remarks CH / A-7-6(37)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

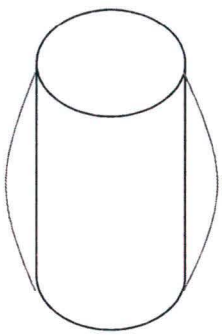
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B2
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	90-91.5'
Date	November 13, 2008	**Sample Description**	Silty Clay, gray
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-6	-3	
0.1%	19	9	
0.2%	28	14	
0.3%	348	174	
0.4%	521	261	
0.5%	636	318	
1.0%	956	478	
1.5%	1213	606	
2.0%	1495	747	
2.5%	1796	898	
3.0%	2139	1070	
4.0%	2952	1476	
5.0%	3851	1925	
6.0%	4656	2328	
7.0%	5358	2679	
8.0%	6029	3015	
9.0%	6643	3321	
10.0%	7123	3562	
11.0%	7462	3731	
12.0%	7786	3893	
13.0%	8109	4055	
14.0%	8397	4199	
15.0%	8621	4311	



Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	26%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	99.4	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Initial void ratio**	e_o	0.696	
Initial weight of specimen		897.5	(g)	**Saturation**	S	0.99	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	28	
				Plastic index	PI	6	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	8621	(psf)	**Major principal stress at failure****	σ_1	17690	(psf)
Shear stress at failure**	q_f	4311	(psf)	**Minor principal stress at failure****	σ_3	9069	(psf)

Average strain rate to failure	1%	/ min
Strain at failure	15%	

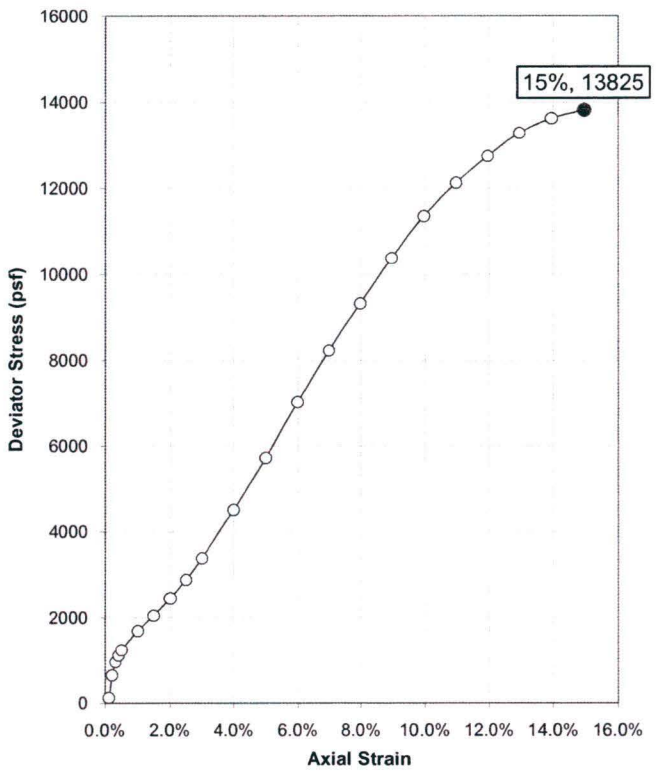
Remarks CL-ML / A-4(6)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

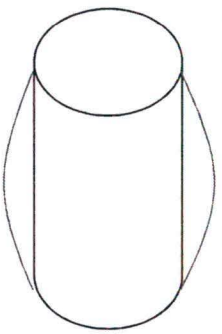
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B2
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	110-111.5'
Date	November 13, 2008	**Sample Description**	Silt w/ sand, dark gray
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-3	-2	
0.1%	128	64	
0.2%	651	326	
0.3%	963	481	
0.4%	1116	558	
0.5%	1241	621	
1.0%	1692	846	
1.5%	2046	1023	
2.0%	2445	1223	
2.5%	2880	1440	
3.0%	3380	1690	
4.0%	4514	2257	
5.0%	5725	2862	
6.0%	7025	3513	
7.0%	8231	4116	
8.0%	9325	4663	
9.0%	10382	5191	
10.0%	11357	5678	
11.0%	12126	6063	
12.0%	12746	6373	
12.9%	13286	6643	
13.9%	13628	6814	
14.9%	13825	6913	



Initial Sample Data

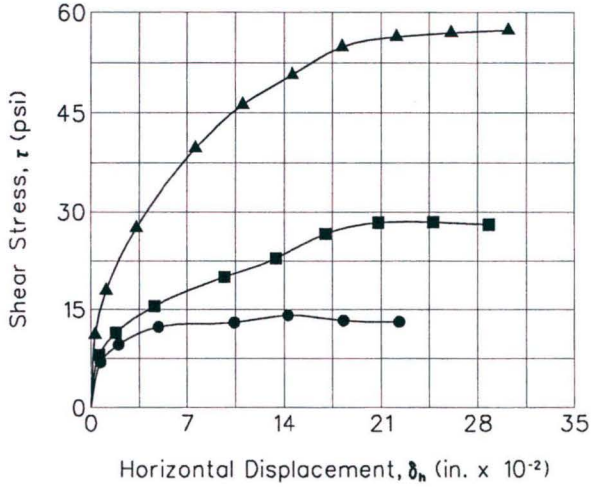
Initial height of specimen	L_o	5.38	(in)	**Moisture content***	w	27%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	97.2	(pcf)
Height-to-diameter ratio	L_o / D_o	2.08		**Initial void ratio**	e_o	0.734	
Initial weight of specimen		917.5	(g)	**Saturation**	S	0.99	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	27	
				Plastic index	PI	2	

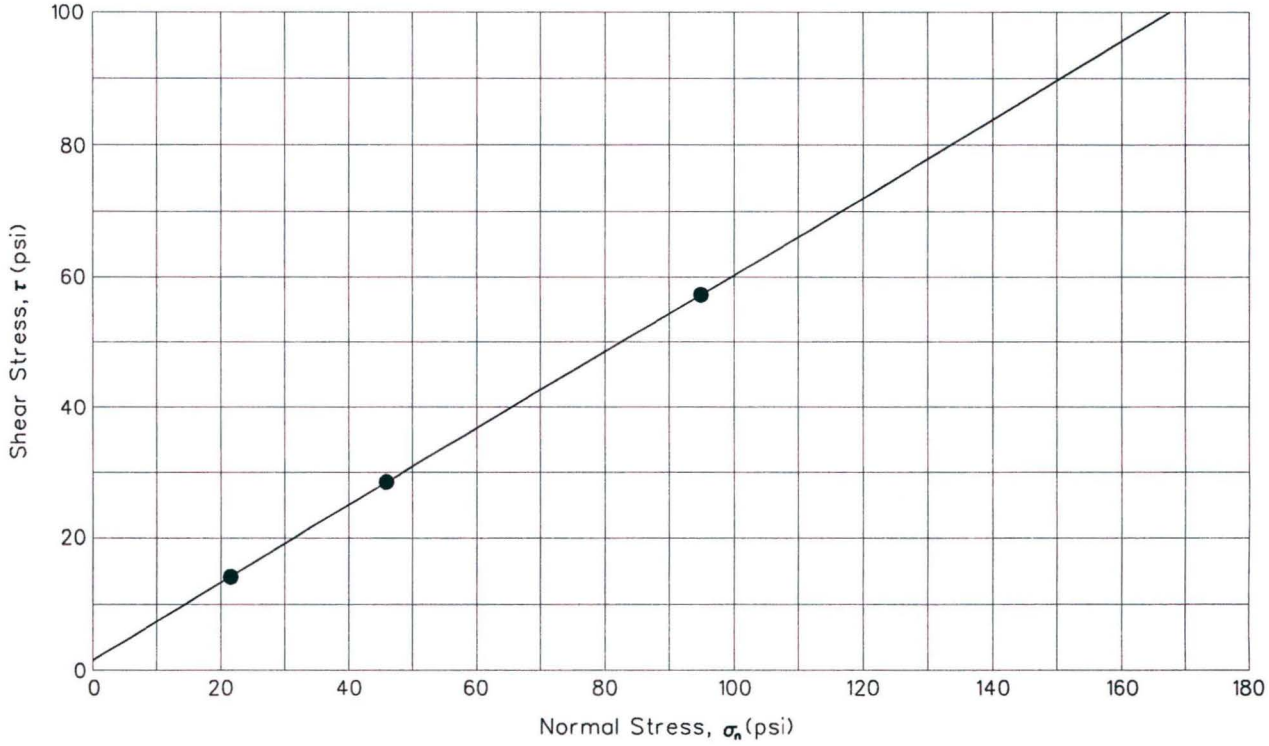
Test Results

Deviator stress at failure**	$\sigma_{d,f}$	13825	(psf)	**Major principal stress at failure****	σ_1	24930	(psf)
Shear stress at failure**	q_f	6913	(psf)	**Minor principal stress at failure****	σ_3	11105	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

Remarks ML / A-4(1)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects





Test No. or Symbol	Sample Size (inches)	Sample Data		Degree of Saturation (%)	Normal Stress δn (psi)	Maximum Shear Stress τ (psi)	Strain Rate (inches/minute)	Shear Strength Parameters	
		Dry Density (pcf)	Moisture Content (%)					Friction Angle ϕ (degrees)	Cohesion (c/psi)
●	2.375	96.7	24.0	~100	21.5	14.1	0.0005	30.4	2
■	2.375	96.8	24.0	~100	45.8	28.5	0.0005		
▲	2.375	96.8	24.1	~100	94.9	57.3	0.0005		

MATERIAL: LEAN CLAY (CL)

RB&G ENGINEERING INC.
Provo, Utah

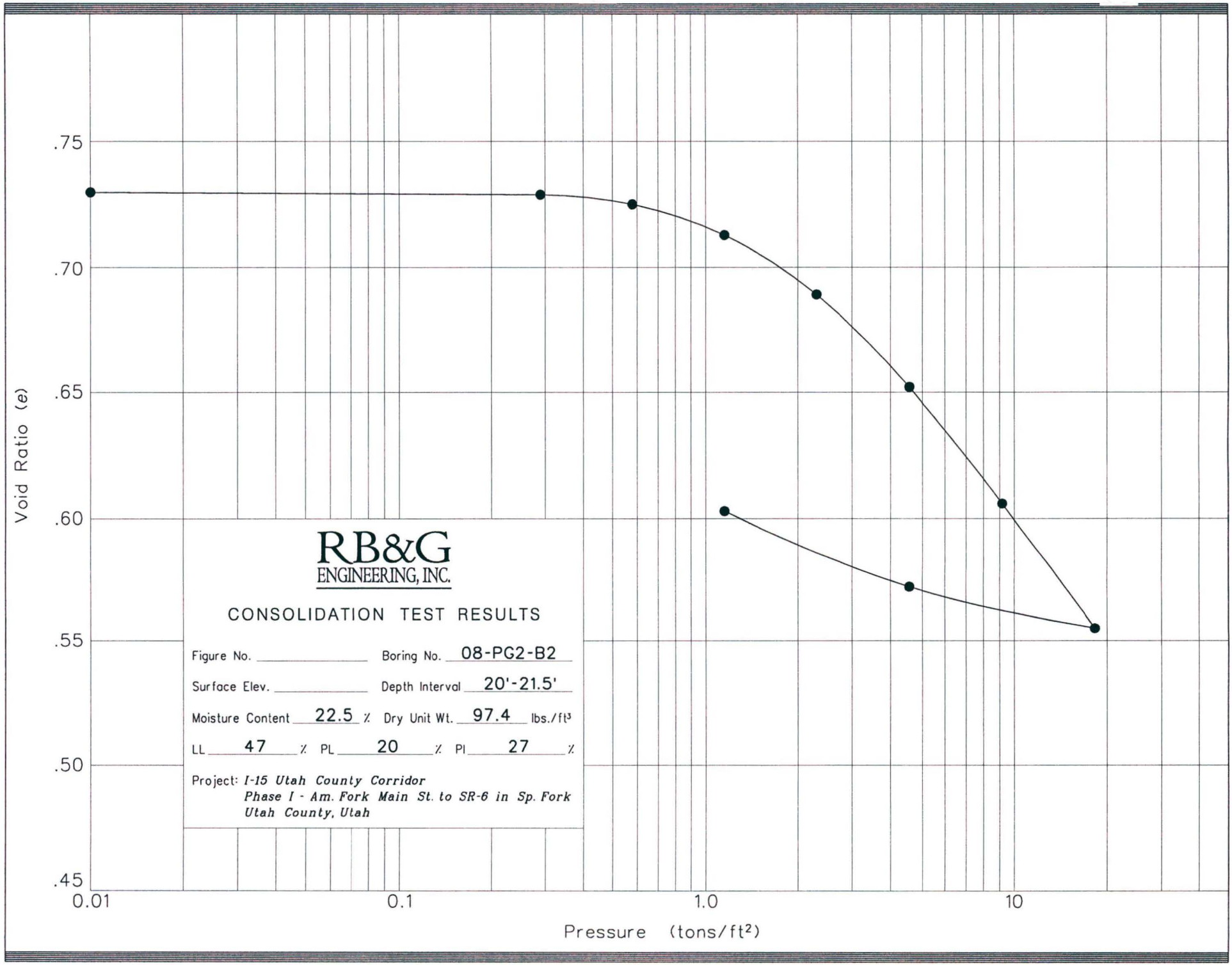
DIRECT SHEAR TEST

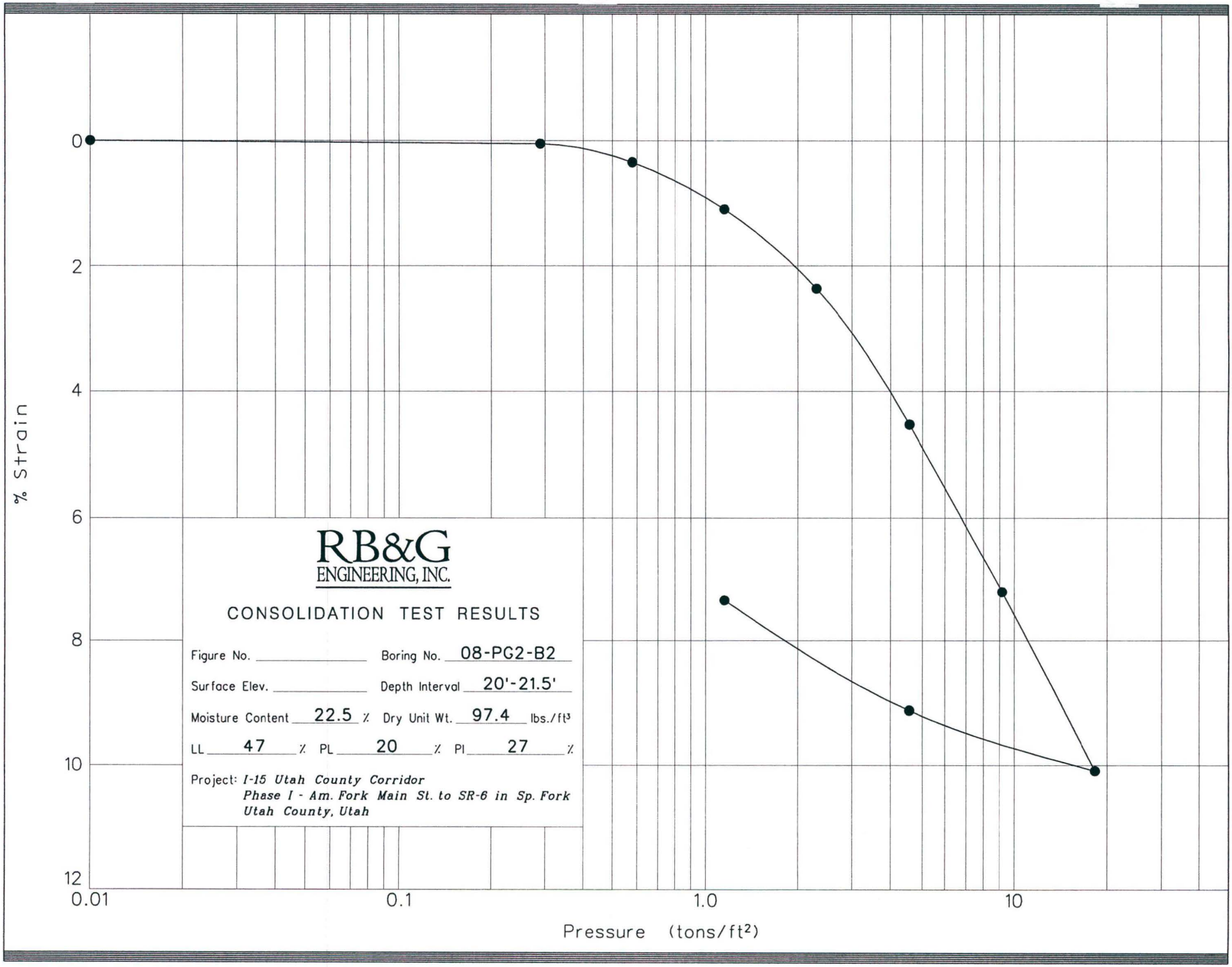
Project: *I-15 Utah County Corridor*
Utah County, Utah

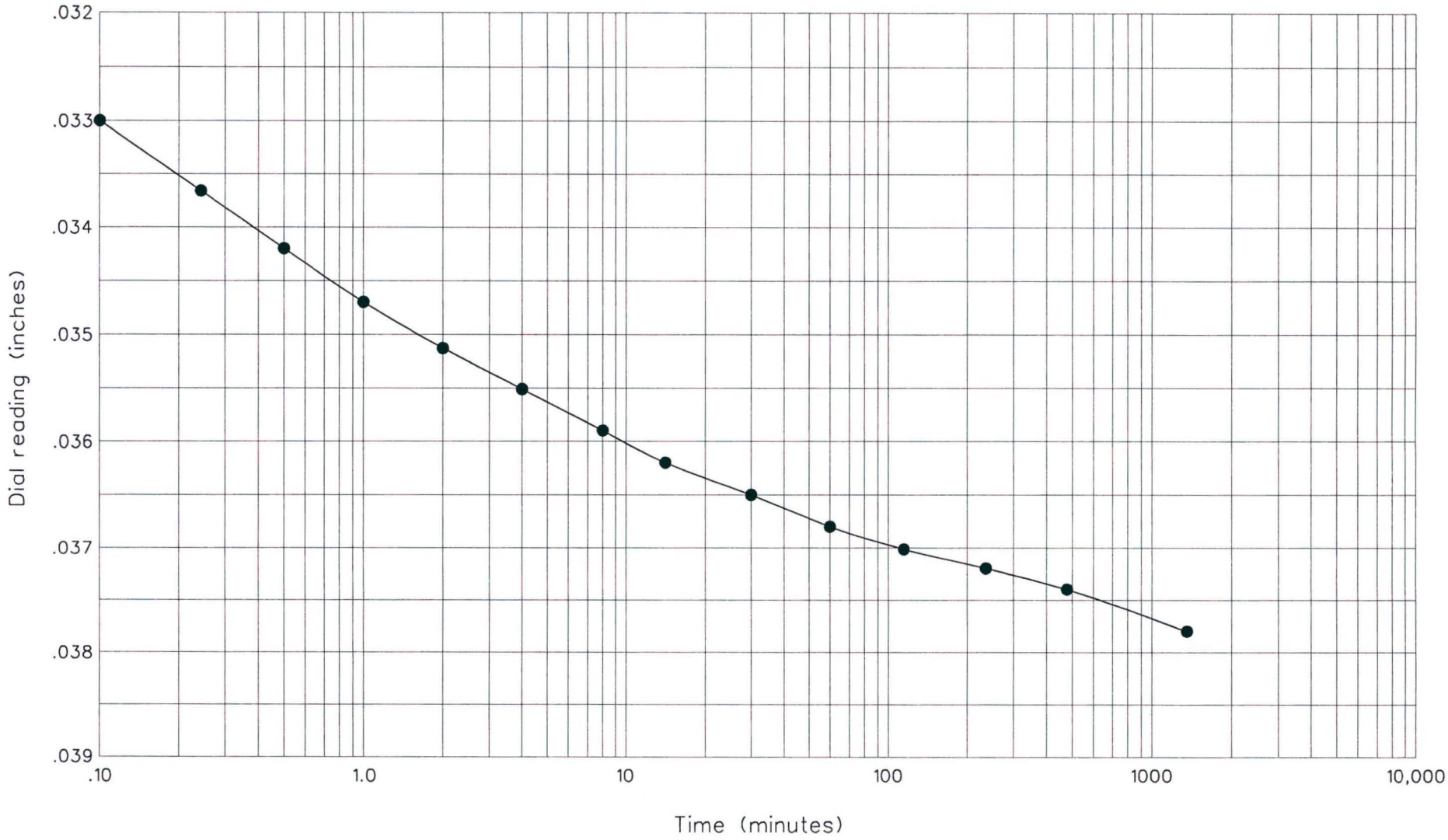
HOLE NO.: 08-PG2-B2

DEPTH: 10'-11.5'

Figure


.75
.70
.65
.60
.55
.50
.45
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 20'-21.5'
Moisture Content 22.5 % Dry Unit Wt. 97.4 lbs./ft³
LL 47 % PL 20 % PI 27 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


% Strain
0
2
4
6
8
10
12
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 20'-21.5'
Moisture Content 22.5 % Dry Unit Wt. 97.4 lbs./ft³
LL 47 % PL 20 % PI 27 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



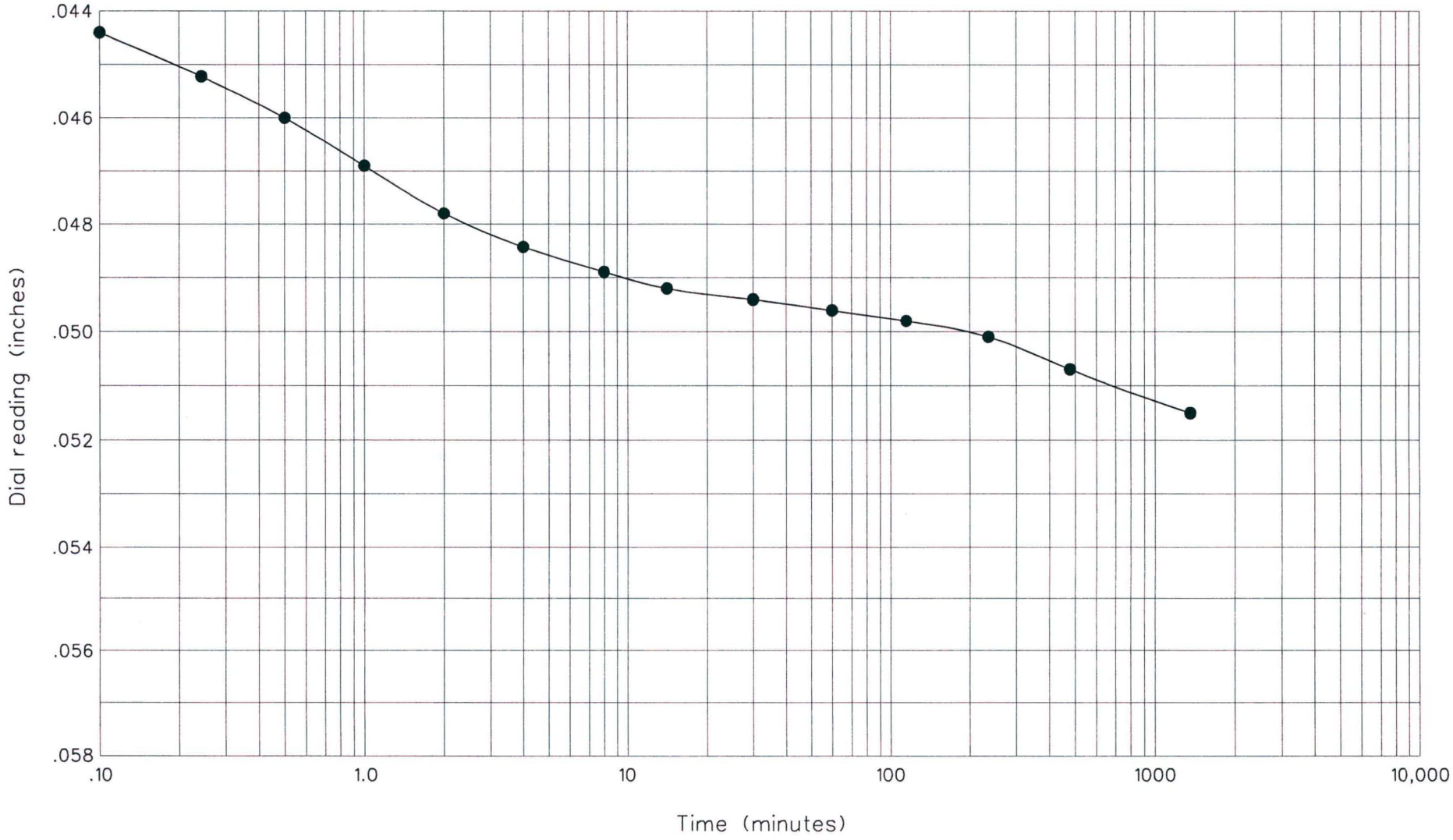
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 20'-21.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



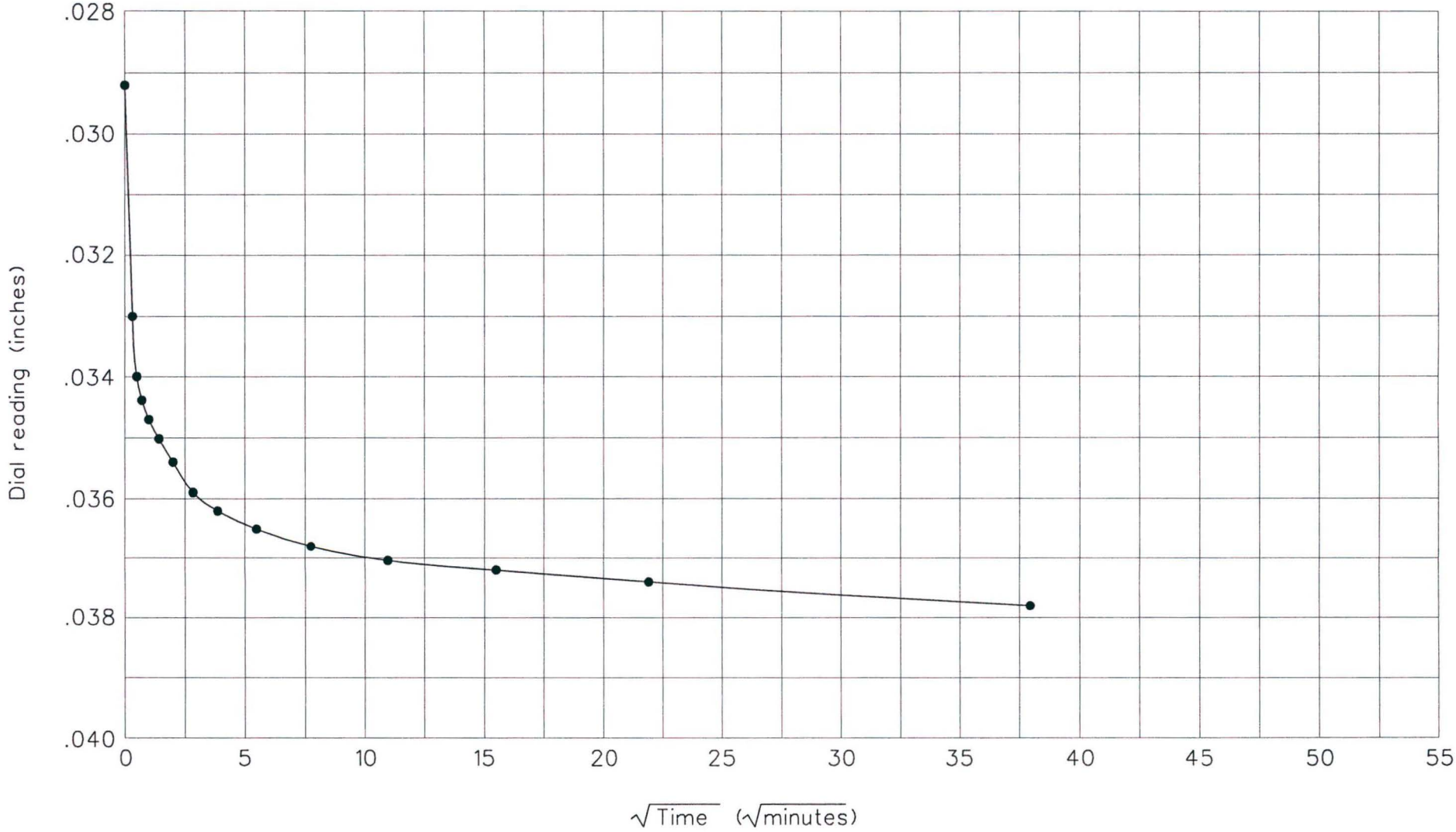
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 20'-21.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



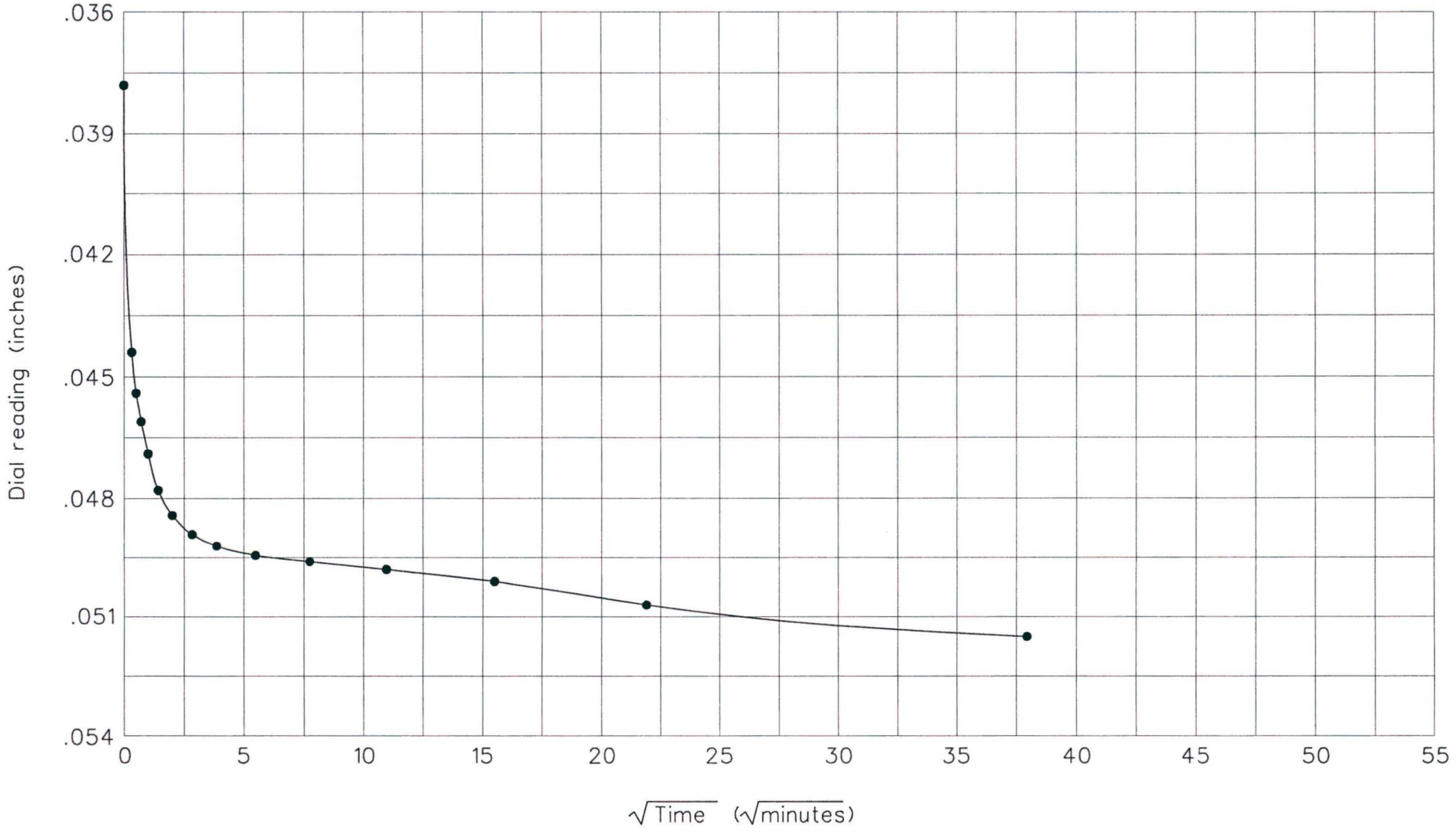
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 20'-21.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



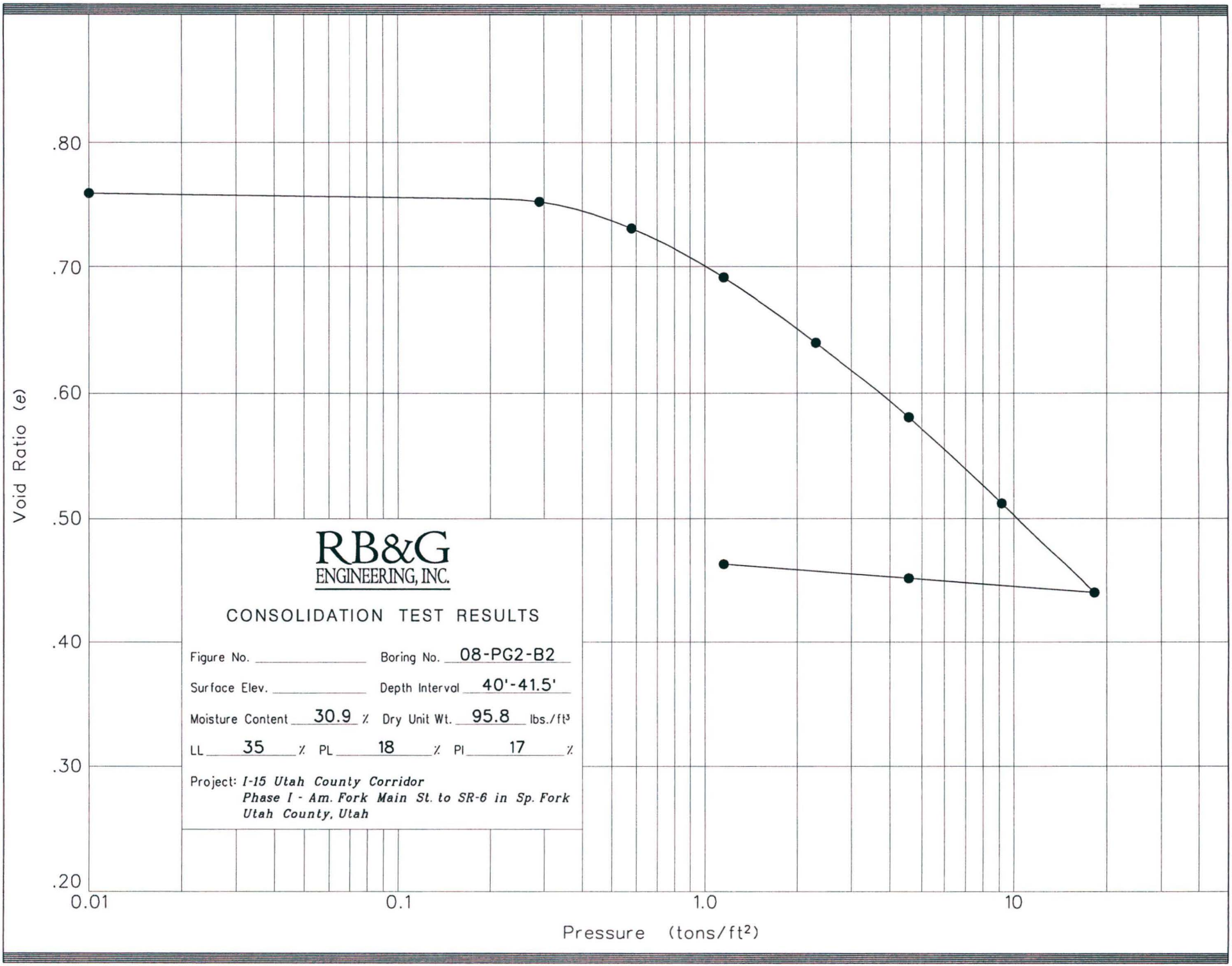
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 20'-21.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

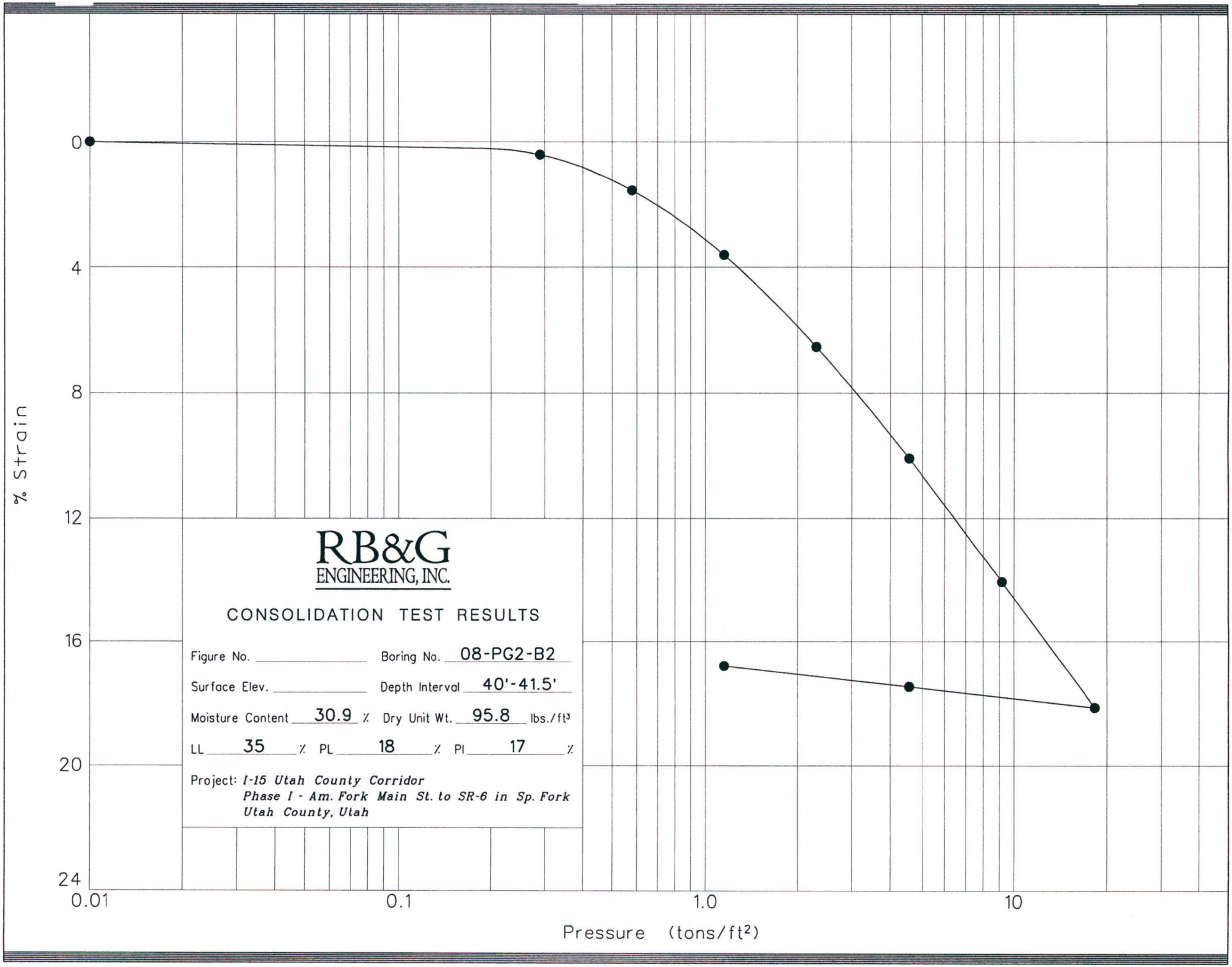
Figure No. _____ Boring No. 08-PG2-B2

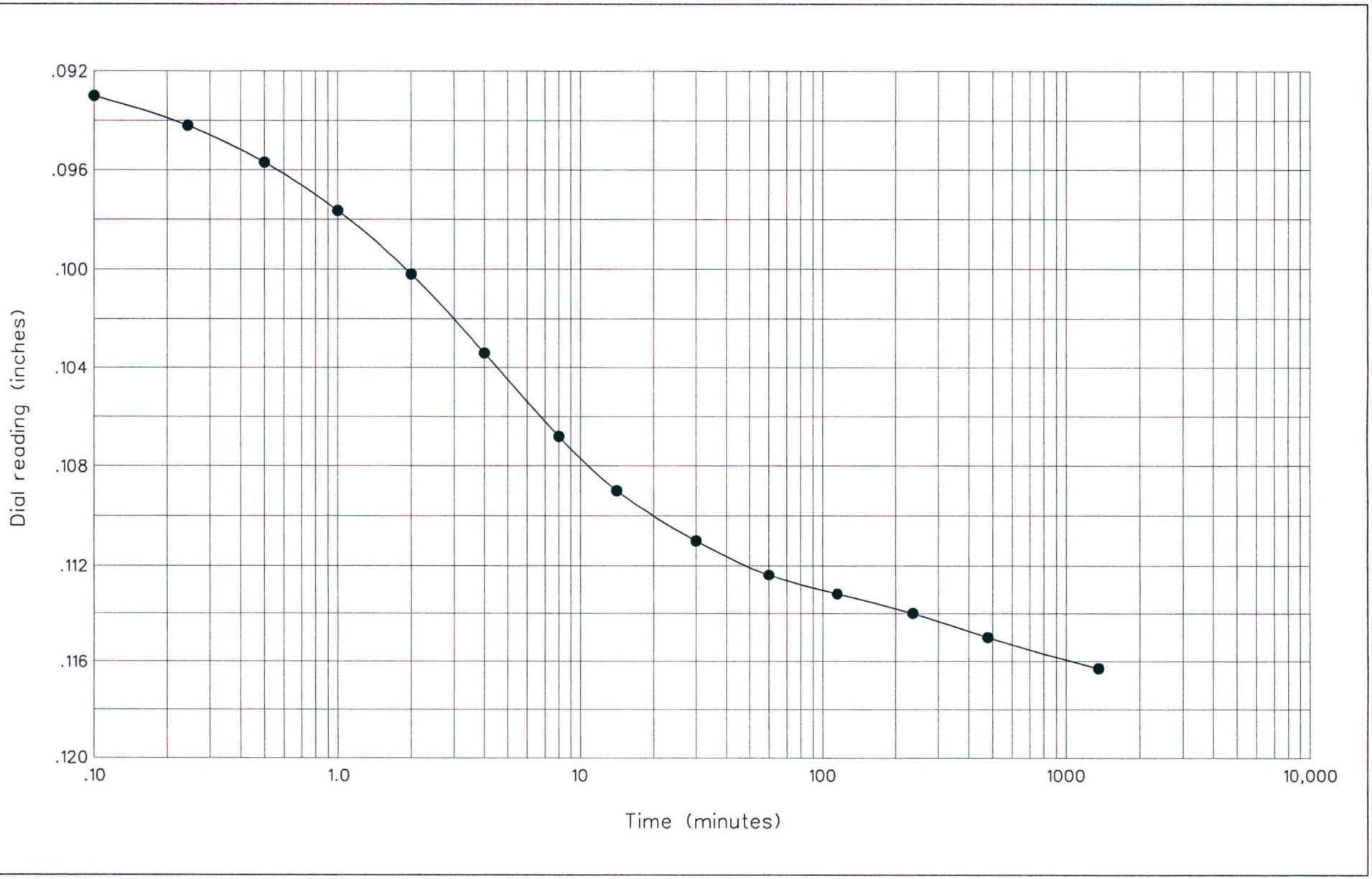
Surface Elev. _____ Depth Interval 40'-41.5'

Moisture Content 30.9 % Dry Unit Wt. 95.8 lbs./ft³

LL 35 % PL 18 % PI 17 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


0
4
8
12
16
20
24
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No.
Boring No. 08-PG2-B2
Surface Elev.
Depth Interval 40'-41.5'
Moisture Content 30.9 % Dry Unit Wt. 95.8 lbs./ft³
LL 35 % PL 18 % PI 17 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



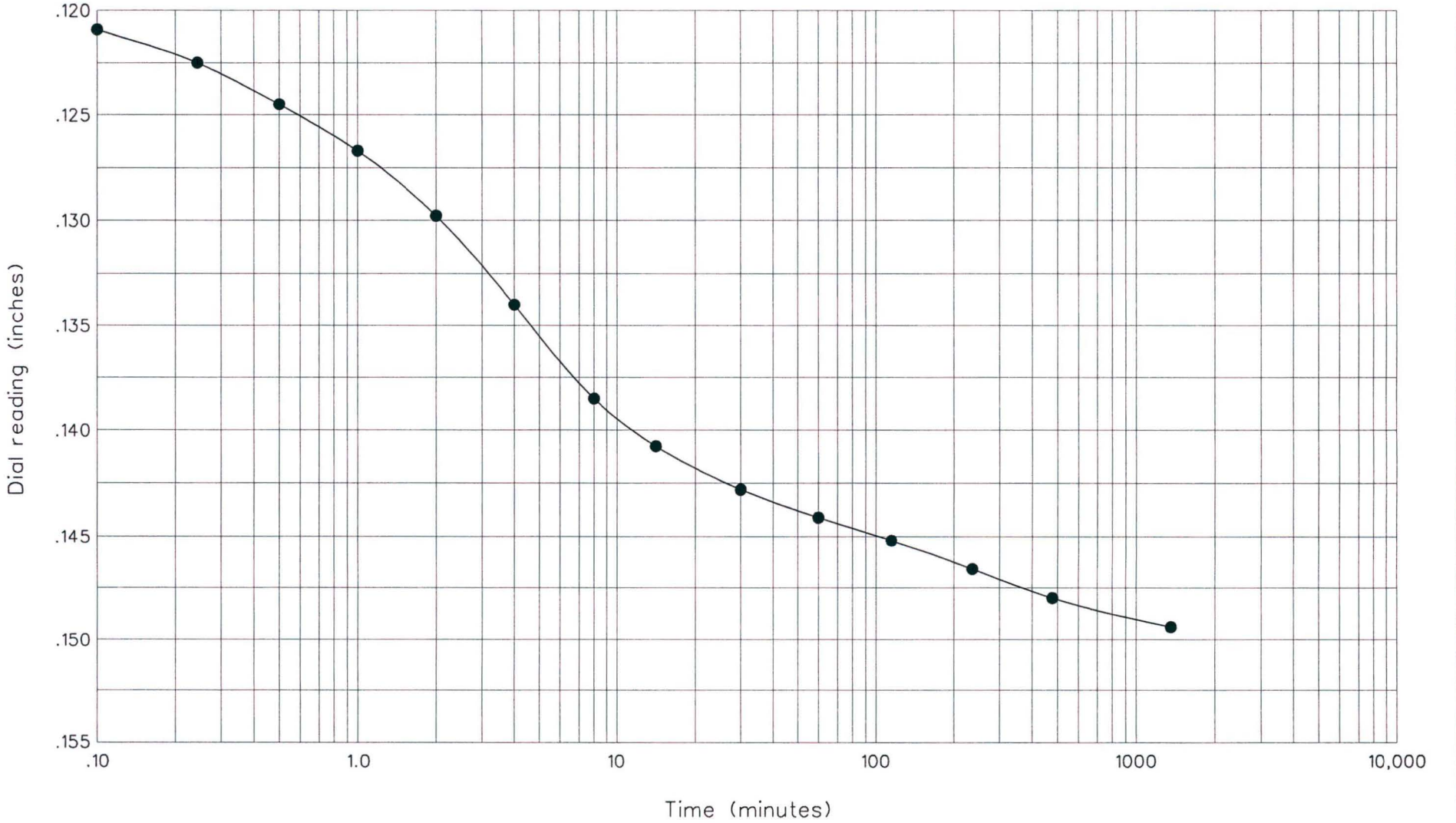
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 40'-41.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



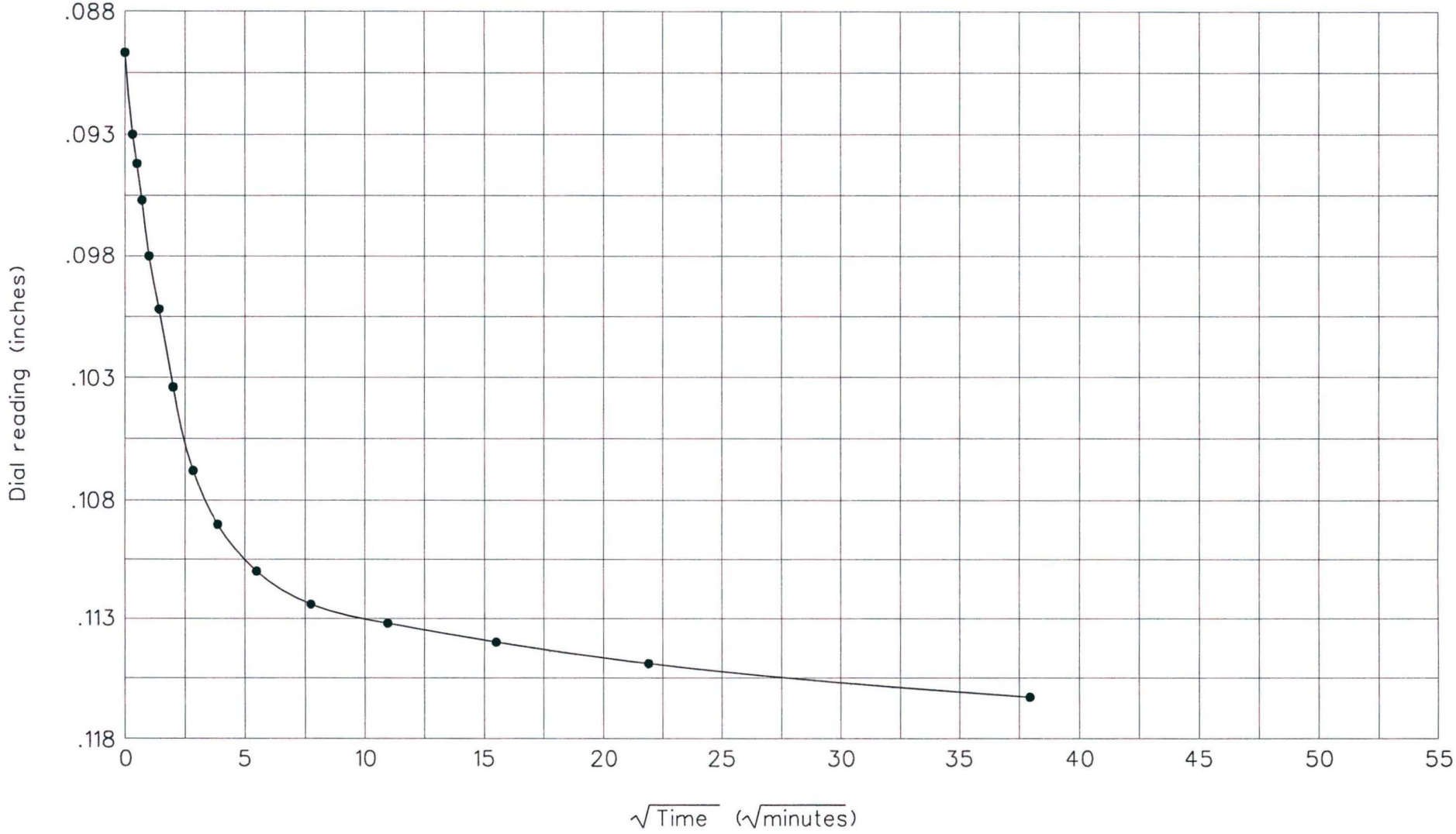
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 40'-41.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



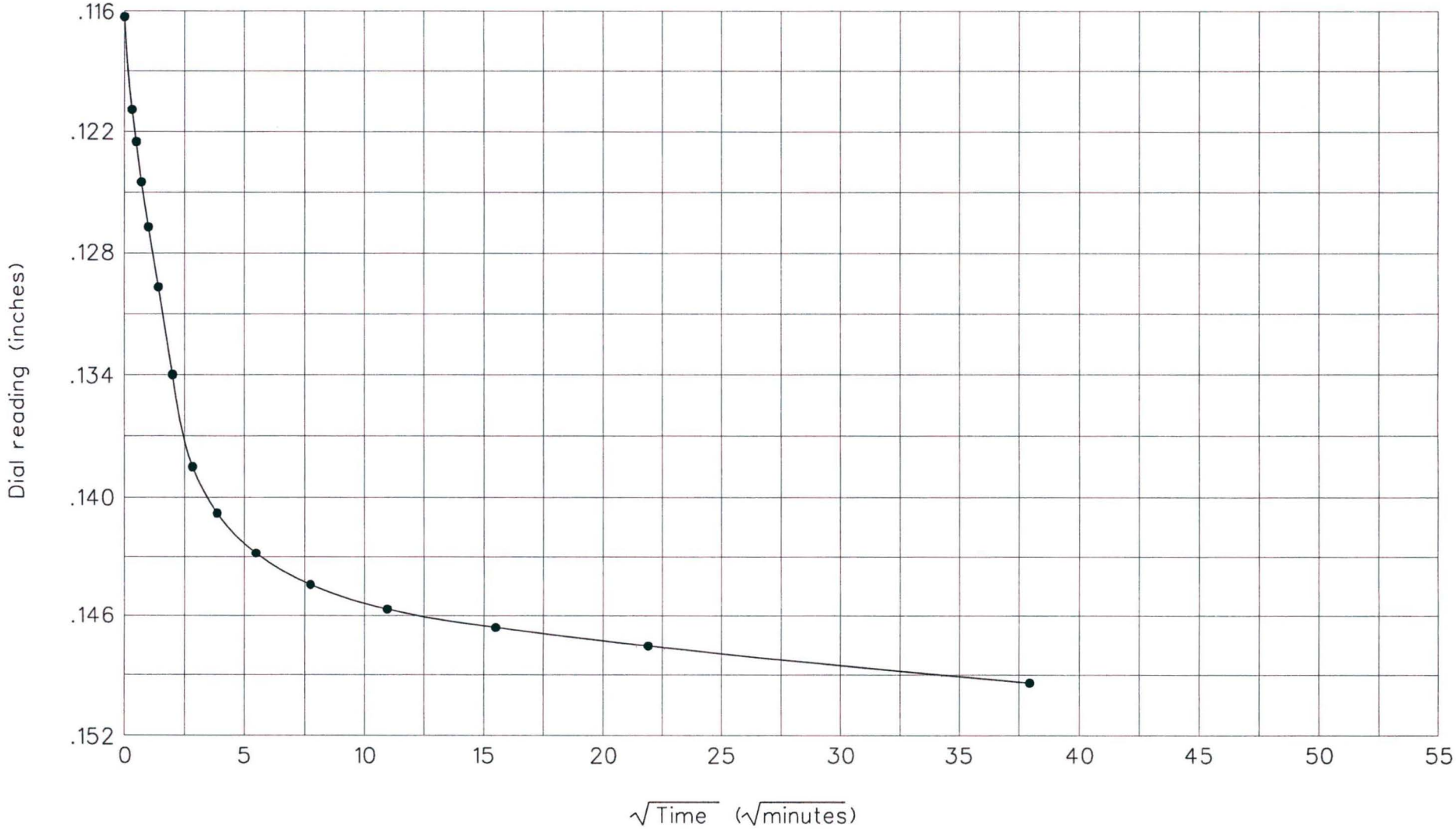
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 40'-41.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



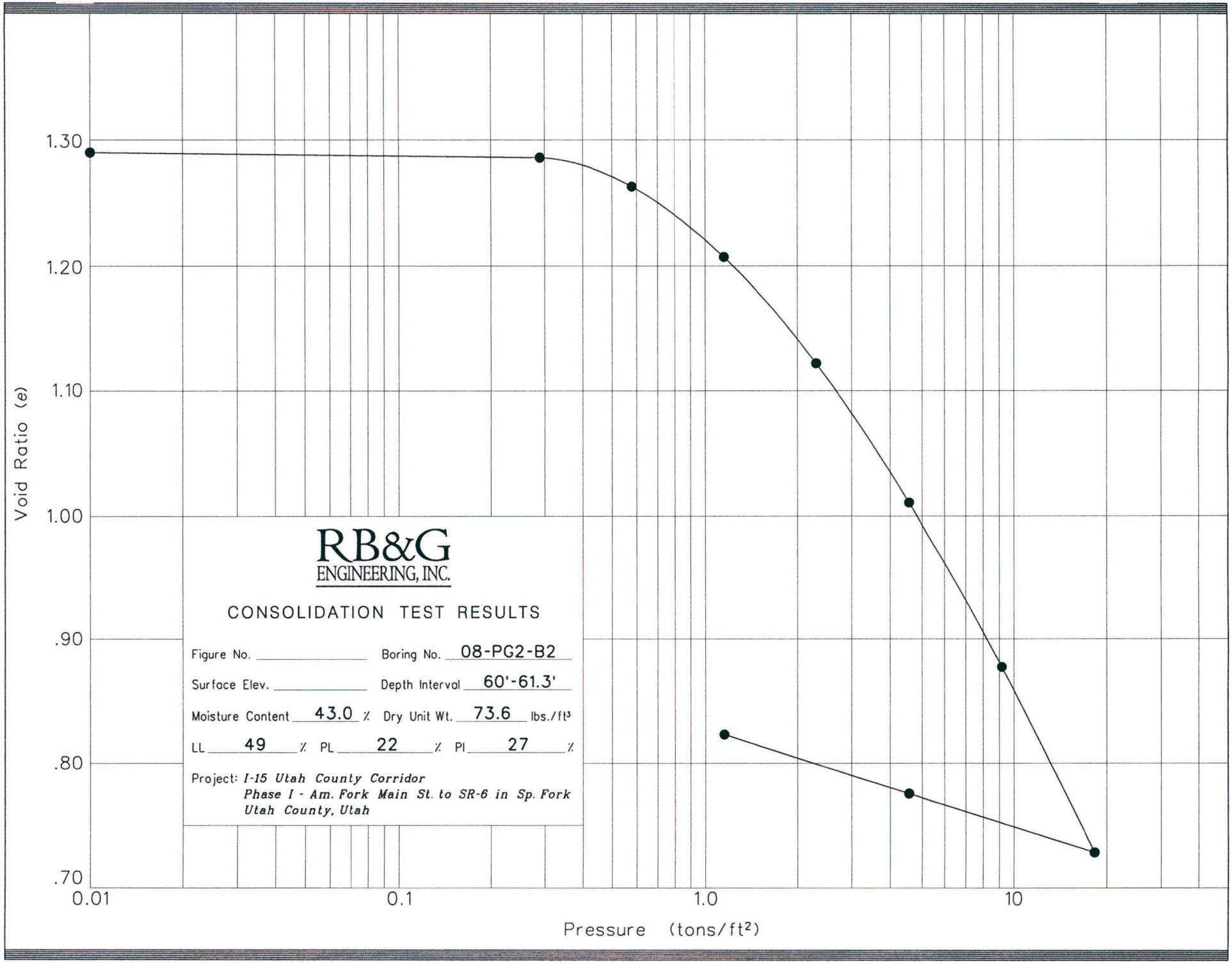
RB&G ENGINEERING, INC.

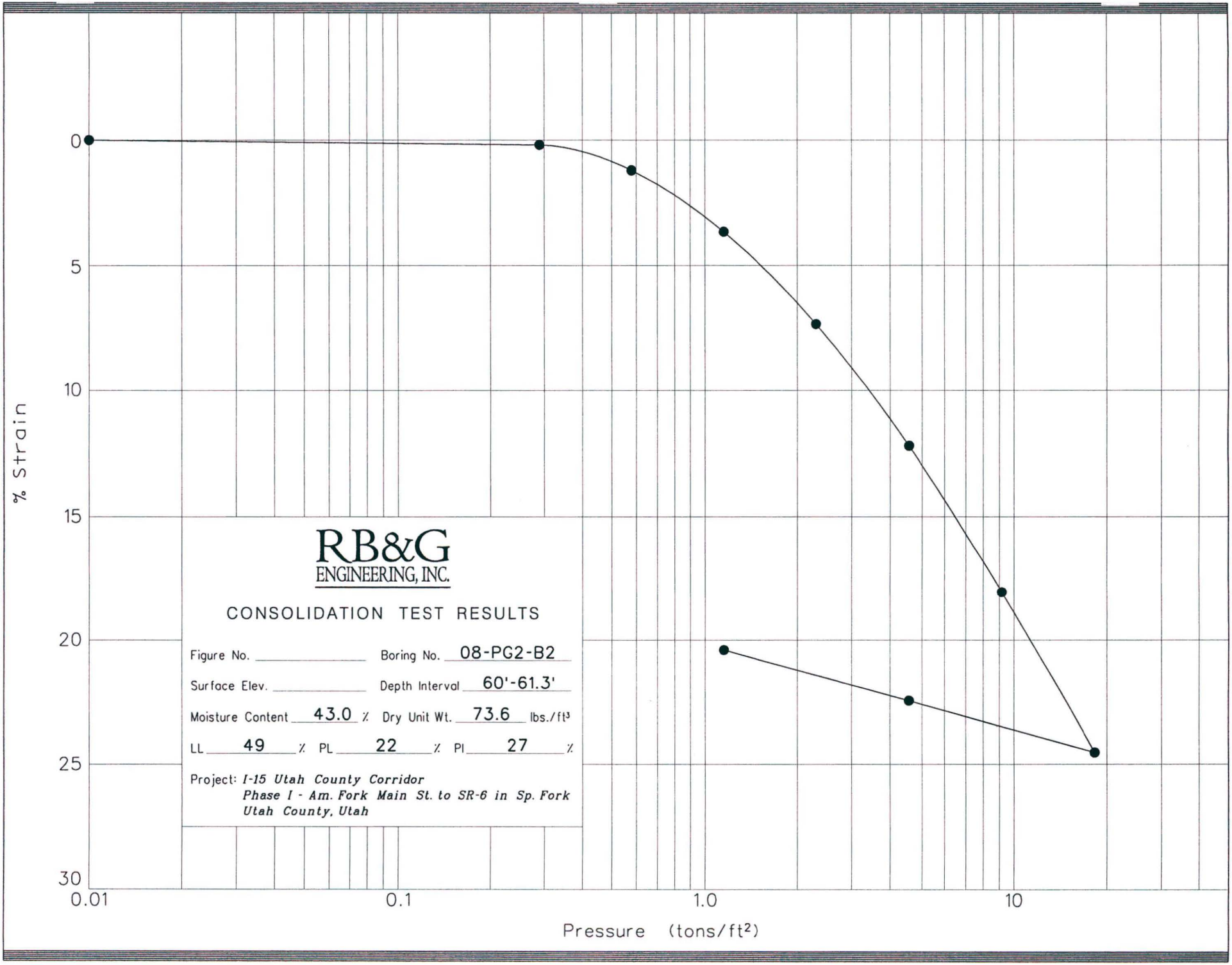
Hole no.: 08-PG2-B2
Depth: 40'-41.5'
Load: 2.30 to 4.60 tons

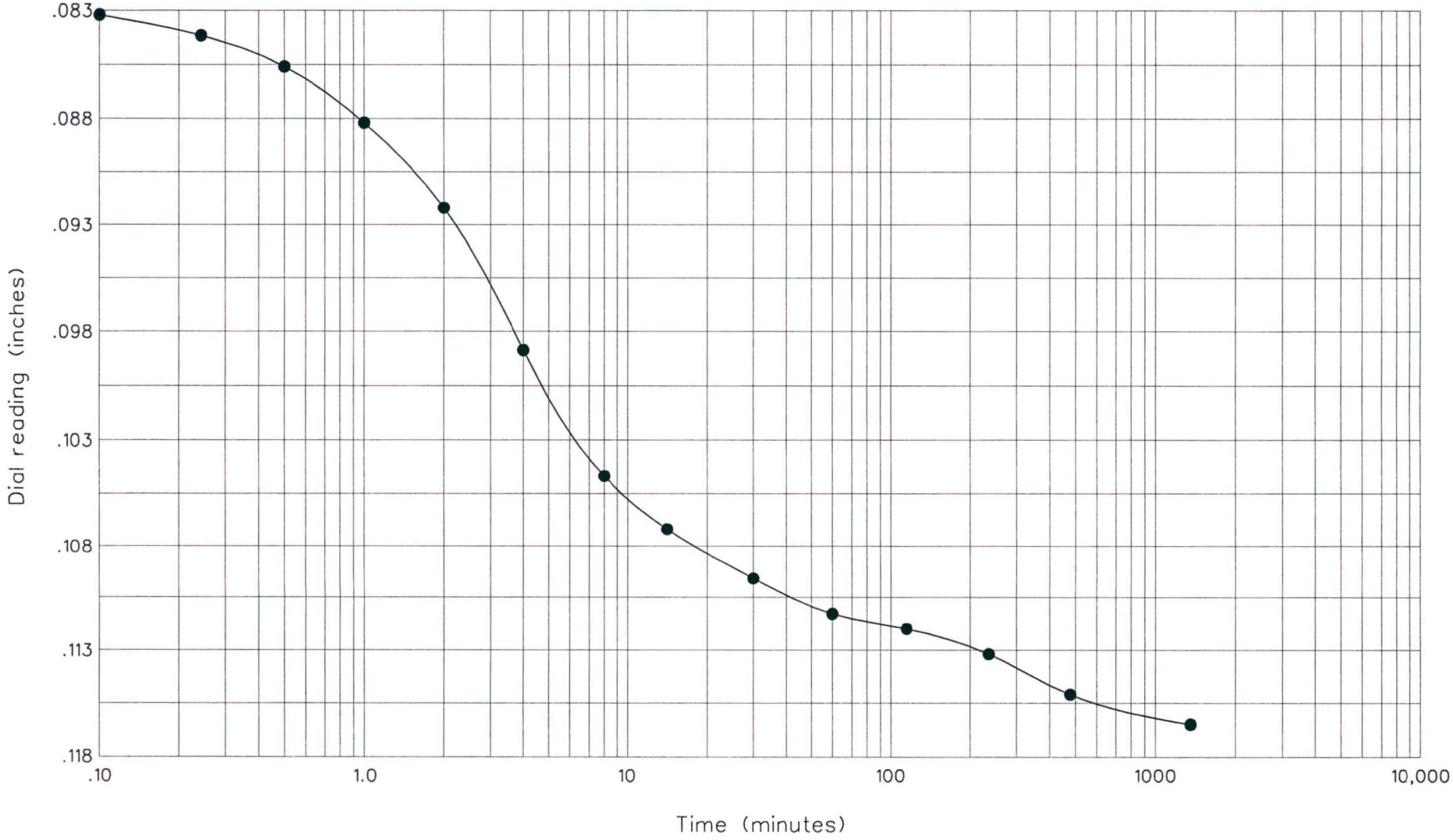
TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure


1.30
1.20
1.10
1.00
.90
.80
.70
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 60'-61.3'
Moisture Content 43.0 % Dry Unit Wt. 73.6 lbs./ft³
LL 49 % PL 22 % PI 27 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


% Strain
0
5
10
15
20
25
30
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 60'-61.3'
Moisture Content 43.0 % Dry Unit Wt. 73.6 lbs./ft³
LL 49 % PL 22 % PI 27 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



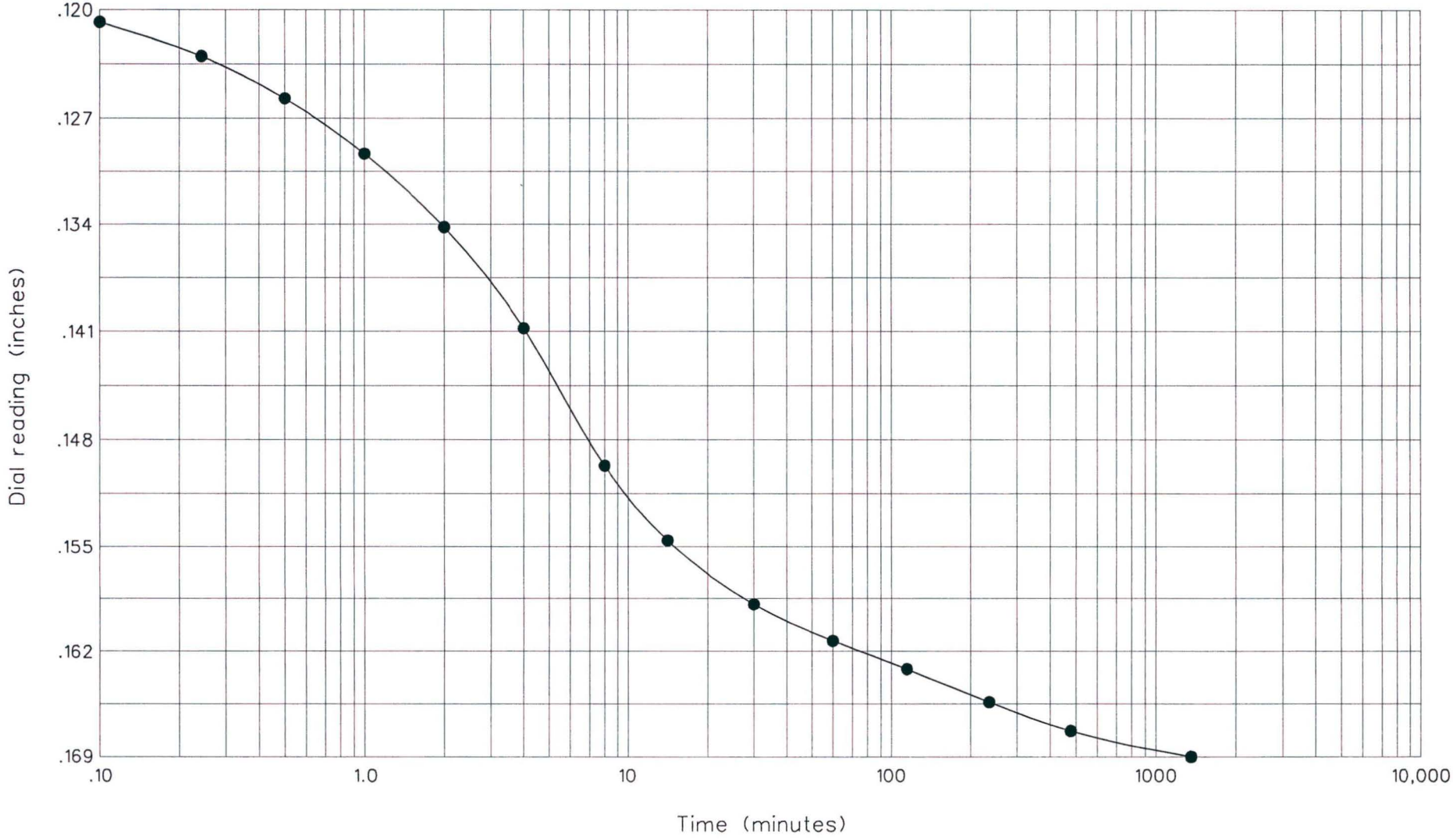
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 60'-61.3'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



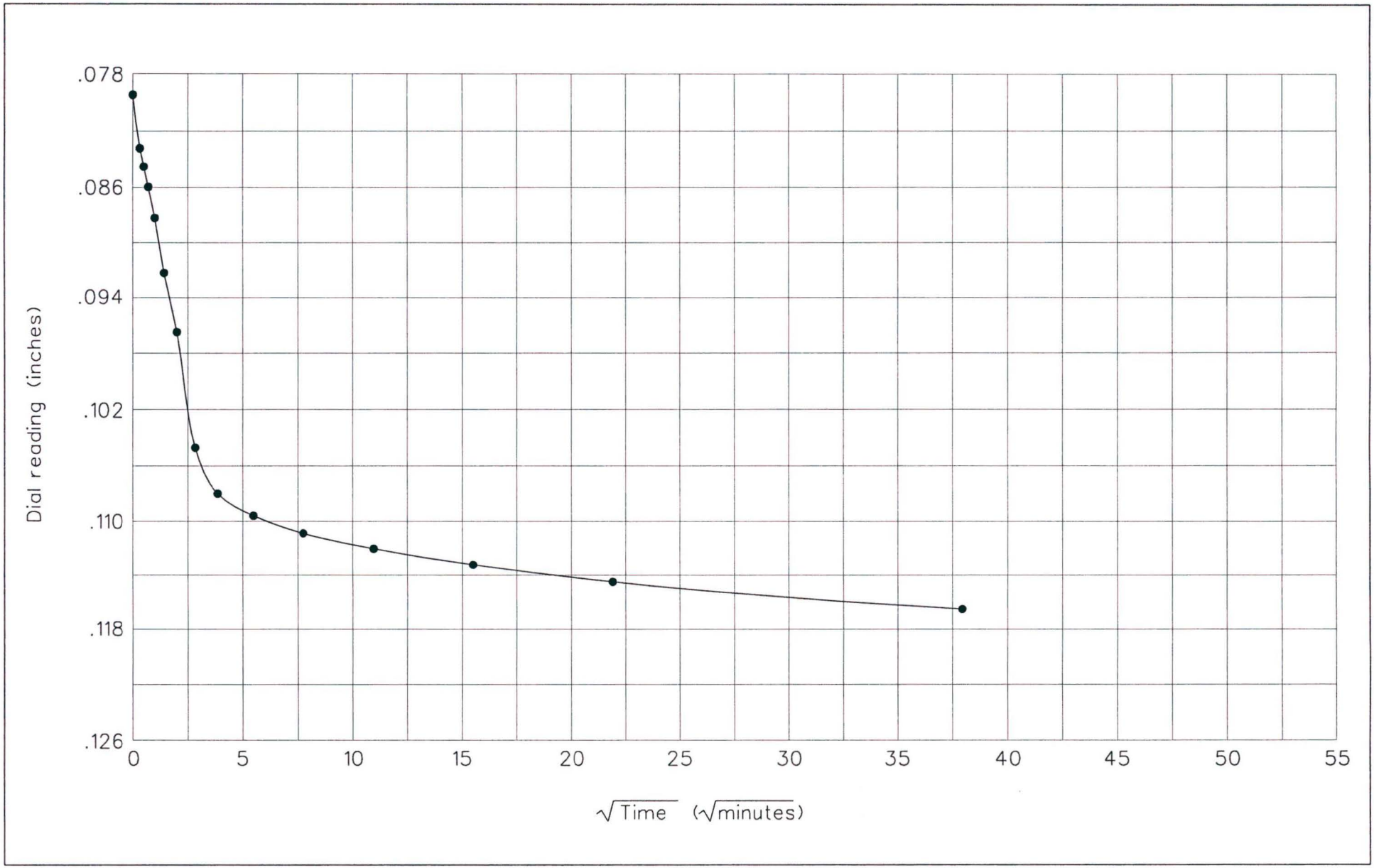
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 60'-61.3'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



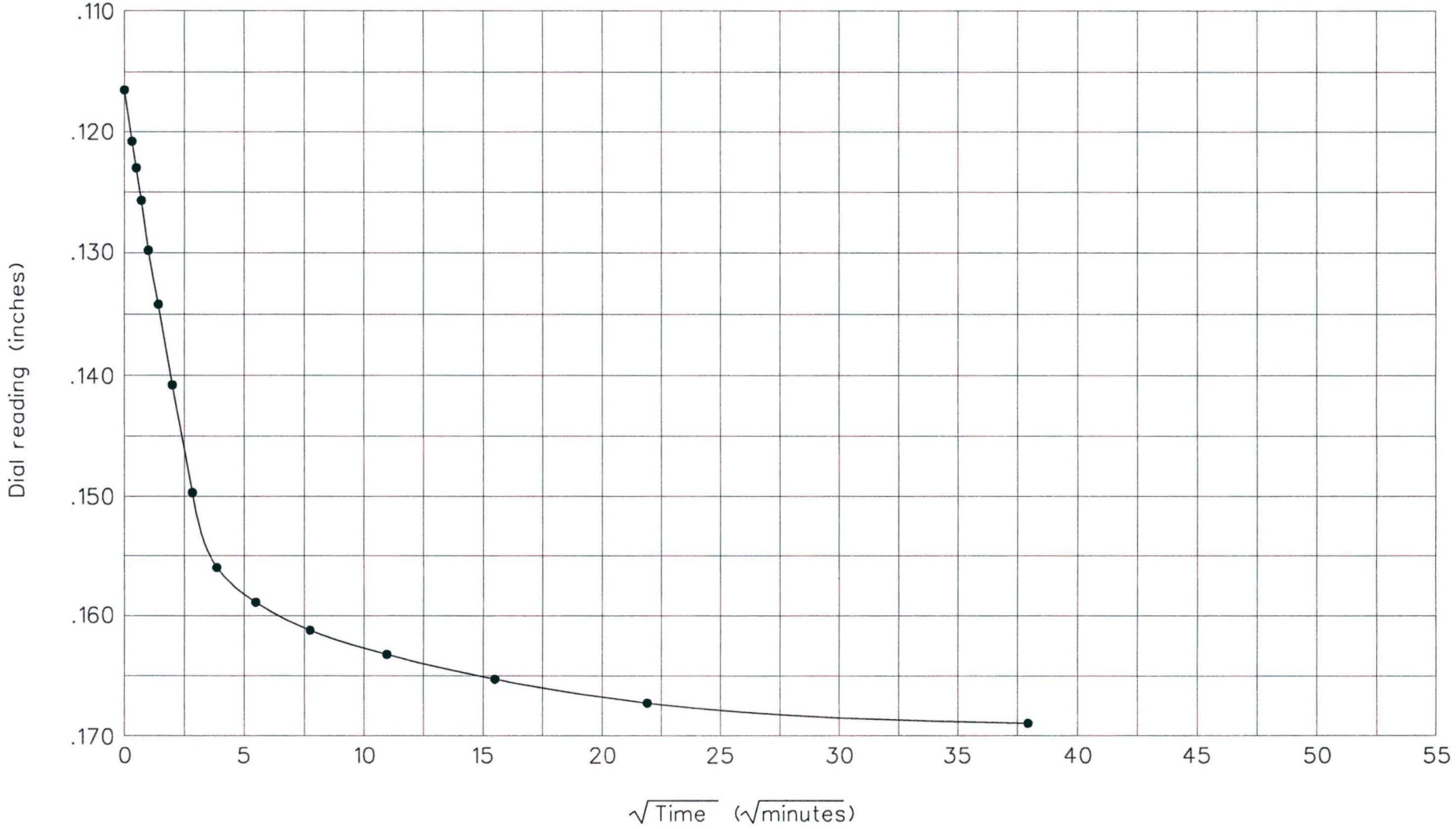
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 60'-61.3'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



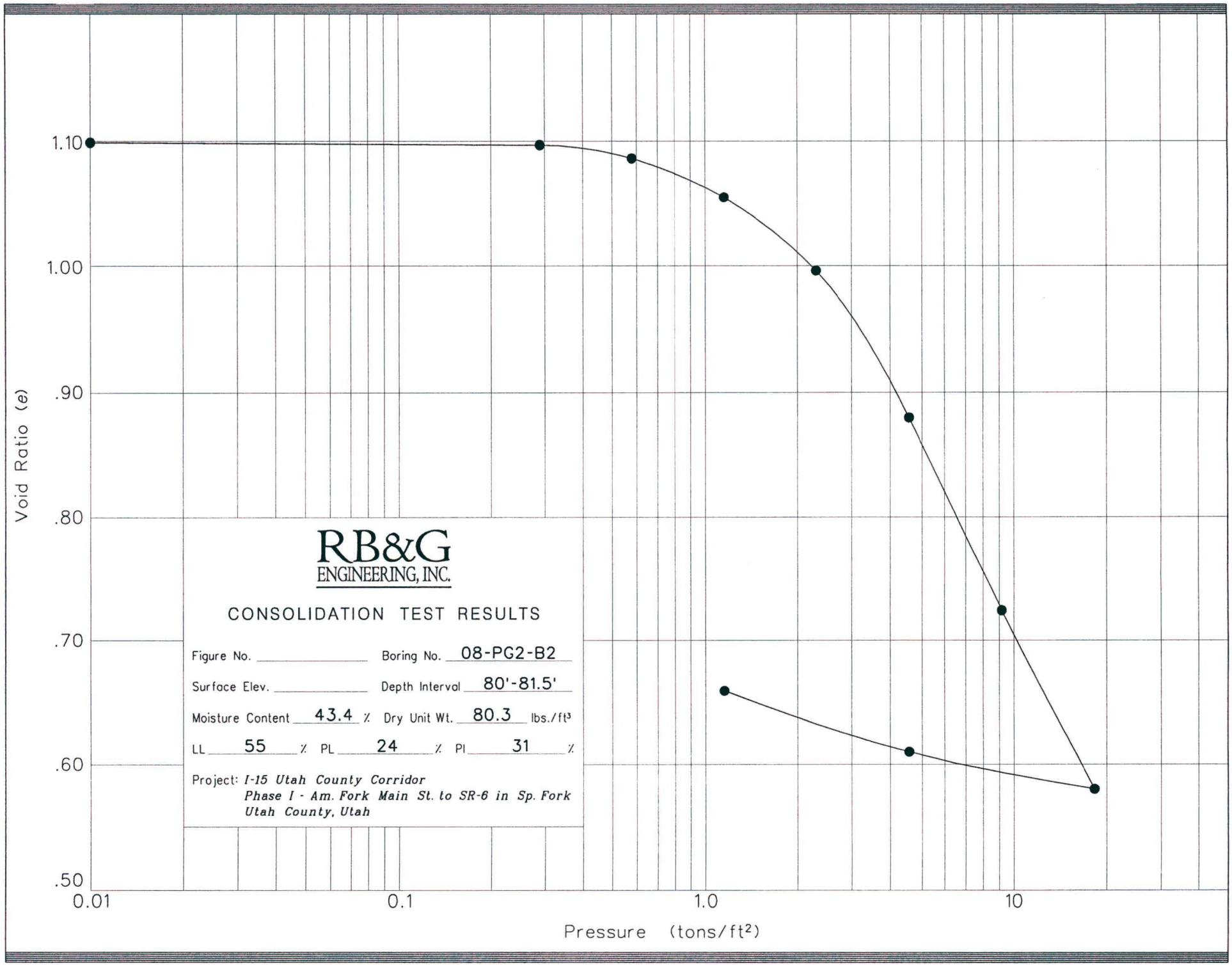
RB&G ENGINEERING, INC.

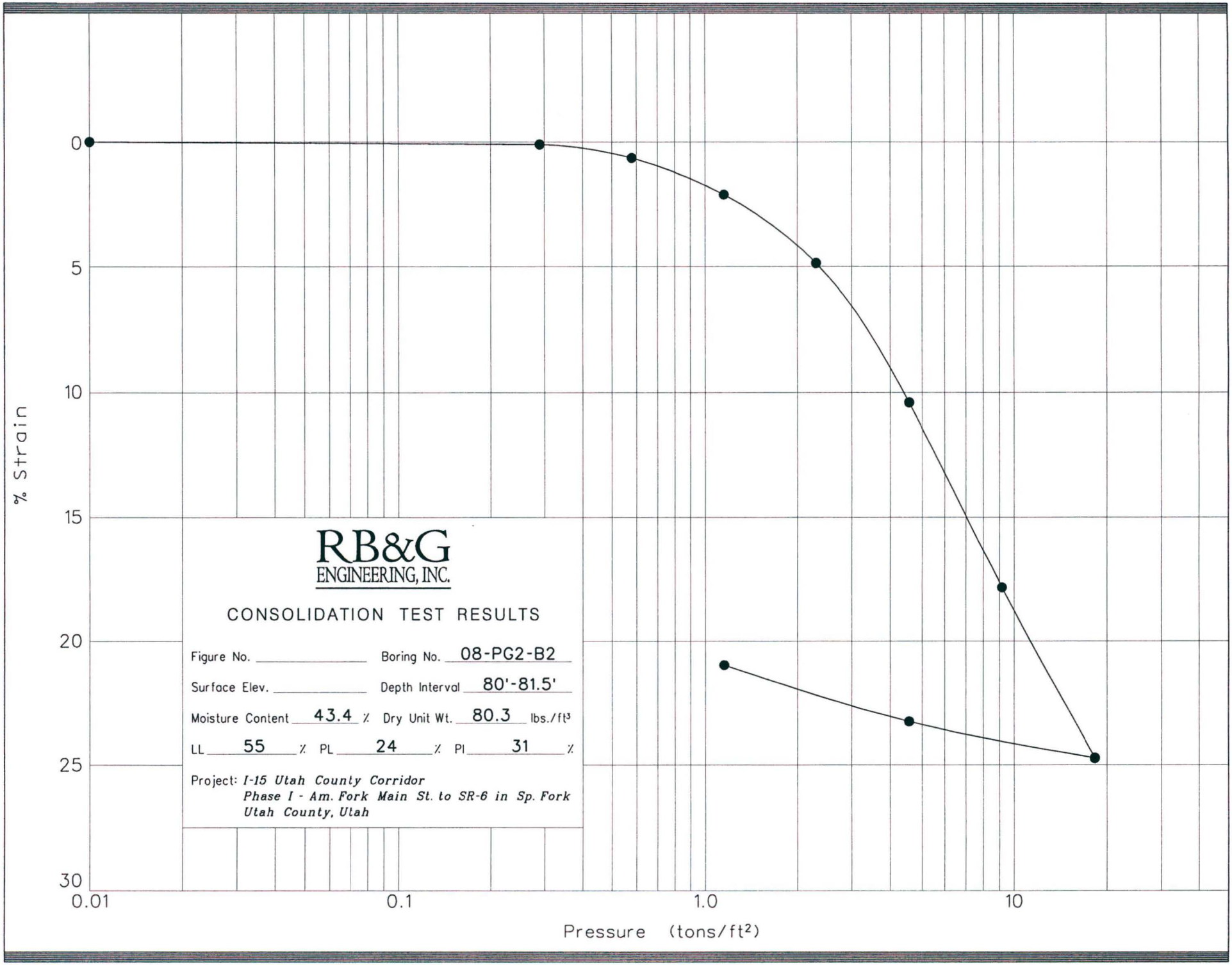
Hole no.: 08-PG2-B2
Depth: 60'-61.3'
Load: 2.30 to 4.60 tons

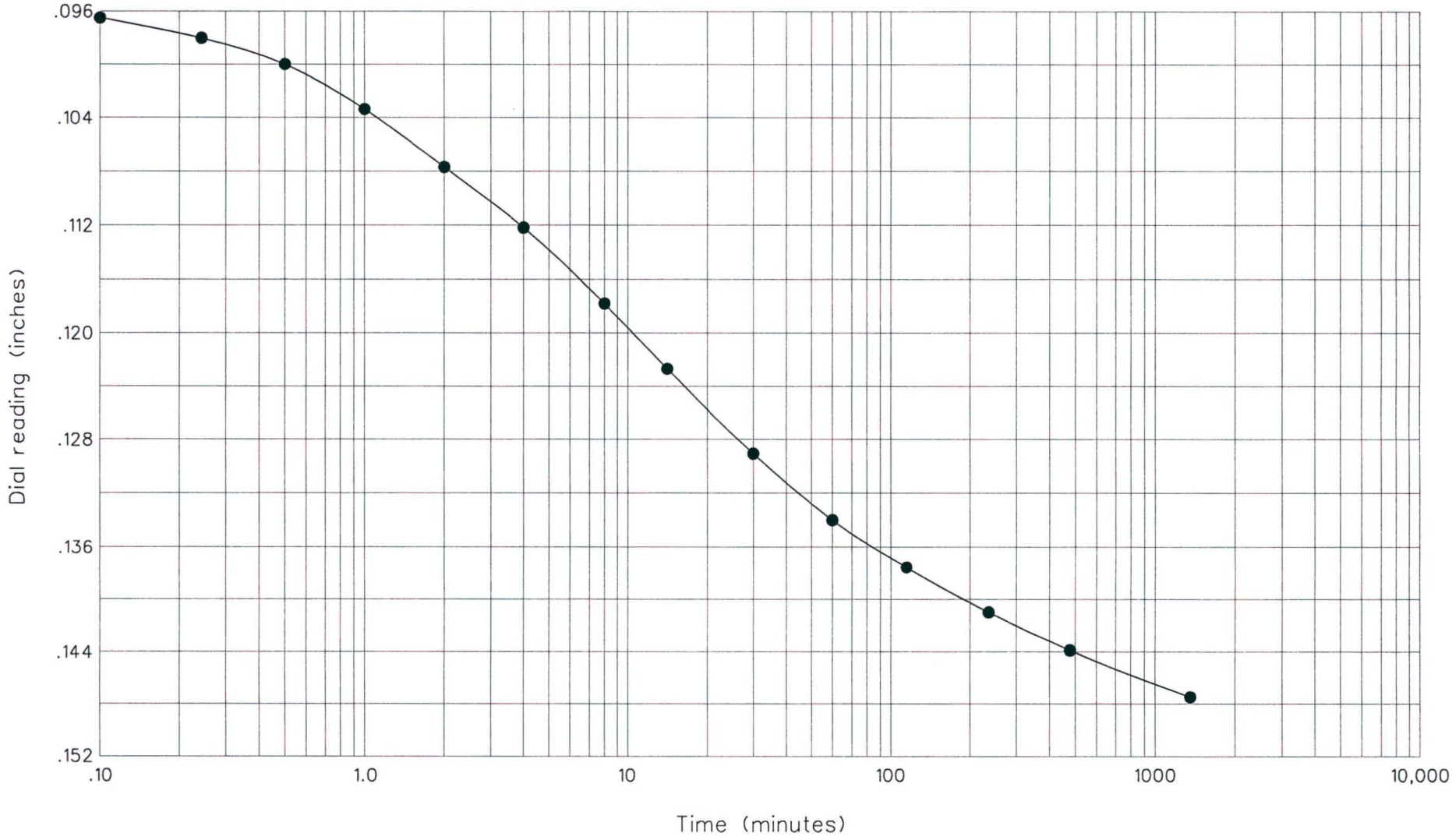
TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure


1.10
1.00
.90
.80
.70
.60
.50
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 80'-81.5'
Moisture Content 43.4 % Dry Unit Wt. 80.3 lbs./ft³
LL 55 % PL 24 % PI 31 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


0
5
10
15
20
25
30
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 80'-81.5'
Moisture Content 43.4 % Dry Unit Wt. 80.3 lbs./ft³
LL 55 % PL 24 % PI 31 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



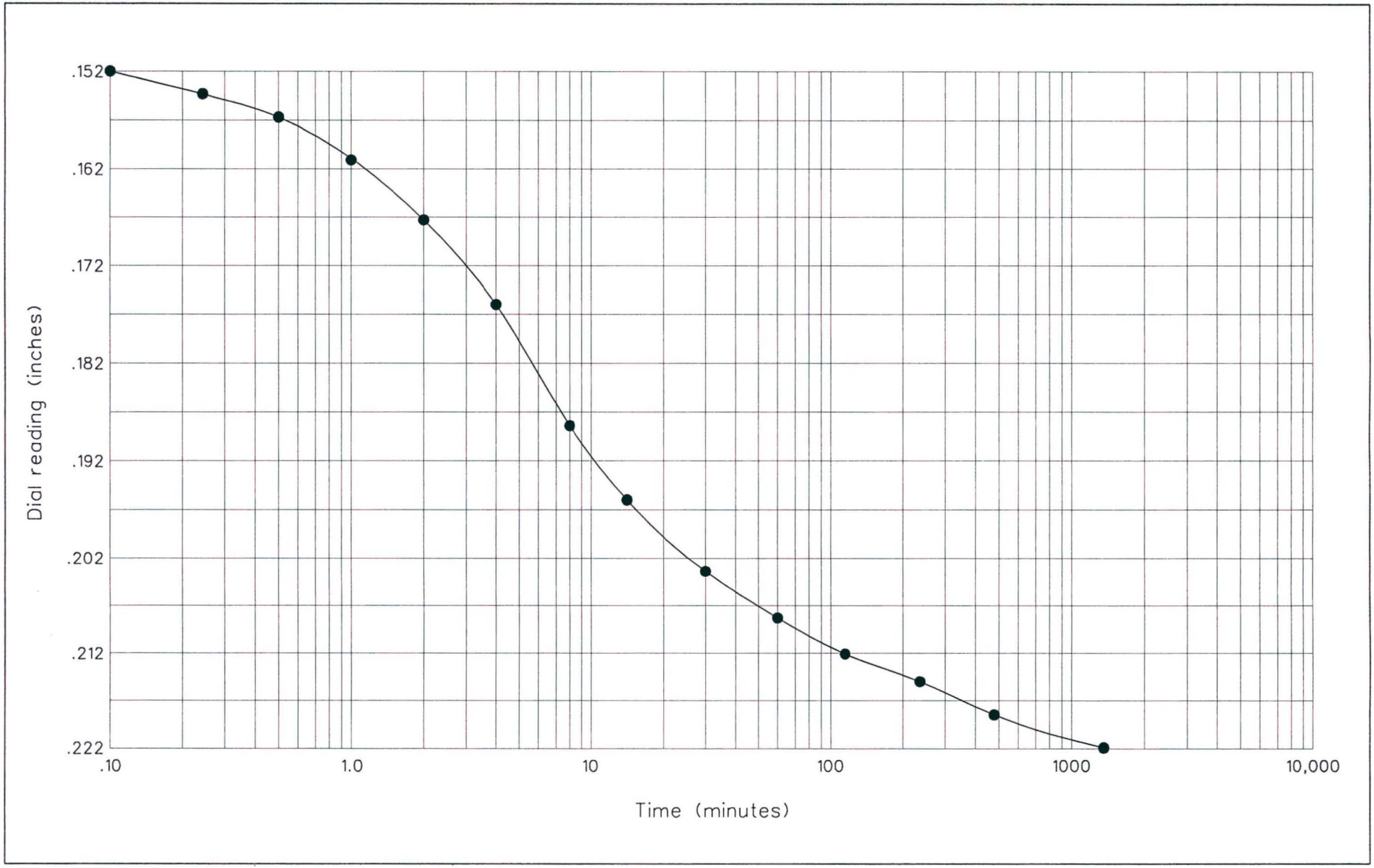
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 80'-81.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



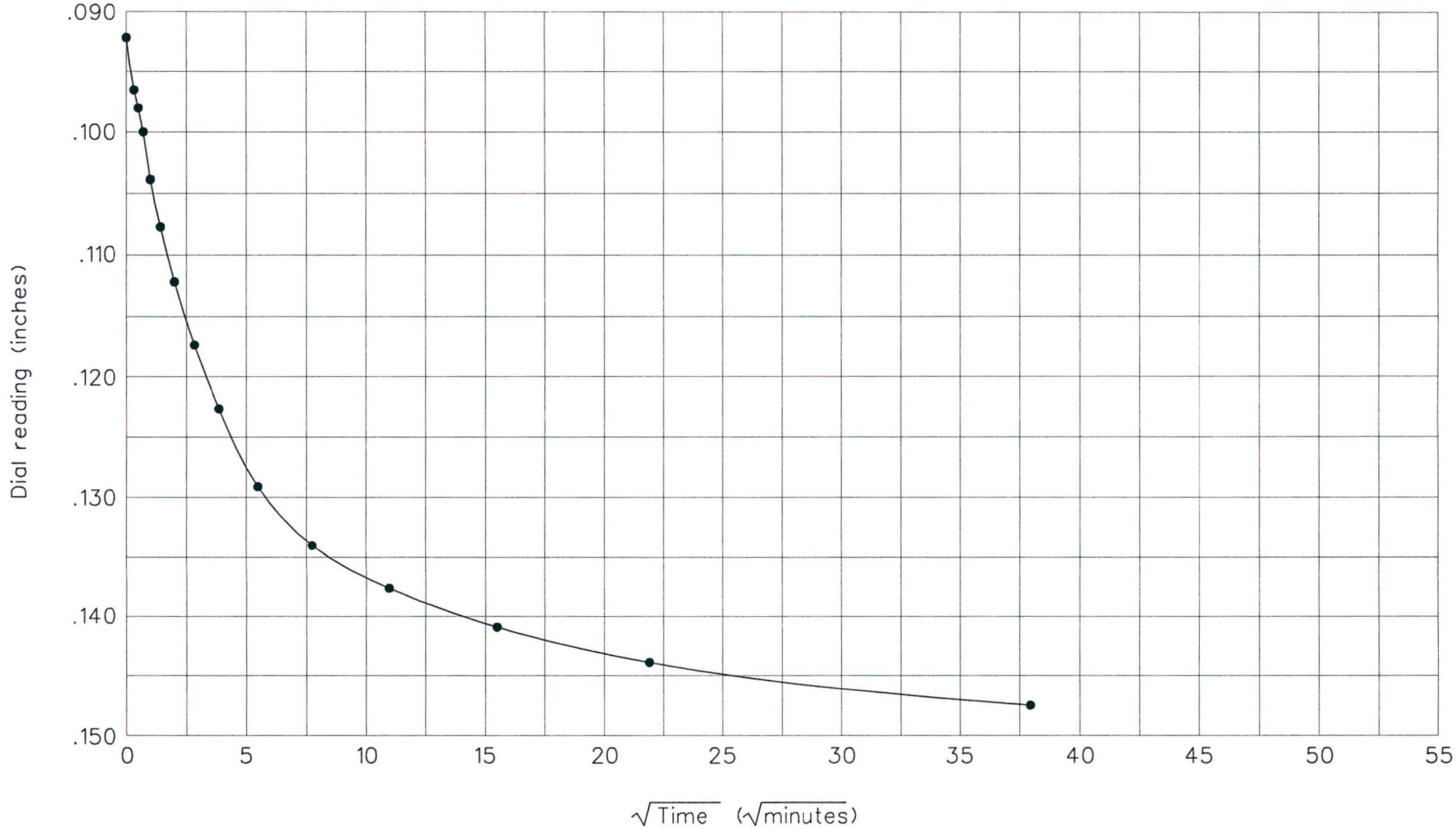
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 80'-81.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



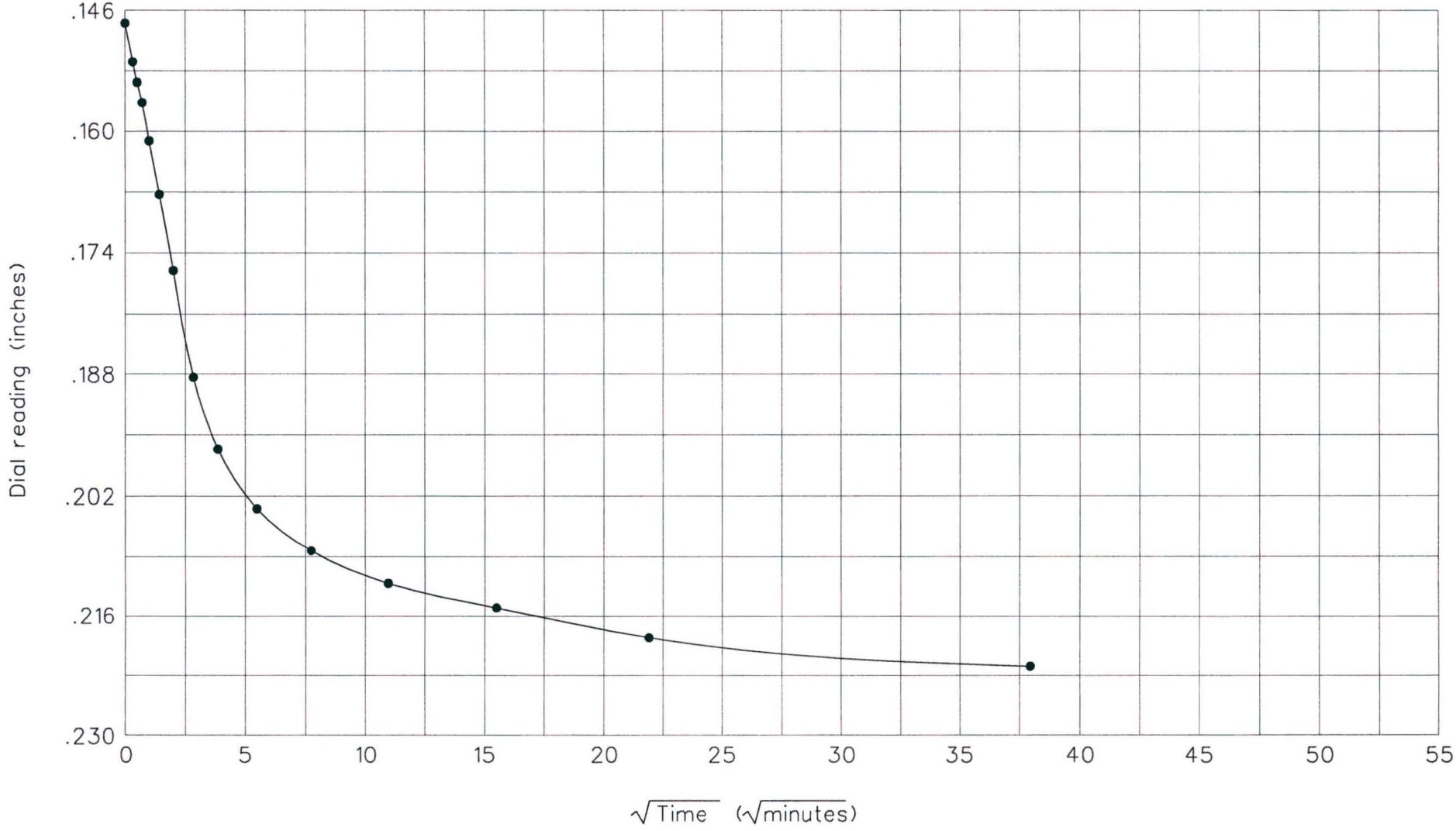
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 80'-81.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



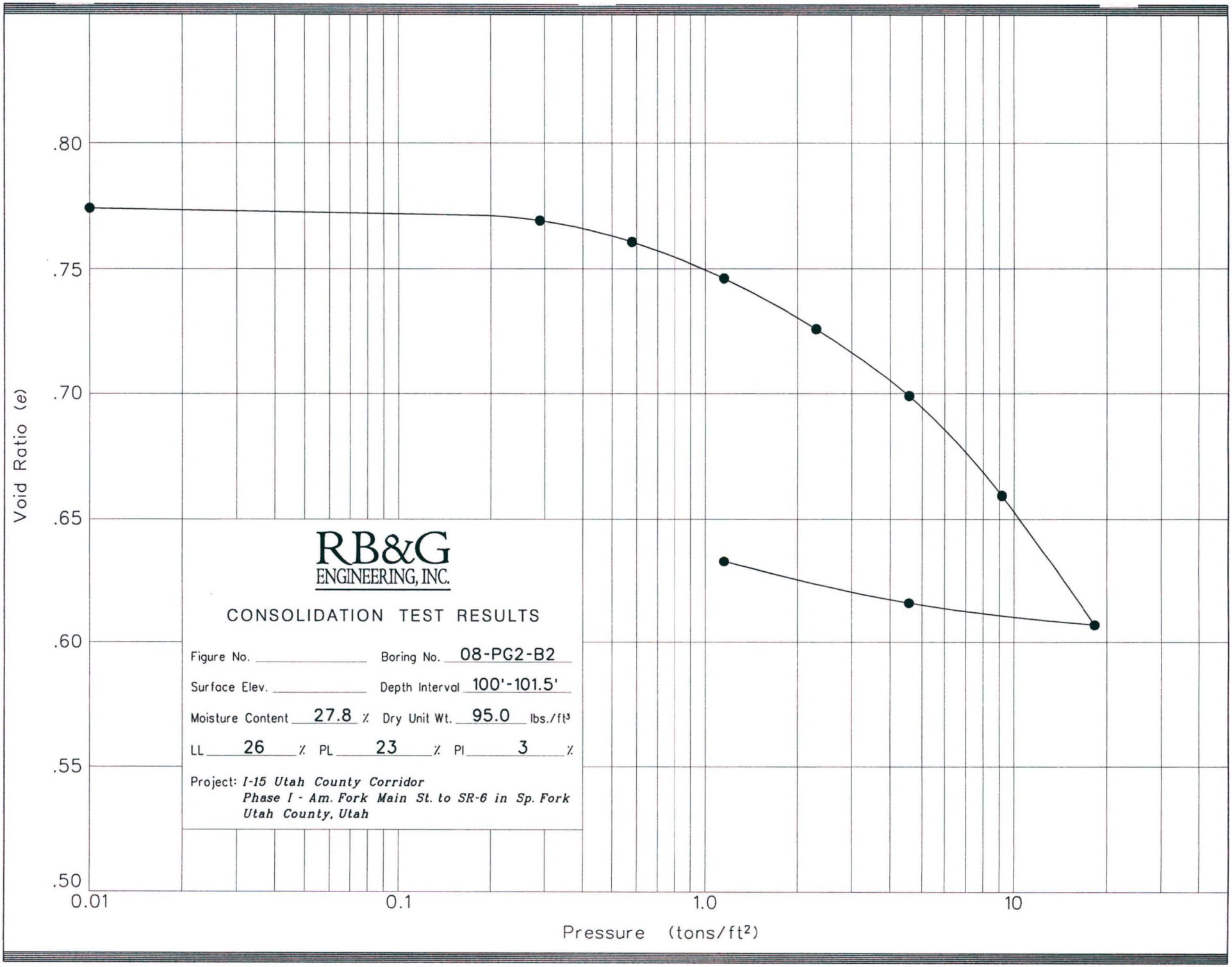
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 80'-81.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

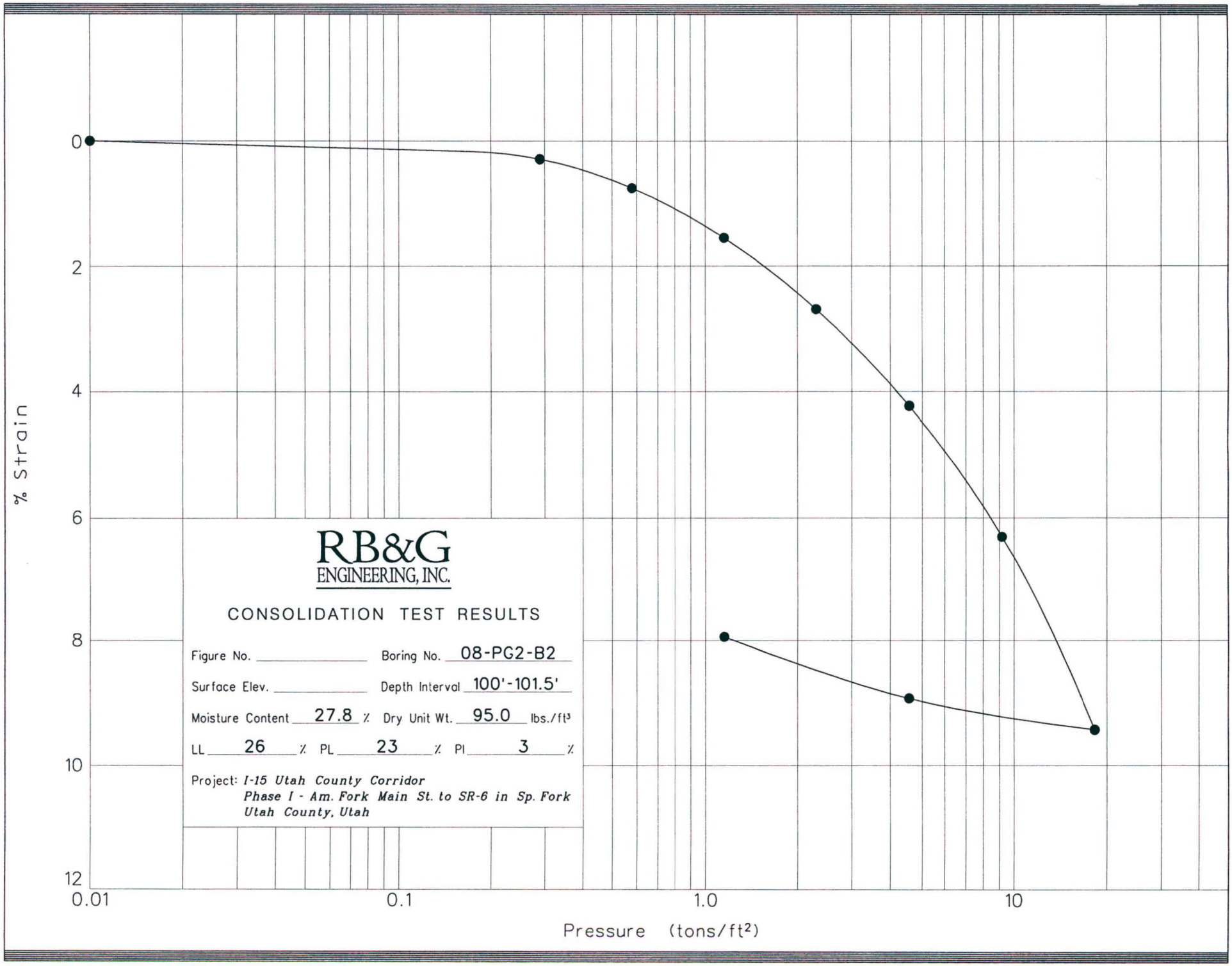
Figure No. _____ Boring No. 08-PG2-B2

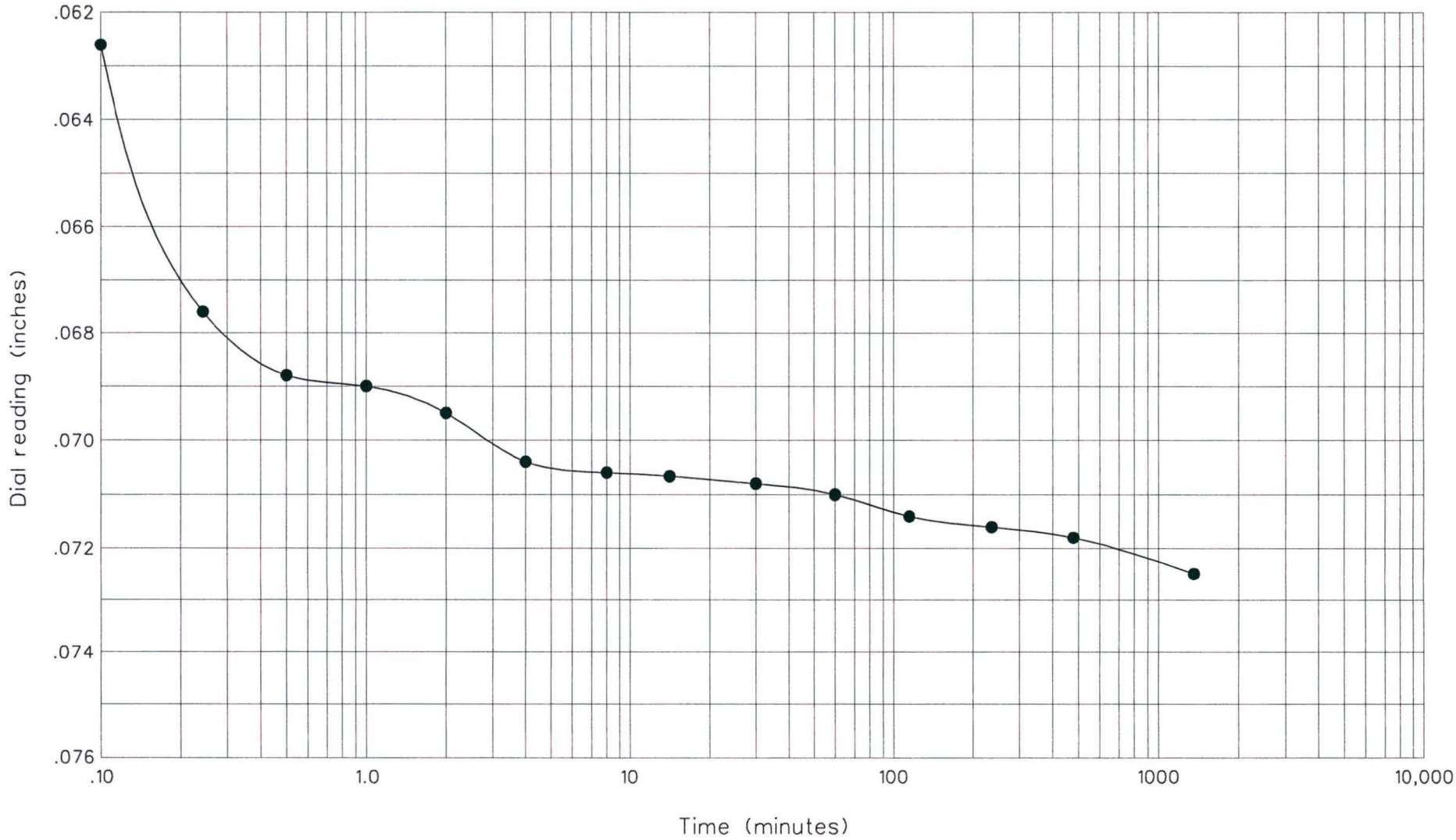
Surface Elev. _____ Depth Interval 100'-101.5'

Moisture Content 27.8 % Dry Unit Wt. 95.0 lbs./ft³

LL 26 % PL 23 % PI 3 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


0
2
4
6
8
10
12
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 100'-101.5'
Moisture Content 27.8 % Dry Unit Wt. 95.0 lbs./ft³
LL 26 % PL 23 % PI 3 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



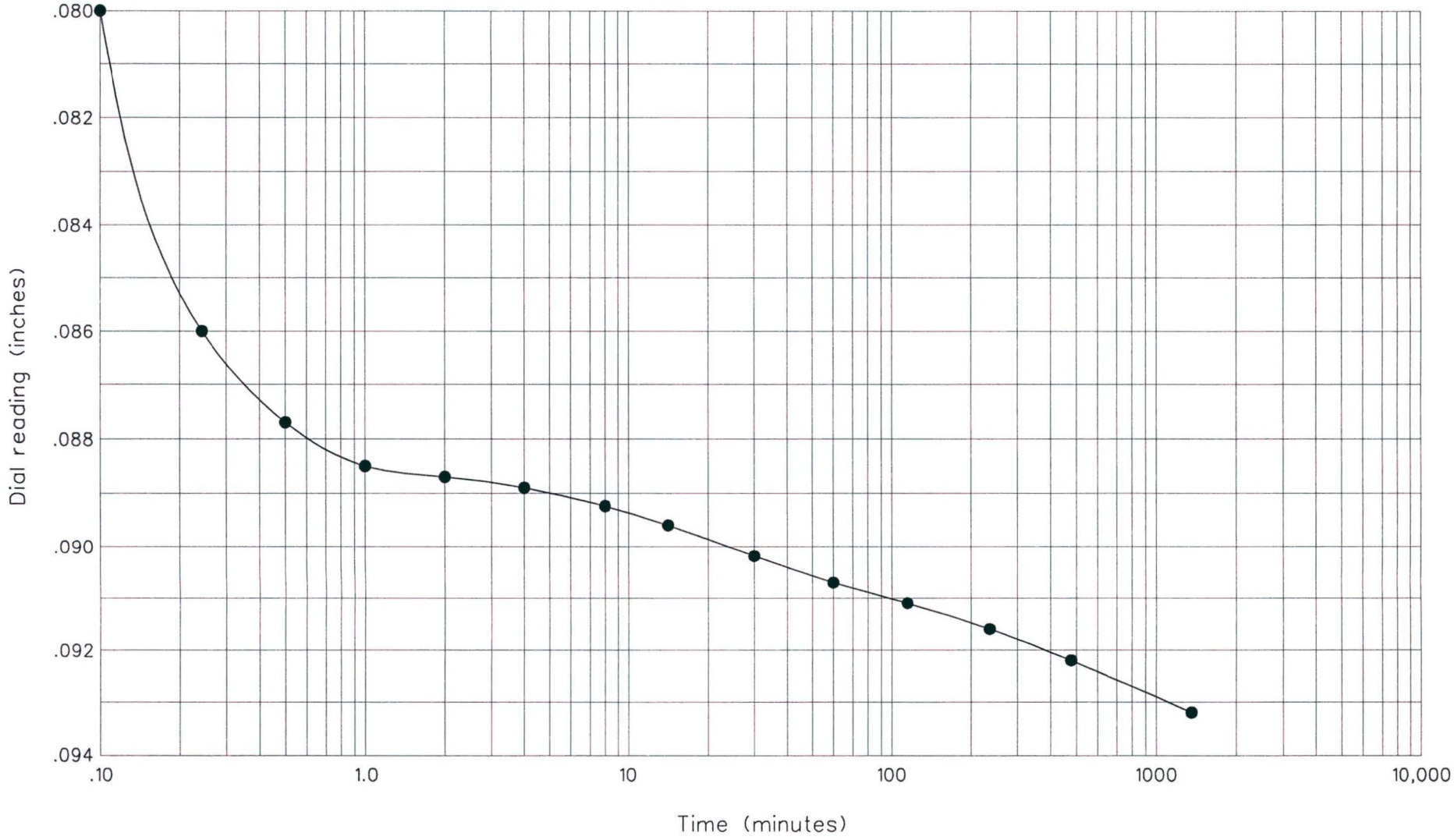
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 100'-101.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



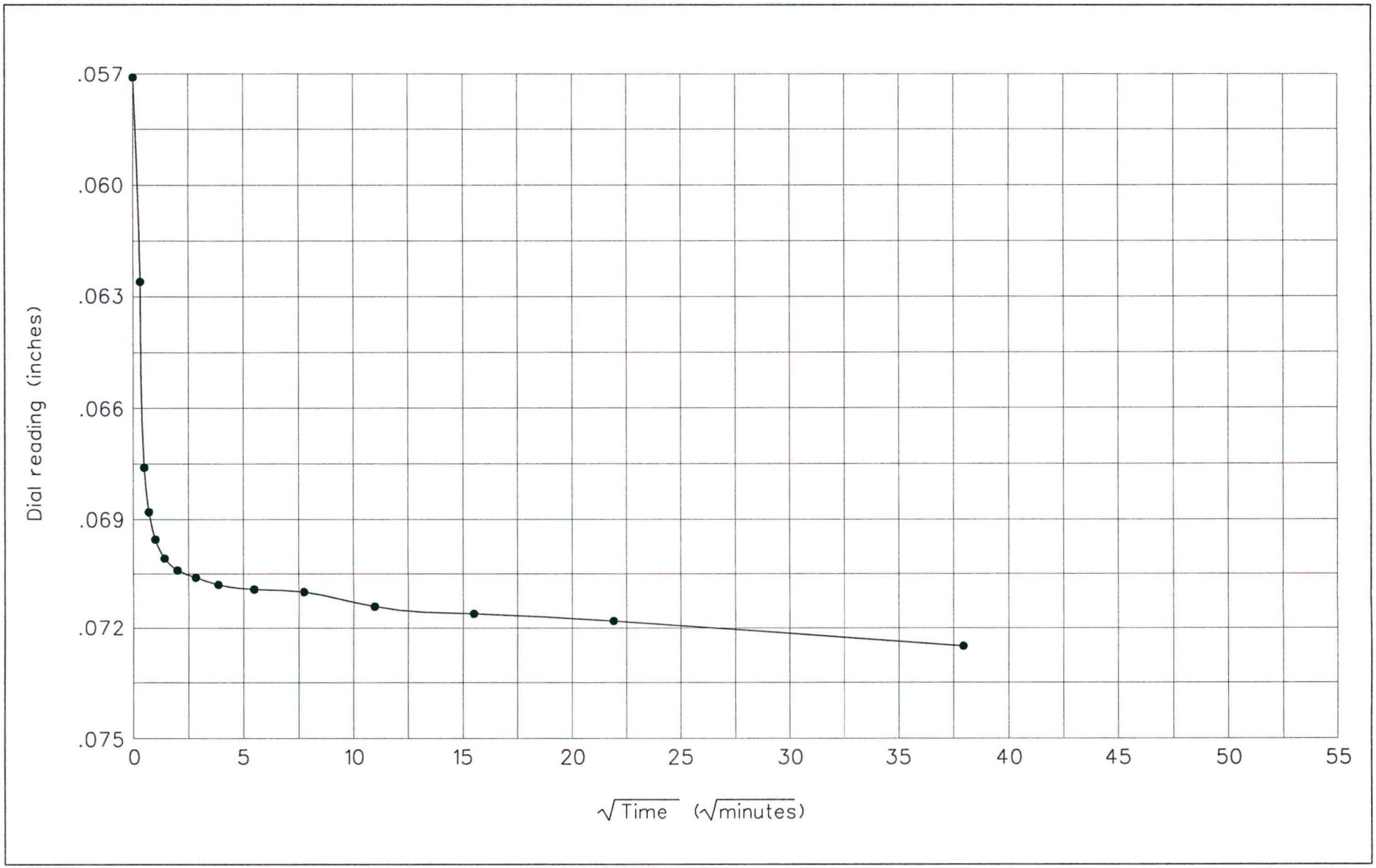
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 100'-101.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



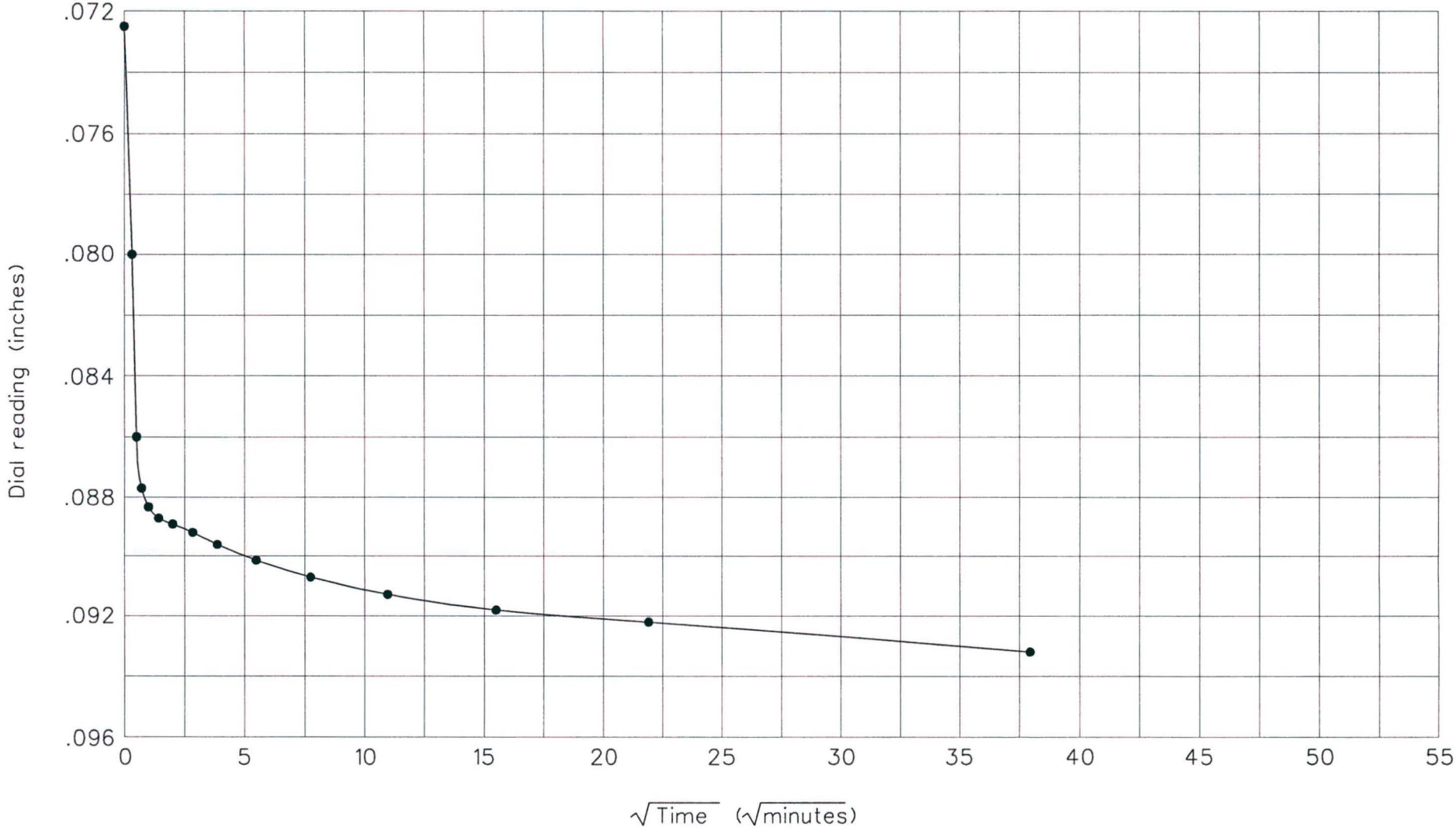
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 100'-101.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



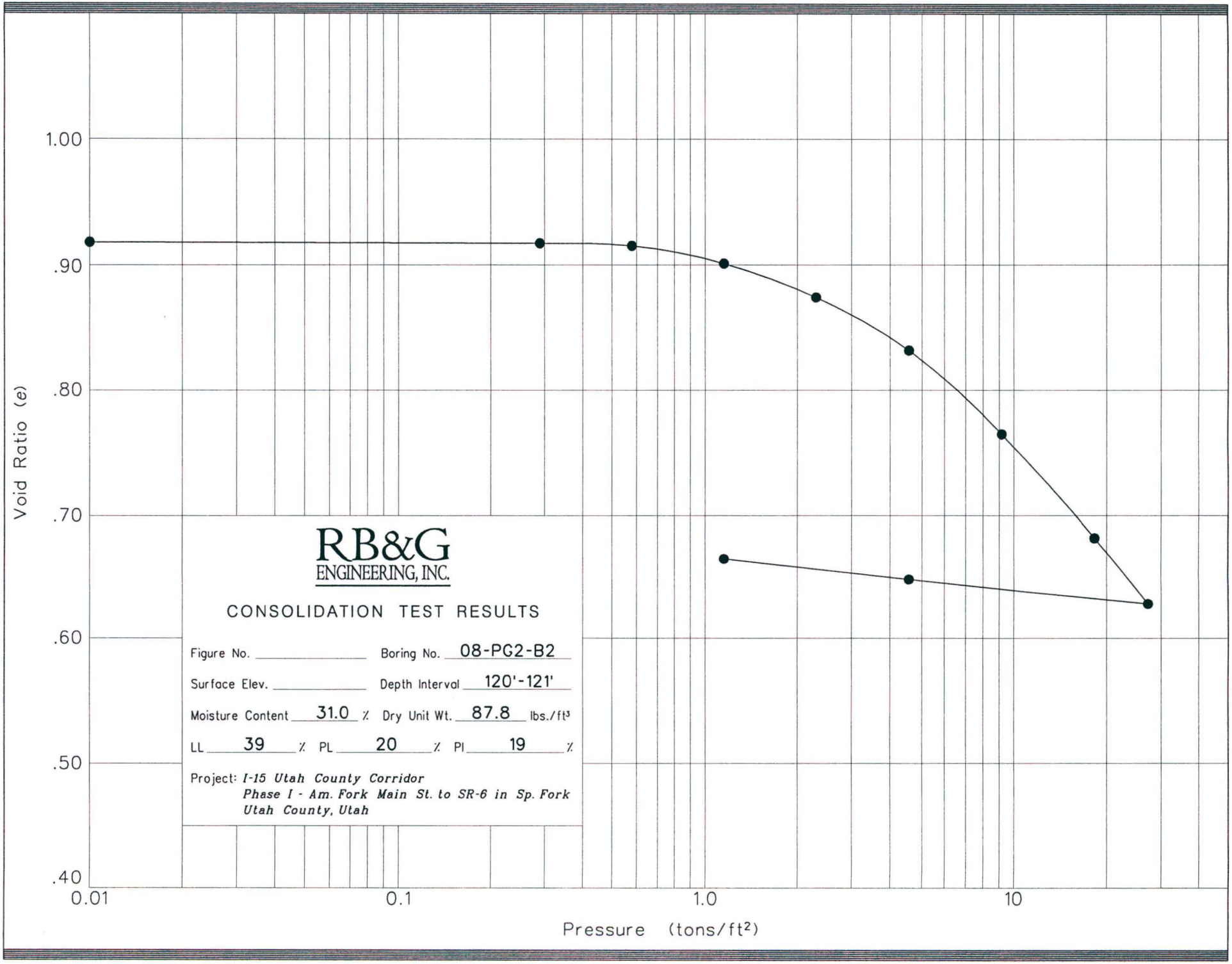
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 100'-101.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

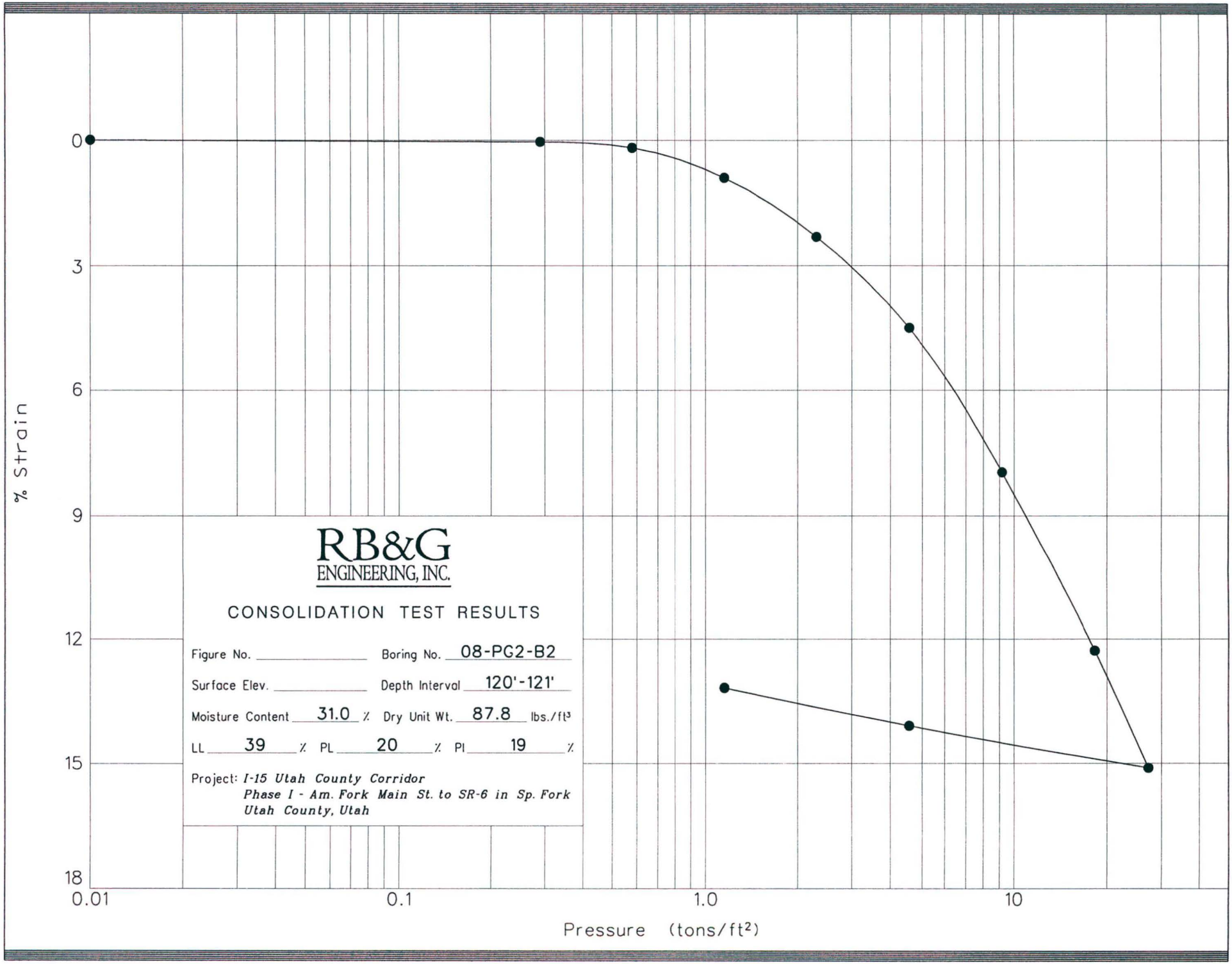
Figure No. _____ Boring No. 08-PG2-B2

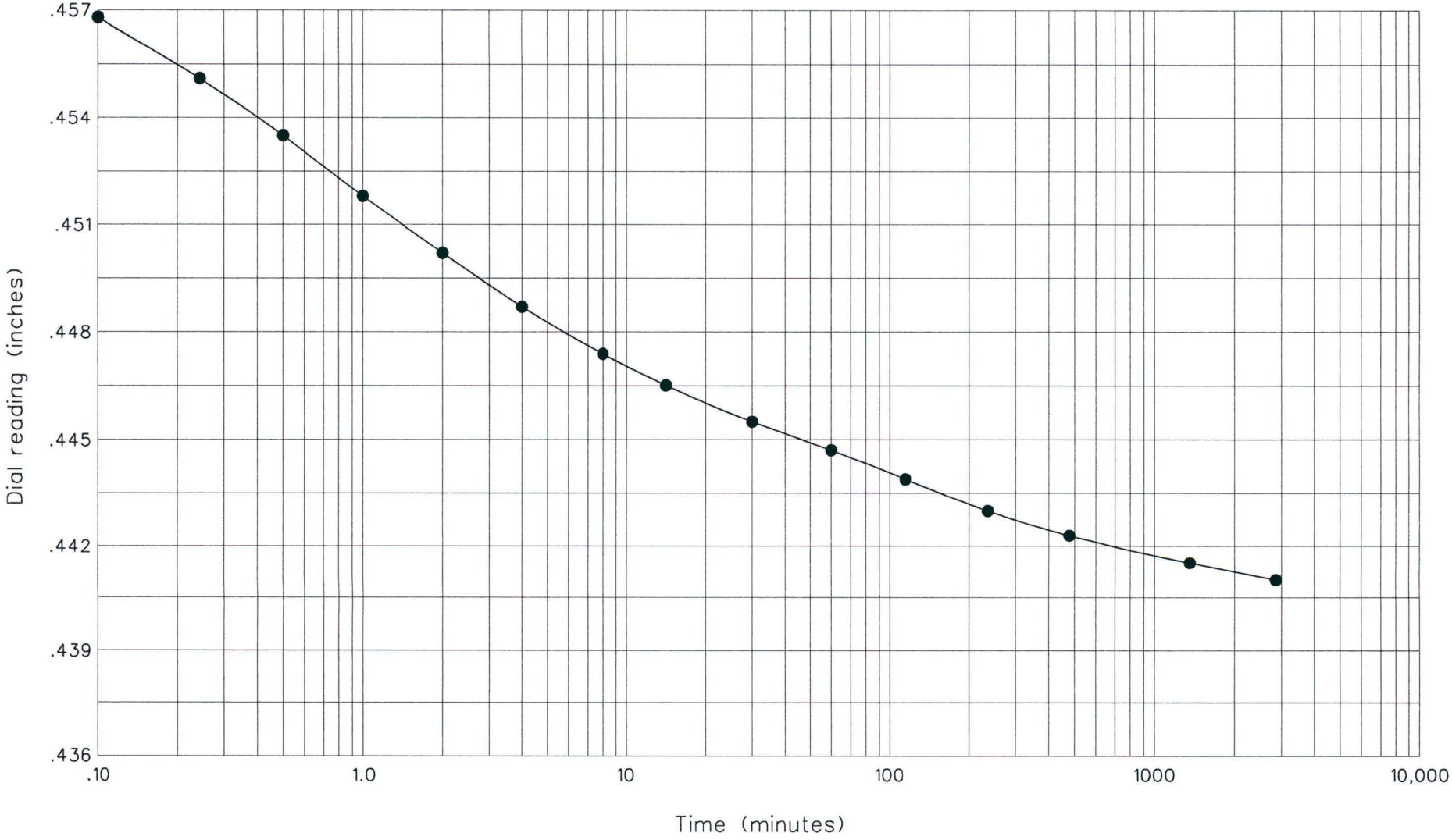
Surface Elev. _____ Depth Interval 120'-121'

Moisture Content 31.0 % Dry Unit Wt. 87.8 lbs./ft³

LL 39 % PL 20 % PI 19 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 120'-121'
Moisture Content 31.0 % Dry Unit Wt. 87.8 lbs./ft³
LL 39 % PL 20 % PI 19 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



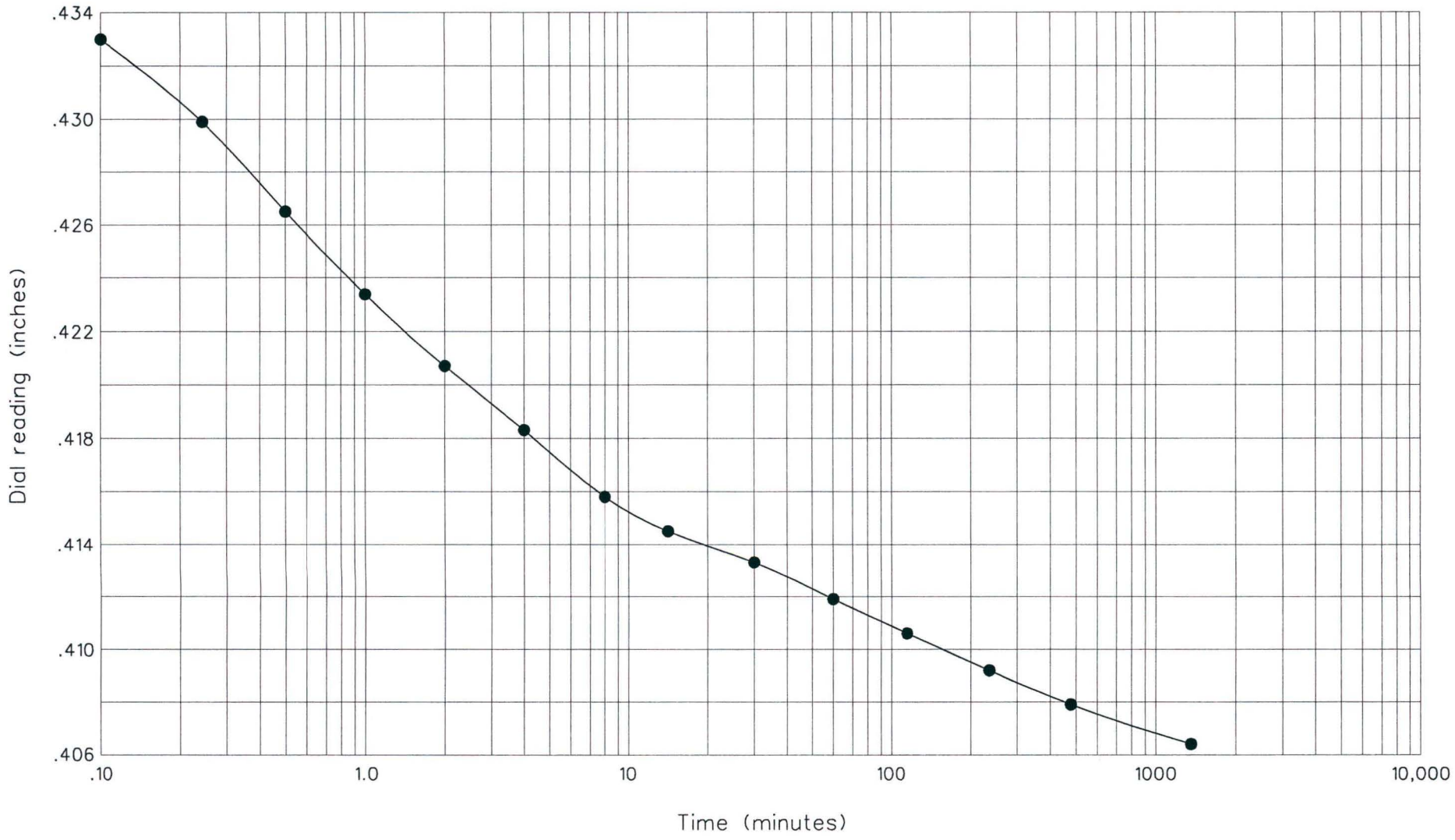
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 120'-121'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



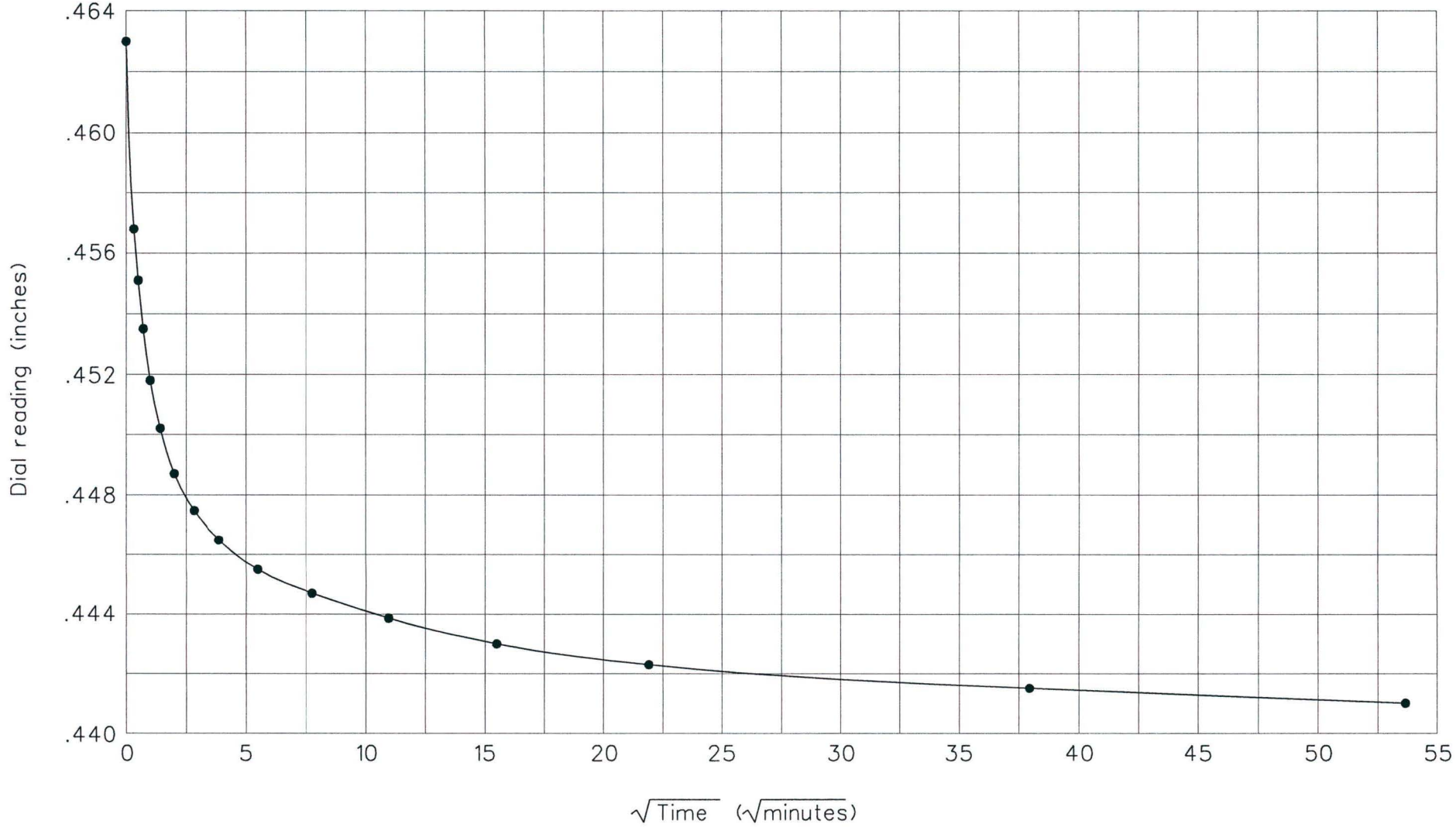
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 120'-121'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



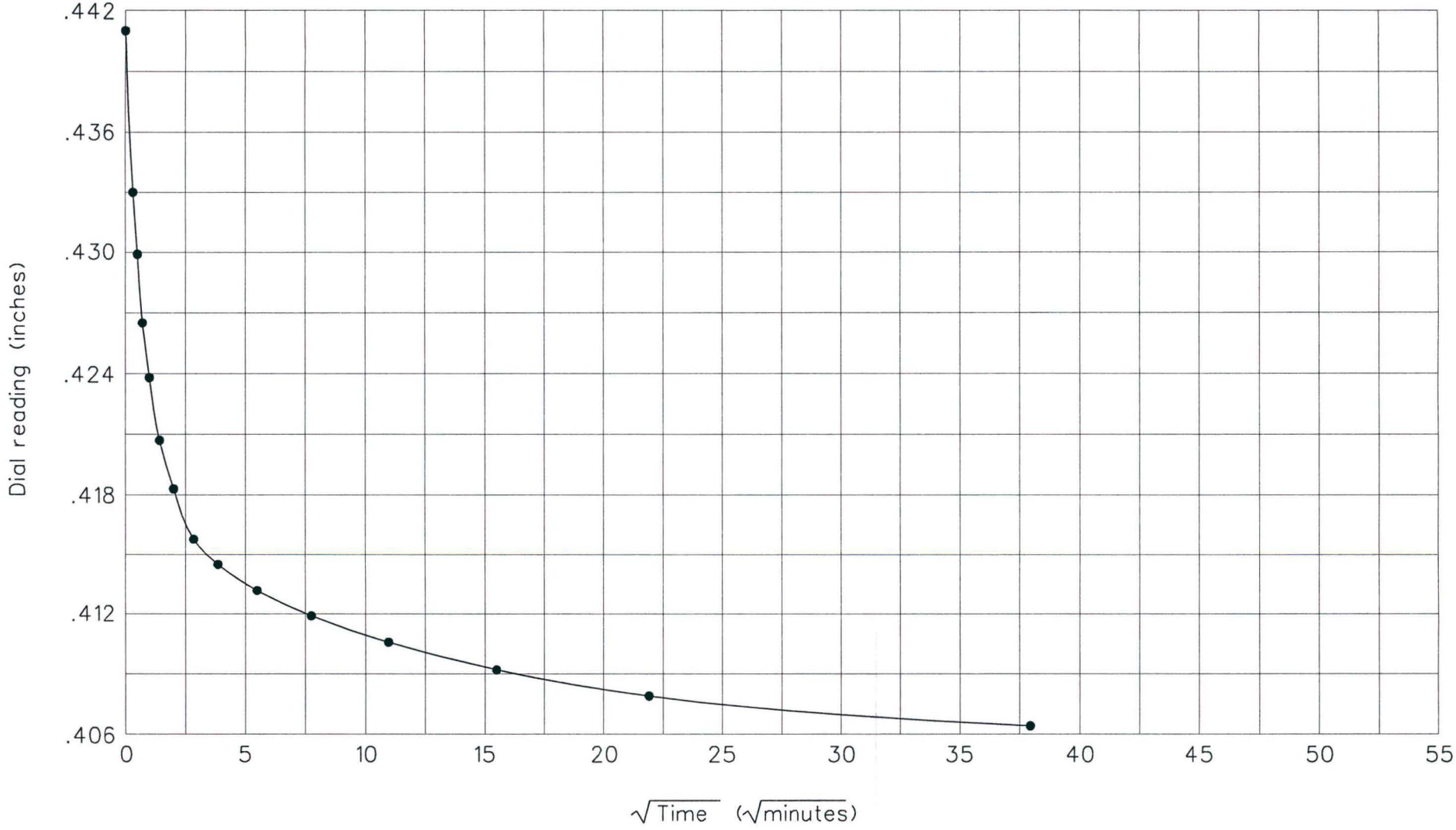
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 120'-121'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



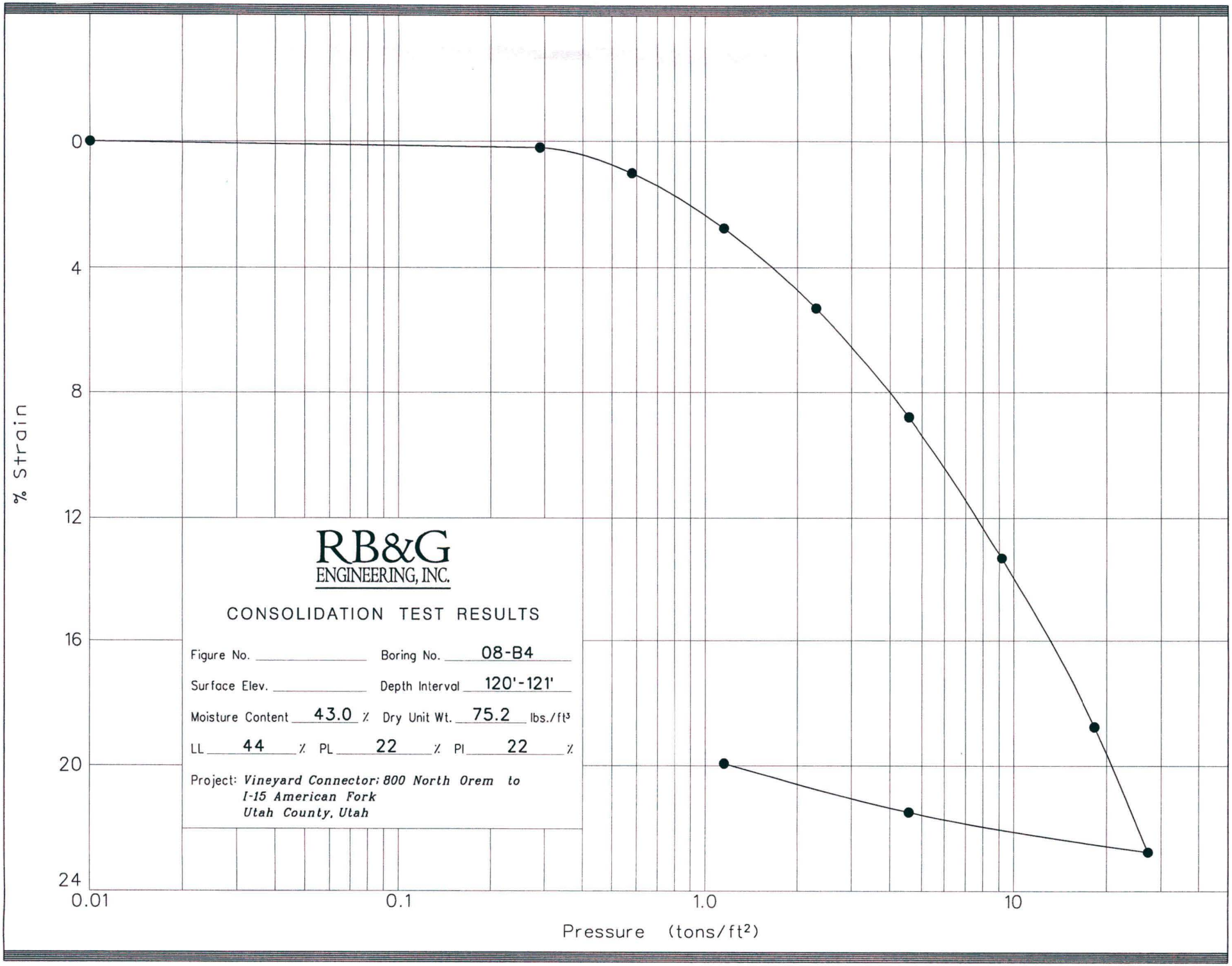
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 120'-121'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

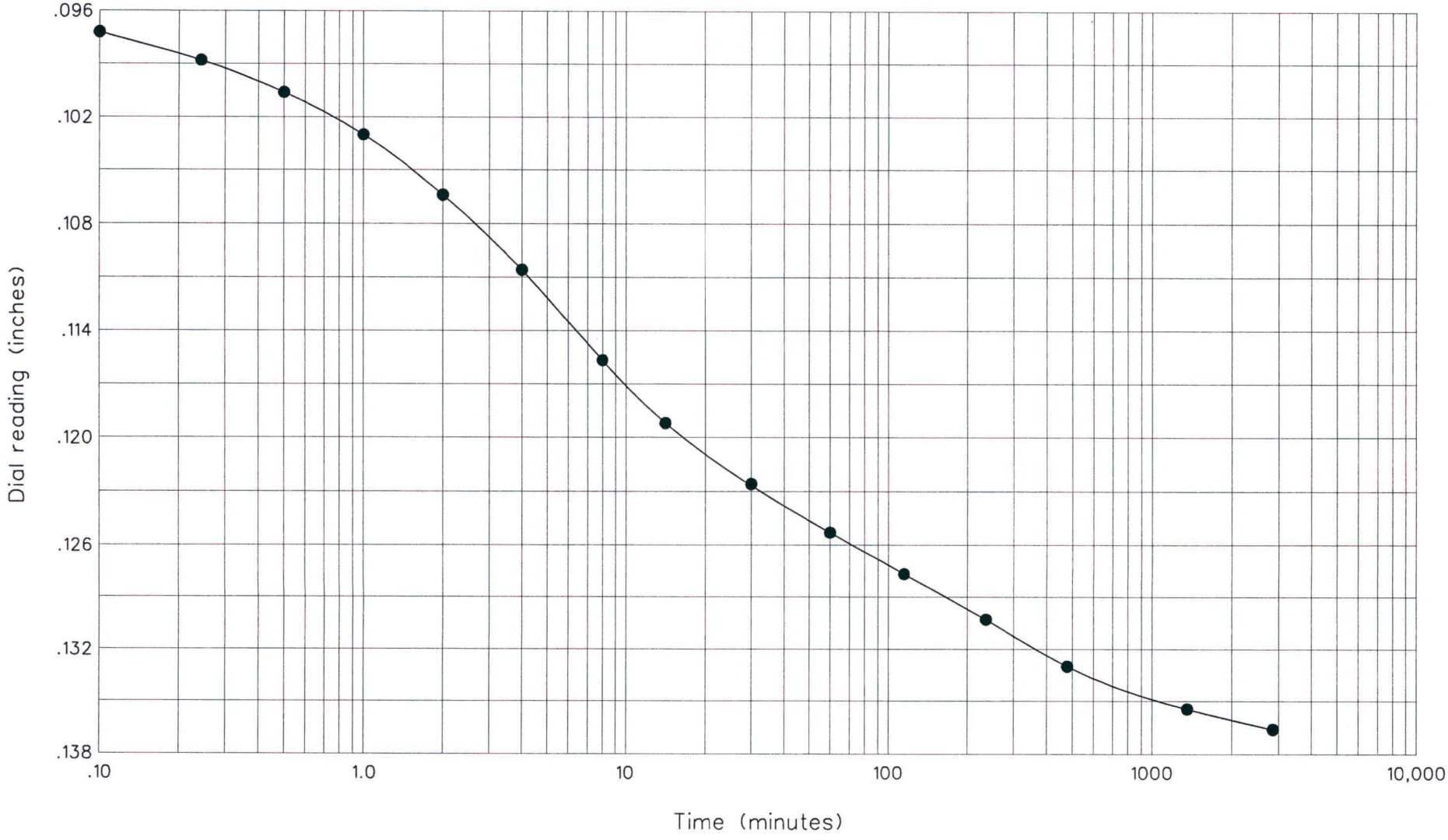
Figure No. _____ Boring No. 08-B4

Surface Elev. _____ Depth Interval 120'-121'

Moisture Content 43.0 % Dry Unit Wt. 75.2 lbs./ft³

LL 44 % PL 22 % PI 22 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*



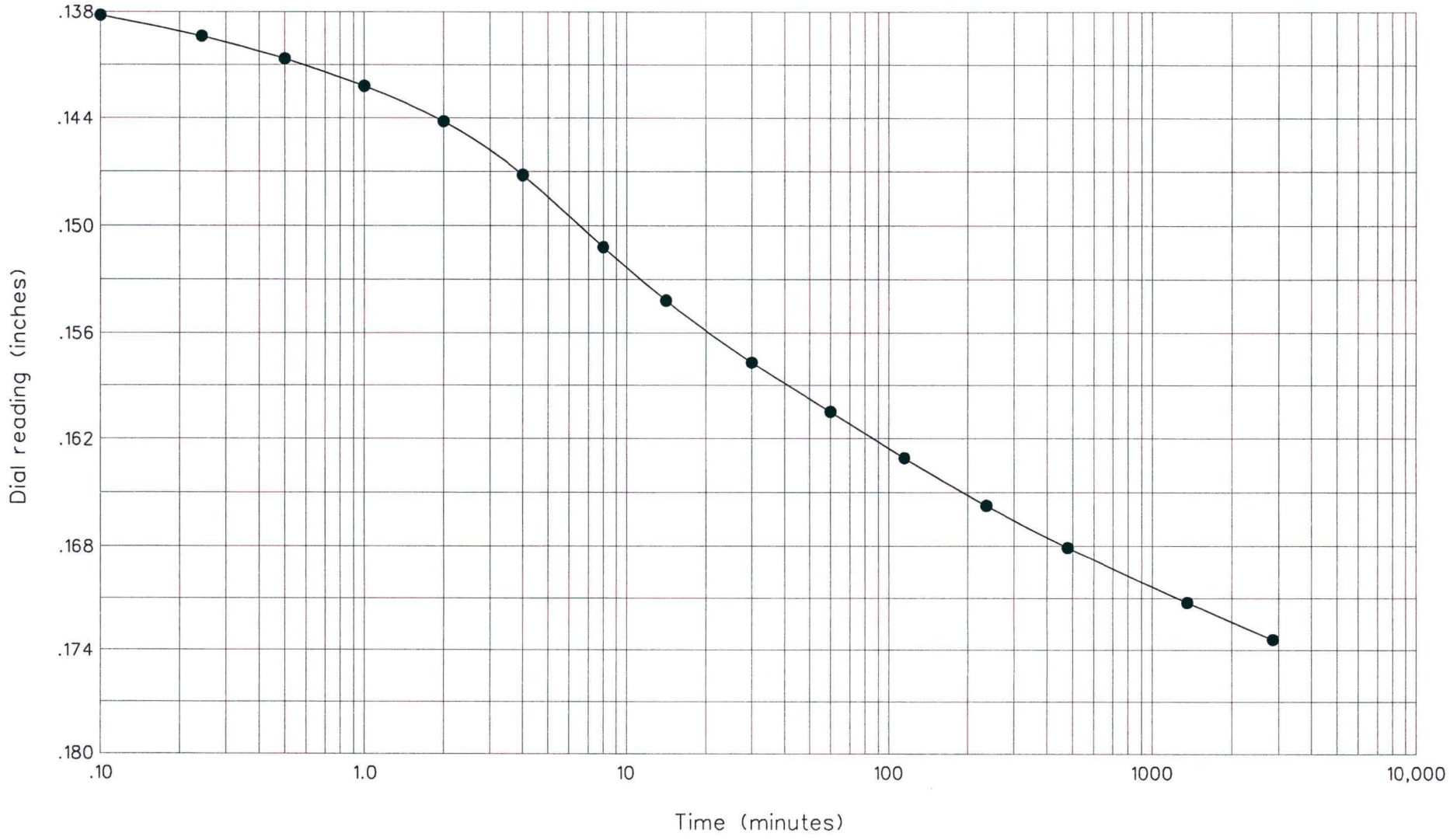
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 120'-121'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



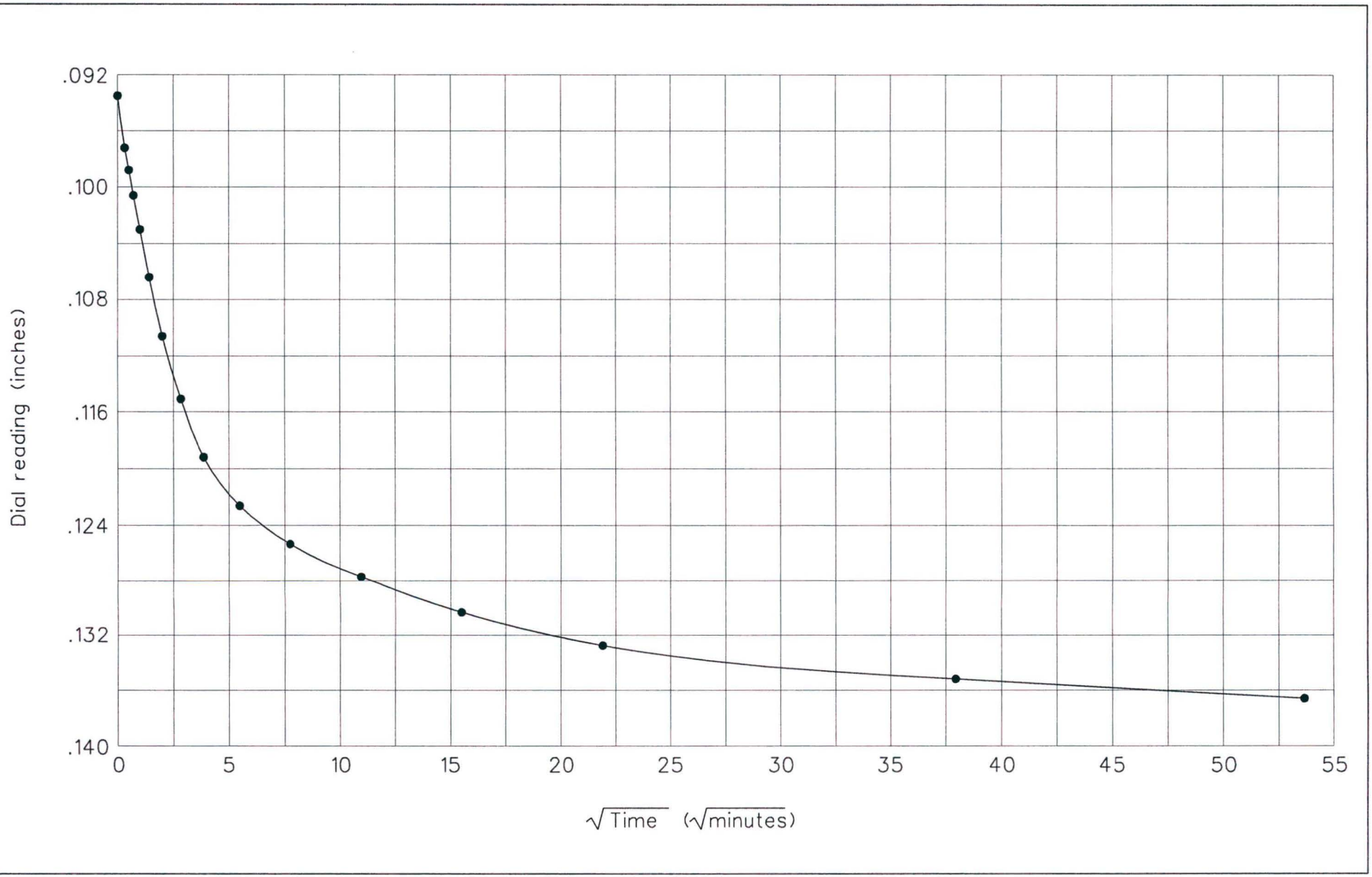
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 120'-121'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



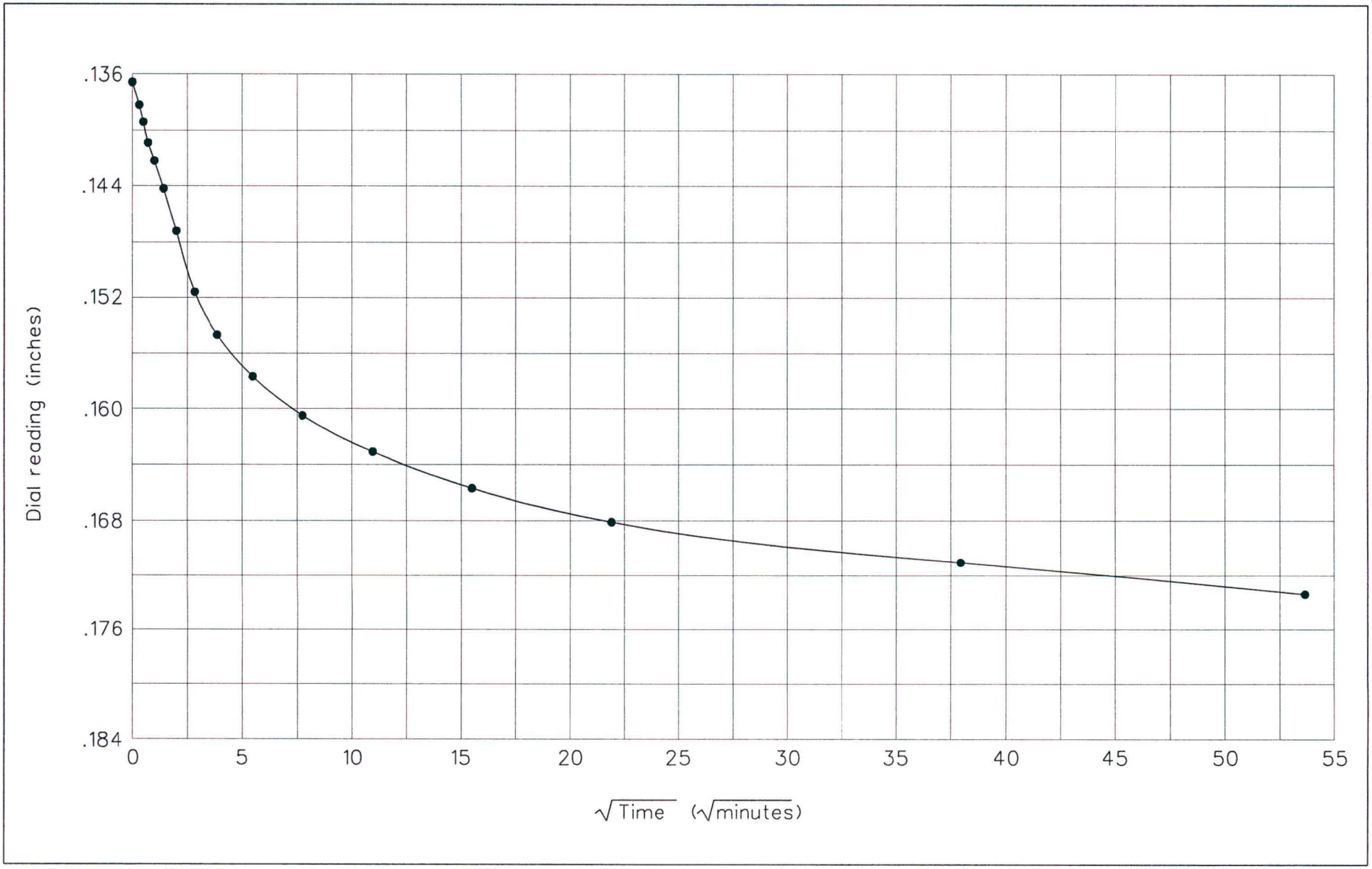
RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 120'-121'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G ENGINEERING, INC.

Hole no.: 08-B4
Depth: 120'-121'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure

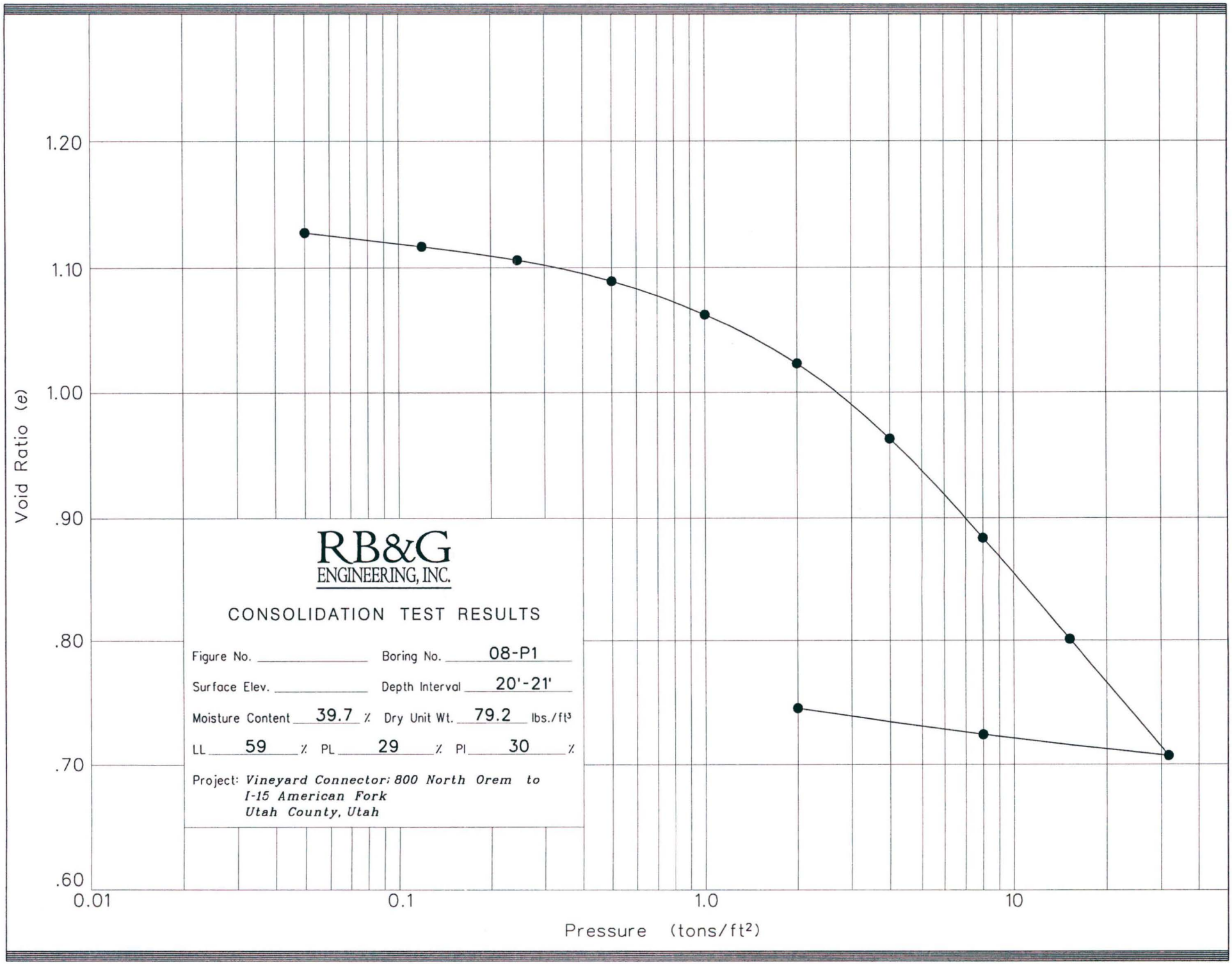
Table 1

SUMMARY OF TEST DATA

PROJECT Vineyard Connector; 800 North Orem to I-15 American Fork
PROJECT NO. 200701-048
LOCATION Utah County, Utah
FEATURE Foundations

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	STANDARD PENETRATION BLOWS PER FOOT	IN-PLACE		UNCONFINED COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO Classification)
			DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
08-P1	6-7.5	19		9.5				NP	59	34	7	GP-GM (A-1-a)
	15-16.5	11		12.8				NP	52	37	11	GP-GM (A-1-a)
	20-21.5	Shelby	79.2	39.7	2013	59	29	30	0	6	94	CH (A-7-6(33))
	30-31.5	7		27.1		27	23	4	0	20	80	ML (A-4(2))
	40-41.5	Shelby	100.5	23.9	4026	41	19	22	0	0	100	CL (A-7-6(24))
	50-51.5	Shelby	100.3	26.4	4092	38	20	18	0	0	100	CL (A-6(19))
	60-61.5	Shelby	85.5	33.9		39	22	17	0	1	99	CL (A-6(18))
	70-71.5	Shelby	89.2	35.2	2663	46	22	24	0	1	99	CL (A-7-6(27))

NP=Nonplastic



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

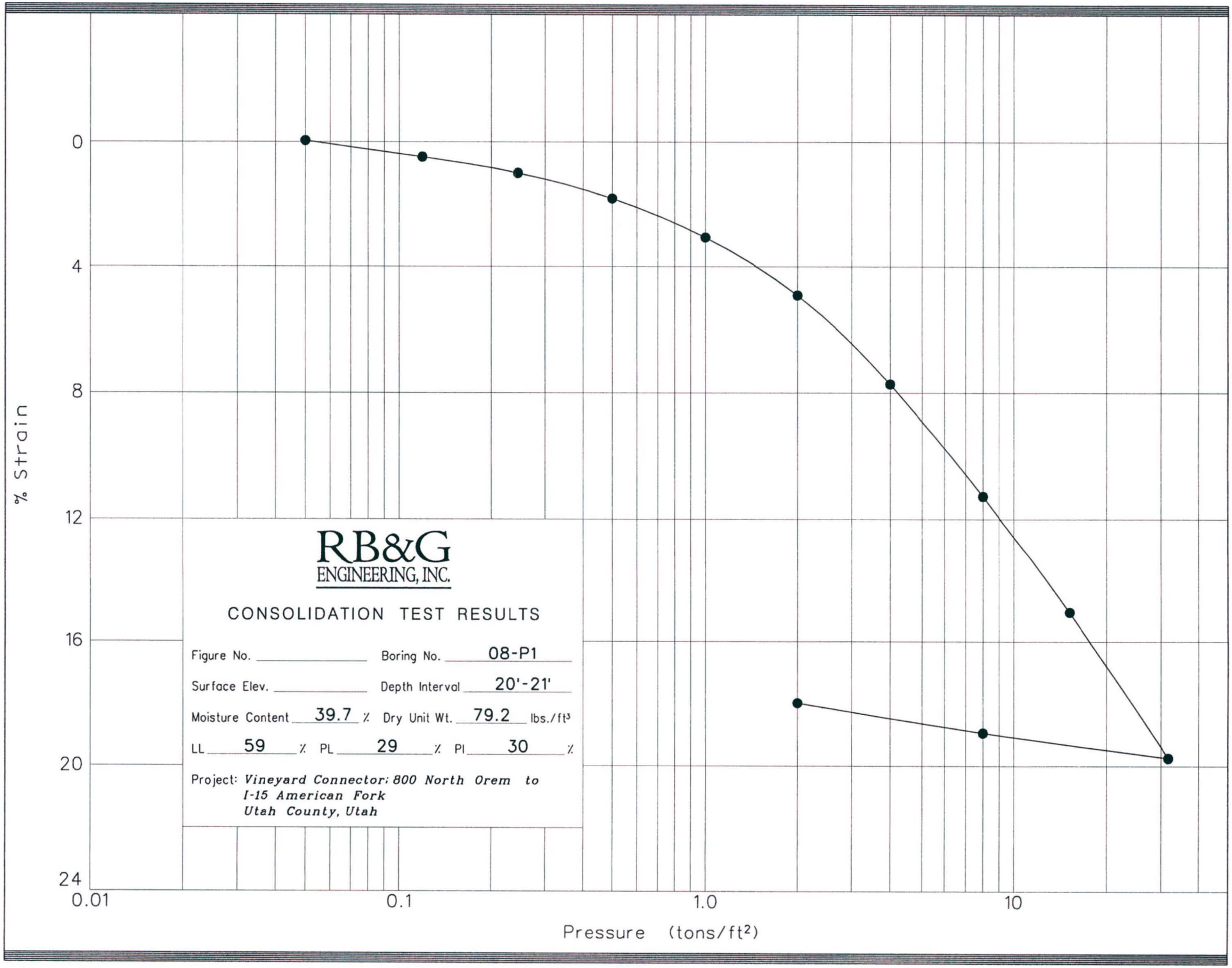
Figure No. _____ Boring No. 08-P1

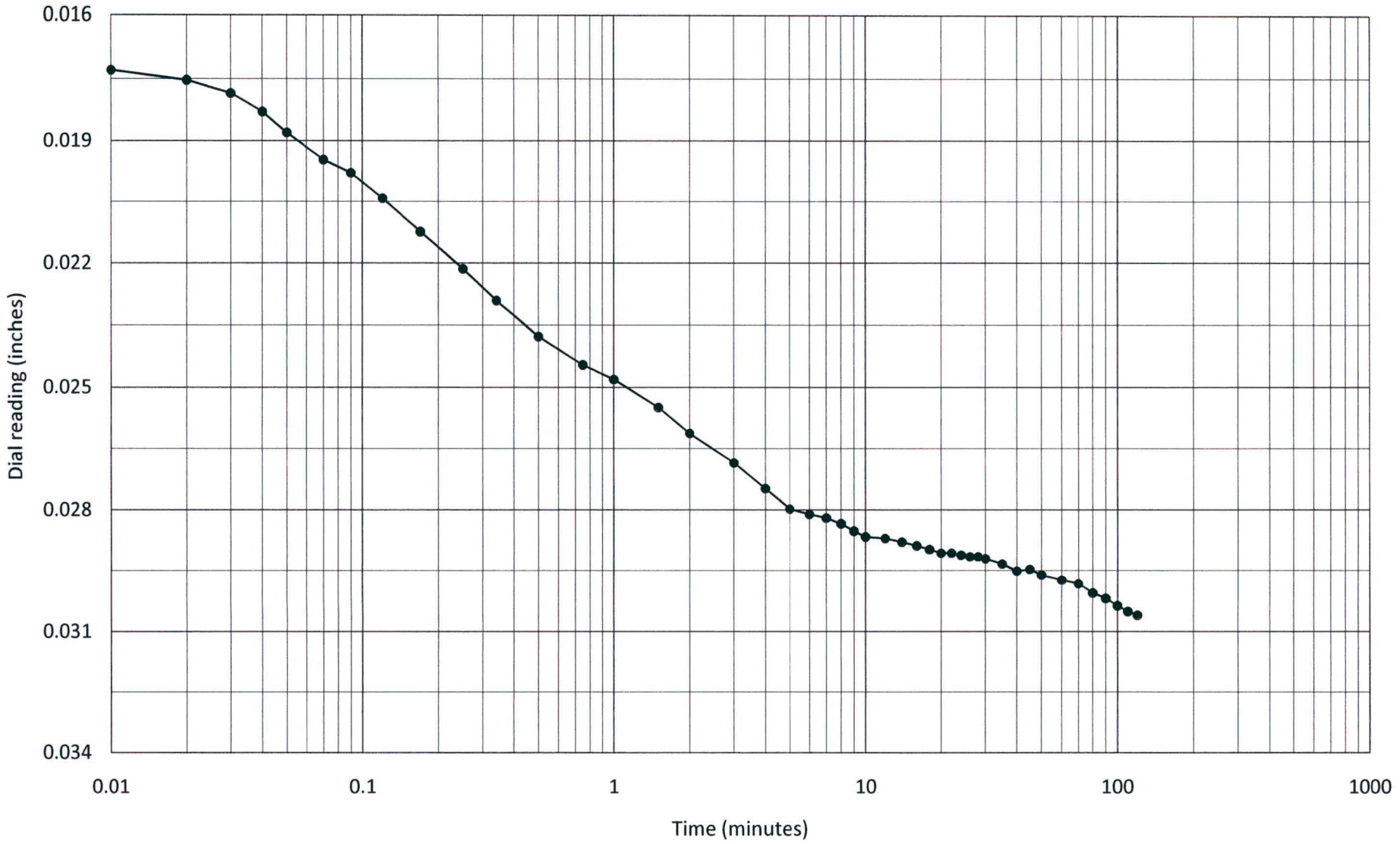
Surface Elev. _____ Depth Interval 20'-21'

Moisture Content 39.7 % Dry Unit Wt. 79.2 lbs./ft³

LL 59 % PL 29 % PI 30 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*


% Strain
0
4
8
12
16
20
24
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P1
Surface Elev. _____ Depth Interval 20'-21'
Moisture Content 39.7 % Dry Unit Wt. 79.2 lbs./ft³
LL 59 % PL 29 % PI 30 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah

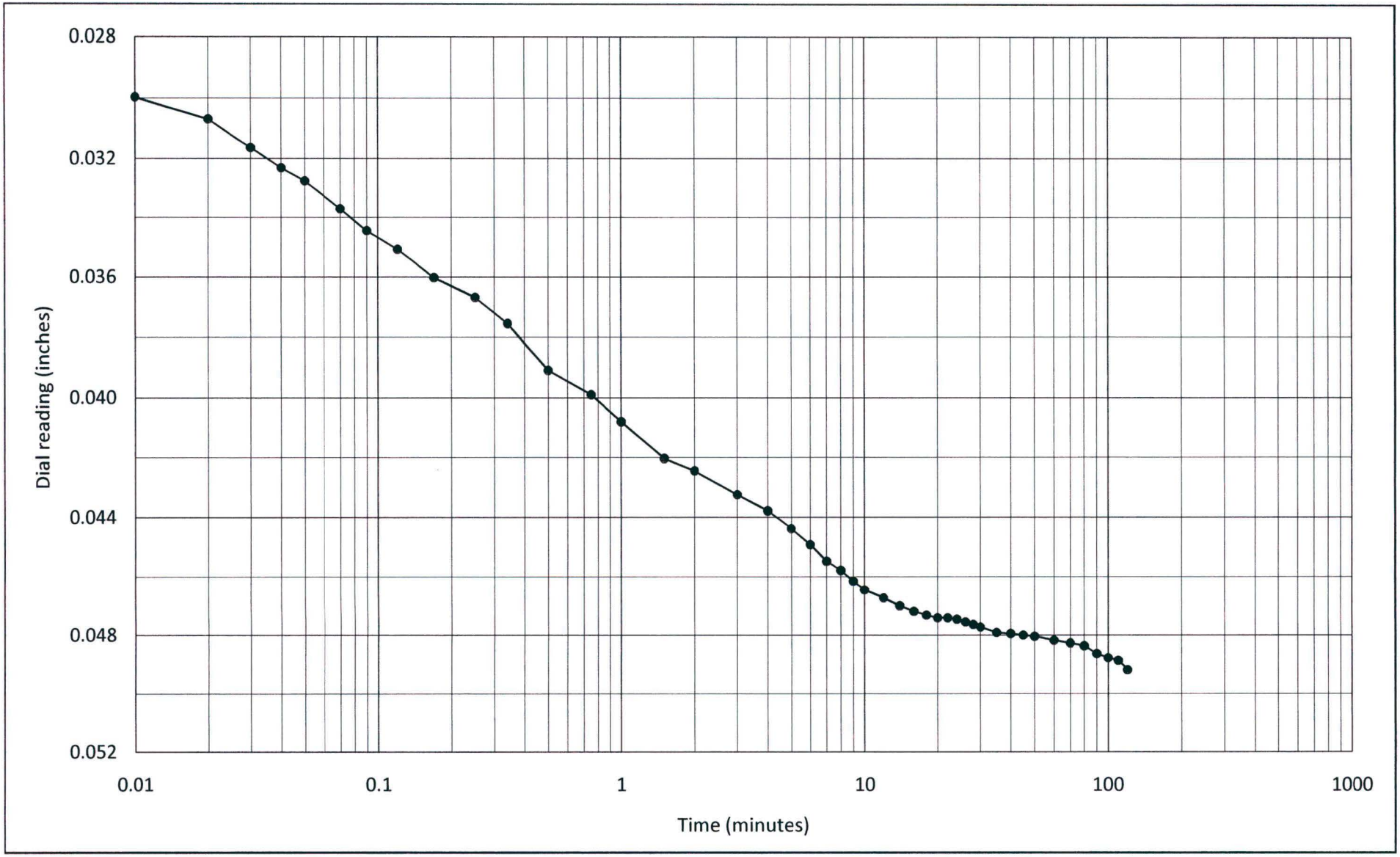


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 20'-21'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

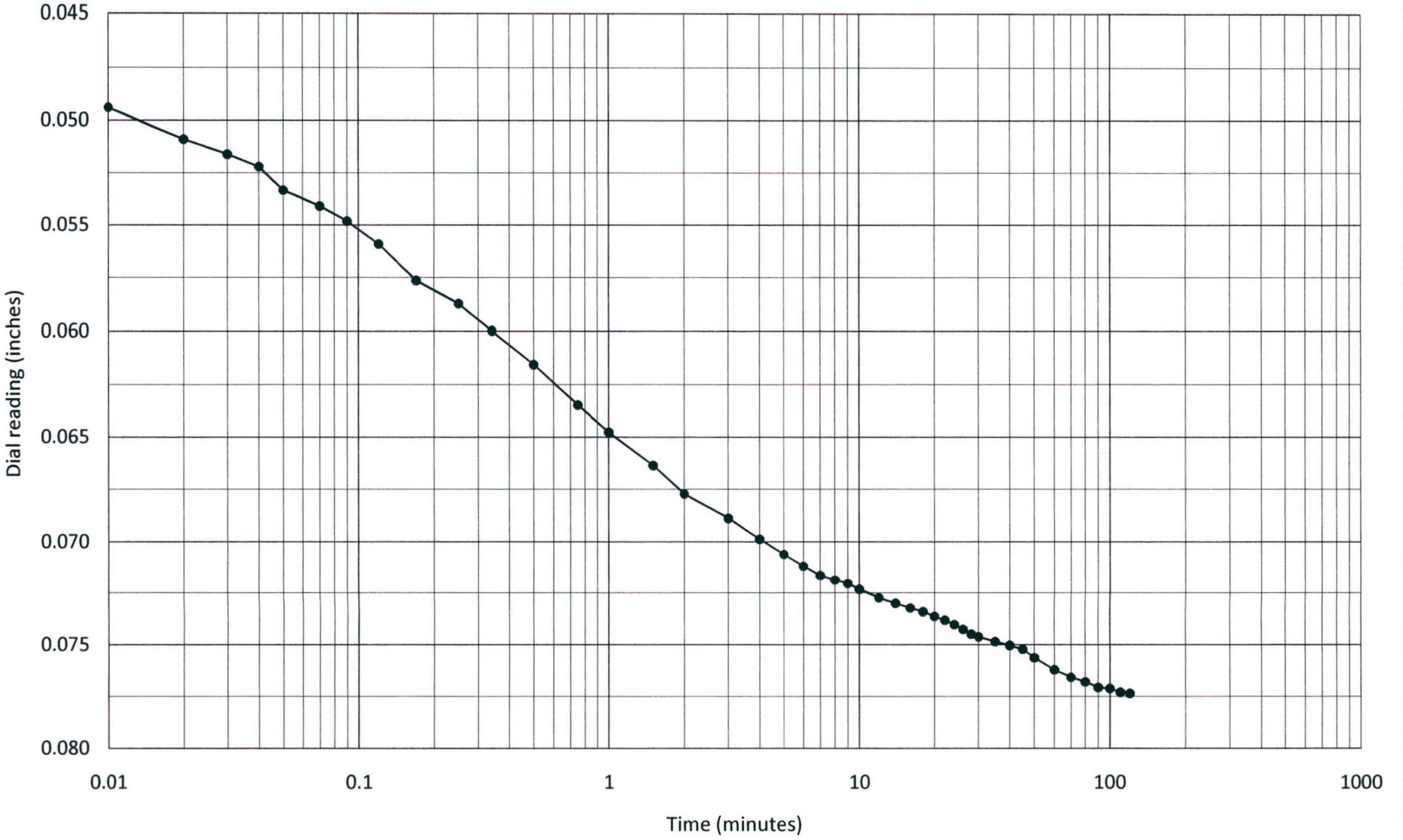


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 20'-21'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

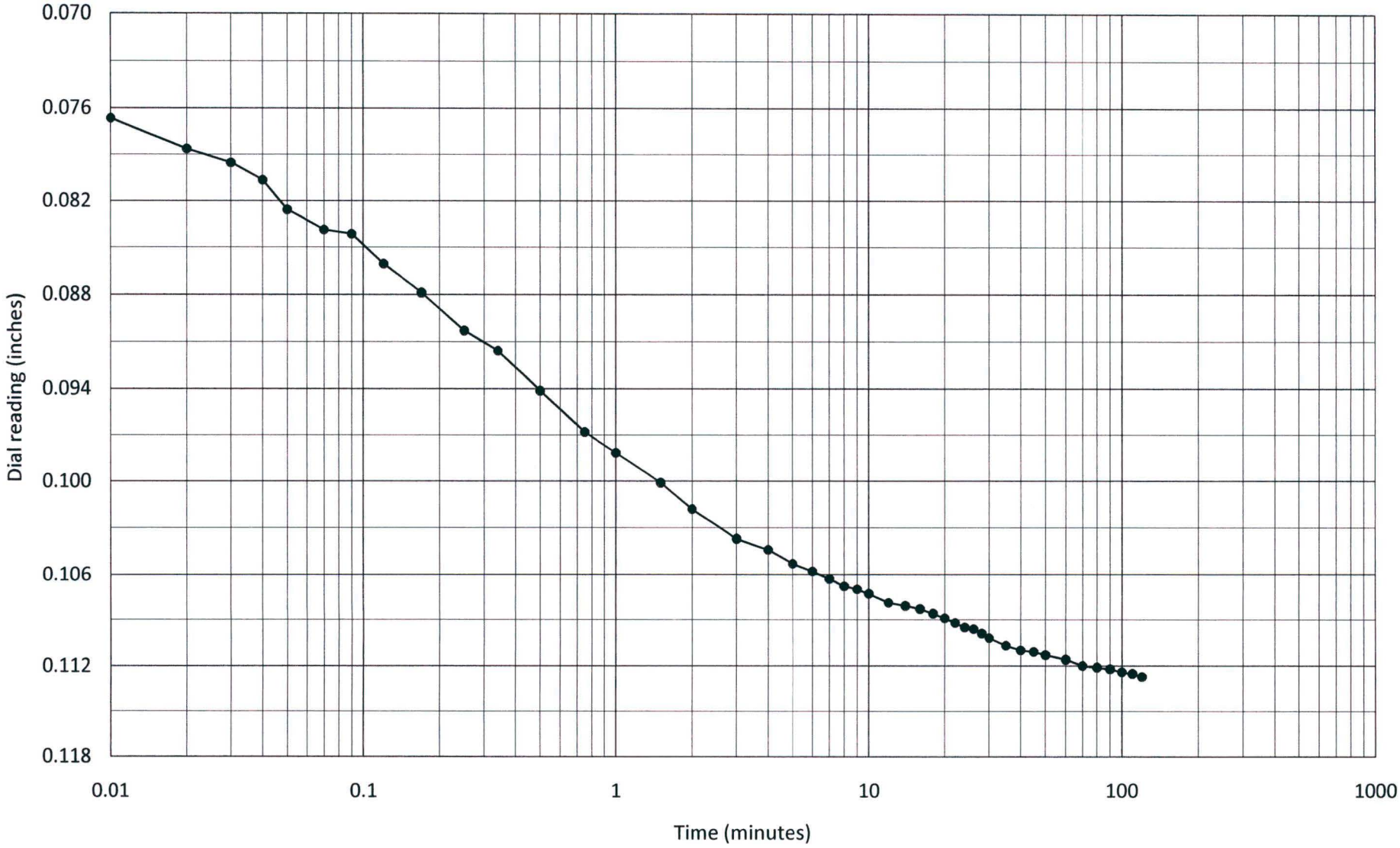


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 20'-21'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

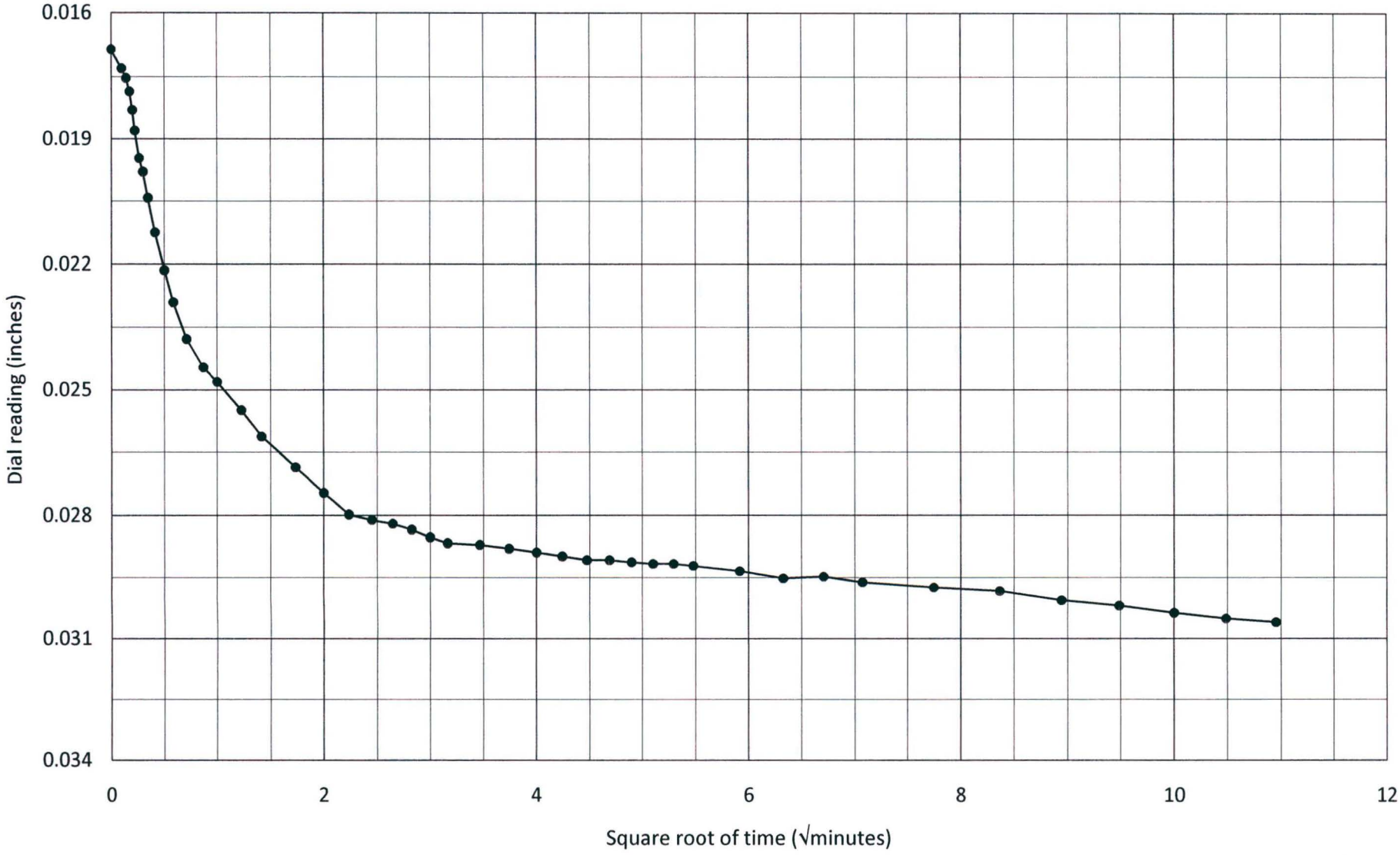


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 20'-21'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

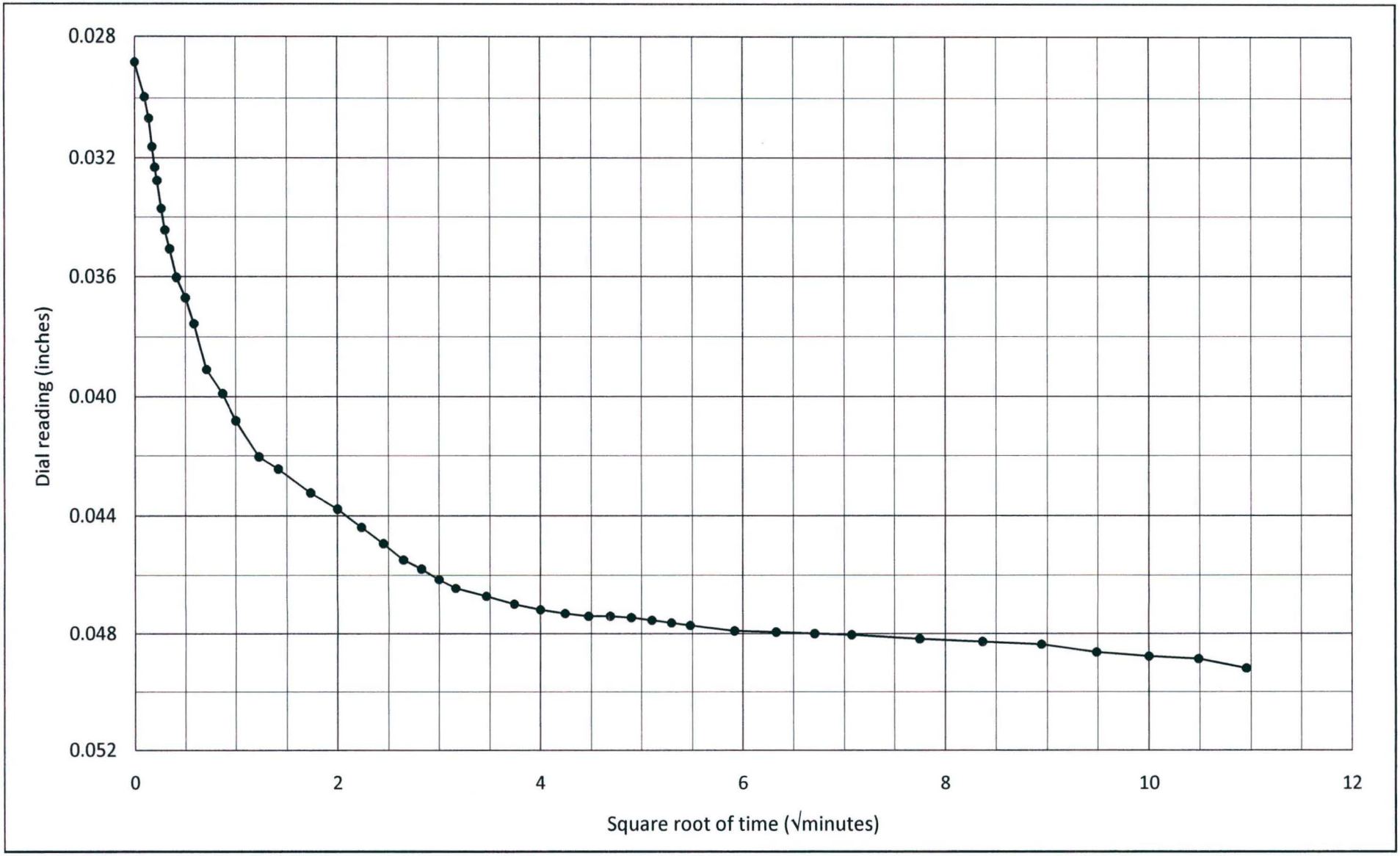


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 20'-21'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

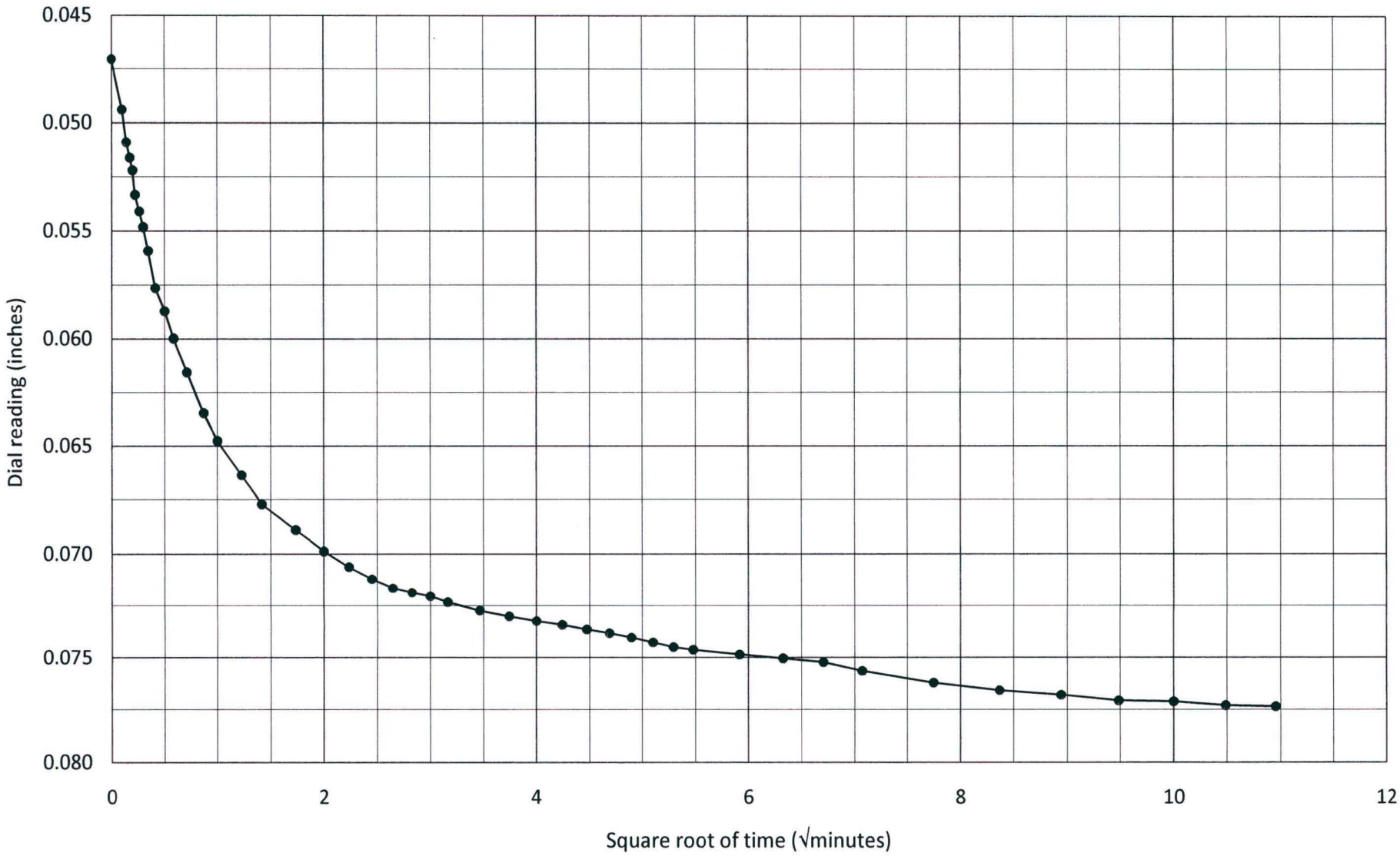


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 20'-21'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

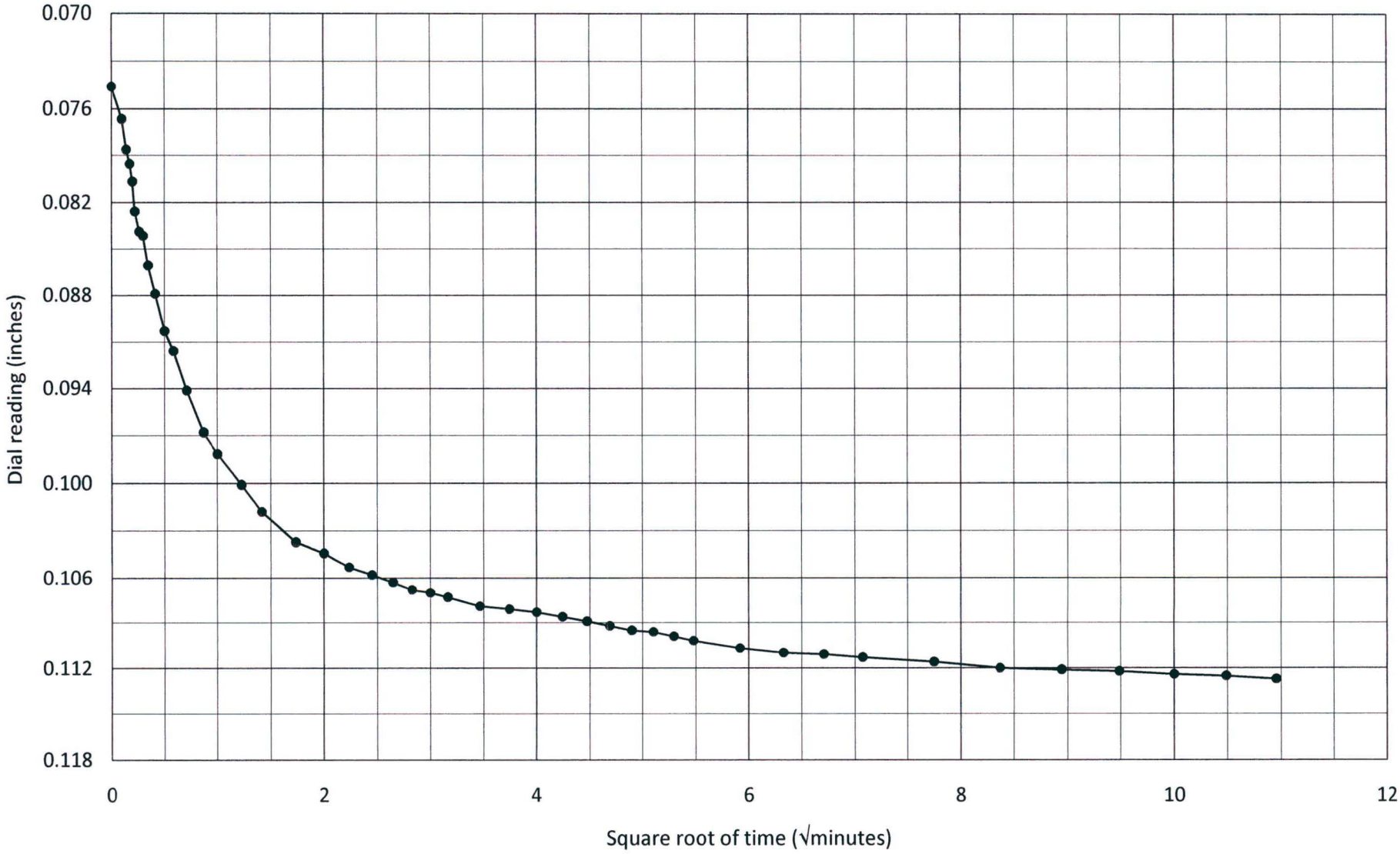


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 20'-21'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

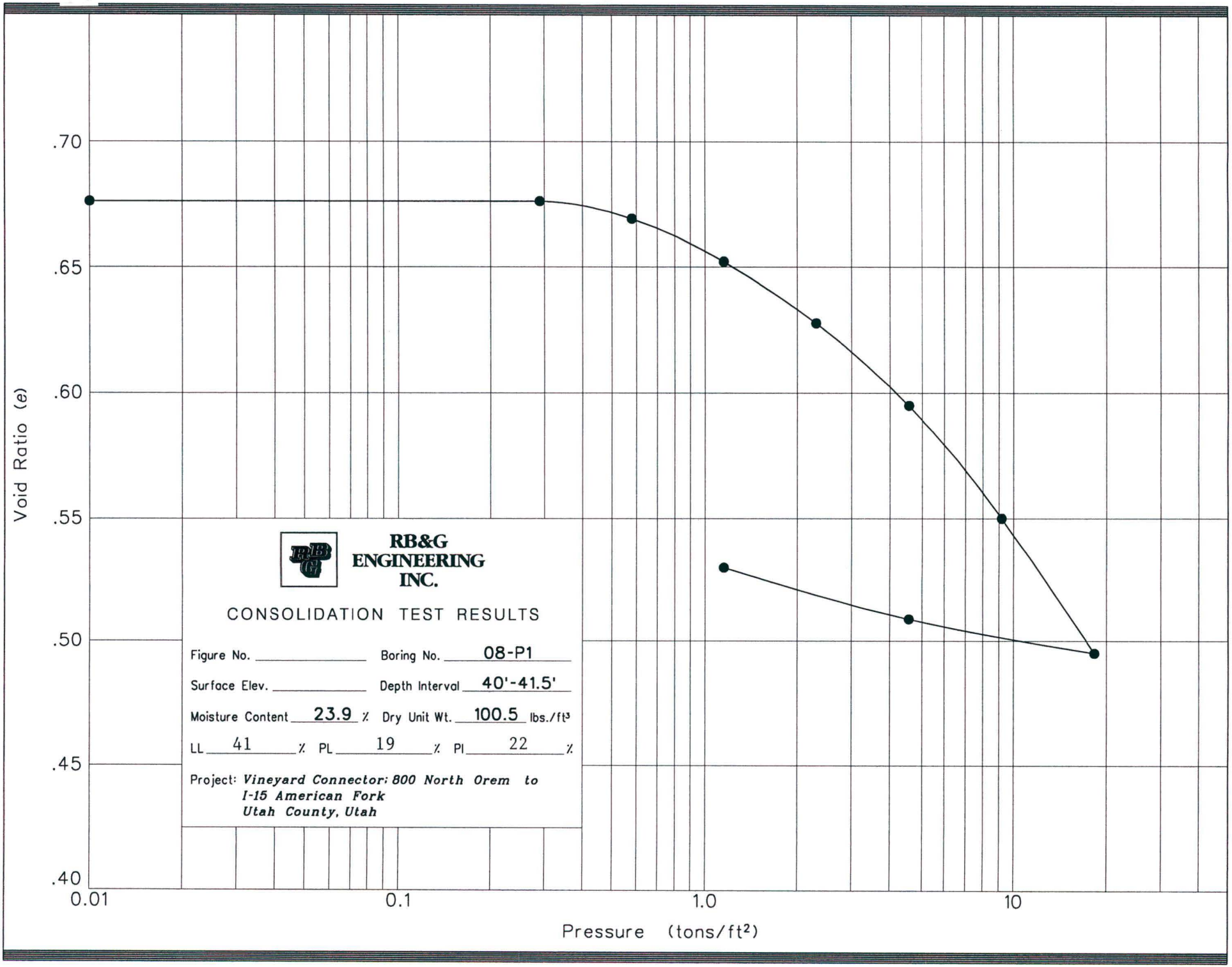


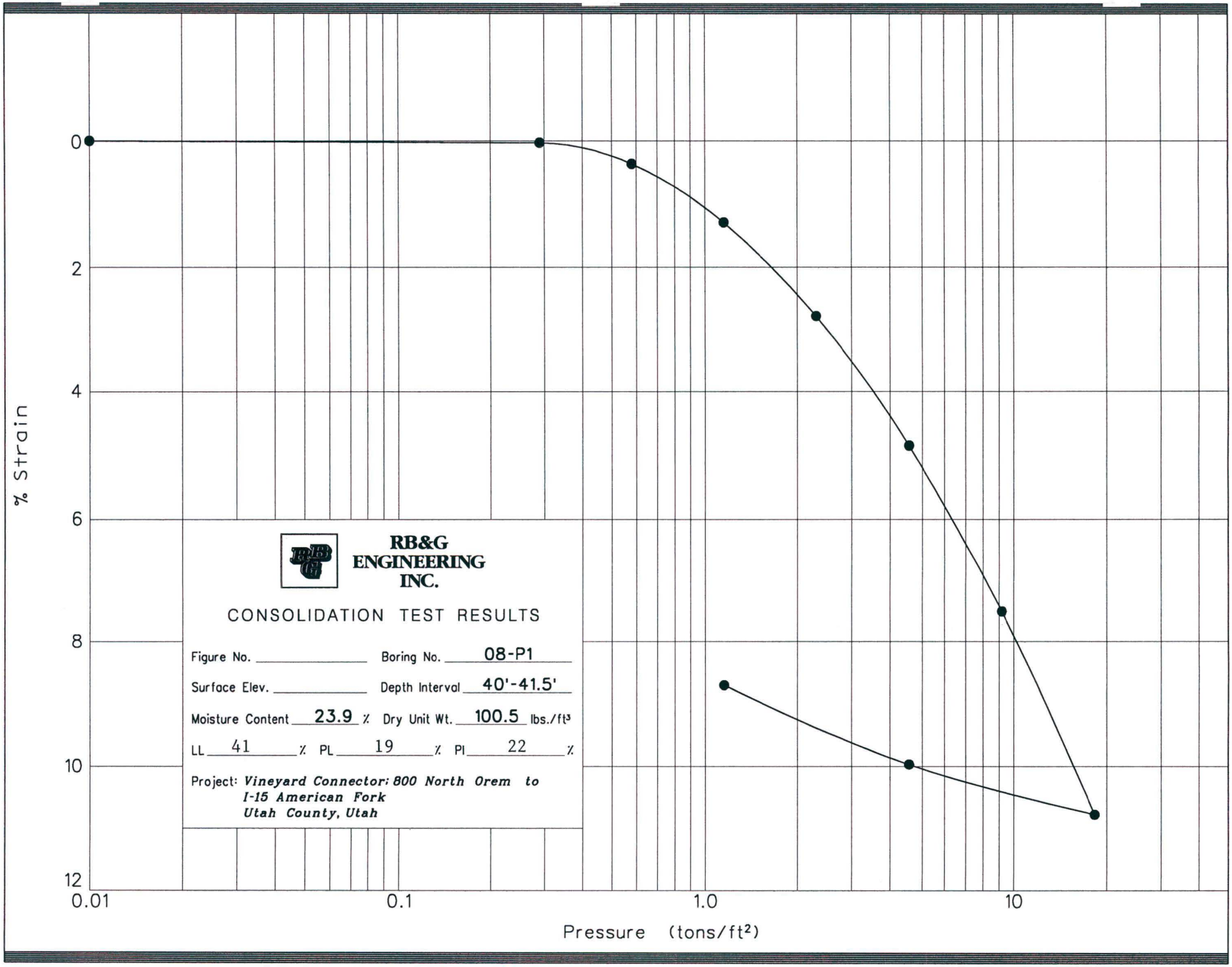
RB&G ENGINEERING, INC.

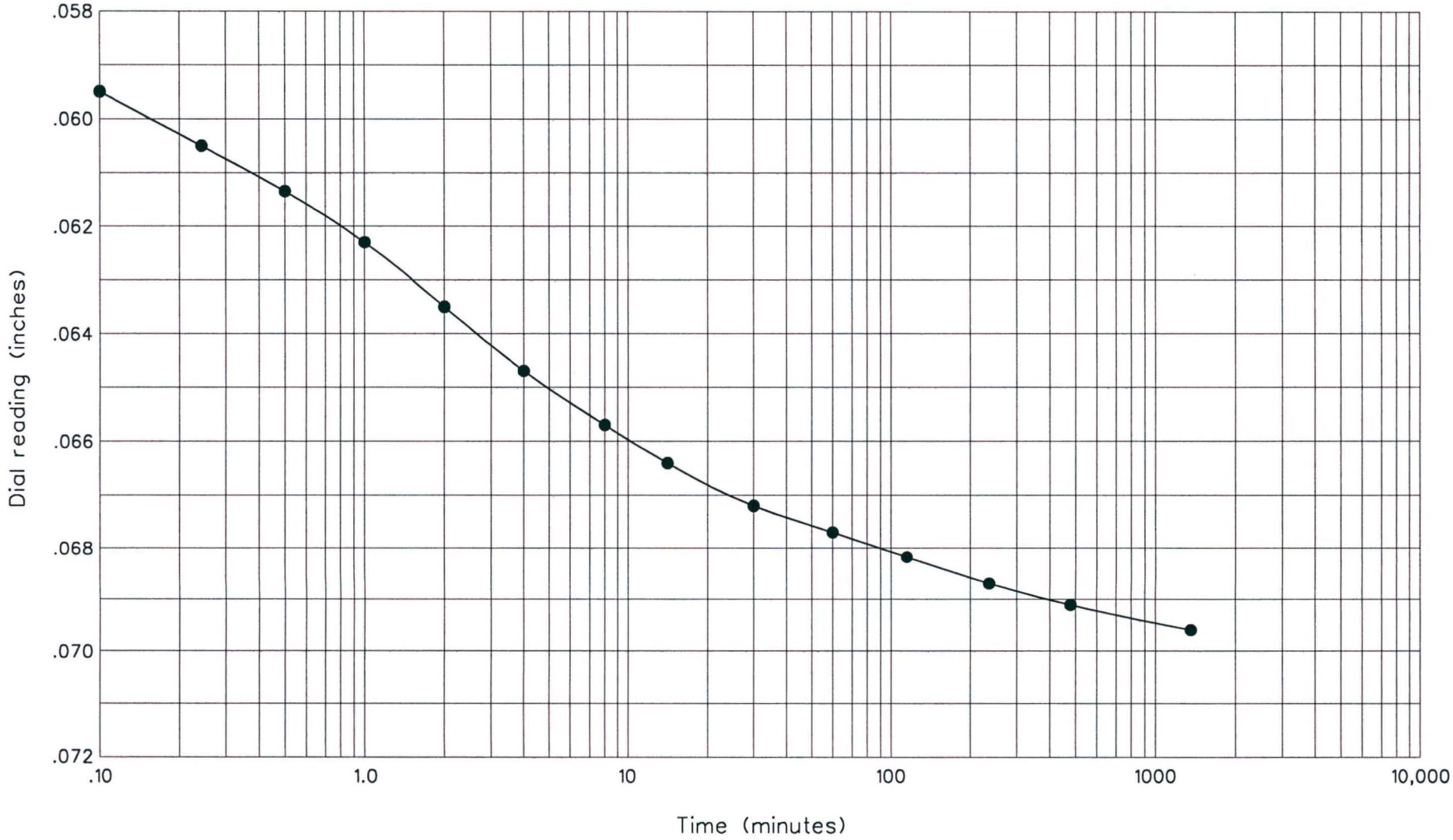
Hole no.: 08-P1
Depth: 20'-21'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah


.70
.65
.60
.55
.50
.45
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P1
Surface Elev. _____ Depth Interval 40'-41.5'
Moisture Content 23.9 % Dry Unit Wt. 100.5 lbs./ft³
LL 41 % PL 19 % PI 22 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah


% Strain
0
2
4
6
8
10
12
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No.
Boring No. 08-P1
Surface Elev.
Depth Interval 40'-41.5'
Moisture Content 23.9 % Dry Unit Wt. 100.5 lbs./ft³
LL 41 % PL 19 % PI 22 %
Project: Vineyard Connector: 800 North Orem to I-15 American Fork
Utah County, Utah



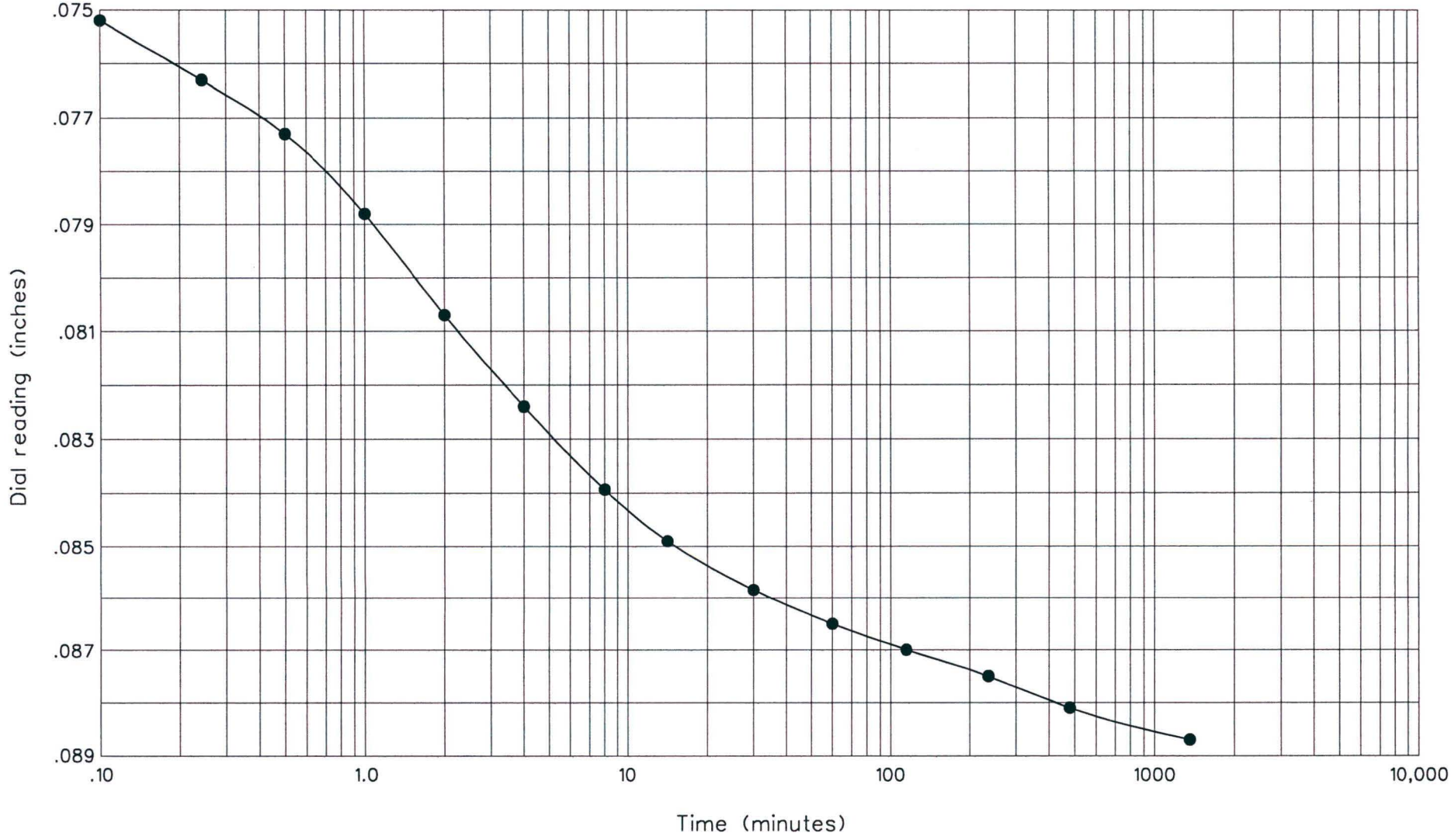
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P1
Depth: 40'-41.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



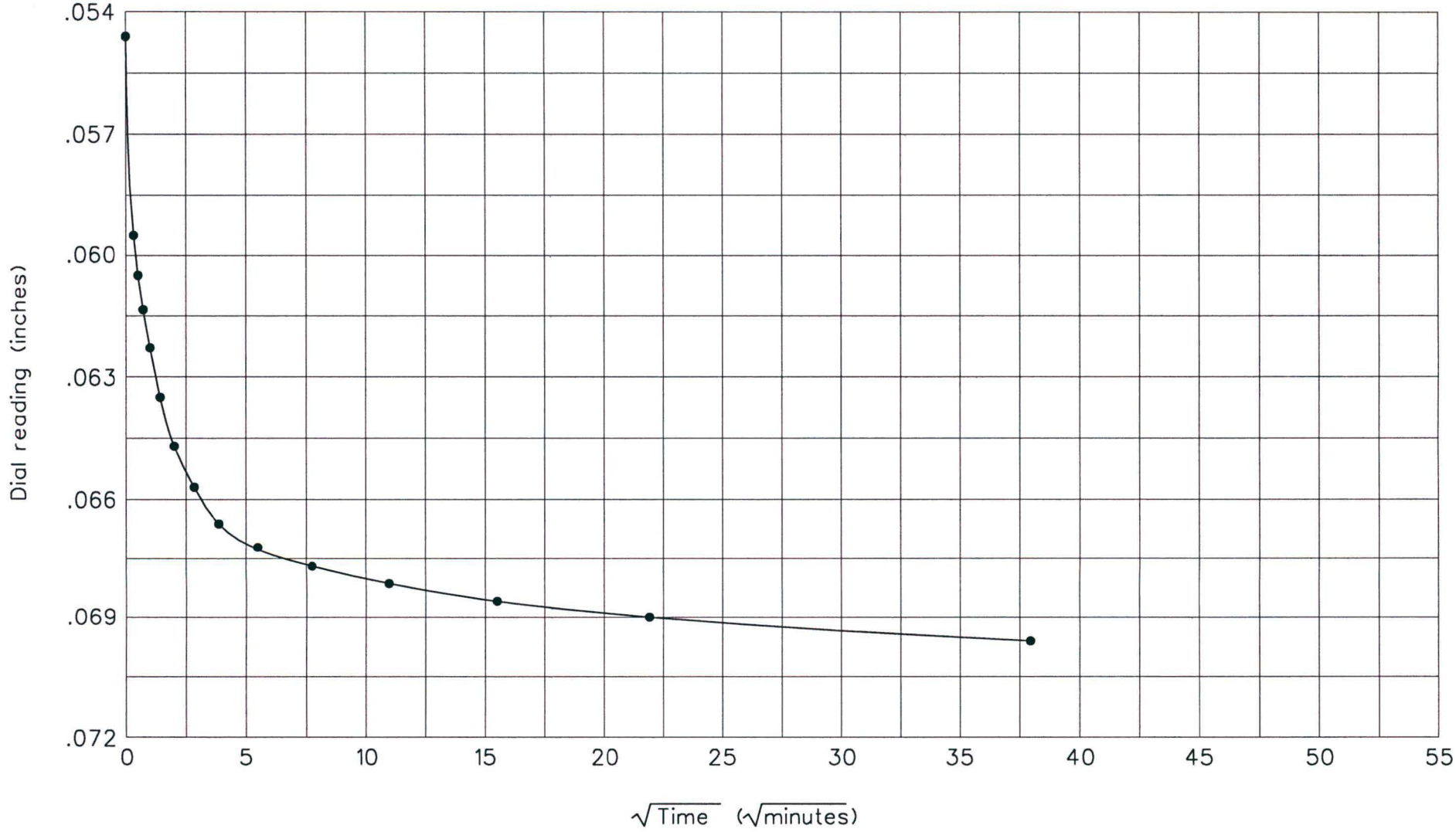
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P1
Depth: 40'-41.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



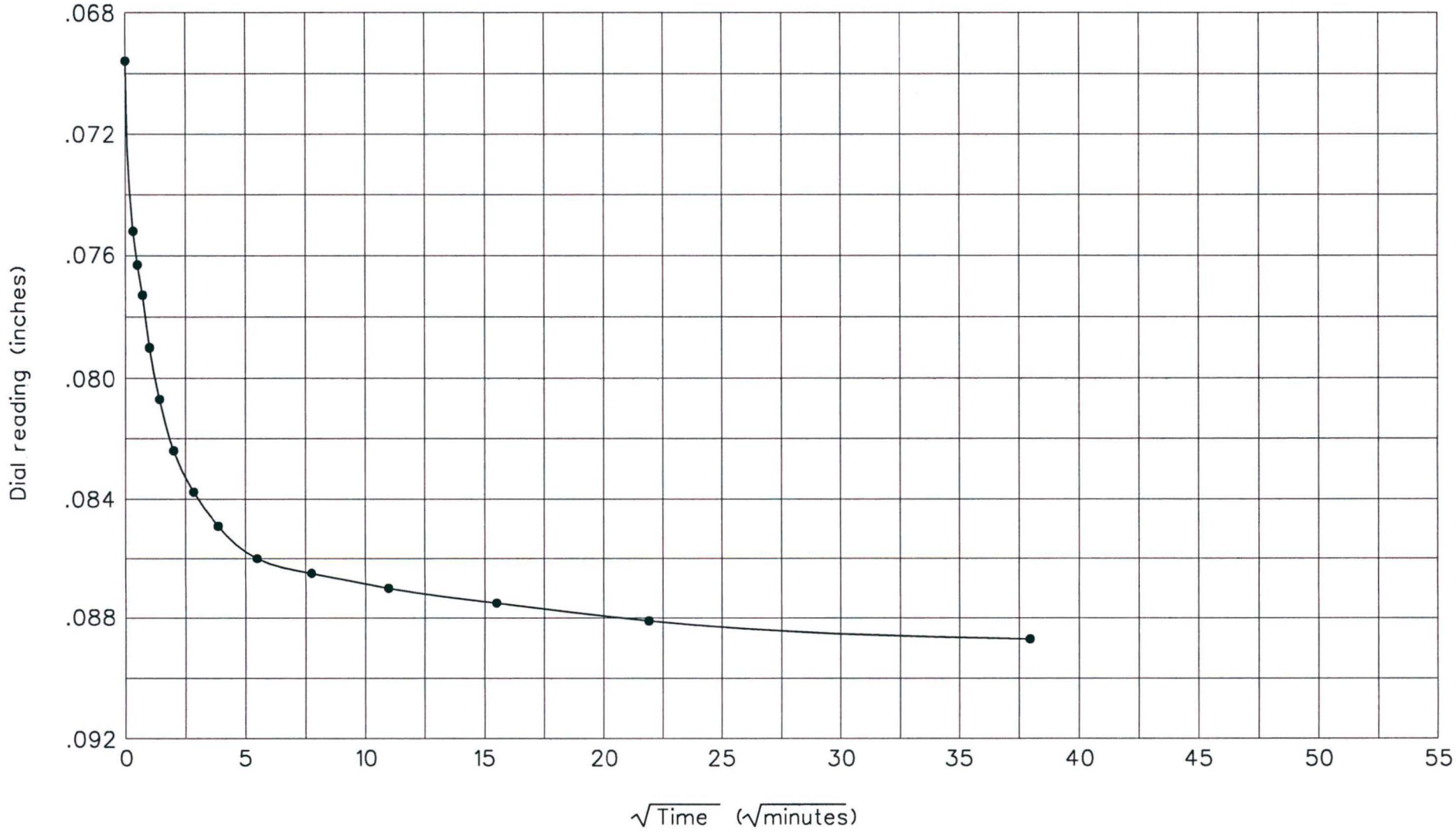
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P1
Depth: 40'-41.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



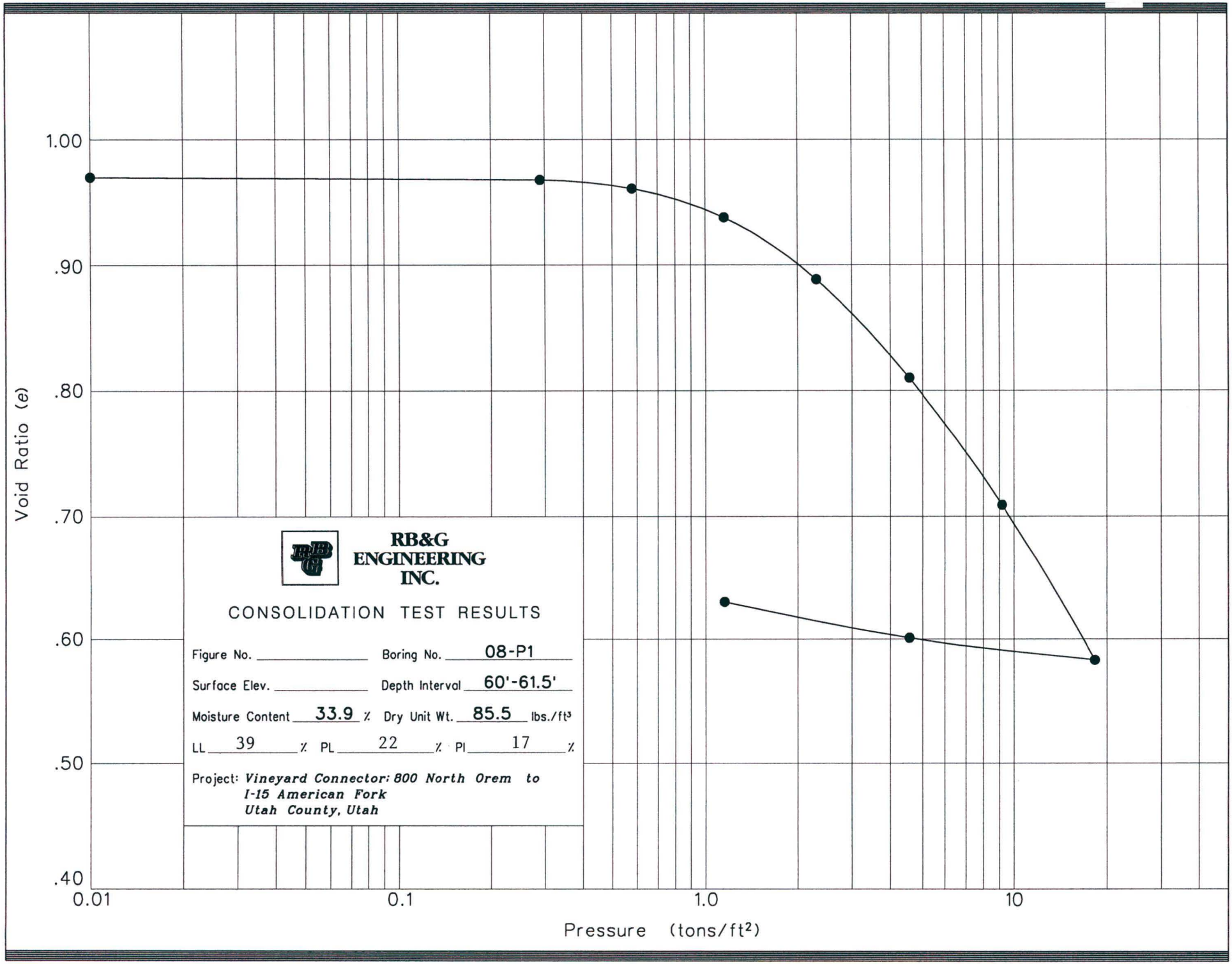
RB&G ENGINEERING INC.
Provo, Utah

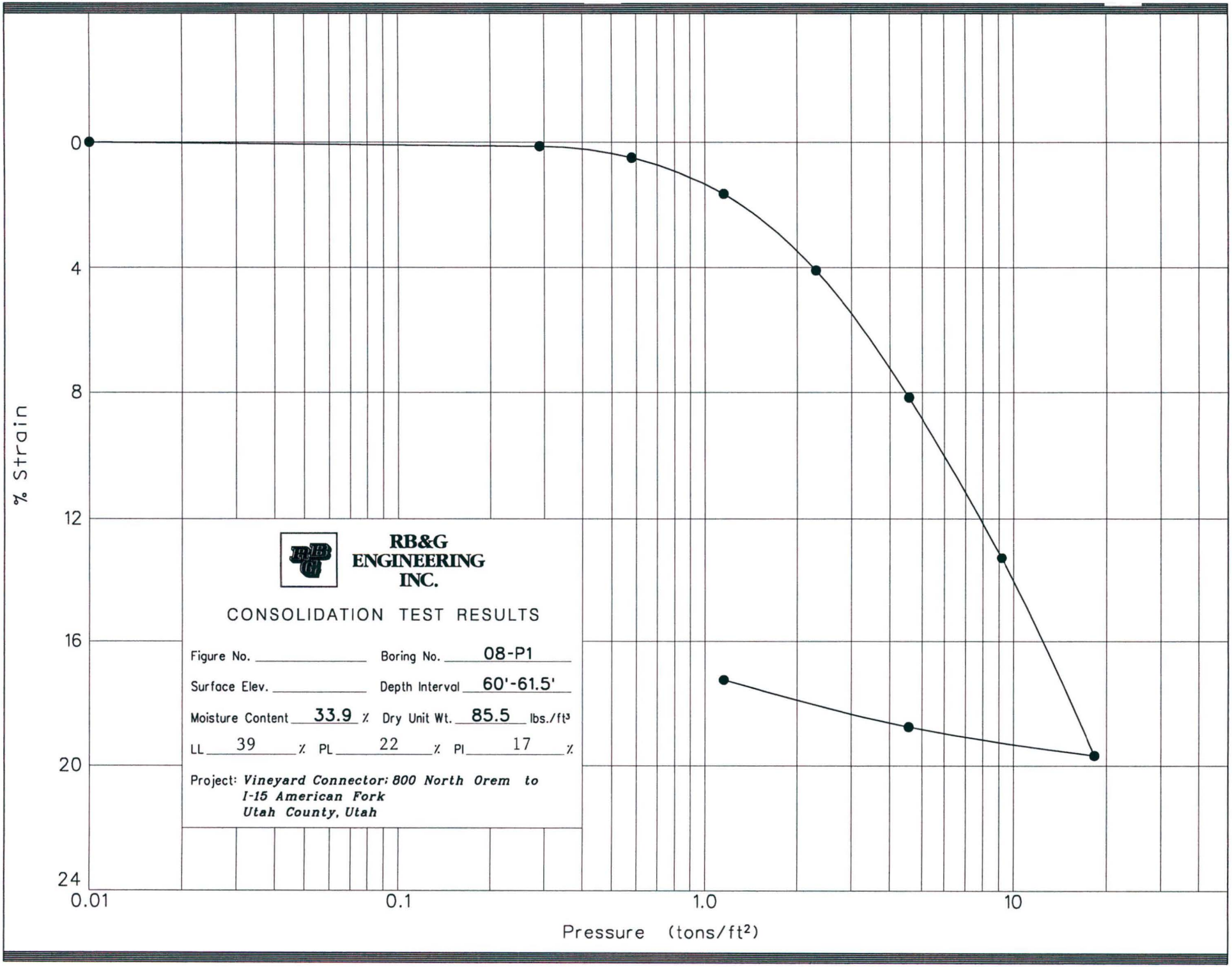
Hole no.: 08-P1
Depth: 40'-41.5'
Load: 2.30 to 4.60 tons

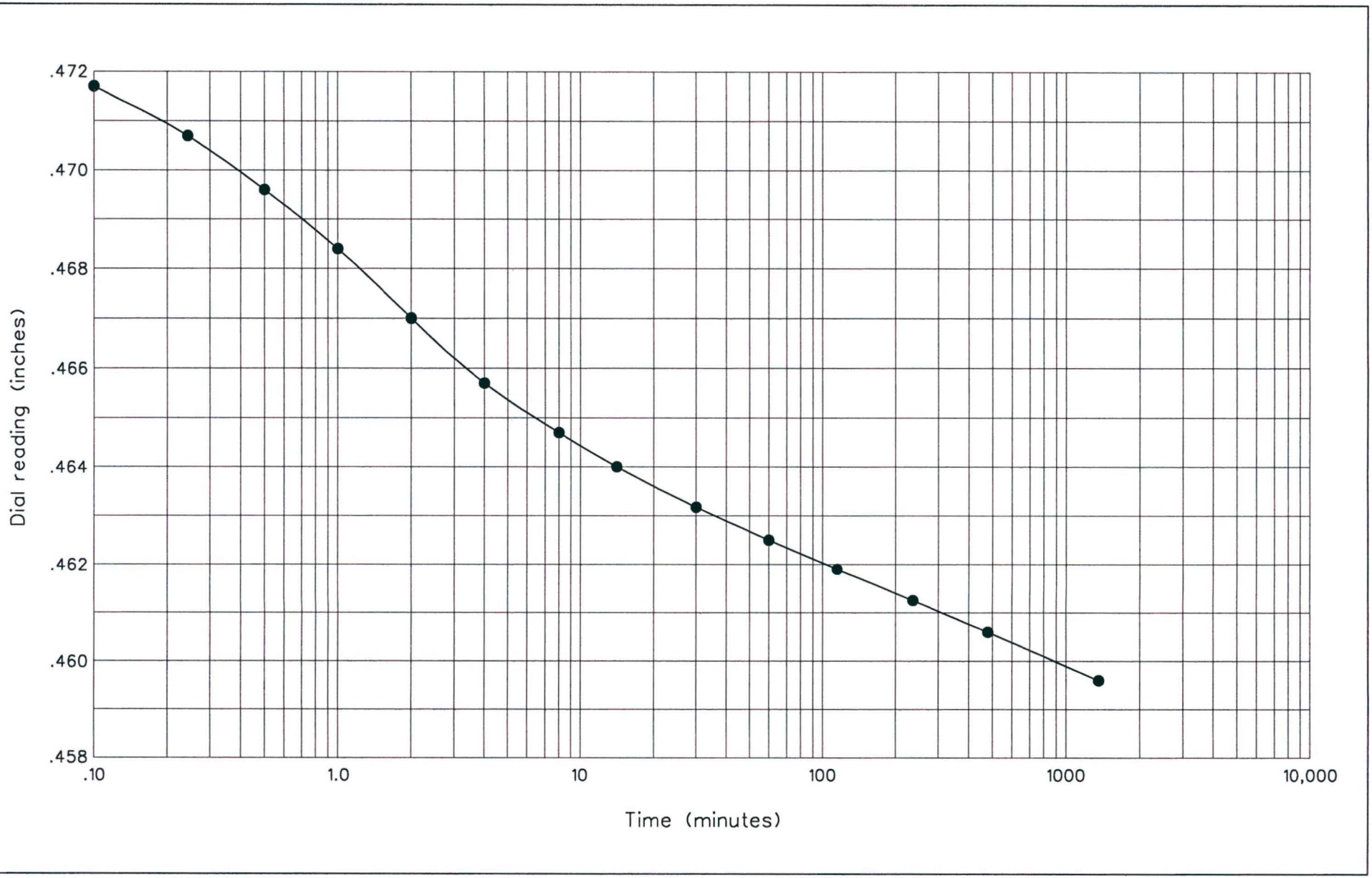
TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure


1.00
.90
.80
.70
.60
.50
.40
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P1
Surface Elev. _____ Depth Interval 60'-61.5'
Moisture Content 33.9 % Dry Unit Wt. 85.5 lbs./ft³
LL 39 % PL 22 % PI 17 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah


0
4
8
12
16
20
24
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No.
Boring No. 08-P1
Surface Elev.
Depth Interval 60'-61.5'
Moisture Content 33.9 % Dry Unit Wt. 85.5 lbs./ft³
LL 39 % PL 22 % PI 17 %
Project: Vineyard Connector: 800 North Orem to I-15 American Fork
Utah County, Utah



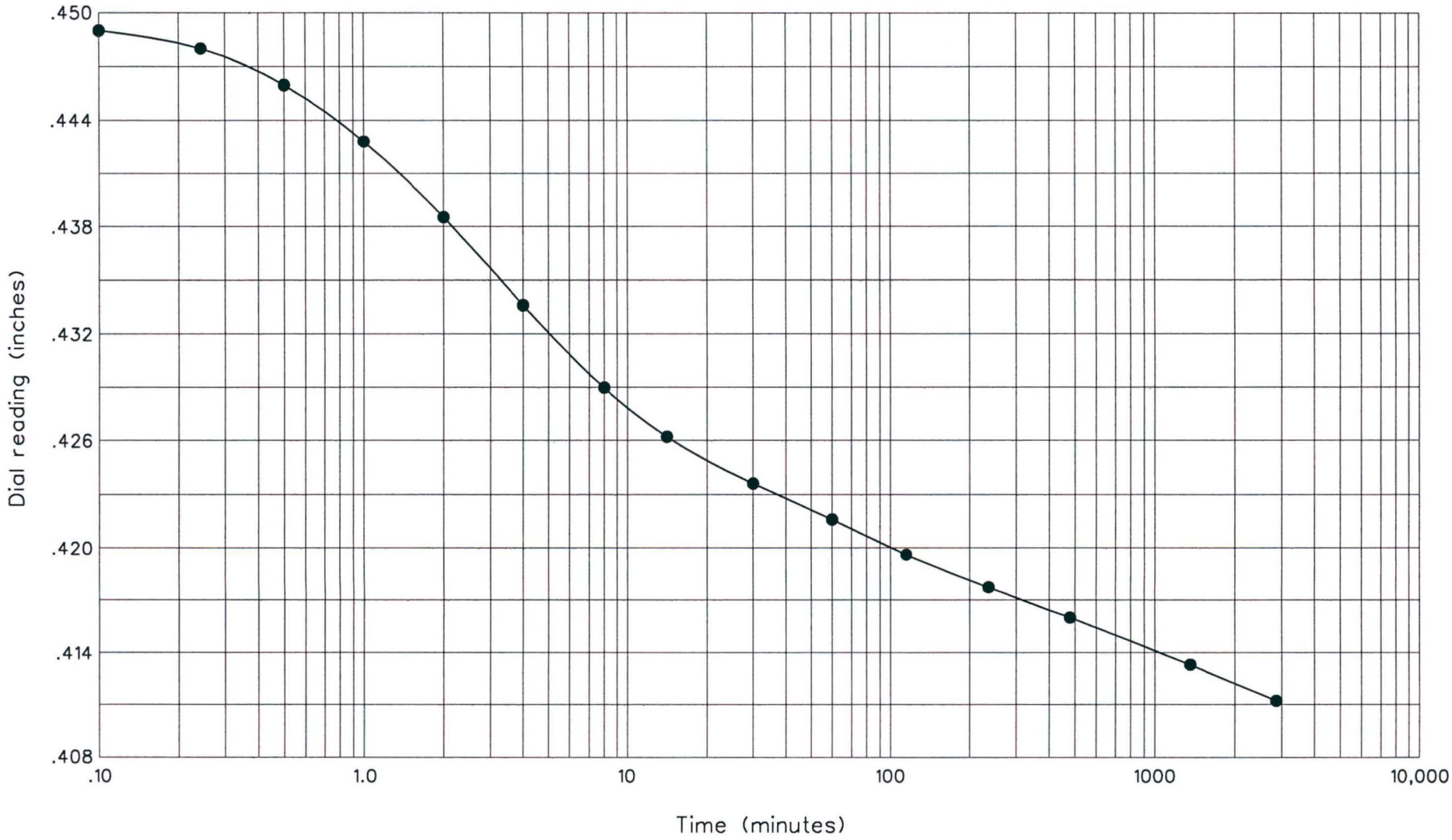
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P1
Depth: 60'-61.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



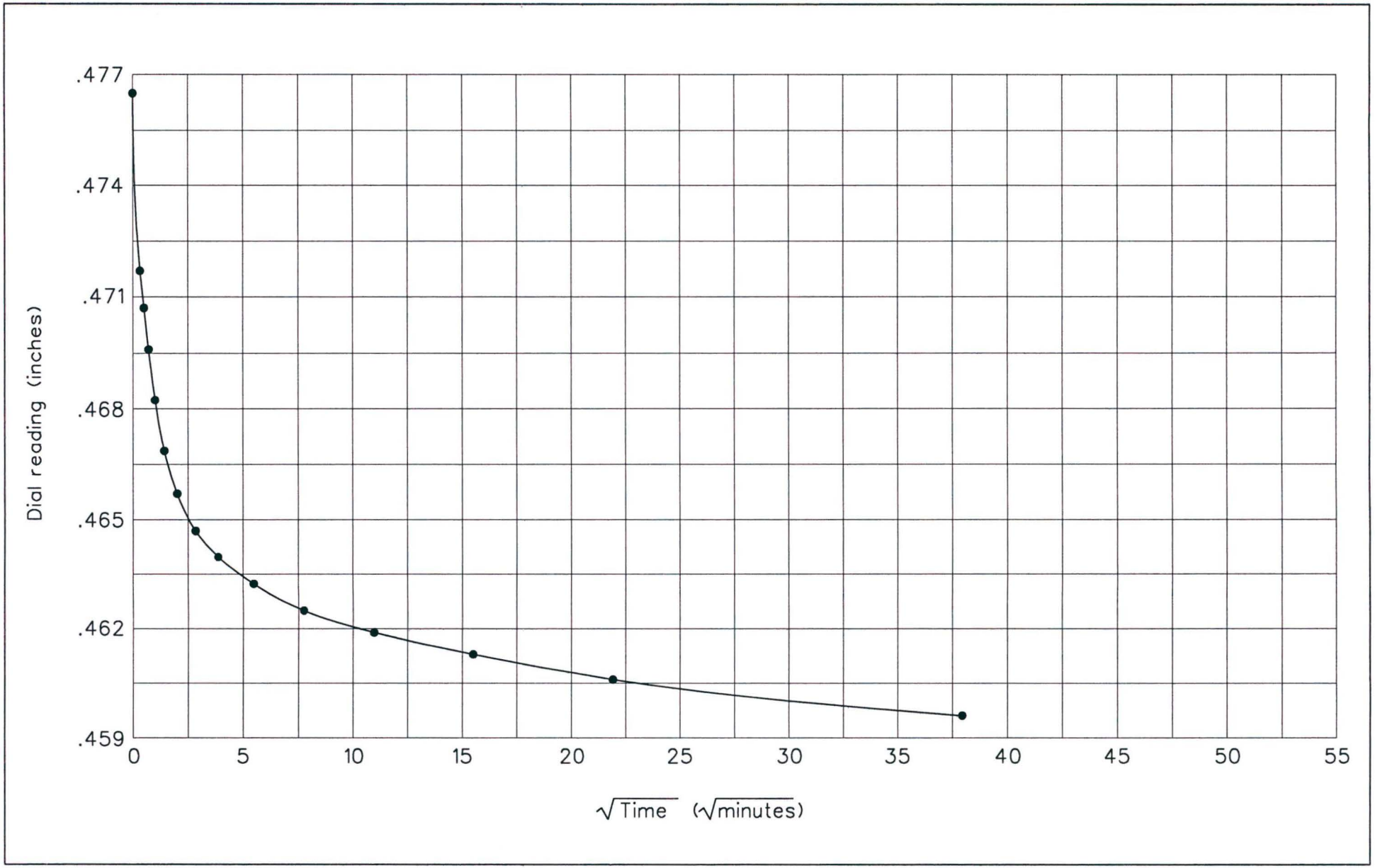
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P1
Depth: 60'-61.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



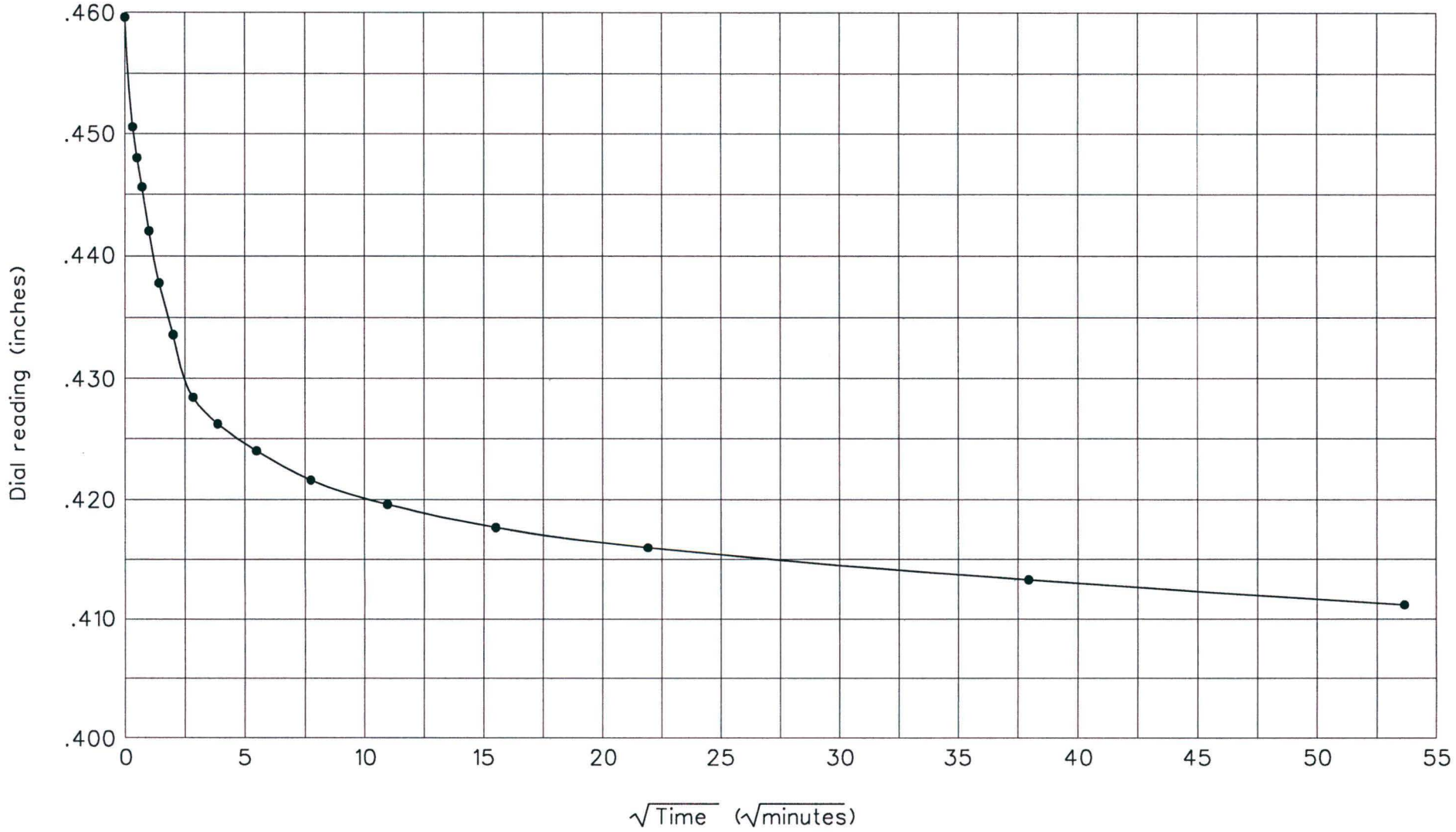
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P1
Depth: 60'-61.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



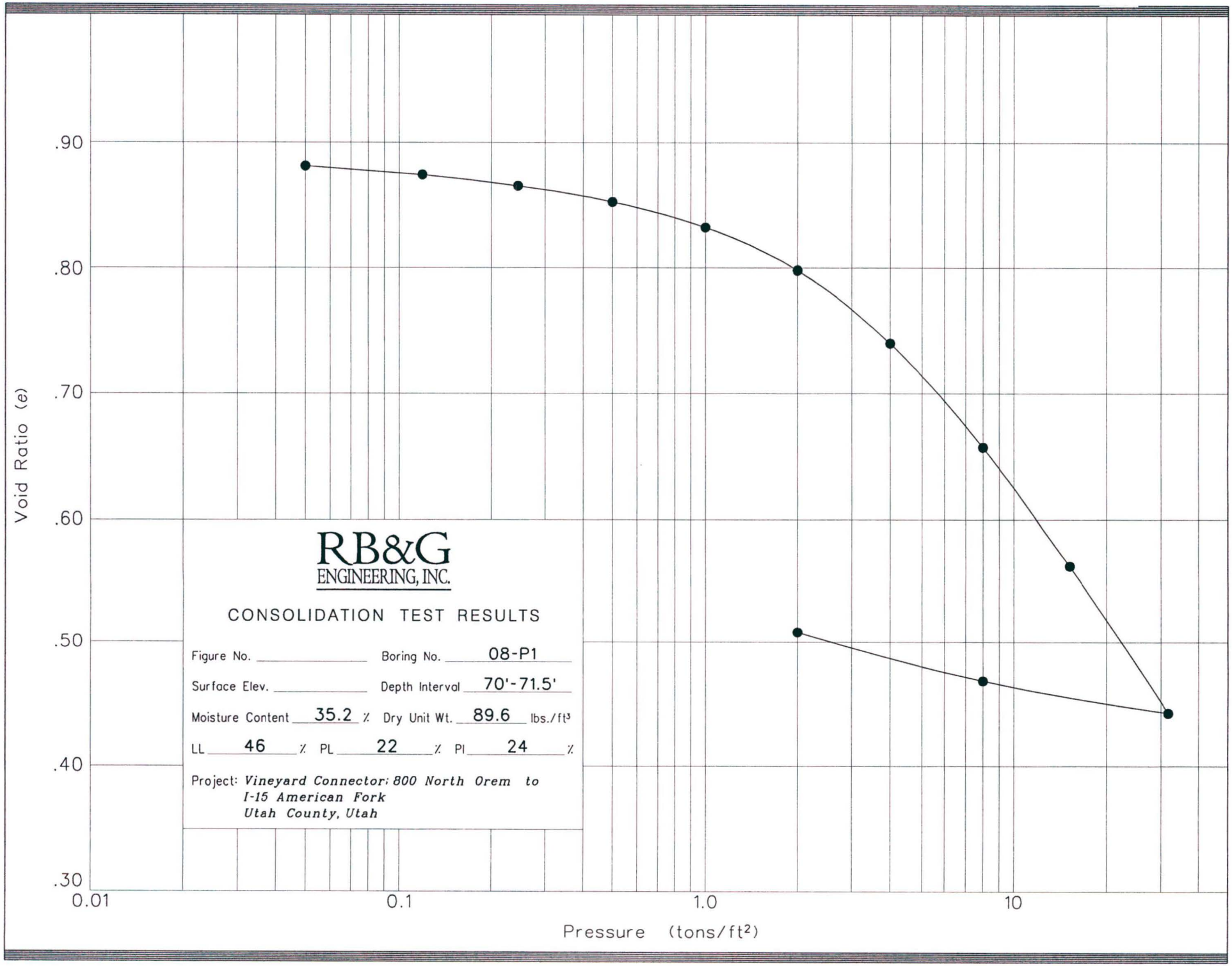
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P1
Depth: 60'-61.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

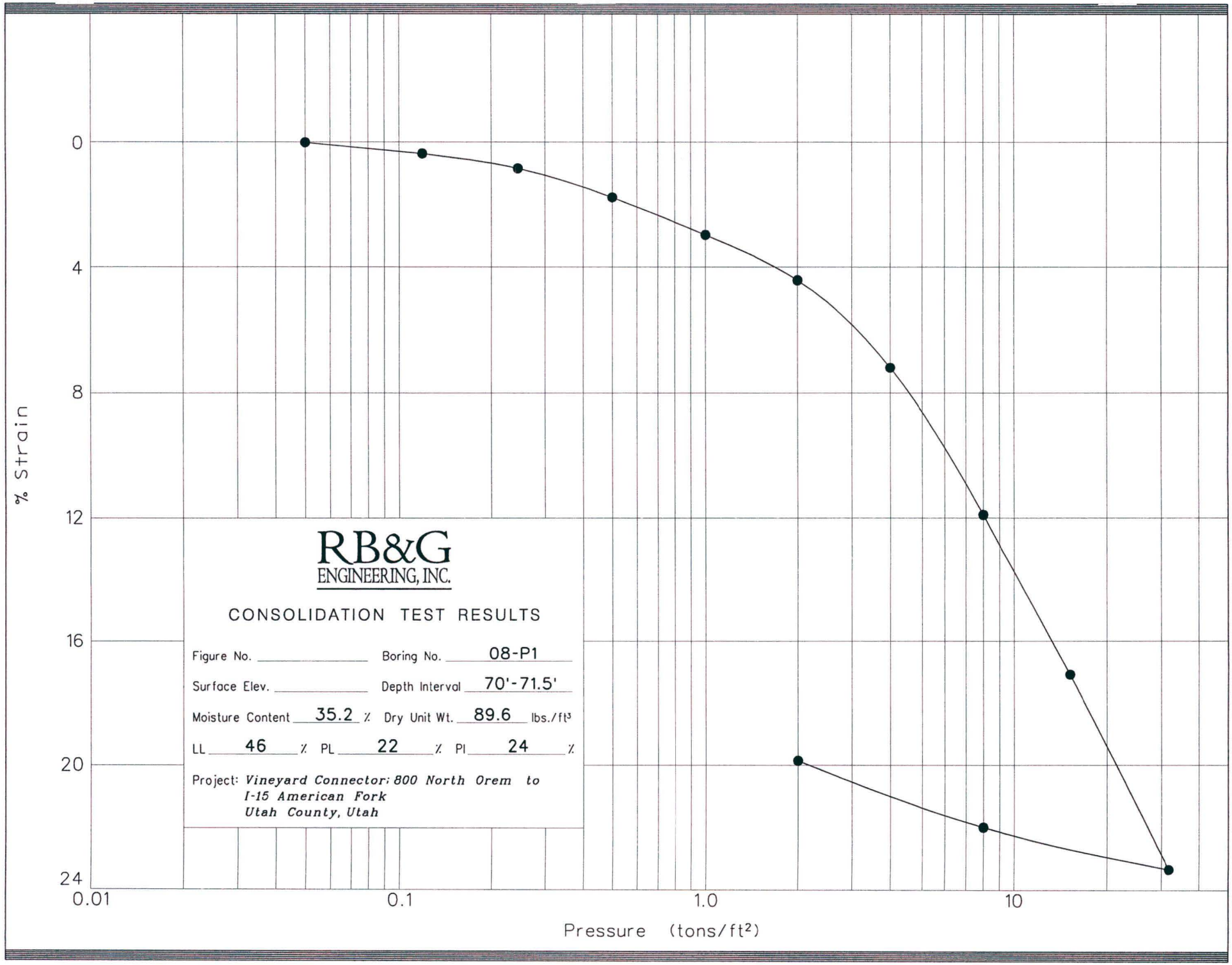
Figure No. _____ Boring No. 08-P1

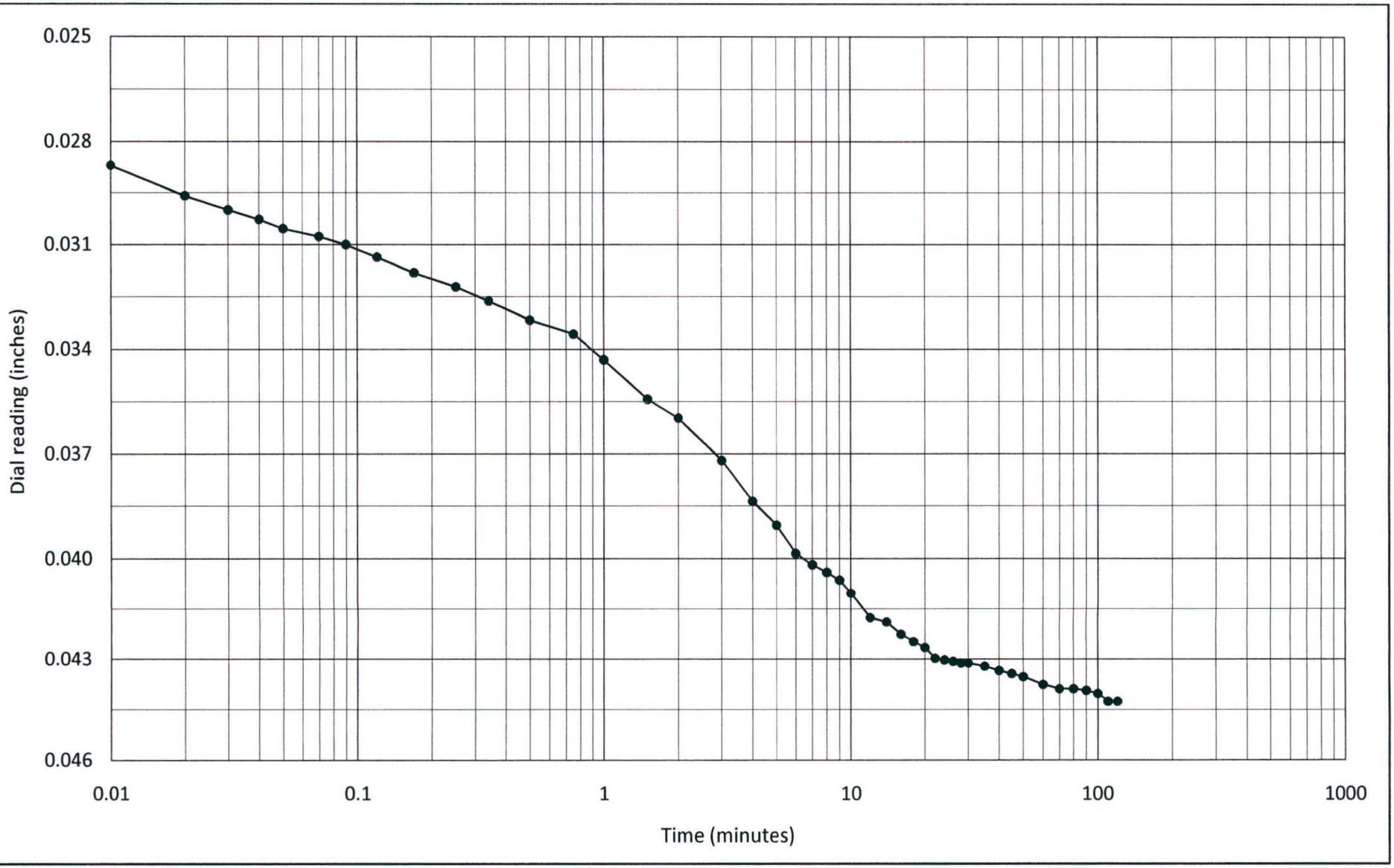
Surface Elev. _____ Depth Interval 70'-71.5'

Moisture Content 35.2 % Dry Unit Wt. 89.6 lbs./ft³

LL 46 % PL 22 % PI 24 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*


% Strain
0
4
8
12
16
20
24
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P1
Surface Elev. _____ Depth Interval 70'-71.5'
Moisture Content 35.2 % Dry Unit Wt. 89.6 lbs./ft³
LL 46 % PL 22 % PI 24 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah

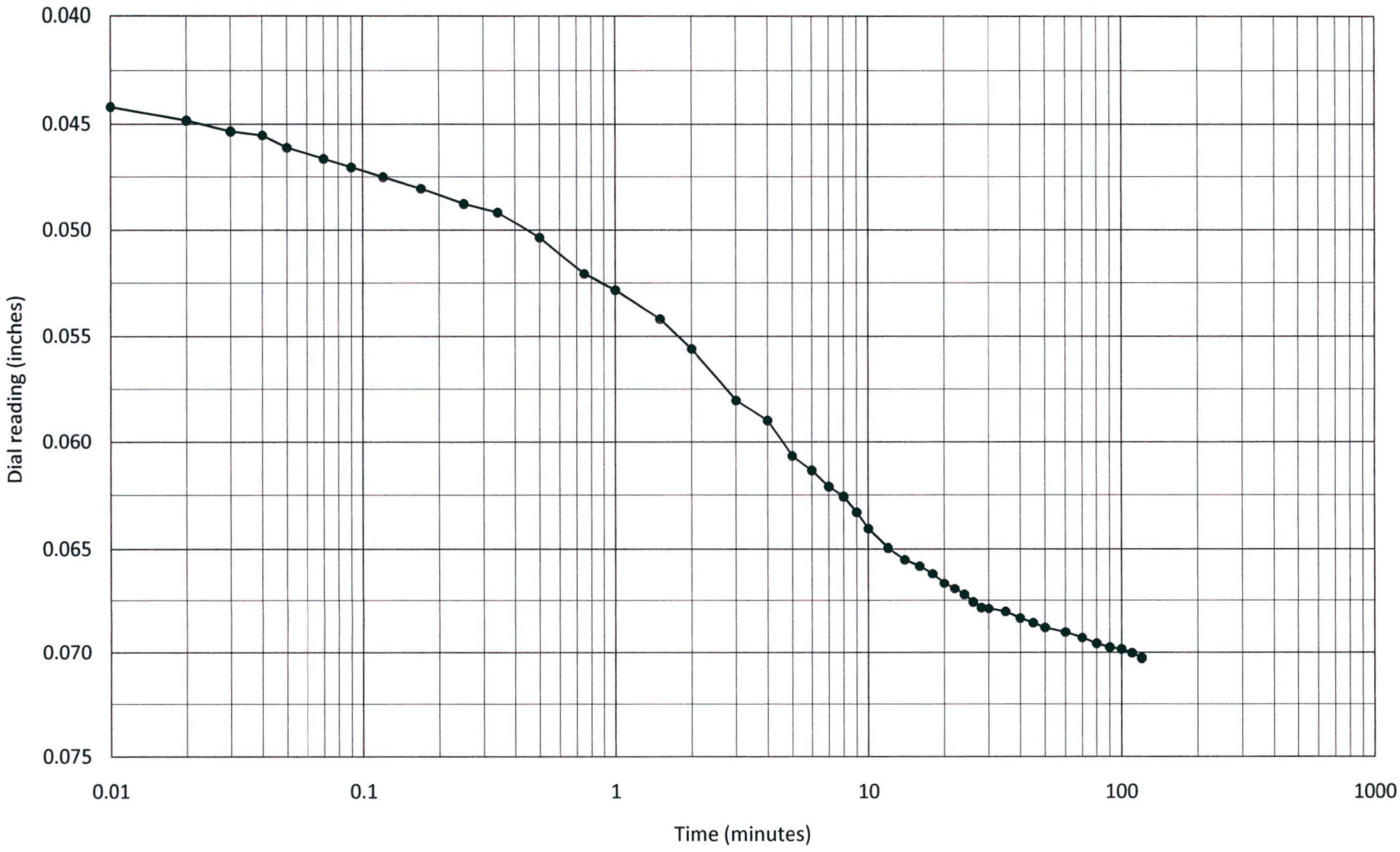


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

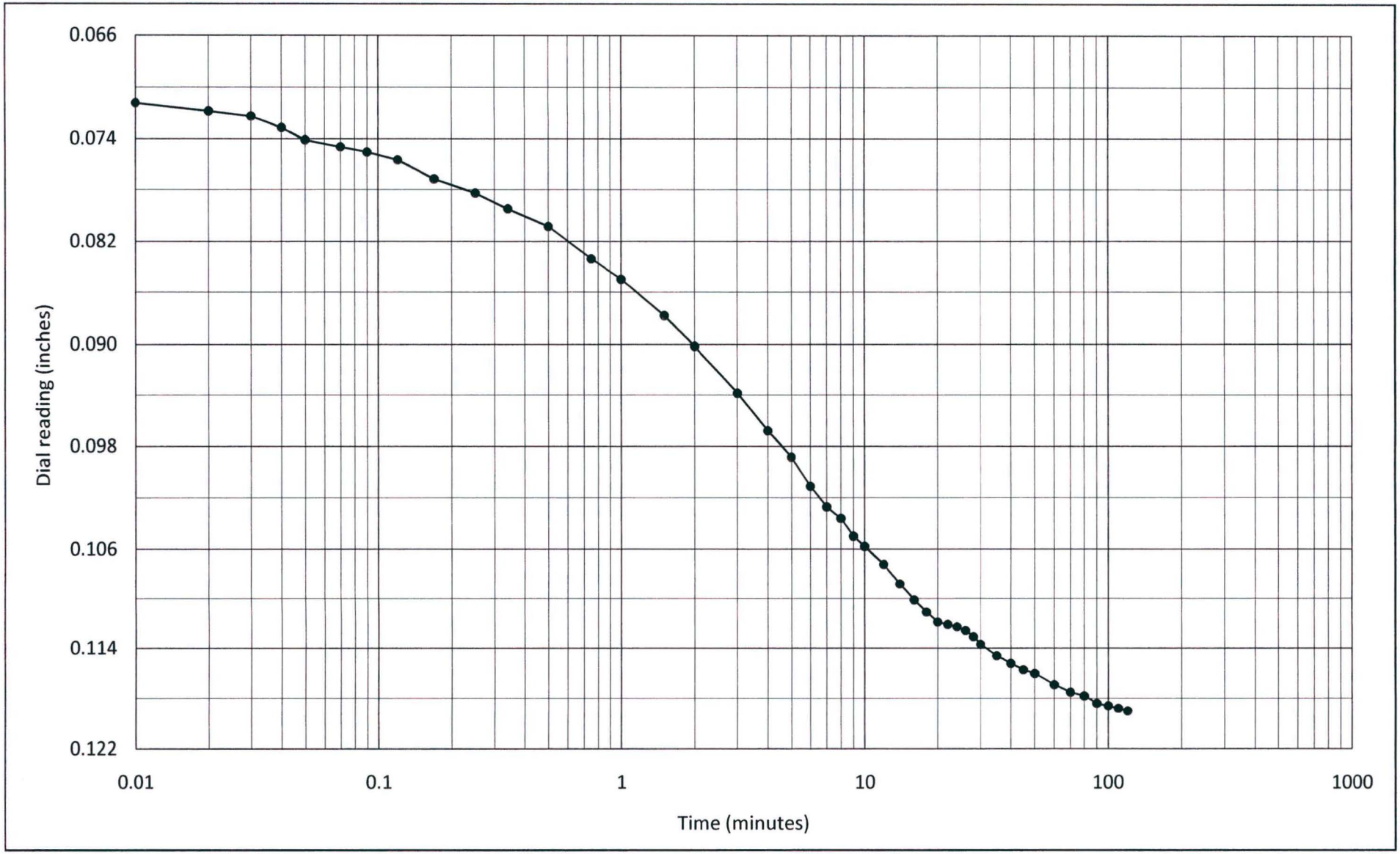


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

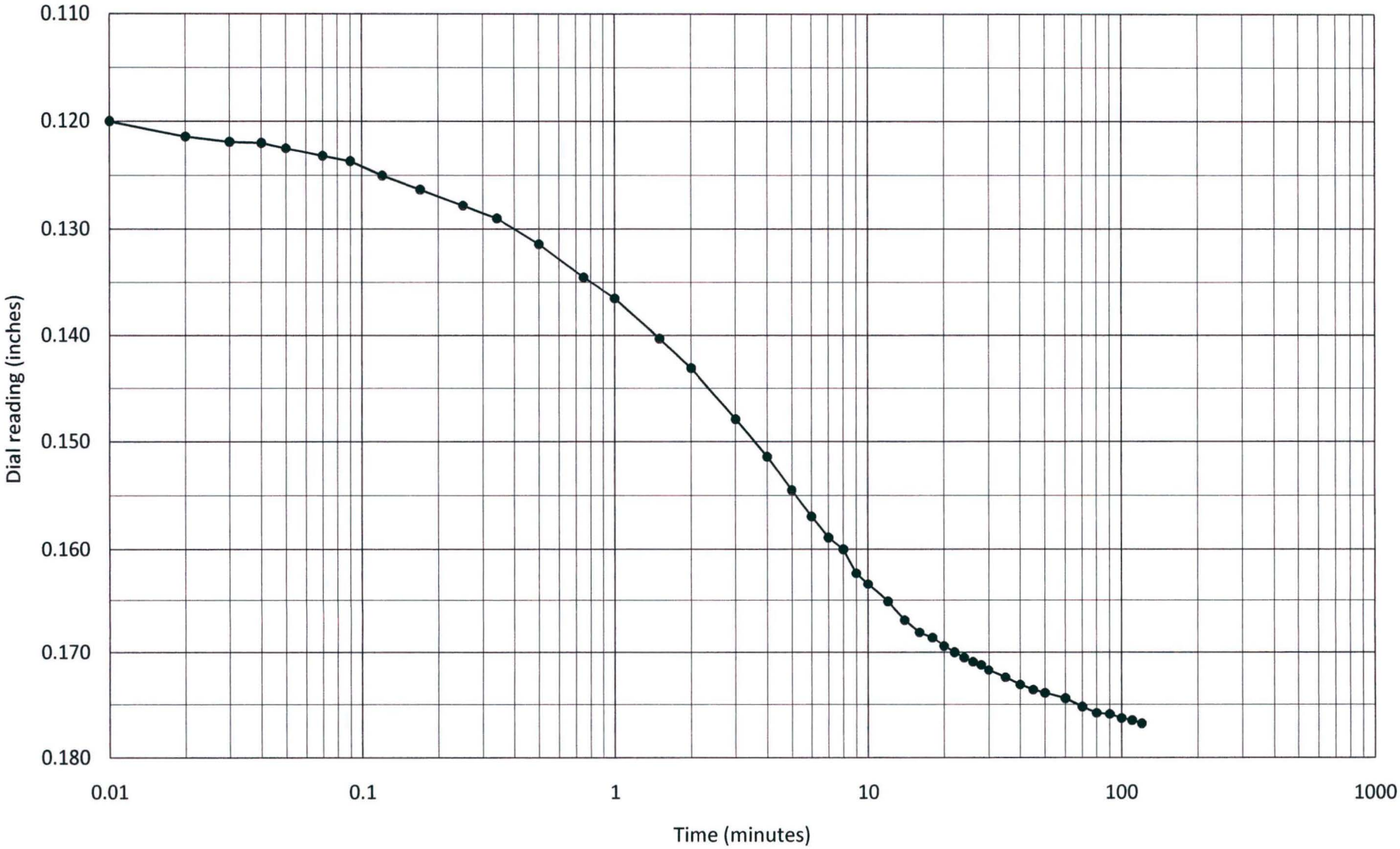


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

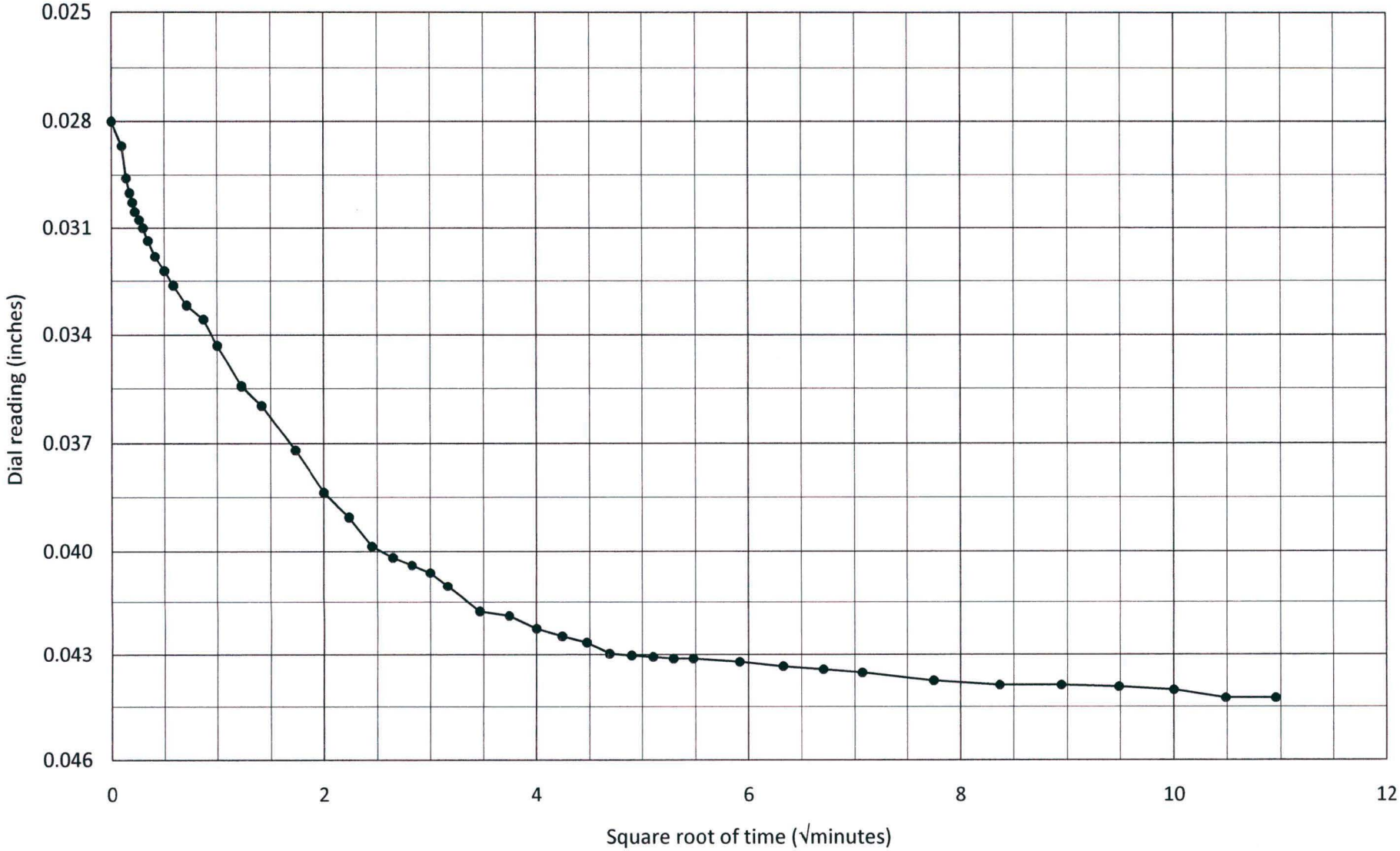


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

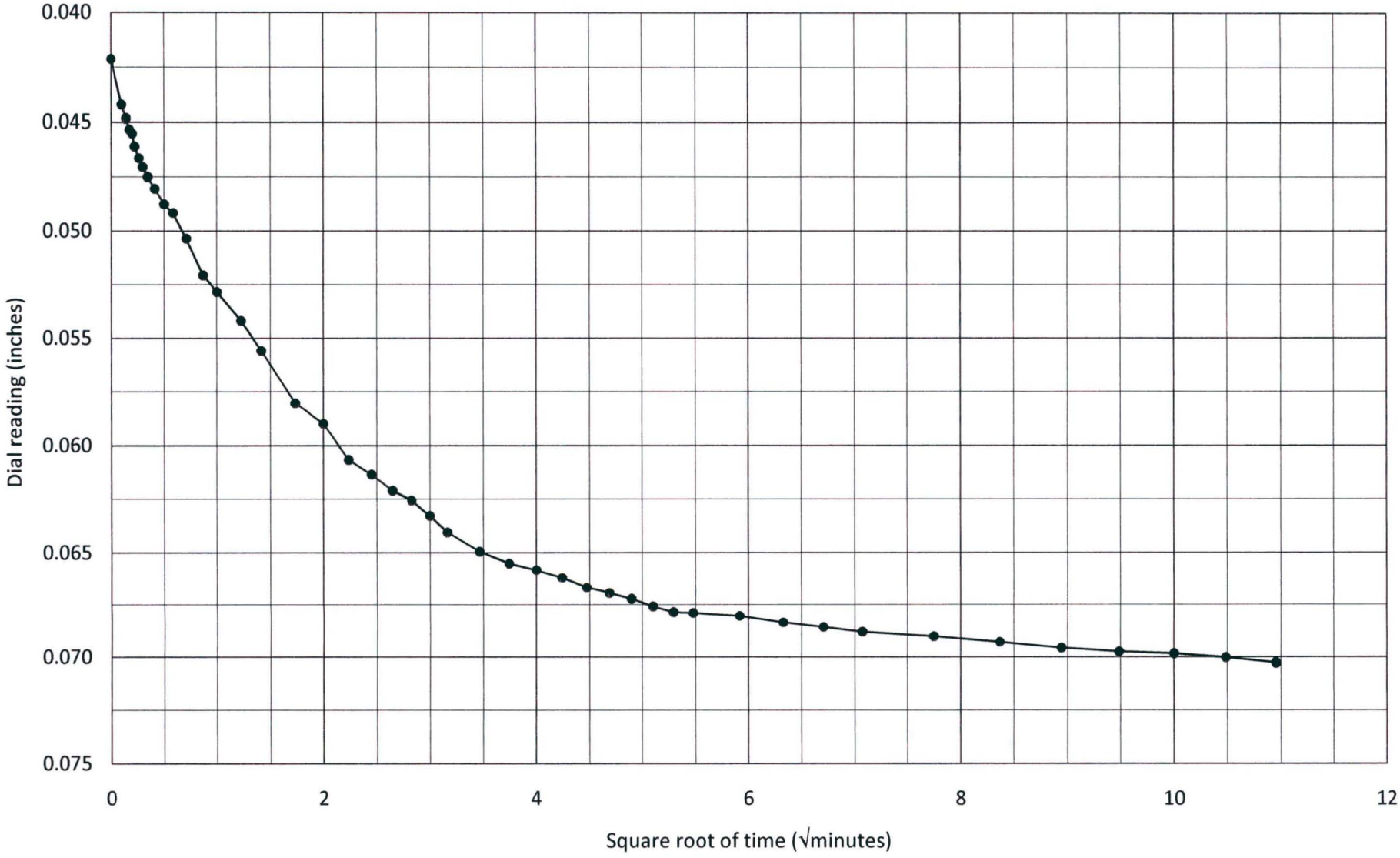


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

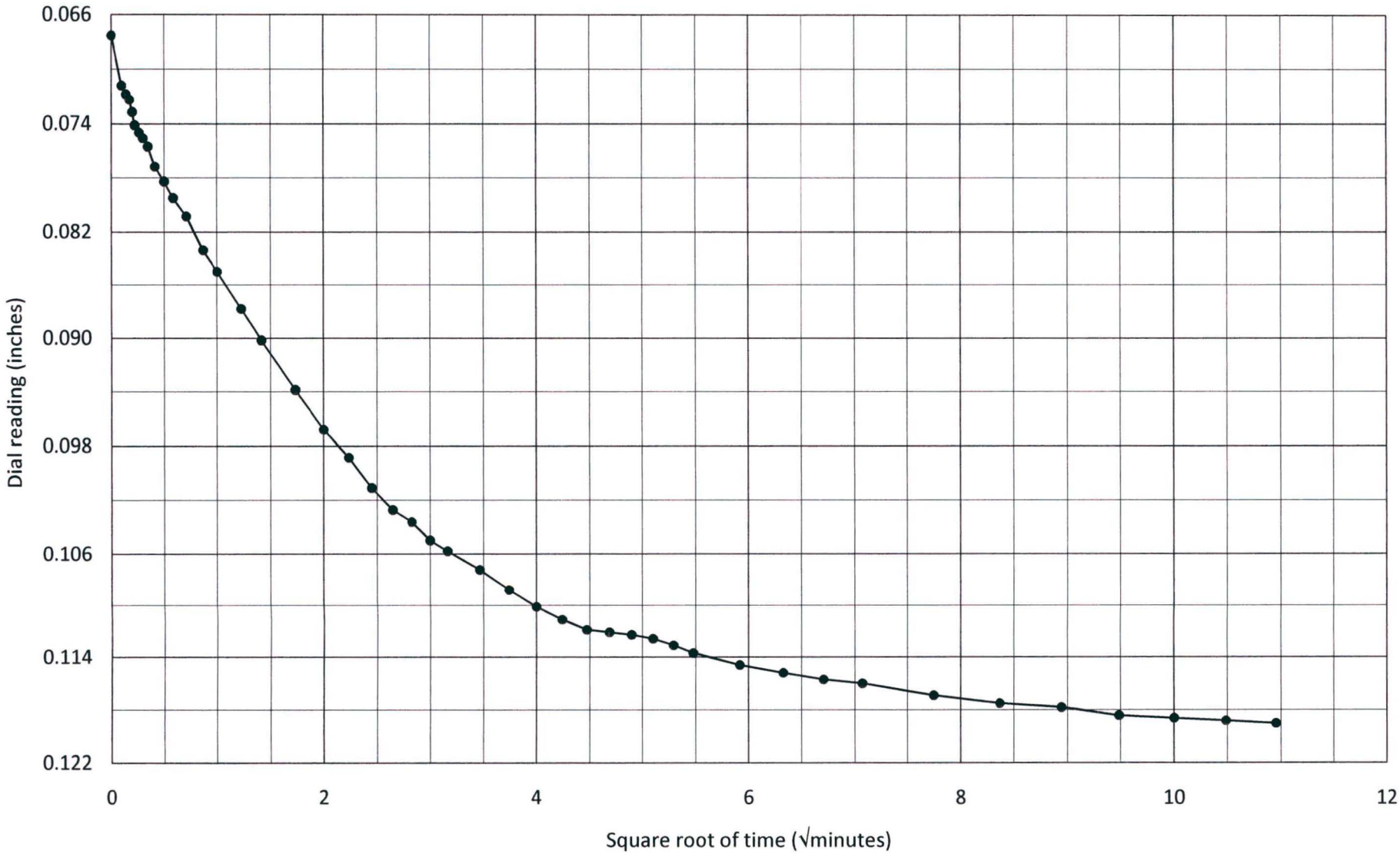


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

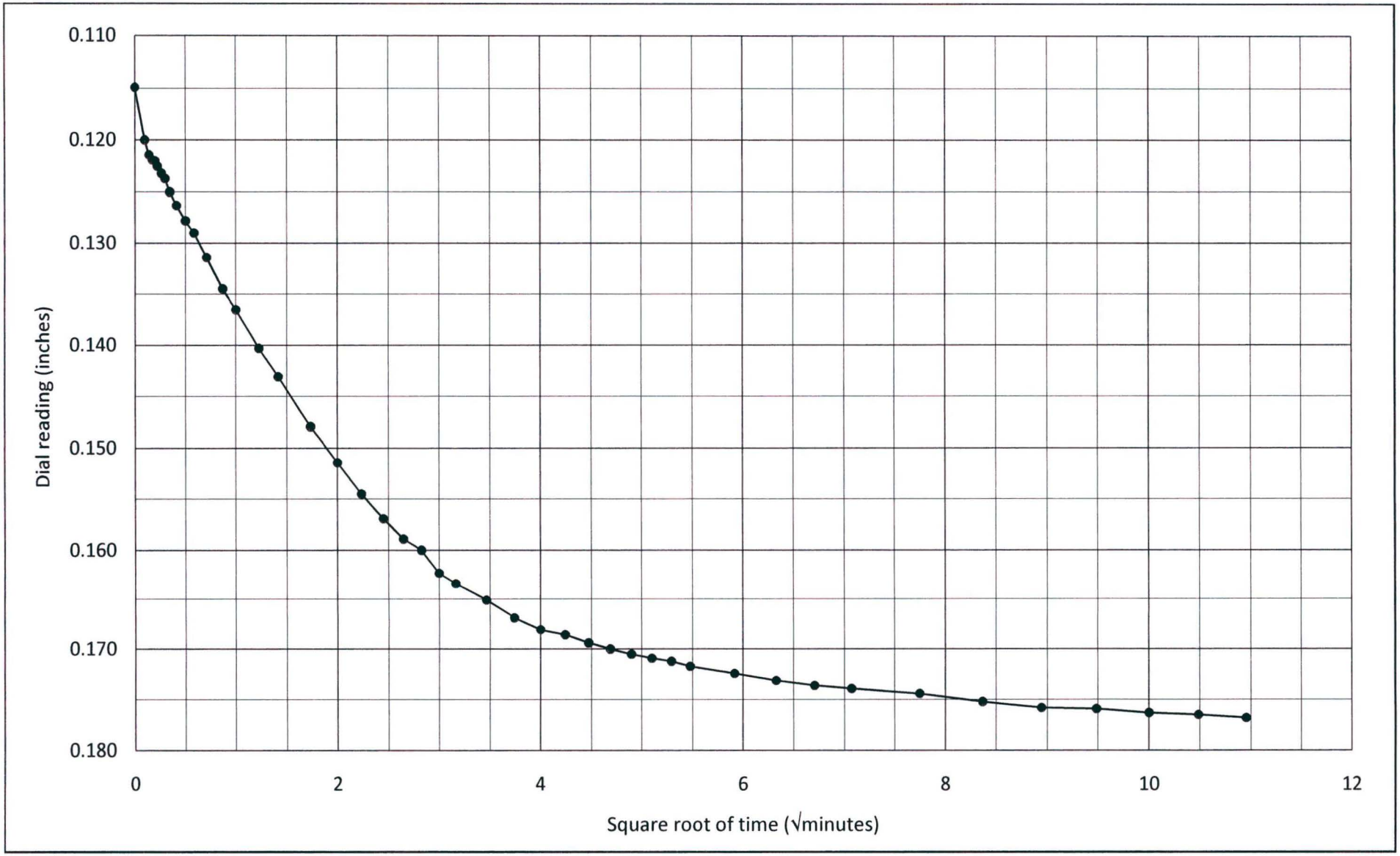


RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah



RB&G ENGINEERING, INC.

Hole no.: 08-P1
Depth: 70'-71.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Table 1

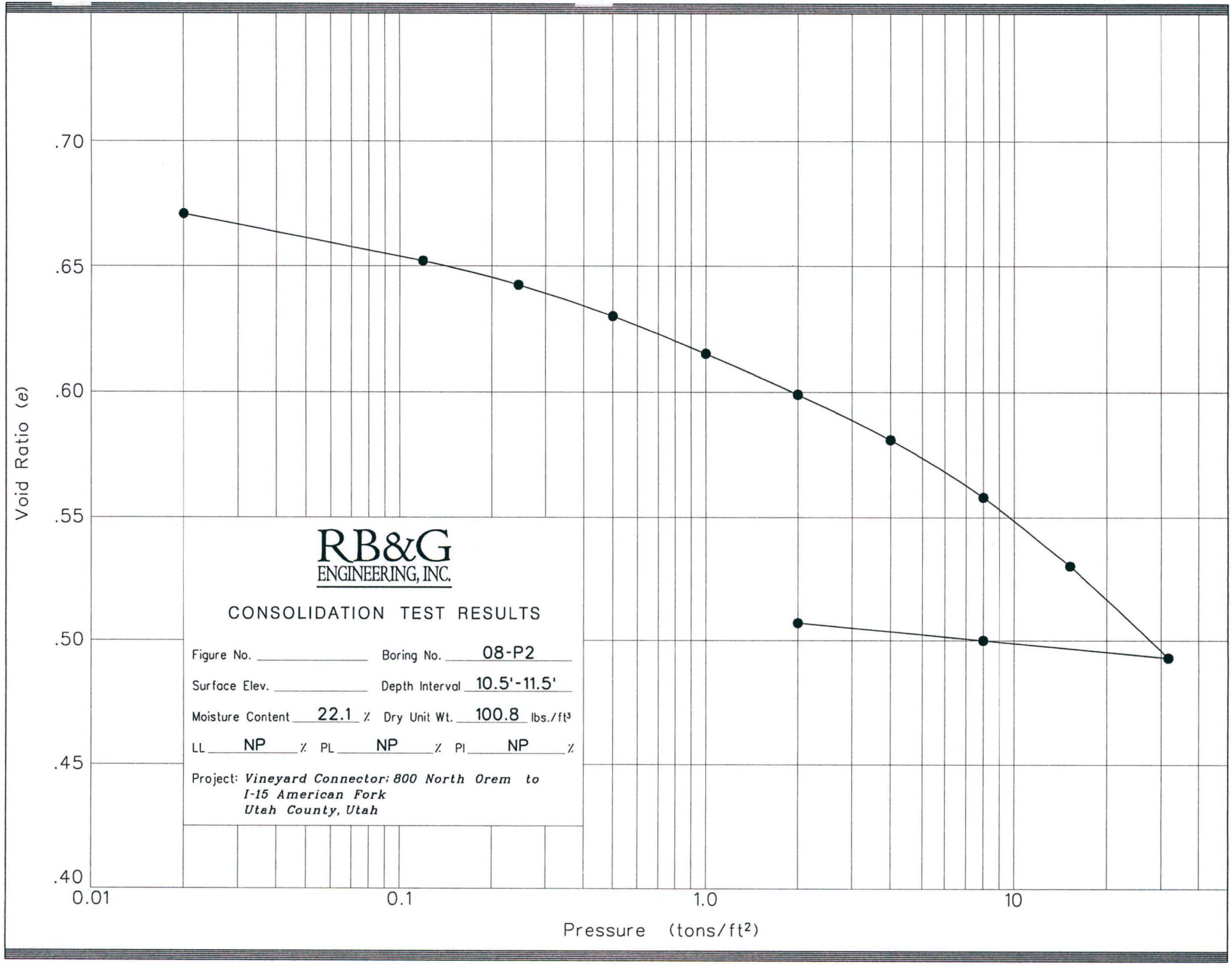
SUMMARY OF TEST DATA

PROJECT Vineyard Connector; 800 North Orem to I-15 American Fork — PROJECT NO. 200701-048

LOCATION Utah County, Utah — FEATURE Foundations

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	STANDARD PENETRATION BLOWS PER FOOT	IN-PLACE		UNCONFINED COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO Classification)
			DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
08-P2	5.1-5.6	Shelby		25.4		40	18	22	0	2	98	CL (A-6(23))
	5.6-6.5	Shelby		24.0				NP	0	72	28	SM (A-2-4(0))
	10-10.7	Shelby		20.1				NP	0	64	36	SM (A-4(0))
	10.7-11.5	Shelby	100.8	22.1				NP	0	34	66	ML (A-4(0))
	11.5-13	11		26.9				NP	0	86	14	SM (A-2-4(0))
	20-20.6	Shelby		19.2				NP	0	61	39	SM (A-4(0))
	20.6-21.5	Shelby	96.5	27.5	1963	32	18	14	0	2	98	CL (A-6(13))
	30-31.5	Shelby	97.4	22.0	1720	27	16	11	0	20	80	CL (A-6(7))
	35-36.5	23		23.9				NP	0	75	25	SM (A-2-4(0))
	40-41.5	Shelby		21.7				NP	0	72	28	SM (A-2-4(0))
	50-51.5	Shelby	79.4	41.3		46	22	24	0	0	100	CL (A-7-6(27))
	60-61.5	Shelby	78.1	41.4	2326	48	22	26	0	1	99	CL (A-7-6(29))
	70-71.5	Shelby	75.4	43.3		58	25	33	0	0	100	CH (A-7-6(38))

NP=Nonplastic



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

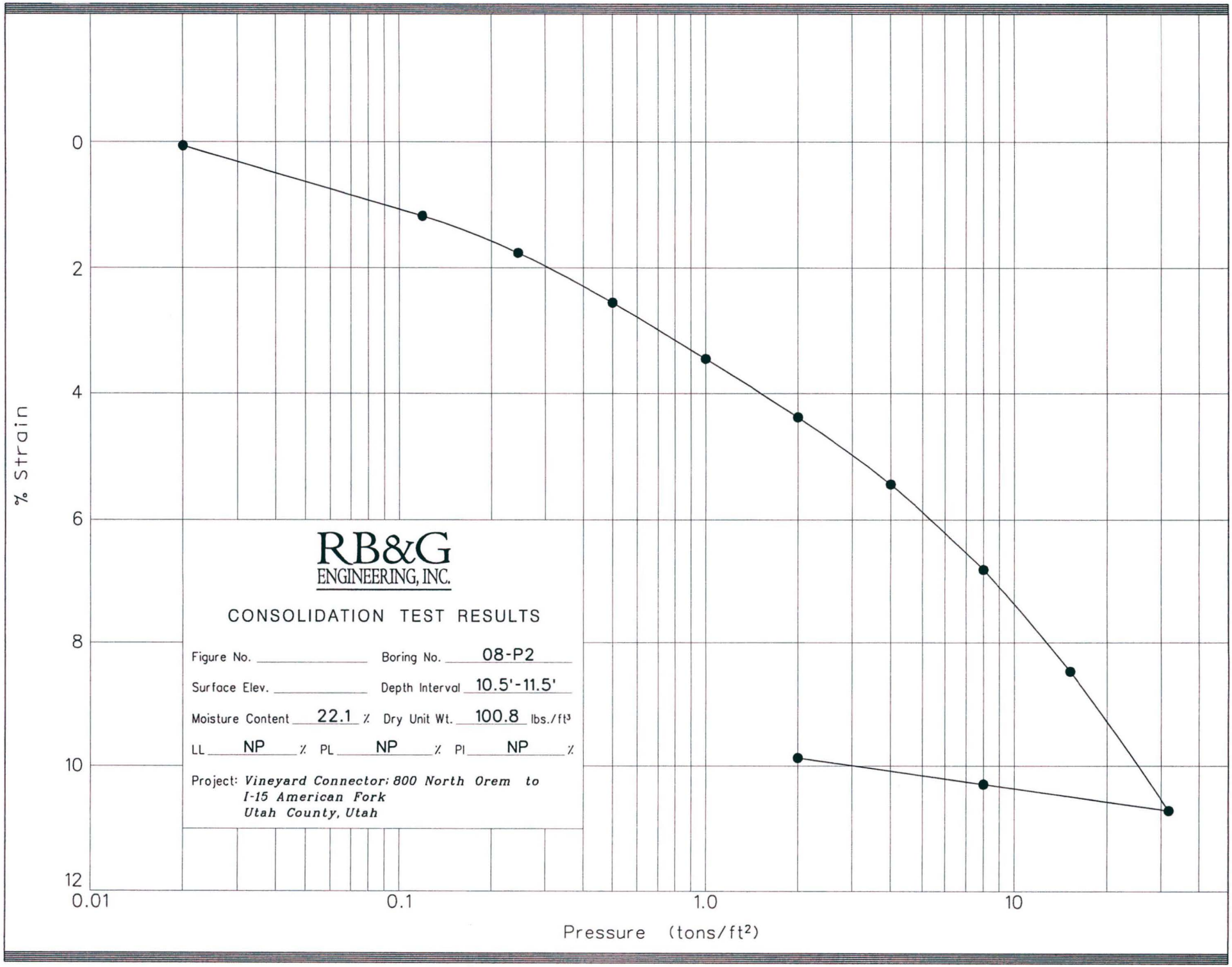
Figure No. _____ Boring No. 08-P2

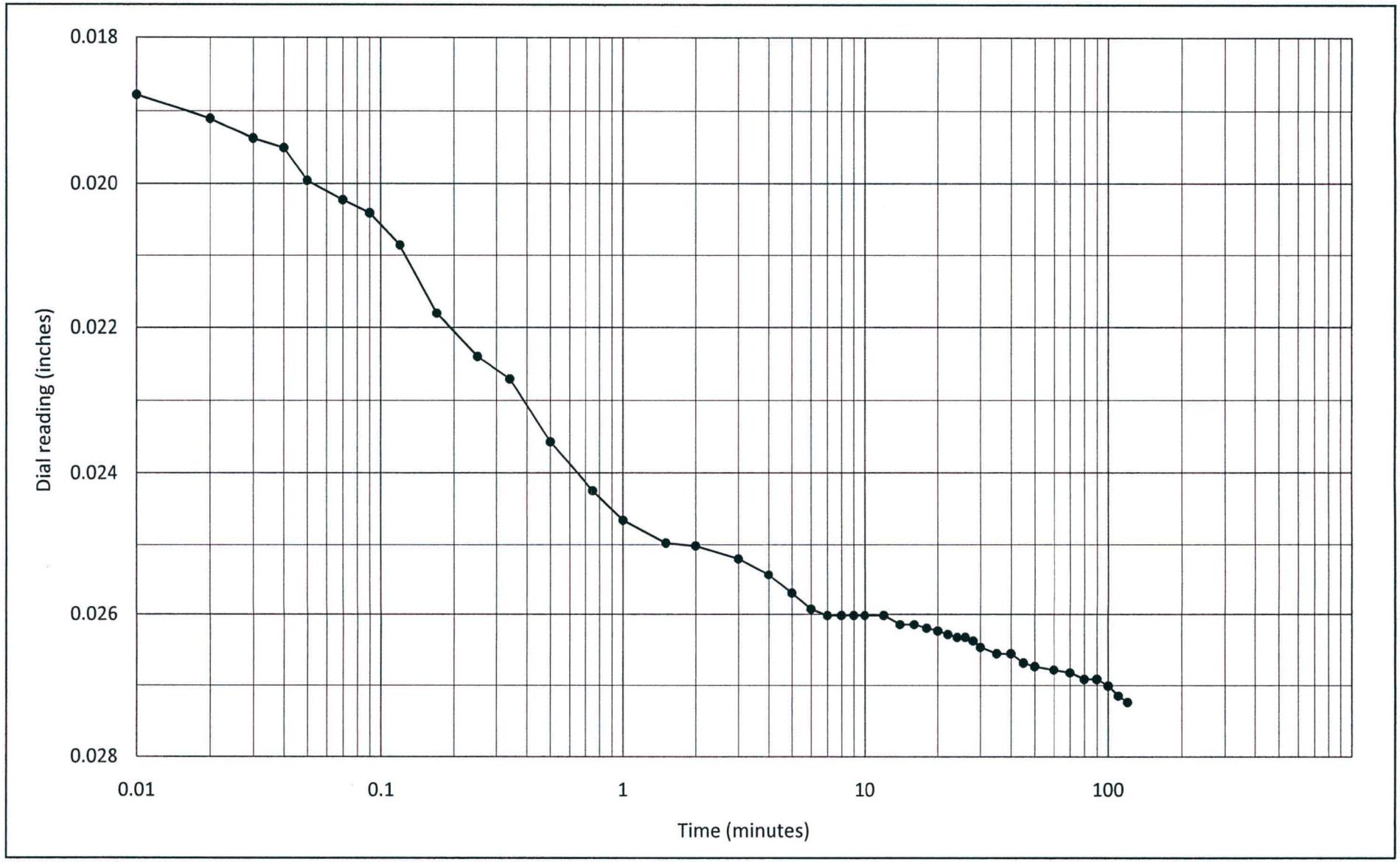
Surface Elev. _____ Depth Interval 10.5'-11.5'

Moisture Content 22.1 % Dry Unit Wt. 100.8 lbs./ft³

LL NP % PL NP % PI NP %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*


% Strain
0
2
4
6
8
10
12
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P2
Surface Elev. _____ Depth Interval 10.5'-11.5'
Moisture Content 22.1 % Dry Unit Wt. 100.8 lbs./ft³
LL NP % PL NP % PI NP %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah

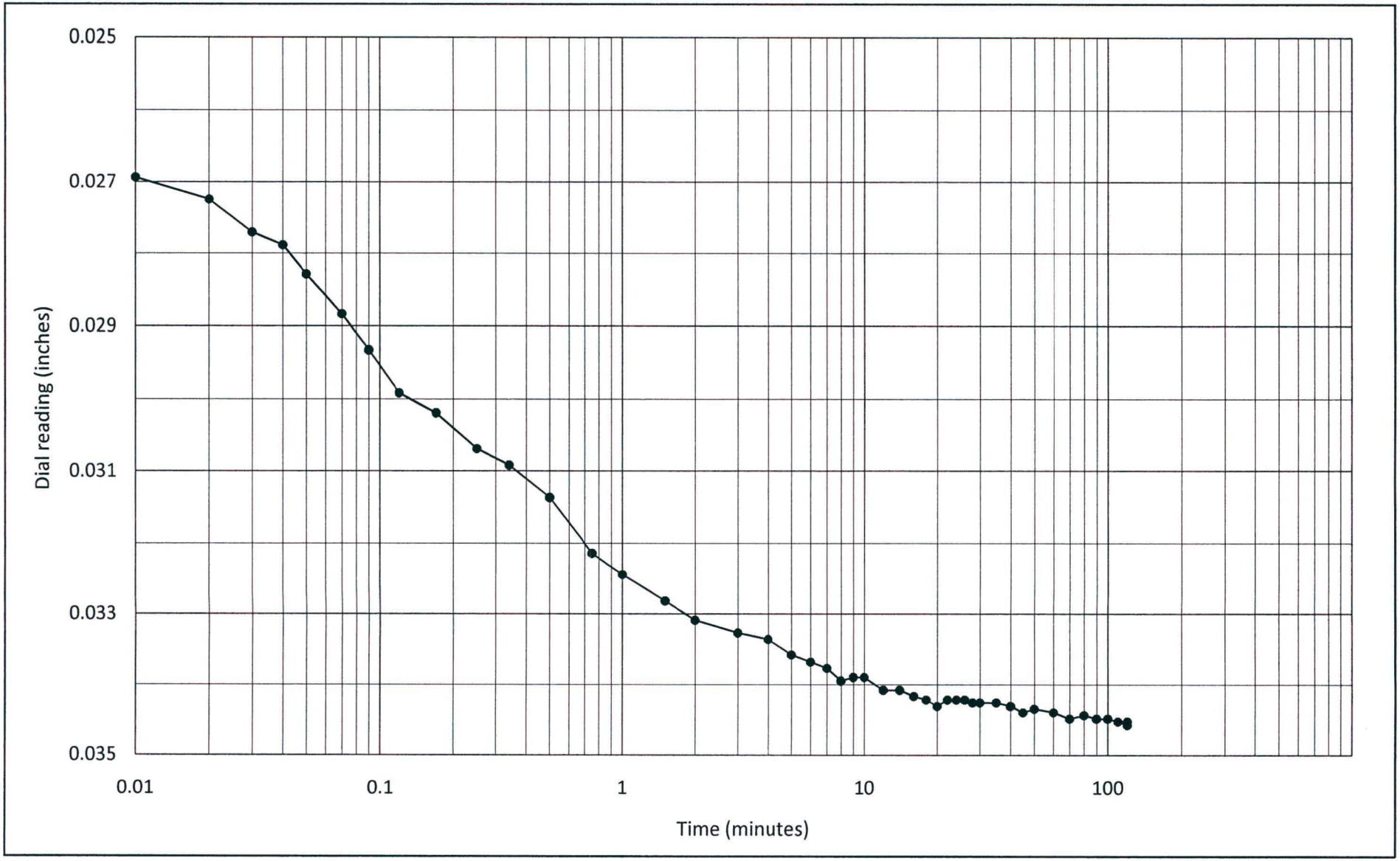


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 0.25 to 0.5 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

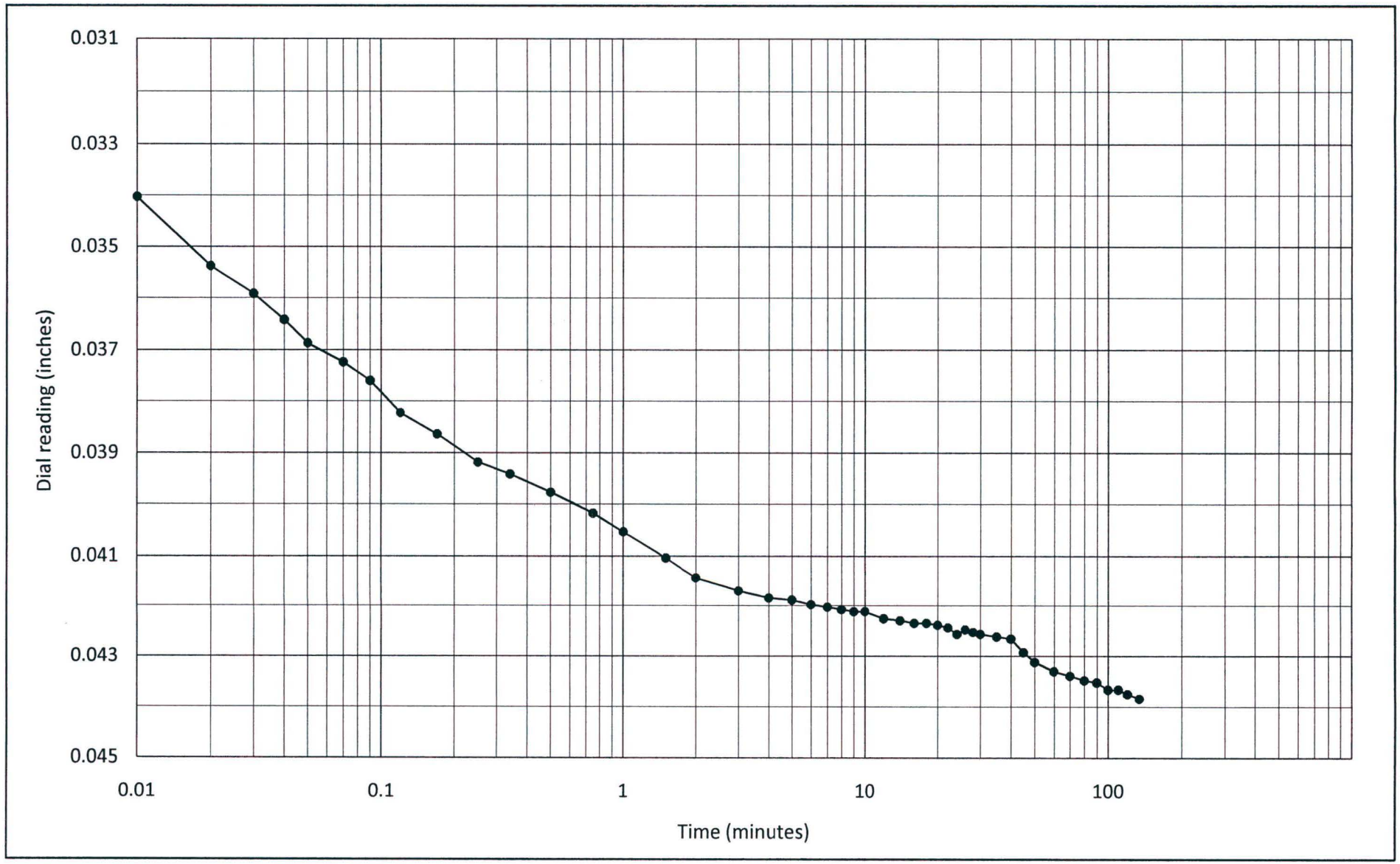


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

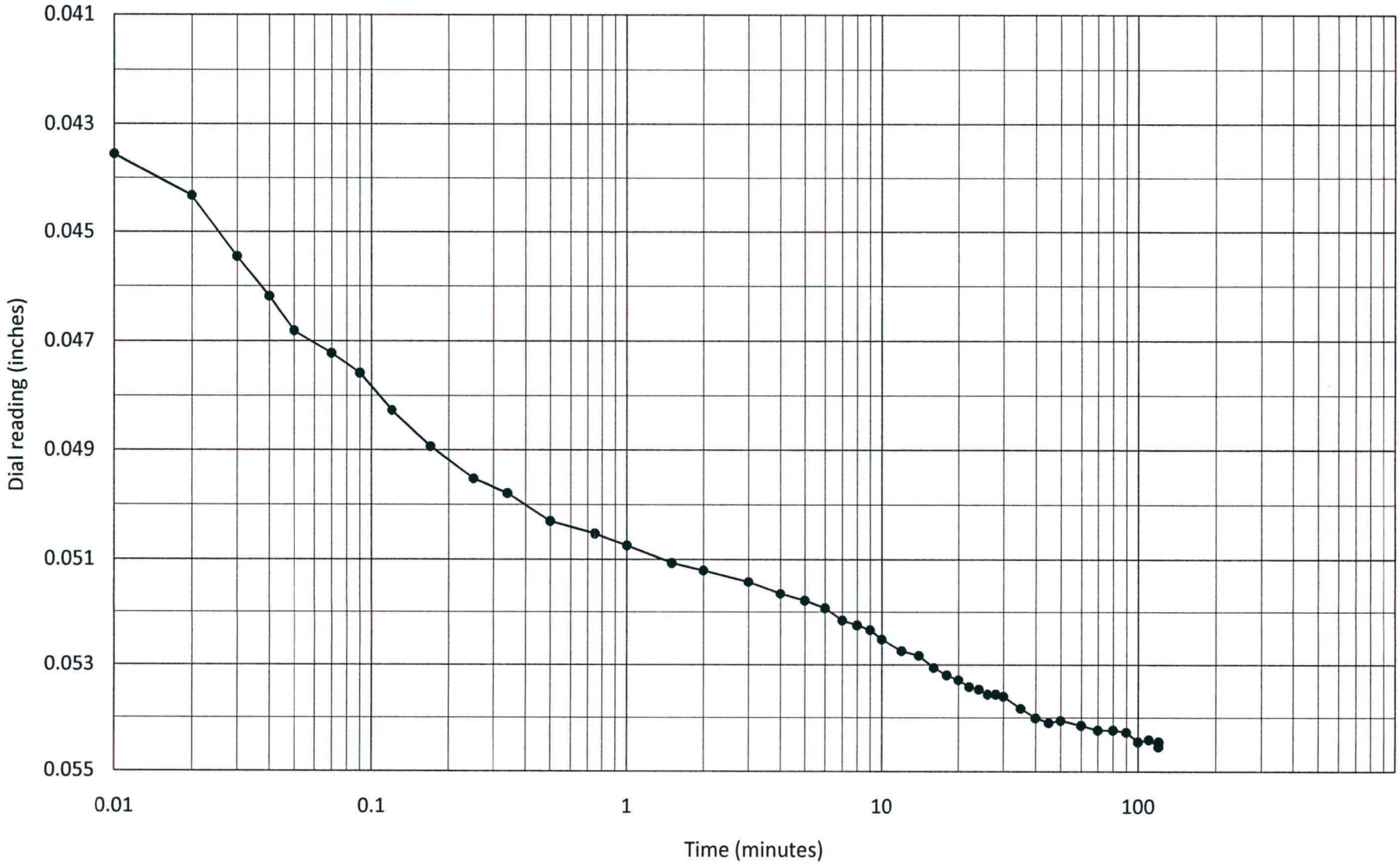


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

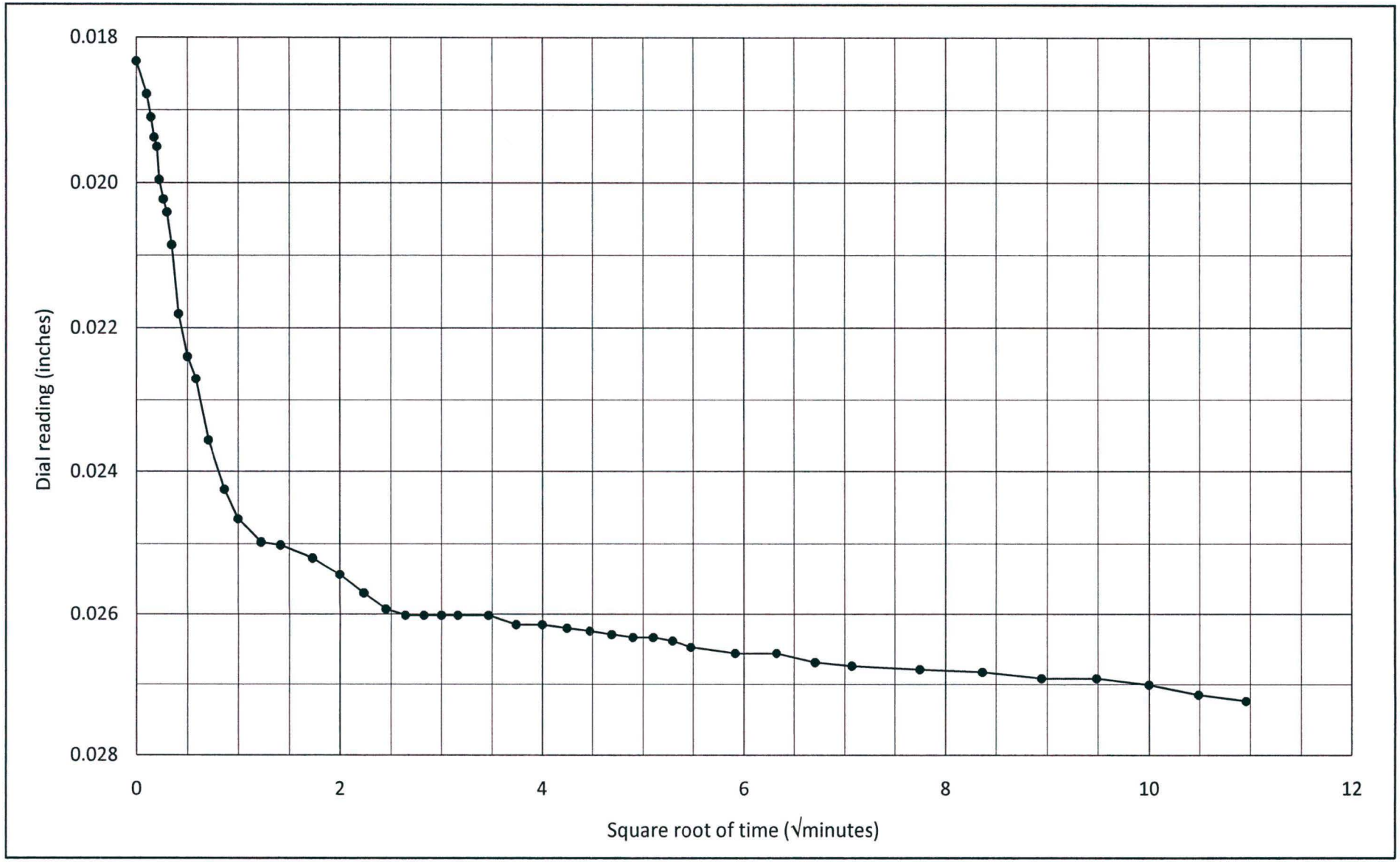


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

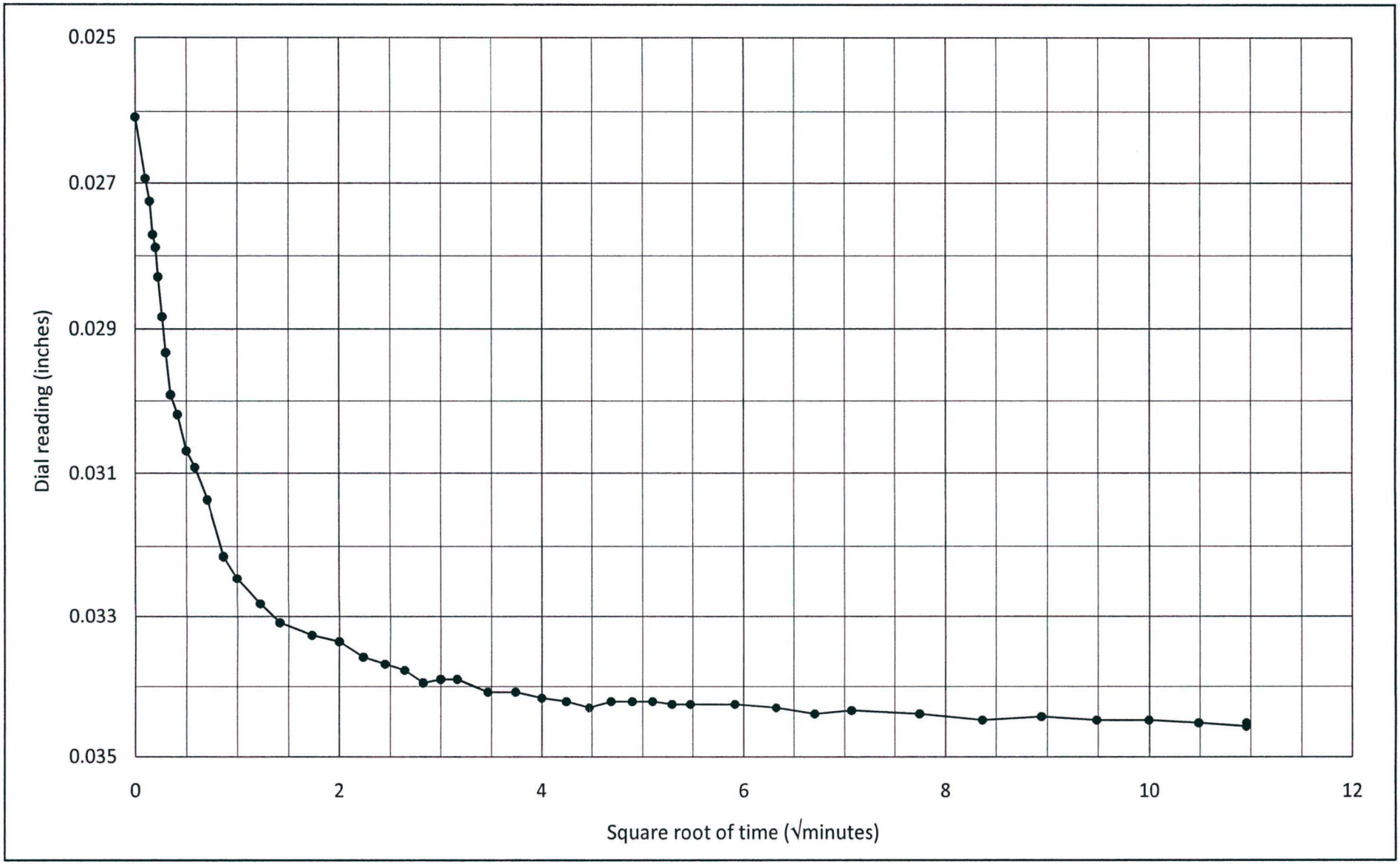


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 0.25 to 0.5 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

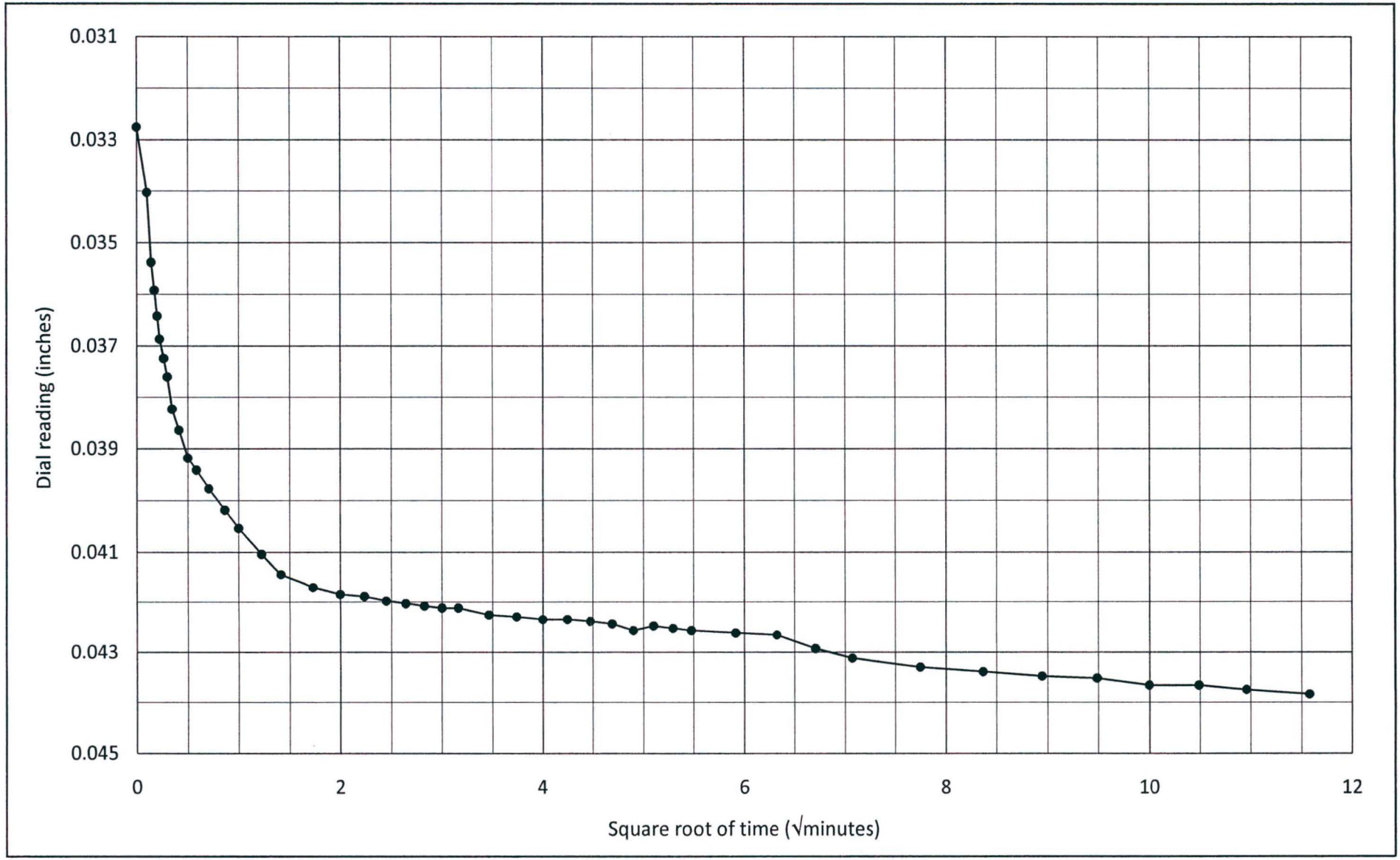


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 0.5 to 1 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

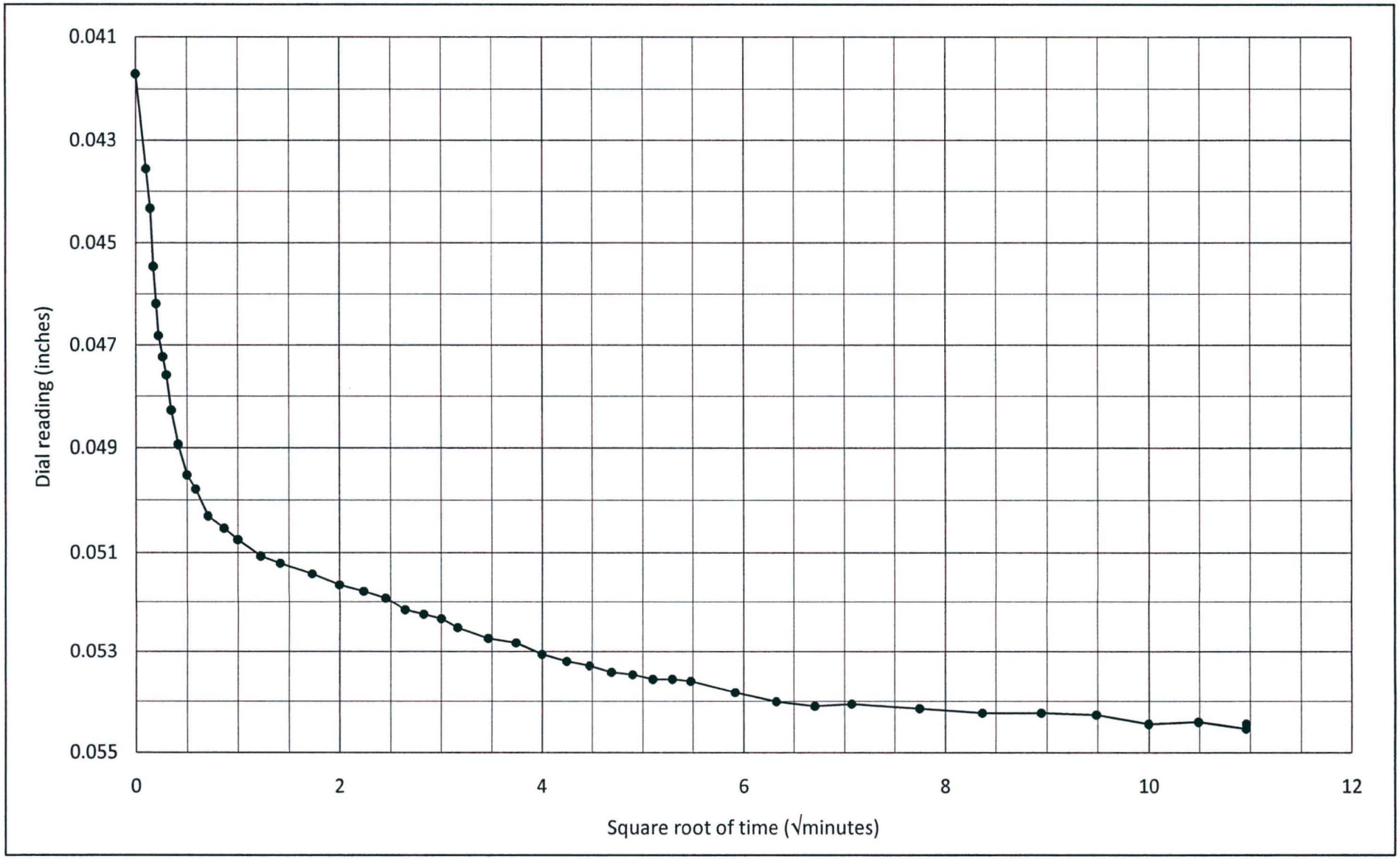


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

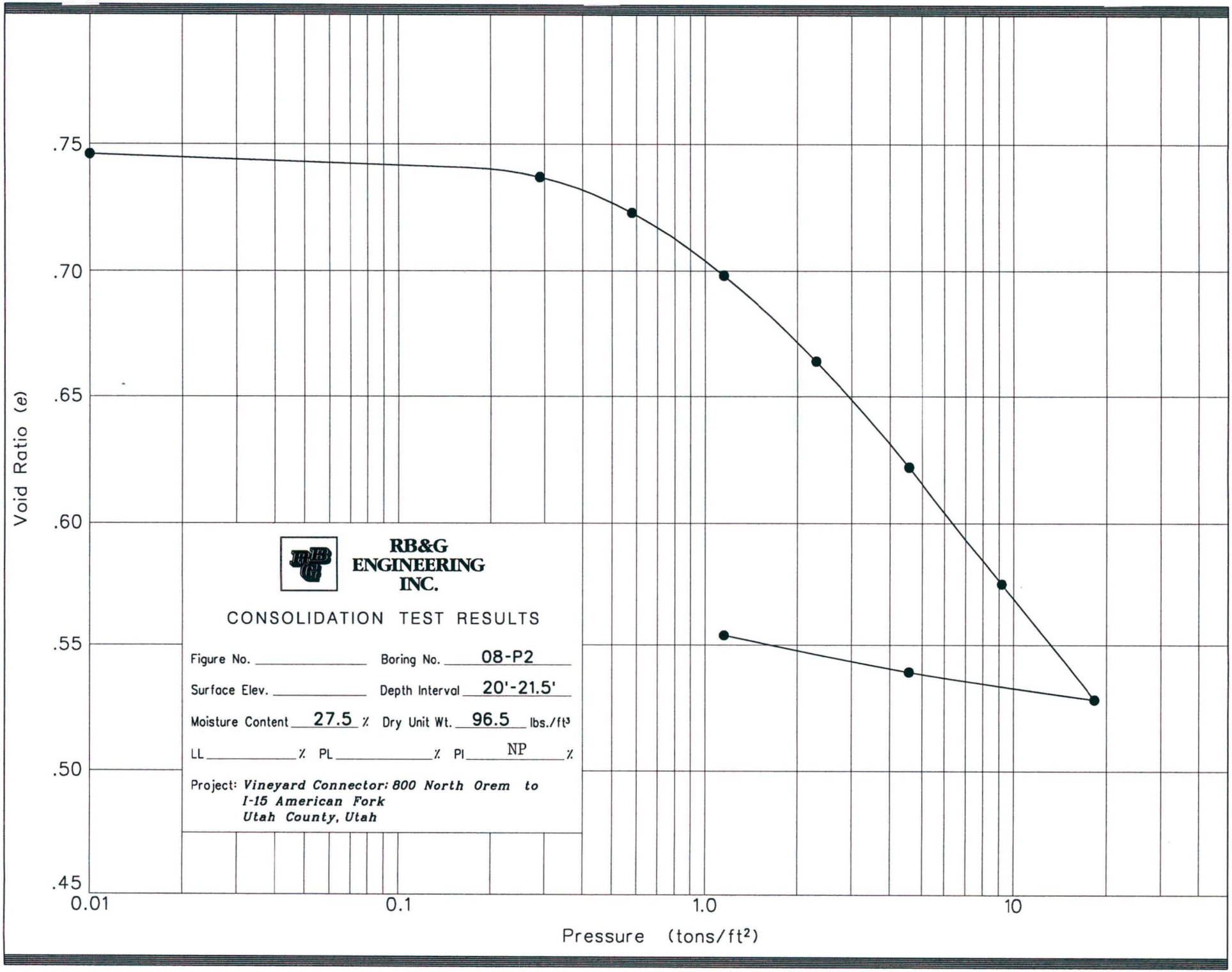


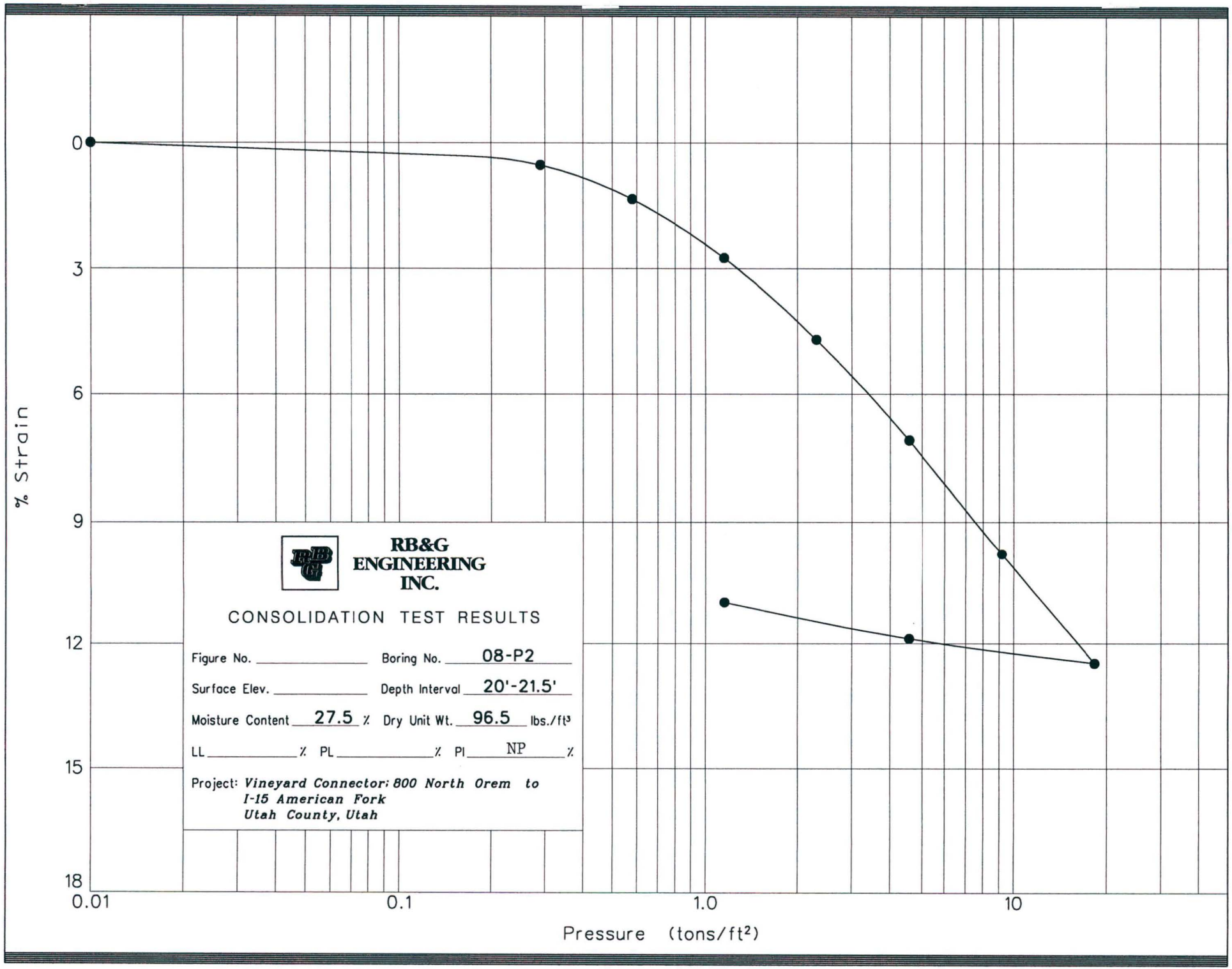
RB&G ENGINEERING, INC.

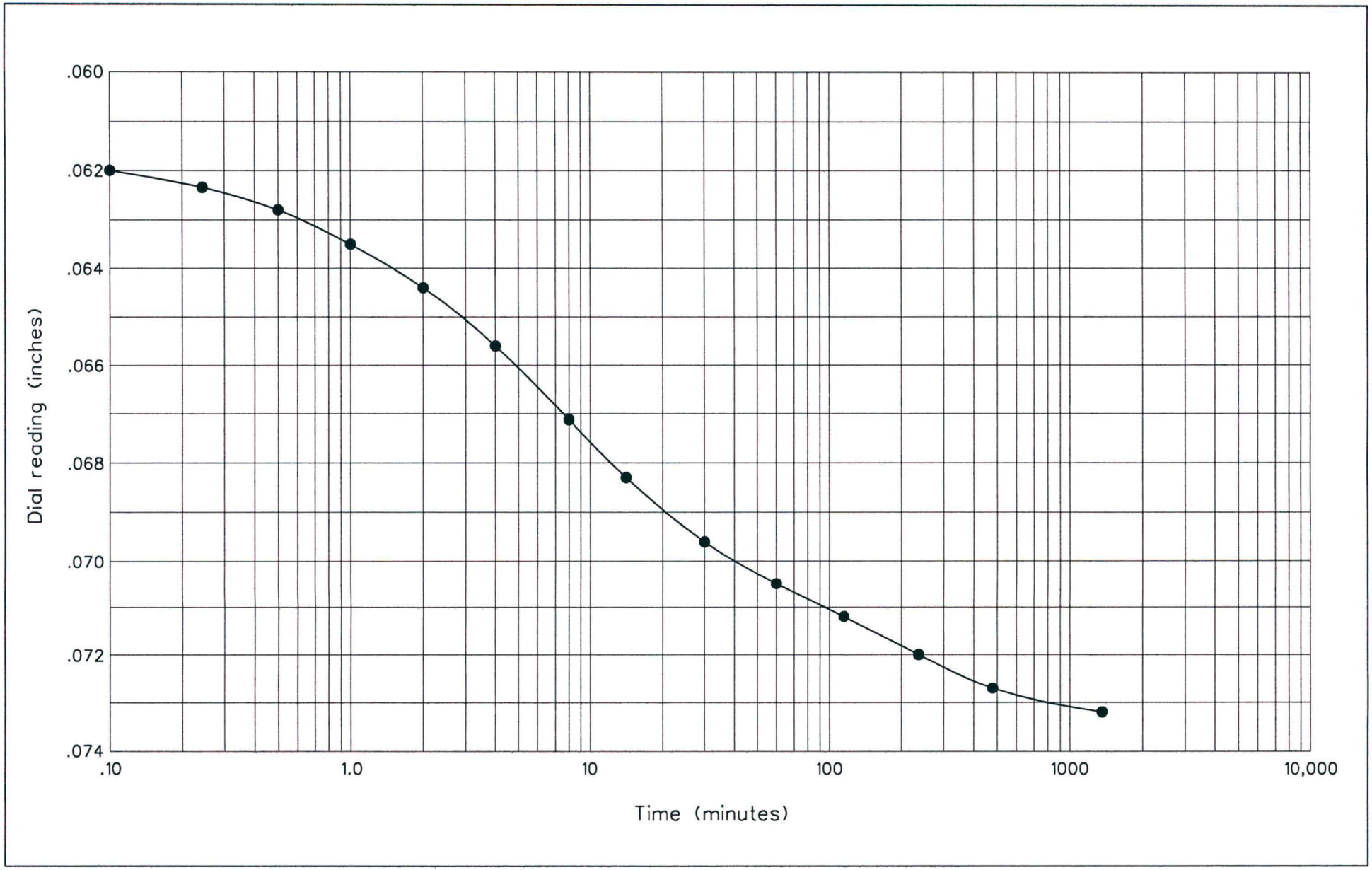
Hole no.: 08-P2
Depth: 10.5' to 11.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah


.75
.70
.65
.60
.55
.50
.45
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P2
Surface Elev. _____ Depth Interval 20'-21.5'
Moisture Content 27.5 % Dry Unit Wt. 96.5 lbs./ft³
LL _____ % PL _____ % PI NP %
Project: Vineyard Connector: 800 North Orem to I-15 American Fork
Utah County, Utah


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P2
Surface Elev. _____ Depth Interval 20'-21.5'
Moisture Content 27.5 % Dry Unit Wt. 96.5 lbs./ft³
LL _____ % PL _____ % PI NP %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah



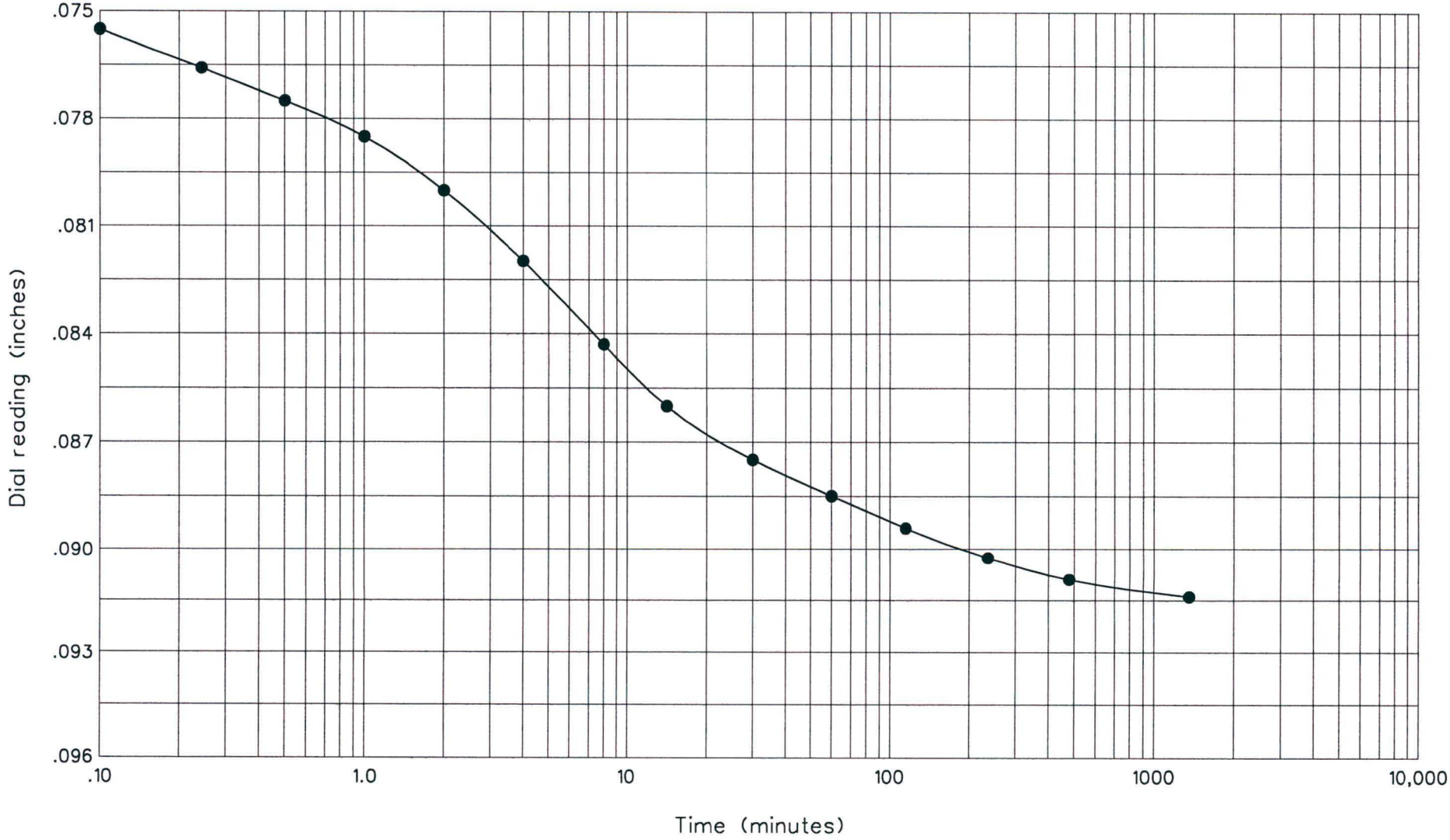
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 20'-21.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



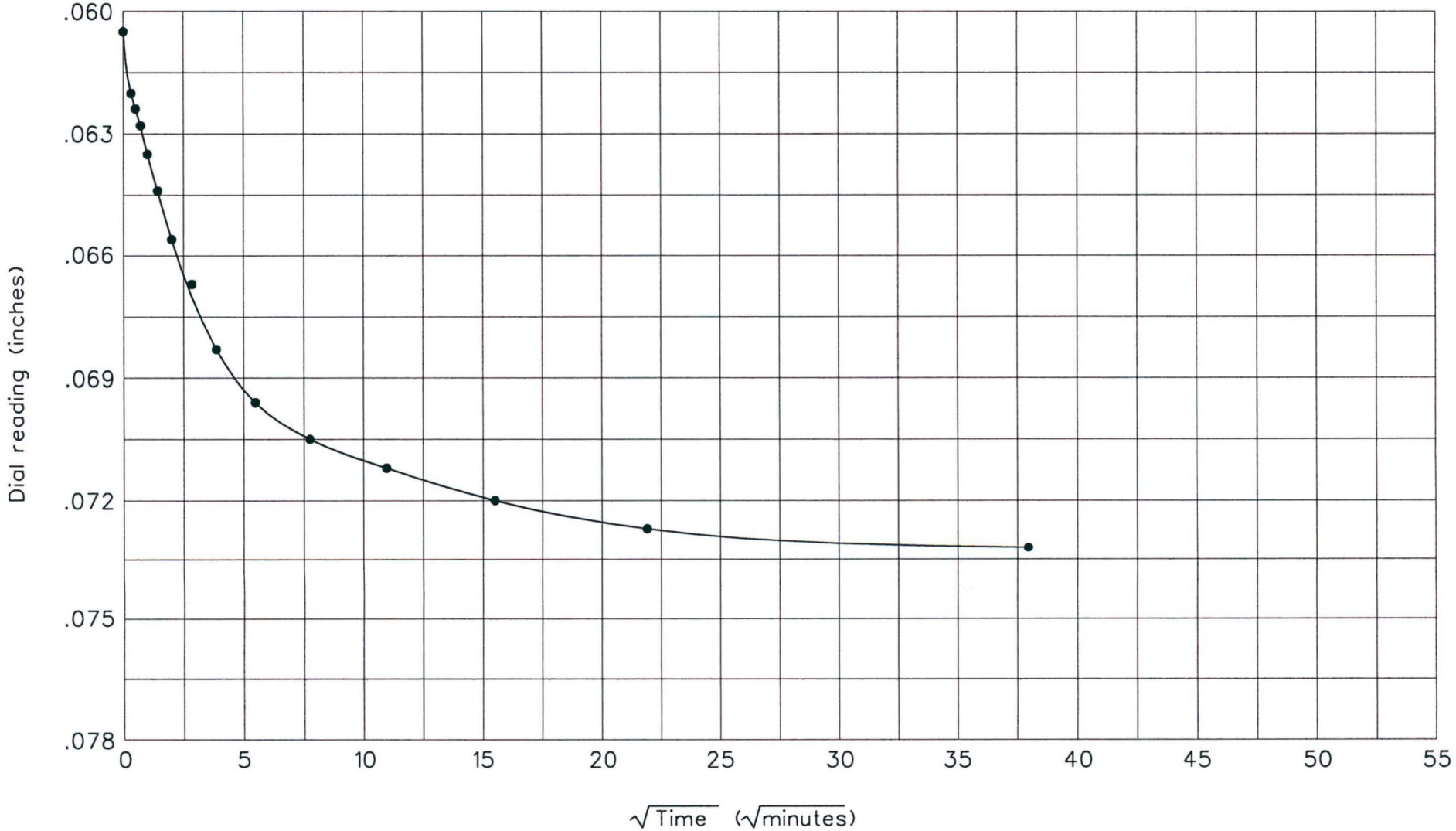
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 20'-21.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



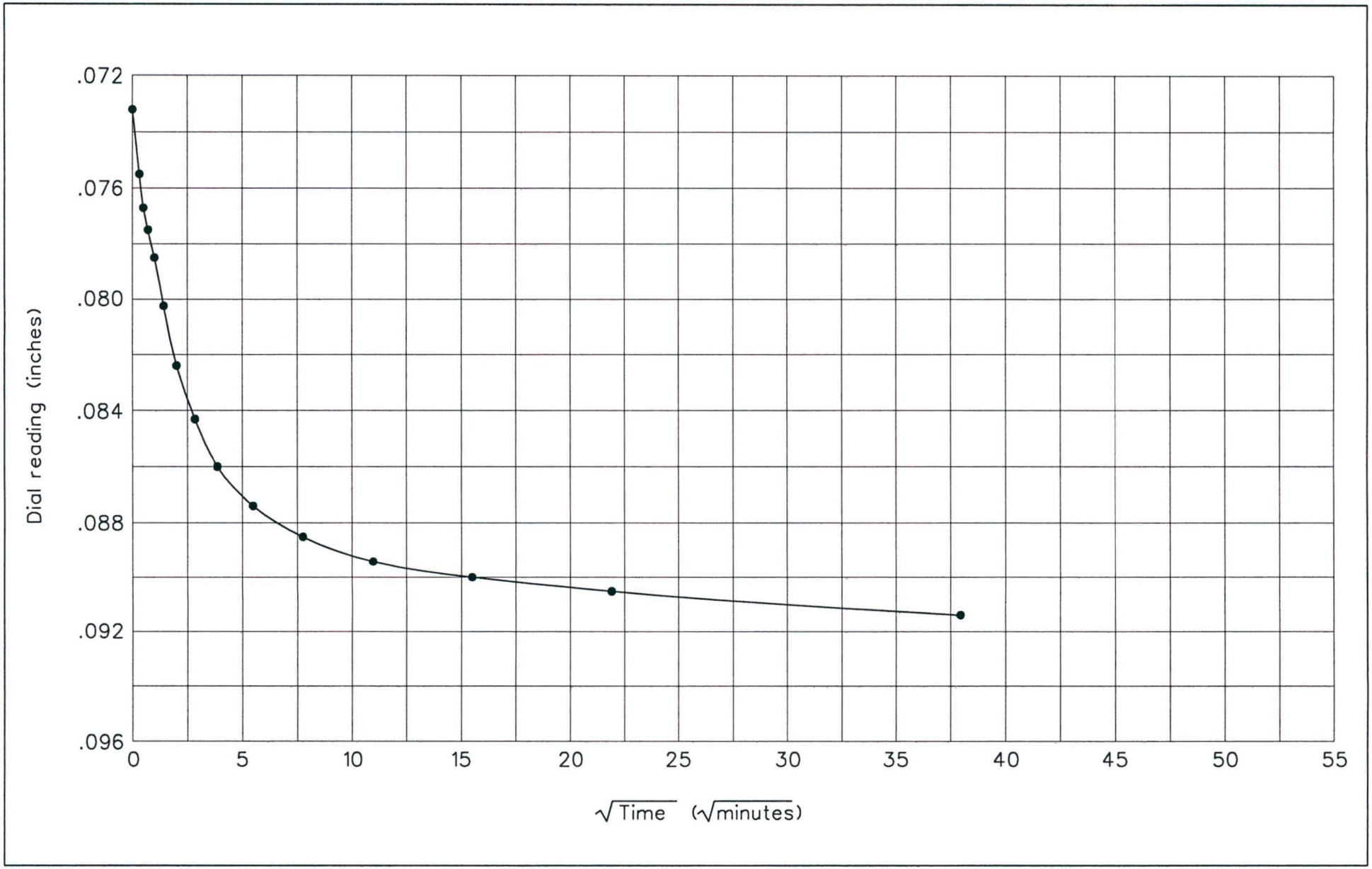
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 20'-21.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



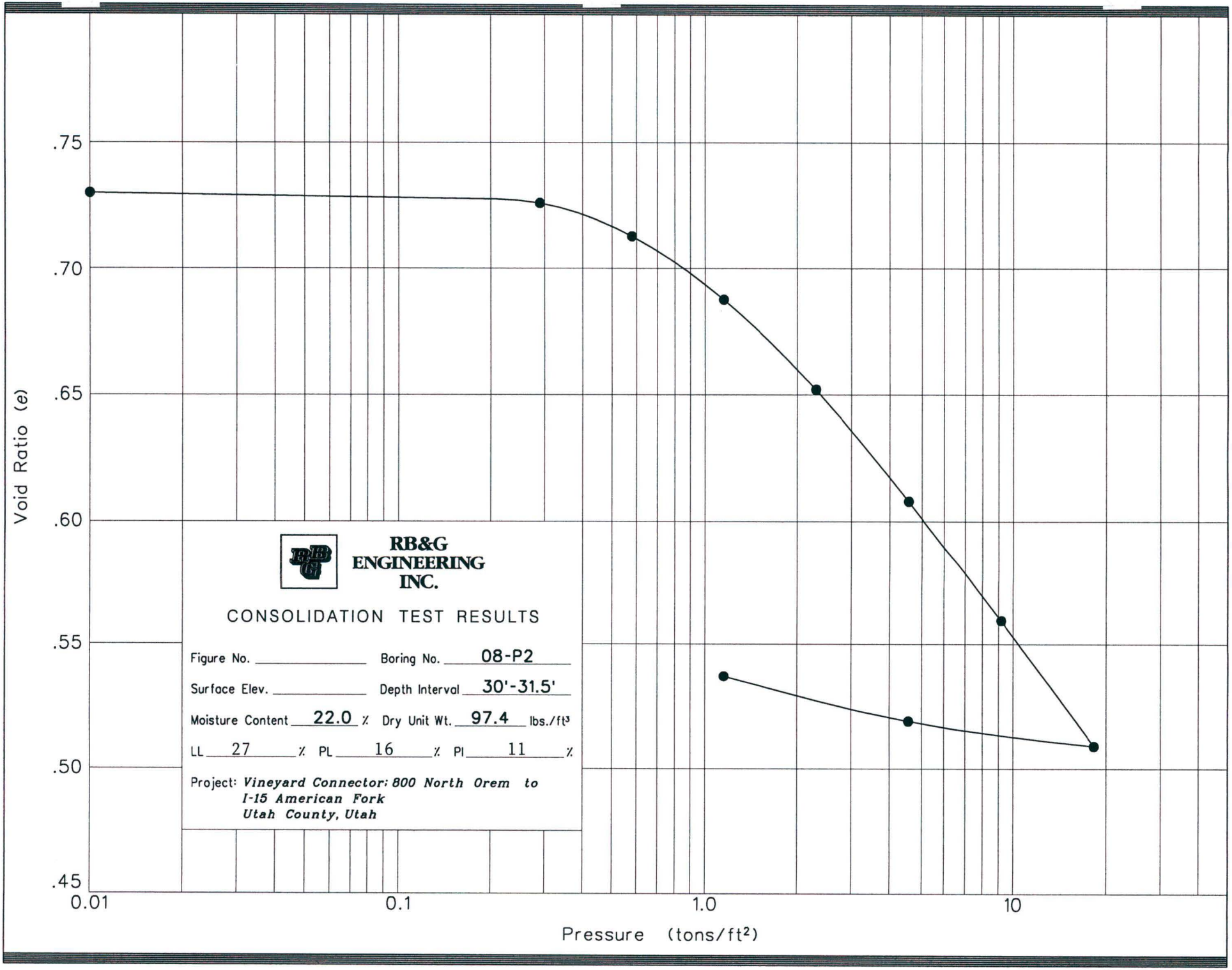
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 20'-21.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G ENGINEERING INC.

CONSOLIDATION TEST RESULTS

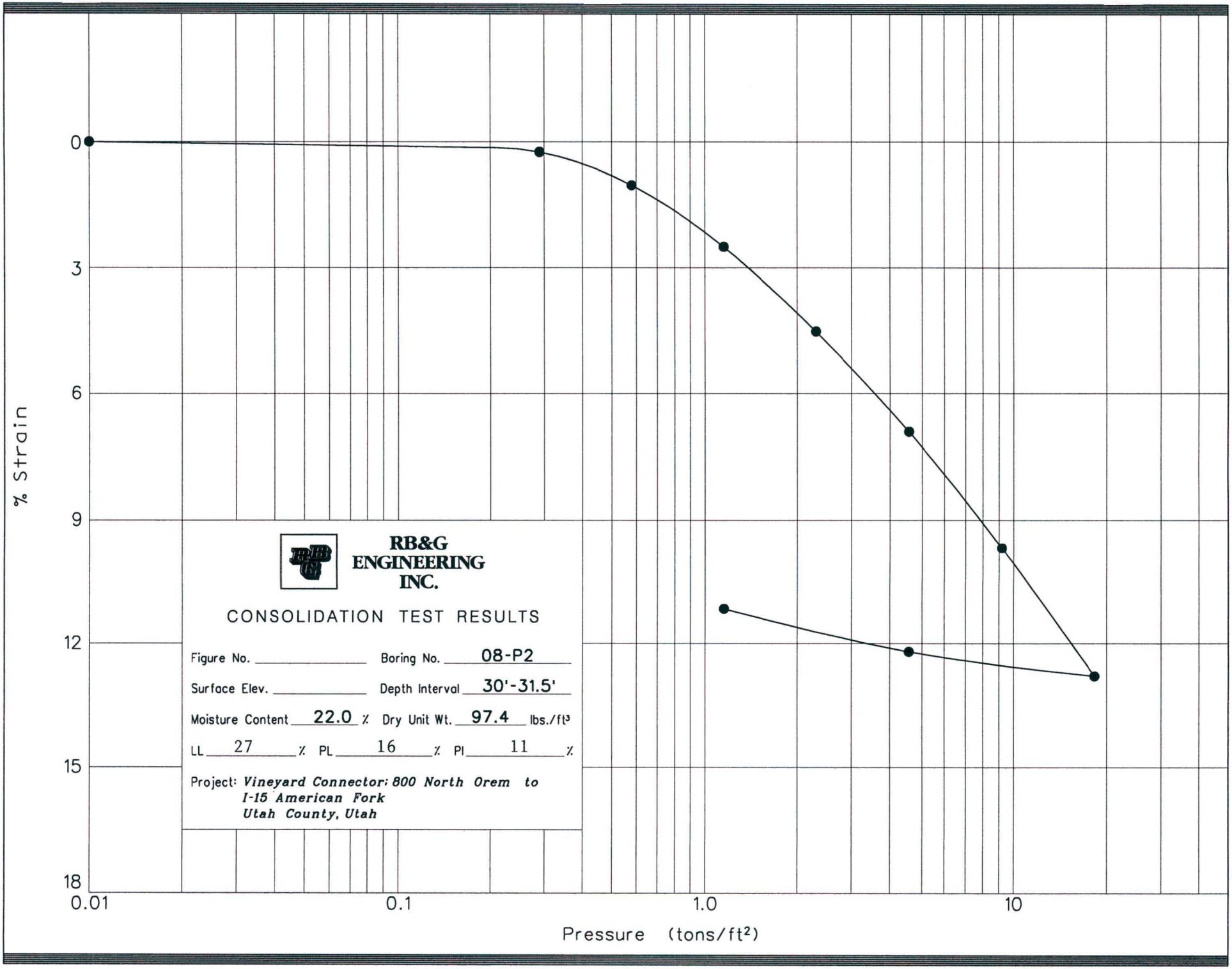
Figure No. _____ Boring No. 08-P2

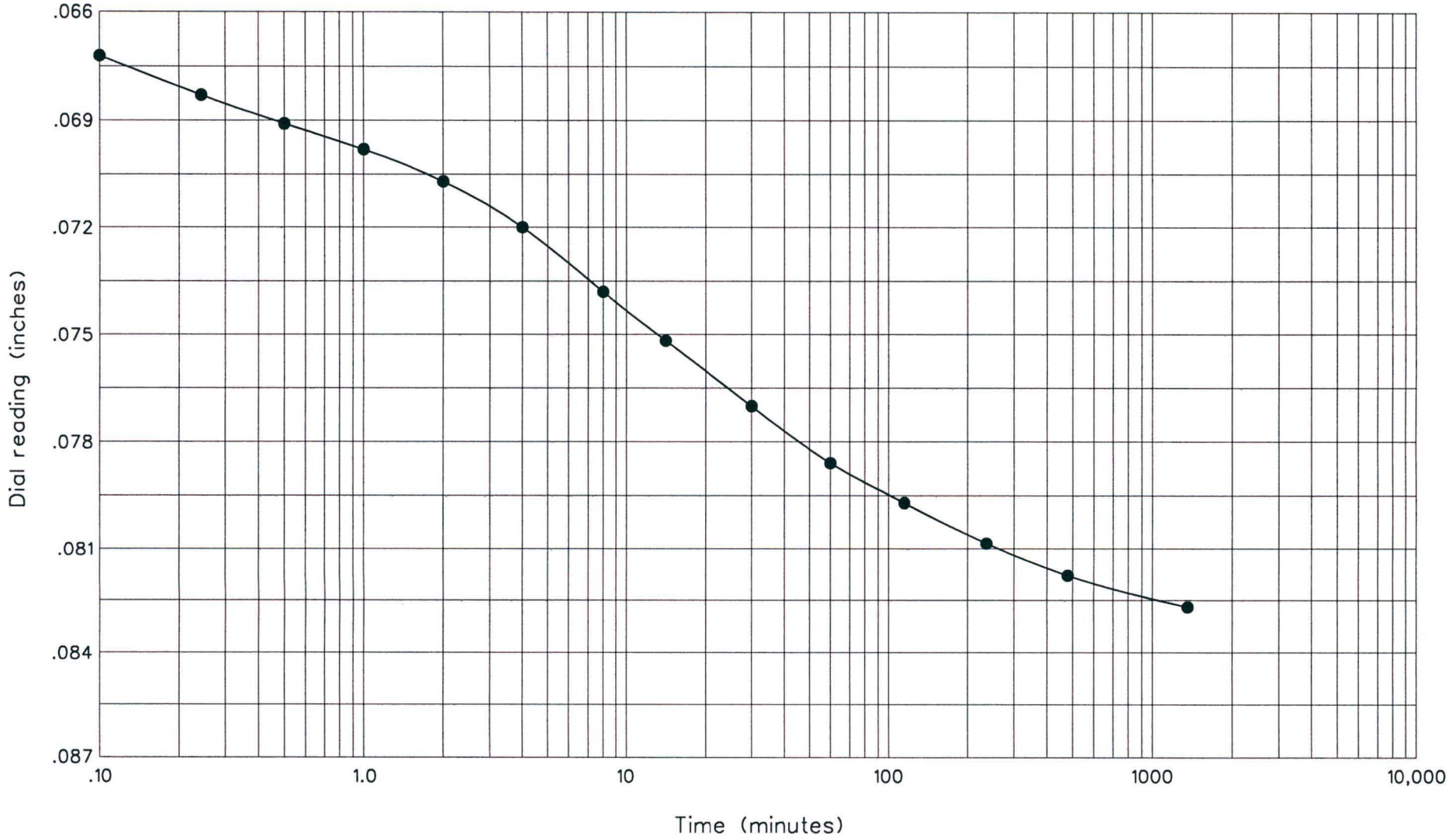
Surface Elev. _____ Depth Interval 30'-31.5'

Moisture Content 22.0 % Dry Unit Wt. 97.4 lbs./ft³

LL 27 % PL 16 % PI 11 %

Project: *Vineyard Connector: 800 North Orem to I-15 American Fork Utah County, Utah*


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P2
Surface Elev. _____ Depth Interval 30'-31.5'
Moisture Content 22.0 % Dry Unit Wt. 97.4 lbs./ft³
LL 27 % PL 16 % PI 11 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah



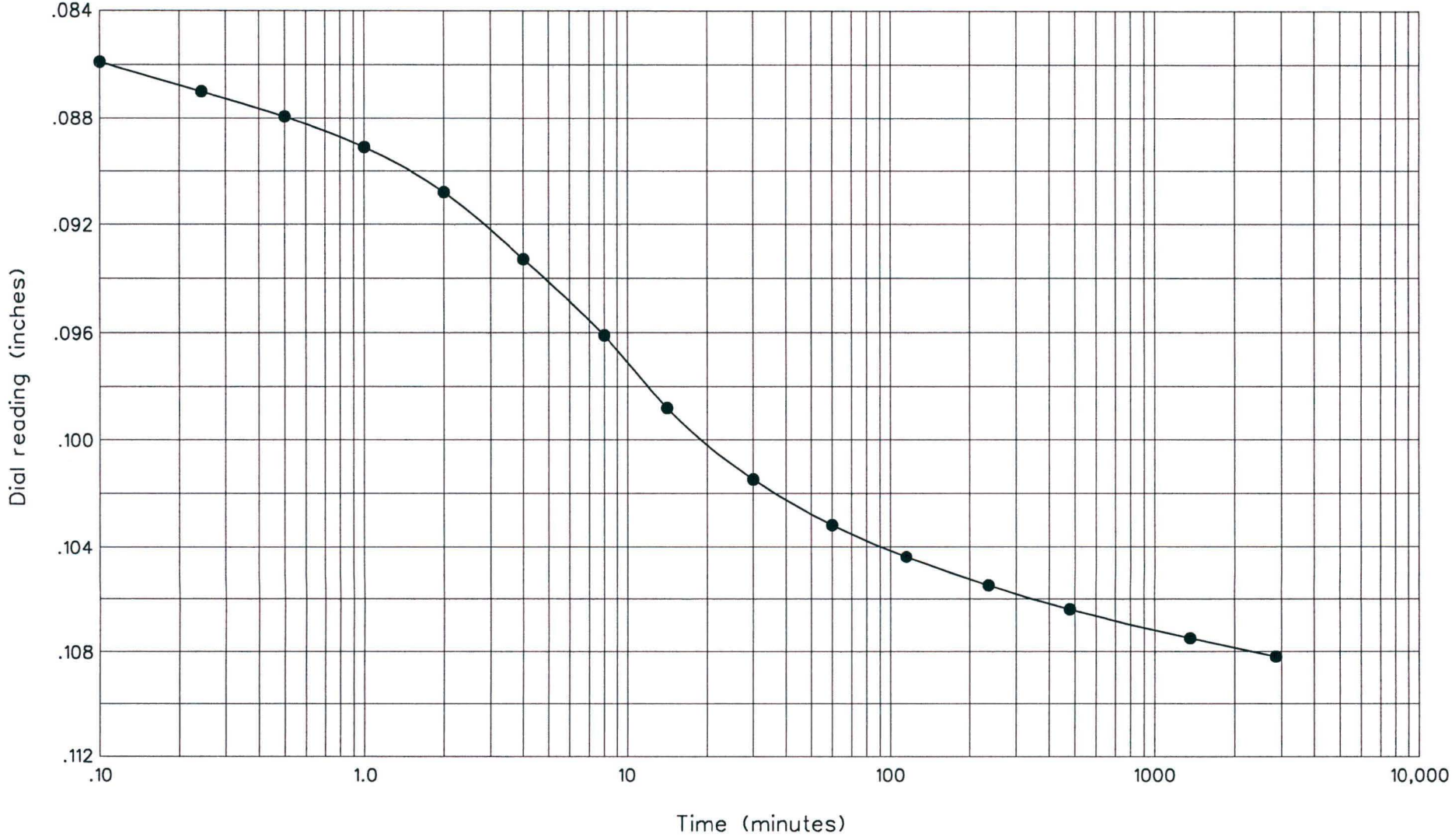
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 30'-31.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



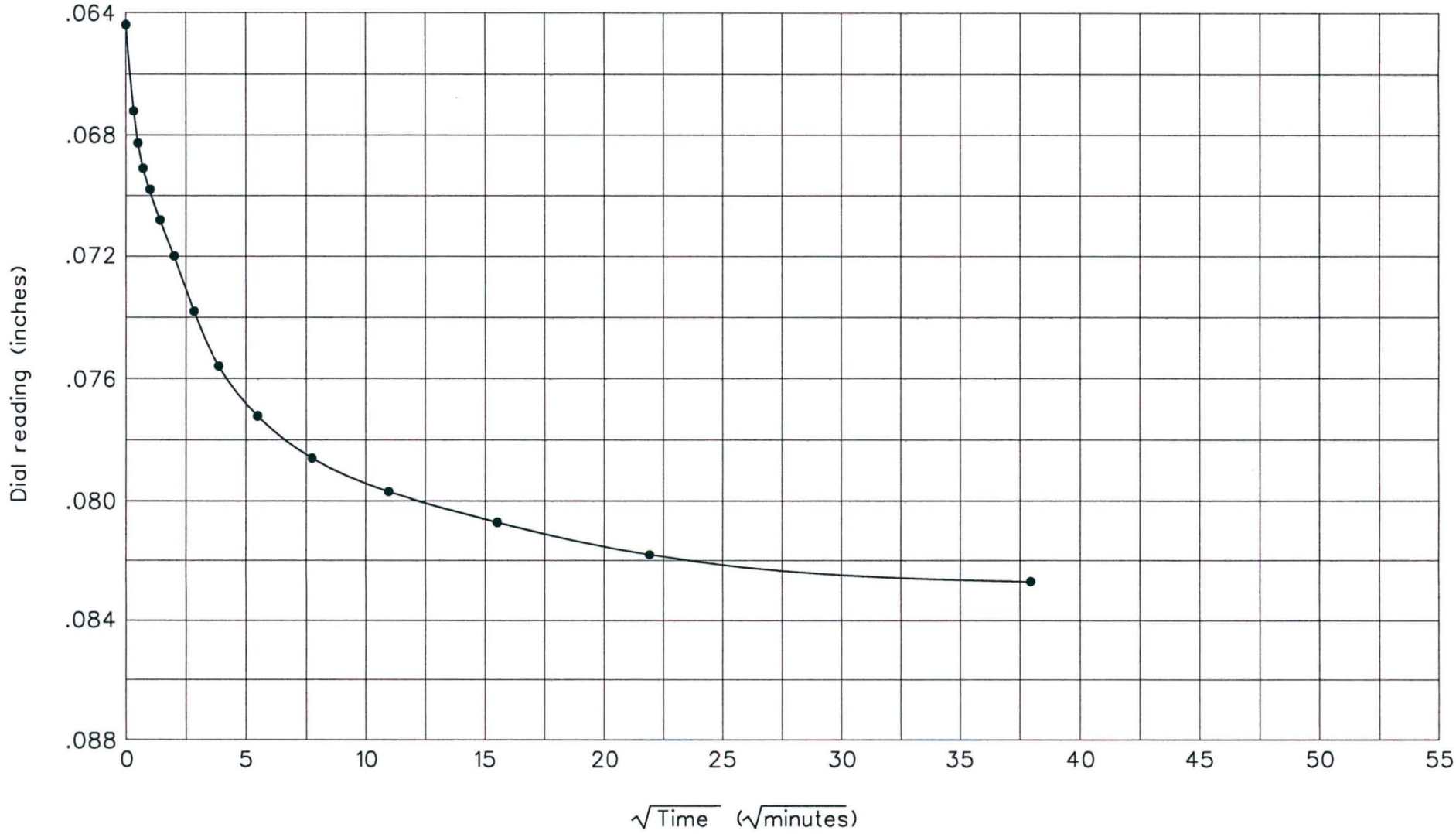
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 30'-31.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



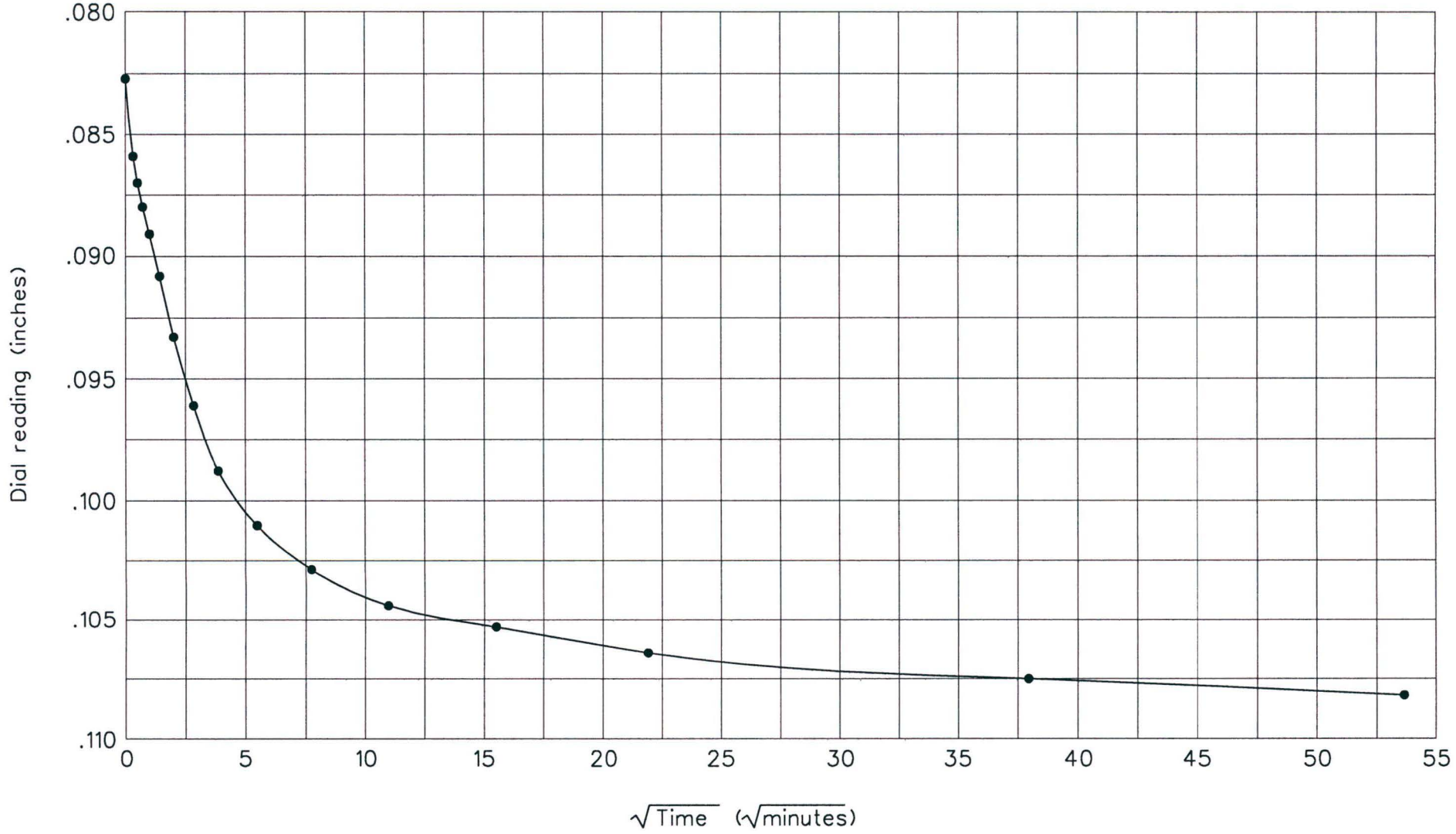
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 30'-31.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



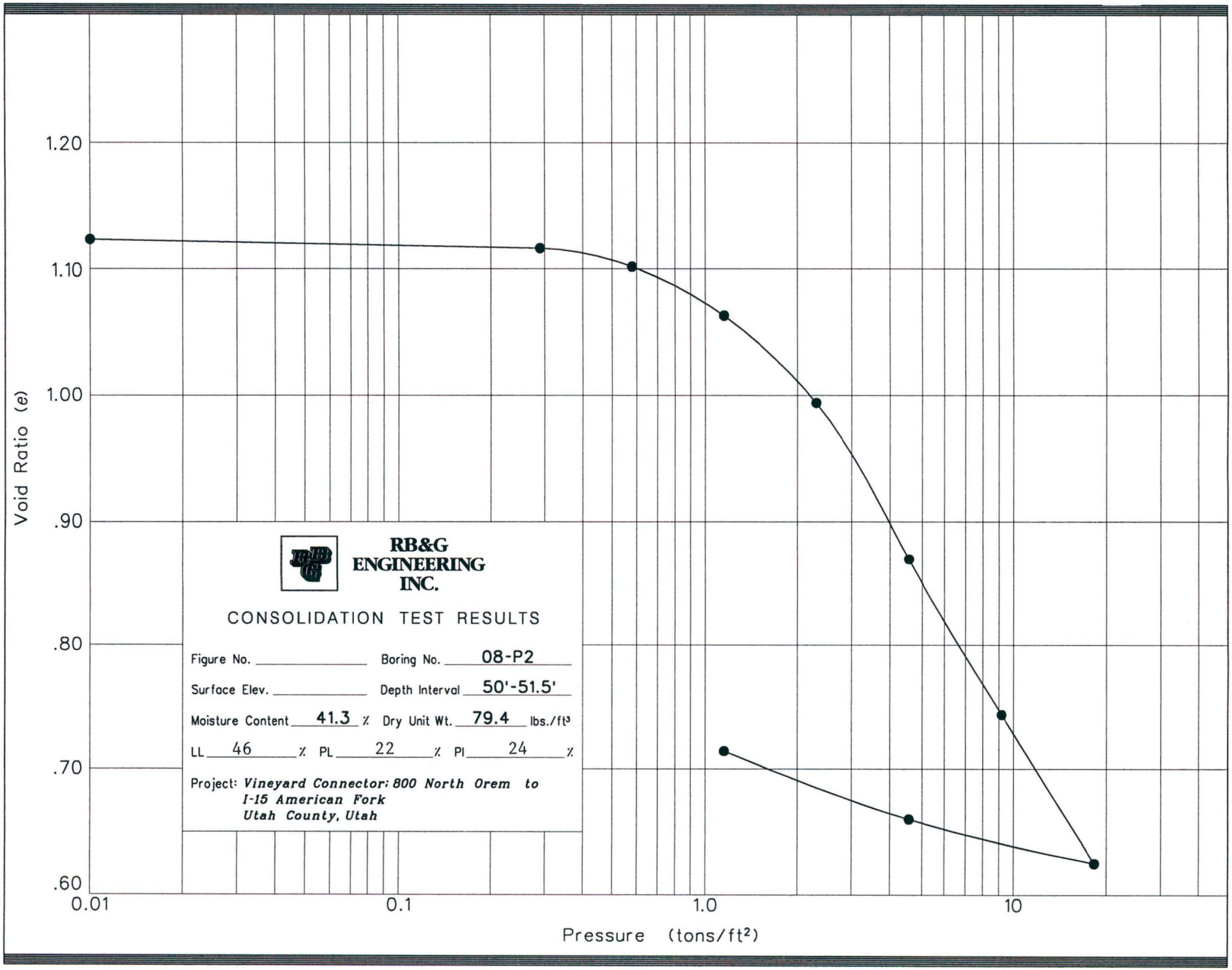
RB&G ENGINEERING INC.
Provo, Utah

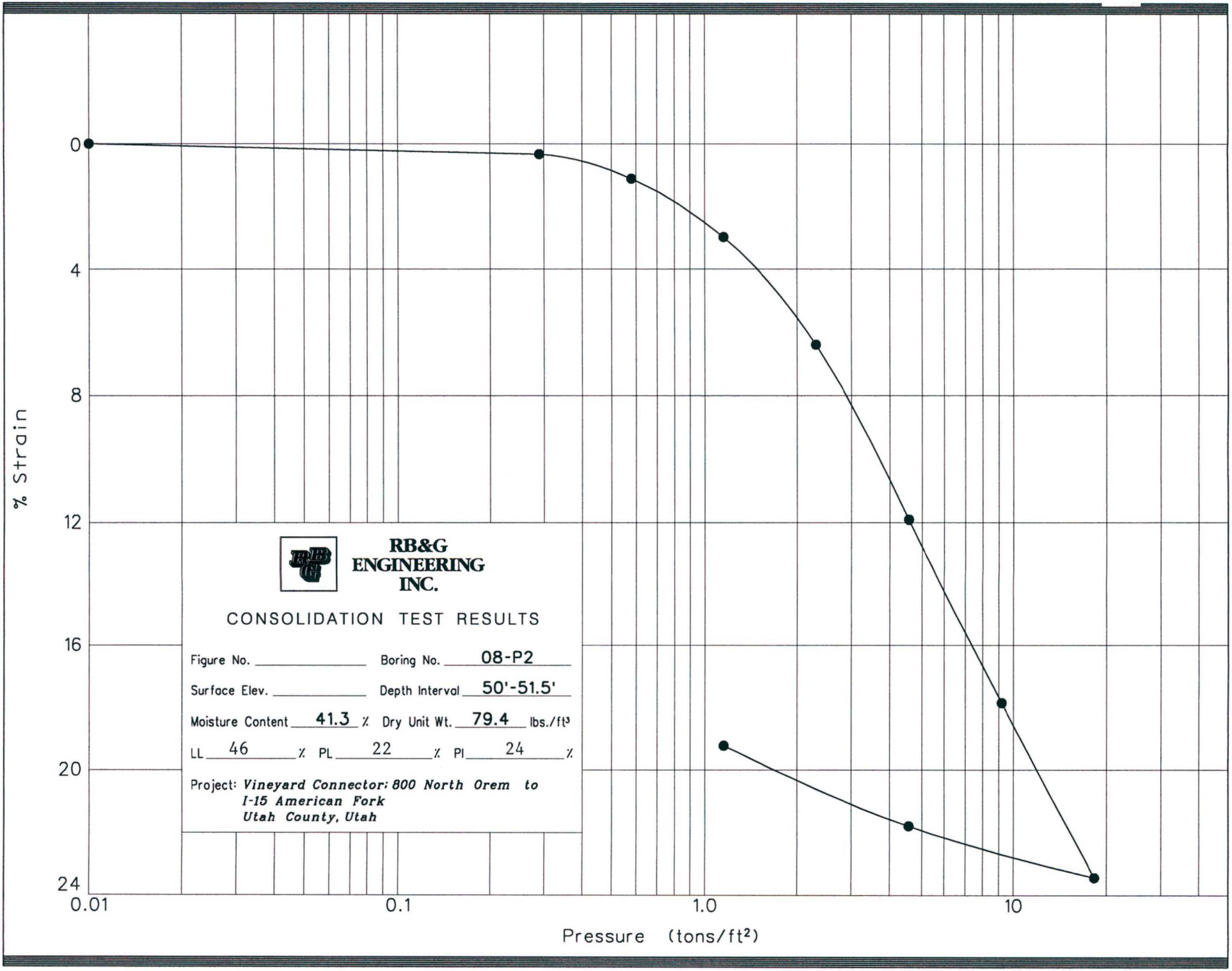
Hole no.: 08-P2
Depth: 30'-31.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure


1.20
1.10
1.00
.90
.80
.70
.60
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING
INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P2
Surface Elev. _____ Depth Interval 50'-51.5'
Moisture Content 41.3 % Dry Unit Wt. 79.4 lbs./ft³
LL 46 % PL 22 % PI 24 %
Project: Vineyard Connector: 800 North Orem to
I-15 American Fork
Utah County, Utah


0
4
8
12
16
20
24
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P2
Surface Elev. _____ Depth Interval 50'-51.5'
Moisture Content 41.3 % Dry Unit Wt. 79.4 lbs./ft³
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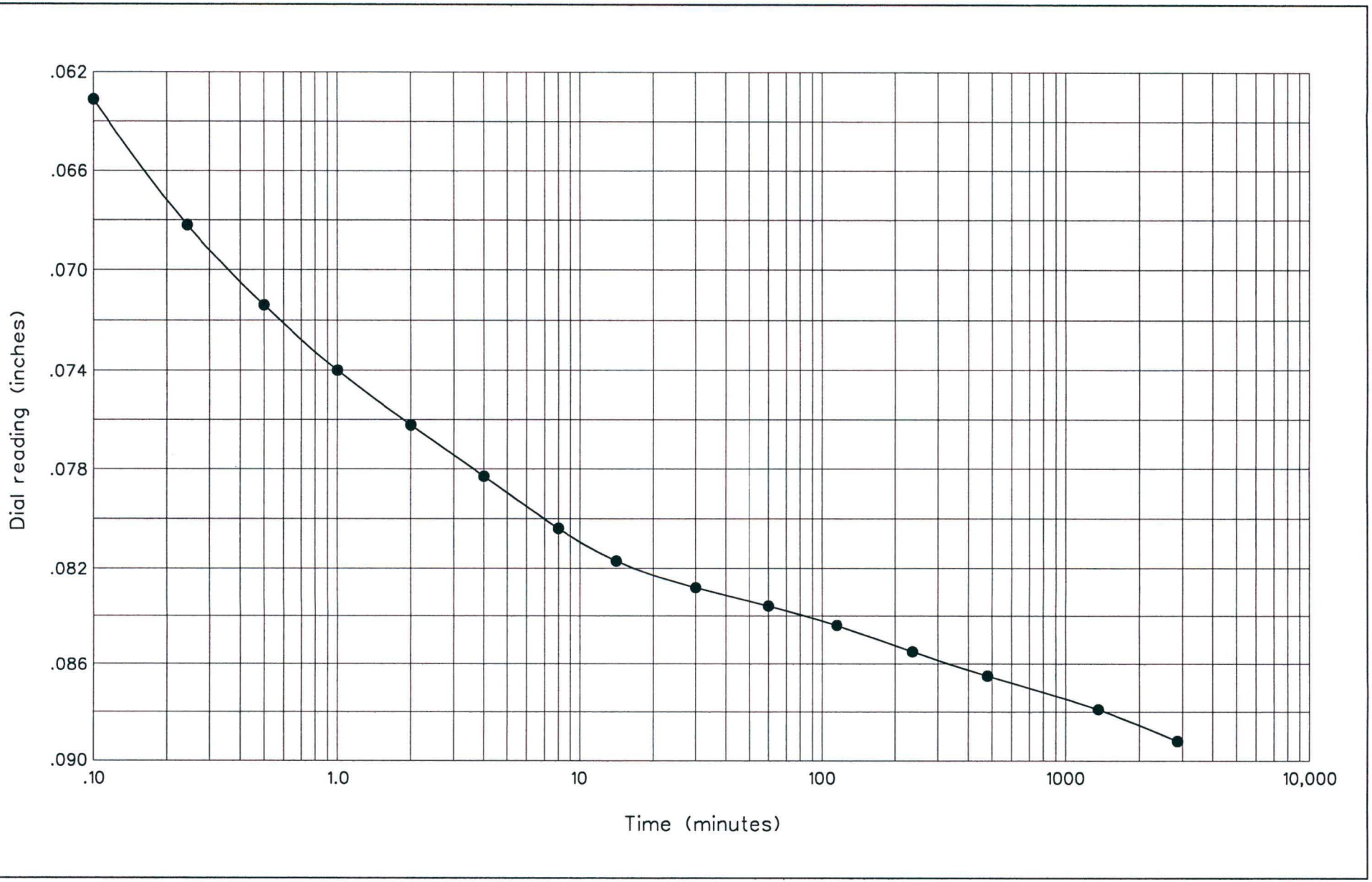
Project: Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah



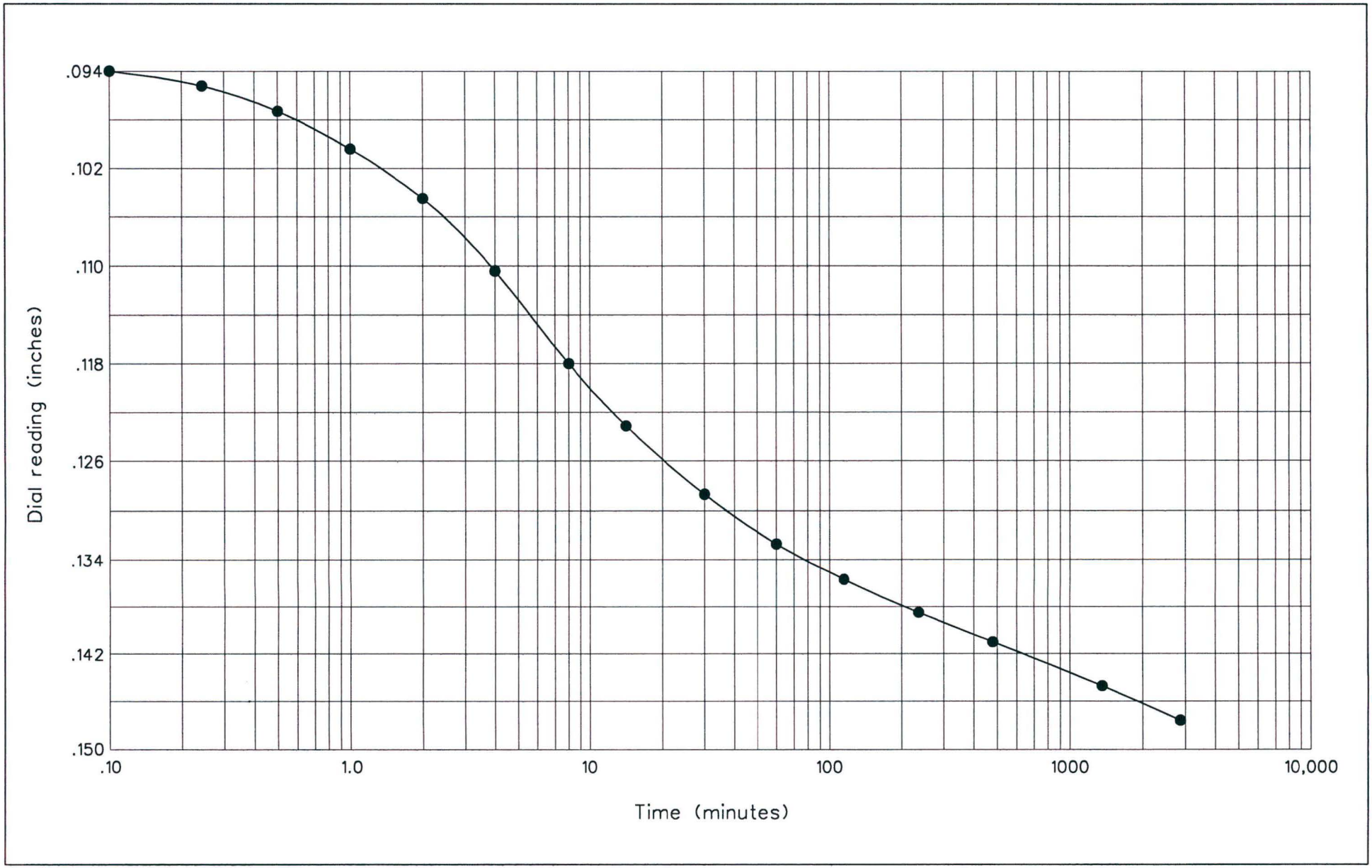
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 50'-51.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



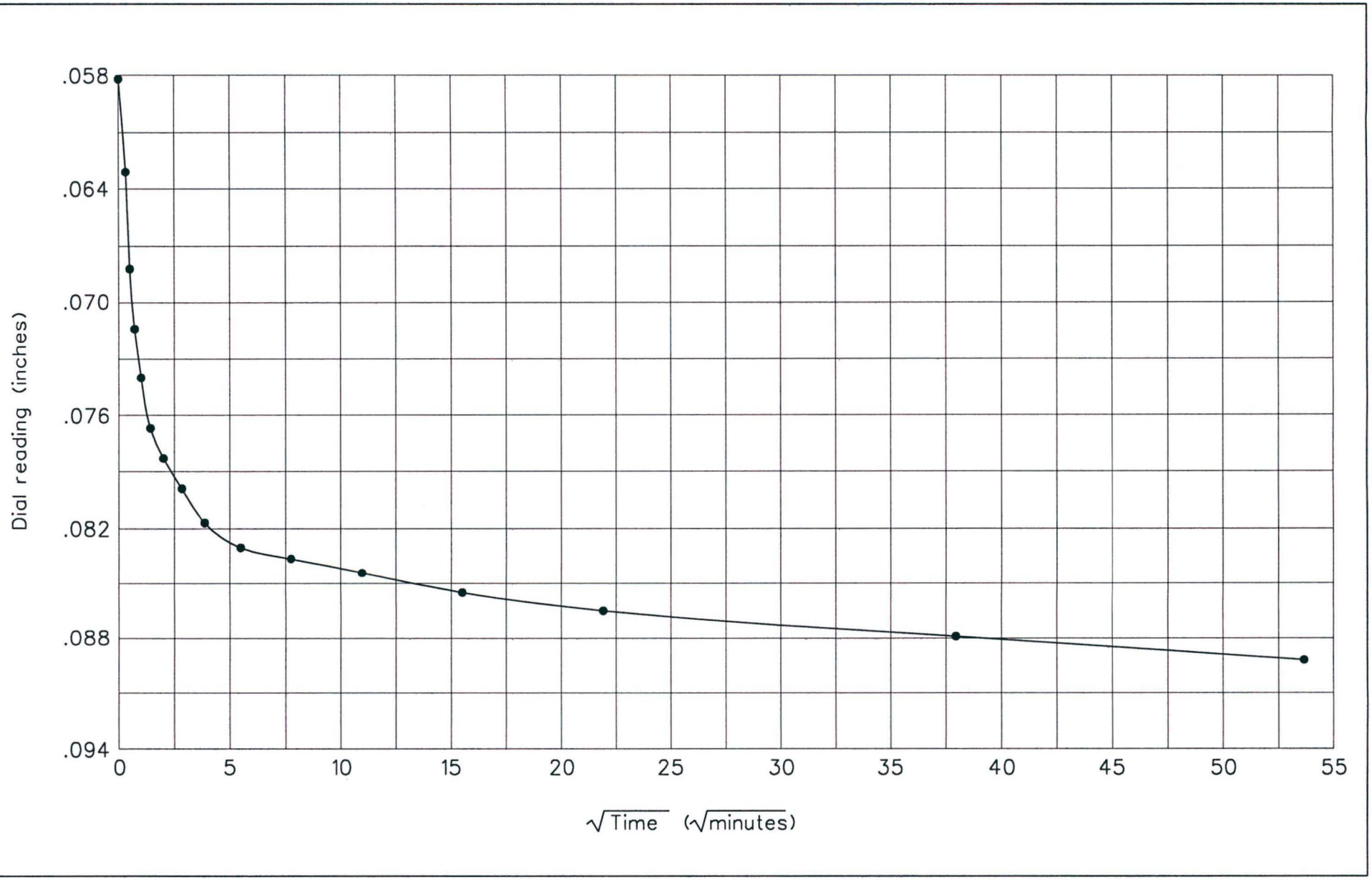
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 50'-51.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



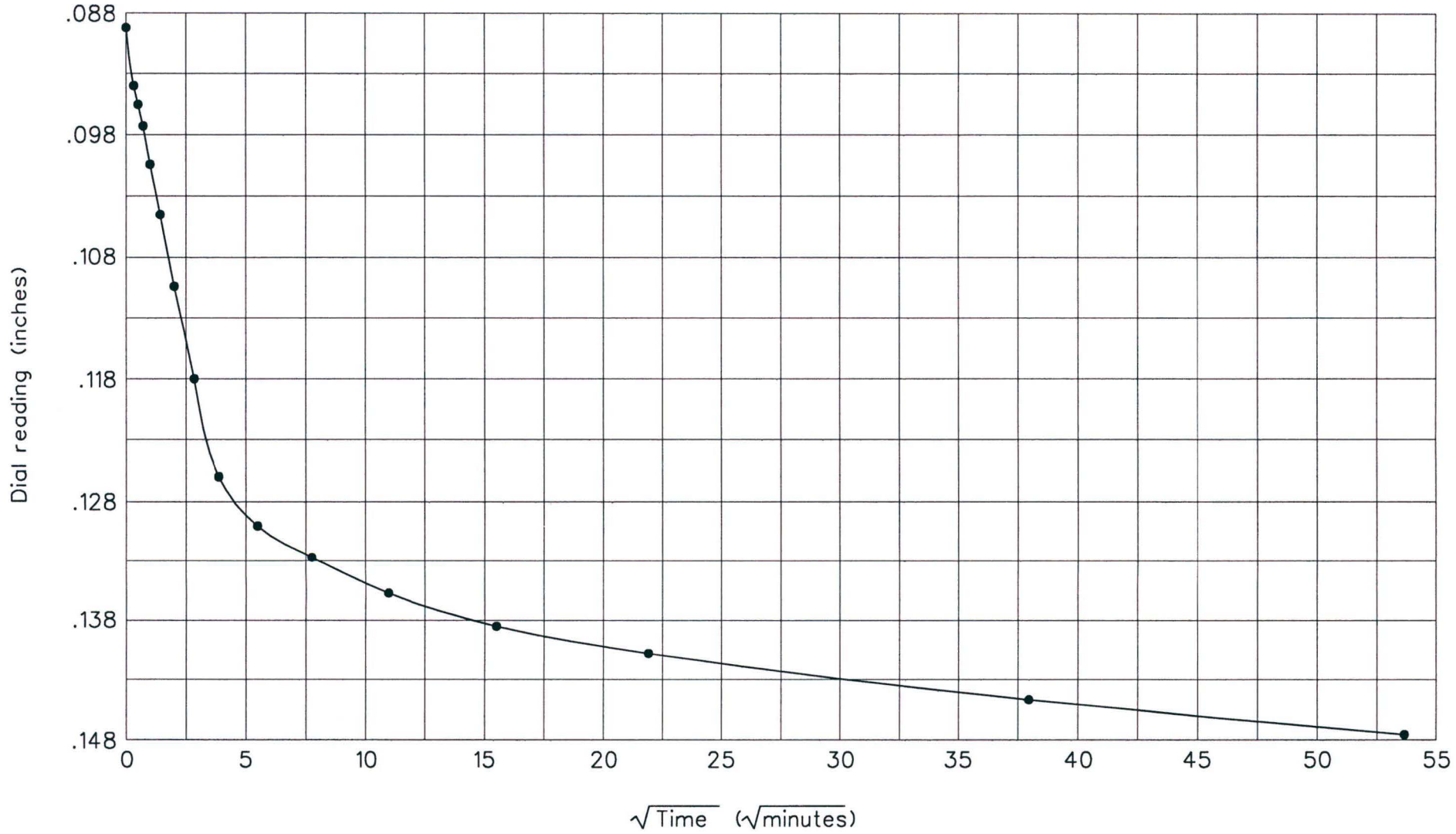
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 50'-51.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



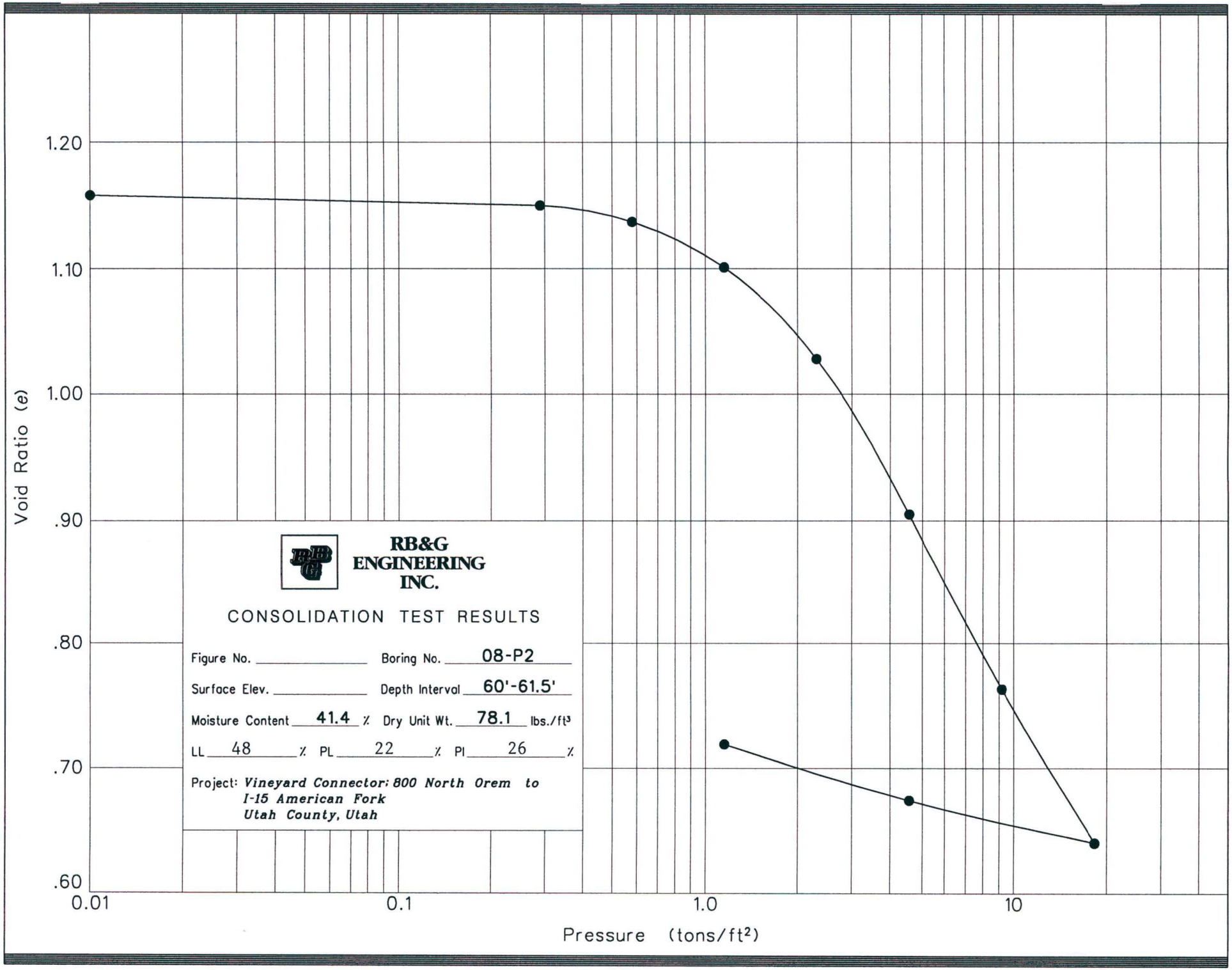
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 50'-51.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G ENGINEERING INC.

CONSOLIDATION TEST RESULTS

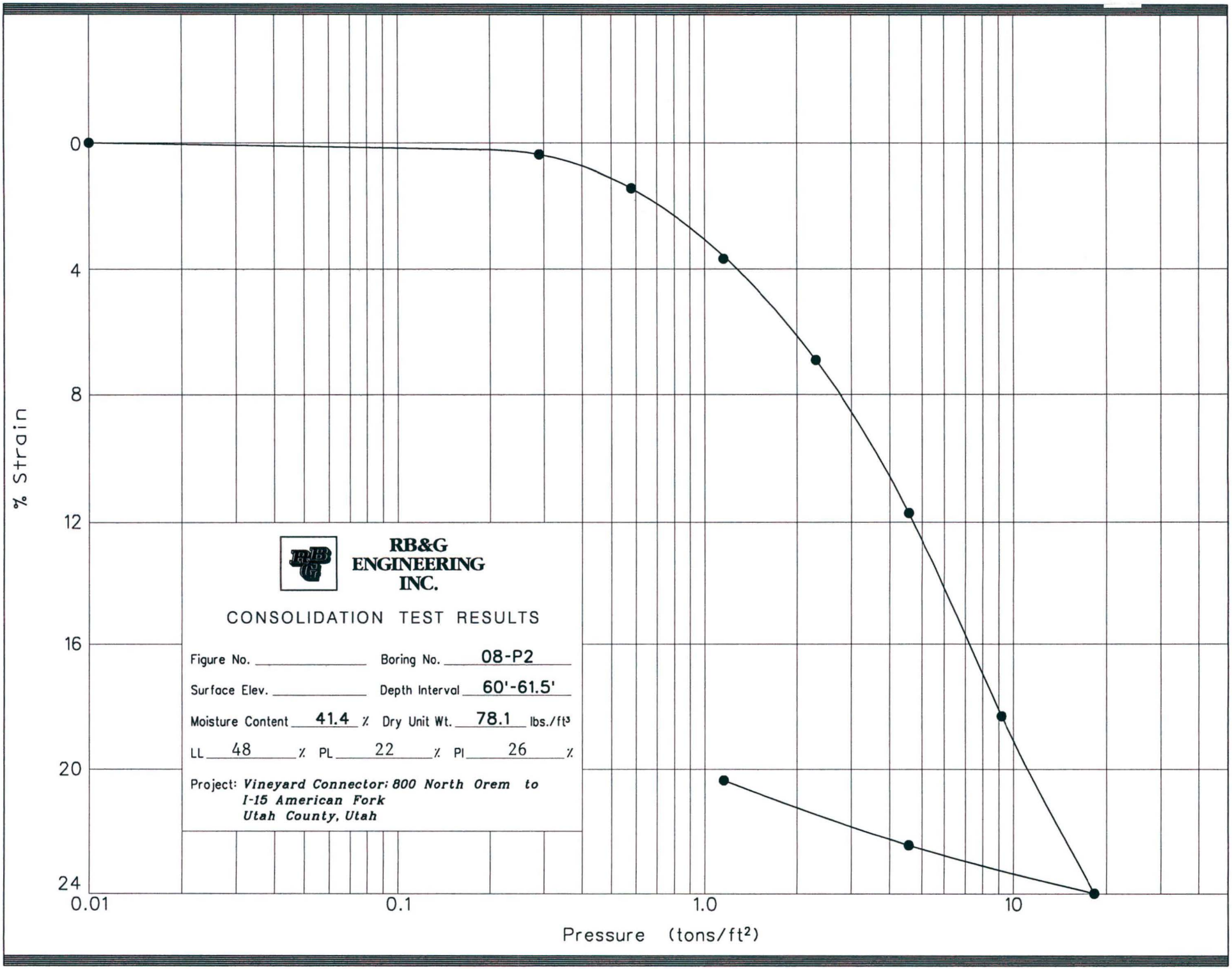
Figure No. _____ Boring No. 08-P2

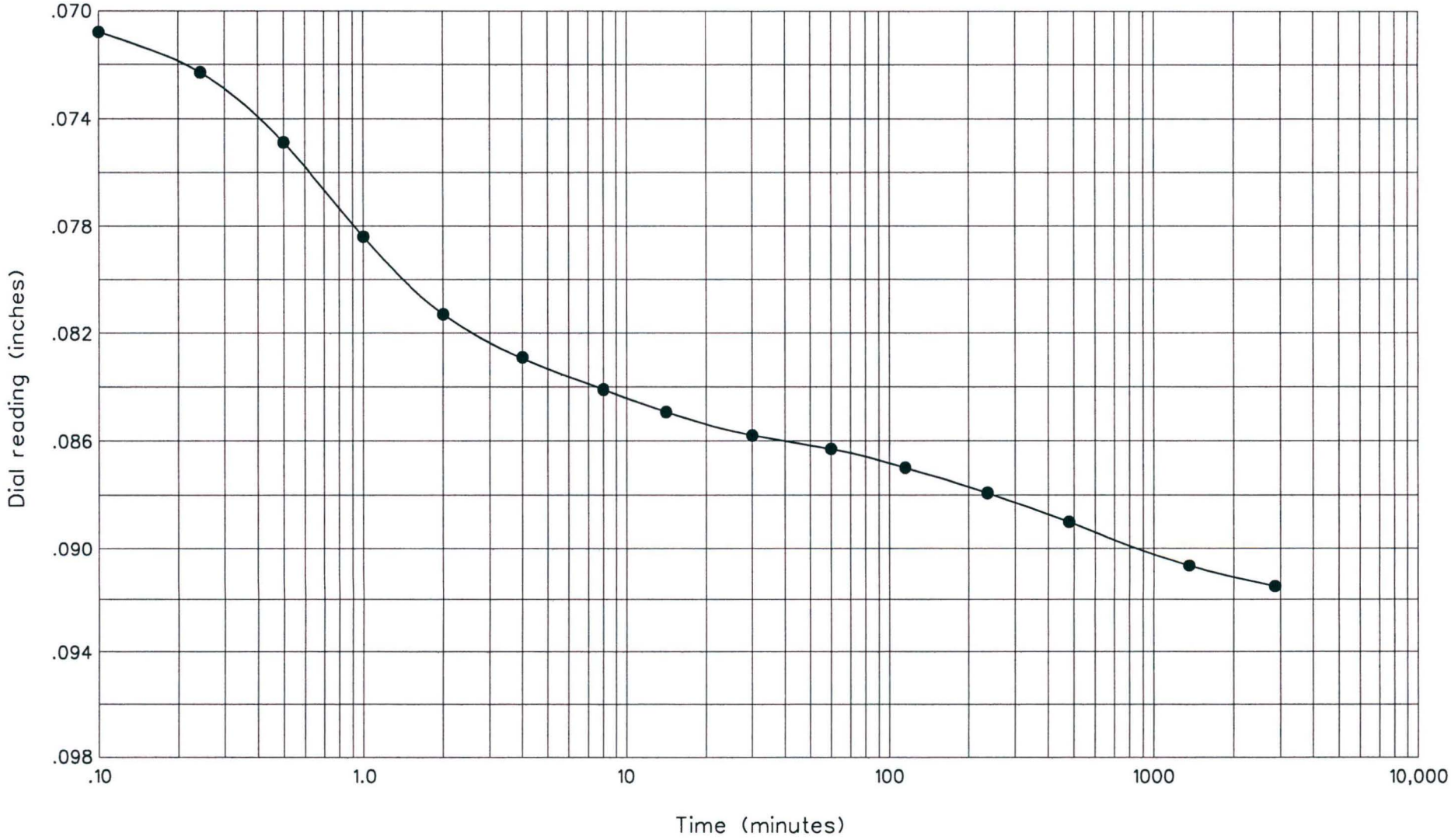
Surface Elev. _____ Depth Interval 60'-61.5'

Moisture Content 41.4 % Dry Unit Wt. 78.1 lbs./ft³

LL 48 % PL 22 % PI 26 %

Project: *Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah*


0
4
8
12
16
20
24
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P2
Surface Elev. _____ Depth Interval 60'-61.5'
Moisture Content 41.4 % Dry Unit Wt. 78.1 lbs./ft³
LL 48 % PL 22 % PI 26 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah



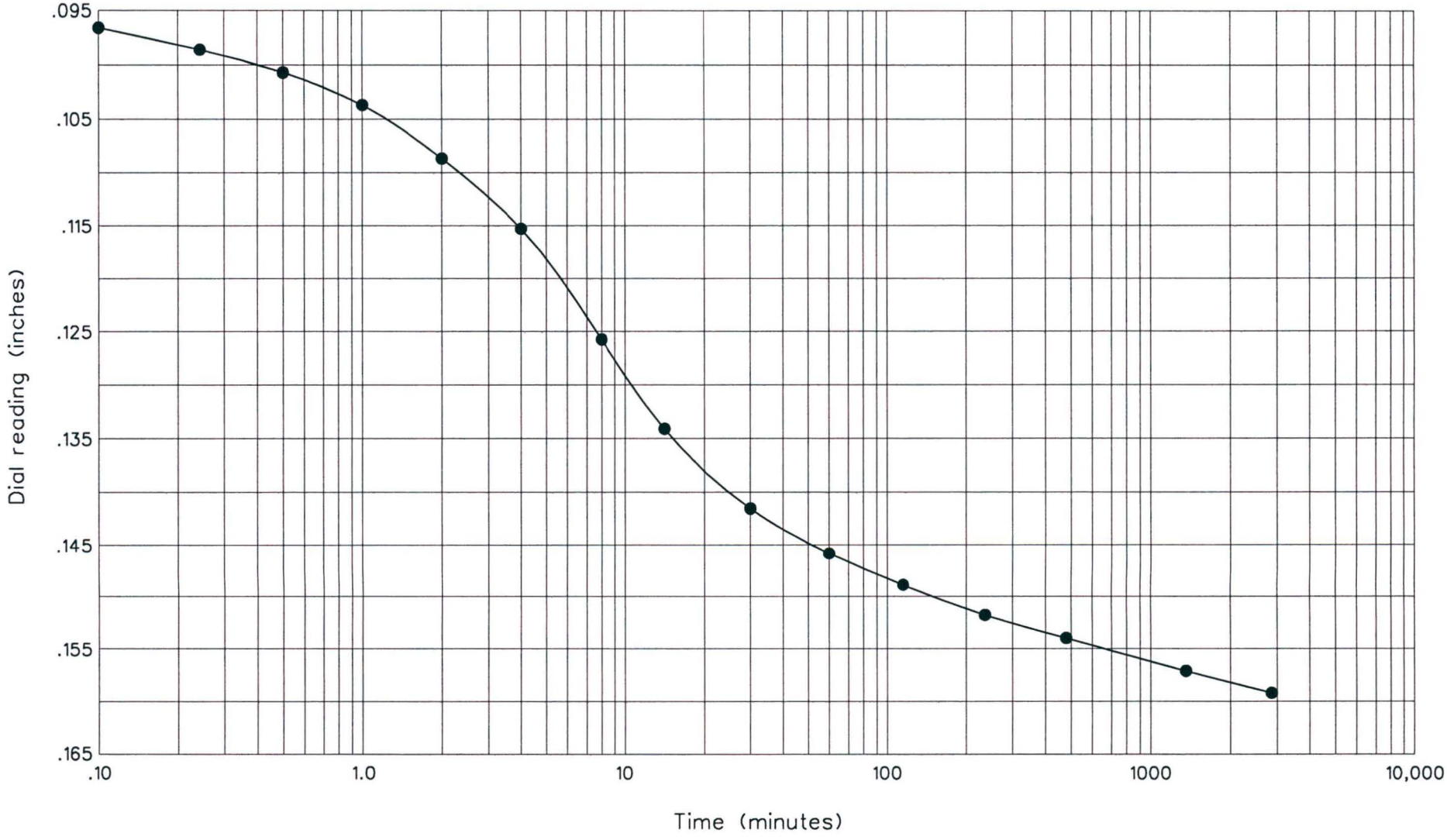
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 60'-61.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



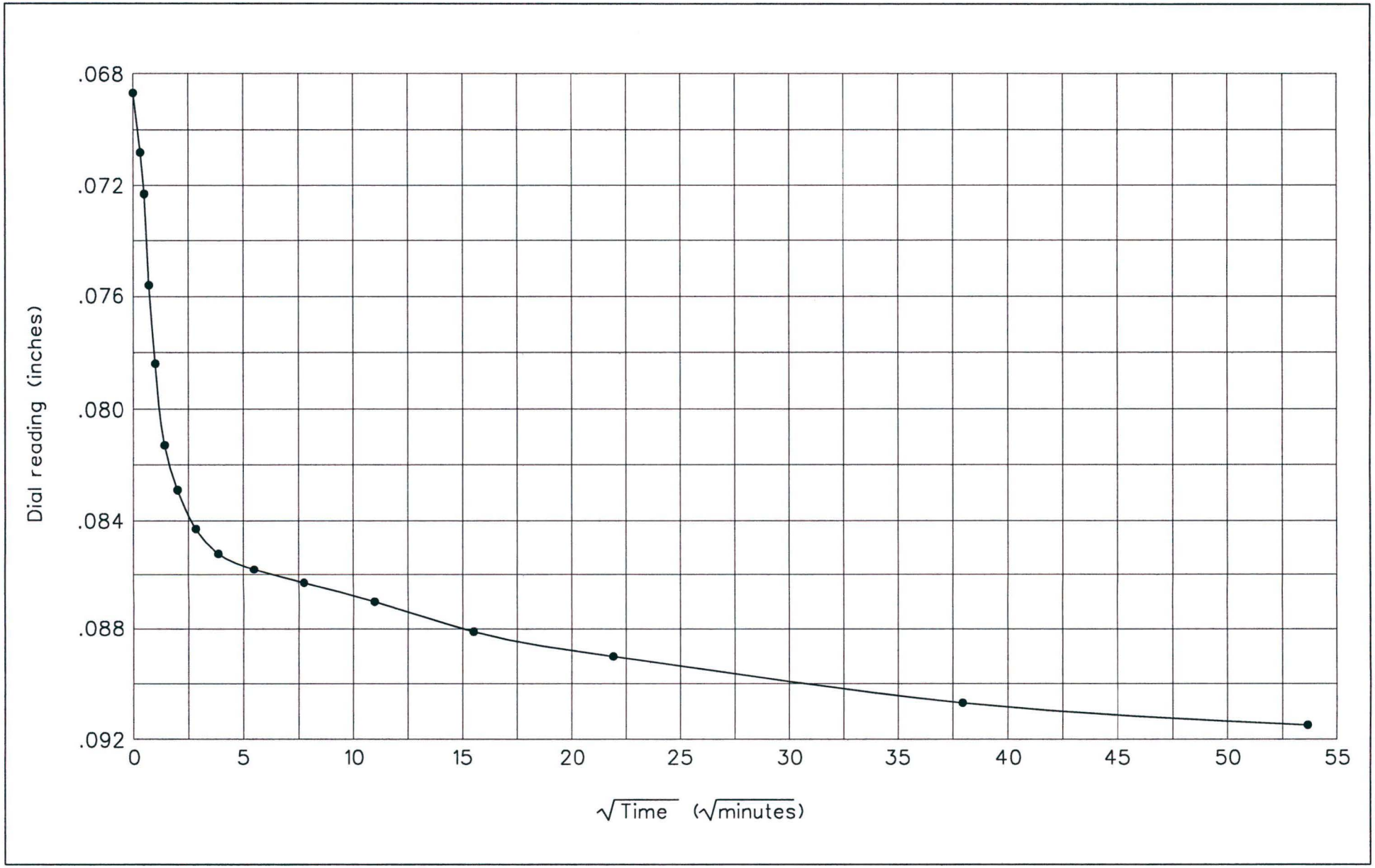
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 60'-61.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



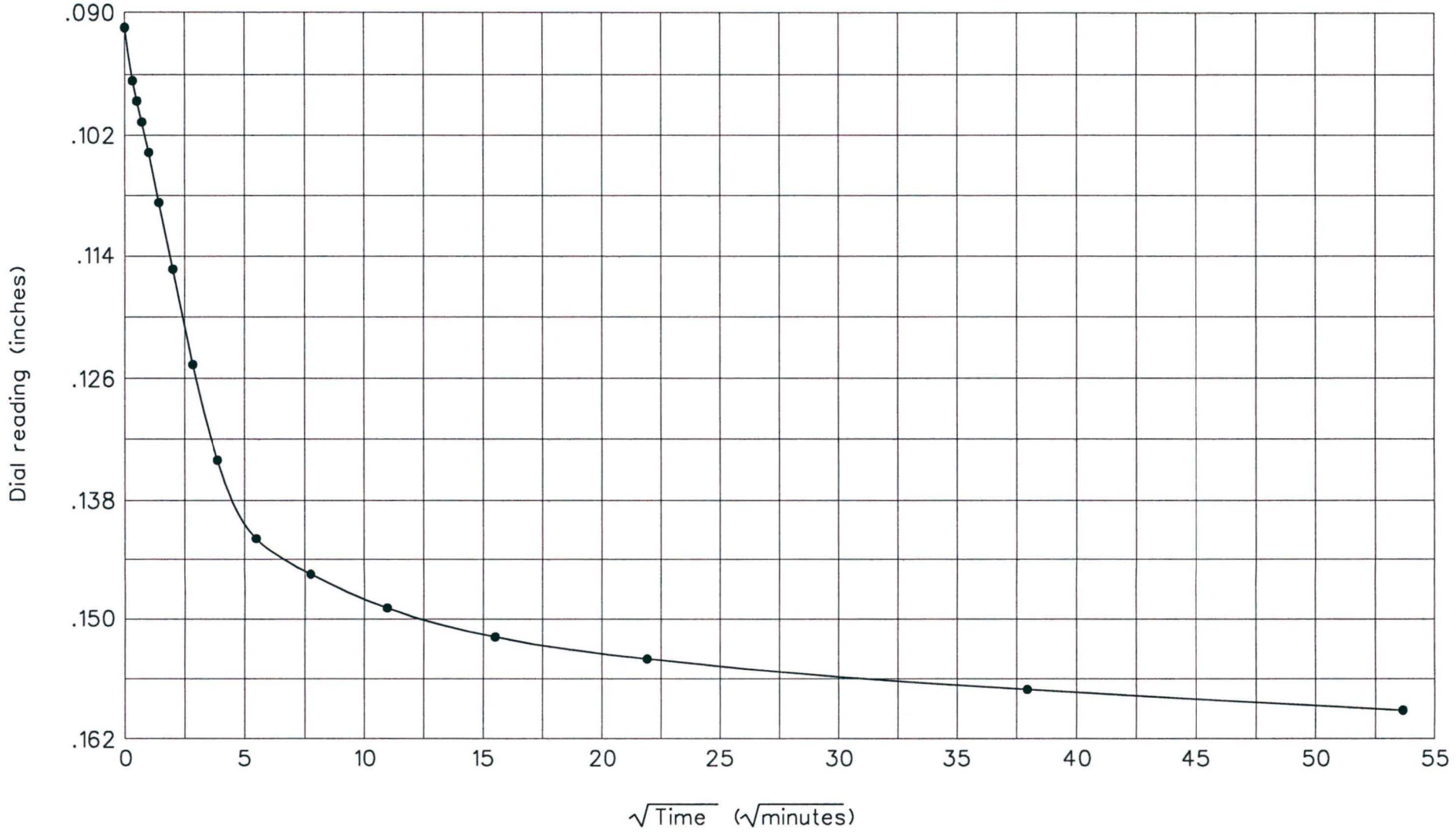
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P2
Depth: 60'-61.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

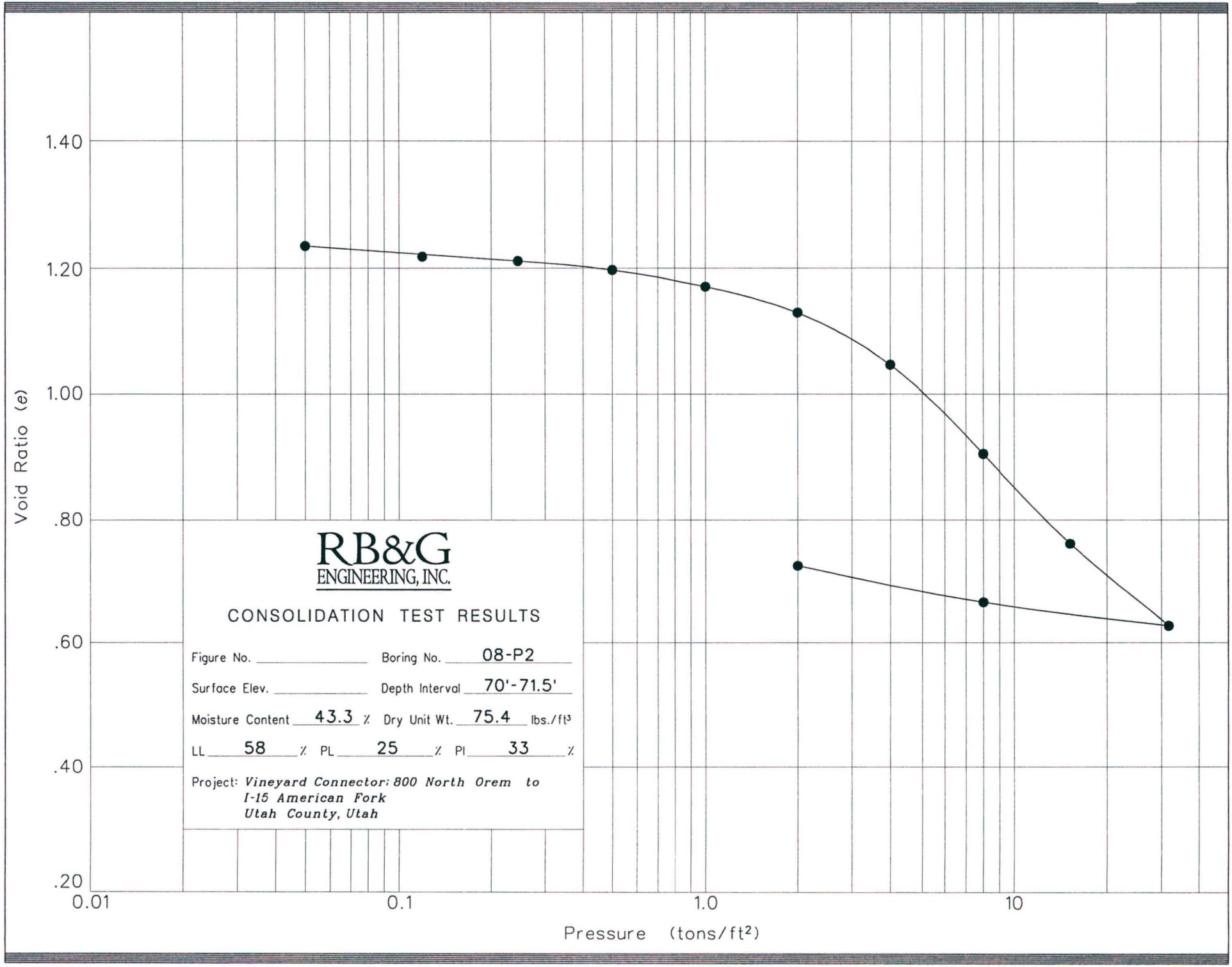
Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G ENGINEERING INC. Provo, Utah	Hole no.: 08-P2 Depth: 60'-61.5' Load: 2.30 to 4.60 tons	TIME CONSOLIDATION *Vineyard Connector;* *800 North Orem to I-15 American Fork* *Utah County, Utah*

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

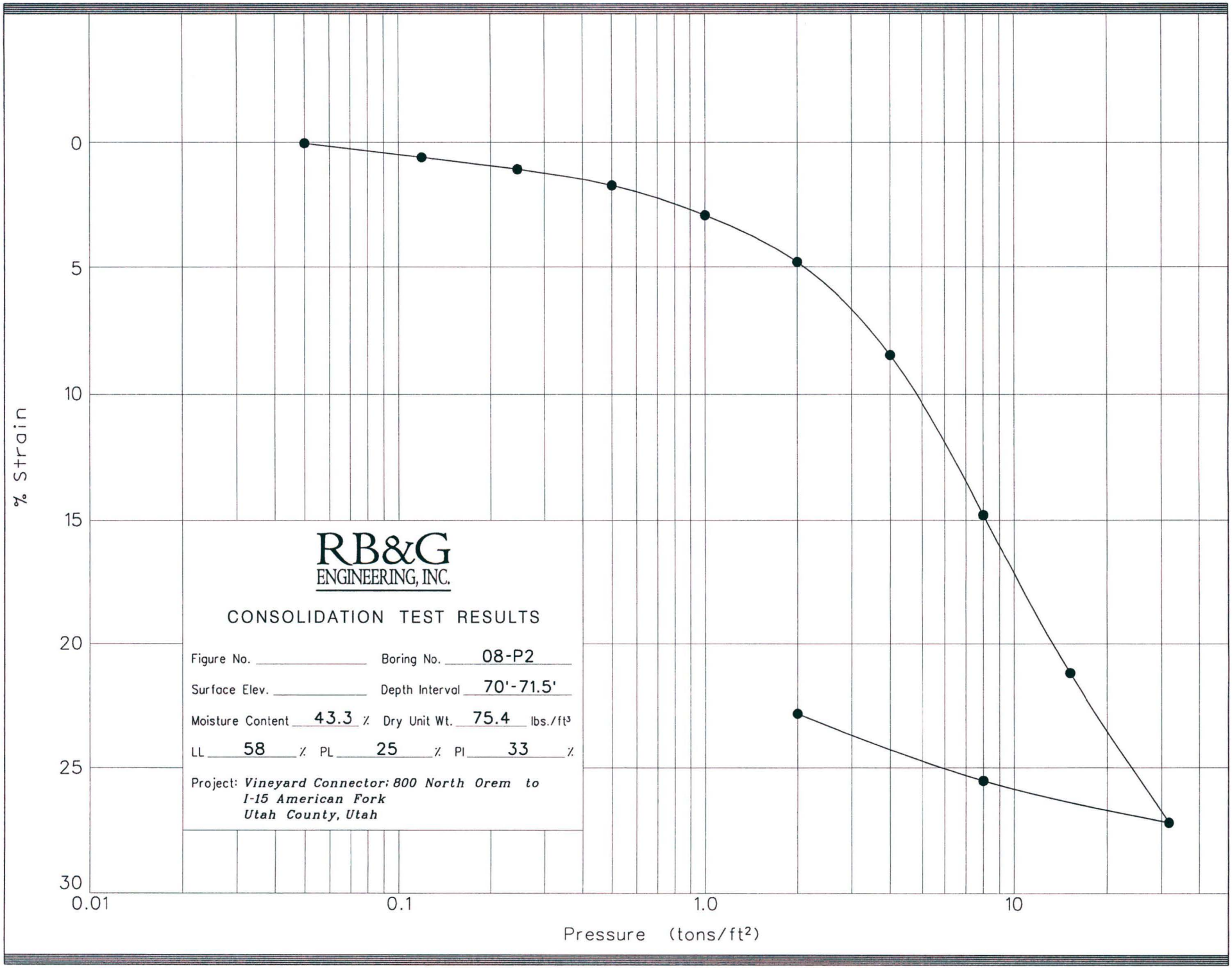
Figure No. _____ Boring No. 08-P2

Surface Elev. _____ Depth Interval 70'-71.5'

Moisture Content 43.3 % Dry Unit Wt. 75.4 lbs./ft³

LL 58 % PL 25 % PI 33 %

Project: *Vineyard Connector: 800 North Orem to I-15 American Fork Utah County, Utah*



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

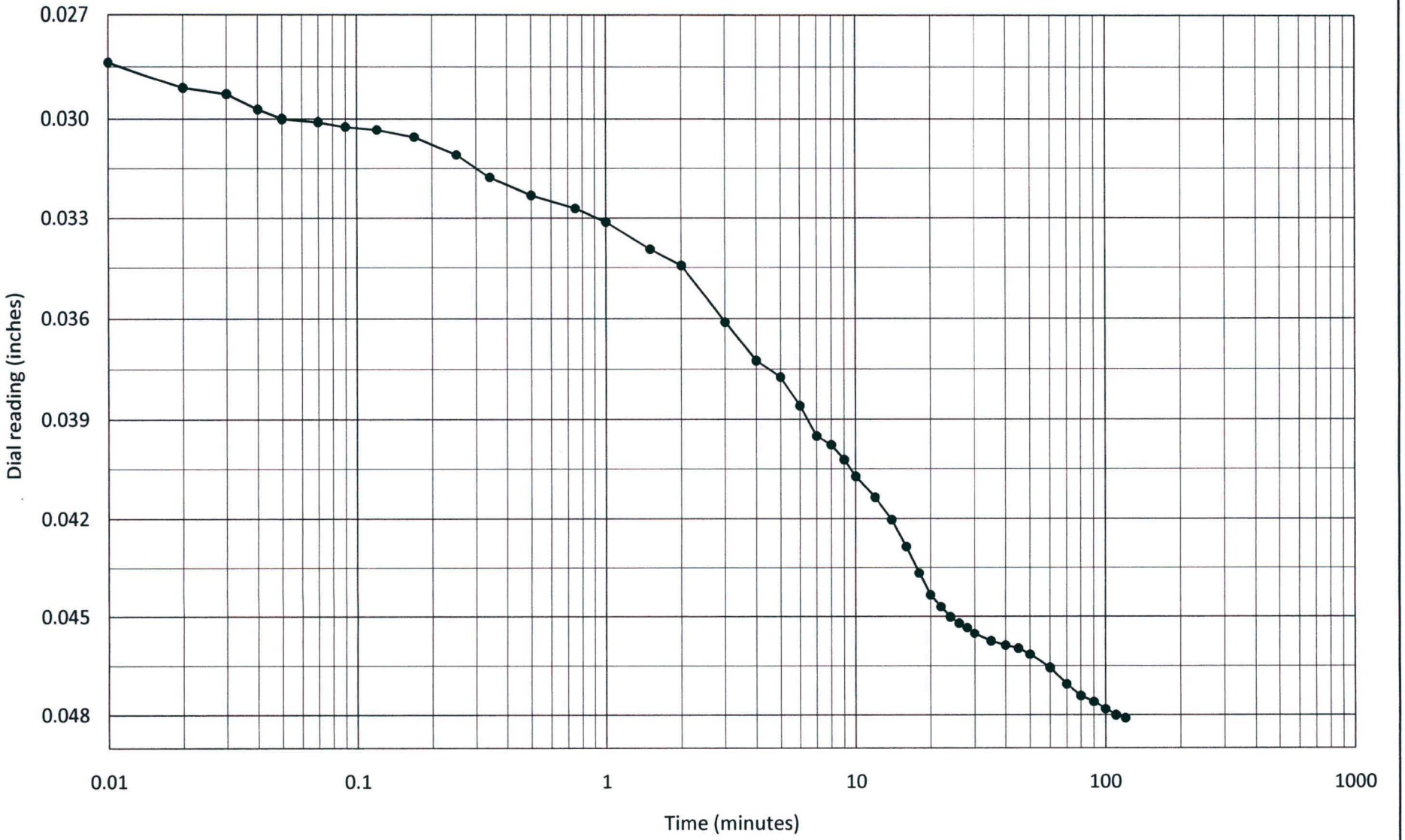
Figure No. _____ Boring No. 08-P2

Surface Elev. _____ Depth Interval 70'-71.5'

Moisture Content 43.3 % Dry Unit Wt. 75.4 lbs./ft³

LL 58 % PL 25 % PI 33 %

Project: *Vineyard Connector: 800 North Orem to I-15 American Fork Utah County, Utah*

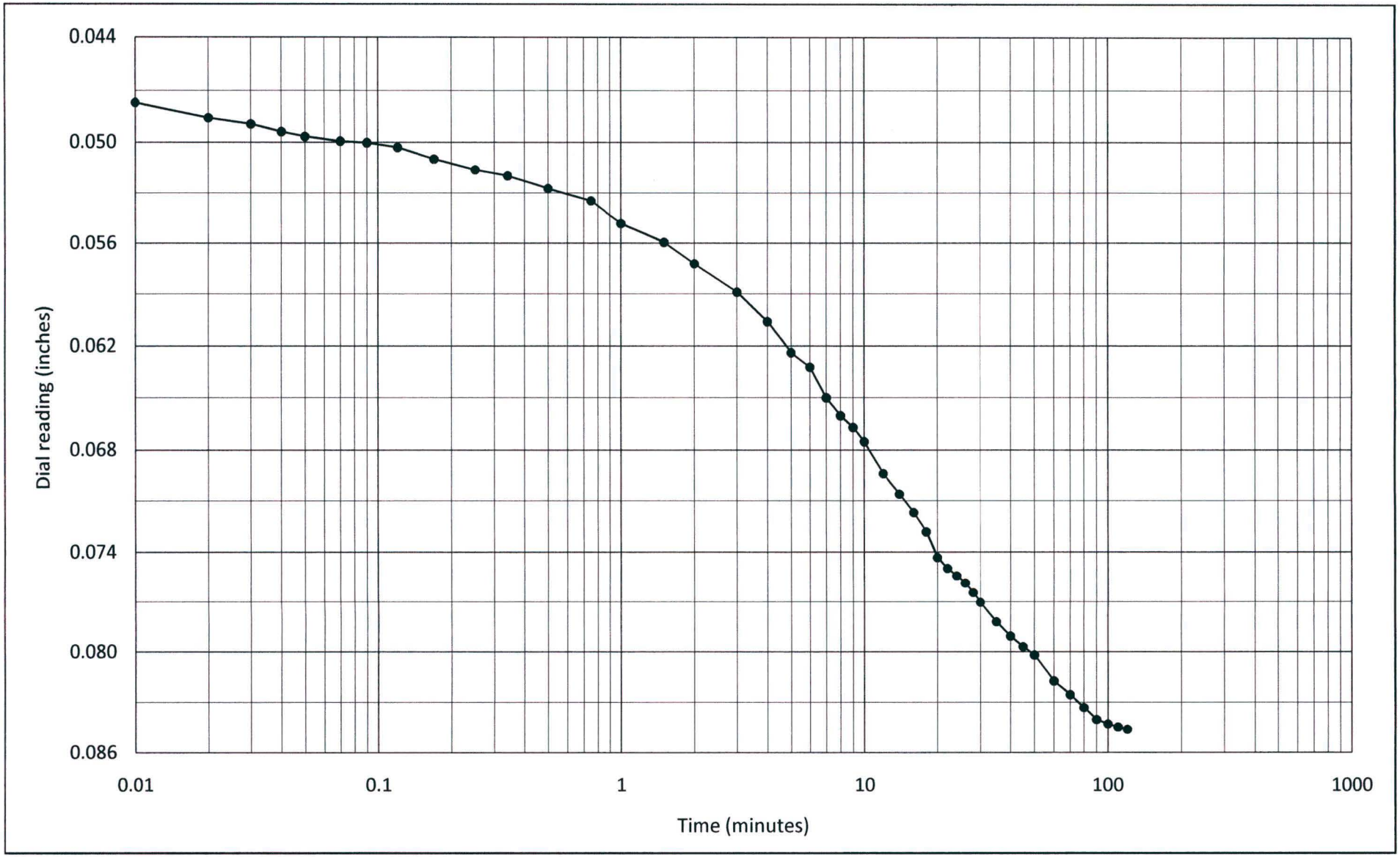


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

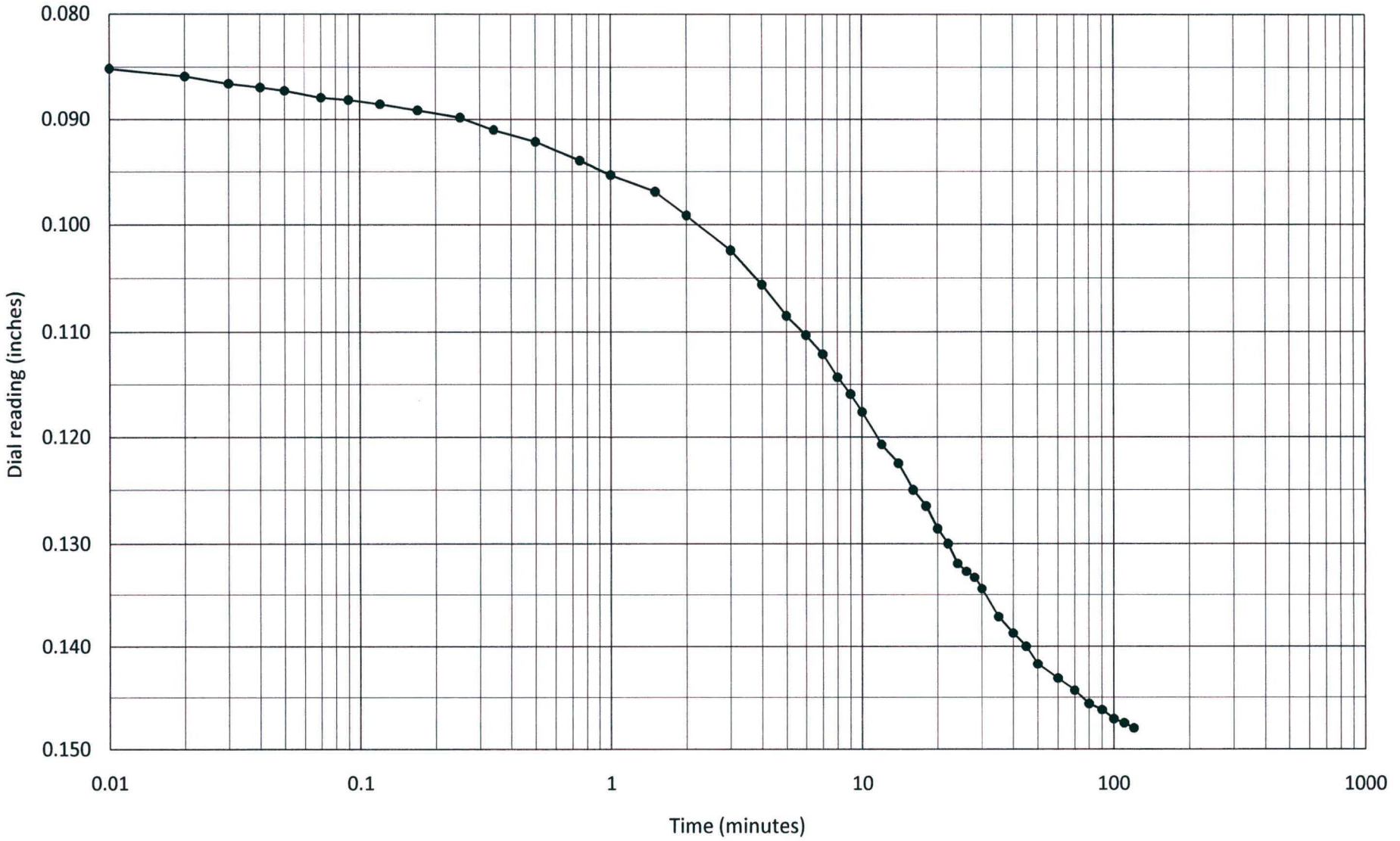


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

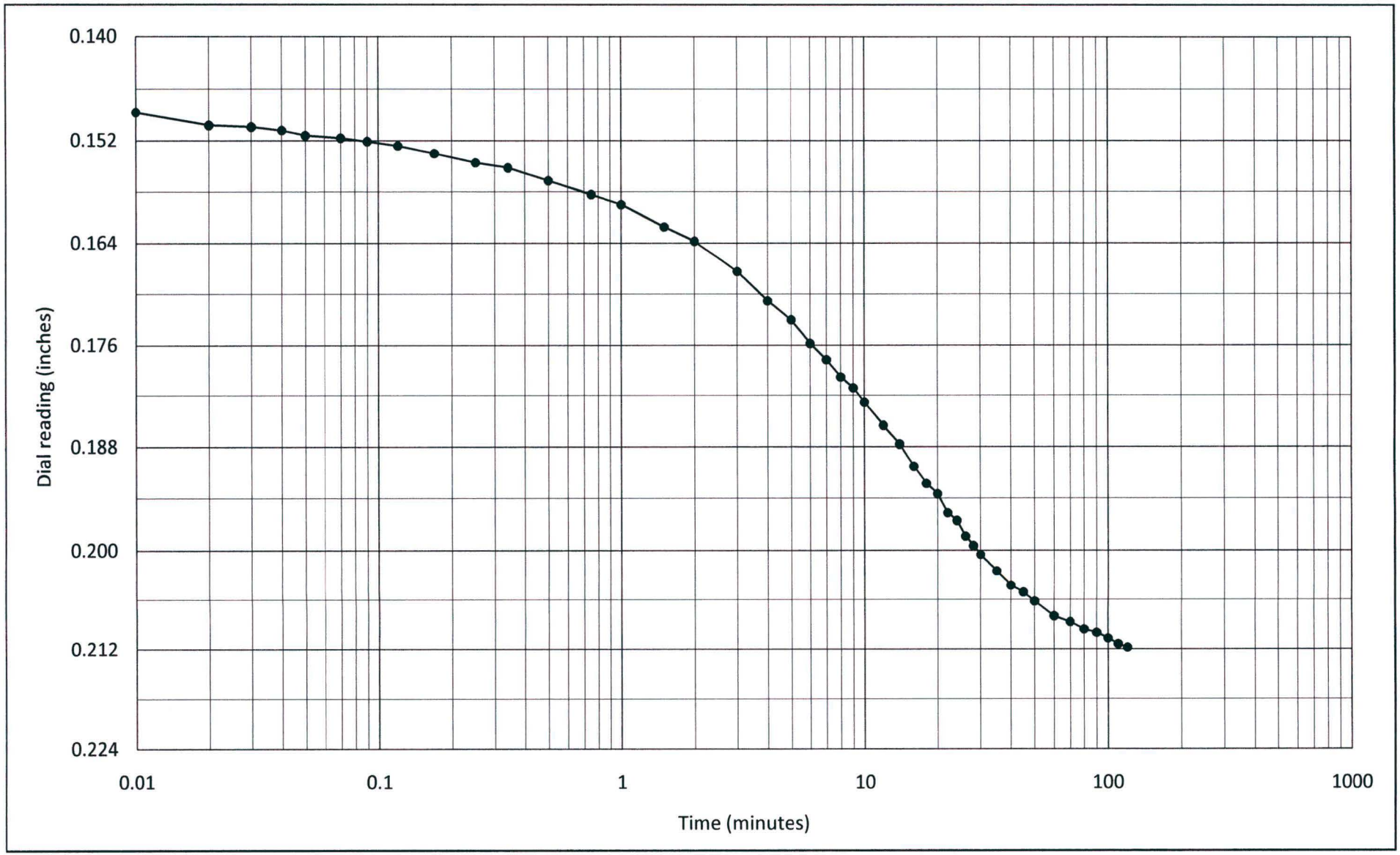


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

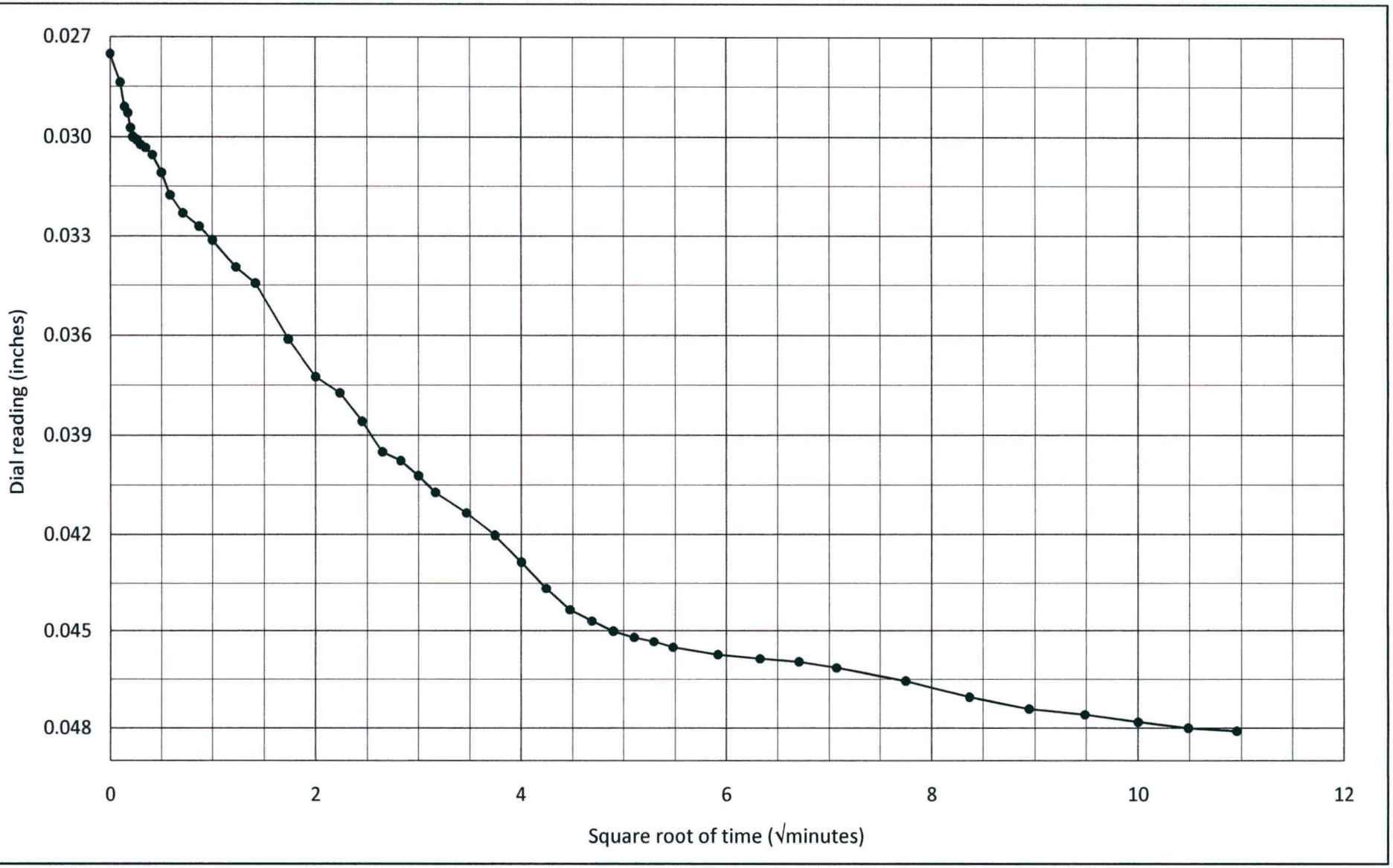


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

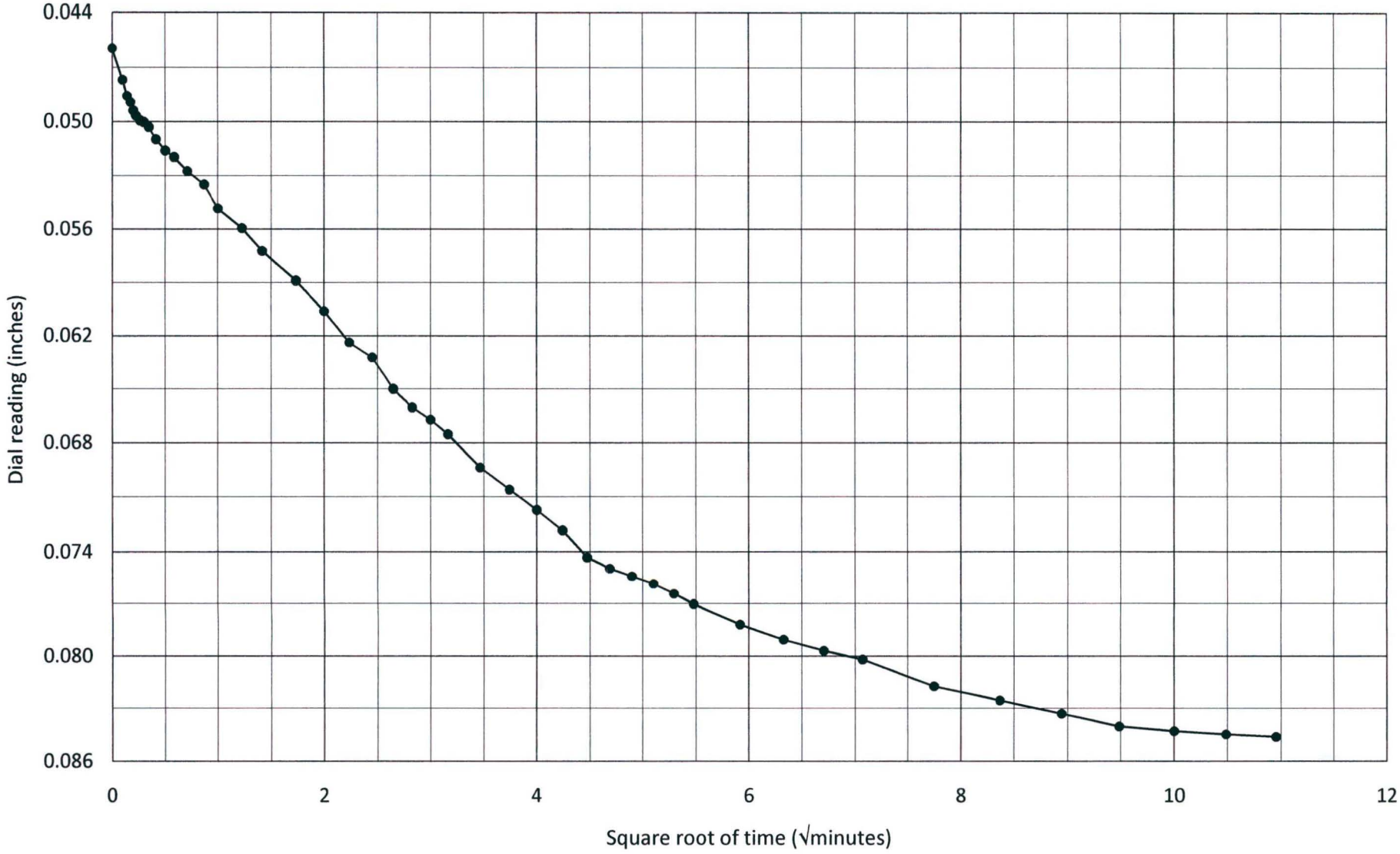


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 1 to 2 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

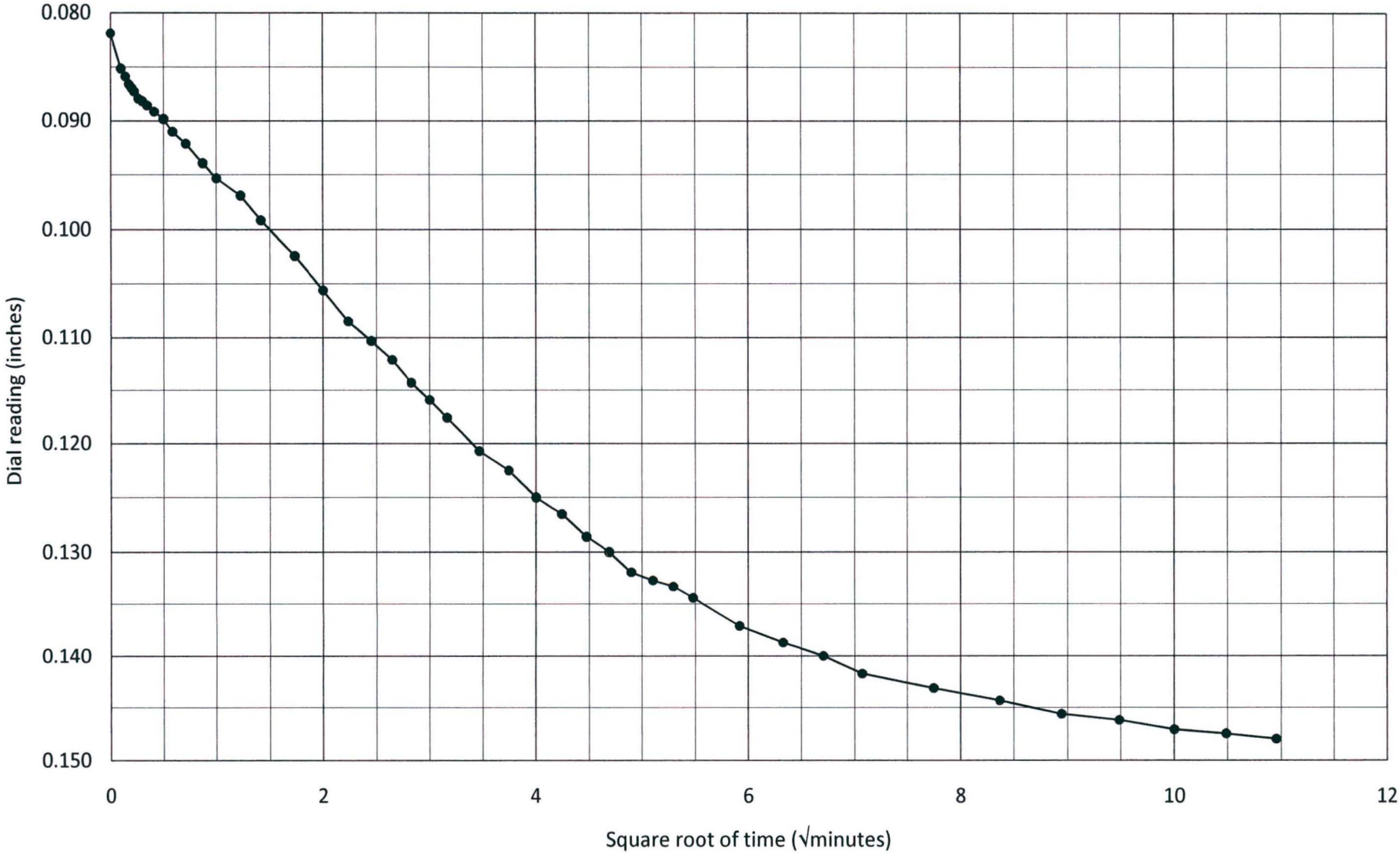


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 2 to 4 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

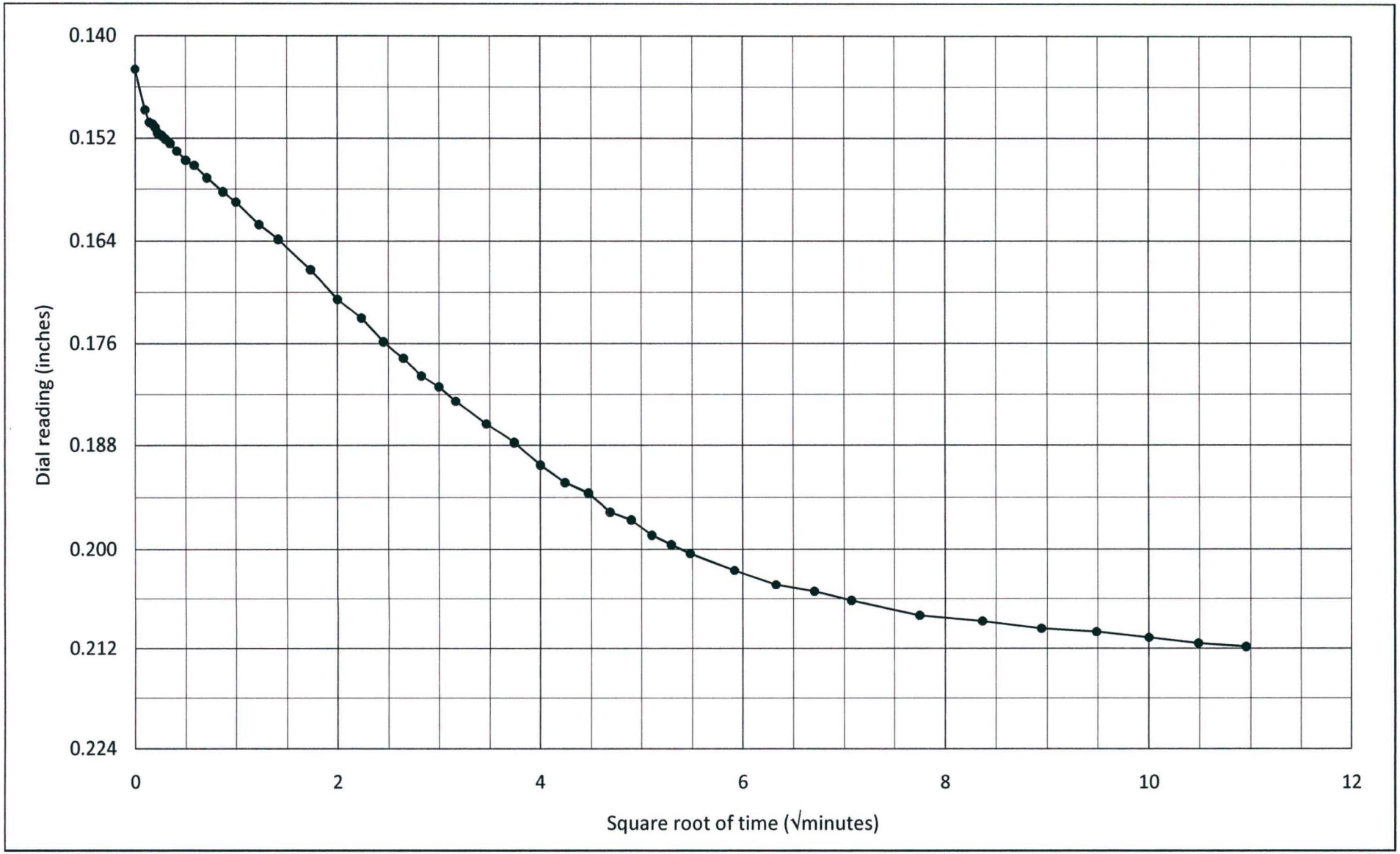


RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 4 to 8 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah



RB&G ENGINEERING, INC.

Hole no.: 08-P2
Depth: 70'-71.5'
Load: 8 to 16 tsf

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

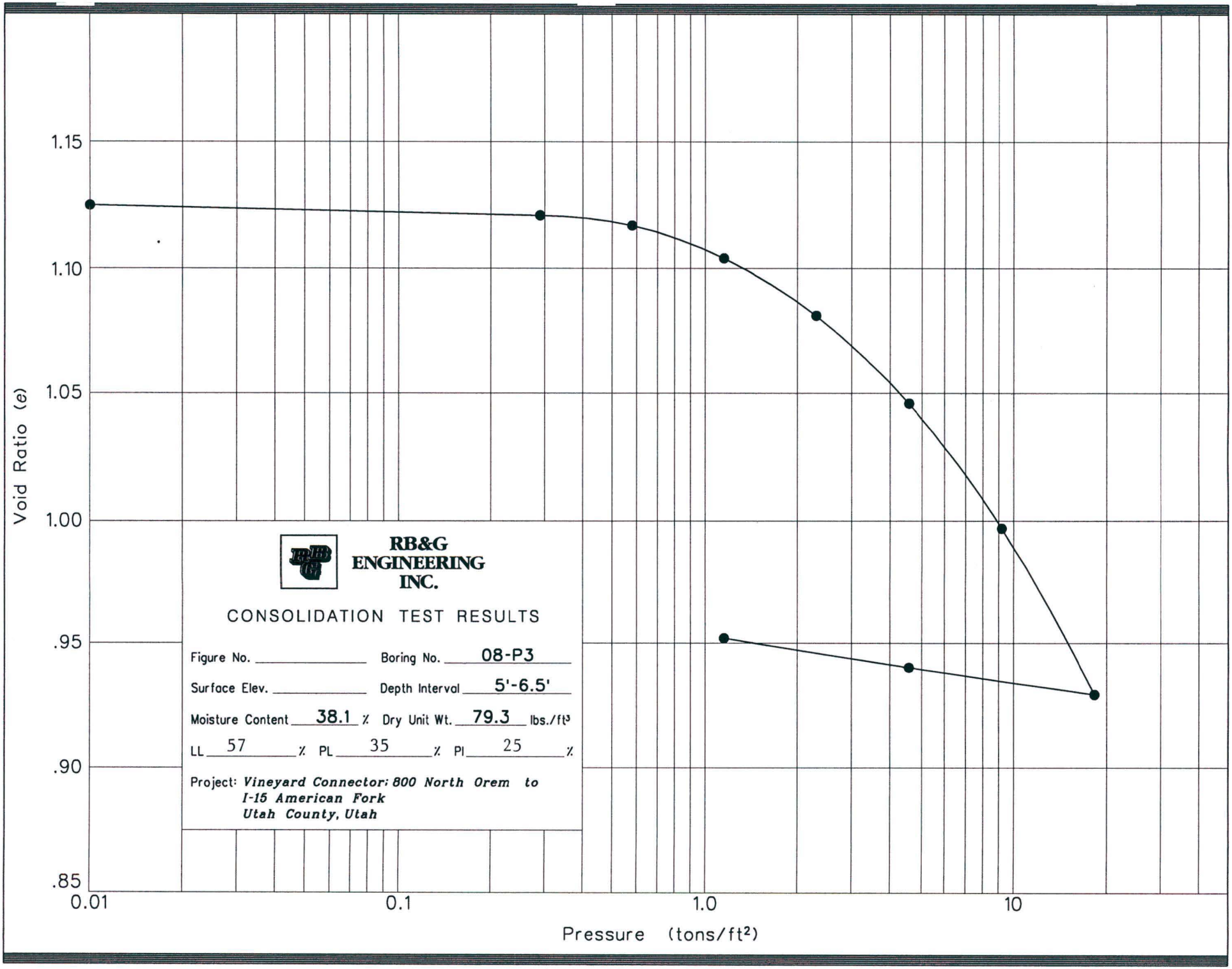
Table 1

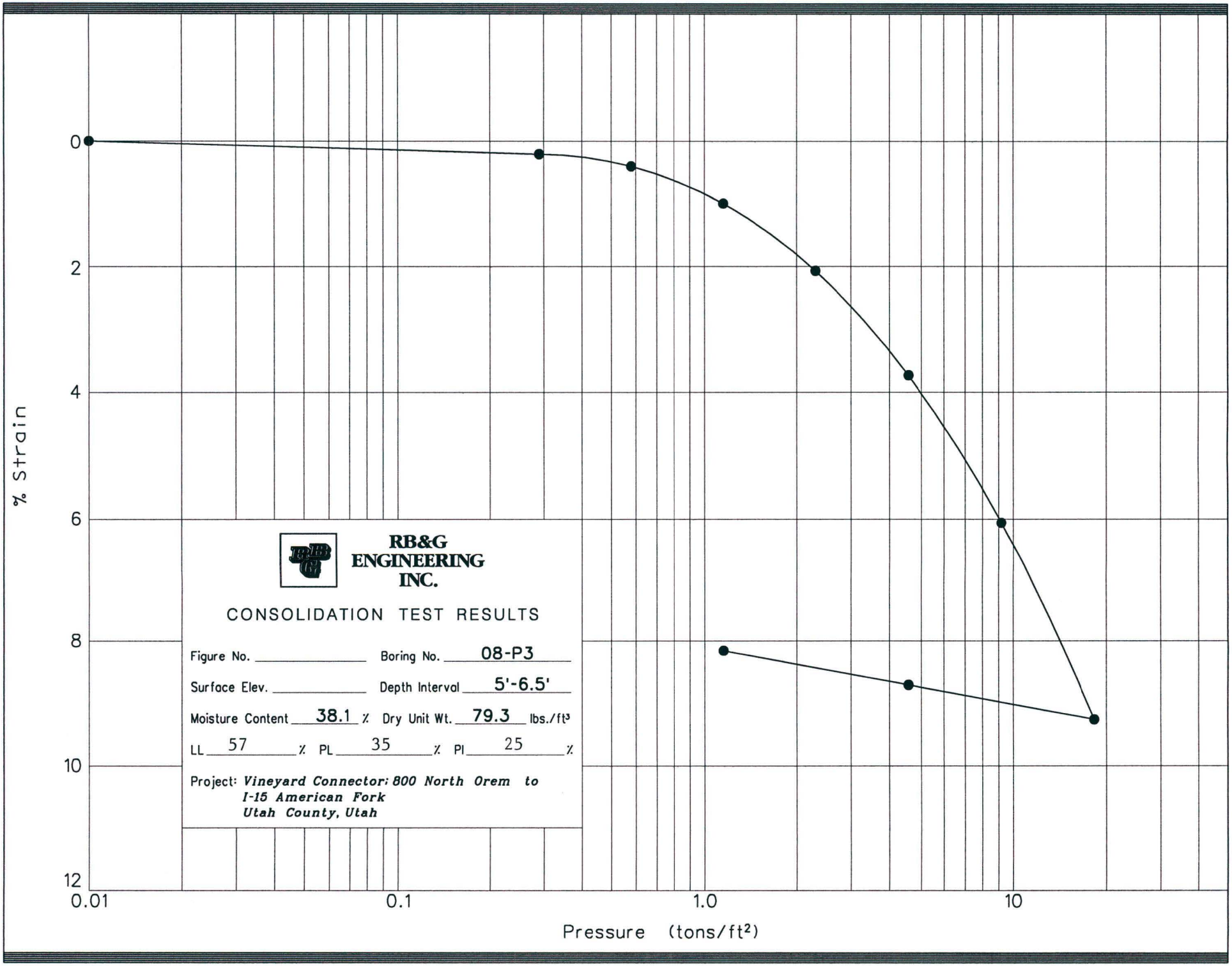
SUMMARY OF TEST DATA

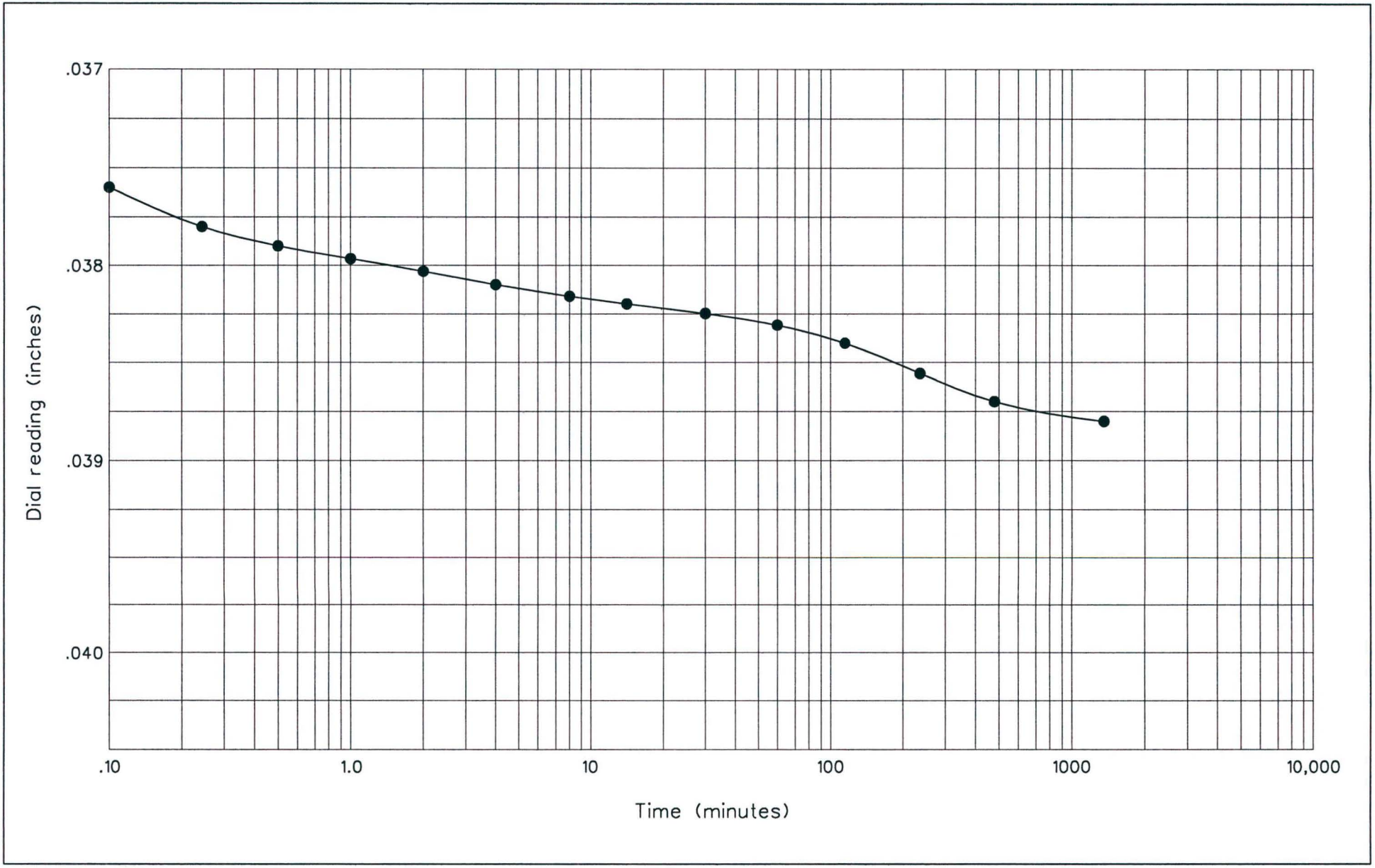
PROJECT Vineyard Connector; 800 North Orem to I-15 American Fork
PROJECT NO. 200701-048
LOCATION Utah County, Utah
FEATURE Foundations

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	STANDARD PENETRATION BLOWS PER FOOT	IN-PLACE		UNCONFINED COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO Classification)
			DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT & CLAY	
08-P3	5-6.5	Shelby	79.3	38.1		57	35	25	0	13	87	MH (A-7-5(26))
	16.5-18	14		21.8				NP	0	80	20	SM (A-2-4(0))
	26.5-28	9		22.8				NP	0	74	26	SM (A-2-4(0))
	30-31.5	Shelby		23.7				NP	0	74	26	SM (A-2-4(0))
	31.5-33	12		25.5				NP	0	76	24	SM (A-2-4(0))
	45-46.5	Shelby		21.5				NP	0	34	66	ML (A-4(0))
	55-56.5	Shelby	93.2	26.2	1868	26	15	11	0	6	94	CL (A-6(9))
	65-66.5	78		20.1				NP	0	84	16	SM (A-2-4(0))

NP=Nonplastic


1.15
1.10
1.05
1.00
.95
.90
.85
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P3
Surface Elev. _____ Depth Interval 5'-6.5'
Moisture Content 38.1 % Dry Unit Wt. 79.3 lbs./ft³
LL 57 % PL 35 % PI 25 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork Utah County, Utah


% Strain
0
2
4
6
8
10
12
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P3
Surface Elev. _____ Depth Interval 5'-6.5'
Moisture Content 38.1 % Dry Unit Wt. 79.3 lbs./ft³
LL 57 % PL 35 % PI 25 %
Project: Vineyard Connector: 800 North Orem to I-15 American Fork Utah County, Utah



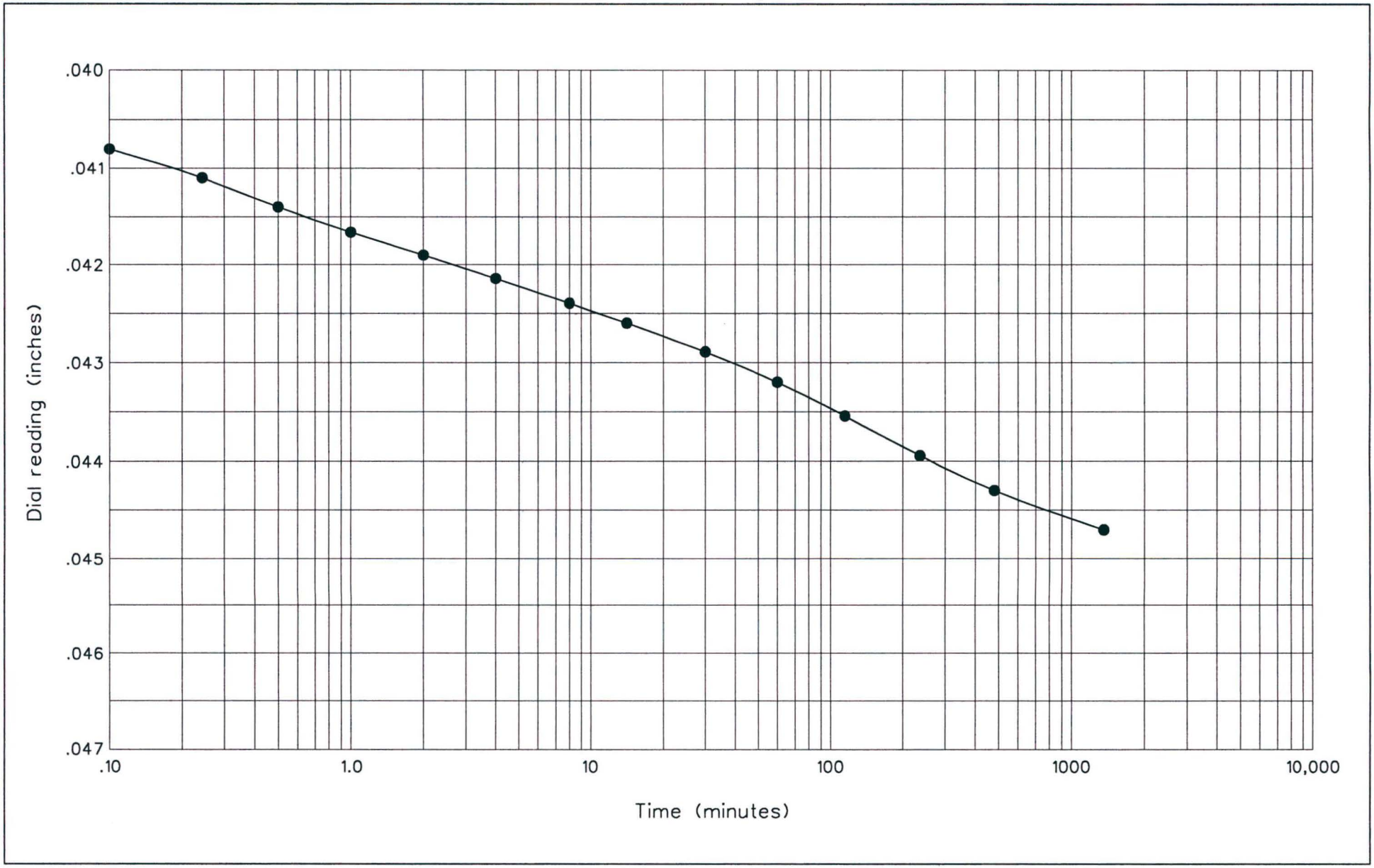
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P3
Depth: 5'-6.5'
Load: 0.29 to 0.58 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



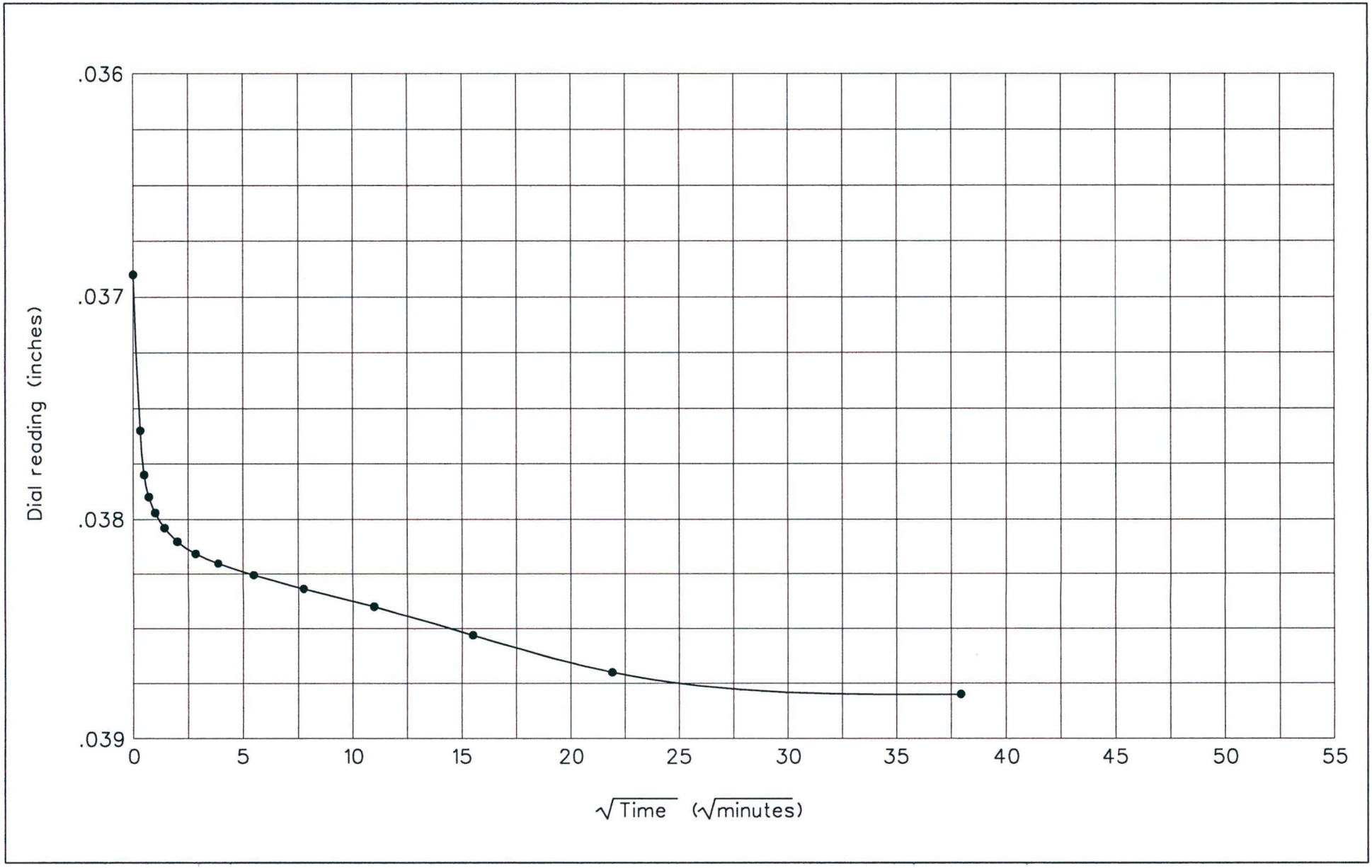
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P3
Depth: 5'-6.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



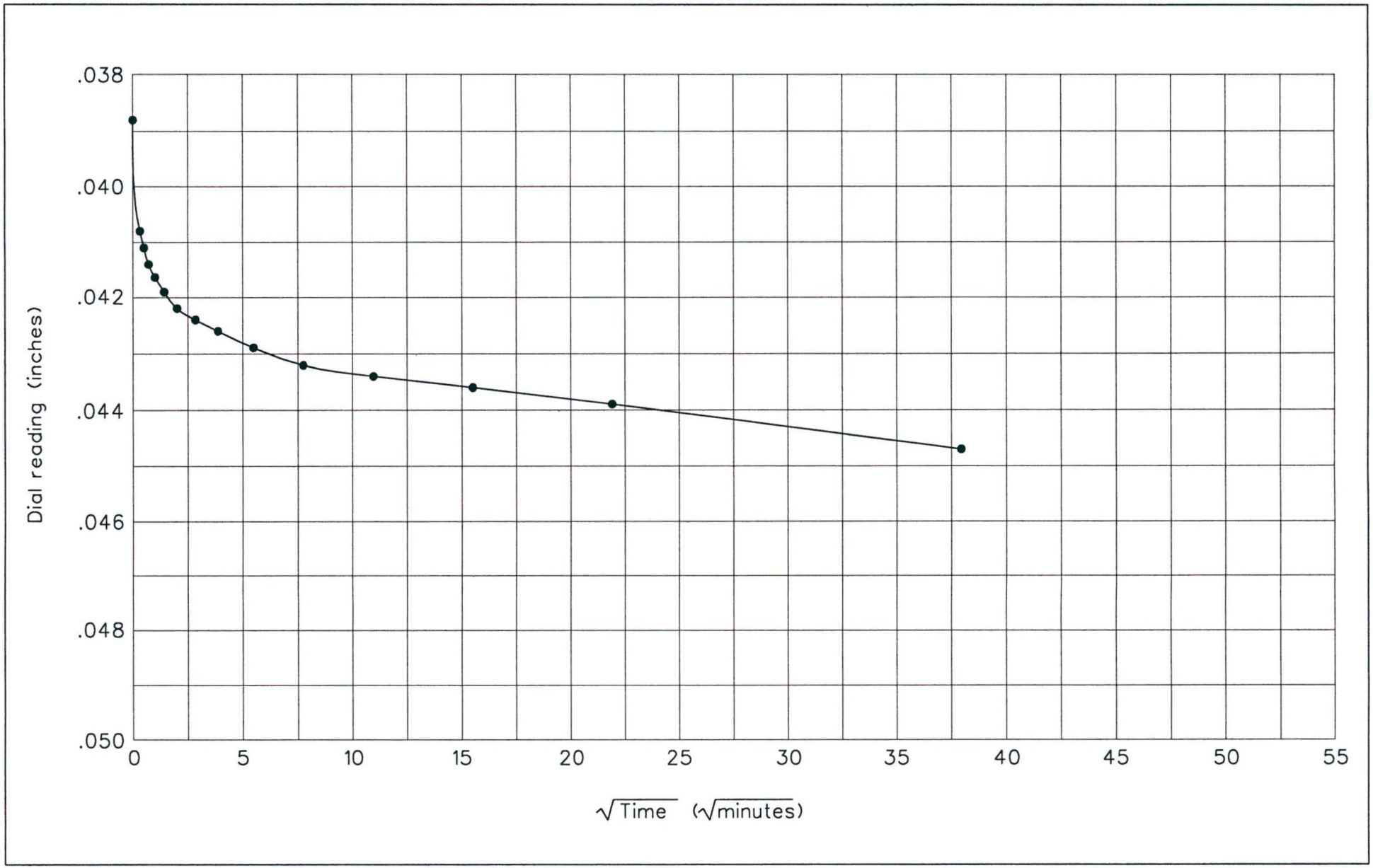
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P3
Depth: 5'-6.5'
Load: 0.29 to 0.58 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



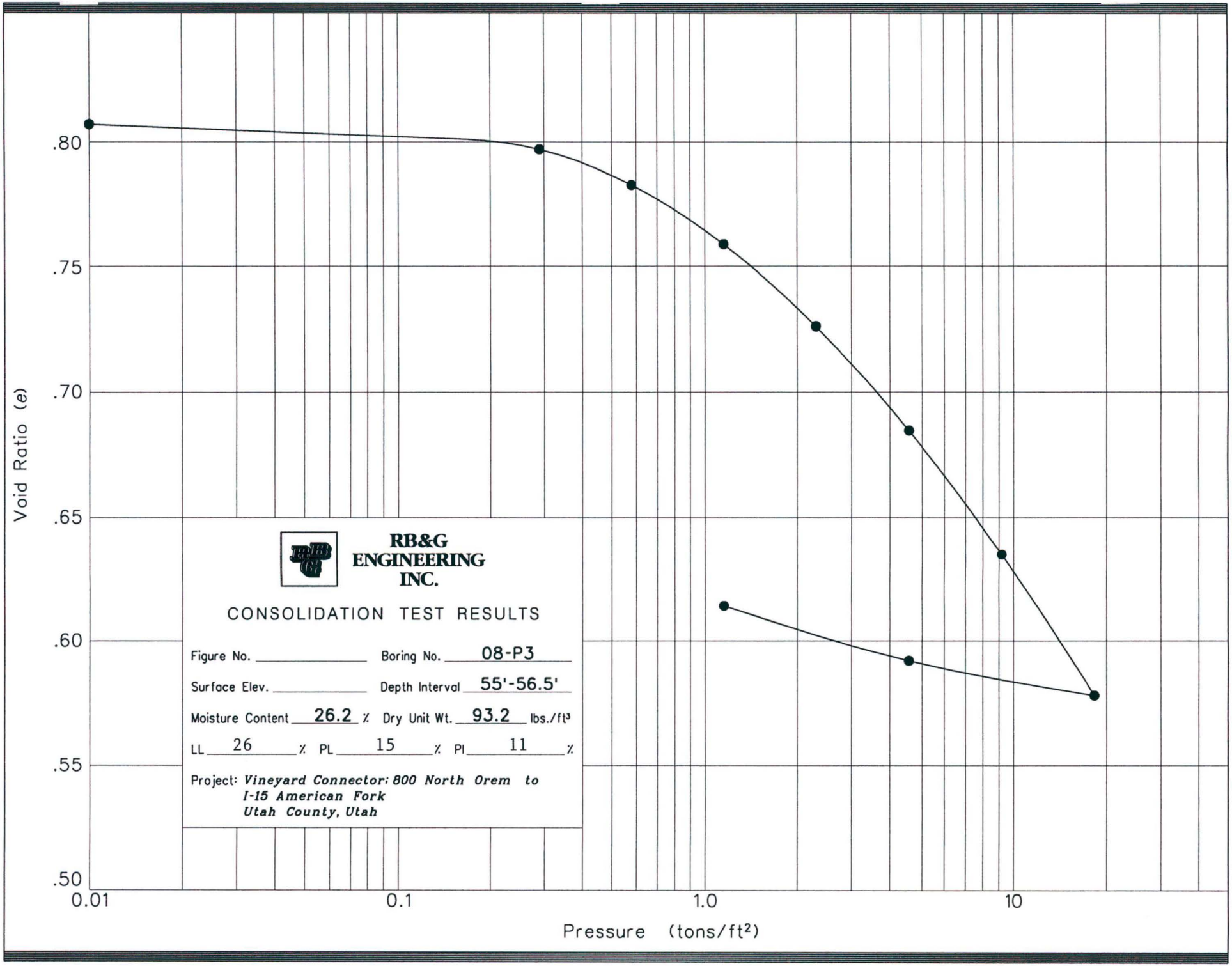
RB&G ENGINEERING INC.
Provo, Utah

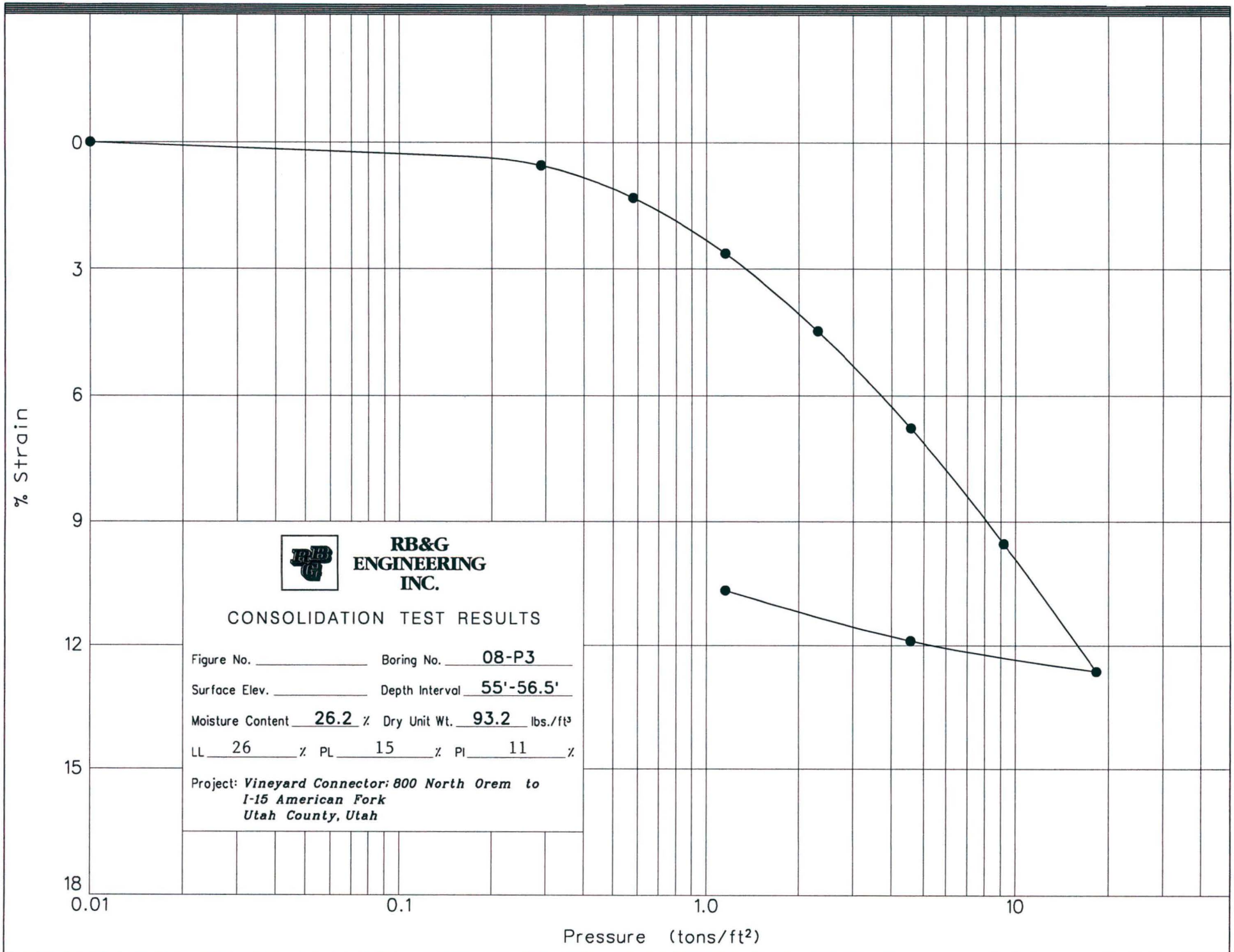
Hole no.: 08-P3
Depth: 5'-6.5'
Load: 0.58 to 1.15 tons

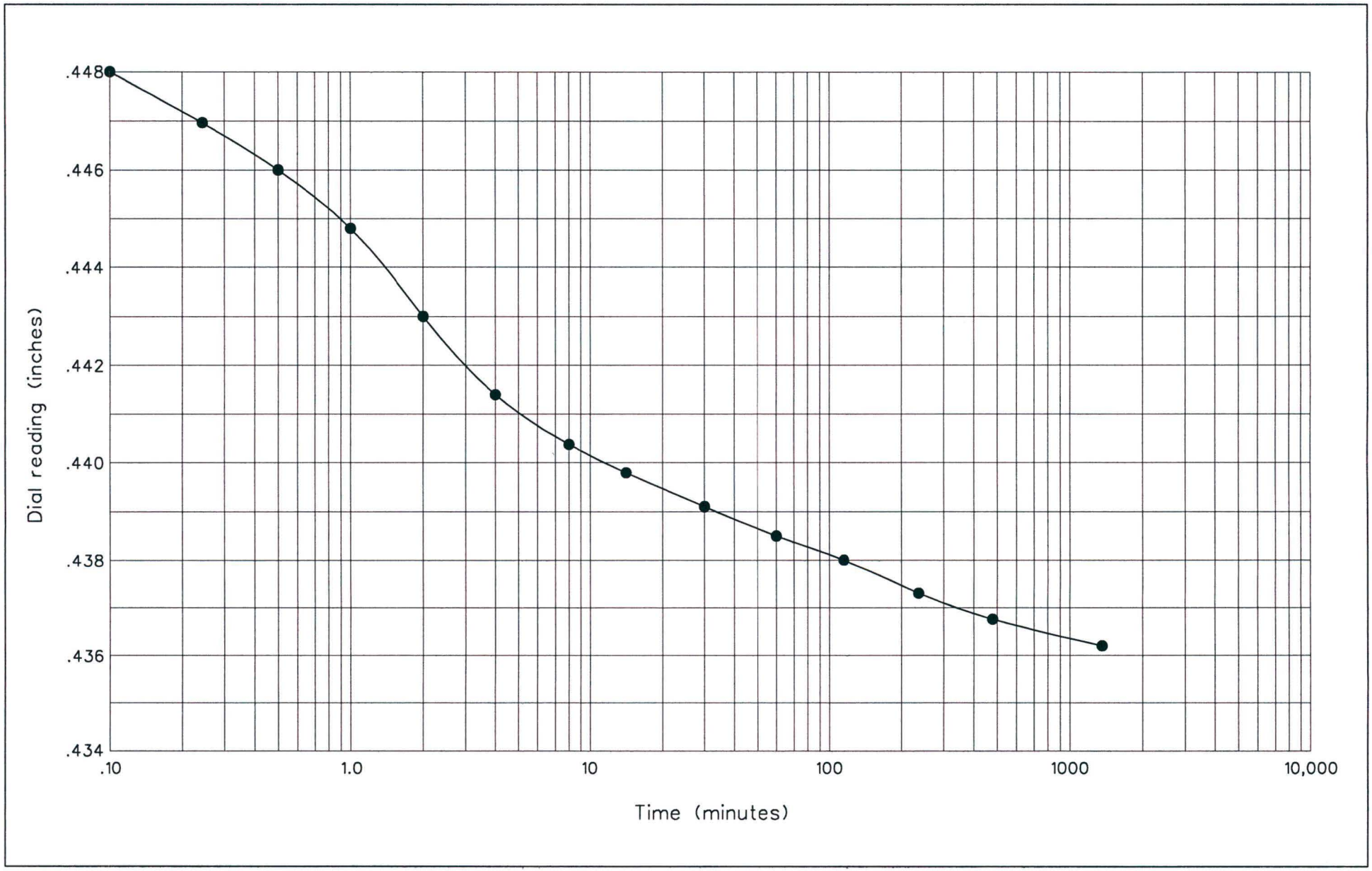
TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure


.80
.75
.70
.65
.60
.55
.50
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P3
Surface Elev. _____ Depth Interval 55'-56.5'
Moisture Content 26.2 % Dry Unit Wt. 93.2 lbs./ft³
LL 26 % PL 15 % PI 11 %
Project: Vineyard Connector: 800 North Orem to I-15 American Fork
Utah County, Utah


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G ENGINEERING INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-P3
Surface Elev. _____ Depth Interval 55'-56.5'
Moisture Content 26.2 % Dry Unit Wt. 93.2 lbs./ft³
LL 26 % PL 15 % PI 11 %
Project: Vineyard Connector; 800 North Orem to I-15 American Fork
Utah County, Utah



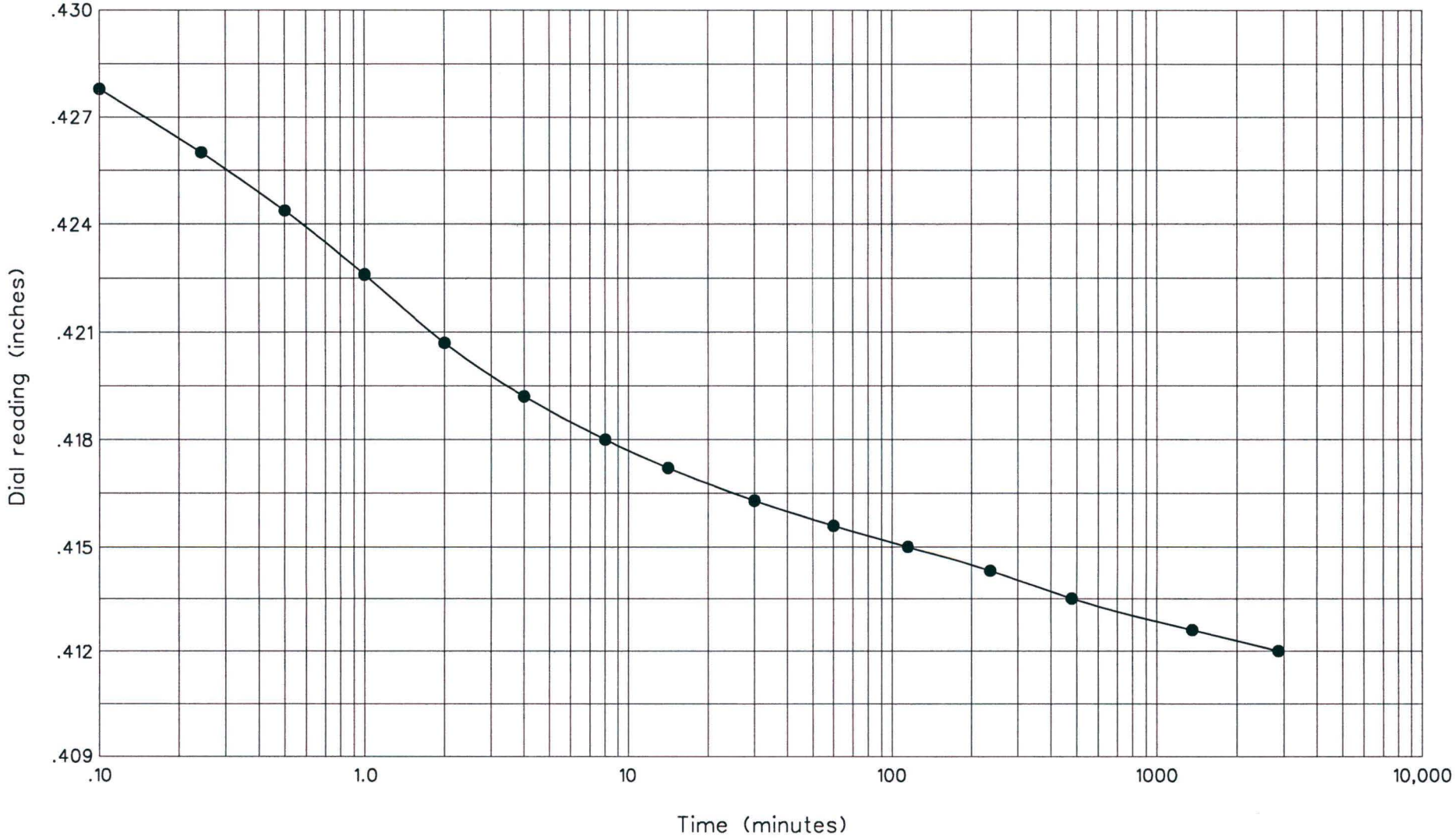
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P3
Depth: 55'-56.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



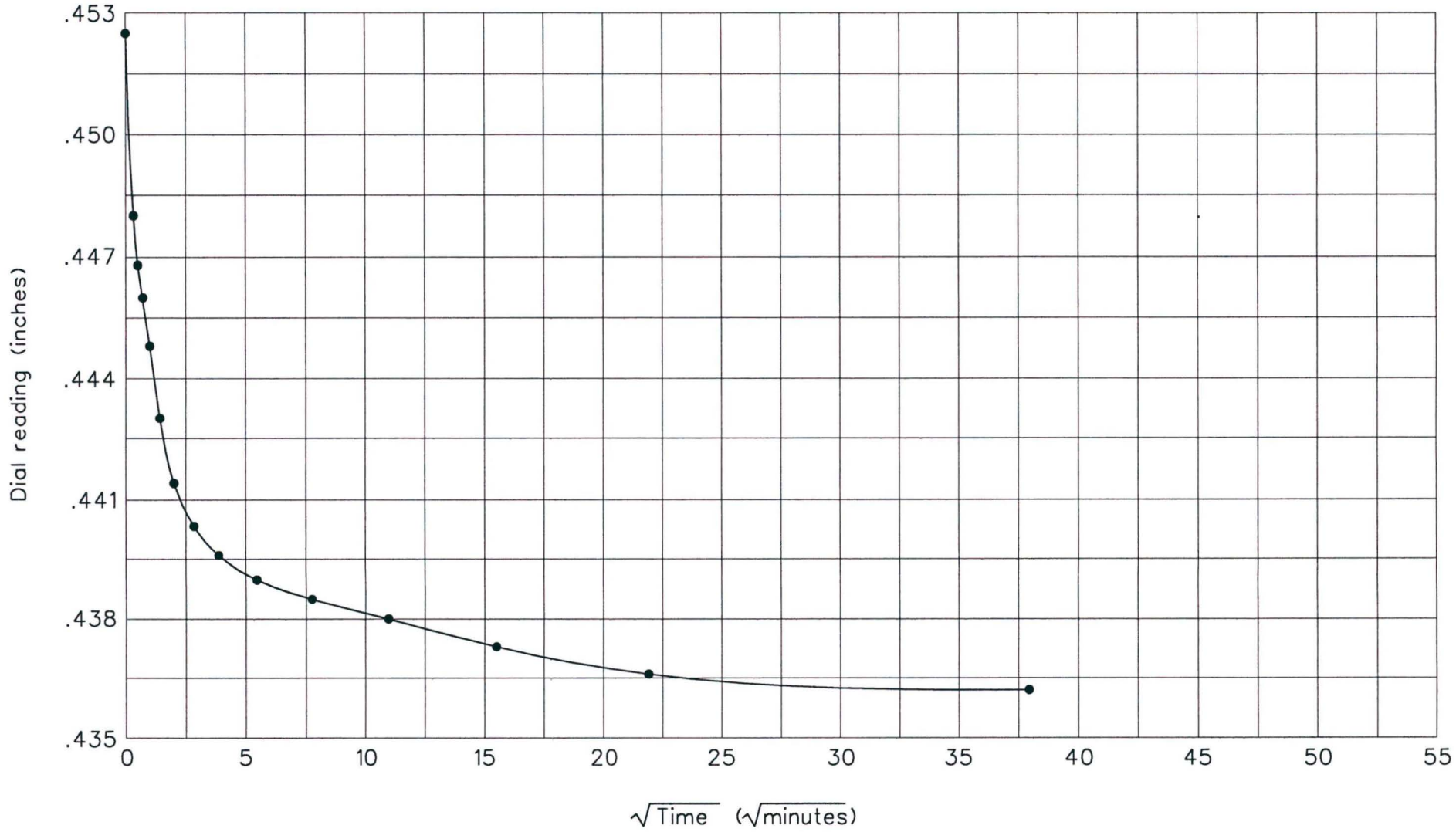
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P3
Depth: 55'-56.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



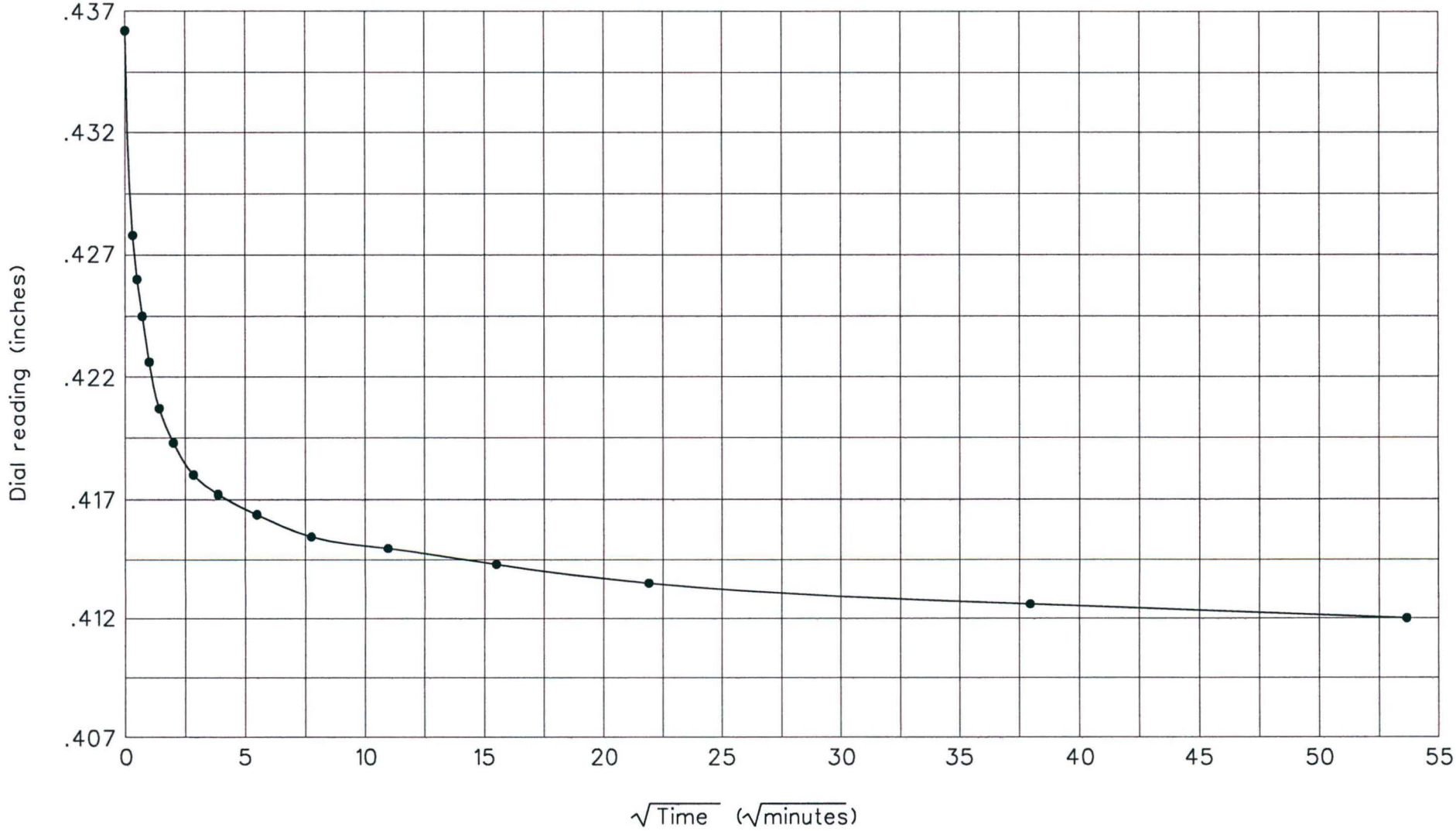
RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P3
Depth: 55'-56.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure



RB&G ENGINEERING INC.
Provo, Utah

Hole no.: 08-P3
Depth: 55'-56.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

Vineyard Connector;
800 North Orem to I-15 American Fork
Utah County, Utah

Figure

Table 1
SUMMARY OF TEST DATA

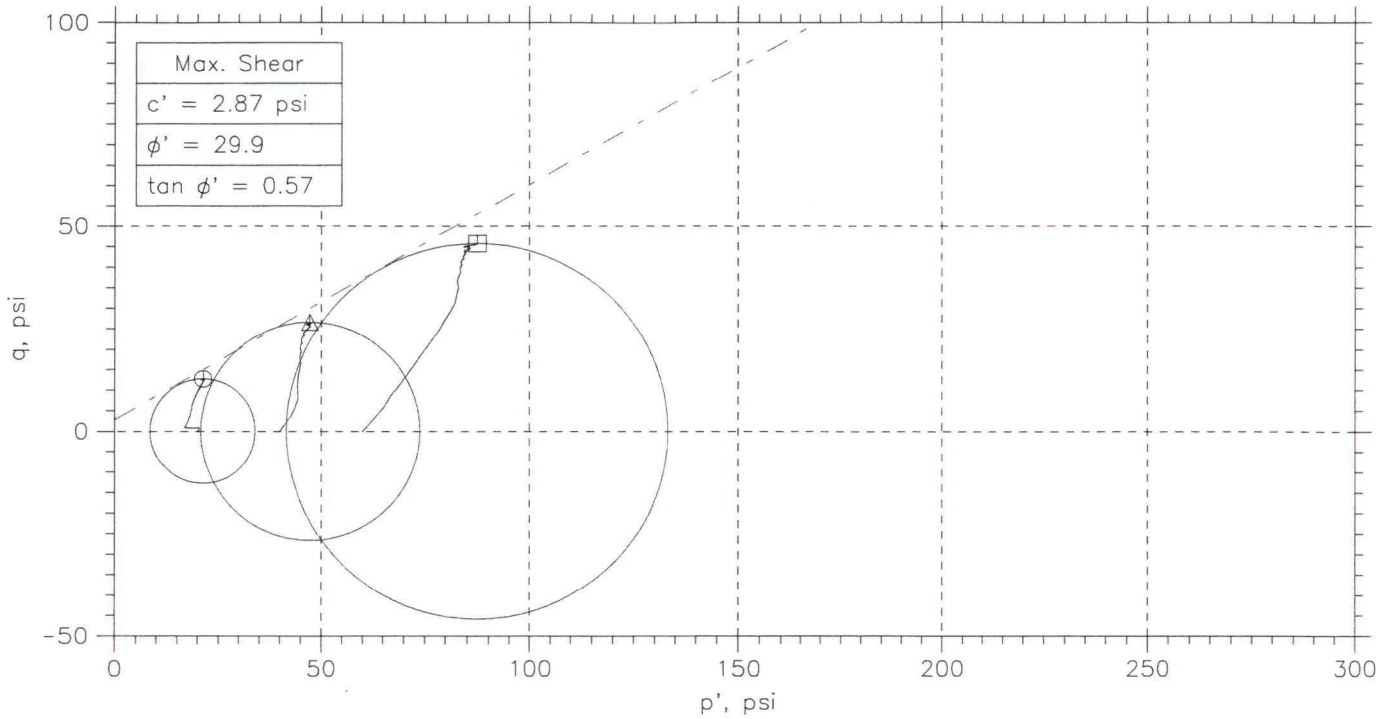
PROJECT I-15 Utah County Corridor — PROJECT NO. 200801-200
LOCATION Proctor Road Over I-15, Pleasant Grove, Utah — FEATURE Foundations

HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	STANDARD PENETRATION BLOWS PER FOOT Corrected $(N1)_{60}$	IN-PLACE		UNCONFINED COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS				UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO Classification)
			DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTIC. INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT& CLAY	PERCENT FINER THAN 0.005 mm	
08-PG2-B1	5-6.5	9		21.1		35	21	14	13	19	68		CL (A-6(8))
	11.5-13	Shelby	90.5	33.5		54	25	29	0	1	99		CH (A-7-6(33))
	20-21.5	Shelby	91.1	34.2	3742	53	22	31	0	0	100		CH (A-7-6(35))
	30-31.5	Shelby	103.4	23.6	4977	35	18	17	0	13	87		CL (A-6(14))
	41-42.5	28		22.4				NP	5	50	45		SM (A-4(0))
	45-46.5	Shelby	86.0	35.5		47	24	23	0	0	100		CL (A-7-6(26))
	55-56.5	Shelby	75.2	46.2	1601	47	23	24	0	0	100		CL (A-7-6(27))
	65-66.5	Shelby	75.6	41.7		51	23	28	0	0	100		CH (A-7-6(32))
	75-76.5	Shelby	75.1	46.3	1496	51	23	28	0	0	100		CH (A-7-6(32))
	85-86.5	Shelby	87.7	35.5									
	90-91.5	53		18.4				NP	0	79	21		SM (A-2-4(0))
	95-96.5	11		21.3				NP	0	78	22		SM (A-2-4(0))
	105-106.5	Shelby	97.3	26.7		33	24	9	0	6	94		ML (A-4(9))
	110-111.5	Shelby	94.7	30.2		31	25	6	0	5	95		ML (A-4(6))
	123-124.5	Shelby	93.8	31.0		40	25	15	0	0	100		CL (A-6(17))
	126.5-128	65		16.7		28	21	7	38	31	31		GC (A-2-4(0))

		Resistivity (ohm cm)	pH	Sulfate (mg/kg-dry)	Chloride (mg/kg-dry)
08-PG2-B1	5-6.5	1466	8.0	190	130

NP=Nonplastic

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol		⏲	△	⏍	
Sample No.		1	1	1	
Test No.		20 psi	40 psi	60 psi	
Depth		11.5-13'	11.5-13'	11.5-13'	
Initial	Diameter, in	1.4	1.4	1.4	
	Height, in	2.84	2.84	2.84	
	Water Content, %	33.5	33.5	33.5	
	Dry Density, pcf	90.88	90.88	90.88	
	Saturation, %	106.8	106.8	106.8	
	Void Ratio	0.841	0.841	0.841	
Before Shear	Water Content, %	30.8	32.1	32.1	
	Dry Density, pcf	91.66	89.94	89.94	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	0.825	0.86	0.86	
	Back Press., psi	28.01	5.011	1.586	
Ver. Eff. Cons. Stress, psi		19.98	40.	60.	
Shear Strength, psi		12.74	26.59	45.82	
Strain at Failure, %		5.13	4.44	6.45	
Strain Rate, %/min		0.01	0.01	0.01	
B-Value		1.12	---	---	
Estimated Specific Gravity		2.68	2.68	2.68	
Liquid Limit		54	54	54	
Plastic Limit		29	29	29	

Project: I-15 UCC

Location: PG 2

Project No.: 200801-200

Boring No.: 08-PG2-B1

Sample Type: shelby

Description: gray brown clay, stiff

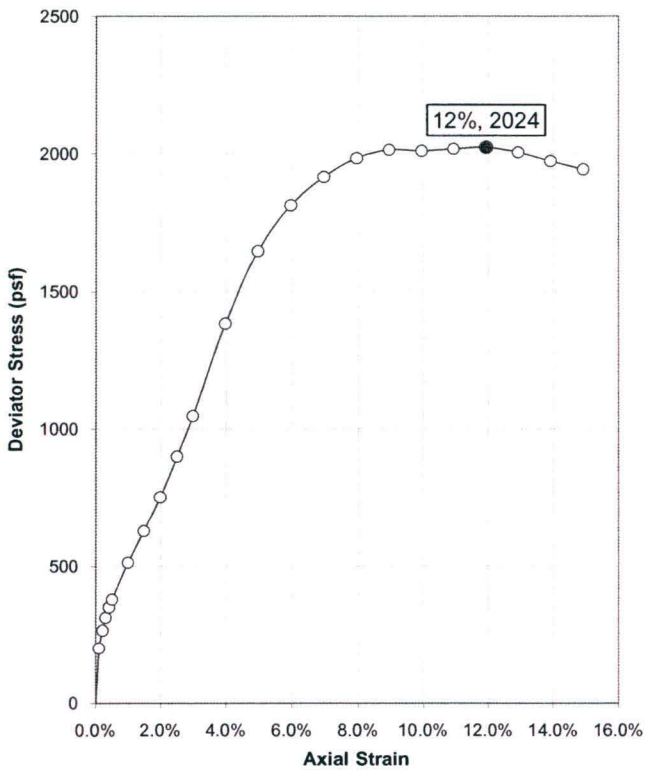
Remarks: multi-stage

Phase calculations based on start and end of test.

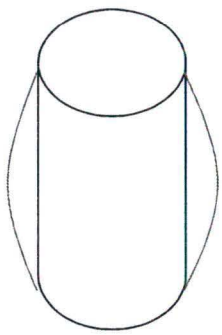
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B1
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	45-46.5'
Date	November 13, 2008	**Sample Description**	Lean clay
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-1	0	
0.1%	202	101	
0.2%	267	133	
0.3%	313	156	
0.4%	351	176	
0.5%	380	190	
1.0%	514	257	
1.5%	629	314	
2.0%	753	377	
2.5%	901	451	
3.0%	1048	524	
4.0%	1385	693	
5.0%	1650	825	
6.0%	1816	908	
7.0%	1917	959	
8.0%	1985	993	
8.9%	2016	1008	
9.9%	2011	1006	
10.9%	2019	1010	
11.9%	2024	1012	
12.9%	2006	1003	
13.9%	1975	987	
14.9%	1945	972	



Initial Sample Data

Initial height of specimen	L_o	5.24	(in)	**Moisture content***	w	36%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	86.0	(pcf)
Height-to-diameter ratio	L_o / D_o	2.02		**Initial void ratio**	e_o	0.960	
Initial weight of specimen		844.2	(g)	**Saturation**	S	1.00	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	47	
				Plastic index	PI	23	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	2024	(psf)	**Major principal stress at failure****	σ_1	6631	(psf)
Shear stress at failure**	q_f	1012	(psf)	**Minor principal stress at failure****	σ_3	4607	(psf)

Average strain rate to failure	1%	/ min
Strain at failure	12%	

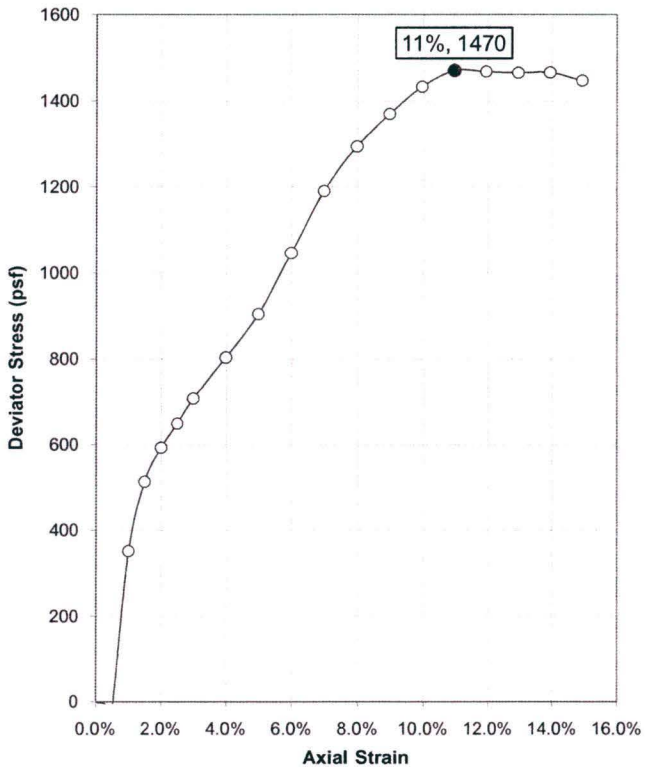
Remarks CL / A-7-6(26)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B1
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	65-66.5'
Date	November 13, 2008	**Sample Description**	Fat Clay, gray
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	0	0	
0.1%	-2	-1	
0.2%	-3	-1	
0.3%	-6	-3	
0.4%	-11	-5	
0.5%	-13	-7	
1.0%	352	176	
1.5%	514	257	
2.0%	593	297	
2.5%	649	325	
3.0%	708	354	
4.0%	804	402	
5.0%	905	452	
6.0%	1047	524	
7.0%	1191	595	
8.0%	1294	647	
9.0%	1370	685	
10.0%	1433	716	
11.0%	1470	735	
11.9%	1468	734	
12.9%	1465	733	
13.9%	1466	733	
14.9%	1447	724	

Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	42%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	75.6	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Initial void ratio**	e_o	1.229	
Initial weight of specimen		770.2	(g)	**Saturation**	S	0.92	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	51	
				Plastic index	PI	28	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	1470	(psf)	**Major principal stress at failure****	σ_1	8077	(psf)
Shear stress at failure**	q_f	735	(psf)	**Minor principal stress at failure****	σ_3	6607	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		11%					

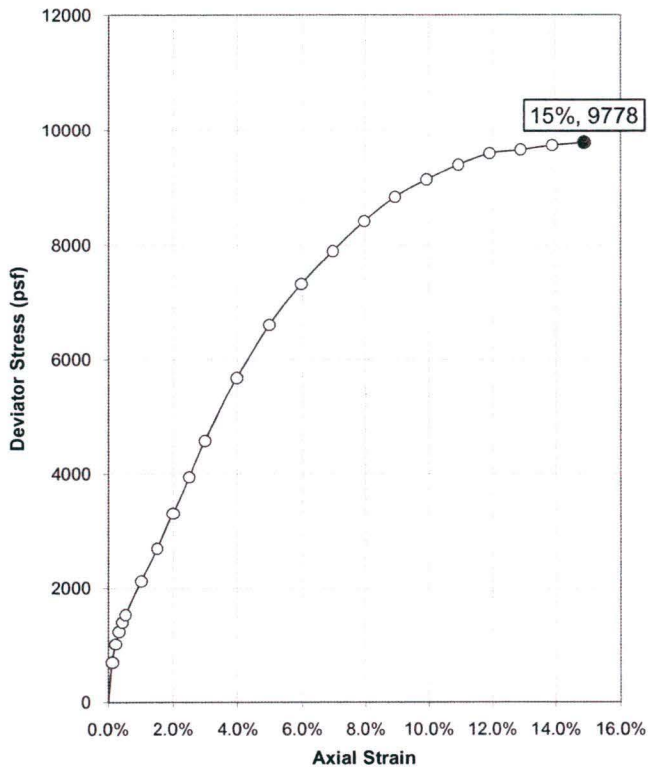
Remarks CH / A-7-6(32)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

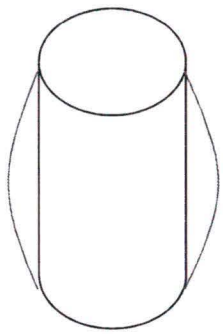
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B1
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	105-106.5
Date	November 13, 2008	**Sample Description**	Silt
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-7	-3	
0.1%	699	350	
0.2%	1022	511	
0.3%	1245	622	
0.4%	1406	703	
0.5%	1536	768	
1.0%	2122	1061	
1.5%	2693	1346	
2.0%	3307	1653	
2.5%	3947	1974	
3.0%	4577	2289	
4.0%	5687	2844	
5.0%	6608	3304	
6.0%	7319	3660	
6.9%	7894	3947	
7.9%	8419	4209	
8.9%	8839	4420	
9.9%	9139	4569	
10.9%	9390	4695	
11.9%	9589	4794	
12.9%	9654	4827	
13.9%	9728	4864	
14.9%	9778	4889	



Initial Sample Data

Initial height of specimen	L_o	5.33	(in)	**Moisture content***	w	27%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	97.3	(pcf)
Height-to-diameter ratio	L_o / D_o	2.06		**Initial void ratio**	e_o	0.731	
Initial weight of specimen		909.0	(g)	**Saturation**	S	0.99	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	33	
				Plastic index	PI	9	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	9778	(psf)	**Major principal stress at failure****	σ_1	20288	(psf)
Shear stress at failure**	q_f	4889	(psf)	**Minor principal stress at failure****	σ_3	10509	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

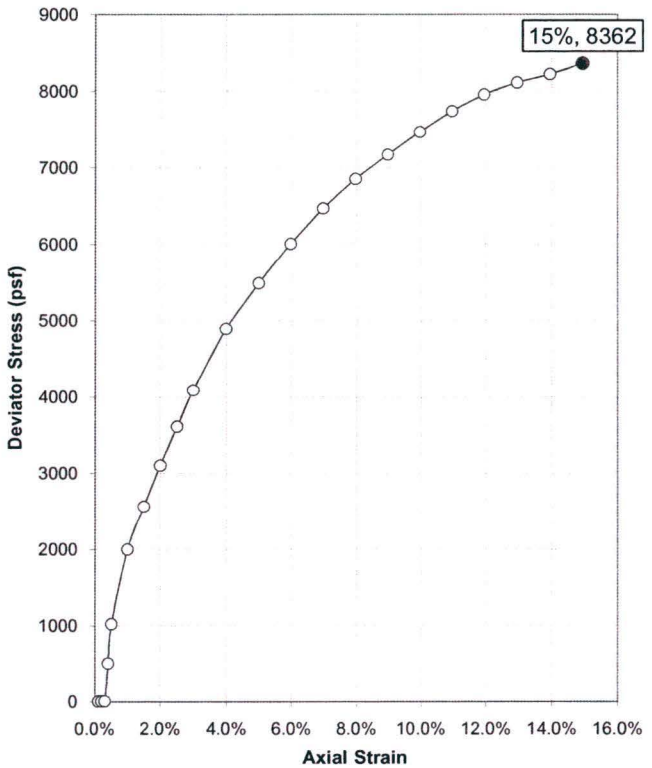
Remarks ML / A-4(9)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

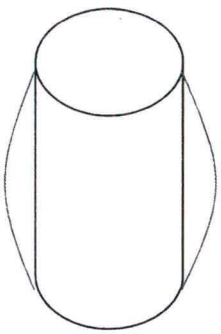
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B1
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	123-124.5
Date	November 13, 2008	**Sample Description**	Lean clay W/ silt lenses
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-4	-2	
0.1%	9	5	
0.2%	8	4	
0.3%	11	5	
0.4%	504	252	
0.5%	1026	513	
1.0%	2006	1003	
1.5%	2565	1282	
2.0%	3105	1552	
2.5%	3614	1807	
3.0%	4094	2047	
4.0%	4897	2448	
5.0%	5495	2748	
6.0%	6008	3004	
7.0%	6472	3236	
8.0%	6854	3427	
9.0%	7170	3585	
10.0%	7469	3734	
11.0%	7741	3870	
11.9%	7957	3978	
12.9%	8113	4057	
13.9%	8223	4112	
14.9%	8362	4181	



Initial Sample Data

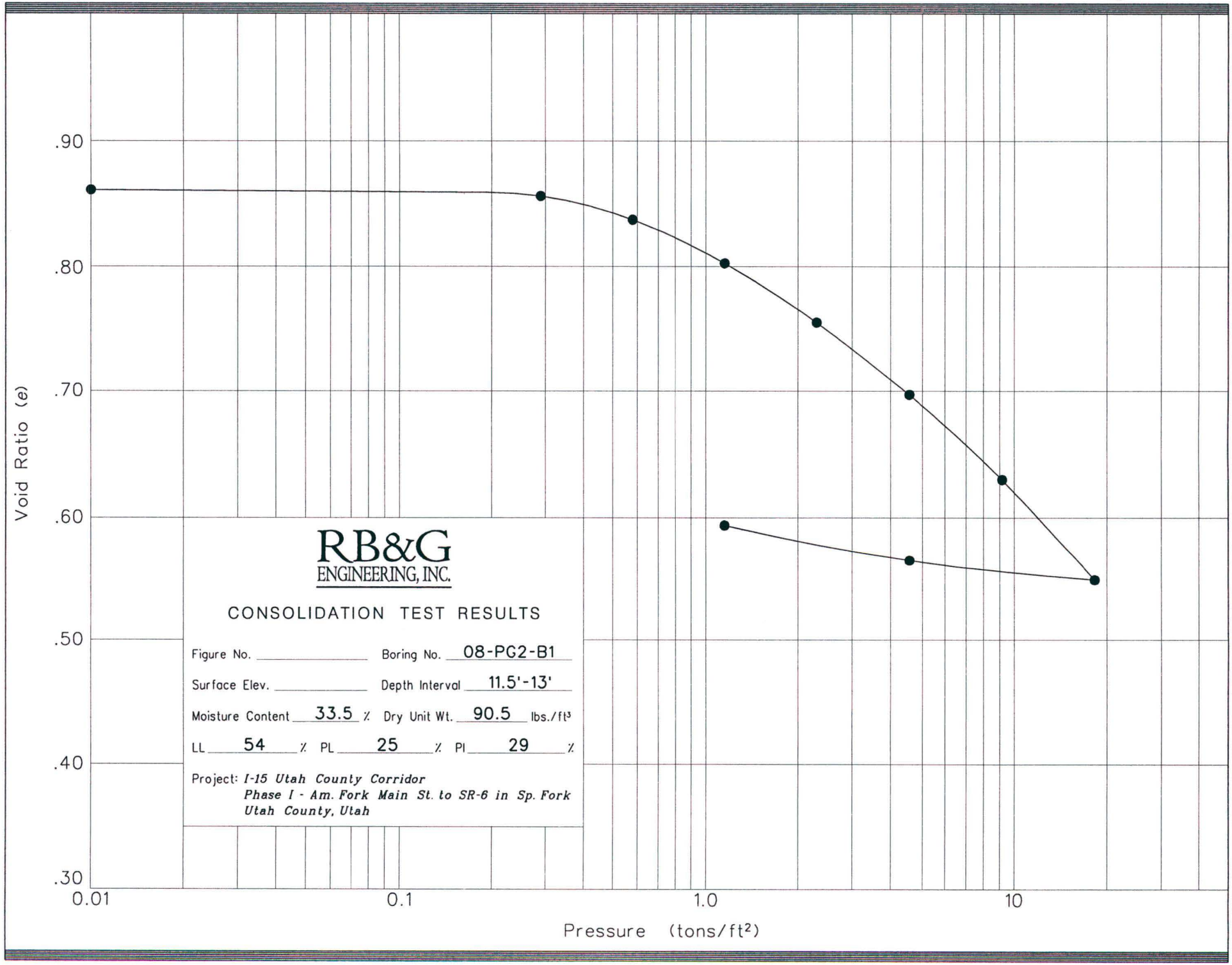
Initial height of specimen	L_o	5.33	(in)	**Moisture content***	w	31%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	92.3	(pcf)
Height-to-diameter ratio	L_o / D_o	2.06		**Initial void ratio**	e_o	0.825	
Initial weight of specimen		891.3	(g)	**Saturation**	S	1.01	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	40	
				Plastic index	PI	15	

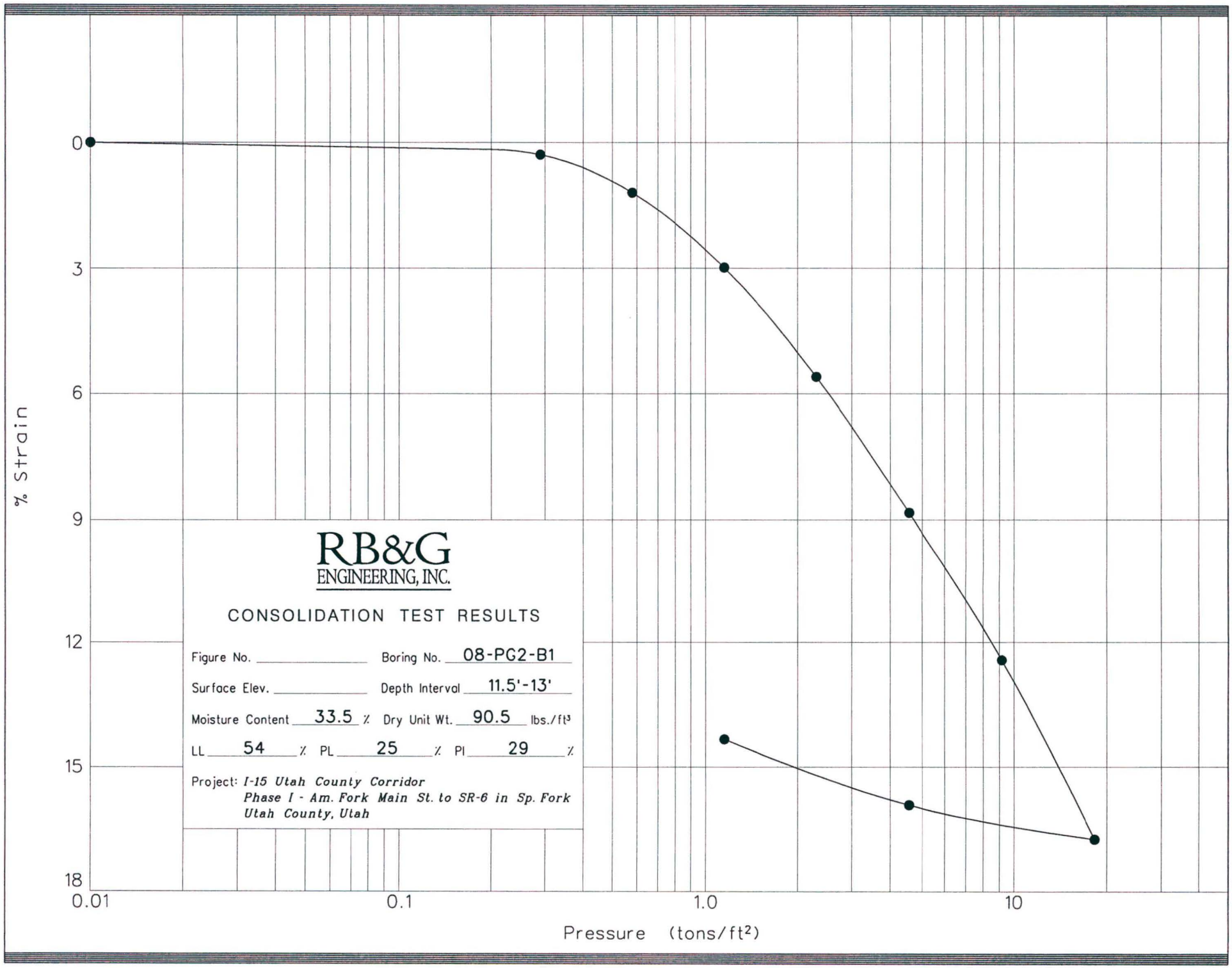
Test Results

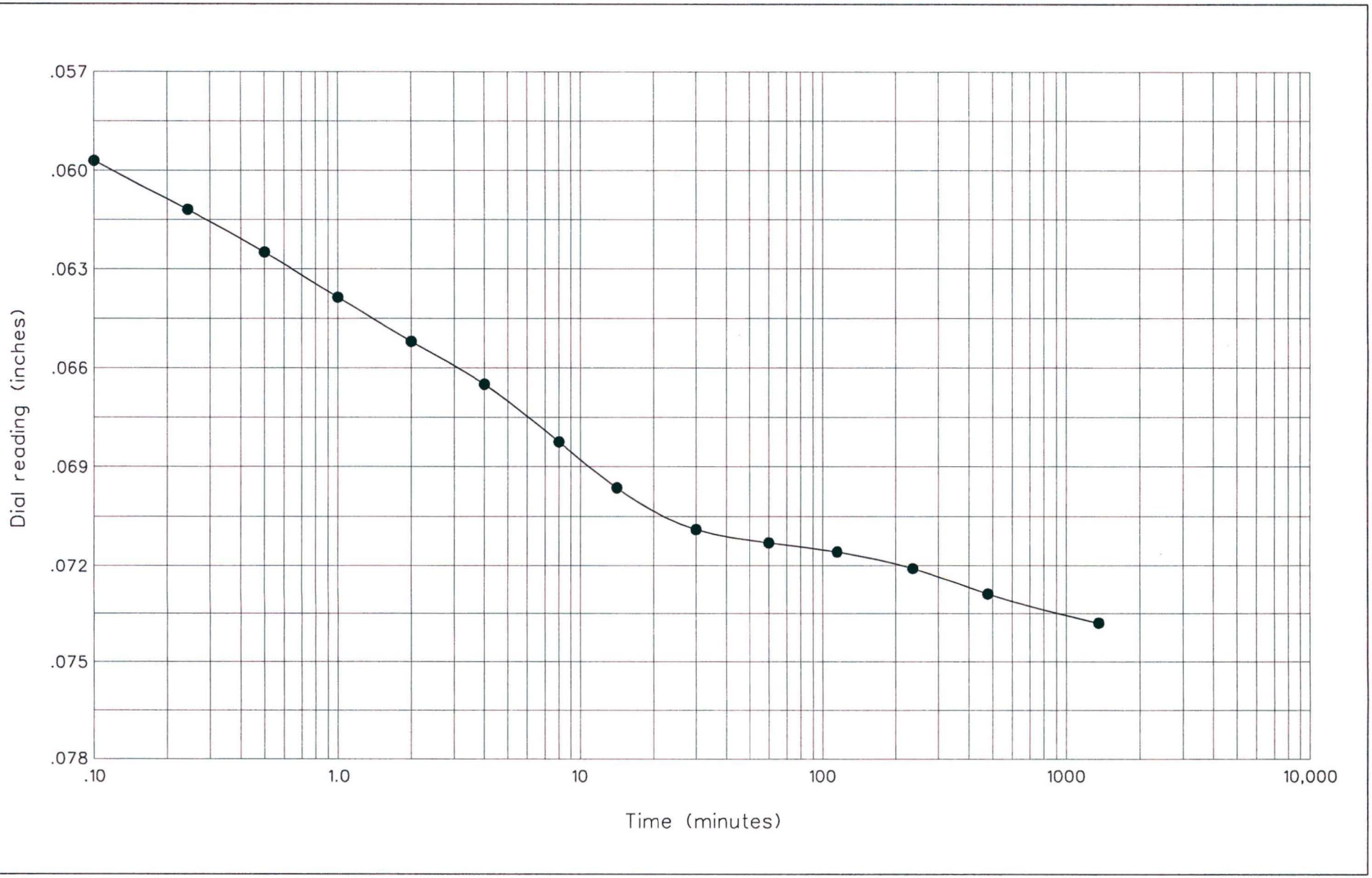
Deviator stress at failure**	$\sigma_{d,f}$	8362	(psf)	**Major principal stress at failure****	σ_1	20745	(psf)
Shear stress at failure**	q_f	4181	(psf)	**Minor principal stress at failure****	σ_3	12383	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

Remarks CL / A-6(17)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects


.90
.80
.70
.60
.50
.40
.30
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B1
Surface Elev. _____ Depth Interval 11.5'-13'
Moisture Content 33.5 % Dry Unit Wt. 90.5 lbs./ft³
LL 54 % PL 25 % PI 29 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


% Strain
0
3
6
9
12
15
18
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B1
Surface Elev. _____ Depth Interval 11.5'-13'
Moisture Content 33.5 % Dry Unit Wt. 90.5 lbs./ft³
LL 54 % PL 25 % PI 29 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



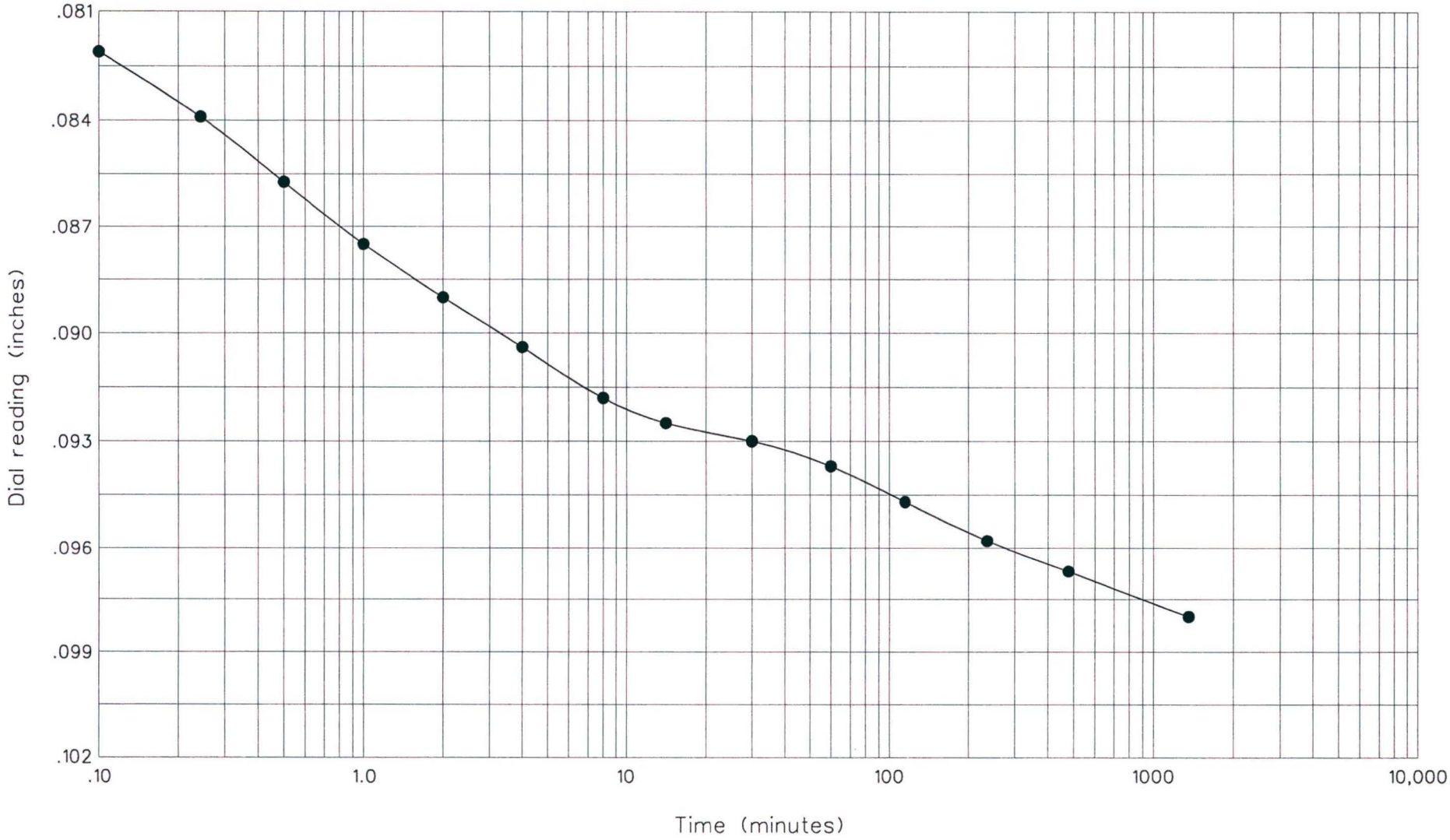
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 11.5'-13'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



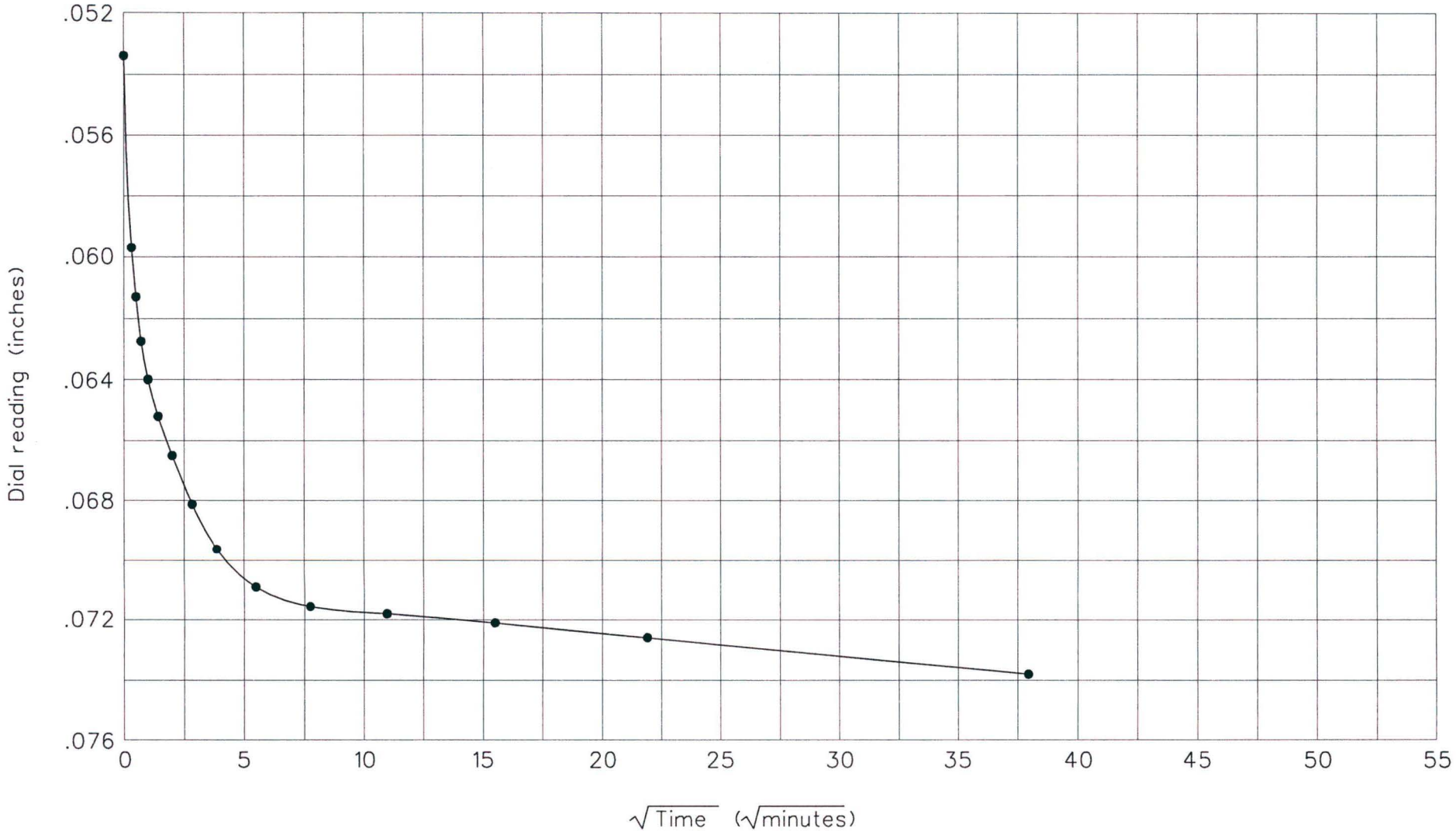
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 11.5'-13'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



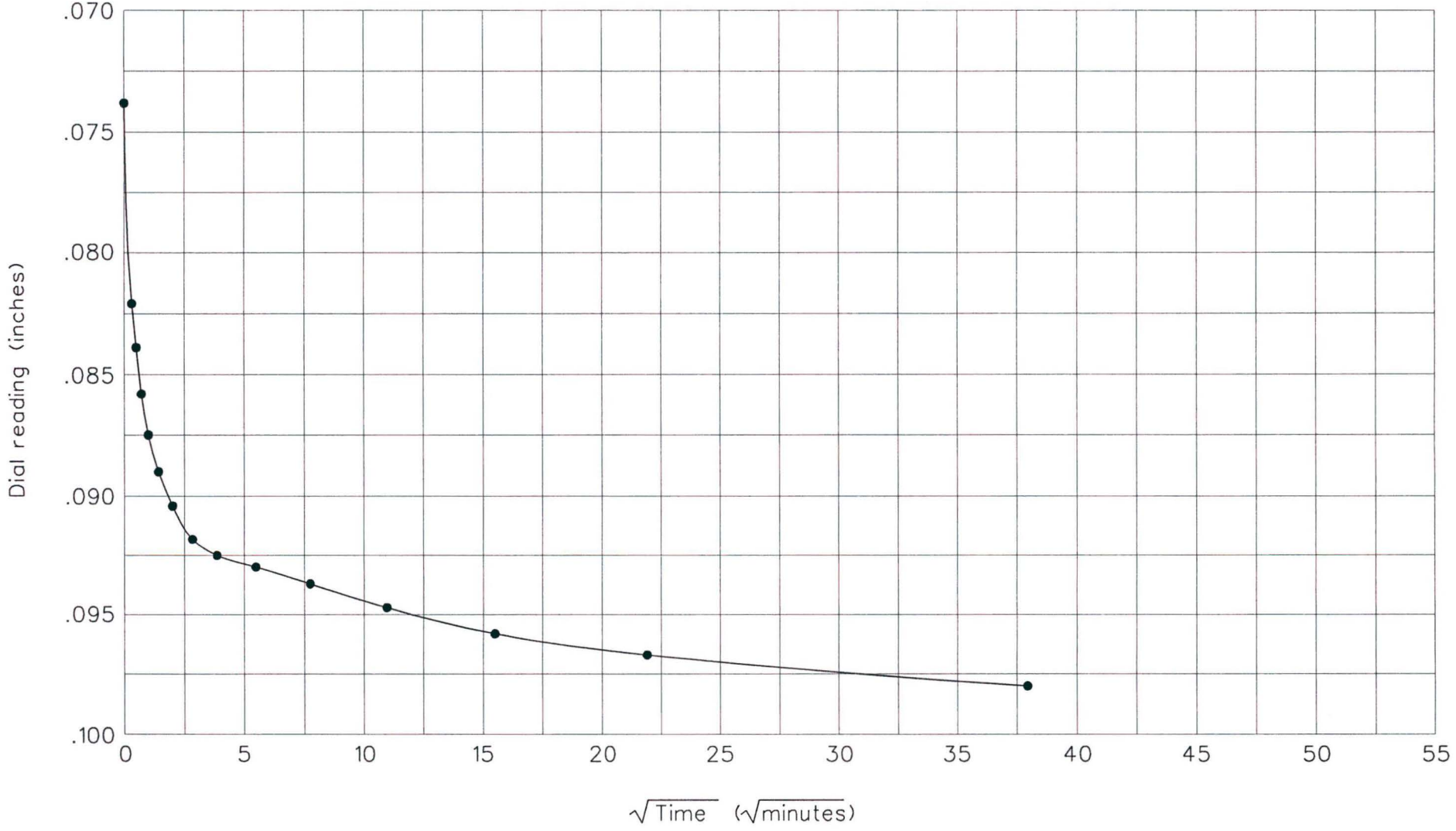
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 11.5'-13'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



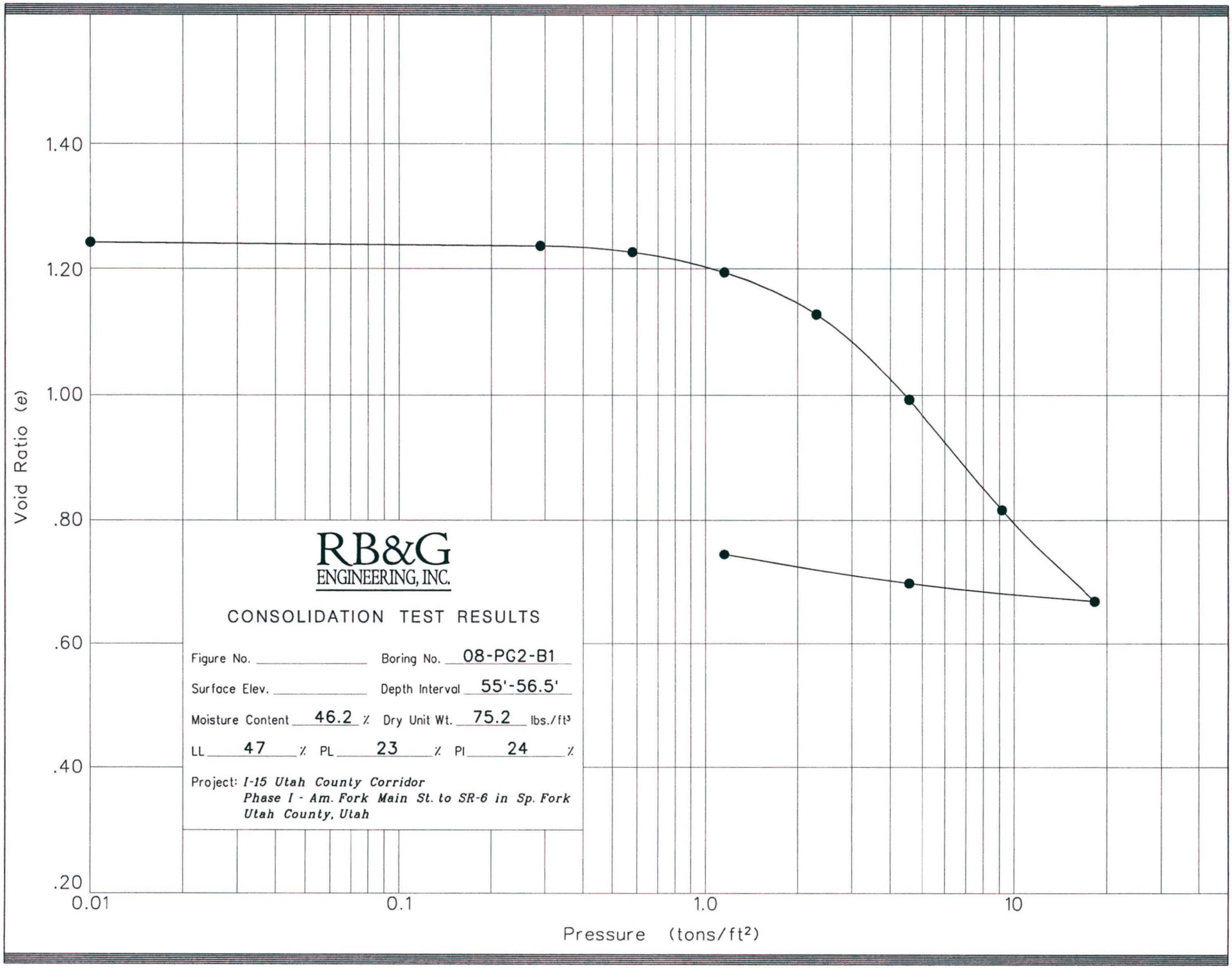
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 11.5'-13'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

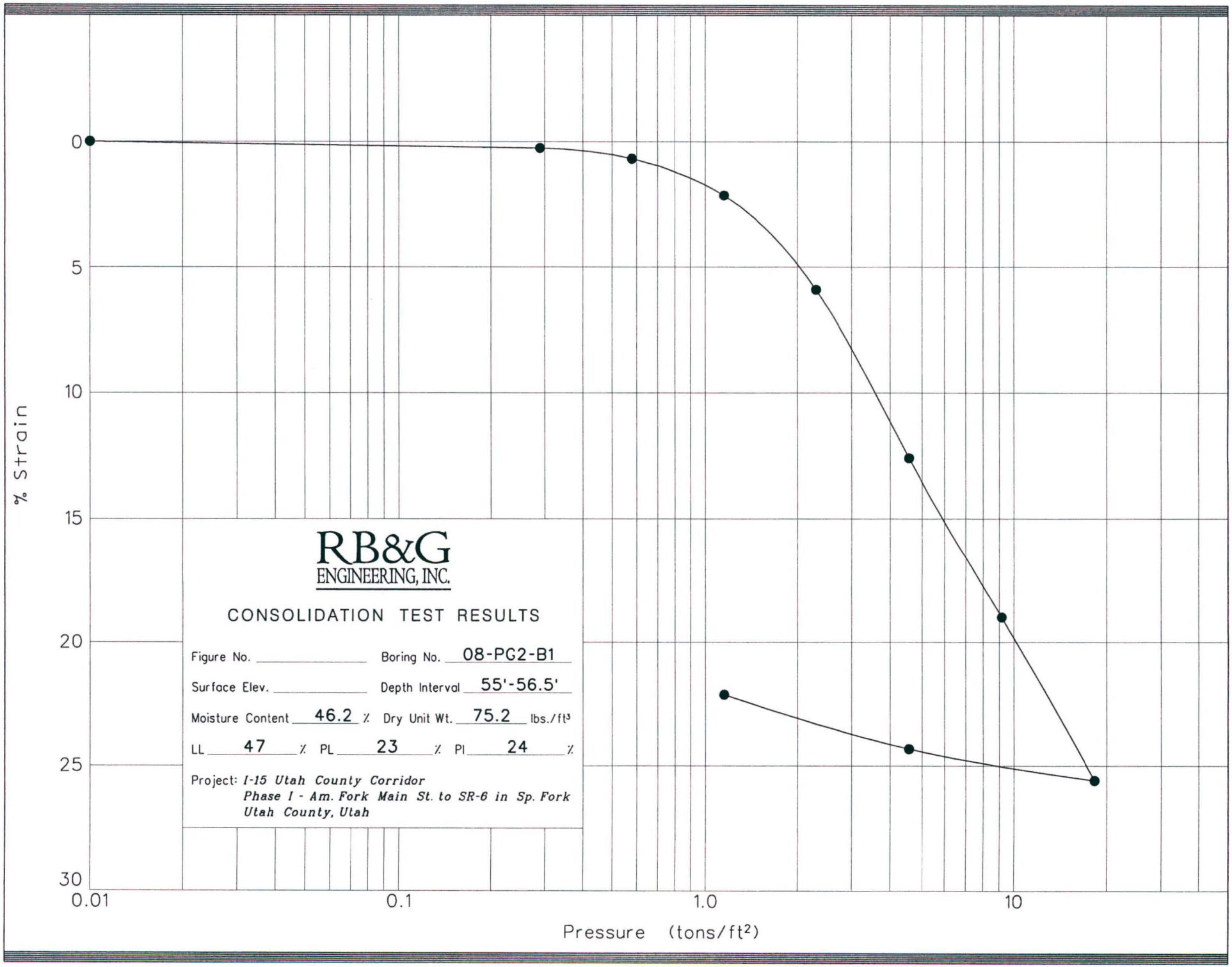
Figure No. _____ Boring No. 08-PG2-B1

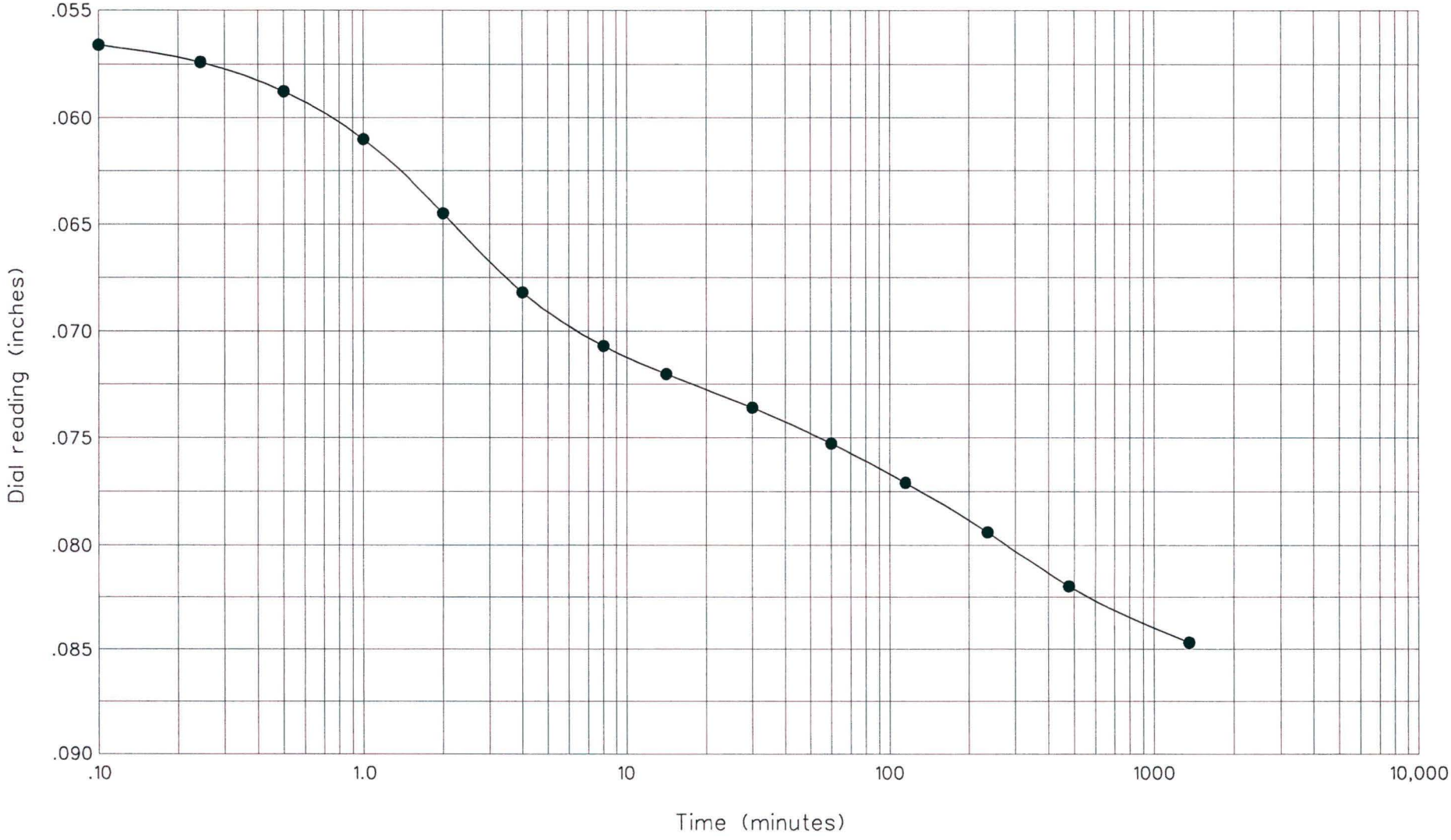
Surface Elev. _____ Depth Interval 55'-56.5'

Moisture Content 46.2 % Dry Unit Wt. 75.2 lbs./ft³

LL 47 % PL 23 % PI 24 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


0
5
10
15
20
25
30
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B1
Surface Elev. _____ Depth Interval 55'-56.5'
Moisture Content 46.2 % Dry Unit Wt. 75.2 lbs./ft³
LL 47 % PL 23 % PI 24 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



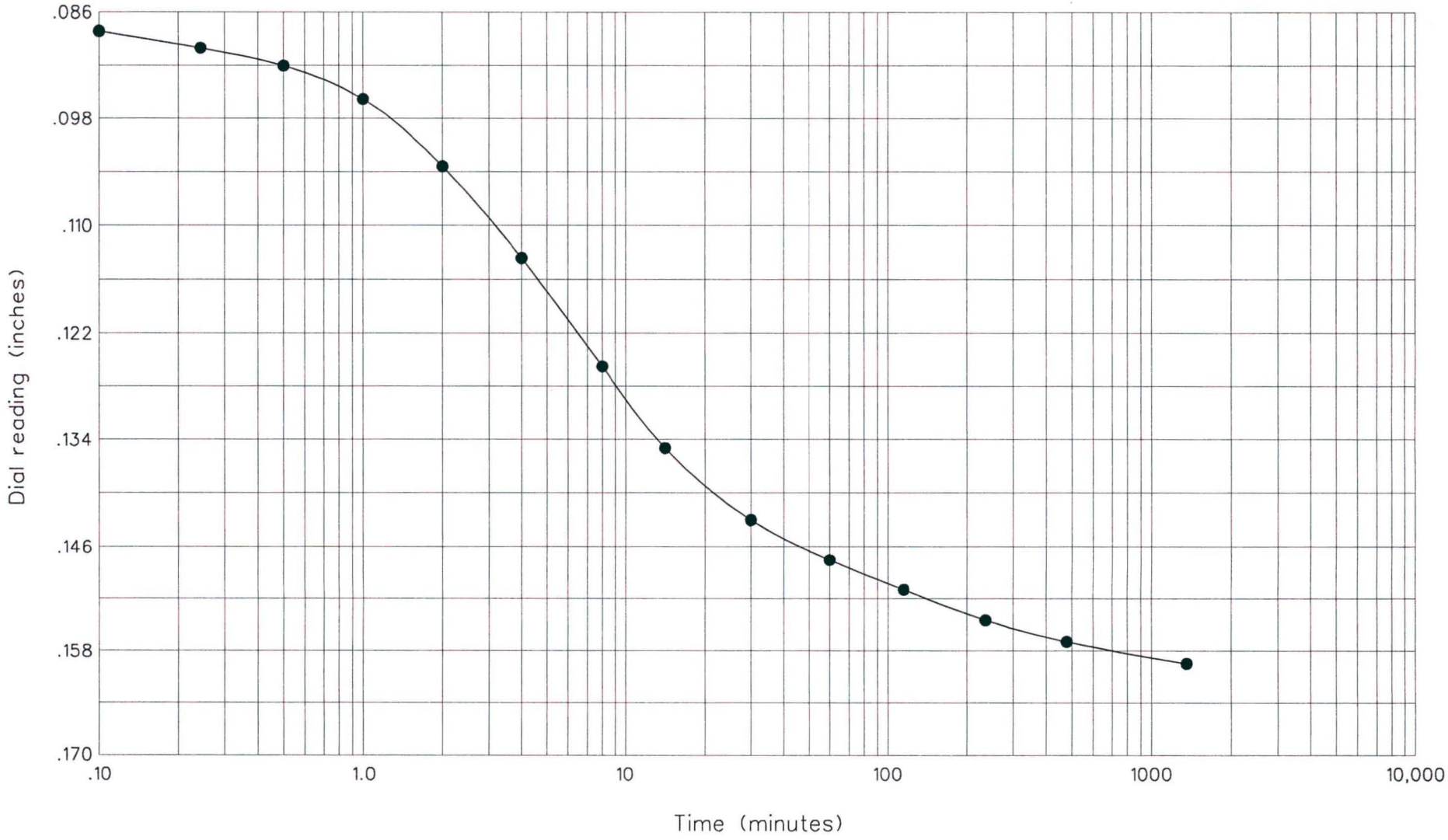
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 55'-56.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



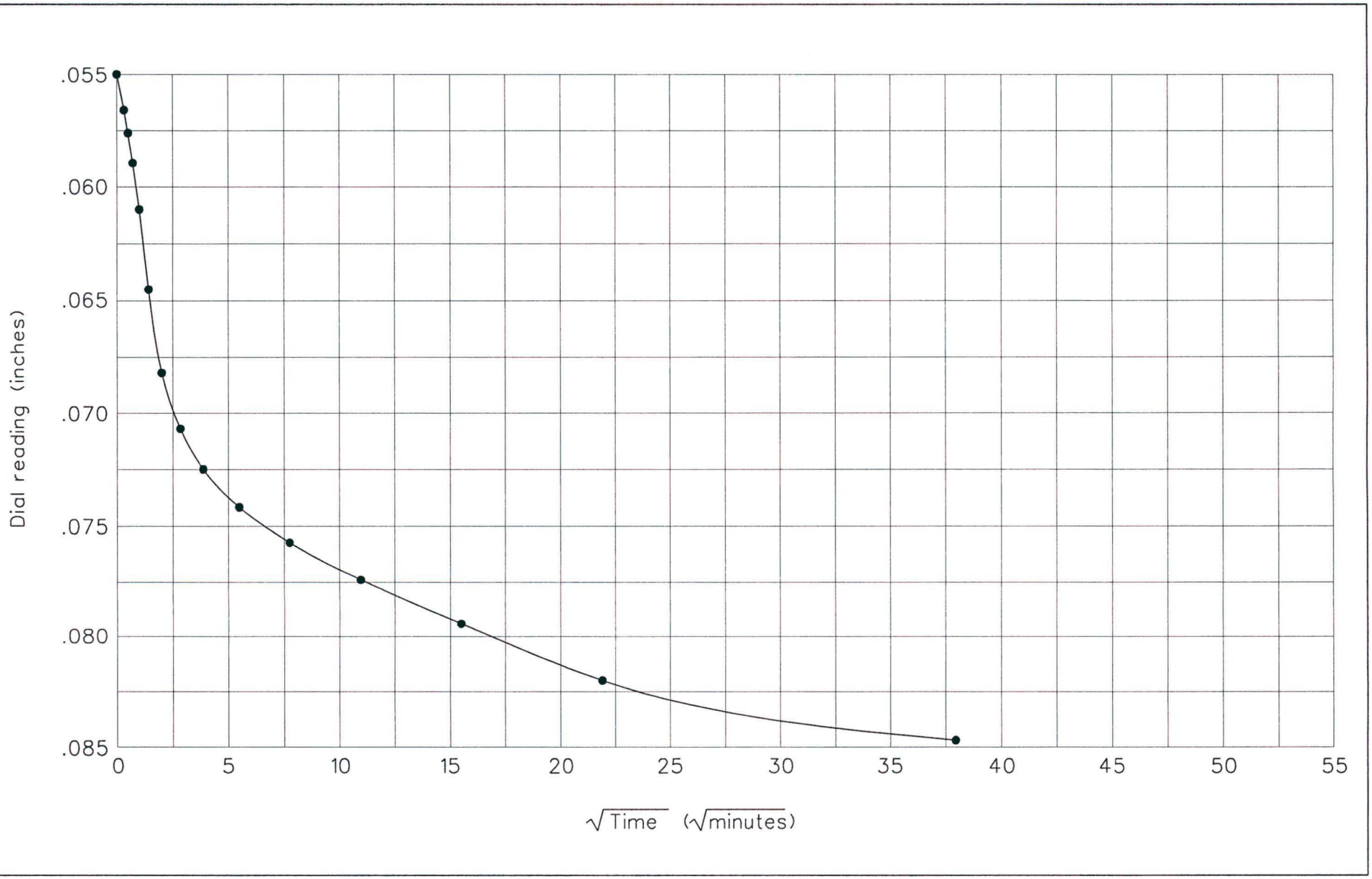
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 55'-56.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



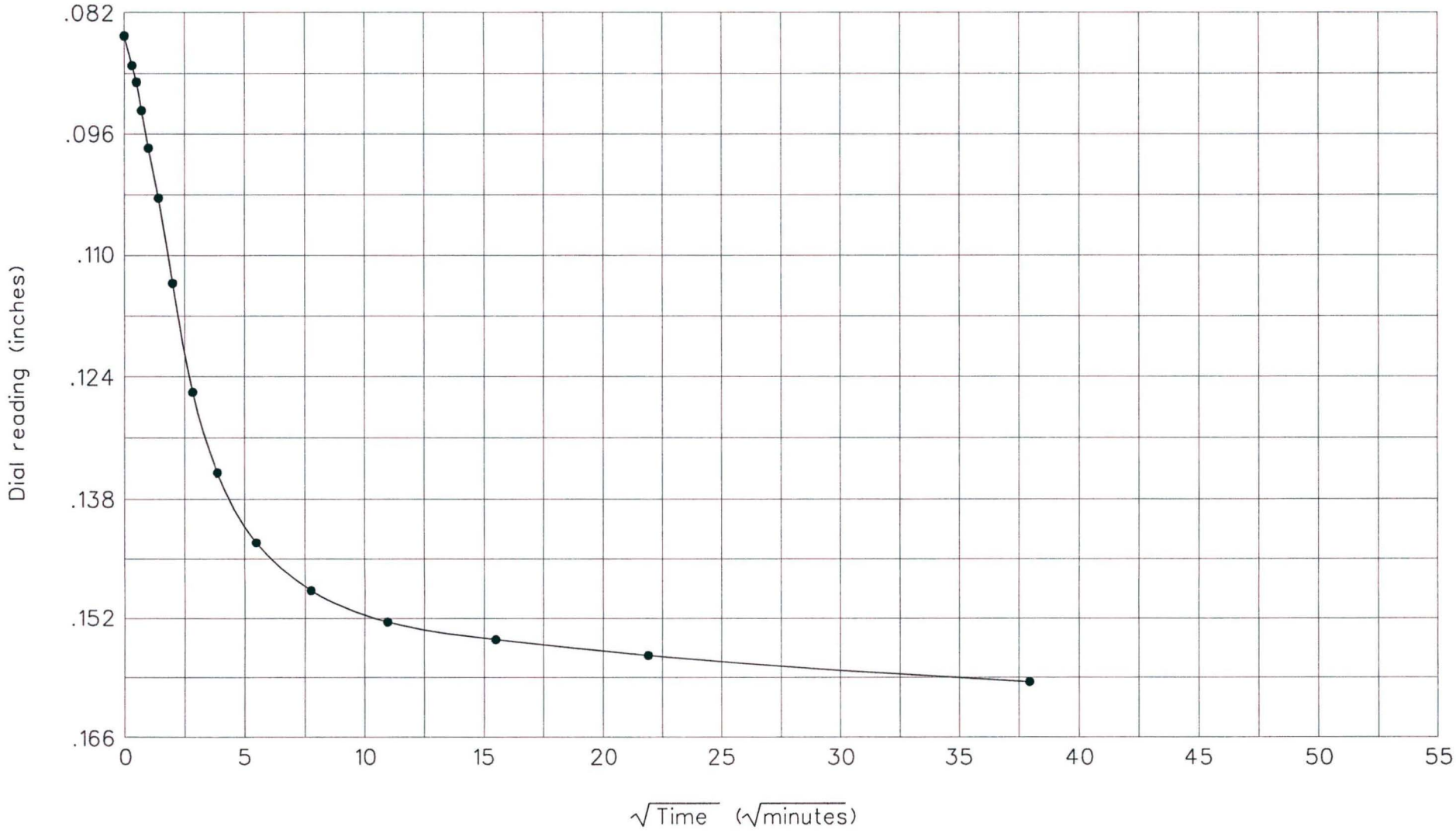
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 55'-56.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



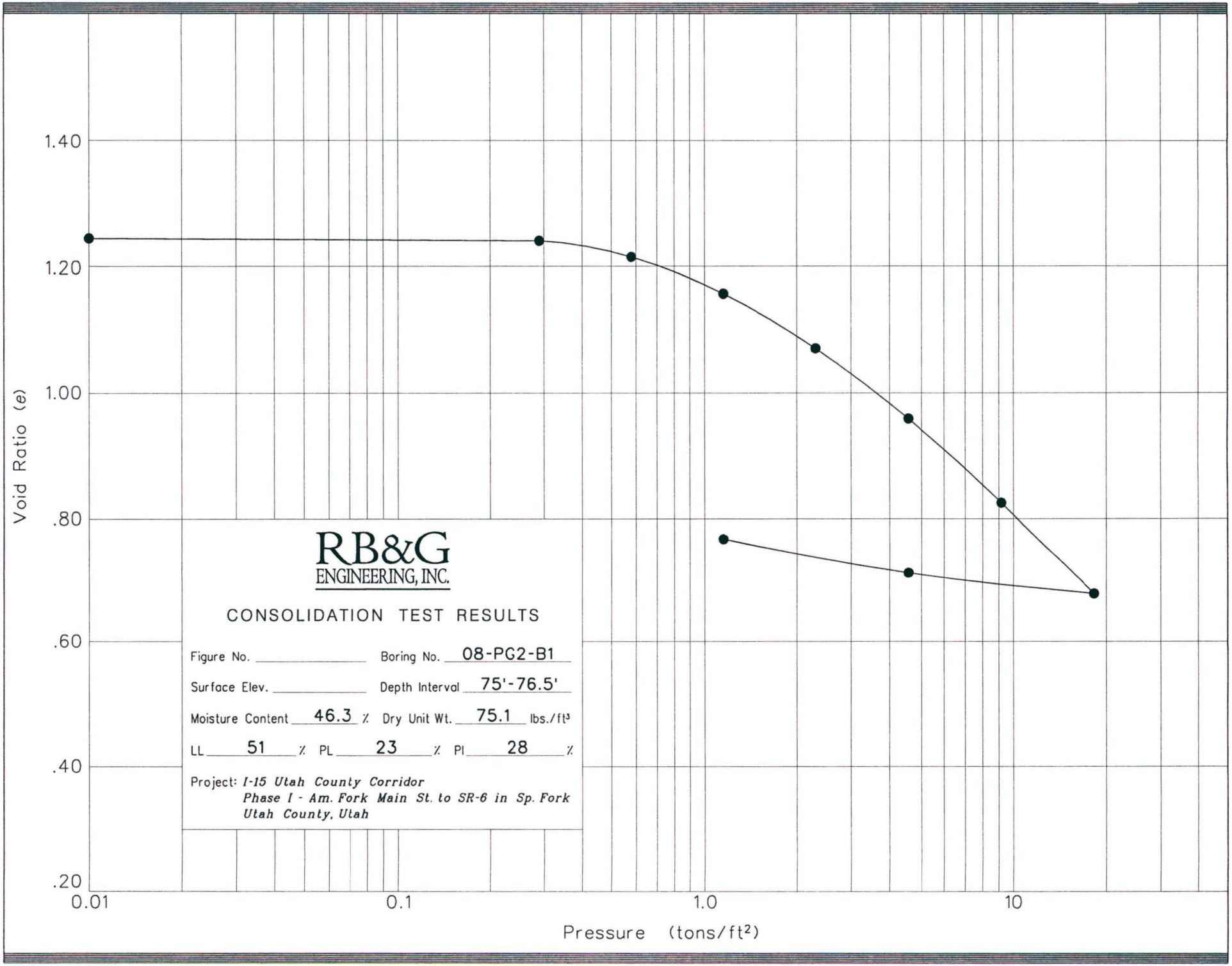
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 55'-56.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

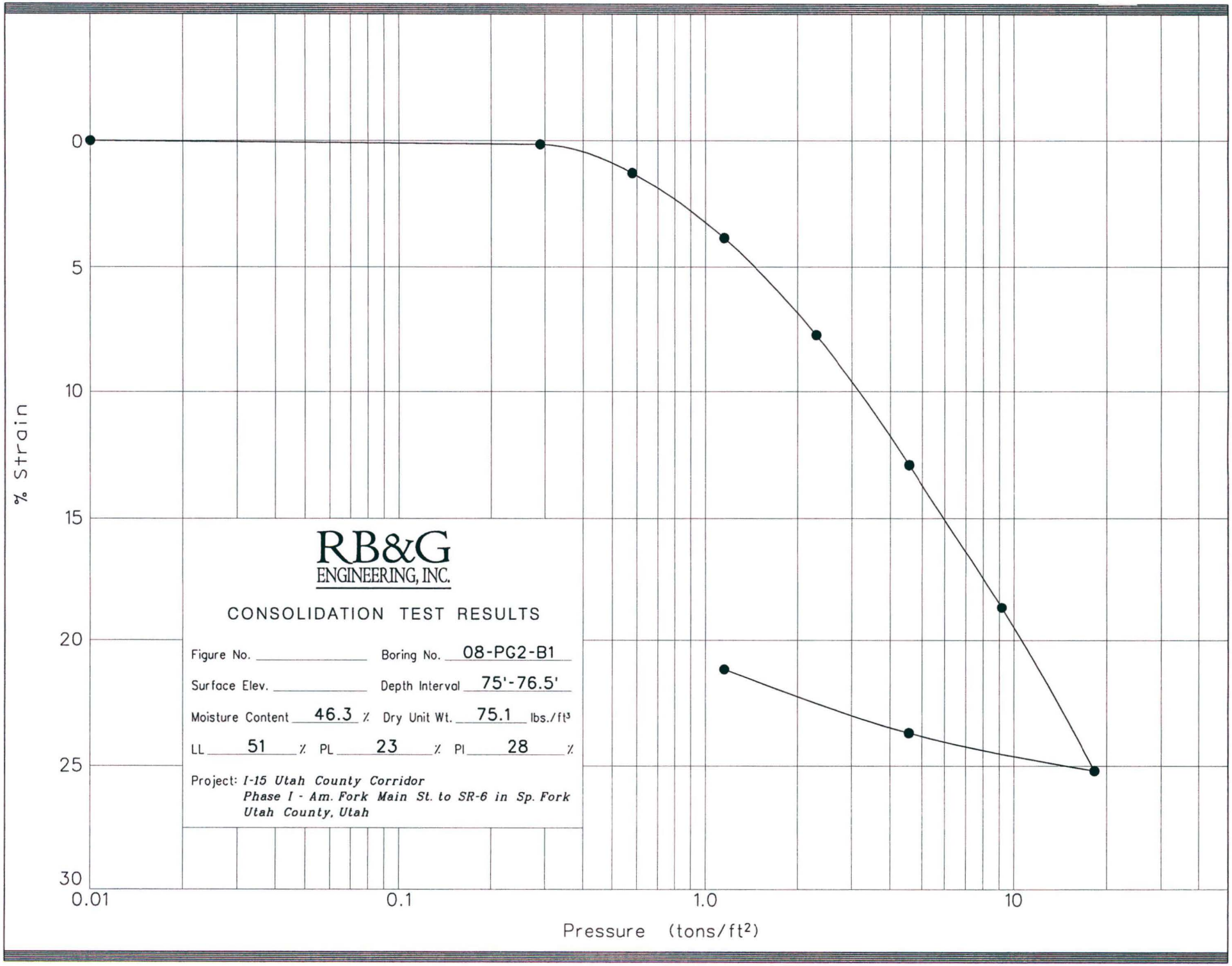
Figure No. _____ Boring No. 08-PG2-B1

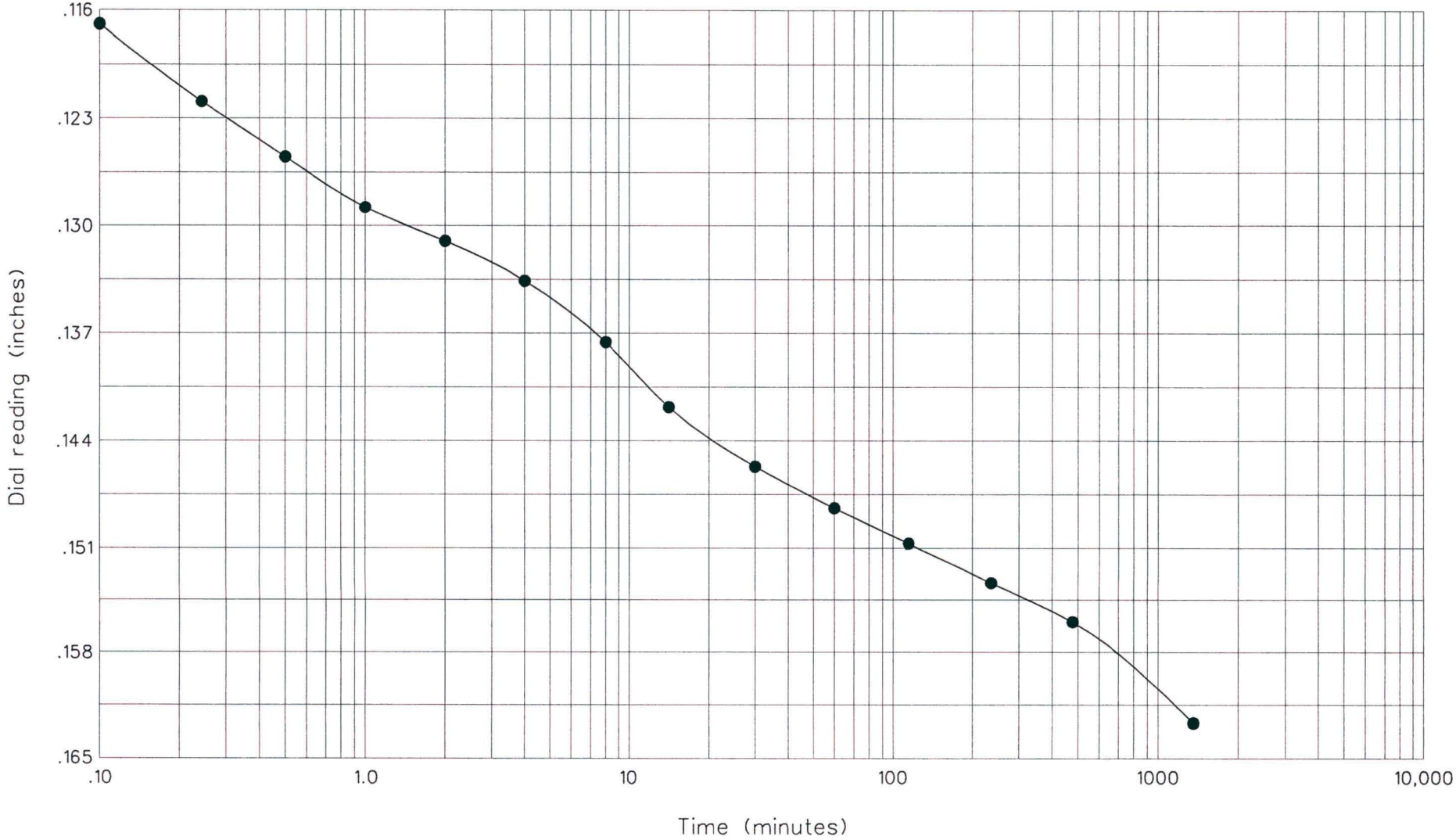
Surface Elev. _____ Depth Interval 75'-76.5'

Moisture Content 46.3 % Dry Unit Wt. 75.1 lbs./ft³

LL 51 % PL 23 % PI 28 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


0
5
10
15
20
25
30
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B1
Surface Elev. _____ Depth Interval 75'-76.5'
Moisture Content 46.3 % Dry Unit Wt. 75.1 lbs./ft³
LL 51 % PL 23 % PI 28 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



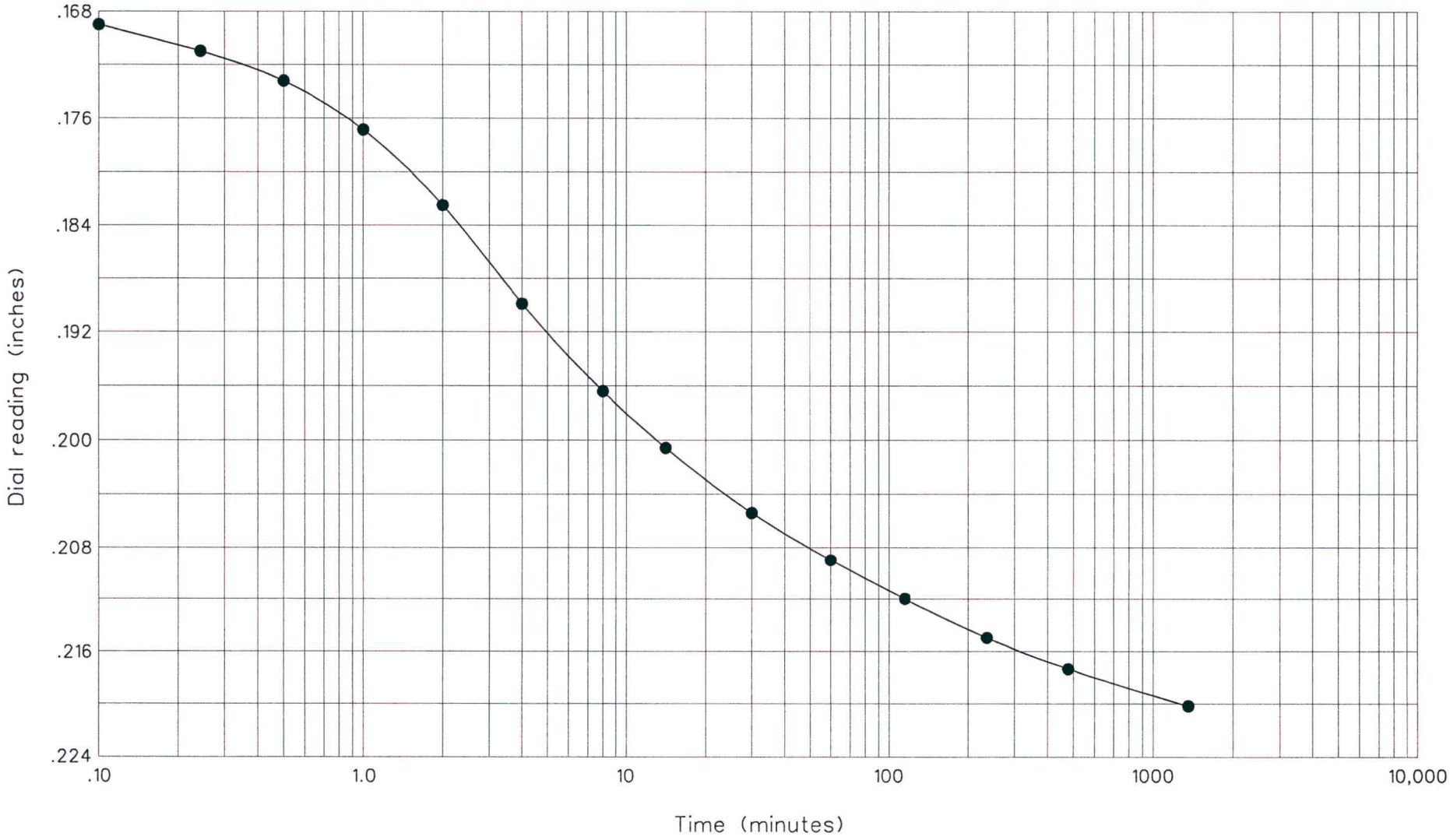
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 75'-76.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



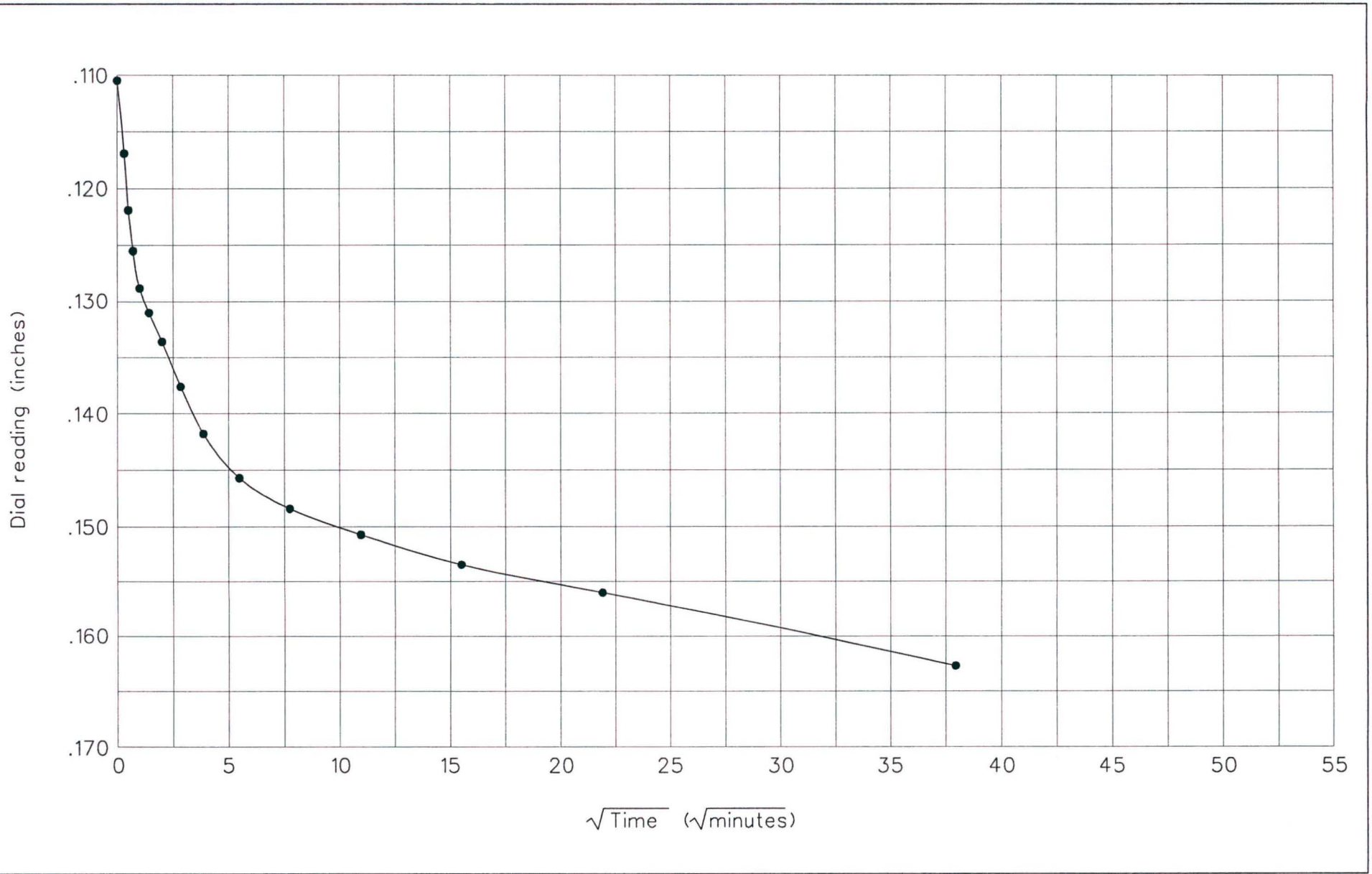
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 75'-76.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



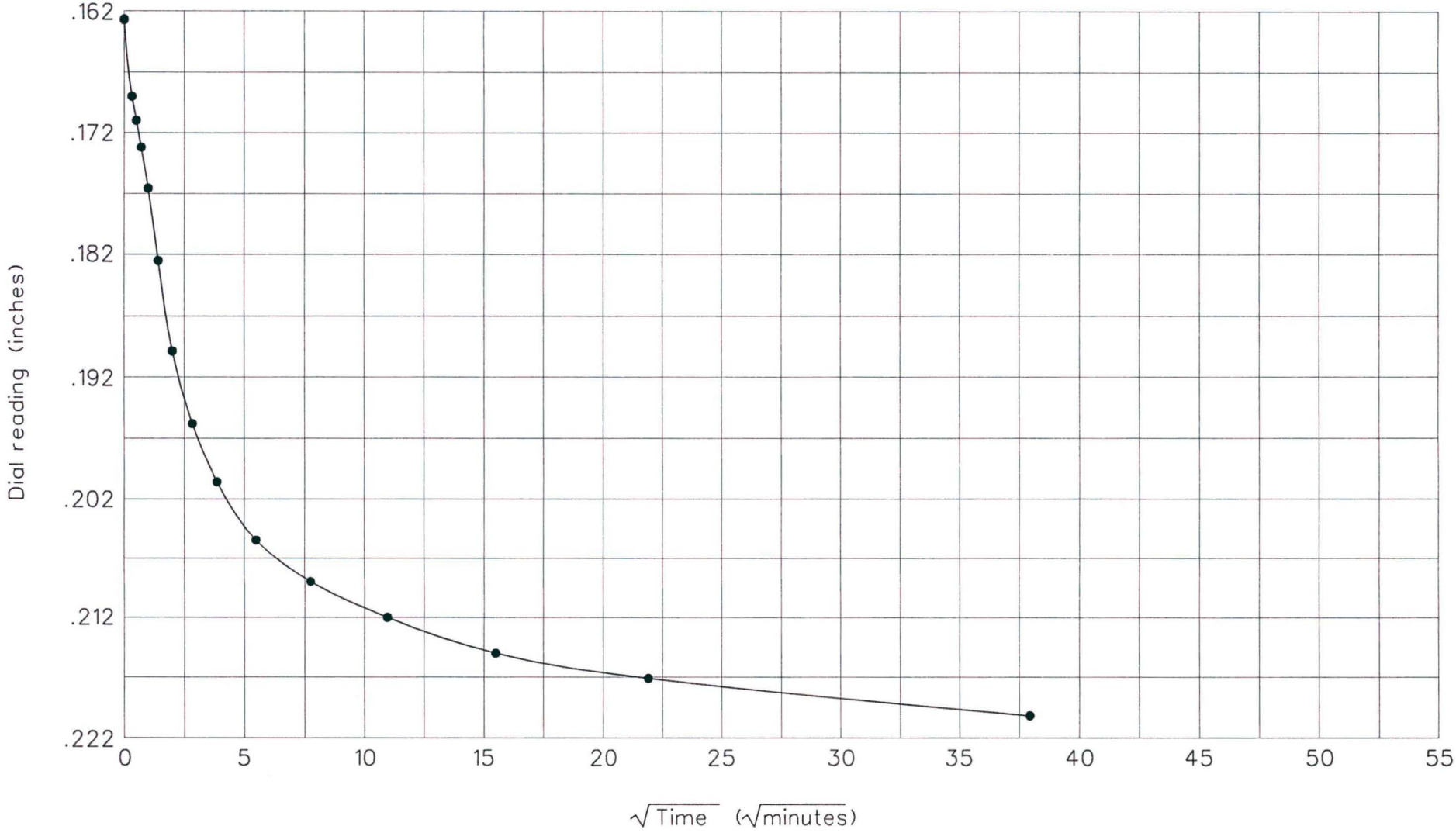
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 75'-76.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



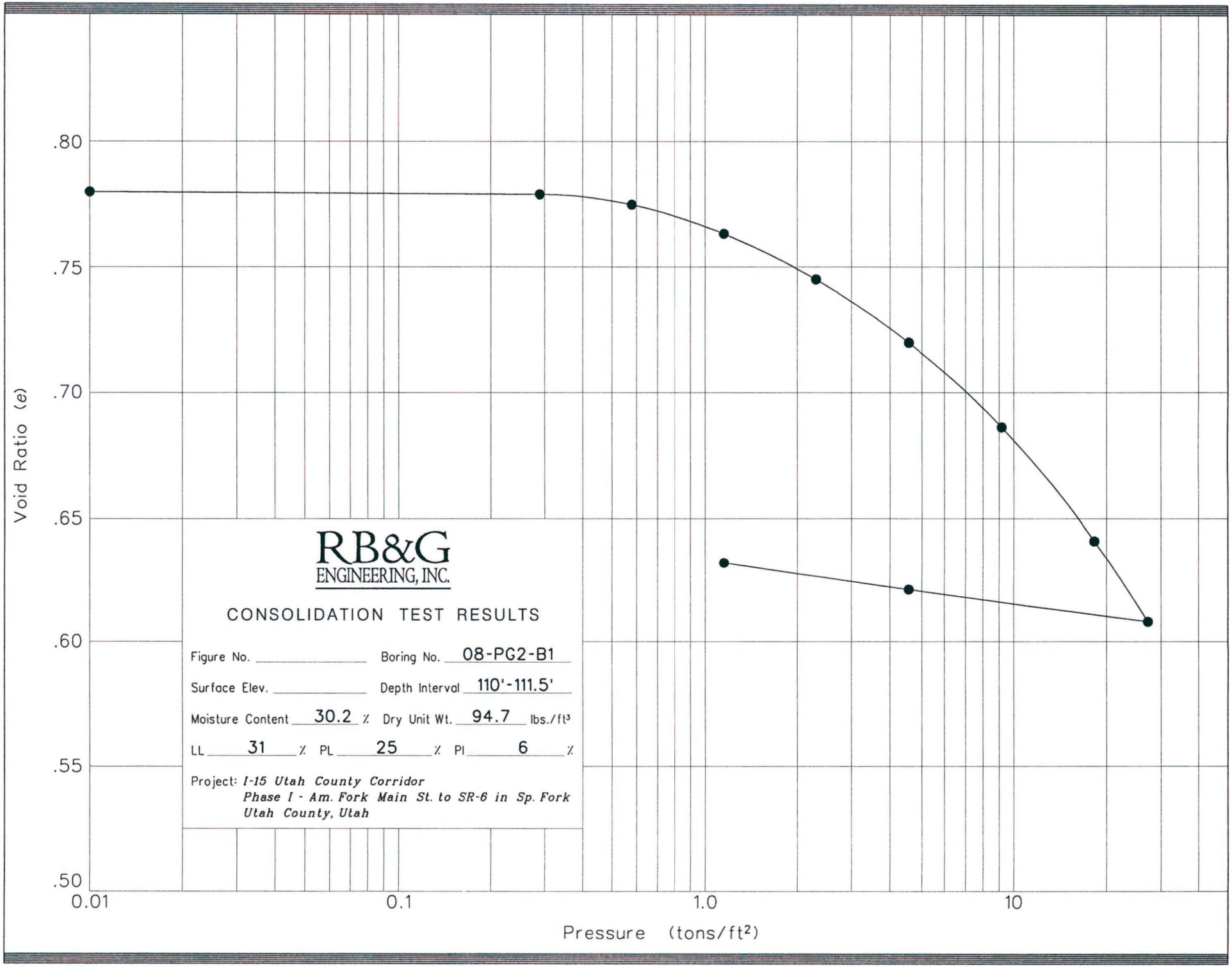
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 75'-76.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

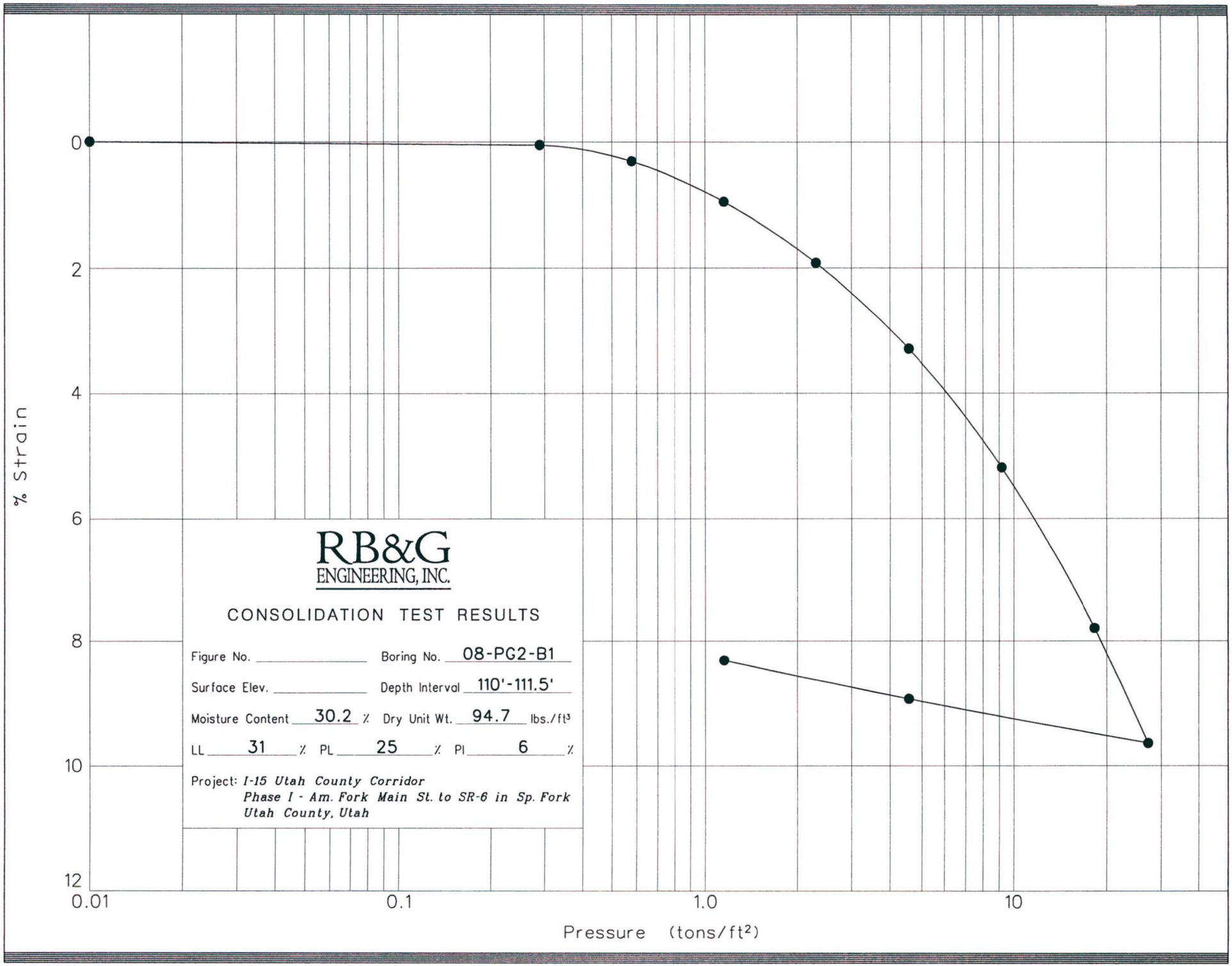
Figure No. _____ Boring No. 08-PG2-B1

Surface Elev. _____ Depth Interval 110'-111.5'

Moisture Content 30.2 % Dry Unit Wt. 94.7 lbs./ft³

LL 31 % PL 25 % PI 6 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

Figure No. _____ Boring No. 08-PG2-B1

Surface Elev. _____ Depth Interval 110'-111.5'

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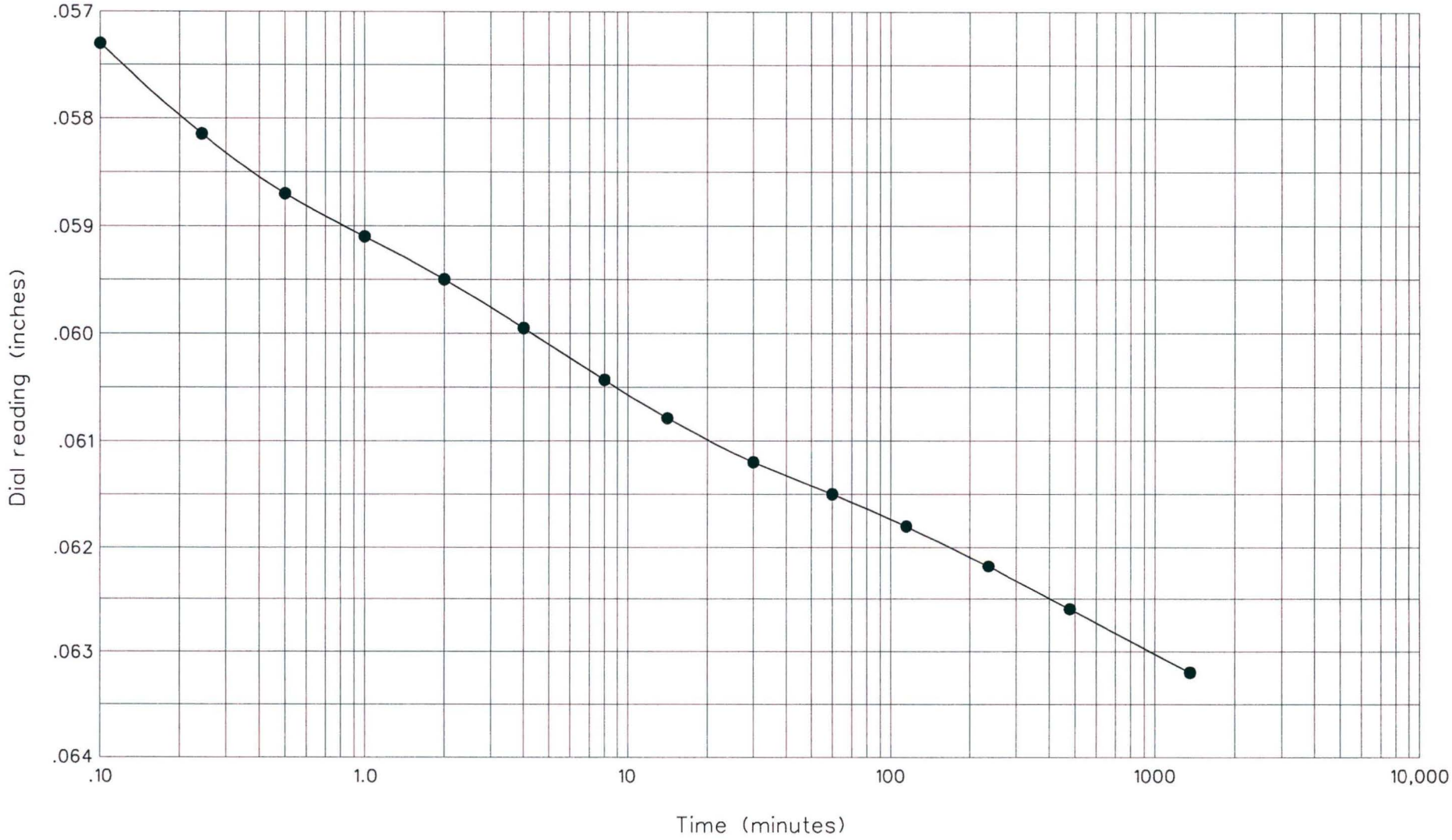
Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



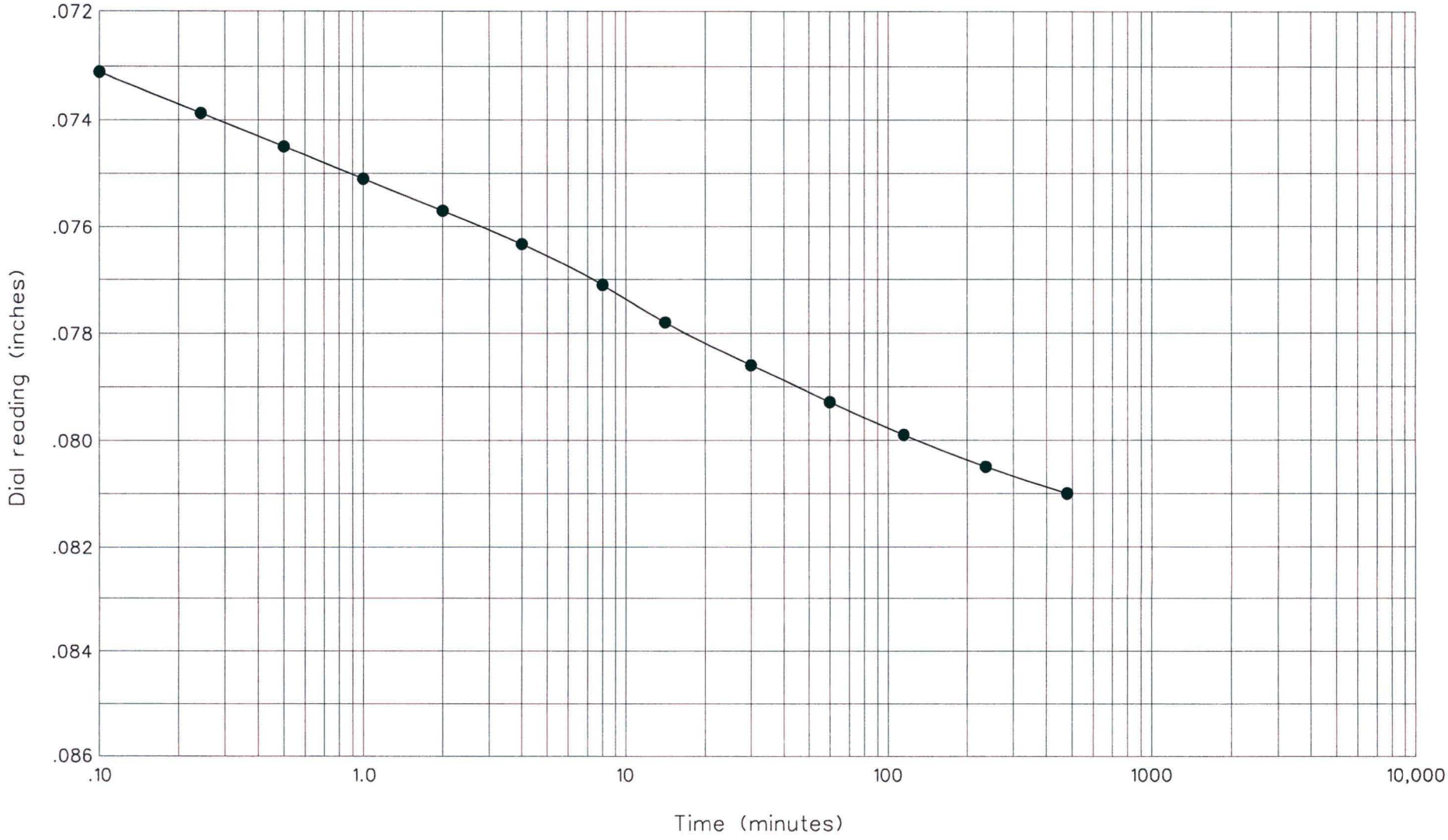
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 110'-111.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



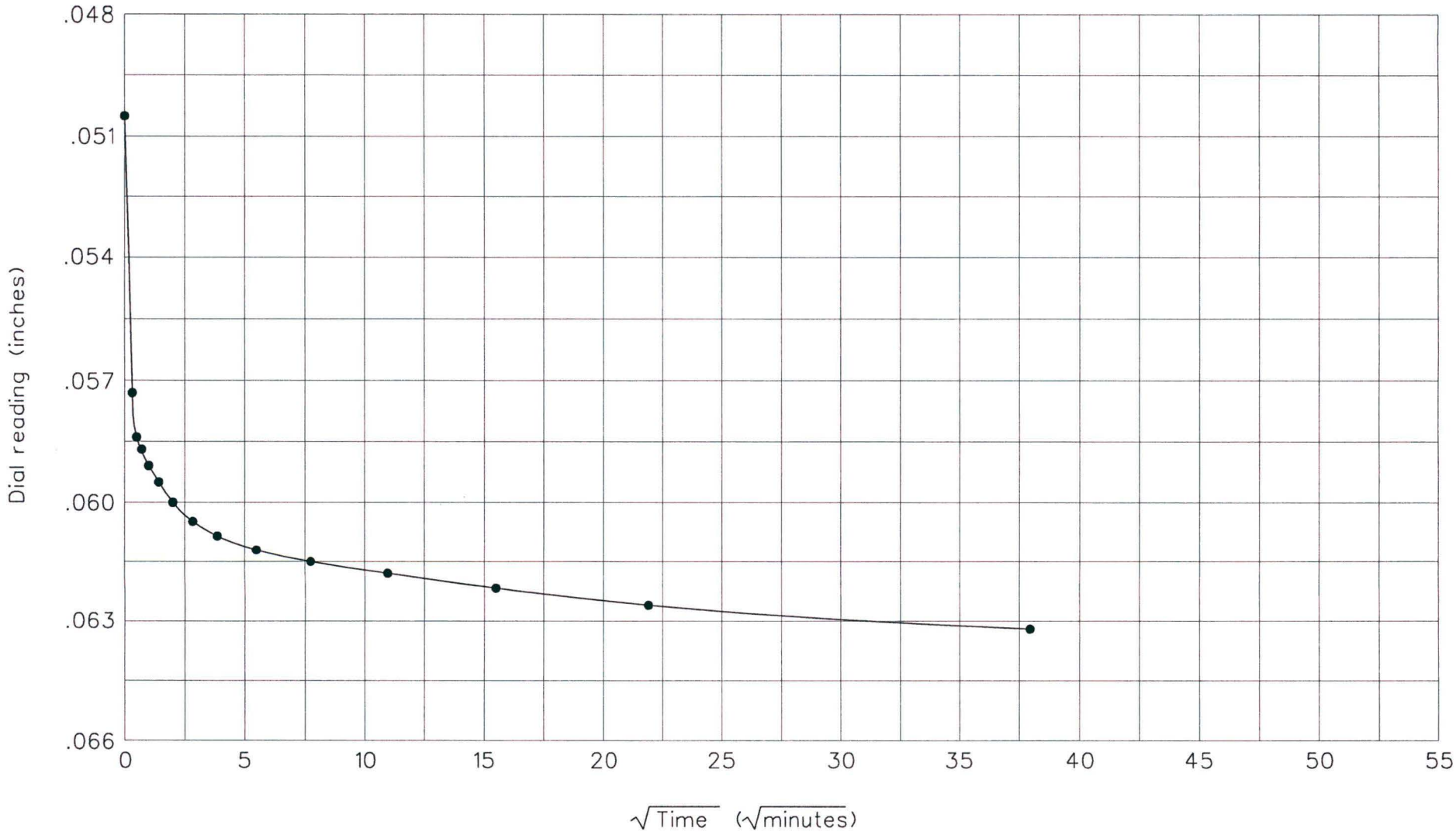
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 110'-111.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



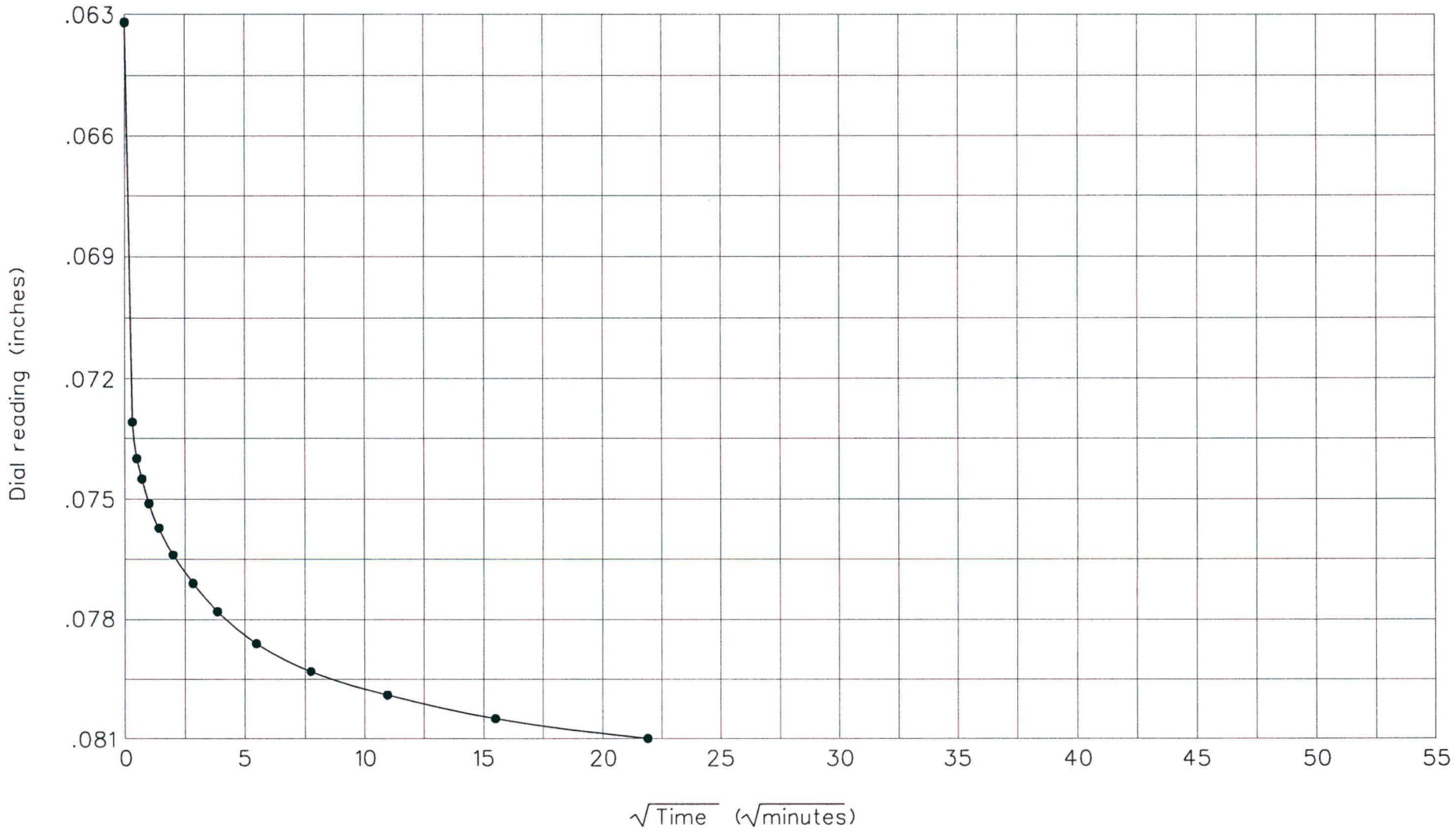
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 110'-111.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



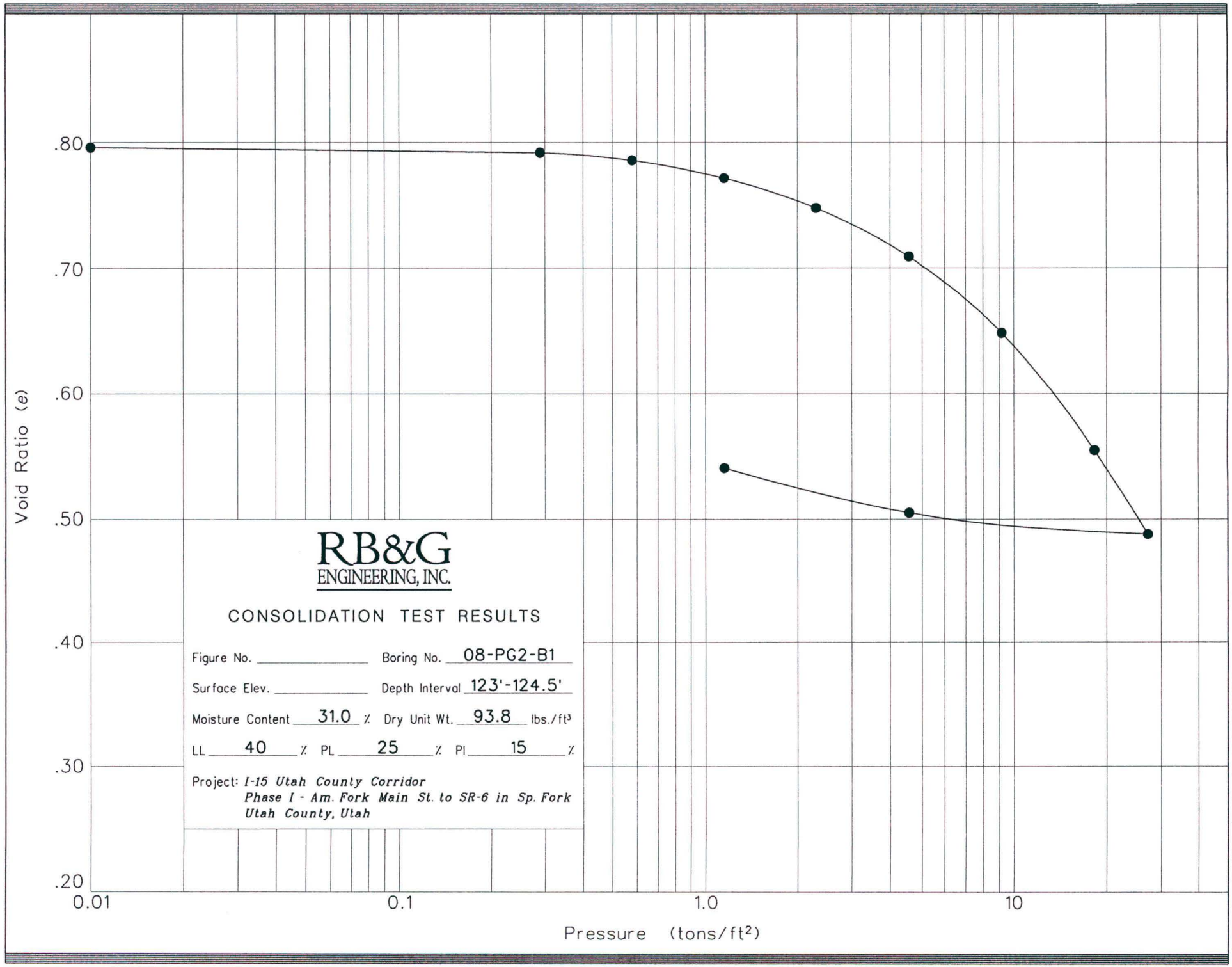
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 110'-111.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

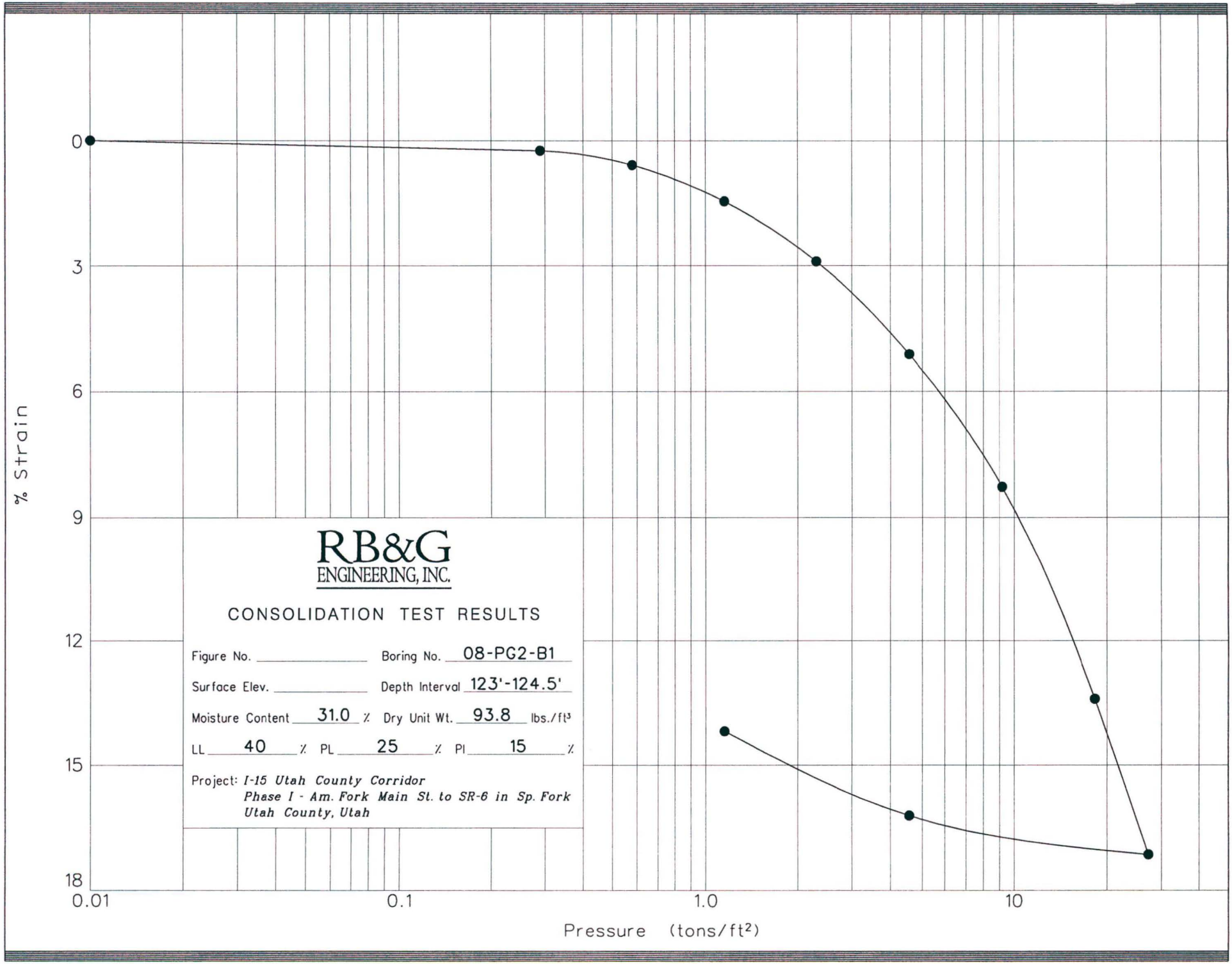
Figure No. _____ Boring No. 08-PG2-B1

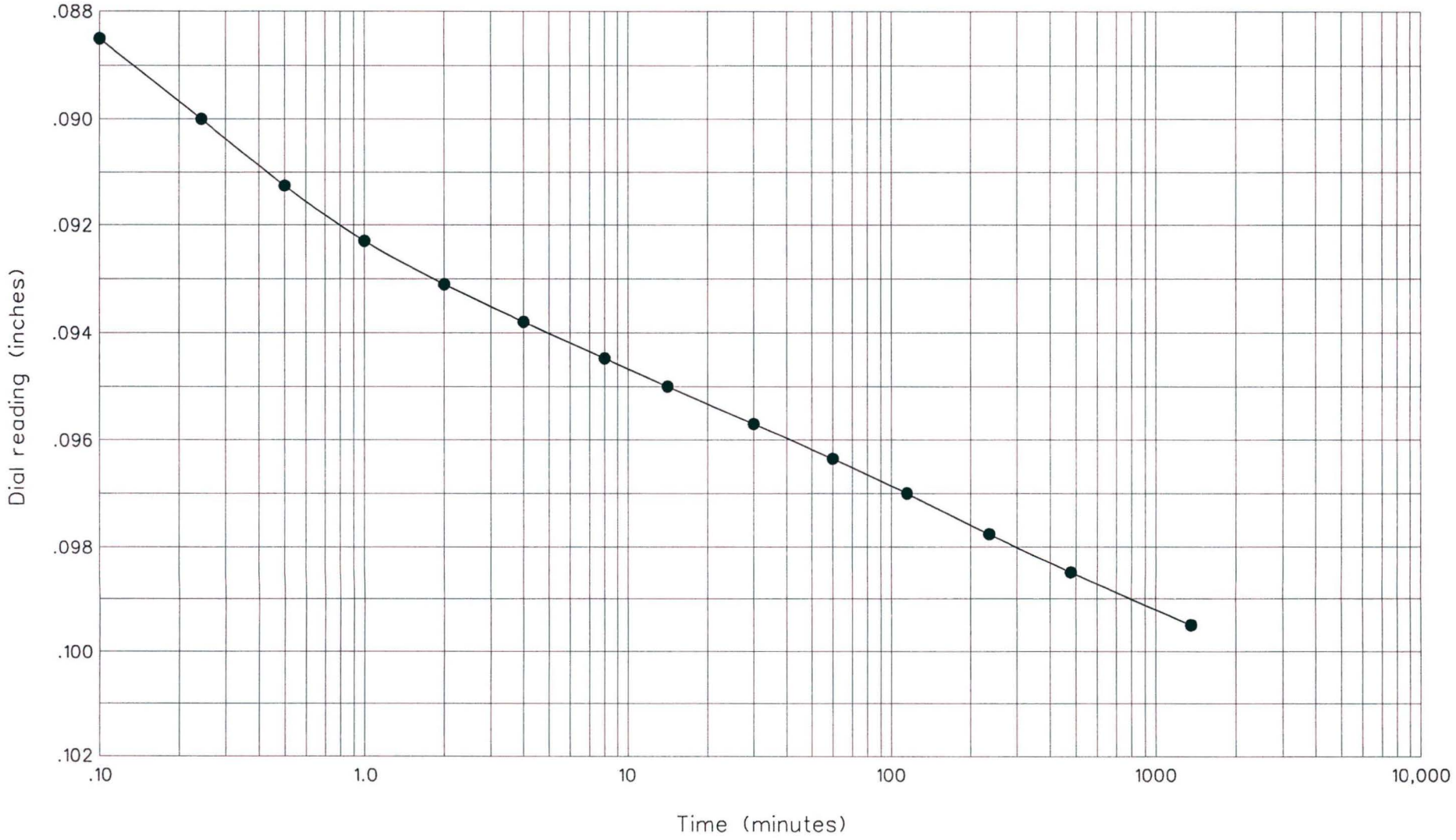
Surface Elev. _____ Depth Interval 123'-124.5'

Moisture Content 31.0 % Dry Unit Wt. 93.8 lbs./ft³

LL 40 % PL 25 % PI 15 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B1
Surface Elev. _____ Depth Interval 123'-124.5'
Moisture Content 31.0 % Dry Unit Wt. 93.8 lbs./ft³
LL 40 % PL 25 % PI 15 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



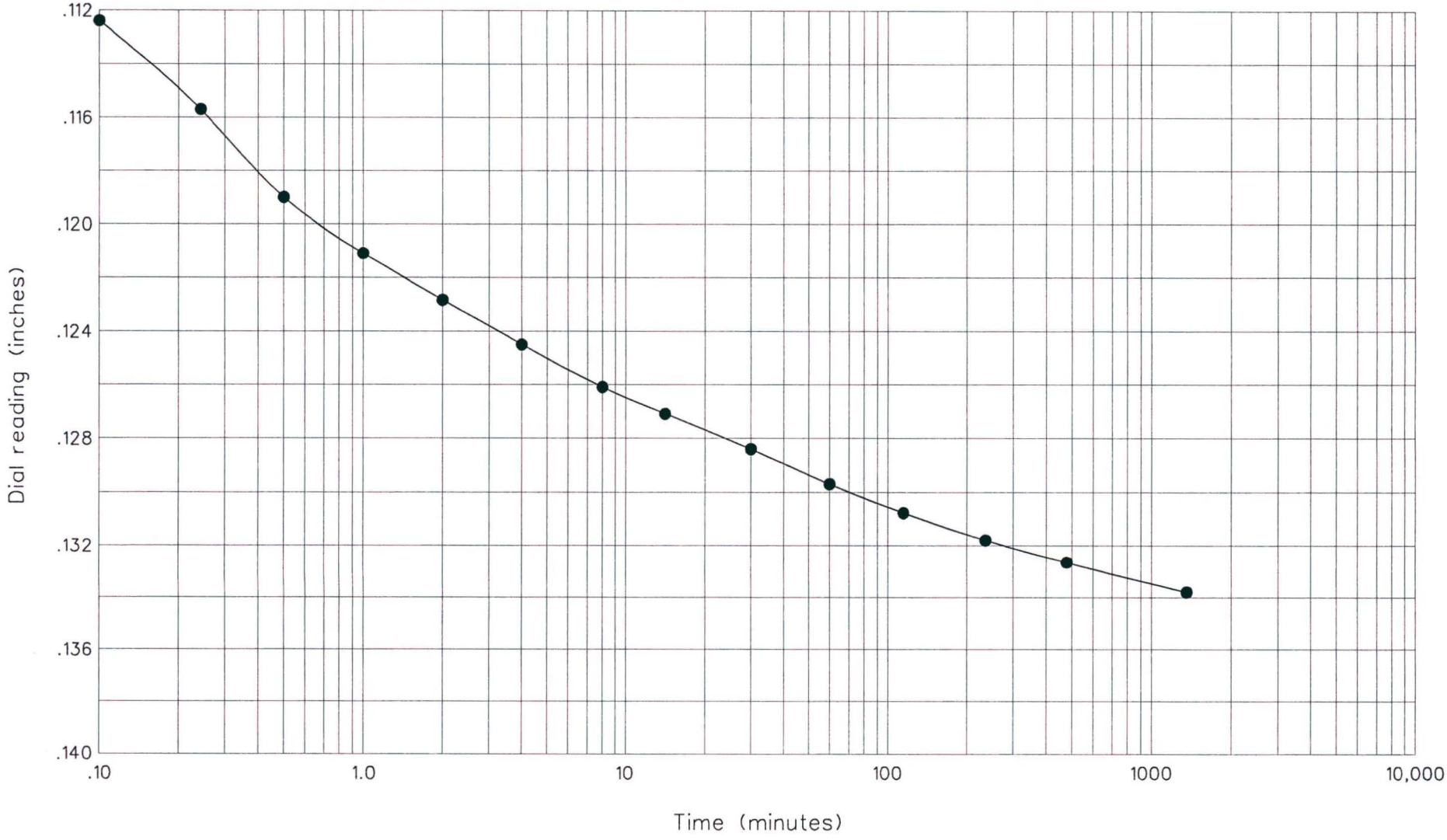
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 123'-124.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



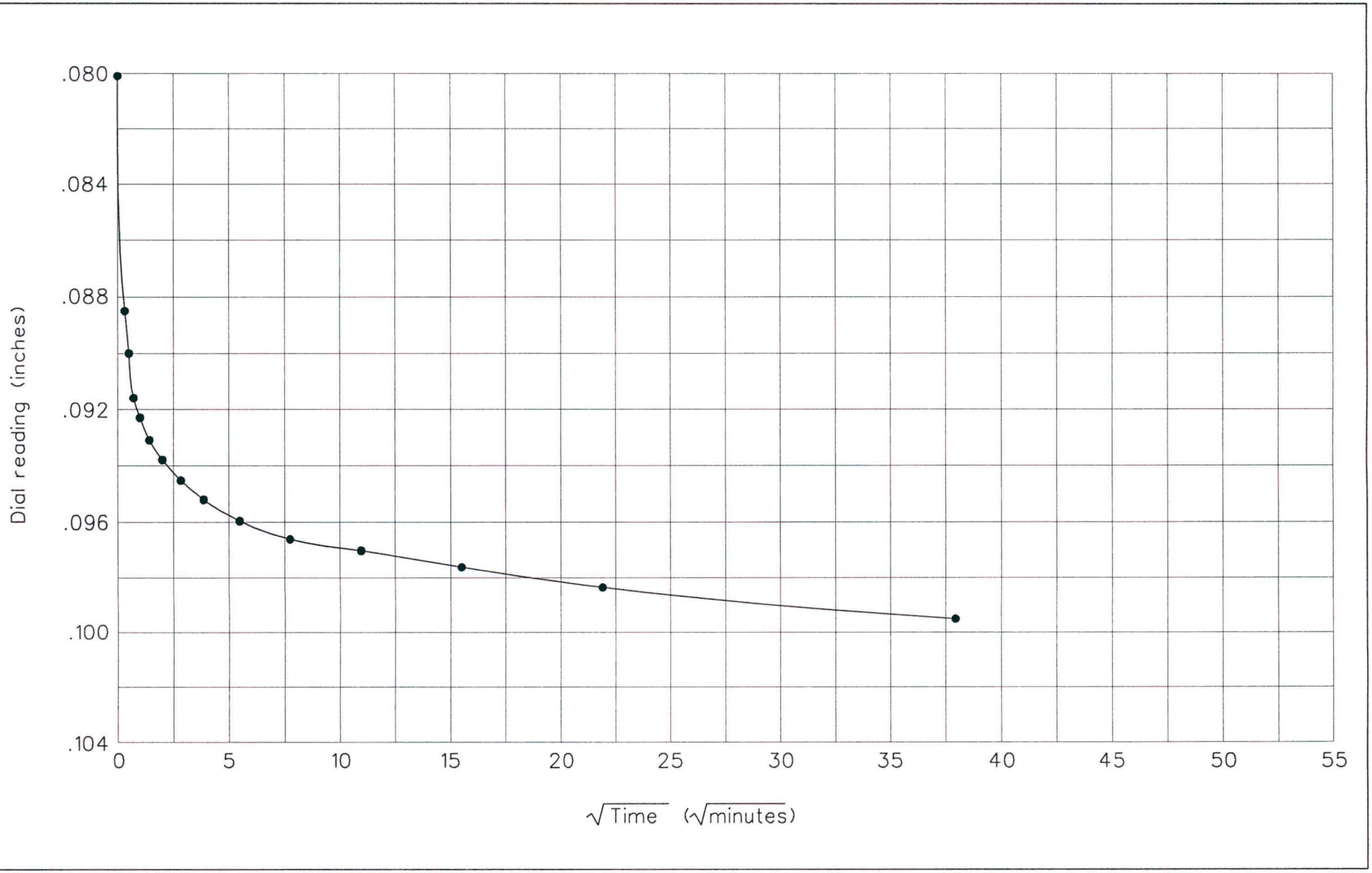
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 123'-124.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



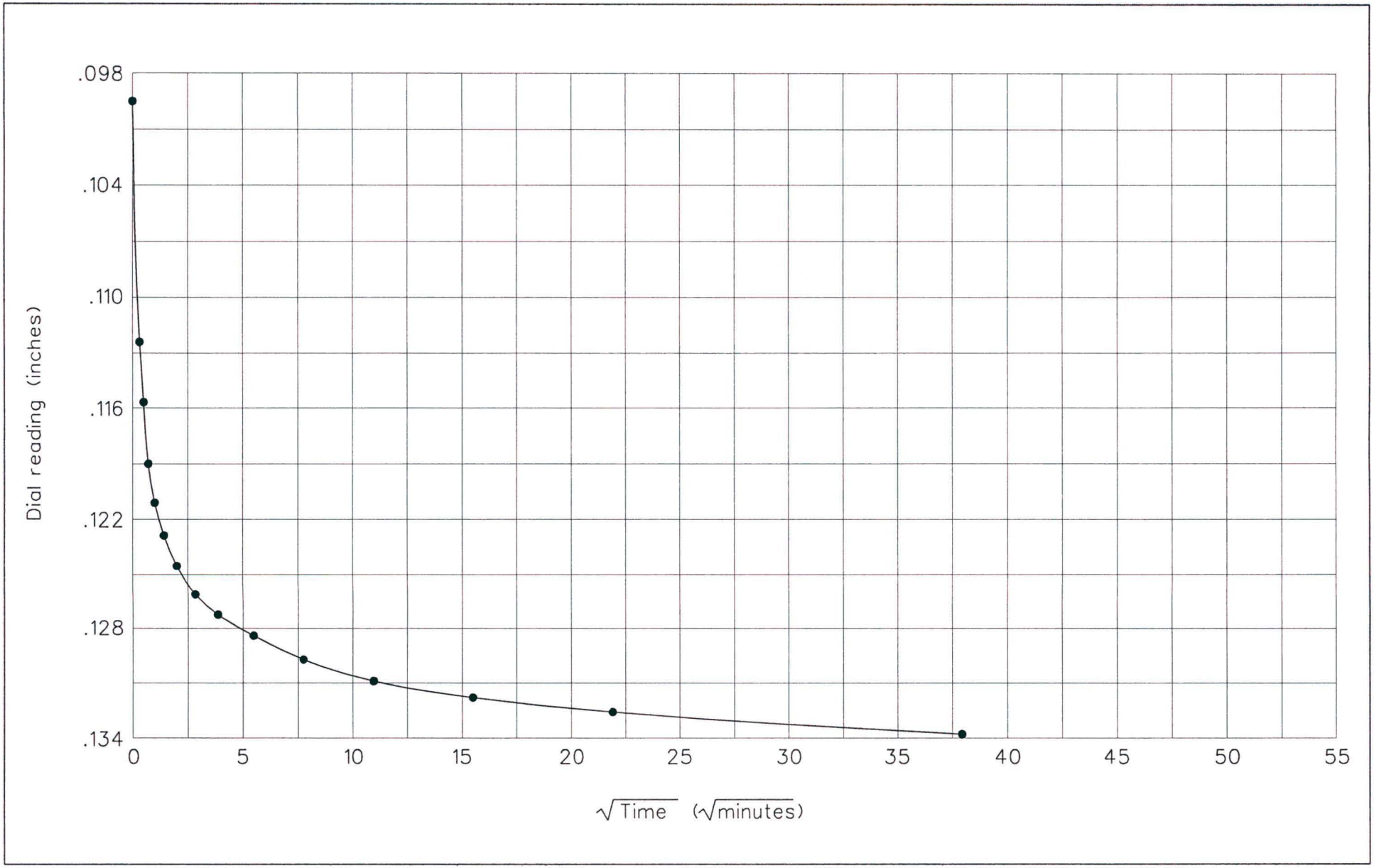
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 123'-124.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B1
Depth: 123'-124.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure

Table 1
SUMMARY OF TEST DATA

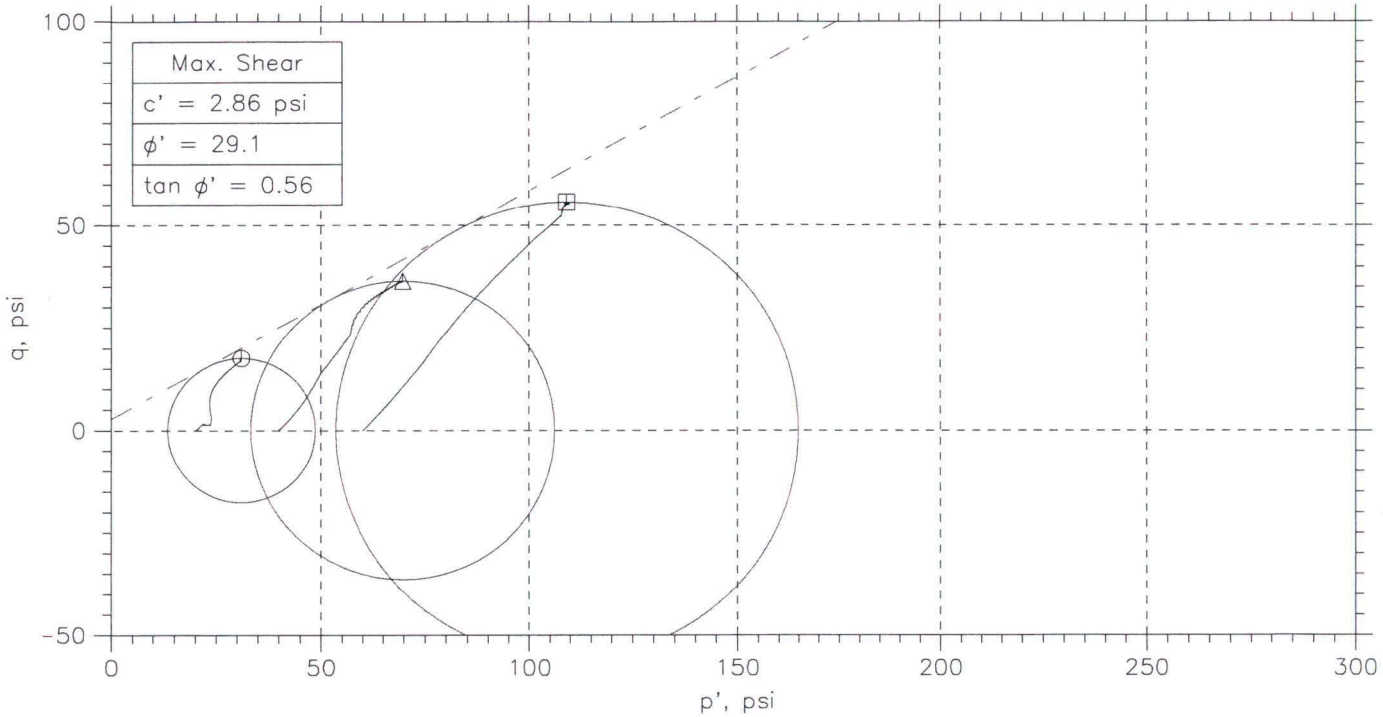
PROJECT LOCATION: I-15 Utah County Corridor; Proctor Road Over I-15, Pleasant Grove, Utah
PROJECT NO.: 200801-200
FEATURE: Foundations

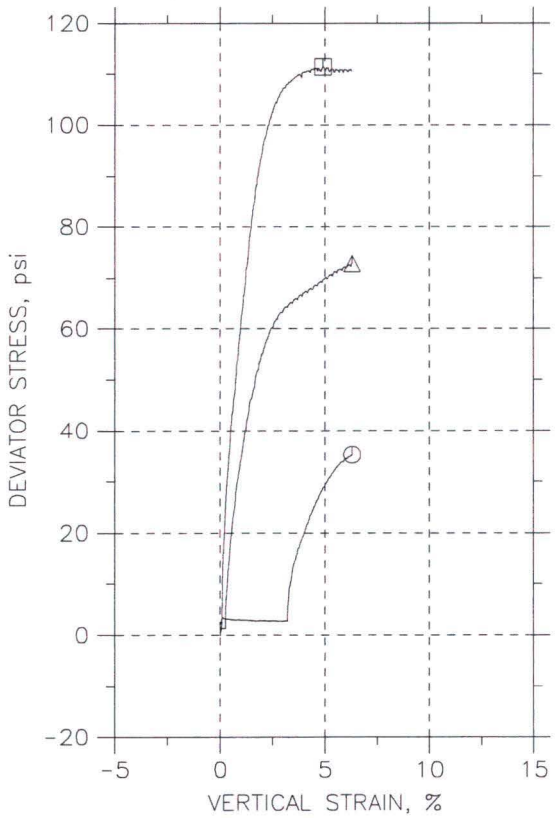
HOLE NO.	DEPTH BELOW GROUND SURFACE (ft)	STANDARD PENETRATION BLOWS PER FOOT Corrected $(N1)_{60}$	IN-PLACE		UNCONFINED COMPRESSIVE STRENGTH (psf)	ATTERBERG LIMITS			MECHANICAL ANALYSIS				UNIFIED SOIL CLASSIFICATION SYSTEM / (AASHTO Classification)
			DRY UNIT WEIGHT (pcf)	MOISTURE (%)		LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT& CLAY	PERCENT FINER THAN 0.005 mm	
08-PG2-B2	0-1.5	43		2.7				NP	46	43	11		GP-GM (A-1-a)
	5-6.5	2		27.8		36	20	16	9	15	76		CL (A-6(11))
	10-11.5	Shelby	96.8	24.1		38	18	20	25	10	65		CL (A-6(11))
	20-21.5	Shelby	97.4	22.5		47	20	27	0	0	100		CL (A-7-6(30))
	30-31.5	Shelby	95.1	25.0		40	17	23	0	4	96		CL (A-6(23))
	40-40.8	Shelby		19.6				NP	0	63	37		SM (A-4(0))
	40.8-41.5	Shelby	95.8	30.9		35	18	17	0	14	86		CL (A-6(14))
	50-51.5	Shelby	77.4	42.2		47	19	28	0	0	100		CL (A-7-6(31))
	60-61.5	Shelby	73.6	43.0	1122	49	22	27	0	2	98		CL (A-7-6(30))
	70-71.5	Shelby	78.4	46.0		55	23	32	0	0	100		CH (A-7-6(37))
	80-81.5	Shelby	80.3	43.4	3689	55	24	31	0	0	100		CH (A-7-6(36))
	90-91.5	Shelby	99.4	25.6		28	22	6	0	1	99		CL-ML (A-4(6))
	100-100.8	Shelby		21.5				NP	0	71	29		SM (A-2-4(0))
	100.8-101.3	Shelby	95.0	27.8		26	23	3	1	8	91		ML (A-4(2))
	110-111.5	Shelby	97.2	26.9		27	25	2	0	10	90		ML (A-4(1))
	120-121.5	Shelby	87.8	31.0	3794	39	20	19	0	3	97		CL (A-6(20))
	130-131.5	53		8.5				NP	36	44	20		SM (A-1-b)

		Resistivity (ohm cm)	pH	Sulfate (mg/kg-dry)	Chloride (mg/kg-dry)
08-PG2-B2	5-6.5	2115	8.1	150	140
	15-16.5	1466	7.4	110	94

NP=Nonplastic

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⏲	△	⏍	
Sample No.		1	1	1	
Test No.		20 psi	40 psi	60 psi	
Depth		20-21.5	20-21.5'	20-21.5'	
Initial	Diameter, in	1.42	1.42	1.42	
	Height, in	2.86	2.86	2.86	
	Water Content, %	22.5	22.5	22.5	
	Dry Density, pcf	98.31	98.31	98.31	
	Saturation, %	85.9	85.9	85.9	
	Void Ratio	0.702	0.702	0.702	
Before Shear	Water Content, %	29.2	29.2	29.2	
	Dry Density, pcf	93.85	93.85	93.85	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	0.783	0.783	0.783	
	Back Press., psi	76.	2.992	2.117	
Ver. Eff. Cons. Stress, psi		20.	39.99	60.	
Shear Strength, psi		17.62	36.41	55.66	
Strain at Failure, %		6.28	6.27	4.9	
Strain Rate, %/min		0.01	0.01	0.01	
B-Value		0.96	---	---	
Estimated Specific Gravity		2.68	2.68	2.68	
Liquid Limit		47	47	47	
Plastic Limit		27	27	27	

Project: I-15 UCC

Location: PG 2

Project No.: 200801-200

Boring No.: 08-PG2-B2

Sample Type: shelby

Description: gray brown clay, very stiff

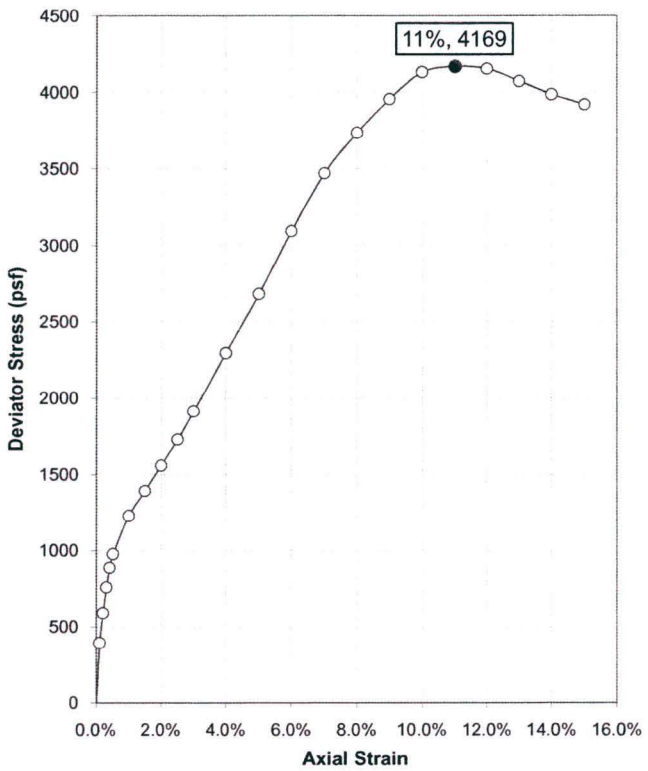
Remarks: multi-stage

Phase calculations based on start and end of test.

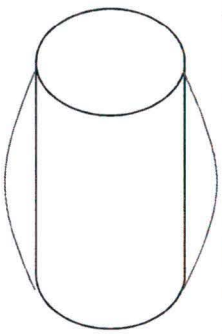
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B2
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	30-31.5
Date	November 13, 2008	**Sample Description**	Lean clay w/ silt lenses, gray/brown
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-1	0	
0.1%	396	198	
0.2%	591	295	
0.3%	760	380	
0.4%	889	445	
0.5%	978	489	
1.0%	1228	614	
1.5%	1393	696	
2.0%	1560	780	
2.5%	1729	865	
3.0%	1914	957	
4.0%	2299	1149	
5.0%	2685	1342	
6.0%	3097	1548	
7.0%	3472	1736	
8.0%	3738	1869	
9.0%	3958	1979	
10.0%	4133	2066	
11.0%	4169	2085	
12.0%	4155	2078	
13.0%	4075	2037	
14.0%	3988	1994	
15.0%	3922	1961	



Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	25%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	95.1	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Initial void ratio**	e_o	0.772	
Initial weight of specimen		854.5	(g)	**Saturation**	S	0.87	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	40	
				Plastic index	PI	23	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	4169	(psf)	**Major principal stress at failure****	σ_1	7195	(psf)
Shear stress at failure**	q_f	2085	(psf)	**Minor principal stress at failure****	σ_3	3026	(psf)

Average strain rate to failure	1%	/ min
Strain at failure	11%	

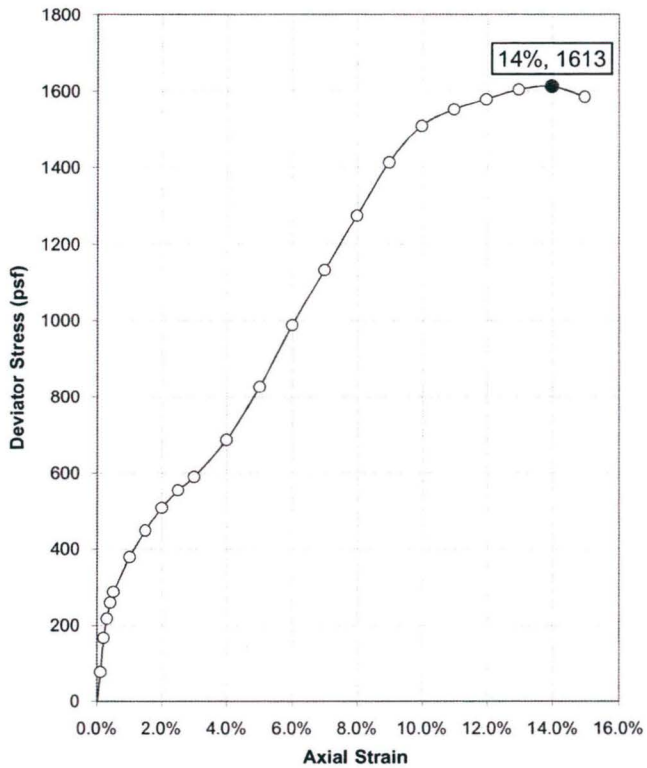
Remarks CL / A-6(23)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B2
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	50-51.5'
Date	November 13, 2008	**Sample Description**	Lean clay, gray
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-1	-1	
0.1%	77	39	
0.2%	168	84	
0.3%	218	109	
0.4%	260	130	
0.5%	288	144	
1.0%	380	190	
1.5%	448	224	
2.0%	509	255	
2.5%	556	278	
3.0%	591	295	
4.0%	687	344	
5.0%	828	414	
6.0%	989	494	
7.0%	1133	566	
8.0%	1275	638	
9.0%	1413	707	
10.0%	1510	755	
11.0%	1554	777	
12.0%	1580	790	
13.0%	1605	802	
14.0%	1613	806	
15.0%	1586	793	

Initial Sample Data

Initial height of specimen	L_o	5.22	(in)	**Moisture content***	w	42%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	77.4	(pcf)
Height-to-diameter ratio	L_o / D_o	2.02		**Initial void ratio**	e_o	1.176	
Initial weight of specimen		794.8	(g)	**Saturation**	S	0.97	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	47	
				Plastic index	PI	28	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	1613	(psf)	**Major principal stress at failure****	σ_1	6649	(psf)
Shear stress at failure**	q_f	806	(psf)	**Minor principal stress at failure****	σ_3	5036	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		14%					

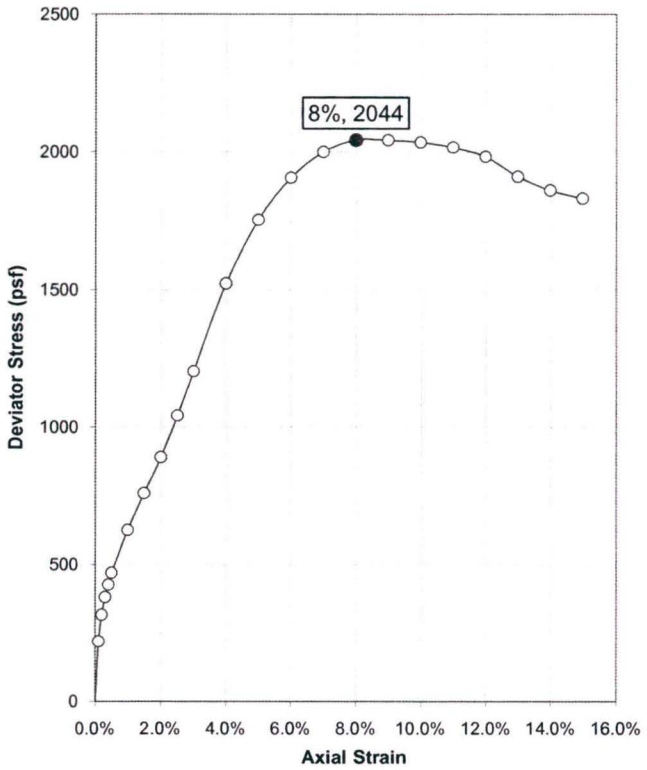
Remarks CL / A-7-6(31)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

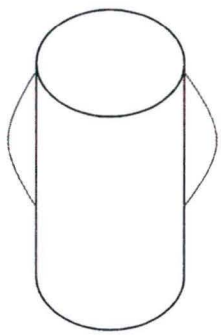
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B2
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	70-71.5'
Date	November 13, 2008	**Sample Description**	Fat Clay, gray
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-1	-1	
0.1%	220	110	
0.2%	317	158	
0.3%	381	190	
0.4%	427	213	
0.5%	470	235	
1.0%	625	312	
1.5%	760	380	
2.0%	891	446	
2.5%	1042	521	
3.0%	1206	603	
4.0%	1524	762	
5.0%	1756	878	
6.0%	1907	954	
7.0%	2000	1000	
8.0%	2044	1022	
9.0%	2043	1022	
10.0%	2035	1018	
11.0%	2017	1008	
12.0%	1983	991	
13.0%	1912	956	
14.0%	1862	931	
15.0%	1833	917	



Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	46%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	78.4	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Initial void ratio**	e_o	1.148	
Initial weight of specimen		823.5	(g)	**Saturation**	S	1.00	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	55	
				Plastic index	PI	32	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	2044	(psf)	**Major principal stress at failure****	σ_1	9094	(psf)
Shear stress at failure**	q_f	1022	(psf)	**Minor principal stress at failure****	σ_3	7050	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		8%					

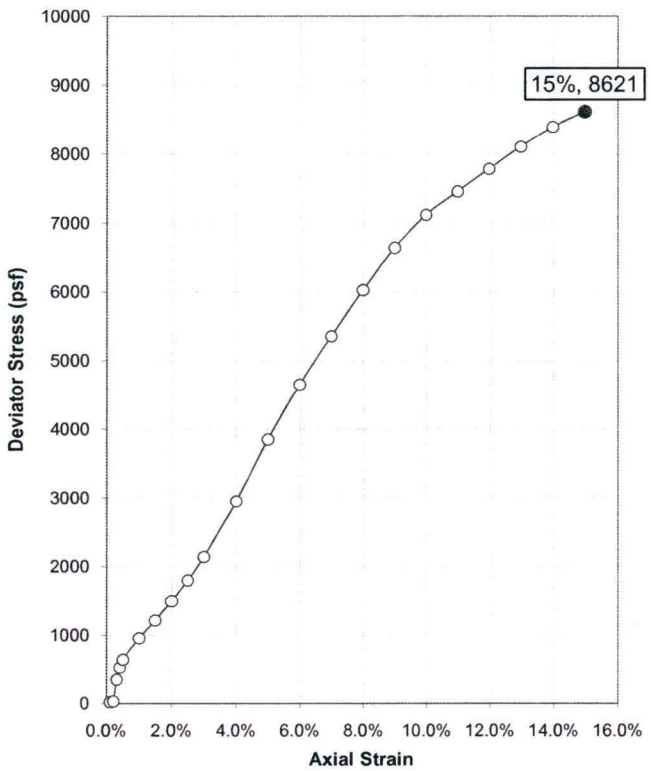
Remarks CH / A-7-6(37)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

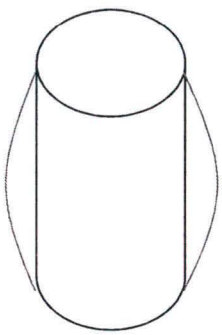
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B2
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	90-91.5'
Date	November 13, 2008	**Sample Description**	Silty Clay, gray
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-6	-3	
0.1%	19	9	
0.2%	28	14	
0.3%	348	174	
0.4%	521	261	
0.5%	636	318	
1.0%	956	478	
1.5%	1213	606	
2.0%	1495	747	
2.5%	1796	898	
3.0%	2139	1070	
4.0%	2952	1476	
5.0%	3851	1925	
6.0%	4656	2328	
7.0%	5358	2679	
8.0%	6029	3015	
9.0%	6643	3321	
10.0%	7123	3562	
11.0%	7462	3731	
12.0%	7786	3893	
13.0%	8109	4055	
14.0%	8397	4199	
15.0%	8621	4311	



Initial Sample Data

Initial height of specimen	L_o	5.2	(in)	**Moisture content***	w	26%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	99.4	(pcf)
Height-to-diameter ratio	L_o / D_o	2.01		**Initial void ratio**	e_o	0.696	
Initial weight of specimen		897.5	(g)	**Saturation**	S	0.99	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	28	
				Plastic index	PI	6	

Test Results

Deviator stress at failure**	$\sigma_{d,f}$	8621	(psf)	**Major principal stress at failure****	σ_1	17690	(psf)
Shear stress at failure**	q_f	4311	(psf)	**Minor principal stress at failure****	σ_3	9069	(psf)

Average strain rate to failure	1%	/ min
Strain at failure	15%	

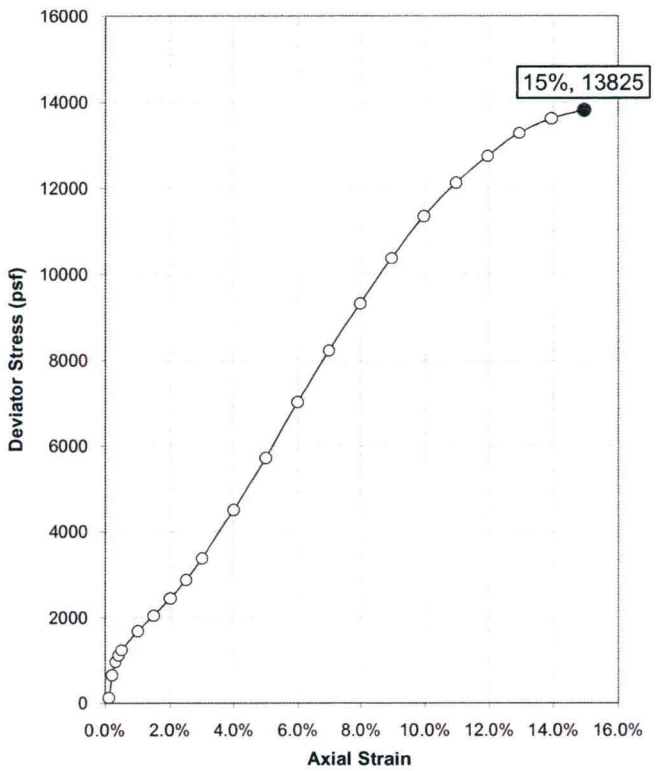
Remarks CL-ML / A-4(6)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects

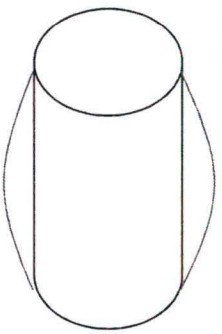
RB&G ENGINEERING, INC.

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS

Project	I-15 Utah County Corridor	**Boring No.**	08-PG2-B2
Project No.	200801-200	**Sample**	
Location	Proctor Road (PG 2000 W) over I-15	**Depth / Elev. (ft)**	110-111.5'
Date	November 13, 2008	**Sample Description**	Silt w/ sand, dark gray
Tested By	J Boone	**Sample Type**	Undisturbed (Shelby)



Axial Strain	σ_d (psf)	q $\sigma_d/2$ (psi)	Sketch of Specimen After Failure
0.0%	-3	-2	
0.1%	128	64	
0.2%	651	326	
0.3%	963	481	
0.4%	1116	558	
0.5%	1241	621	
1.0%	1692	846	
1.5%	2046	1023	
2.0%	2445	1223	
2.5%	2880	1440	
3.0%	3380	1690	
4.0%	4514	2257	
5.0%	5725	2862	
6.0%	7025	3513	
7.0%	8231	4116	
8.0%	9325	4663	
9.0%	10382	5191	
10.0%	11357	5678	
11.0%	12126	6063	
12.0%	12746	6373	
12.9%	13286	6643	
13.9%	13628	6814	
14.9%	13825	6913	



Initial Sample Data

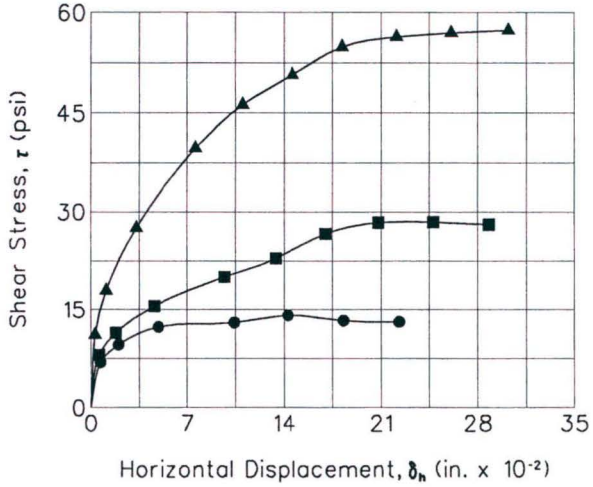
Initial height of specimen	L_o	5.38	(in)	**Moisture content***	w	27%	
Initial diameter of specimen	D_o	2.59	(in)	**Dry unit weight**	γ_d	97.2	(pcf)
Height-to-diameter ratio	L_o / D_o	2.08		**Initial void ratio**	e_o	0.734	
Initial weight of specimen		917.5	(g)	**Saturation**	S	0.99	
Specific gravity of soil solids	G_s	2.7	*[Estimated value]*	**Liquid limit**	LL	27	
				Plastic index	PI	2	

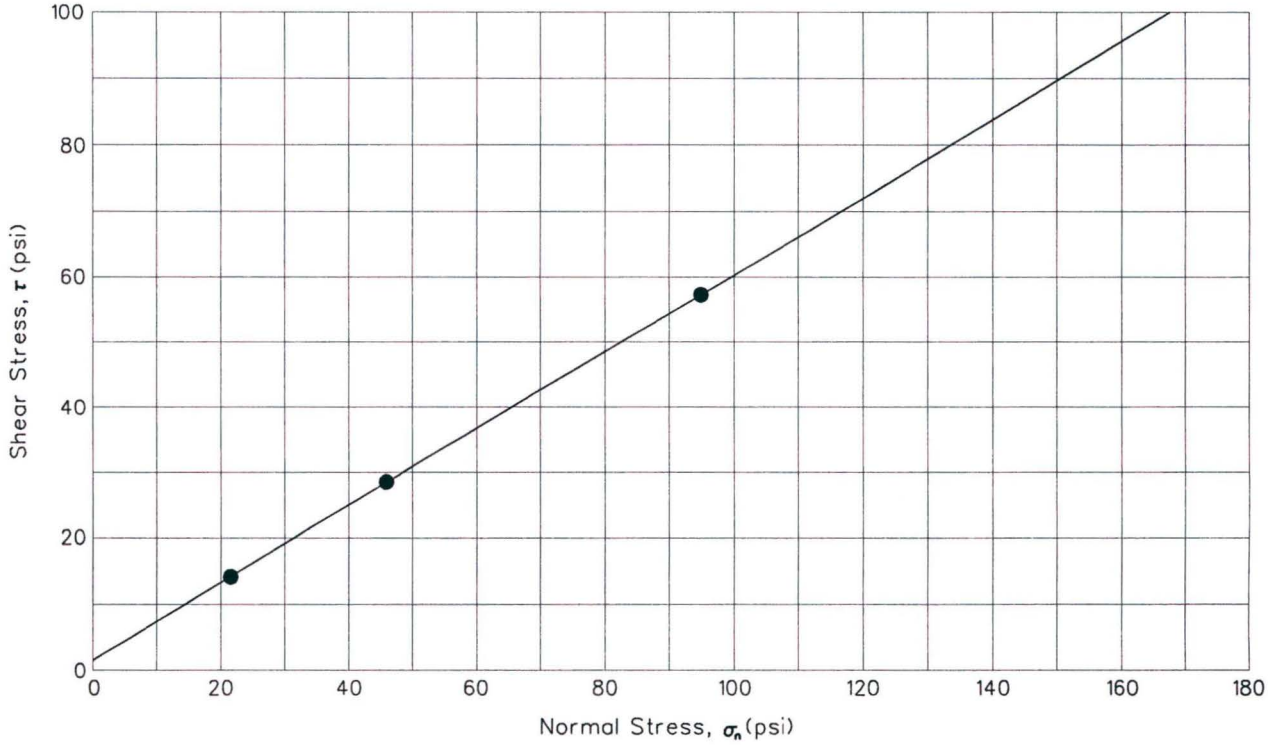
Test Results

Deviator stress at failure**	$\sigma_{d,f}$	13825	(psf)	**Major principal stress at failure****	σ_1	24930	(psf)
Shear stress at failure**	q_f	6913	(psf)	**Minor principal stress at failure****	σ_3	11105	(psf)
Average strain rate to failure		1%	/ min				
Strain at failure		15%					

Remarks ML / A-4(1)

*Moisture content obtained from cuttings and or excess material
**Values corrected for membrane effects





Test No. or Symbol	Sample Size (inches)	Sample Data		Degree of Saturation (%)	Normal Stress δn (psi)	Maximum Shear Stress τ (psi)	Strain Rate (inches/minute)	Shear Strength Parameters	
		Dry Density (pcf)	Moisture Content (%)					Friction Angle ϕ (degrees)	Cohesion (c/psi)
●	2.375	96.7	24.0	~100	21.5	14.1	0.0005	30.4	2
■	2.375	96.8	24.0	~100	45.8	28.5	0.0005		
▲	2.375	96.8	24.1	~100	94.9	57.3	0.0005		

MATERIAL: LEAN CLAY (CL)

RB&G ENGINEERING INC.
Provo, Utah

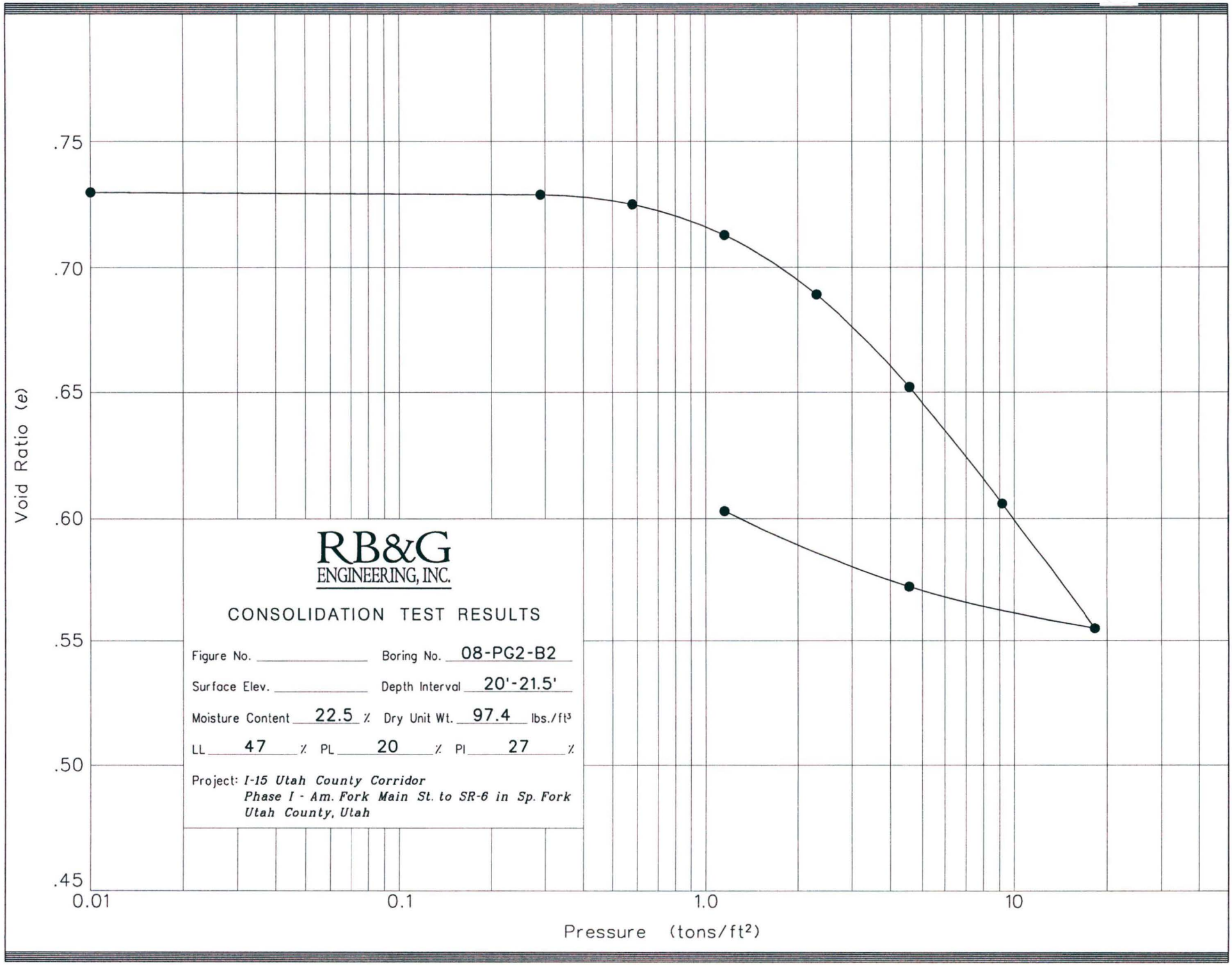
DIRECT SHEAR TEST

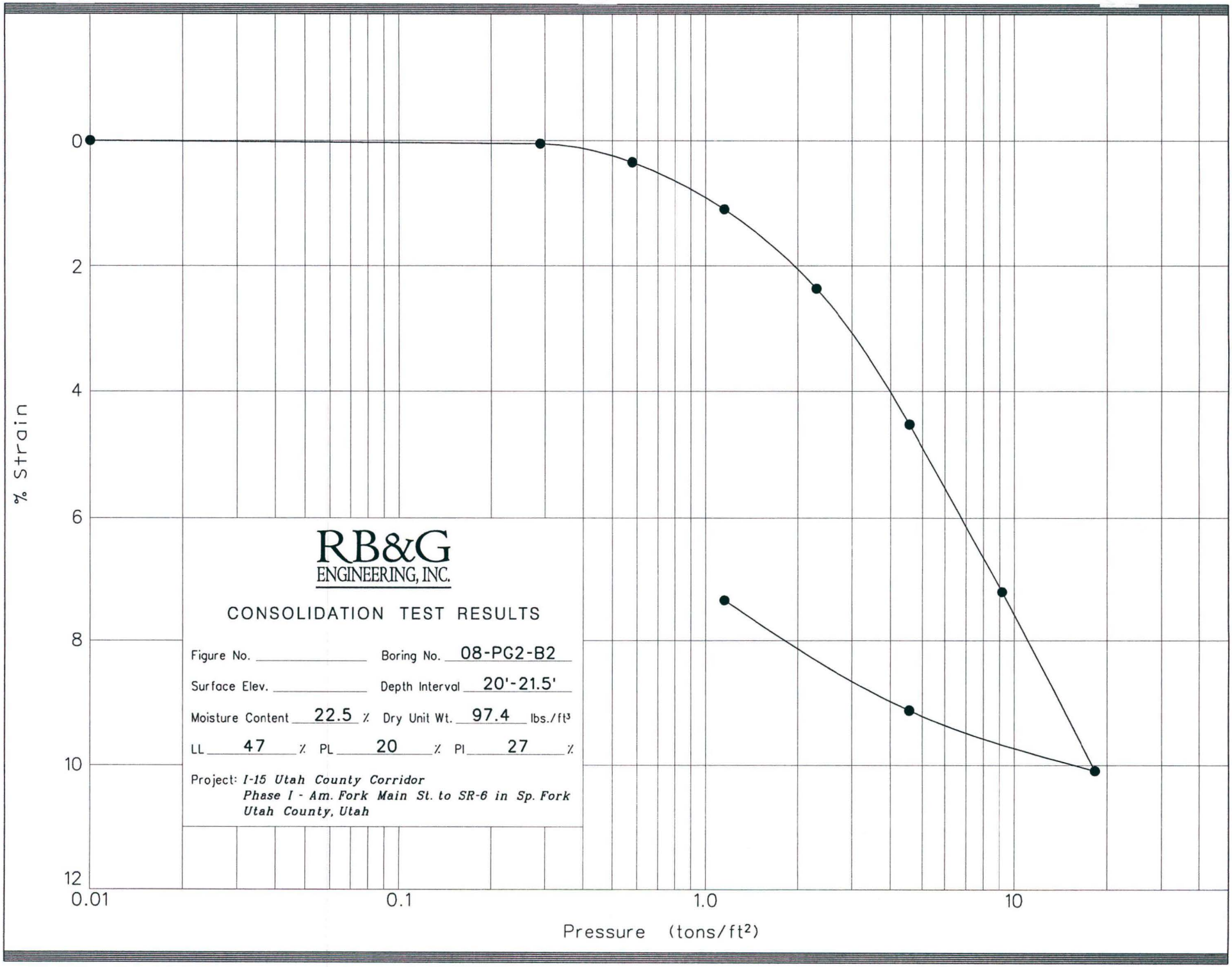
Project: *I-15 Utah County Corridor*
Utah County, Utah

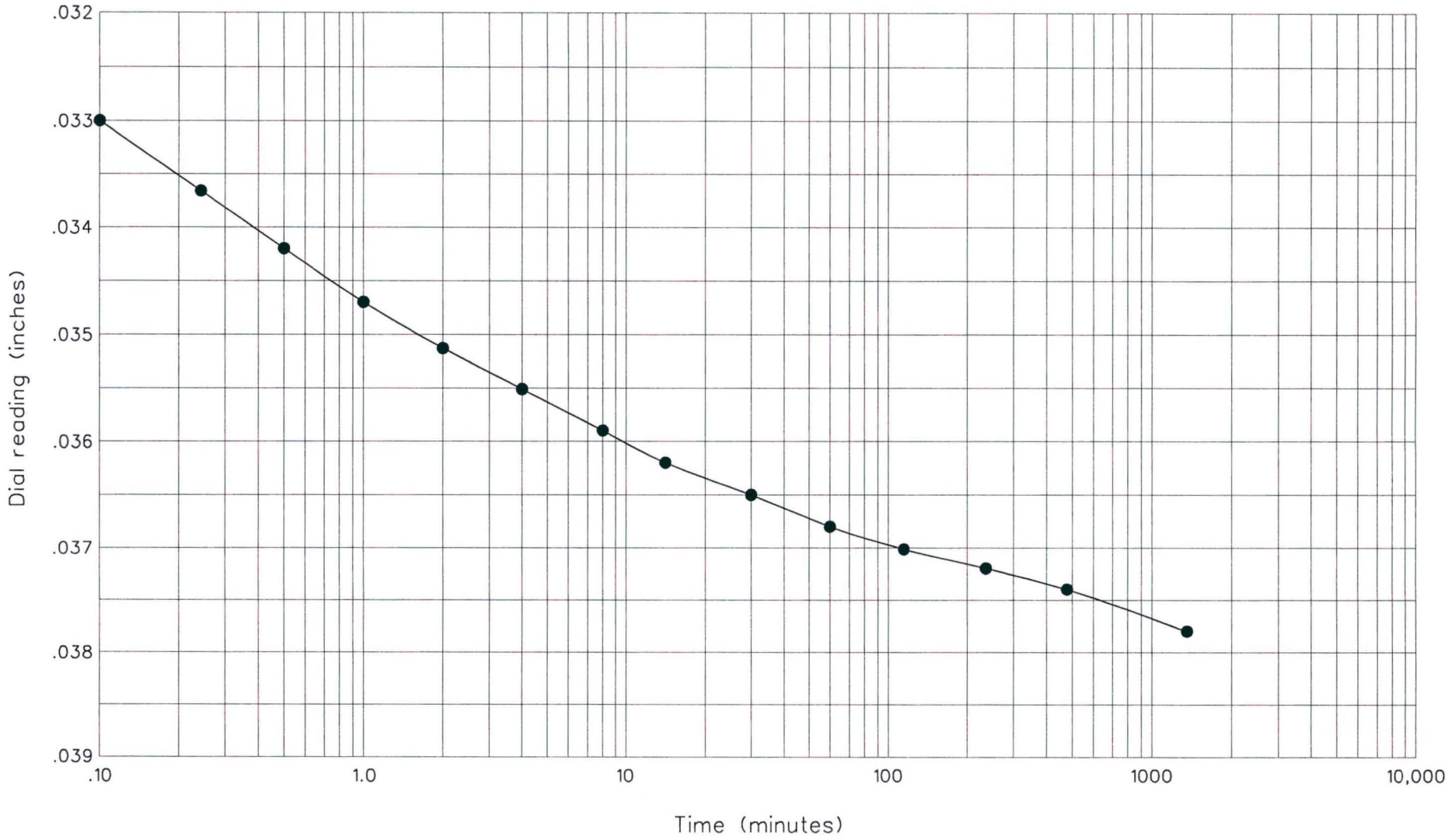
HOLE NO.: 08-PG2-B2

DEPTH: 10'-11.5'

Figure


.75
.70
.65
.60
.55
.50
.45
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 20'-21.5'
Moisture Content 22.5 % Dry Unit Wt. 97.4 lbs./ft³
LL 47 % PL 20 % PI 27 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


% Strain
0
2
4
6
8
10
12
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 20'-21.5'
Moisture Content 22.5 % Dry Unit Wt. 97.4 lbs./ft³
LL 47 % PL 20 % PI 27 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



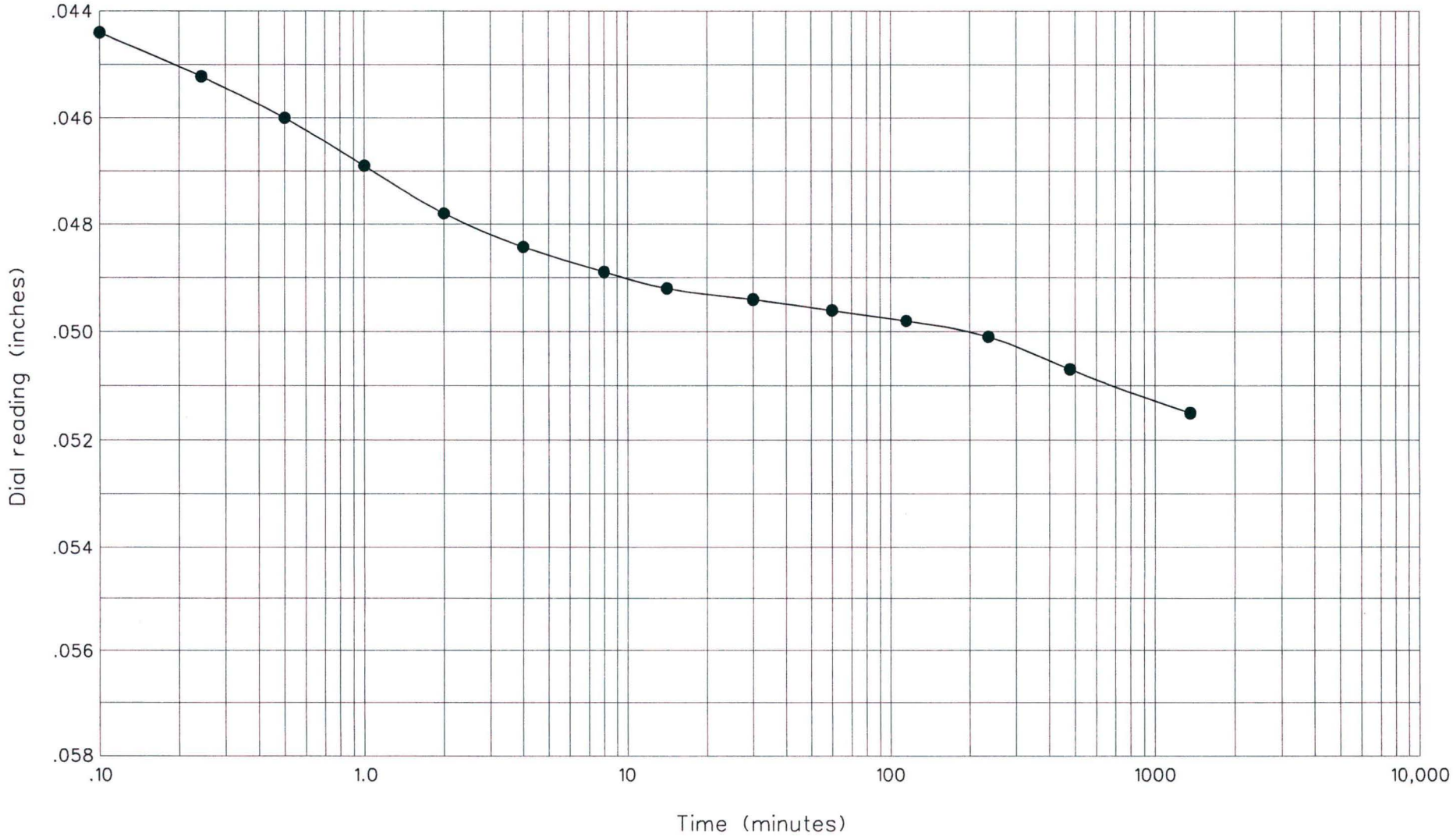
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 20'-21.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



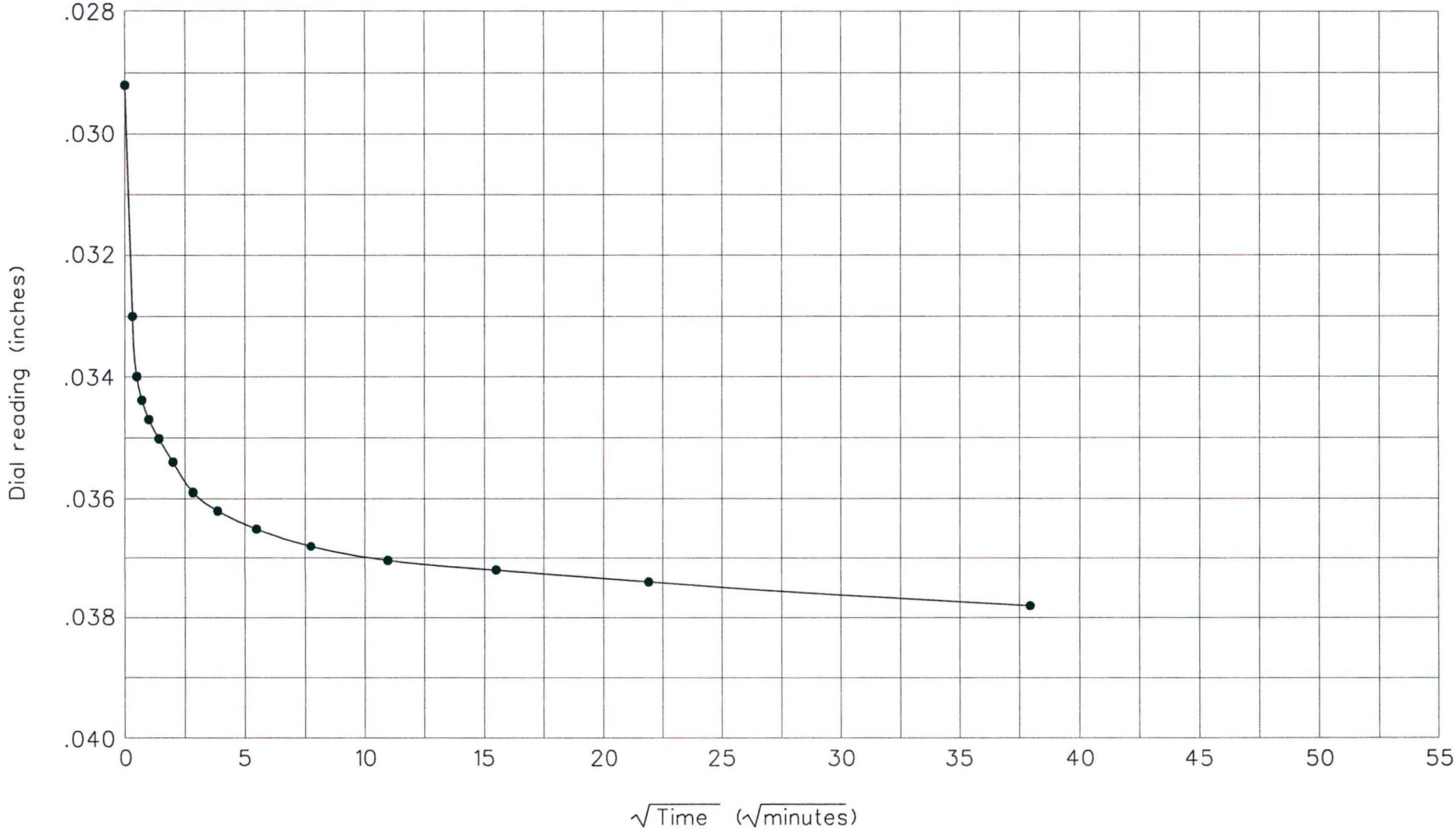
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 20'-21.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



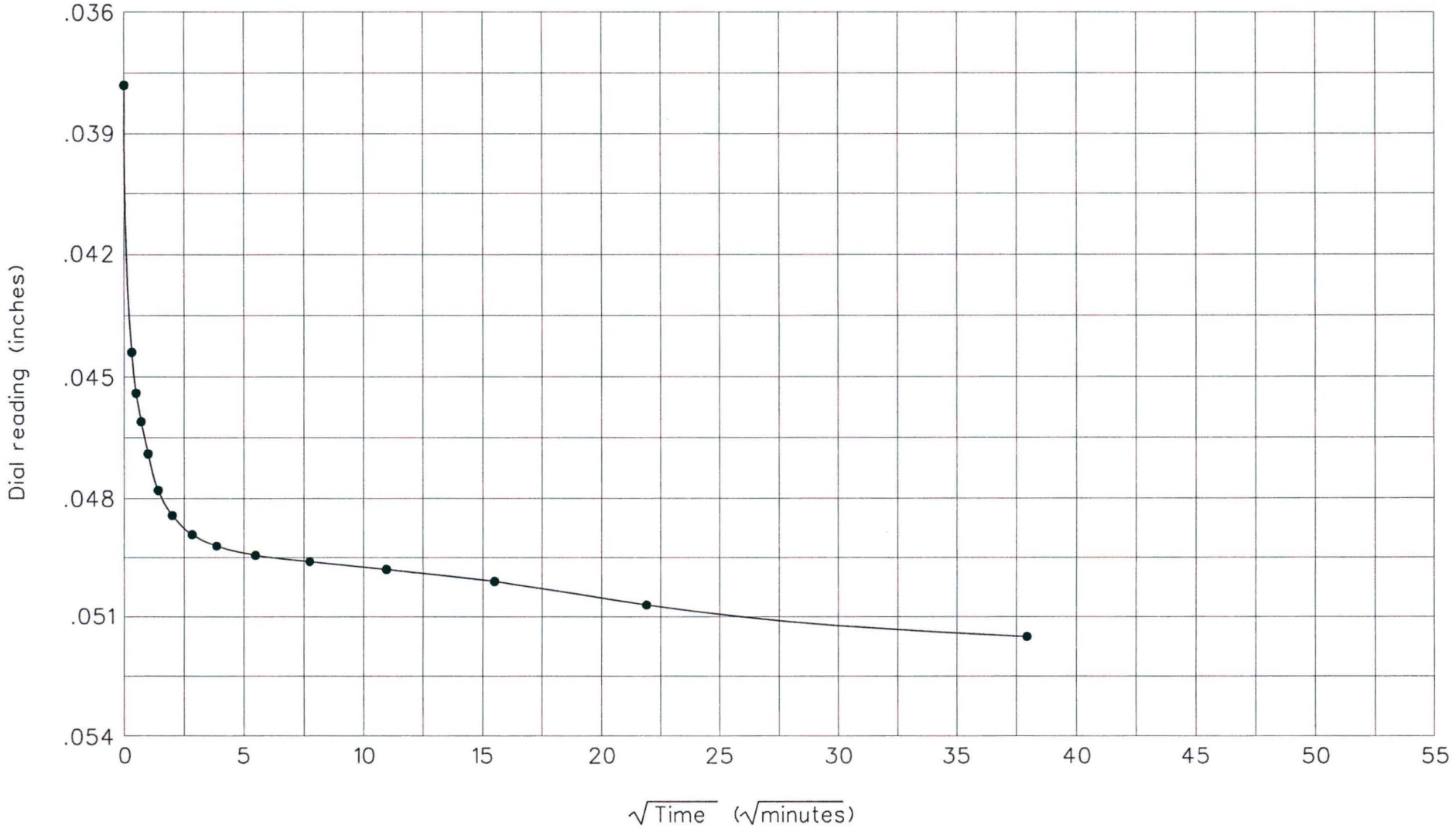
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 20'-21.5'
Load: 0.58 to 1.15 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



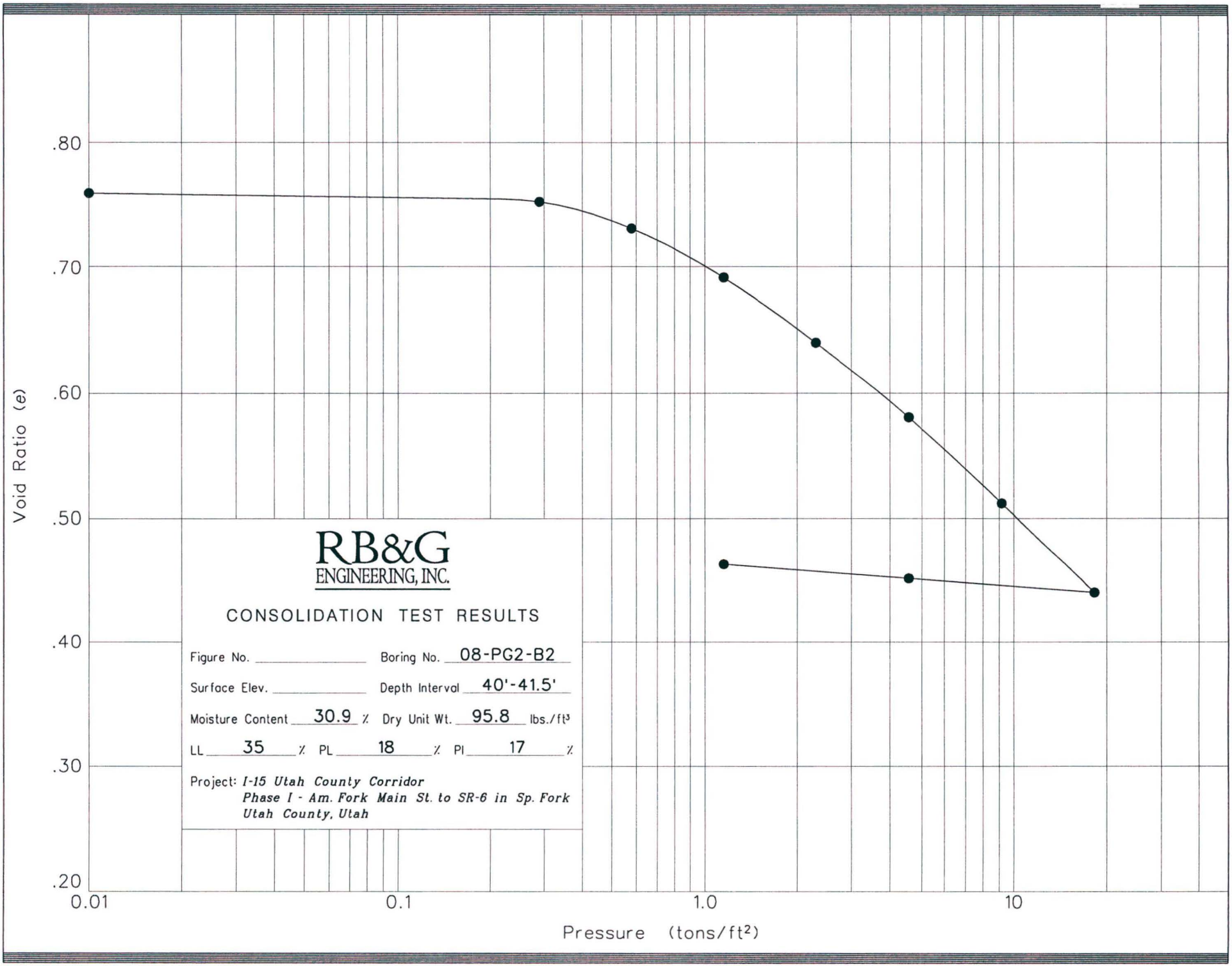
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 20'-21.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

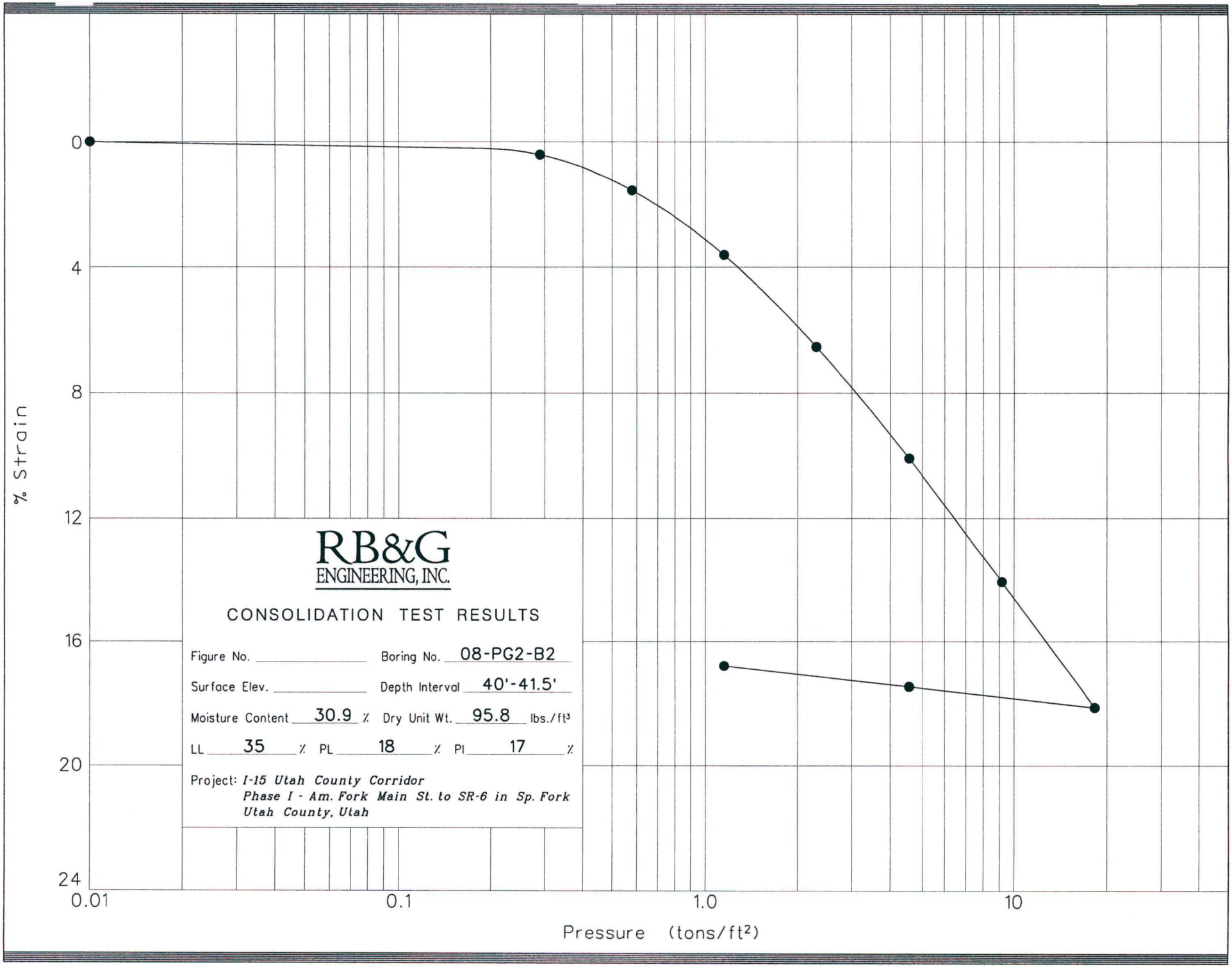
Figure No. _____ Boring No. 08-PG2-B2

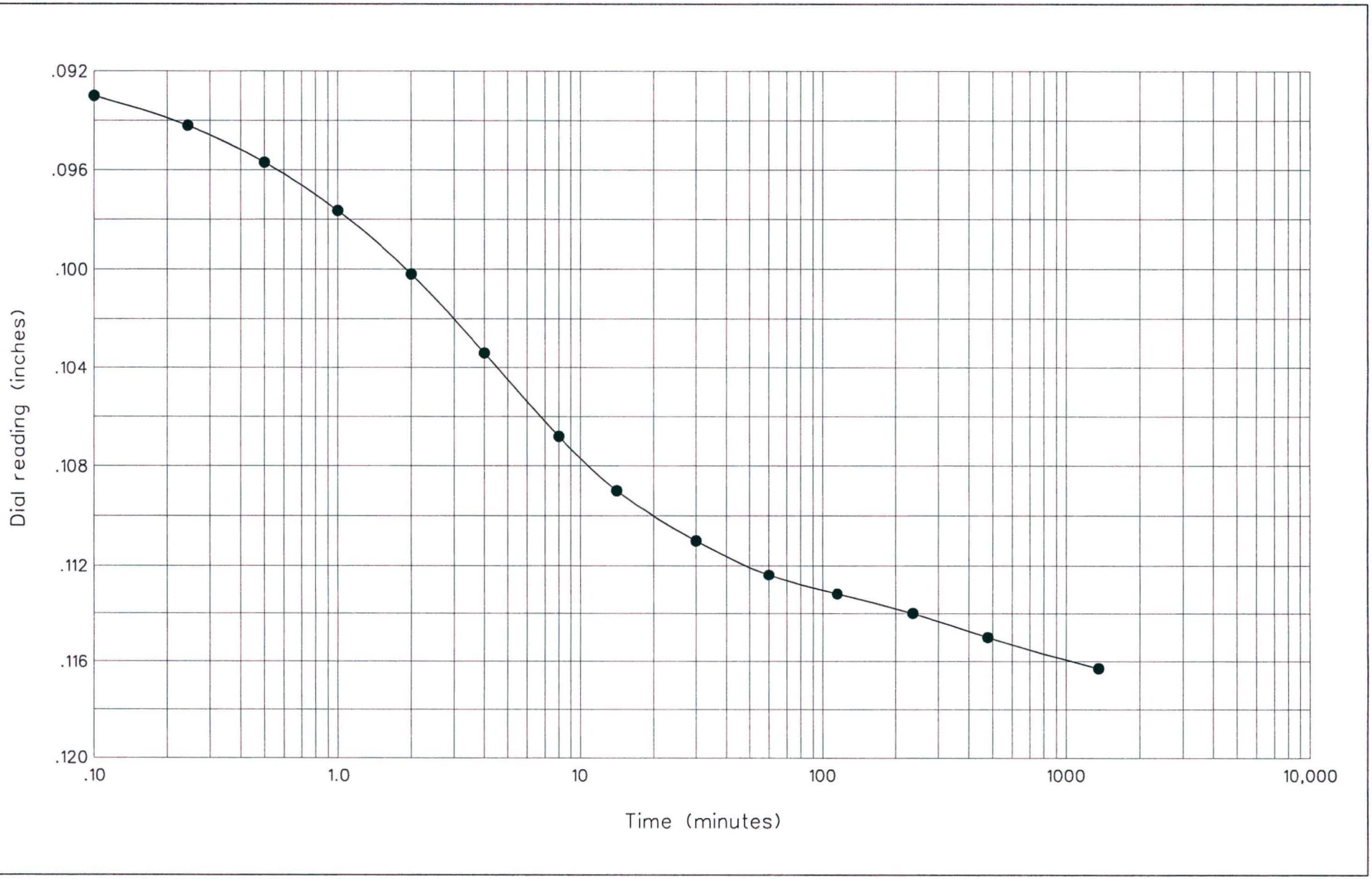
Surface Elev. _____ Depth Interval 40'-41.5'

Moisture Content 30.9 % Dry Unit Wt. 95.8 lbs./ft³

LL 35 % PL 18 % PI 17 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


0
4
8
12
16
20
24
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No.
Boring No. 08-PG2-B2
Surface Elev.
Depth Interval 40'-41.5'
Moisture Content 30.9 % Dry Unit Wt. 95.8 lbs./ft³
LL 35 % PL 18 % PI 17 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



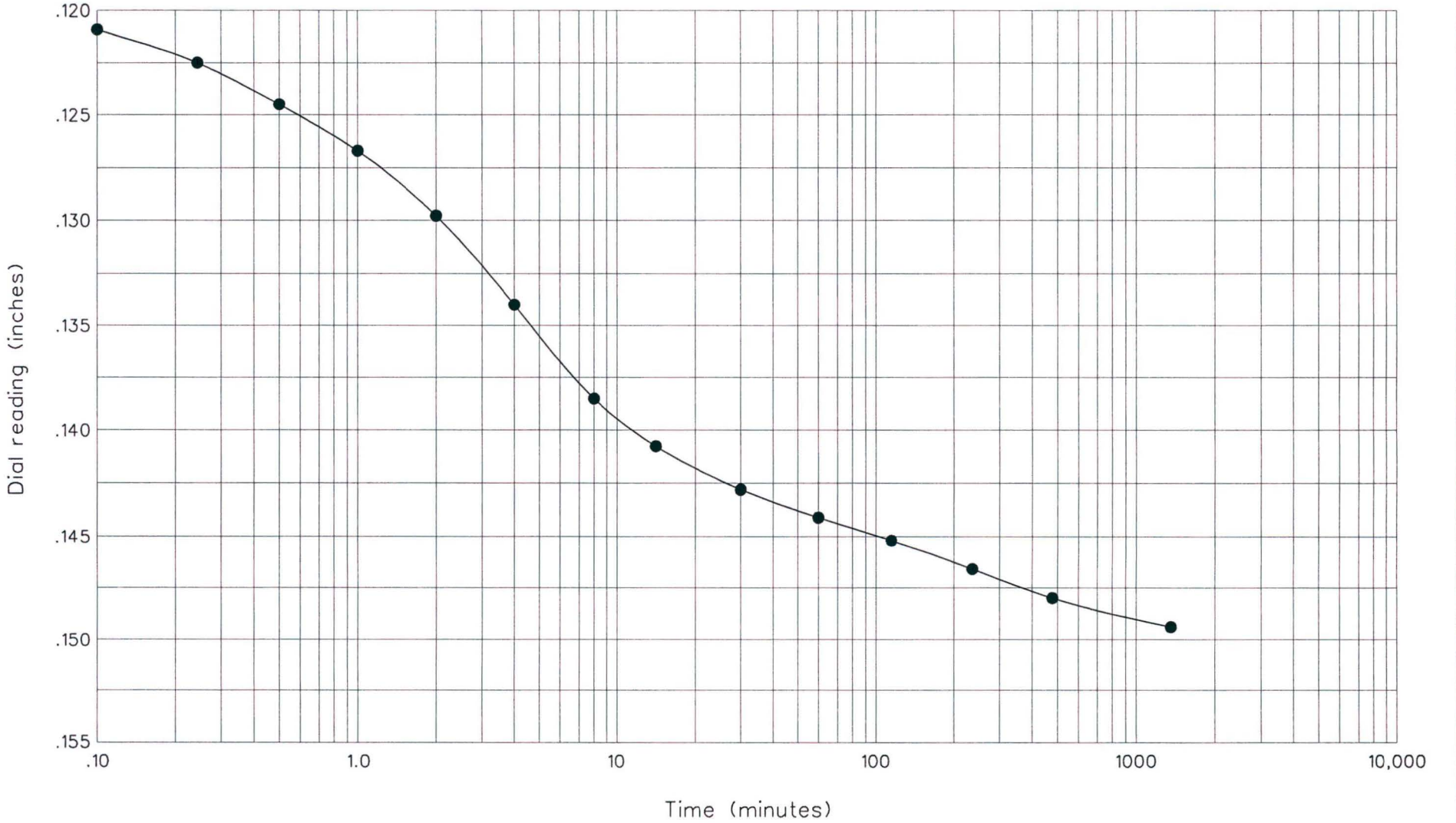
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 40'-41.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



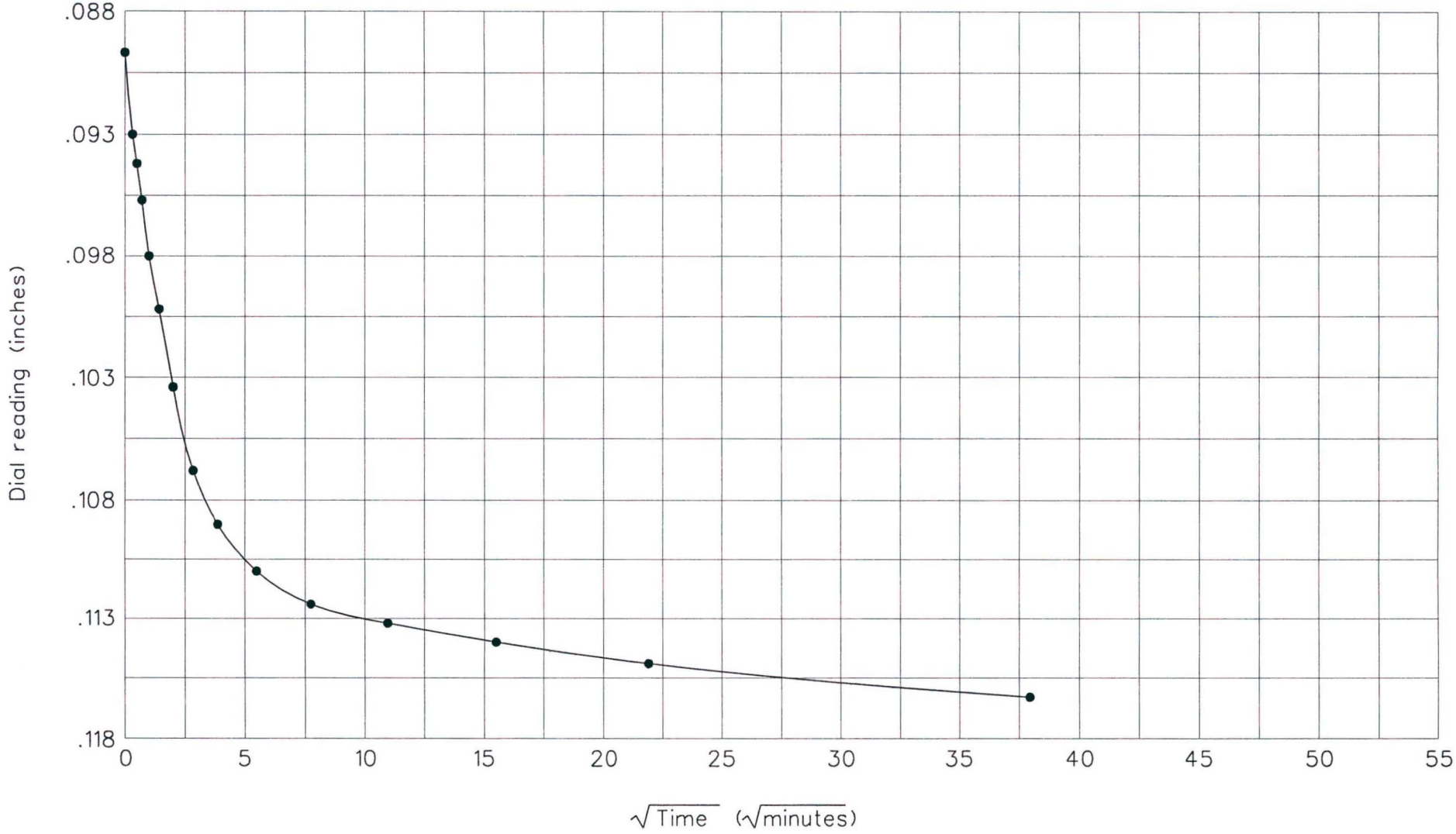
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 40'-41.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



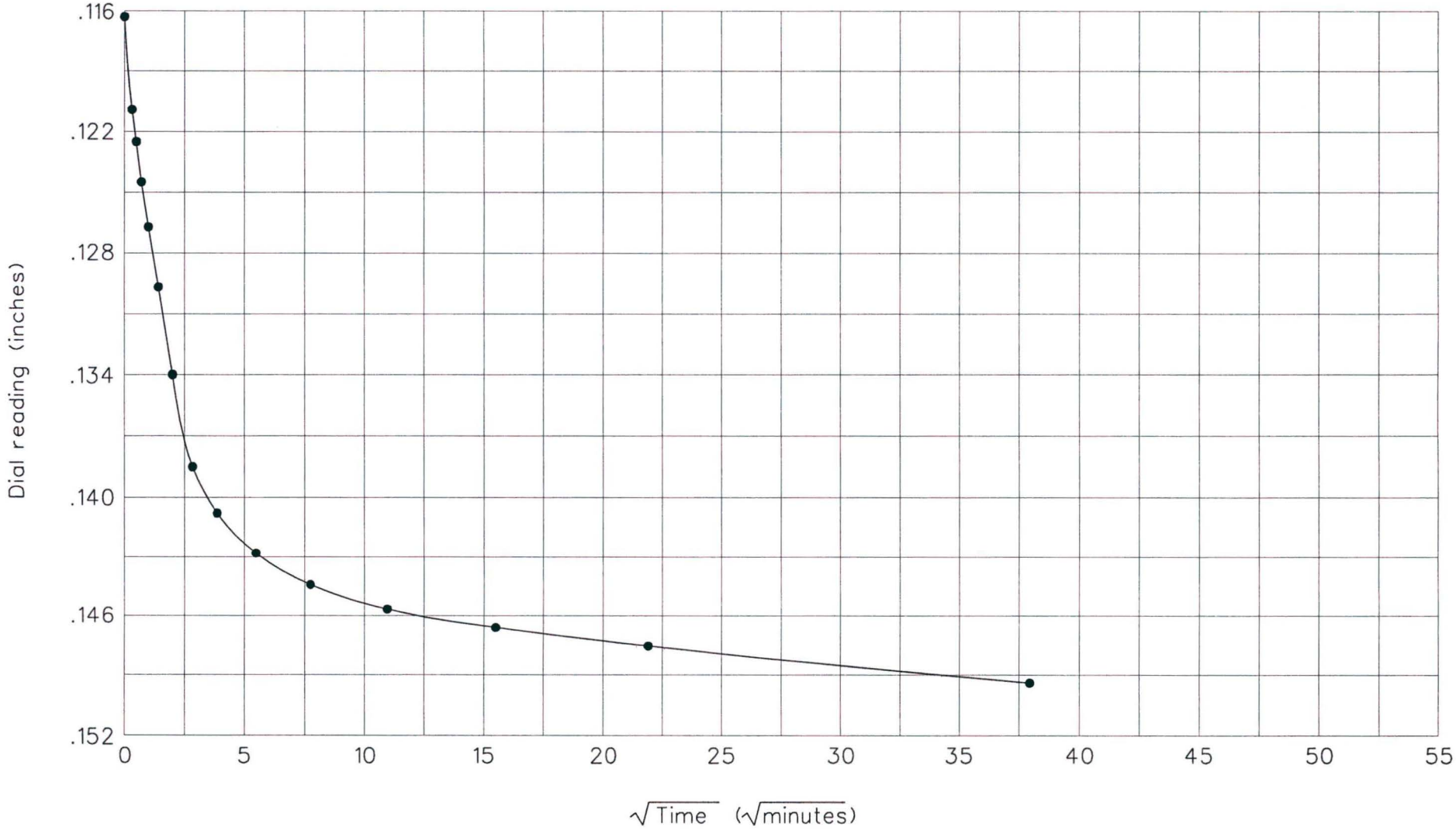
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 40'-41.5'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



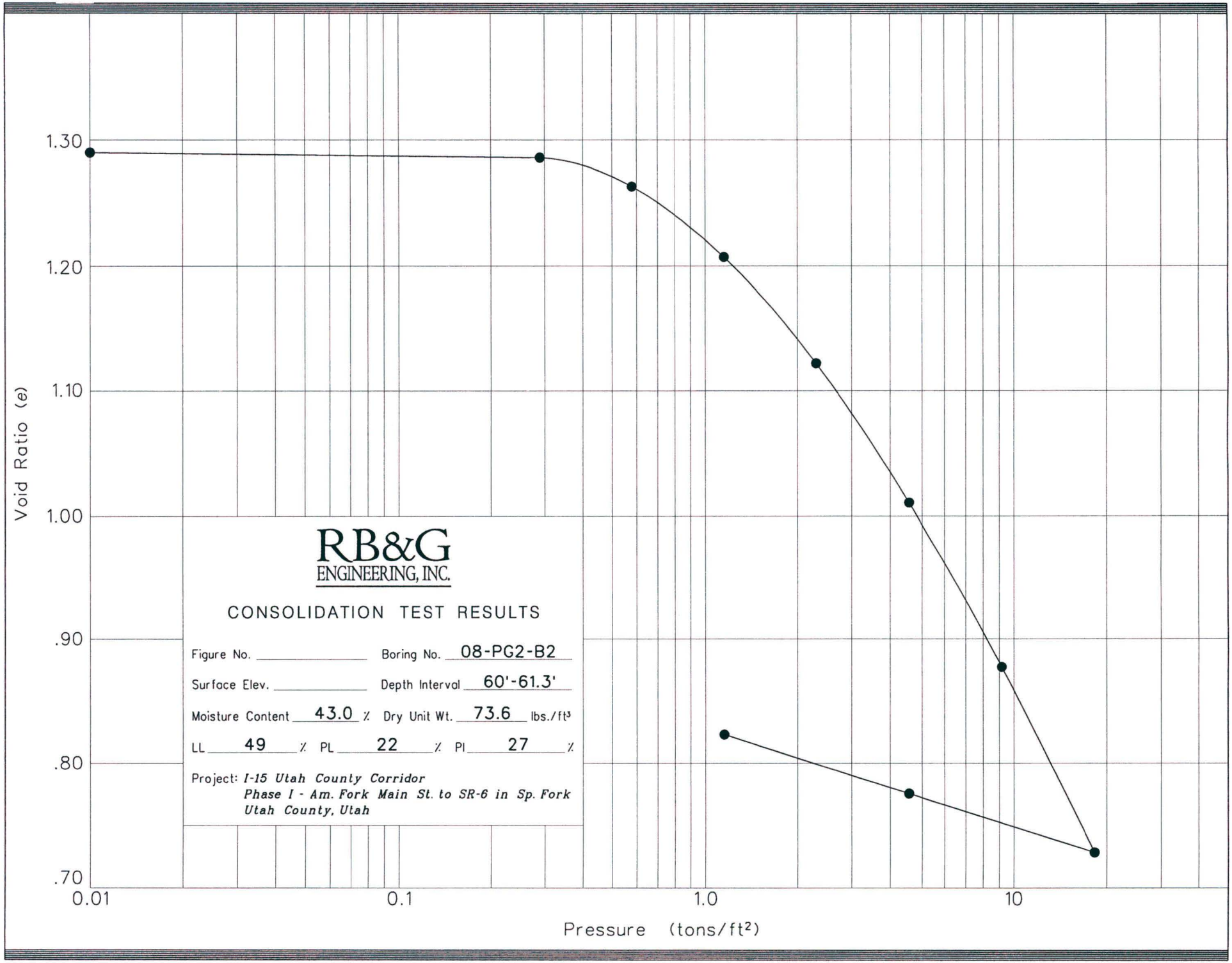
RB&G ENGINEERING, INC.

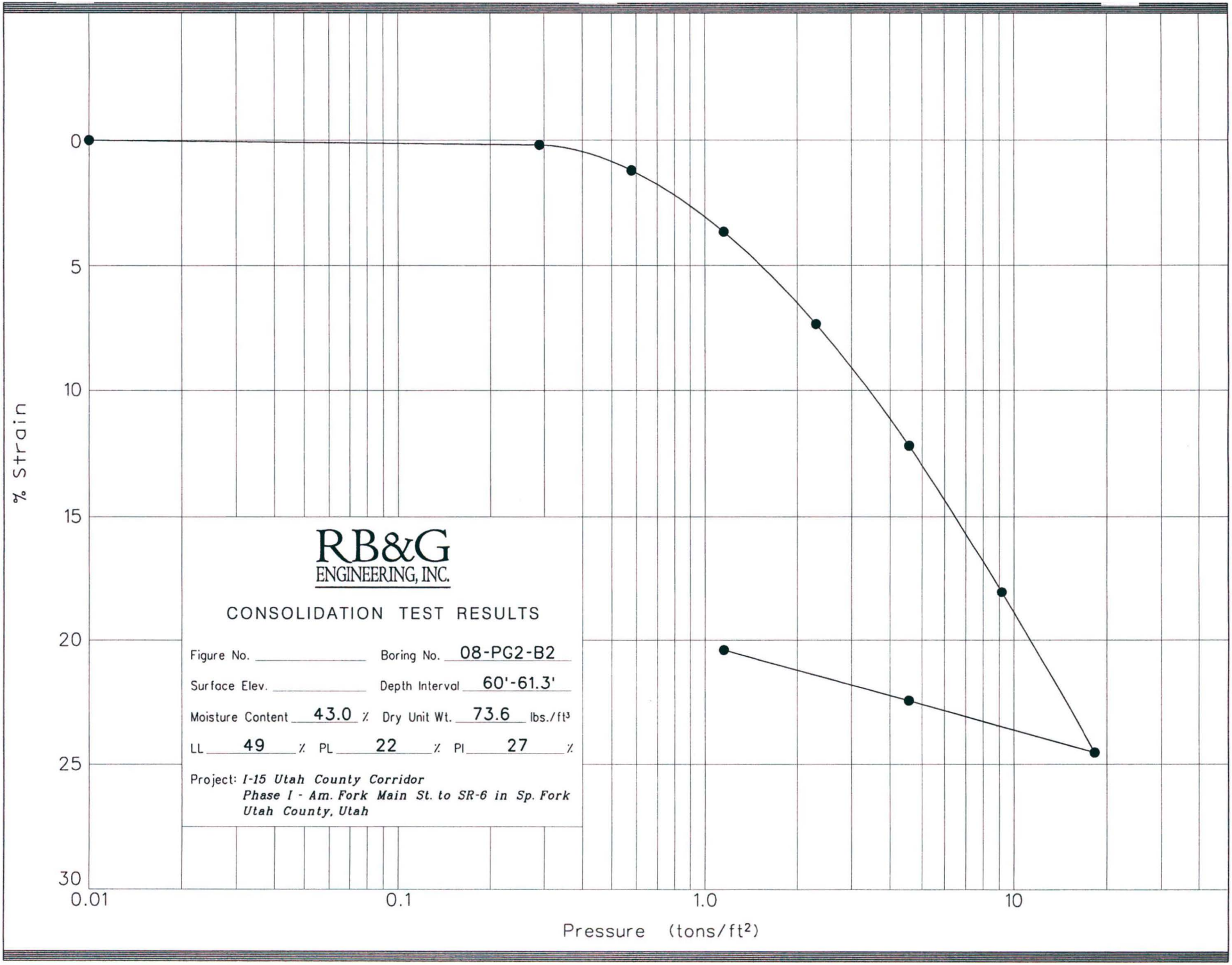
Hole no.: 08-PG2-B2
Depth: 40'-41.5'
Load: 2.30 to 4.60 tons

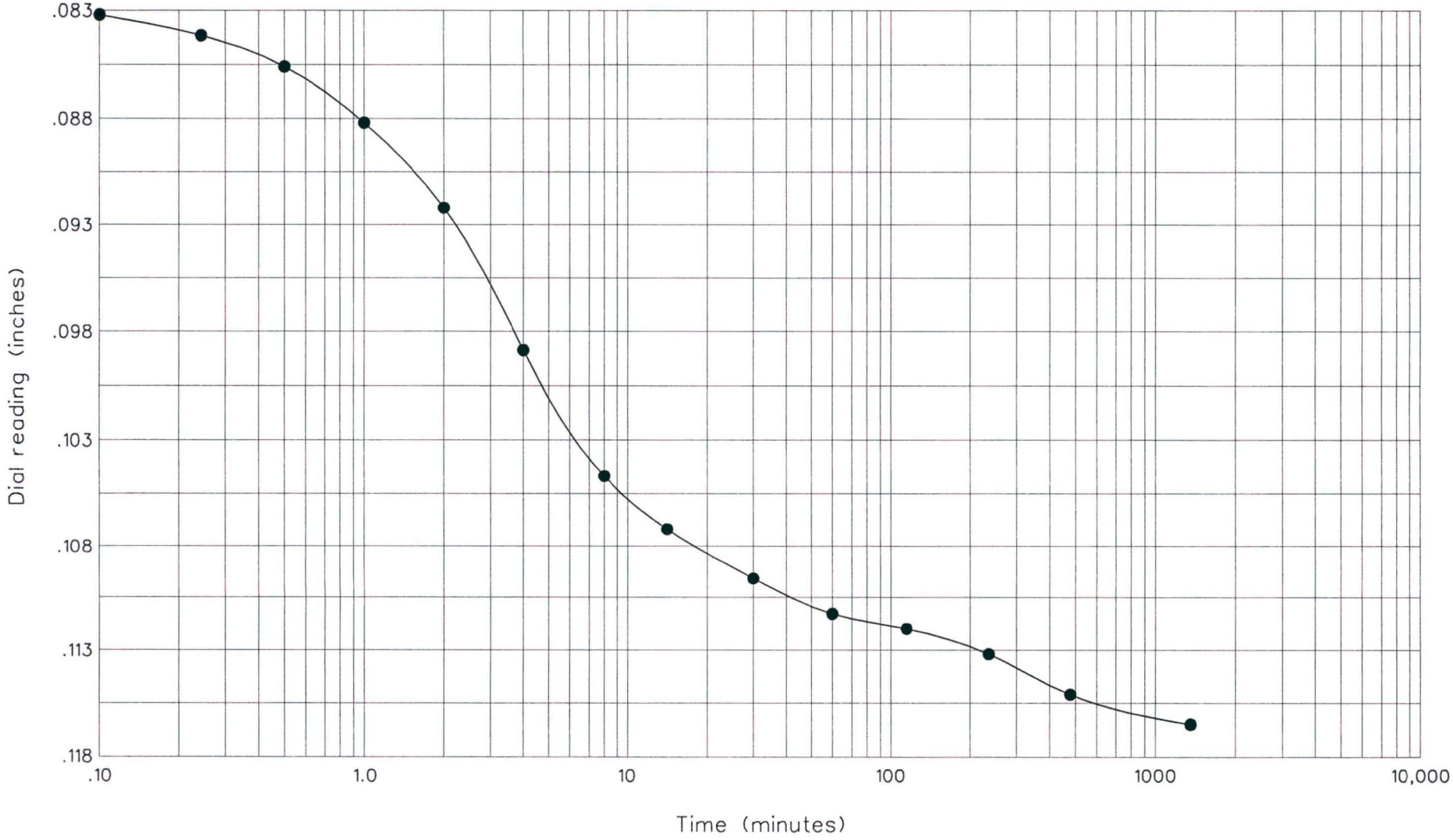
TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure


1.30
1.20
1.10
1.00
.90
.80
.70
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 60'-61.3'
Moisture Content 43.0 % Dry Unit Wt. 73.6 lbs./ft³
LL 49 % PL 22 % PI 27 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


% Strain
0
5
10
15
20
25
30
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 60'-61.3'
Moisture Content 43.0 % Dry Unit Wt. 73.6 lbs./ft³
LL 49 % PL 22 % PI 27 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



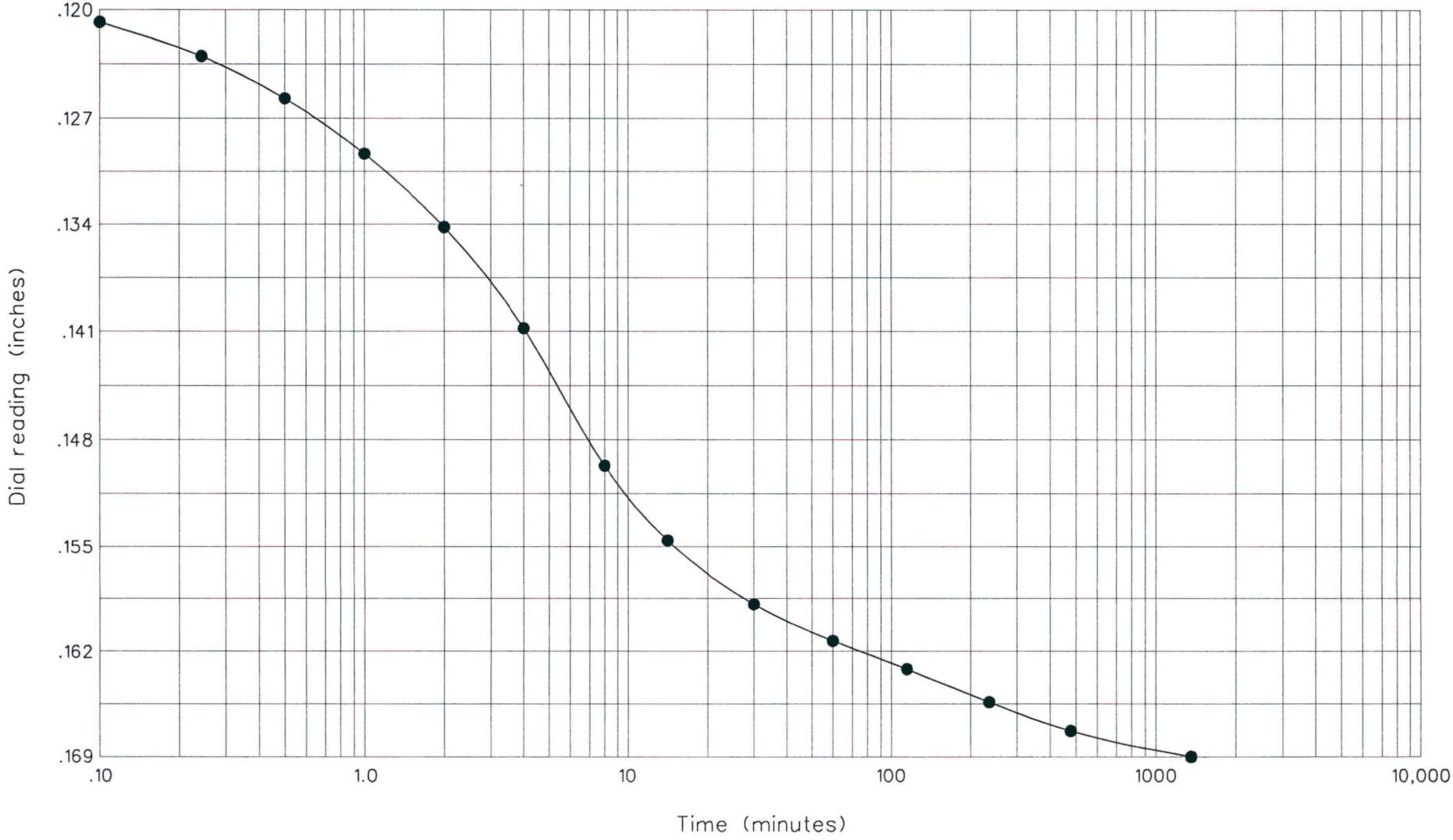
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 60'-61.3'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



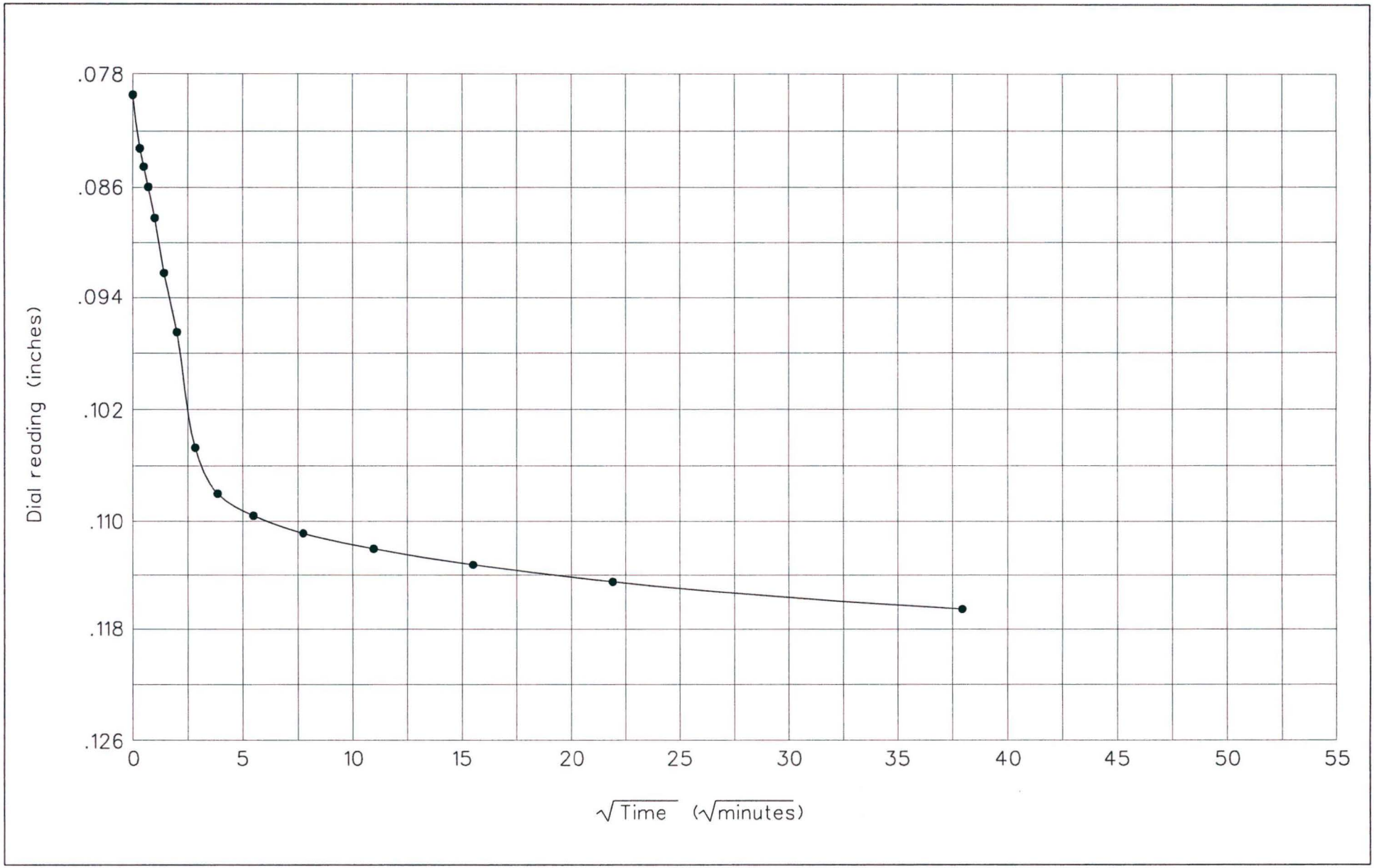
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 60'-61.3'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



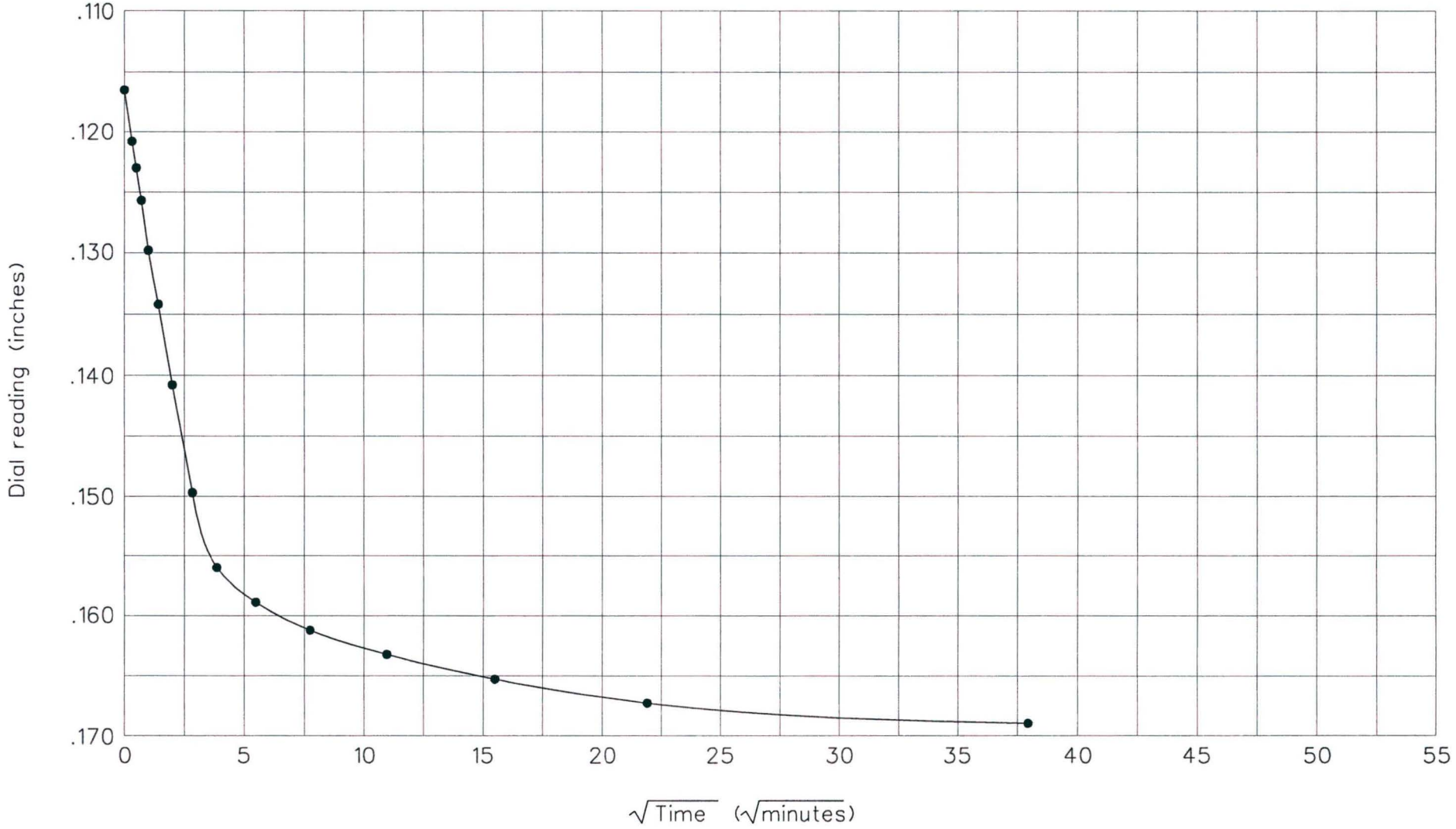
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 60'-61.3'
Load: 1.15 to 2.30 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



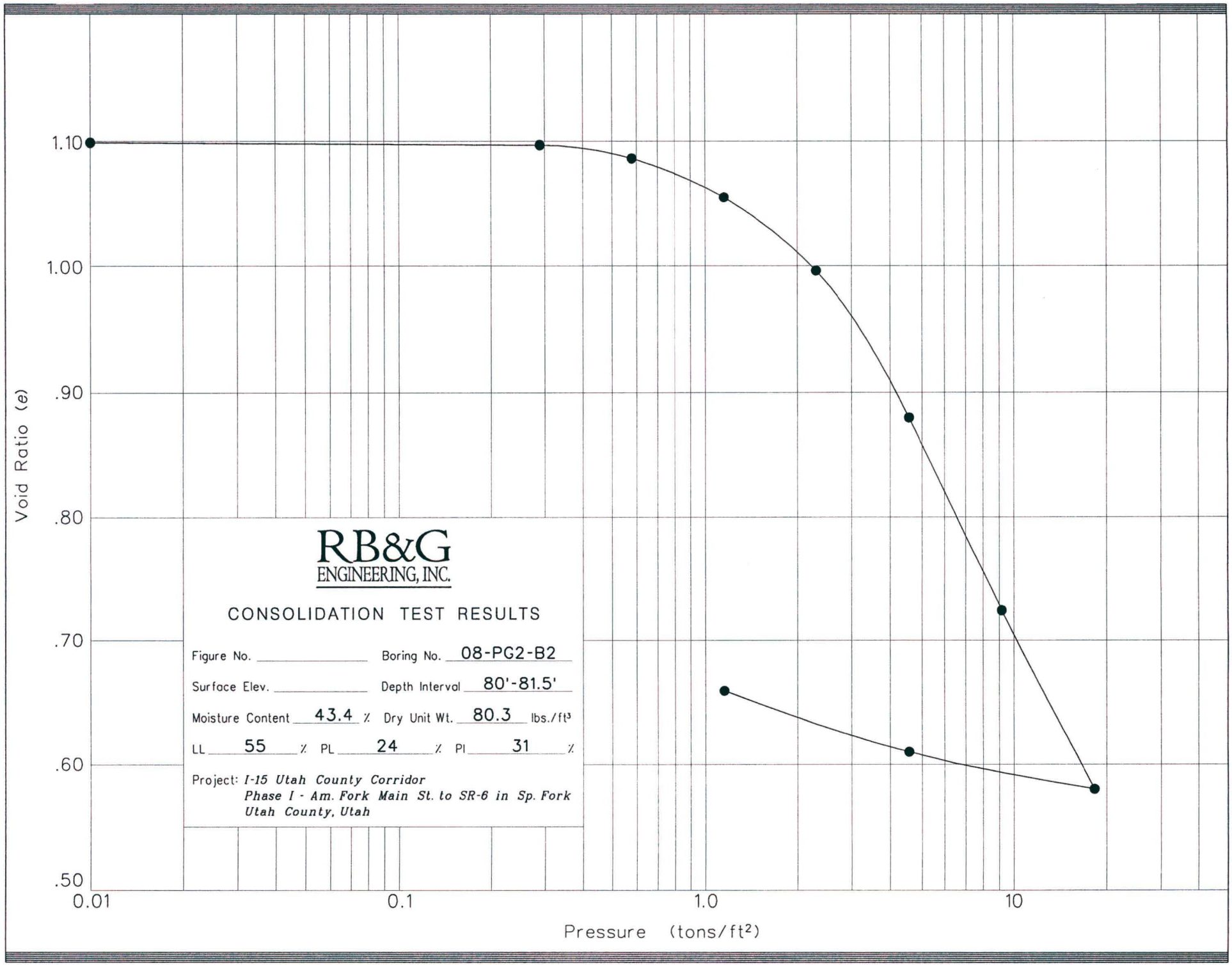
RB&G ENGINEERING, INC.

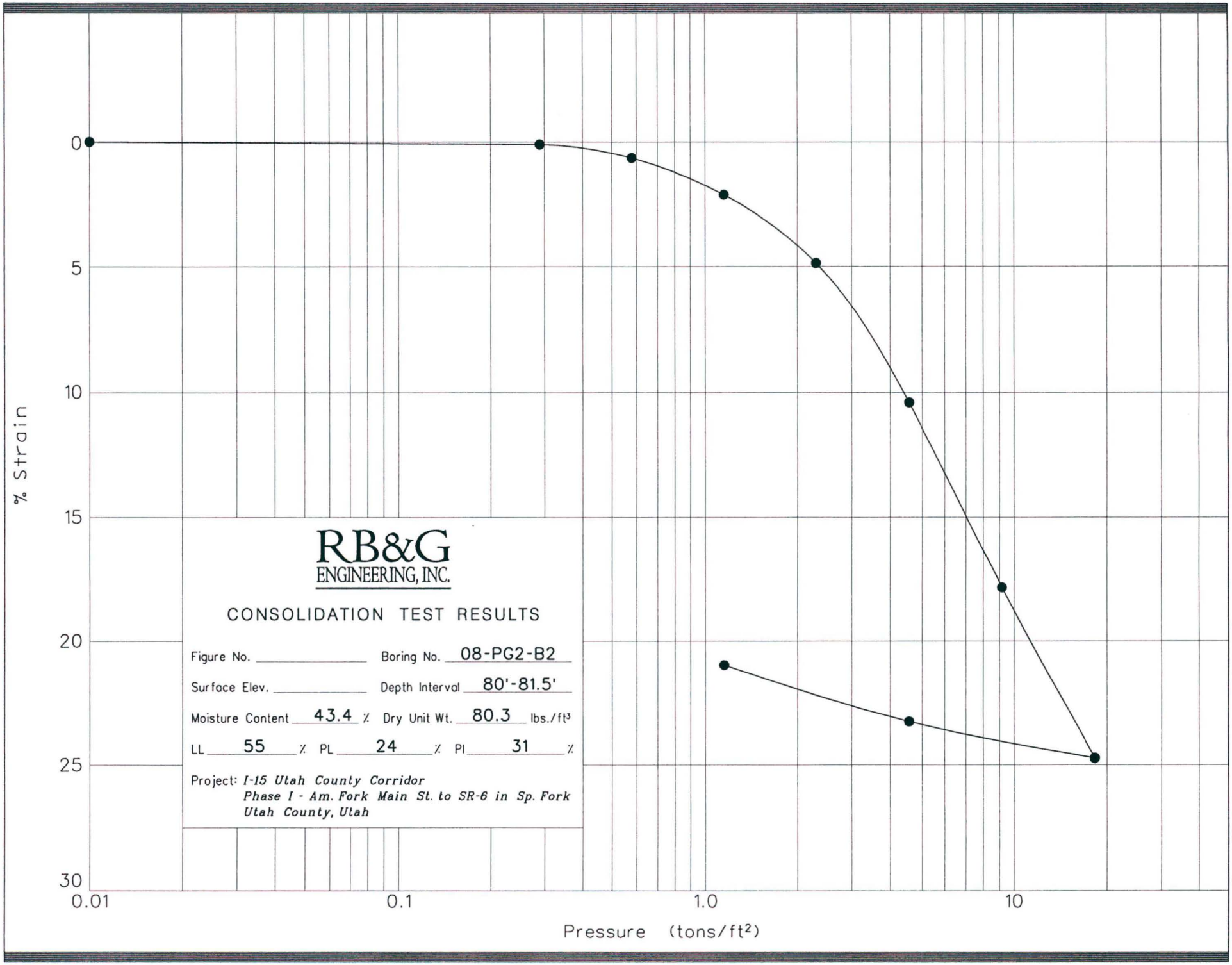
Hole no.: 08-PG2-B2
Depth: 60'-61.3'
Load: 2.30 to 4.60 tons

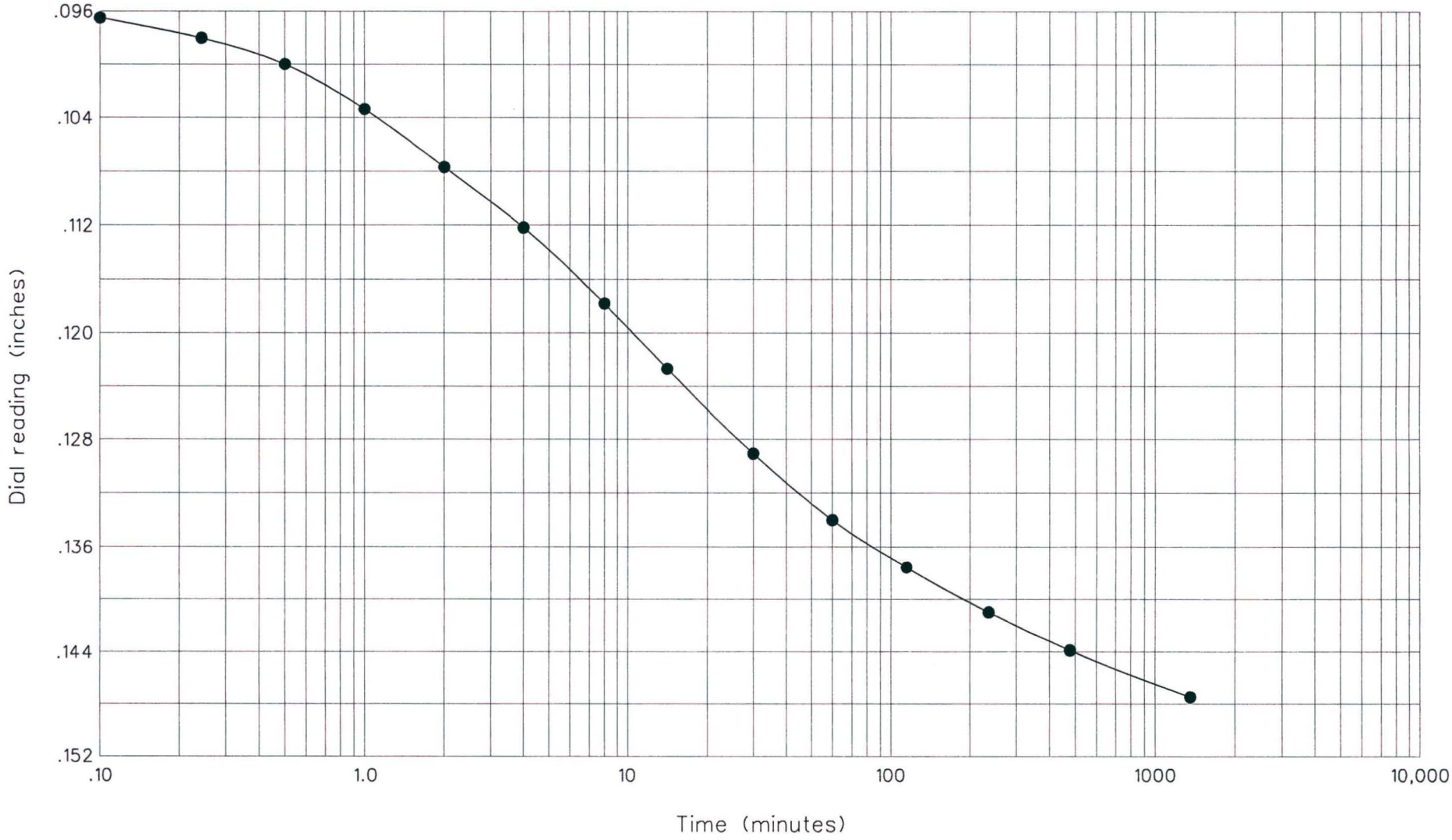
TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure


1.10
1.00
.90
.80
.70
.60
.50
Void Ratio (e)
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 80'-81.5'
Moisture Content 43.4 % Dry Unit Wt. 80.3 lbs./ft³
LL 55 % PL 24 % PI 31 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


0
5
10
15
20
25
30
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 80'-81.5'
Moisture Content 43.4 % Dry Unit Wt. 80.3 lbs./ft³
LL 55 % PL 24 % PI 31 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



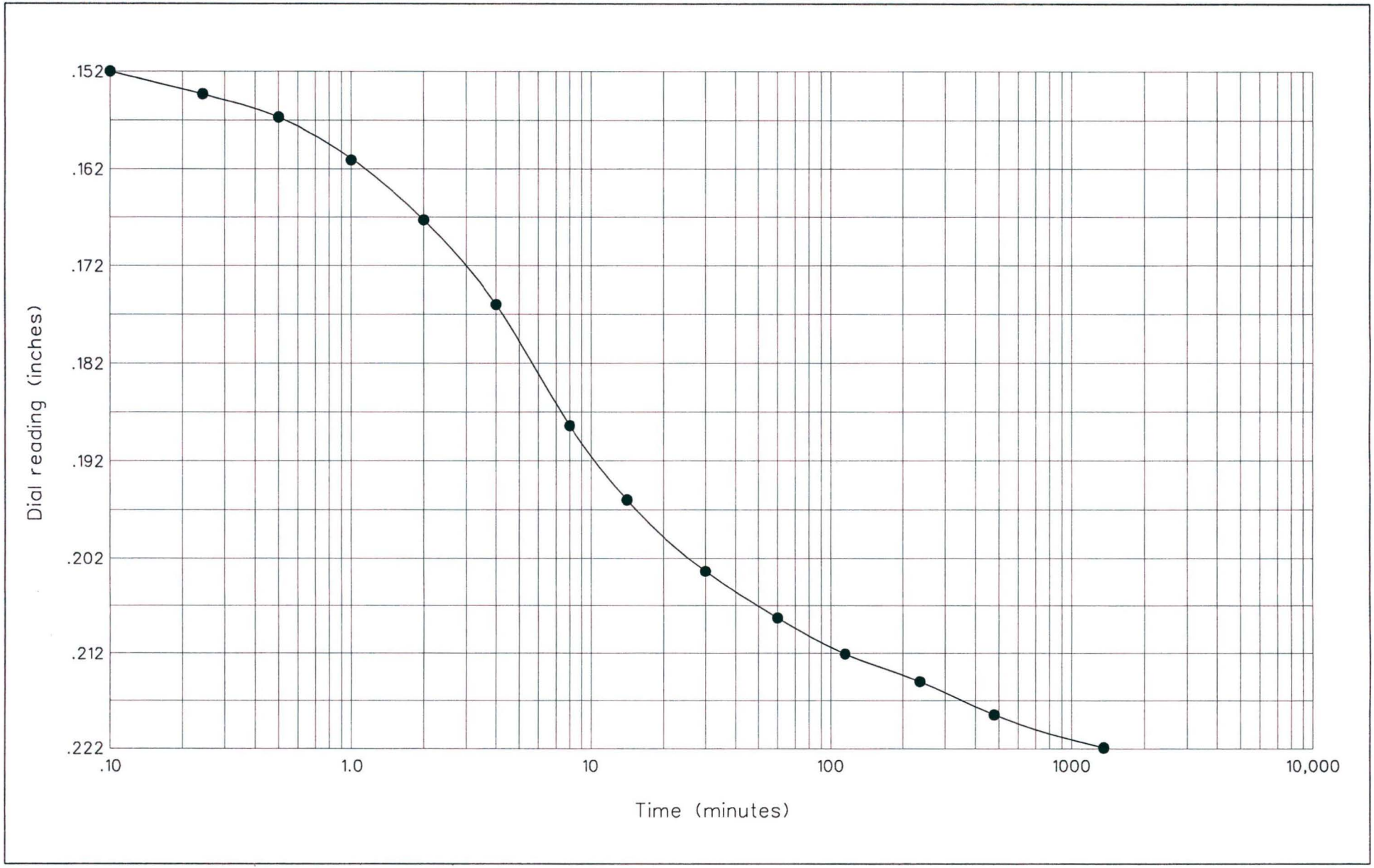
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 80'-81.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



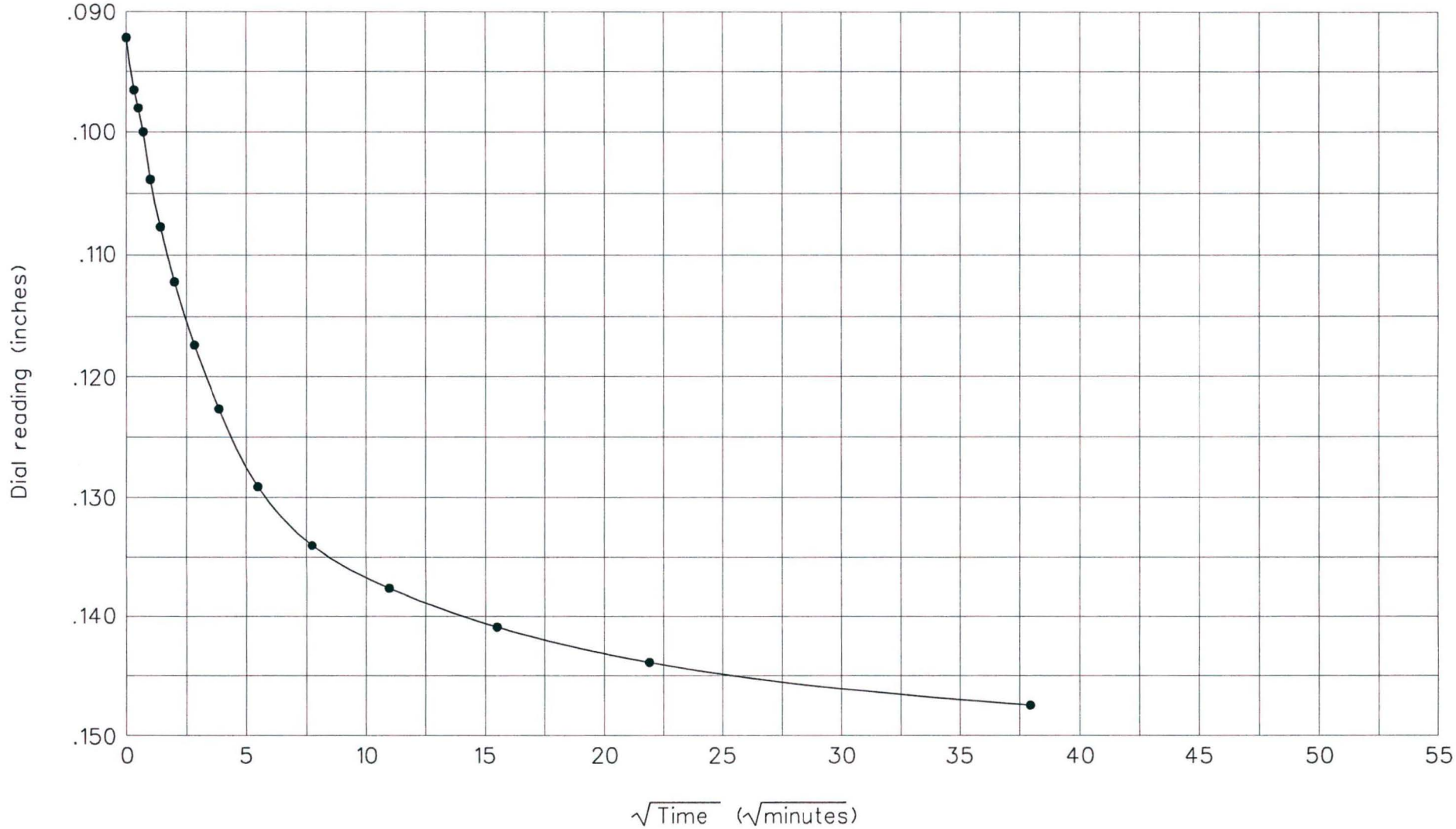
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 80'-81.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



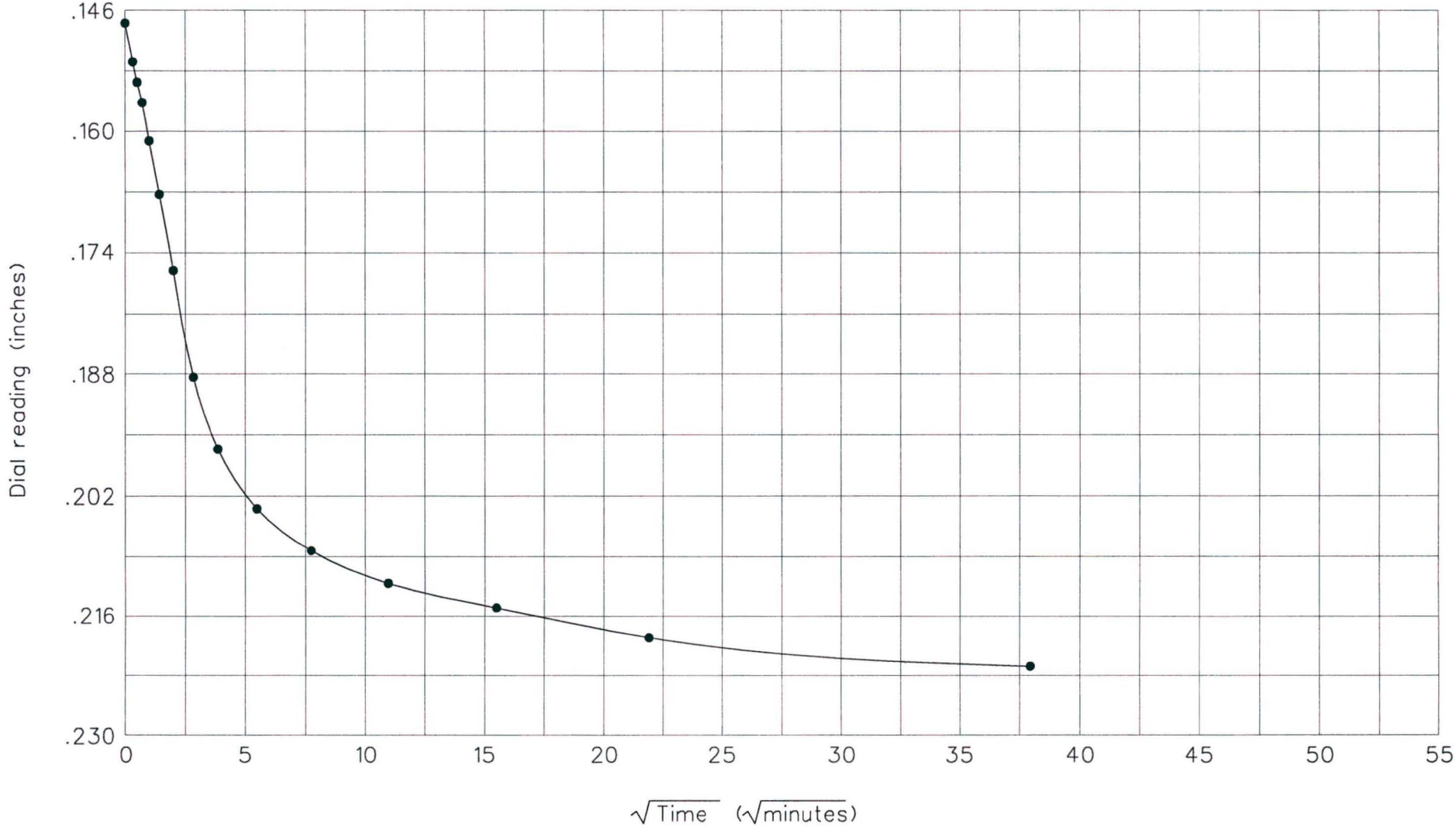
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 80'-81.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



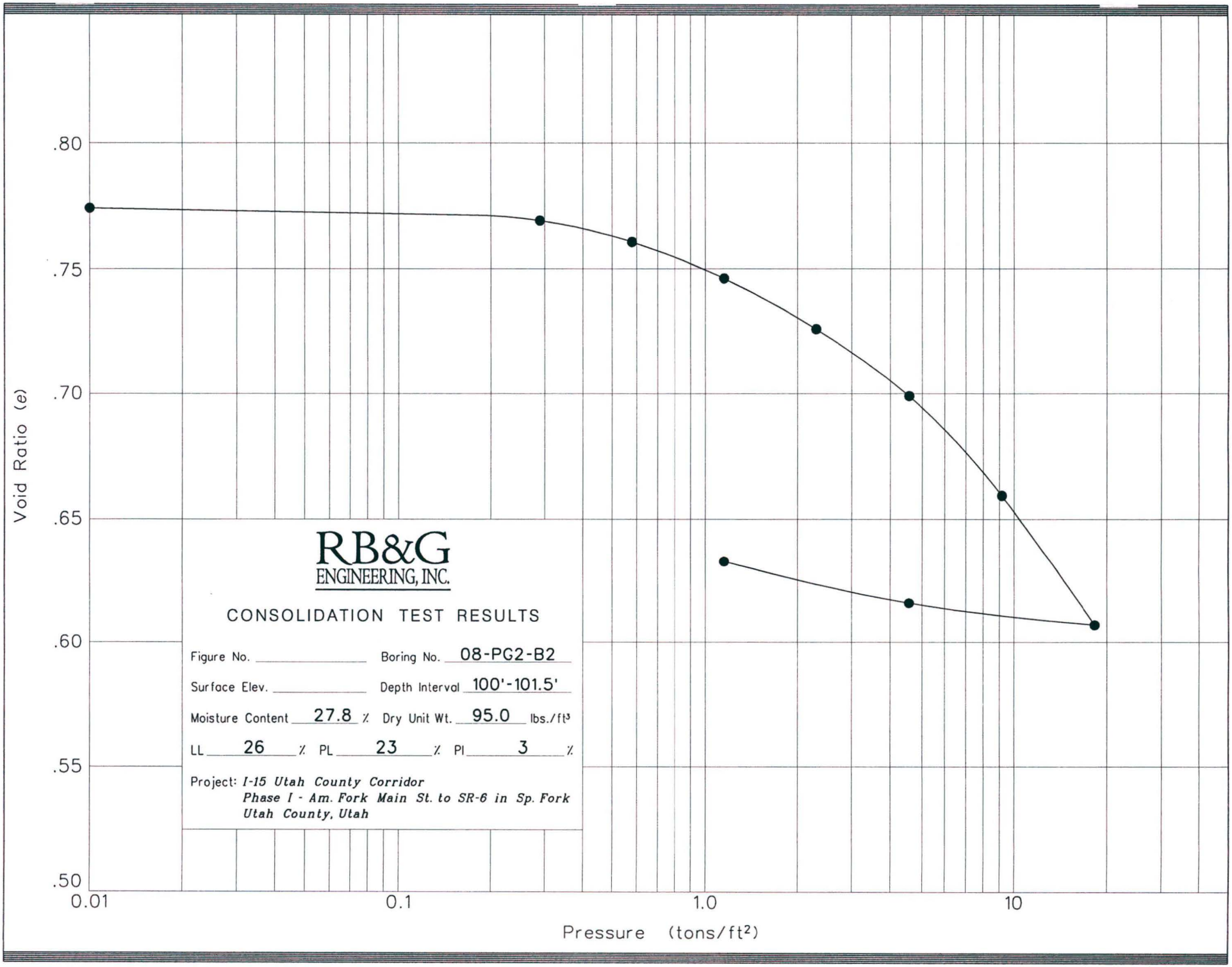
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 80'-81.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

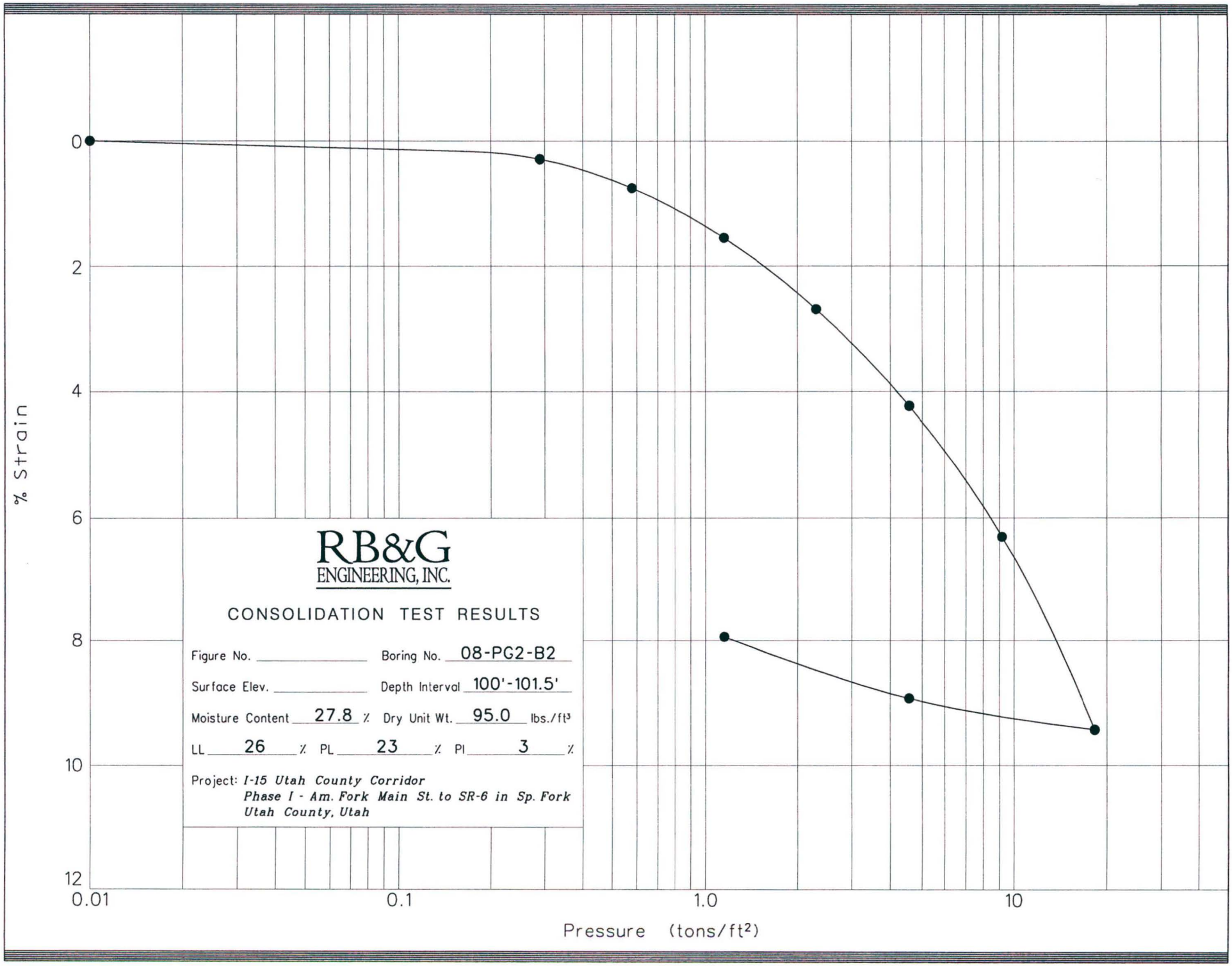
Figure No. _____ Boring No. 08-PG2-B2

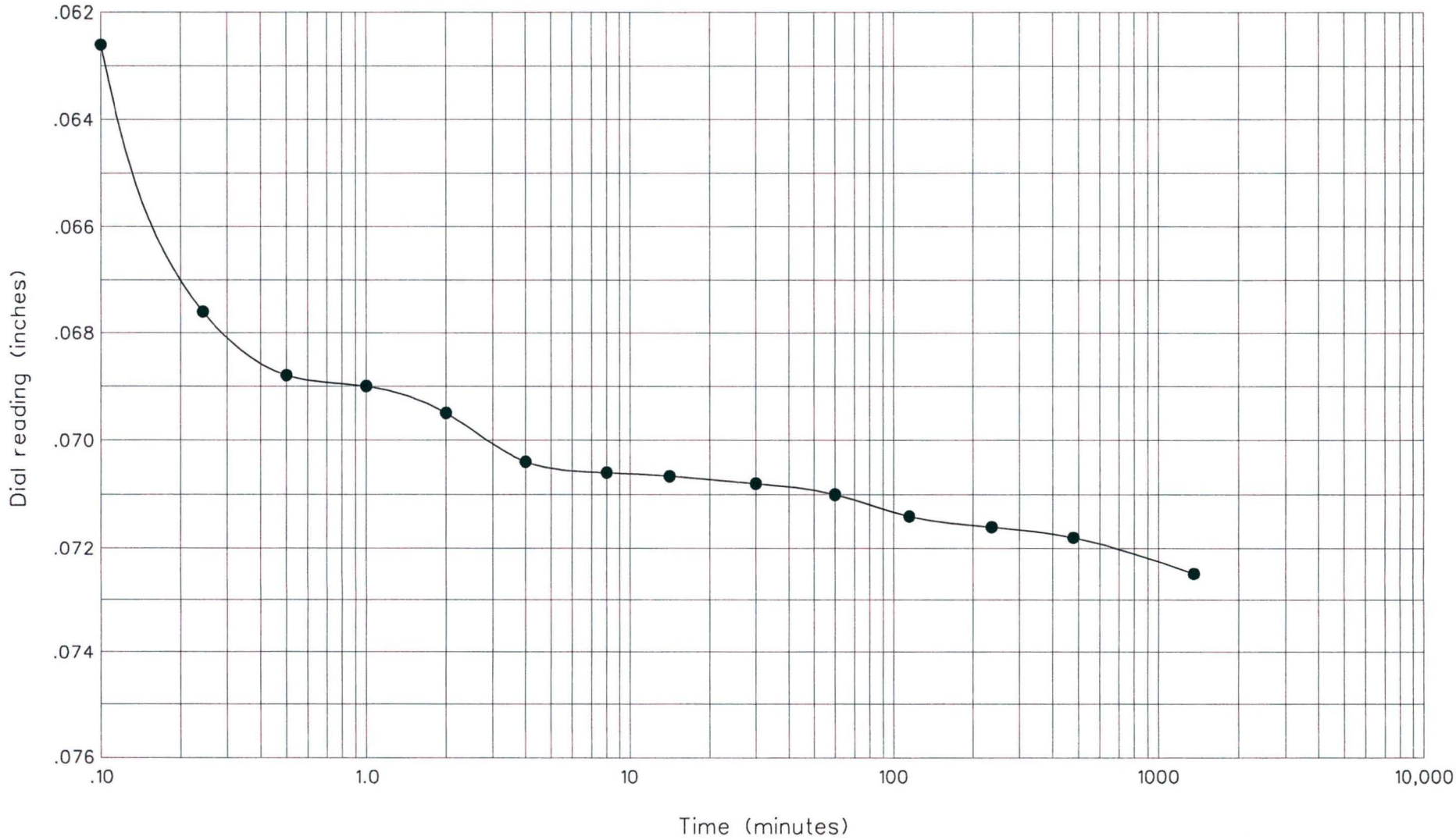
Surface Elev. _____ Depth Interval 100'-101.5'

Moisture Content 27.8 % Dry Unit Wt. 95.0 lbs./ft³

LL 26 % PL 23 % PI 3 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


0
2
4
6
8
10
12
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 100'-101.5'
Moisture Content 27.8 % Dry Unit Wt. 95.0 lbs./ft³
LL 26 % PL 23 % PI 3 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



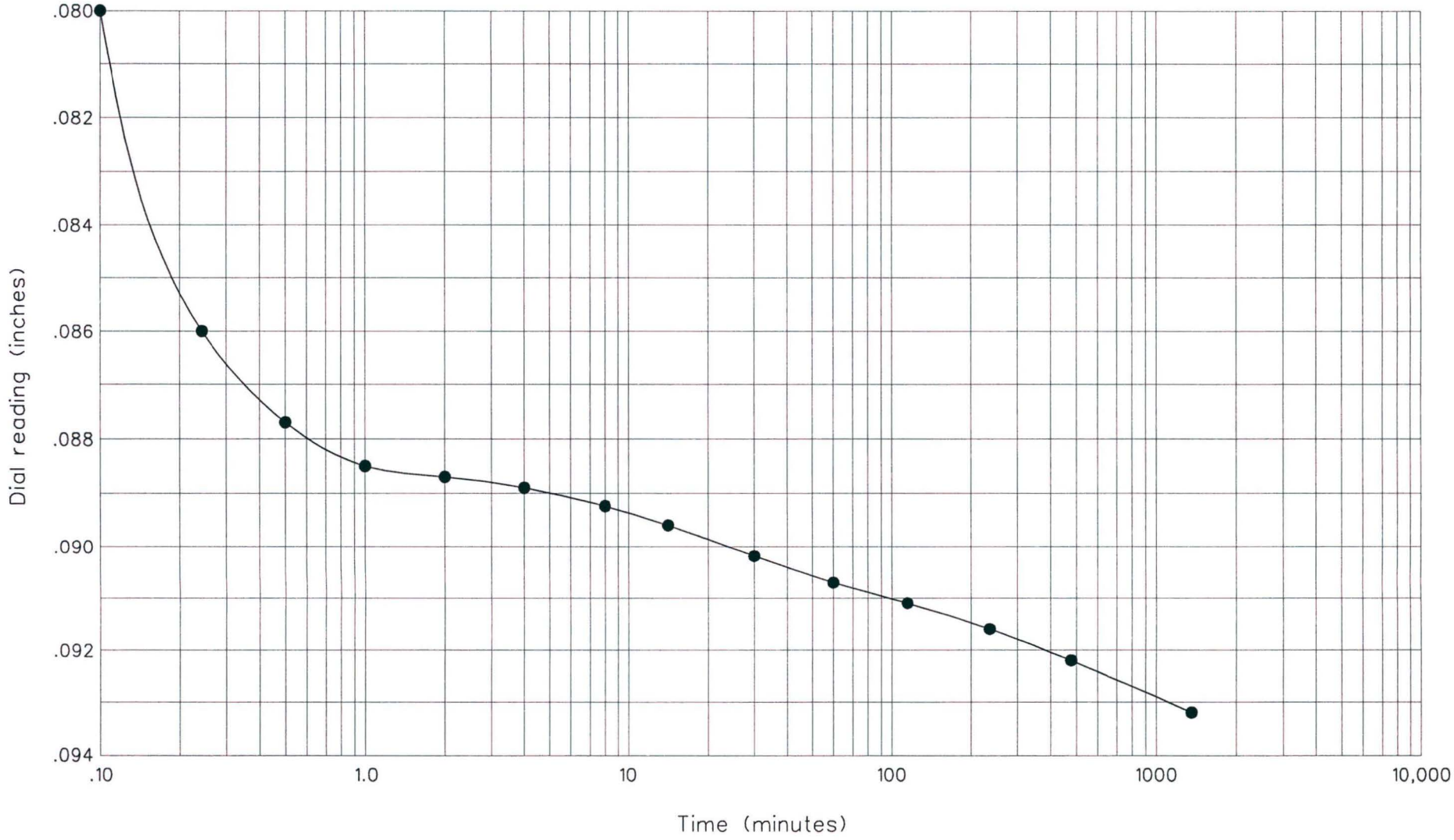
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 100'-101.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



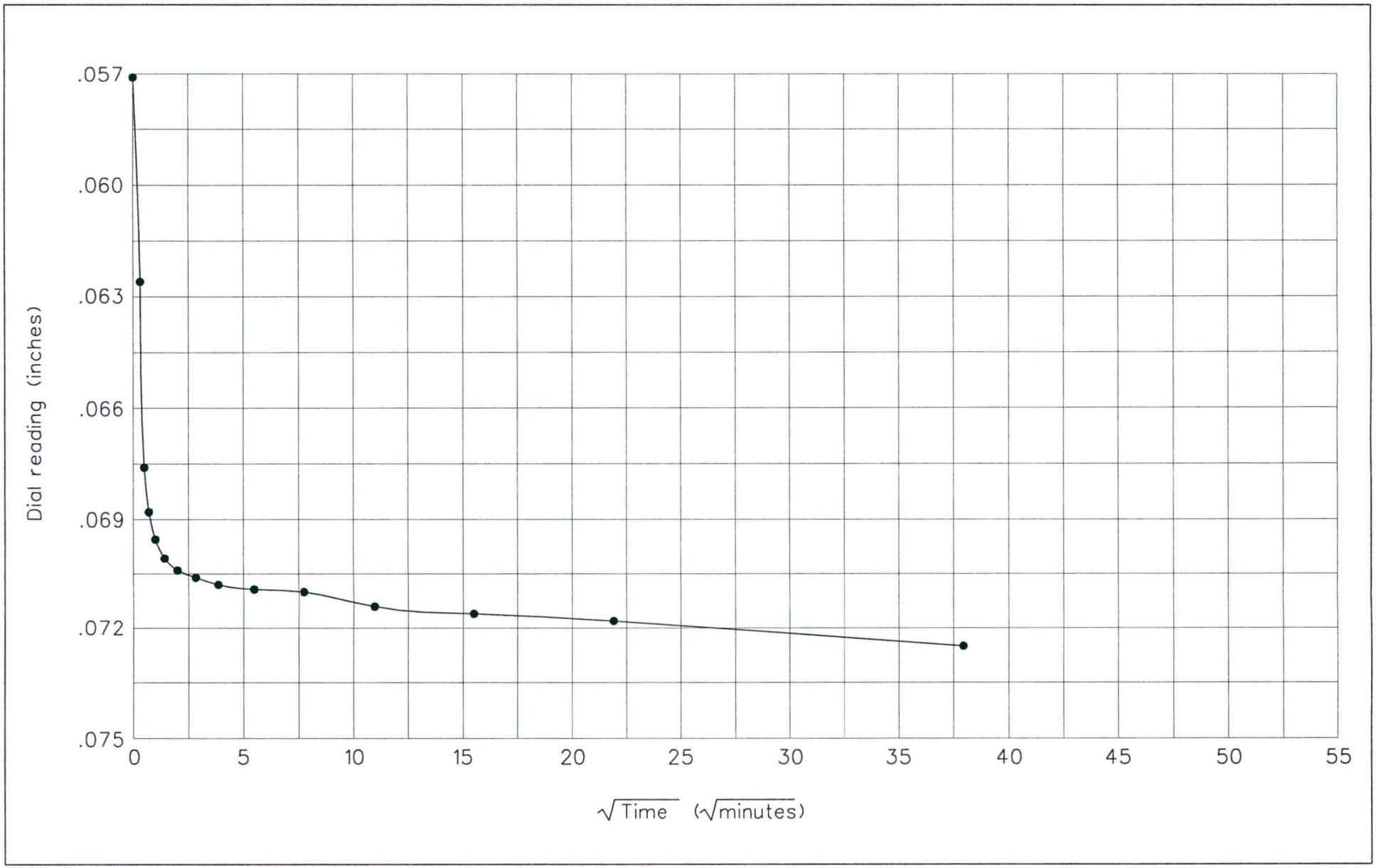
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 100'-101.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



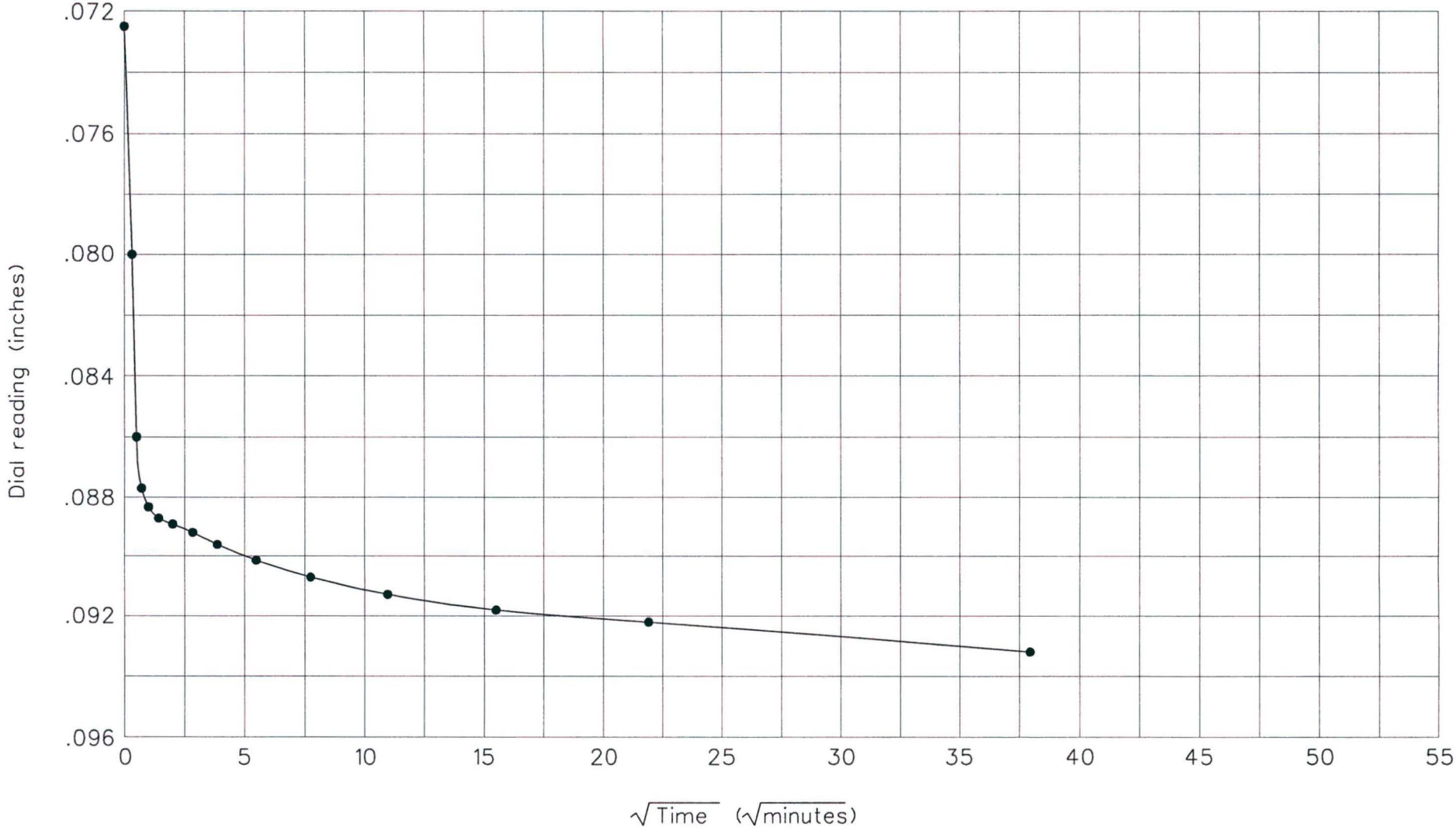
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 100'-101.5'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



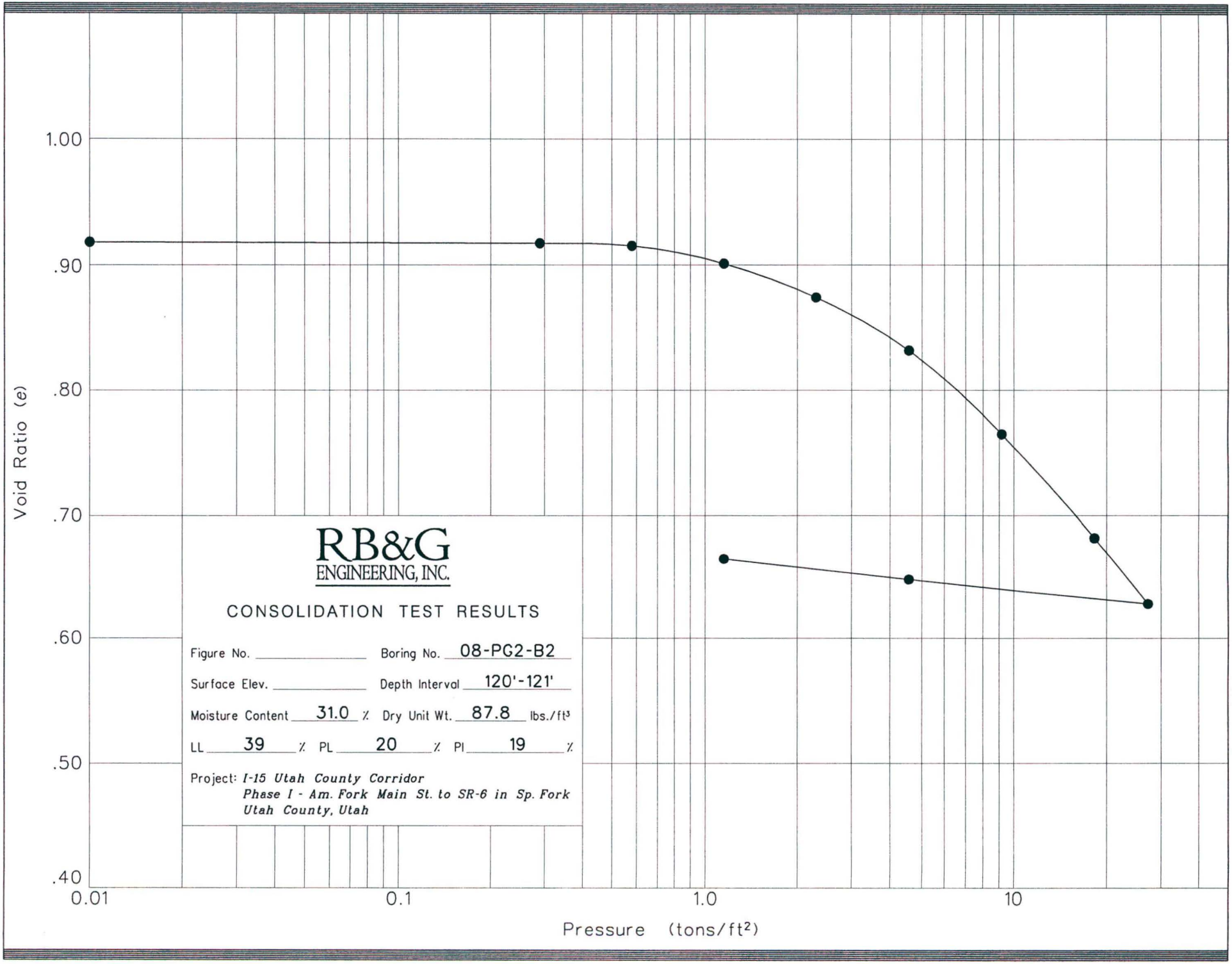
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 100'-101.5'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G
ENGINEERING, INC.

CONSOLIDATION TEST RESULTS

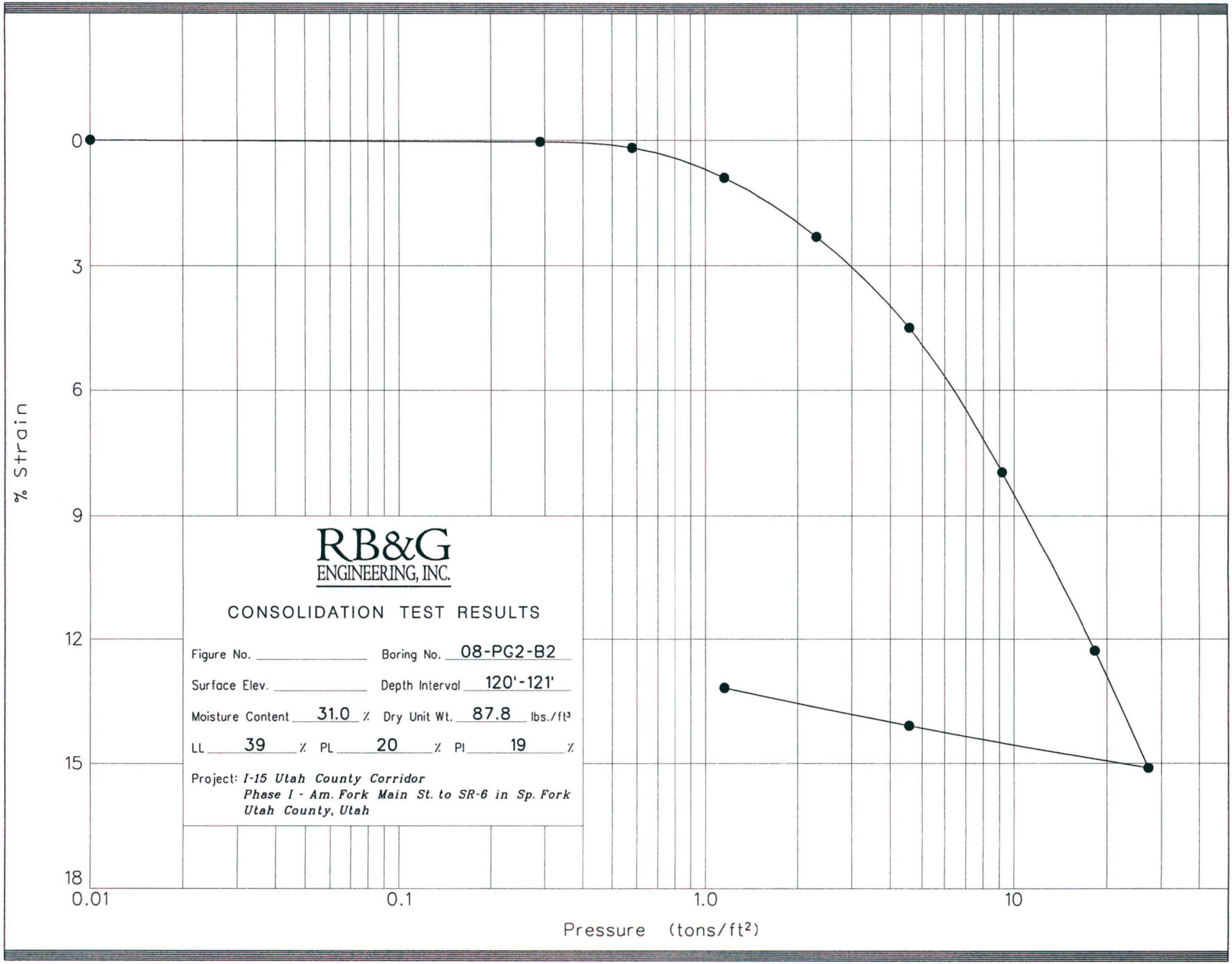
Figure No. _____ Boring No. 08-PG2-B2

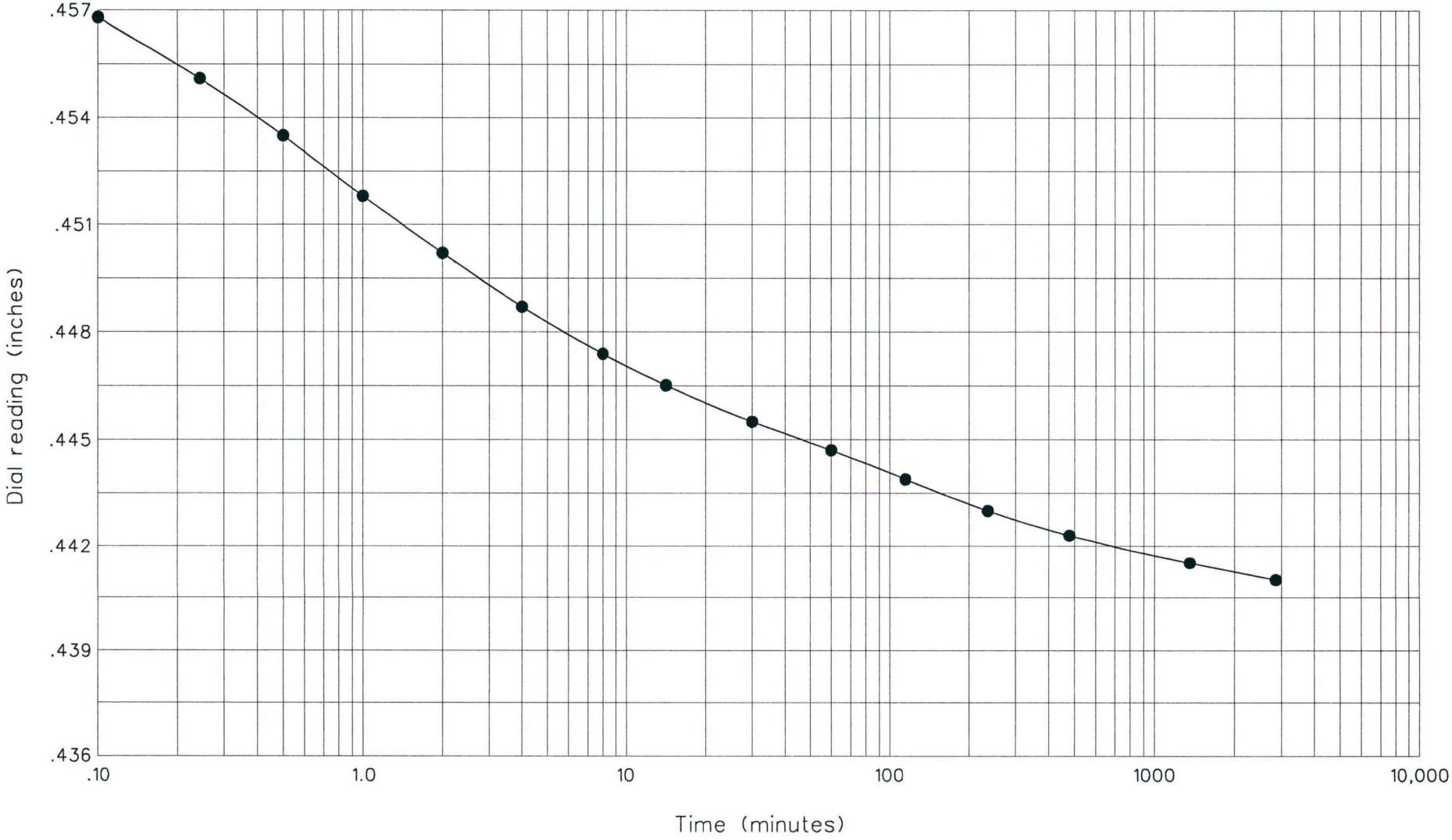
Surface Elev. _____ Depth Interval 120'-121'

Moisture Content 31.0 % Dry Unit Wt. 87.8 lbs./ft³

LL 39 % PL 20 % PI 19 %

Project: *I-15 Utah County Corridor*
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah


0
3
6
9
12
15
18
% Strain
0.01
0.1
1.0
10
Pressure (tons/ft²)
RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 08-PG2-B2
Surface Elev. _____ Depth Interval 120'-121'
Moisture Content 31.0 % Dry Unit Wt. 87.8 lbs./ft³
LL 39 % PL 20 % PI 19 %
Project: I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah



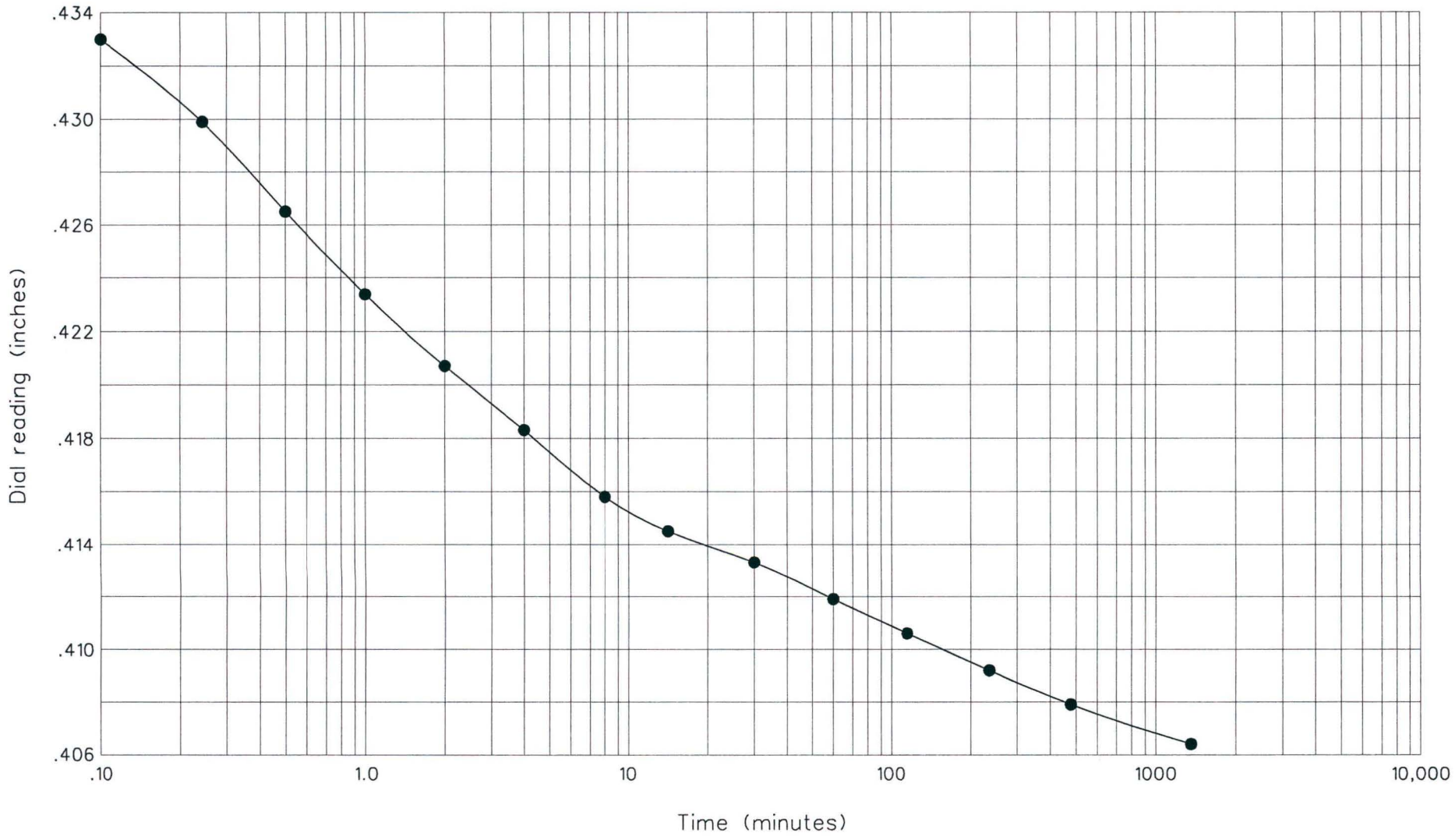
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 120'-121'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



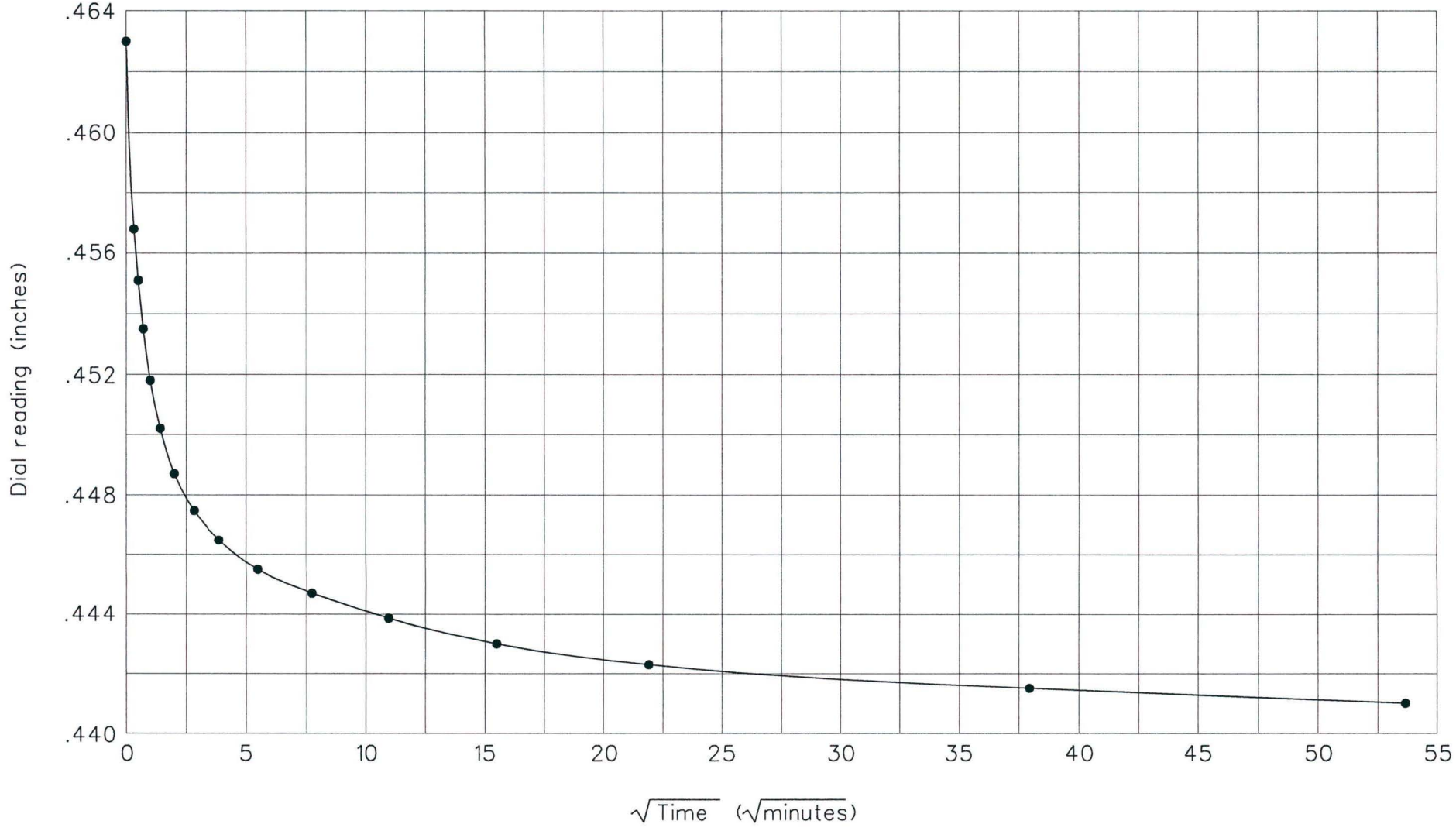
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 120'-121'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



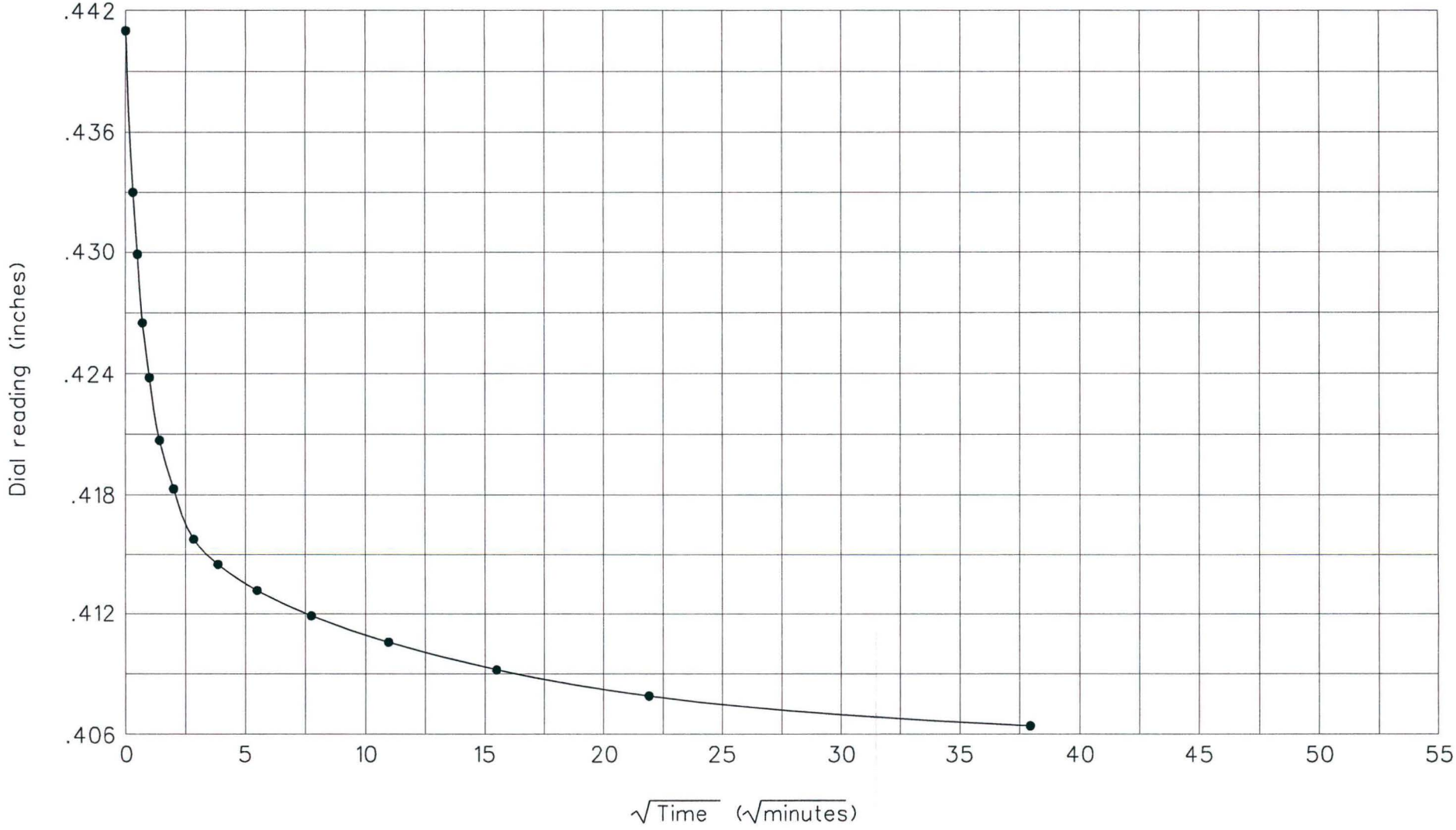
RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 120'-121'
Load: 2.30 to 4.60 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure



RB&G ENGINEERING, INC.

Hole no.: 08-PG2-B2
Depth: 120'-121'
Load: 4.60 to 9.20 tons

TIME CONSOLIDATION

I-15 Utah County Corridor
Phase I - Am. Fork Main St. to SR-6 in Sp. Fork
Utah County, Utah

Figure