OAK ENGINEERS

BORING LOG: B211

Ground Elevation:	See Plan	Total Depth:	33.0 Feet	Logged By:	PDD/DEG
GW encountered:	N.M. Feet	Boring Diameter:	4 Inches	Date Drilled:	4/24/07 to 4/24/07
GW @ completion:	N.M. Feet	Well Stickup:	0	Driller:	Northern Test Borings

DEPTH	DESCRIPTION	REMARKS	SAMPLE	SAMPLE NUMBER	BLOW COUNTS (per 6 inches)	PENETRATION/ RECOVERY (in.)	USCS SYMBOL	N	WELL
	Brown fine to coarse SAND, some fine to coarse gravel, trace brick, organic fibers	(damp)	☒	SS1	7,12 3,6	24/8	SW	15	
5	(firm) Gray fine to medium SAND and CLAY/SILT, some Wood, Coal	(damp)	☒	SS2	1,1 1,3	24/10	SM-CL/ML	2	
10		(damp)	☒	SS3	12,5 14,17	24/15	SM-CL/ML	19	
15	(very loose to firm) Mottled CLAY	(moist)	☒	SS4	14,16 18,21	24/4	CL	34	
20		(moist)	☒	SS5	3,6 7,9	24/24	CL	13	
25	becomes gray	(wet)	☒	SS6	2,1 2,2	24/24	CL	3	
		(wet)	☒	SS7	1,2 2,1	24/24	CL	4	
30		(wet)	☒	SS8	1,2 2,2	24/24	CL	4	
	(hard to soft) Tan fine SAND, little Silt/Clay	(saturated)	☒	SS9	7,10 12,15	24/24	SM	22	
	(firm) Boring Terminated @ 33.0' bgs.								
35									

NOTES:
1. Drilling Method: Automatic Hammer with 2-1/4" i.d. Hollow Stem Auger (HSA)
2. Soil Sampling: 2-inch Split Spoon Sampler driven with 140 lb. hammer falling 30 inches (Auto-Hammer).
3. N.M.= Not Measured, N.O.= Not Observed, N.T.= Not Tested,

CLIENT:
Northeast Civil Solutions

SITE:
Village at Little Falls
Depot Street
South Windham, Maine

VIL_RESP02546

Project No.: 064006 Page: 1

OAK

ENGINEERS

Civil Engineers & Land Surveyors

Soil & Rock Classification Guidelines

Grain Size		
Material	*Fraction*	*Sieve Size*
Boulders		12" +
Cobbles		3" - 12"
Gravel	coarse	3/4" - 3"
	fine	No. 4 to 3/4"
Sand	coarse	No. 10 to No. 4
	medium	No. 40 to No. 10
	fine	No. 200 to No. 40
Fines (Silt & Clay)		Passing No. 200

Identification of soil type is made on basis of an estimate of particle sizes, and in the case of fine grained soils also on basis of plasticity.

Classification - Rock Terms			
Term		Meaning	
Hardness	Soft	Scratched by fingernail	
	Medium Hard	Scratched easily by penknife	
	Hard	Scratched with difficulty by penknife	
	Very Hard	Cannot be scratched by penknife	
Weathering	Very Weathered Weathered Sound	Judged from relative amounts of disintegration, iron staining, core recovery, clay seams, etc.	
Bedding	Laminated	(< 1")	Natural Break in Rock Layers
	Thin Bedded	(1" - 4")	
	Bedded	(4" - 12")	
	Thick Bedded	(12" - 36")	
	Massive	(> 36")	

Coarse and Fine Grained Soils	
Descriptive Adjective	**Percentage Requirement*
Trace	1-10%
Little	10-20%
Some	20-35%
And	35-50%

When sampling gravelly soils with a standard split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter.
*Percentage measured by weight.

Rock Weathering Classification		
Grade	*Symbol*	*Diagnostic Features*
Fresh	F	No visible sign of decomposition or discoloration. Rings under hammer impact.
Slightly Weathered	WS	Slight discoloration inwards from open fracture, otherwise similar to F.
Moderately Weathered	WM	Discoloration throughout. Weaker mineral such as feldspar decomposed. Strength somewhat less than fresh rock but cores can not be broken by hand or scraped by knife.
Highly Weathered	WH	Most minerals somewhat decomposed. Specimens can be broken by hand with effort or shaved with knife. Core stones present in rock mass. Texture becoming distinct but fabric.
Completely Weathered	WC	Minerals decomposed to soil but fabric and structure preserved (Saprolite). Specimens easily crumbled or penetrated.
Residual Soil	RS	Advanced state of decomposition resulting in Plastic soils. Rock fabric and structure completely destroyed. Large volume change.

Brown's Wharf, Newburyport, MA 01950
T: 978.465.9877 • F: 978.465.2986
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Unified System Classification of Soils (ASTM D-2487)

Major Divisions			Group Symbols	Typical Names
Coarse-Grained Soils More than 50% retained on No. 200 Sieve	Gravels 50% or more of coarse fraction retained on No.4 sieve.	Clean Gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines.
		Gravels w/ Fines	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	Sands more than 50% coarse fraction passes No. 4 sieve.	Clean Sands	SW	Well-graded sands and gravelly sands little or no fines.
			SP	Poorly graded sands and gravelly sands little or no fines.
		Sands w/ Fines	SM	Silty gravels, gravel-sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
Fine-Grained Soils 50% or more passes No. 200 Sieve	Silts and Clays Liquid Limit 50% or less.		ML	Inorganic silts, very fine sands, rock flour, silty or clayey sands.
			CL	Inorganic clays of low plasticity, gravelly clays, sandy clays, silty clays.
			OL	Organic silts and organic silty clays of low plasticity.
	Silts and Clays Liquid Limit greater than 50%.		MH	Inroganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity.
Highly Organic Soils			Pt	Peat, much and other highly organic soils

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ATTACHMENT C

Laboratory Analysis

Supplemental Geotechnical Investigation
Village at Little Falls, LLC
7 to 13 Depot Street
South Windham, Maine

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Oak Engineers		
Project Name:	So. Windham		
Project Location:	---		
GTX #:	7434	Tested By:	md
Test Date:	05/02/07	Checked By:	jdt

TUBE LOG using Density of Soil In Place by the Drive Cylinder Method by ASTM D 2937 and Moisture Content by ASTM D 2216

Boring ID	Sample ID	Depth, ft	Section	Visual Description	Bulk Density, lb/ft^3	Moisture Content, %	Dry Density, lb/ft^3
* ~~B-105~~	---	17-19	Top	Wet, gray clayey silt, very soft	109	32	82.8
* ~~B-105~~	---	17-19	Middle	Wet, gray clayey silt, very soft	121	35	89.7
* ~~B-105~~	---	17-19	Bottom	Wet, gray clayey silt, very soft	111	38	79.9

Notes: Density determined on undisturbed tube sample provided to GeoTesting Express in a Shelby tube
Moisture content determined by ASTM D 2216 at 110° C

* B208
DEG

VIL_RESP02550

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Oak Engineers
Project Name:	So. Windham
Project Location:	---
GTX #:	7434
Date:	05/11/07
Tested by:	md
Checked by:	jdt

Laboratory Vane Shear by ASTM D 4648

Boring ID	Sample ID	Depth, ft	Visual Description	Vane Shear Strength, kN/m^2			Vane Shear Strength, tsf		
				Top	Middle	Bottom	Top	Middle	Bottom
~~B-105~~ ★	---	17-19	Wet, gray clayey silt, very soft	---	1.7	2.5	---	0.02	0.03
				---	1.7	2.0	---	0.02	0.02
				---	1.8	1.5	---	0.02	0.02
			Average	---	1.7	2.0	---	0.02	0.02

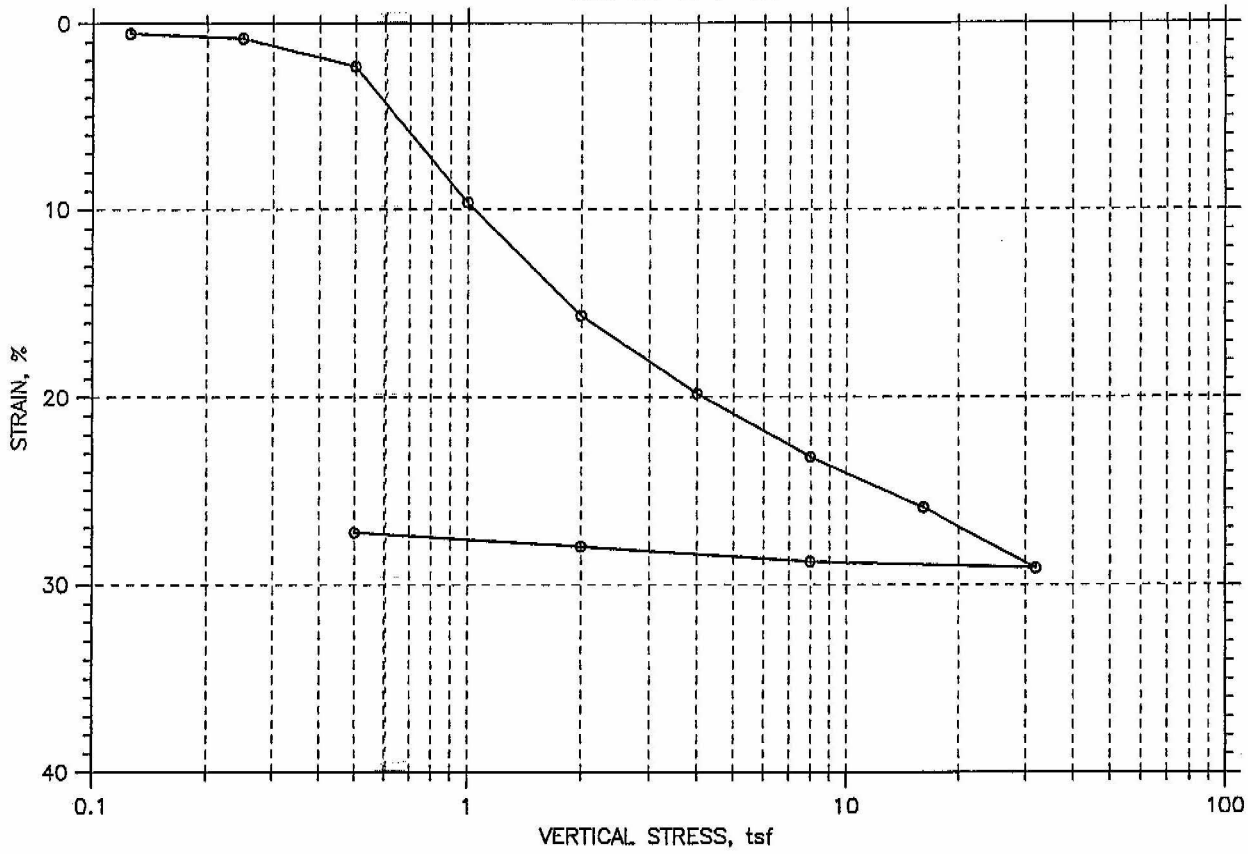
Notes: As requested, two tests were performed on this tube sample. The middle and bottom sections of the tube were tested.

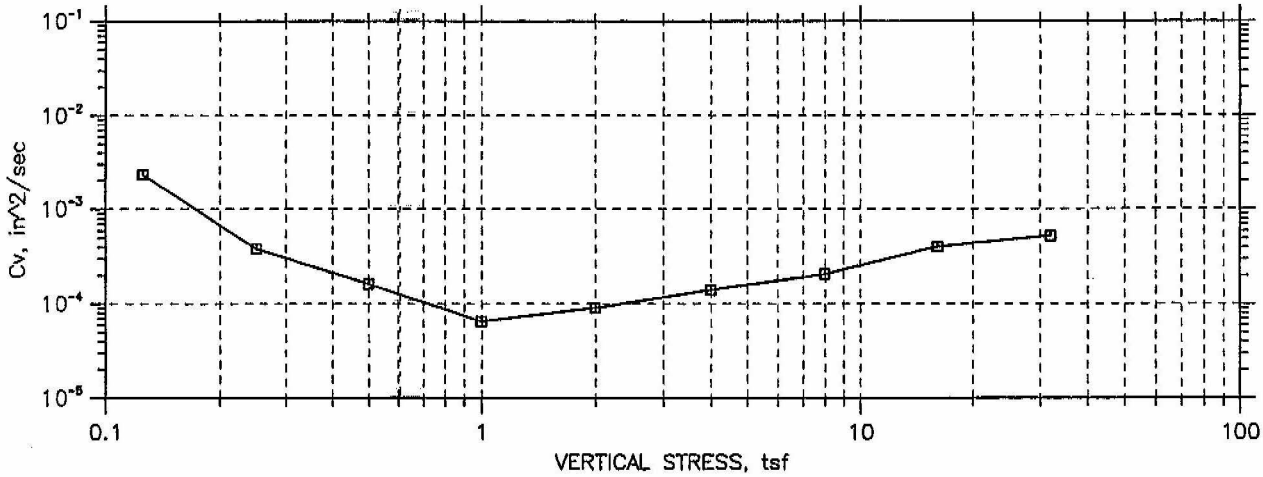
★ B208
DEG

VIL_RESP02551

CONSOLIDATION TEST DATA

SUMMARY REPORT





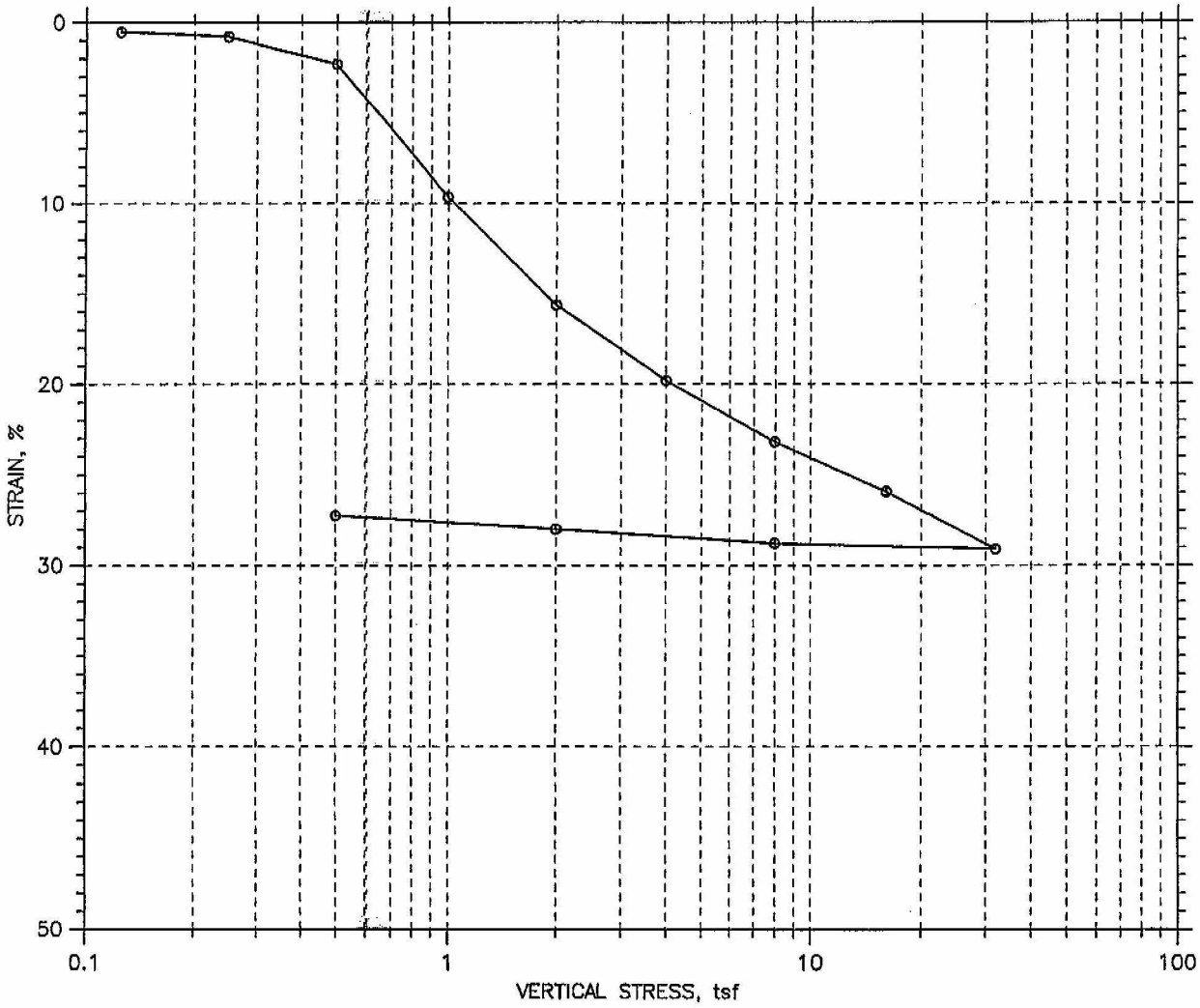
GeoTesting express a subsidiary of Geocomp Corporation	Project: So. Windham	Location: ---	Project No.: GTX-7434
	Boring No.: ~~B-105~~ ★	Tested By: md	Checked By: jdt
	Sample No.: ---	Test Date: 05/02/07	Depth: 17-19 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Wet, gray clayey silt, very soft		
	Remarks: System C		

Fri, 11-MAY-2007 12:22:16 ★ B208 DEG

VIL_RESP02552

CONSOLIDATION TEST DATA

SUMMARY REPORT



					Before Test	After Test
Overburden Pressure: ---				Water Content, %	45.39	23.27
Preconsolidation Pressure: ---				Dry Unit Weight, pcf	75.21	103.4
Compression Index: ---				Saturation, %	98.93	100.00
Diameter: 2.5 in		Height: 1 in		Void Ratio	1.24	0.63
LL: ---	PL: ---	PI: ---	GS: 2.69			

GeoTesting express a subsidiary of Geocomp Corporation	Project: So. Windham	Location: ---	Project No.: GTX-7434
	Boring No.: ~~B-105~~ ★	Tested By: md	Checked By: jdt
	Sample No.: ---	Test Date: 05/02/07	Depth: 17-19 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Wet, gray clayey silt, very soft		
	Remarks: System C		

Fri, 11-MAY-2007 12:22:16 ★ B208 DEG

VIL_RESP02553

CONSOLIDATION TEST DATA

Project: So. Windham
Boring No.: ~~B-105~~ ★
Sample No.: ---
Test No.: C-1

Location: ---
Tested By: md
Test Date: 05/02/07
Sample Type: Tube

Project No.: GTX-7434
Checked By: jdt
Depth: 17-19 ft
Elevation: ---

Soil Description: Wet, gray clayey silt, very soft
Remarks: System C

Estimated Specific Gravity: 2.69
Initial Void Ratio: 1.24
Final Void Ratio: 0.63

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Initial Height: 1.00 in
Specimen Diameter: 2.50 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	2163	RING		
Wt. Container + Wet Soil, gm	392.6	348.46	327.02	126.73
Wt. Container + Dry Soil, gm	275.45	304.47	304.47	104.33
Wt. Container, gm	8.25	207.57	207.57	8.05
Wt. Dry Soil, gm	267.2	96.905	96.905	96.28
Water Content, %	43.84	45.39	23.27	23.27
Void Ratio	---	1.24	0.63	---
Degree of Saturation, %	---	98.93	100.00	---
Dry Unit Weight, pcf	---	75.206	103.37	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

★ B208 DGE

VIL_RESP02554

CONSOLIDATION TEST DATA

Project: So. Windham
Boring No.: ~~B-105~~ ★
Sample No.: ---
Test No.: C-1

Location: ---
Tested By: md
Test Date: 05/02/07
Sample Type: Tube

Project No.: GTX-7434
Checked By: jdt
Depth: 17-19 ft
Elevation: ---

Soil Description: Wet, gray clayey silt, very soft
Remarks: System C

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. in^2/sec	Coefficient of Consolidation Log in^2/sec	Coefficient of Consolidation Ave. in^2/sec
1	0.125	0.005253	1.224	0.53	0.4	0.0	2.32e-003	0.00e+000	2.32e-003
2	0.25	0.00791	1.218	0.79	2.1	0.0	3.85e-004	0.00e+000	3.85e-004
3	0.5	0.02304	1.184	2.30	5.1	4.6	1.55e-004	1.73e-004	1.64e-004
4	1	0.09617	1.021	9.62	10.5	11.8	6.91e-005	6.18e-005	6.52e-005
5	2	0.156	0.887	15.60	7.0	6.9	8.99e-005	9.11e-005	9.05e-005
6	4	0.1978	0.794	19.78	3.7	4.2	1.50e-004	1.34e-004	1.41e-004
7	8	0.232	0.717	23.20	2.1	2.8	2.42e-004	1.81e-004	2.07e-004
8	16	0.2593	0.656	25.93	1.0	1.3	4.78e-004	3.51e-004	4.05e-004
9	32	0.2911	0.585	29.11	0.7	0.9	6.13e-004	4.64e-004	5.28e-004
10	8	0.2878	0.592	28.78	0.0	0.0	4.81e-002	0.00e+000	4.81e-002
11	2	0.2799	0.610	27.99	0.8	0.0	5.59e-004	0.00e+000	5.59e-004
12	0.5	0.2725	0.627	27.25	2.8	3.3	1.53e-004	1.29e-004	1.40e-004

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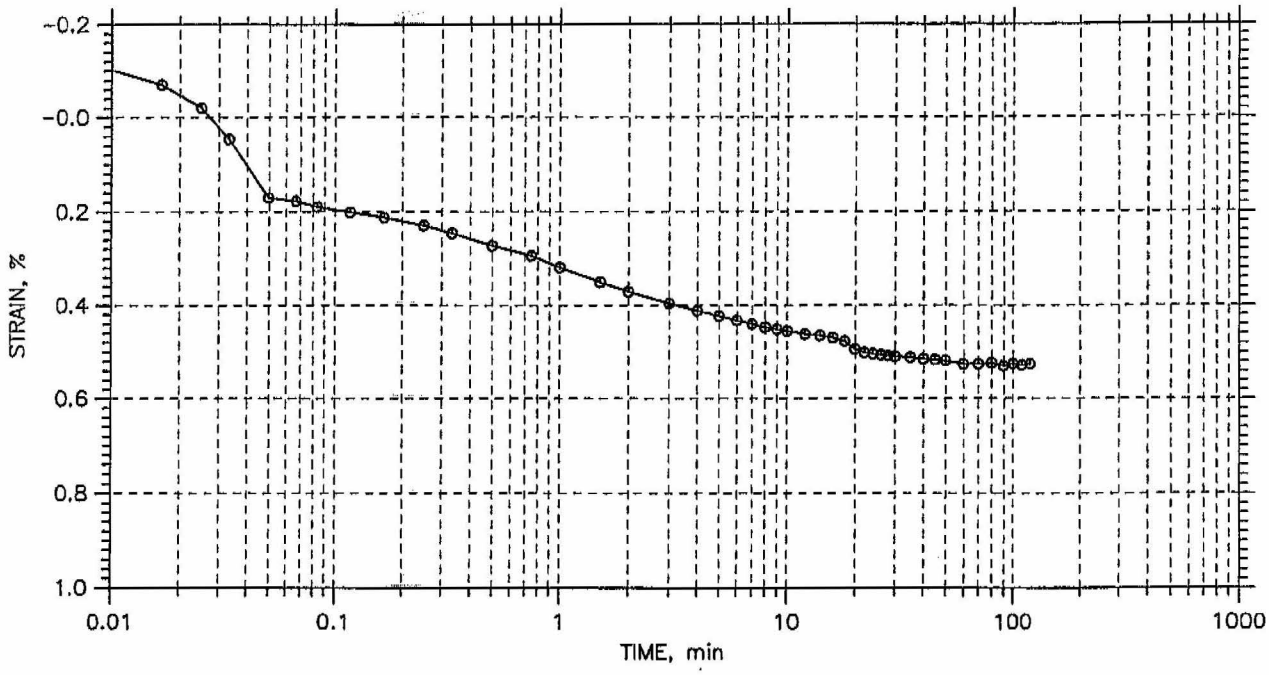
VIL_RESP02555

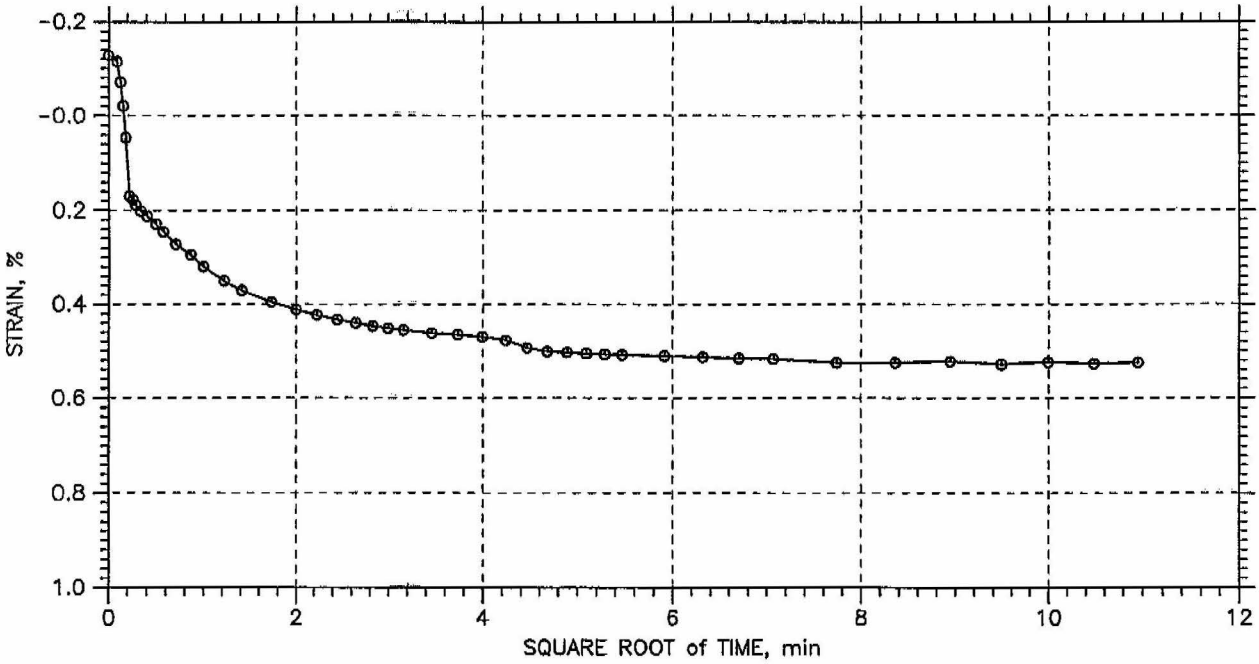
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 1 of 12

Stress: 0.125 tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: So. Windham	Location: ---	Project No.: GTX-7434
	Boring No.: ~~B-105~~ ★	Tested By: md	Checked By: jdt
	Sample No.: ---	Test Date: 05/02/07	Depth: 17-19 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Wet, gray clayey silt, very soft		
	Remarks: System C		

Fri, 11-MAY-2007 12:22:16 ★ B208 DEG

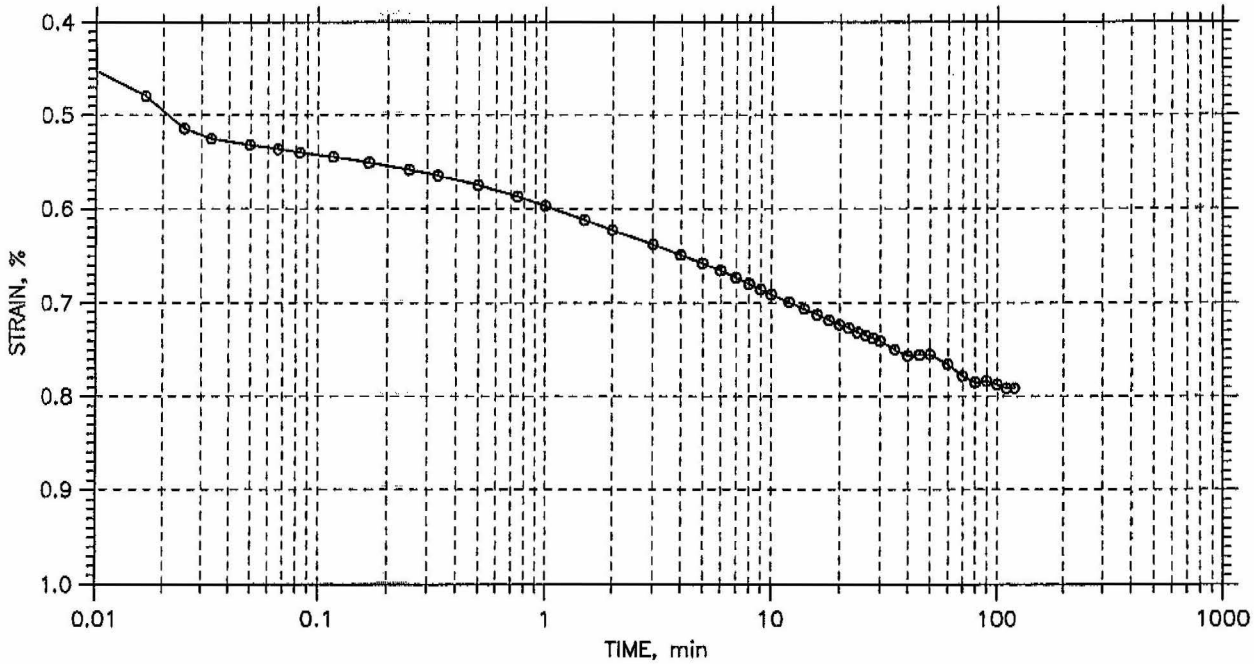
VIL_RESP02556

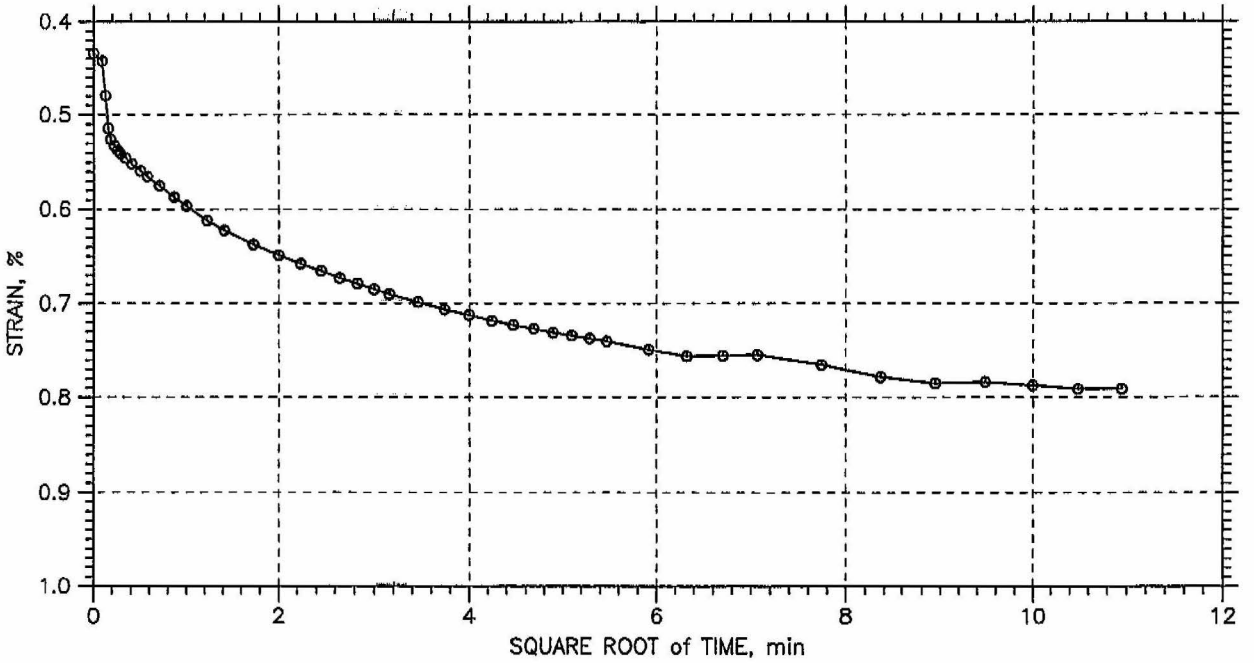
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 2 of 12

Stress: 0.25 tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: So. Windham	Location: ---	Project No.: GTX-7434
	Boring No.: ~~B-105~~ ★	Tested By: md	Checked By: jdt
	Sample No.: ---	Test Date: 05/02/07	Depth: 17-19 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Wet, gray clayey silt, very soft		
	Remarks: System C		

Fri, 11-MAY-2007 12:22:16 ★ B208 DEG

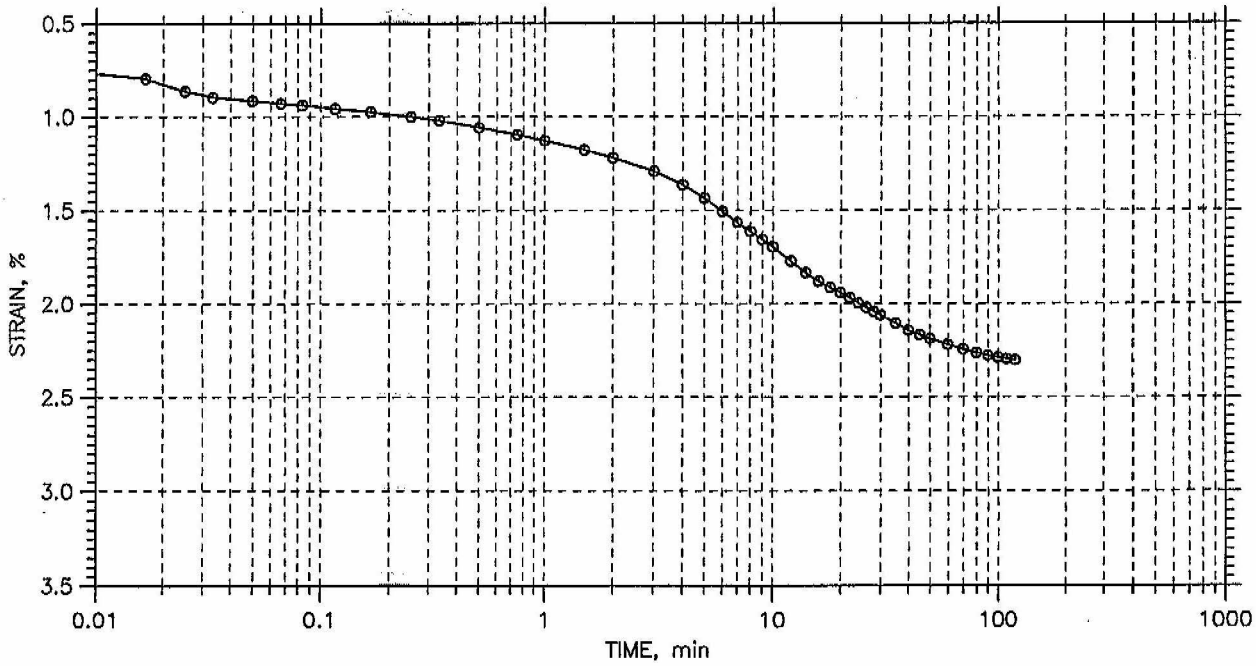
VIL_RESP02557

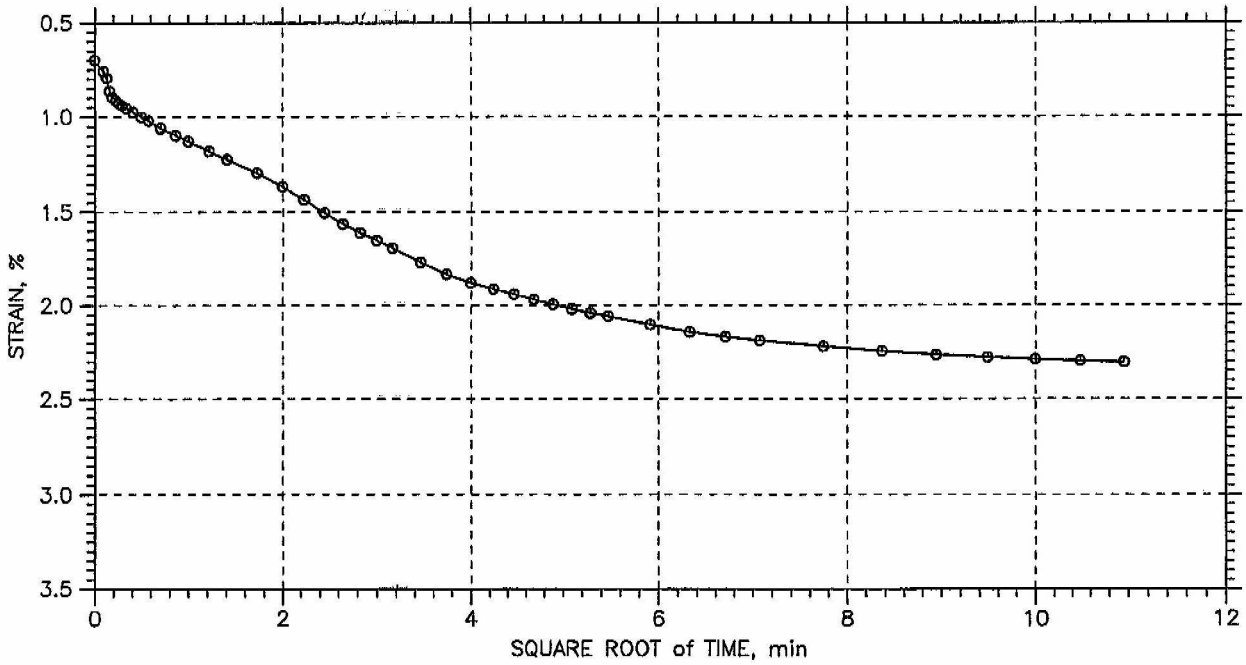
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 3 of 12

Stress: 0.5 tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: So. Windham	Location: ---	Project No.: GTX-7434
	Boring No.: ~~B-105~~ ★	Tested By: md	Checked By: jdt
	Sample No.: ---	Test Date: 05/02/07	Depth: 17-19 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Wet, gray clayey silt, very soft		
	Remarks: System C		

Fri, 11-MAY-2007 12:22:16 ★ B208 DEG

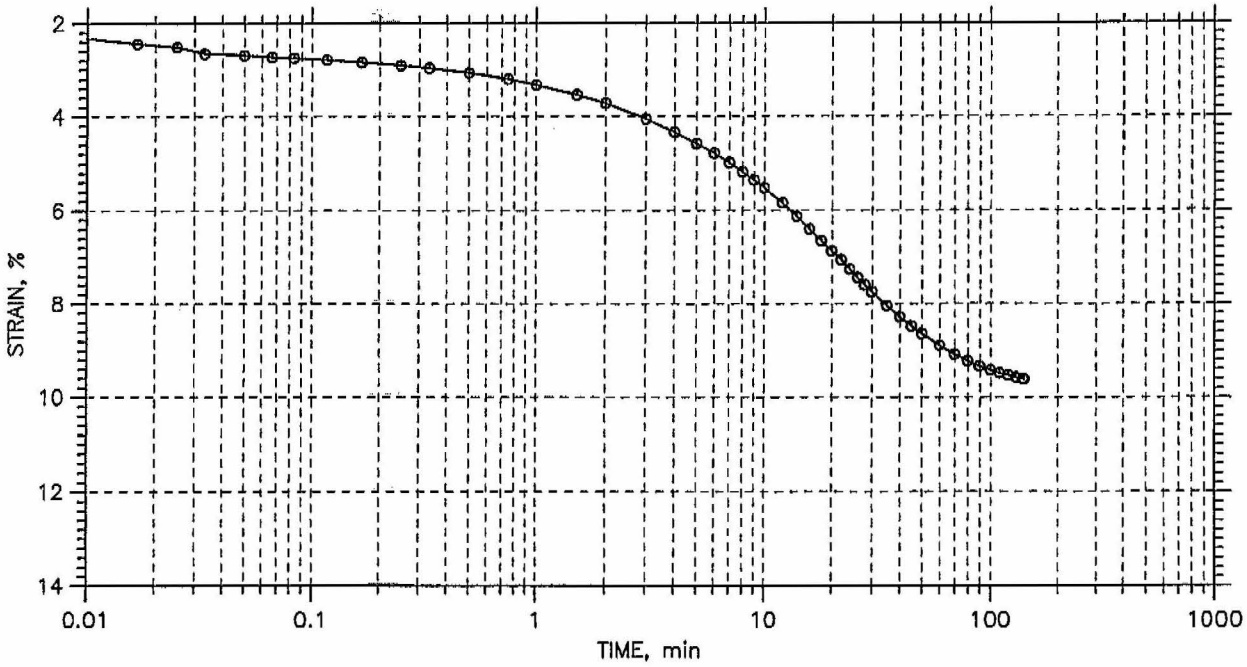
VIL_RESP02558

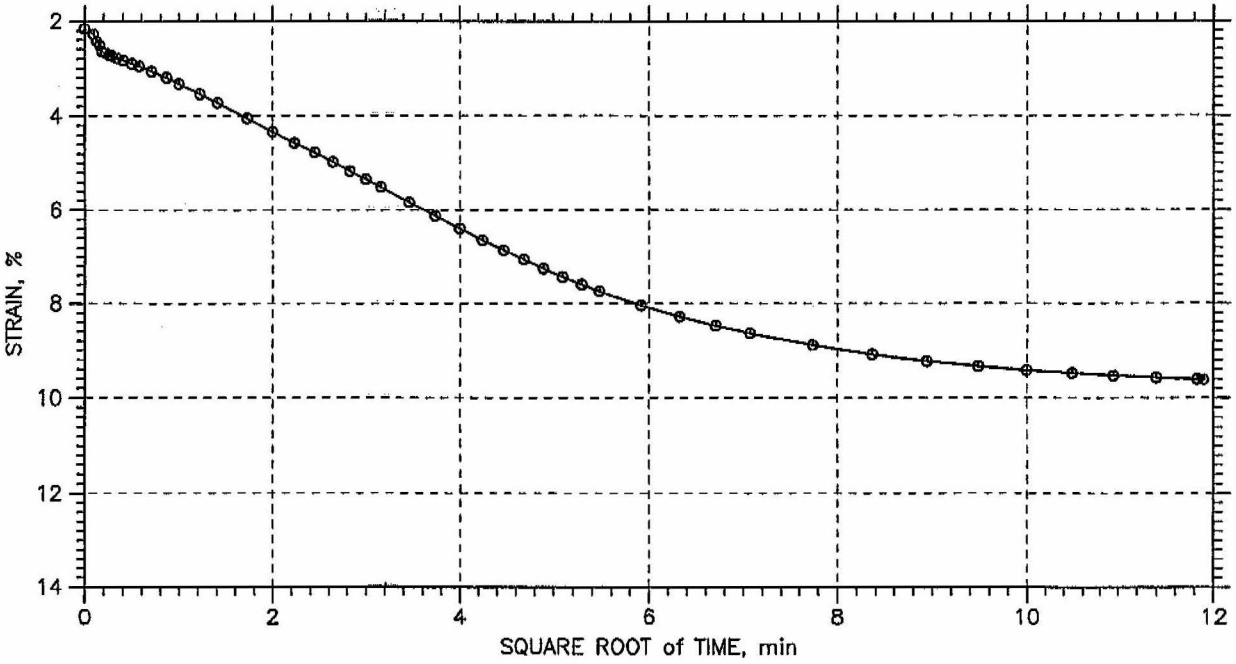
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 4 of 12

Stress: 1. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: So. Windham	Location: ---	Project No.: GTX-7434
	Boring No.: ~~B-105~~ ★	Tested By: md	Checked By: jdt
	Sample No.: ---	Test Date: 05/02/07	Depth: 17-19 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Wet, gray clayey silt, very soft		
	Remarks: System C		

Fri, 11-MAY-2007 12:22:16 ★B208 DEG

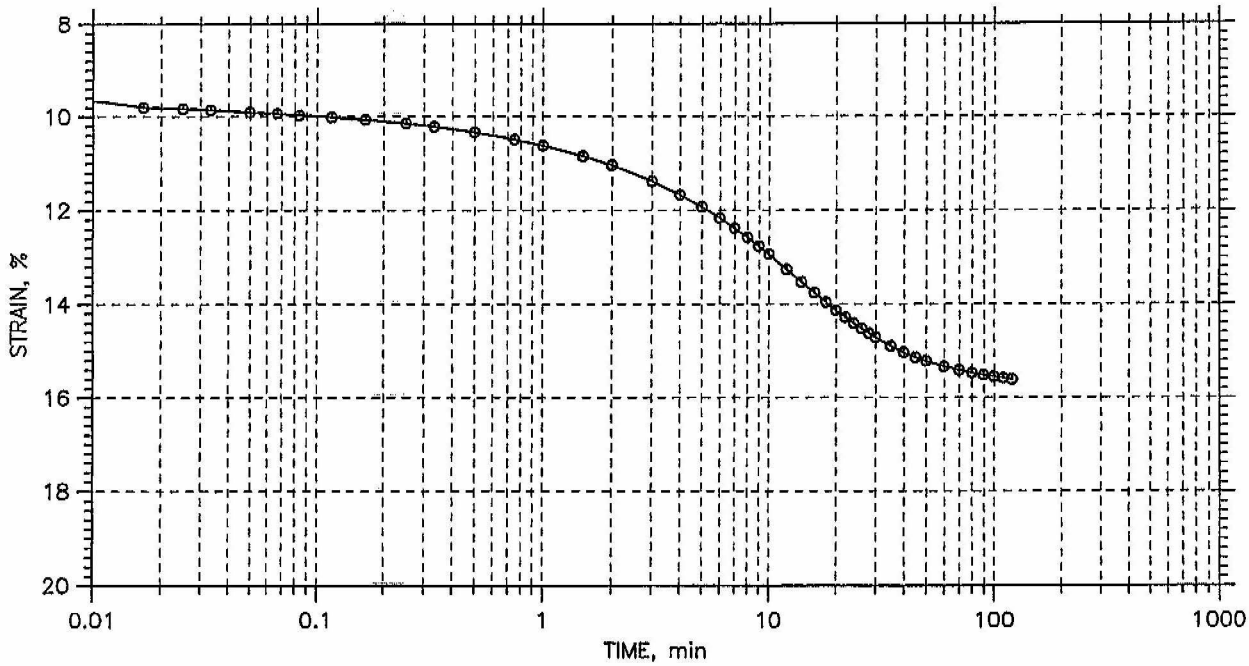
VIL_RESP02559

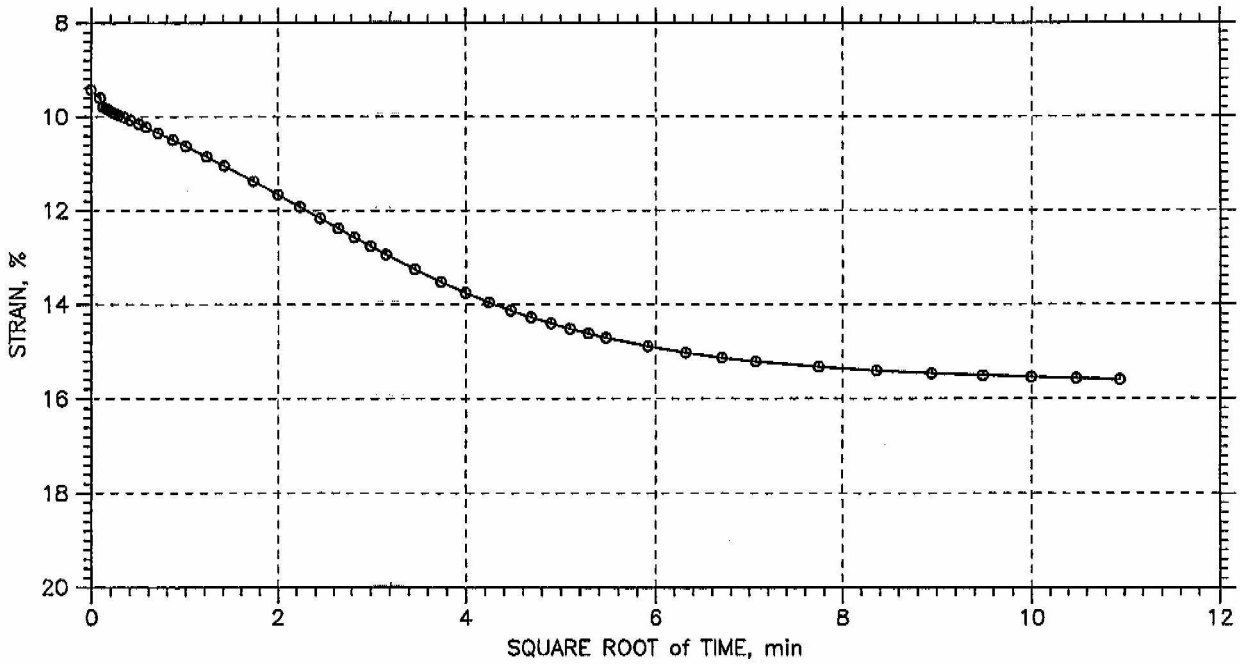
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 5 of 12

Stress: 2. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: So. Windham	Location: ---	Project No.: GTX-7434
	Boring No.: ~~B-105~~ ★	Tested By: md	Checked By: jdt
	Sample No.: ---	Test Date: 05/02/07	Depth: 17-19 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Wet, gray clayey silt, very soft		
	Remarks: System C		

Fri, 11-MAY-2007 12:22:16 ★B208 DEG

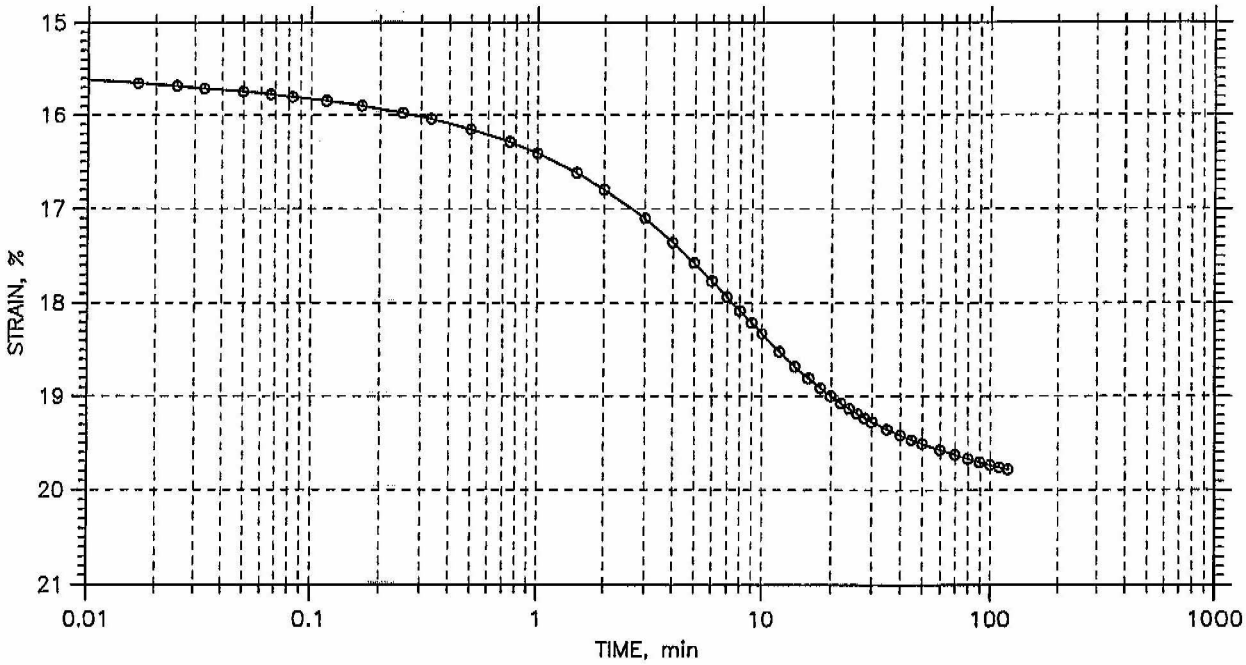
VIL_RESP02560

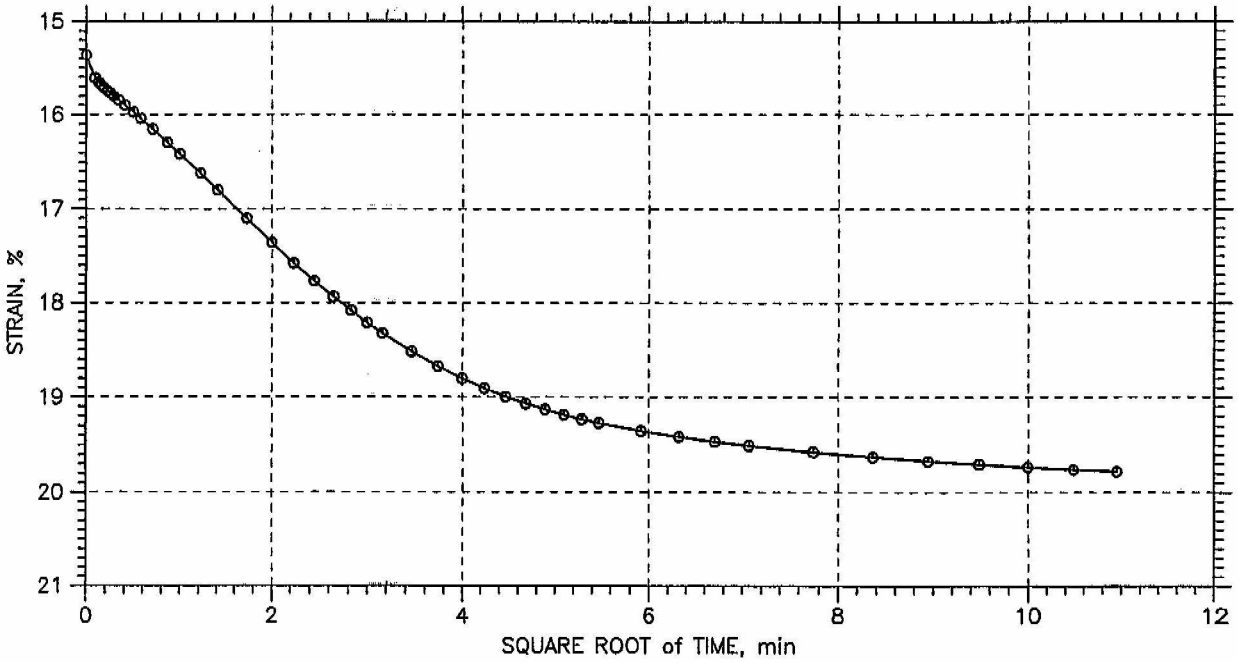
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 6 of 12

Stress: 4. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: So. Windham	Location: ---	Project No.: GTX-7434
	Boring No.: ~~B-105~~ ★	Tested By: md	Checked By: jdt
	Sample No.: ---	Test Date: 05/02/07	Depth: 17-19 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Wet, gray clayey silt, very soft		
	Remarks: System C		

Fri, 11-MAY-2007 12:22:16 ★ B208

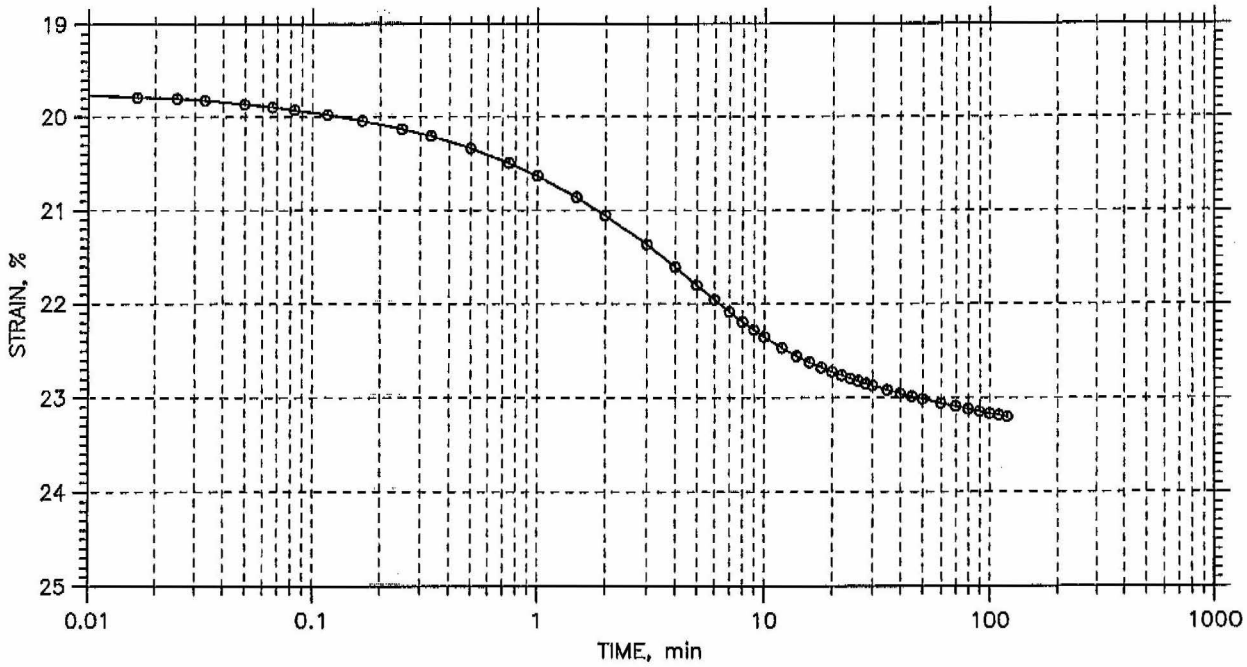
VIL_RESP02561

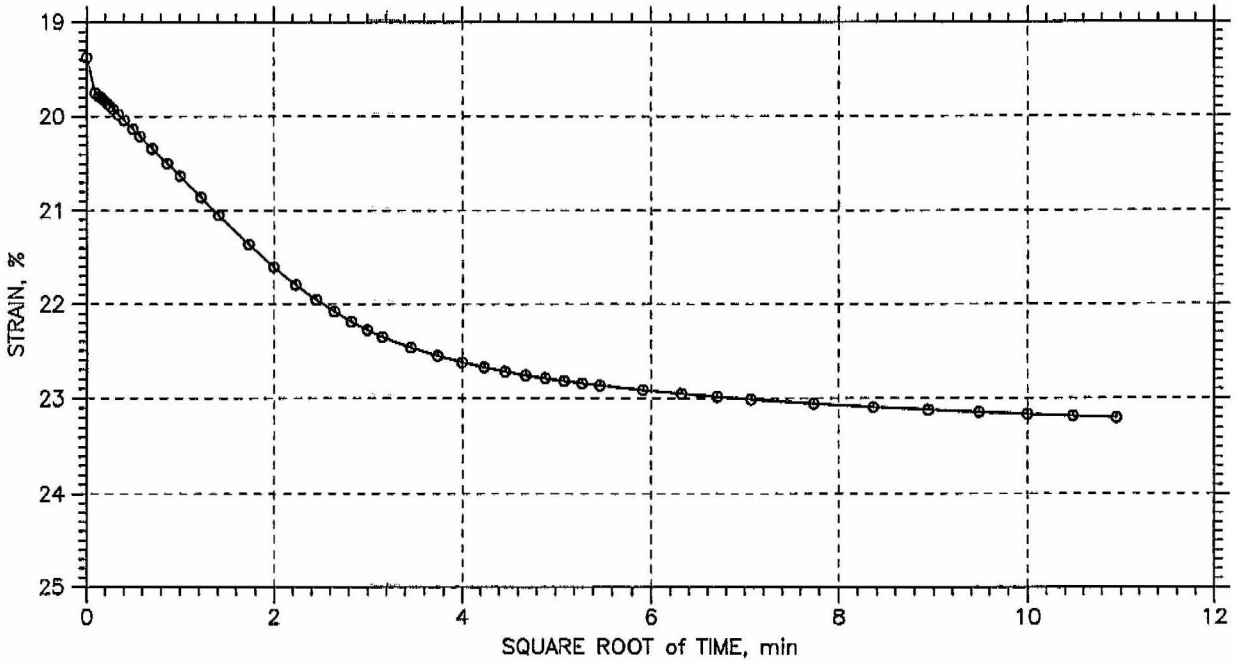
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 7 of 12

Stress: 8. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: So. Windham	Location: ---	Project No.: GTX-7434
	Boring No.: ~~B-105~~ *	Tested By: md	Checked By: jdt
	Sample No.: ---	Test Date: 05/02/07	Depth: 17-19 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Wet, gray clayey silt, very soft		
	Remarks: System C		

Fri, 11-MAY-2007 12:22:16 * B208 DEG.

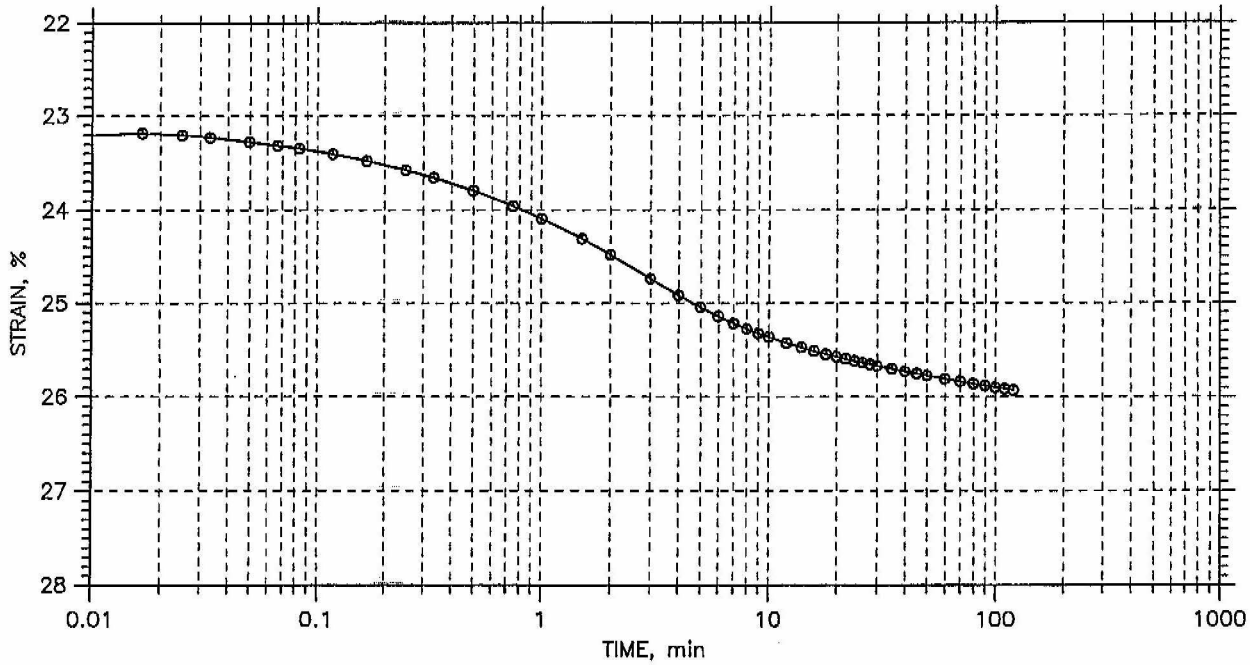
VIL_RESP02562

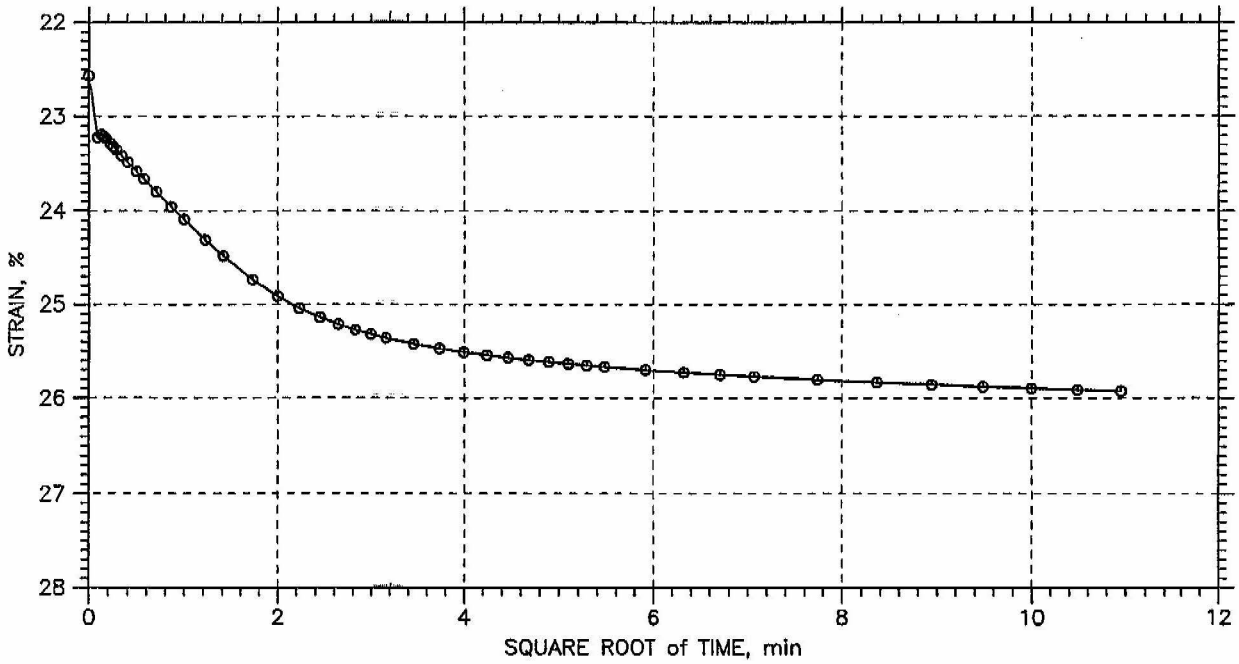
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 8 of 12

Stress: 16. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: So. Windham	Location: ---	Project No.: GTX-7434
	Boring No.: ~~B-105~~ ☆	Tested By: md	Checked By: jdt
	Sample No.: ---	Test Date: 05/02/07	Depth: 17-19 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Wet, gray clayey silt, very soft		
	Remarks: System C		

Fri, 11-MAY-2007 12:22:16 ☆ B208 D.E.G

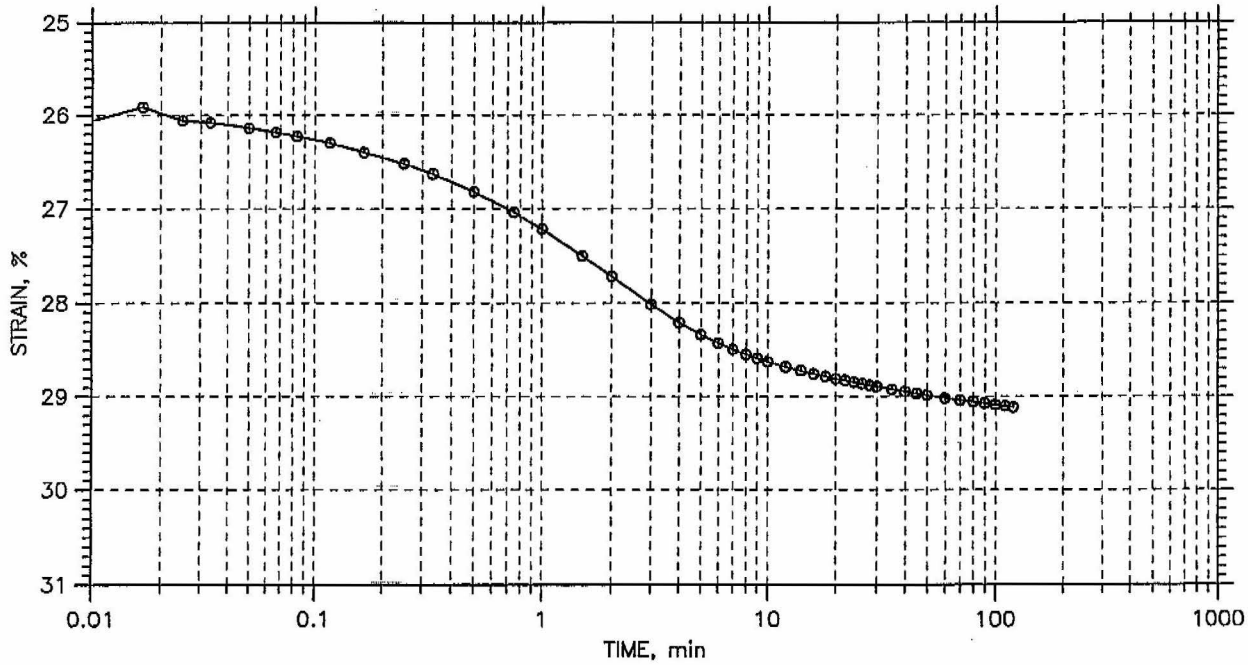
VIL_RESP02563

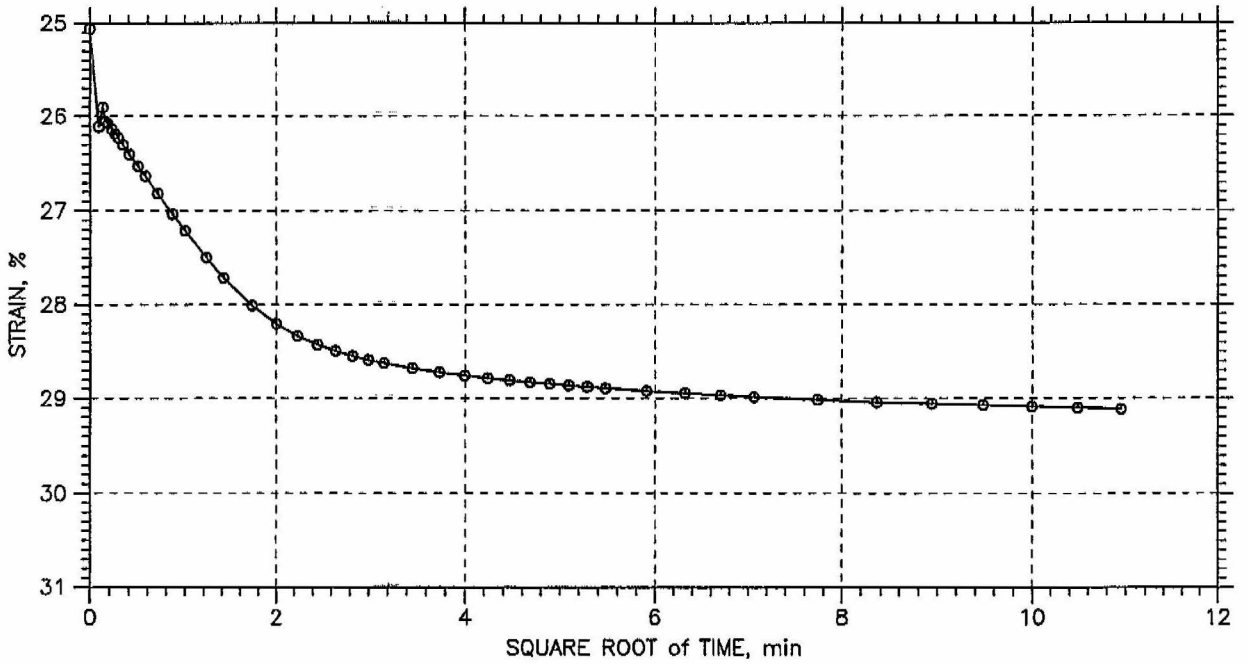
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 9 of 12

Stress: 32. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: So. Windham	Location: ---	Project No.: GTX-7434
	Boring No.: ~~B-105~~ ★	Tested By: md	Checked By: jdt
	Sample No.: ---	Test Date: 05/02/07	Depth: 17-19 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Wet, gray clayey silt, very soft		
	Remarks: System C		

Fri, 11-MAY-2007 12:22:16 ★ B208 D.E.G.

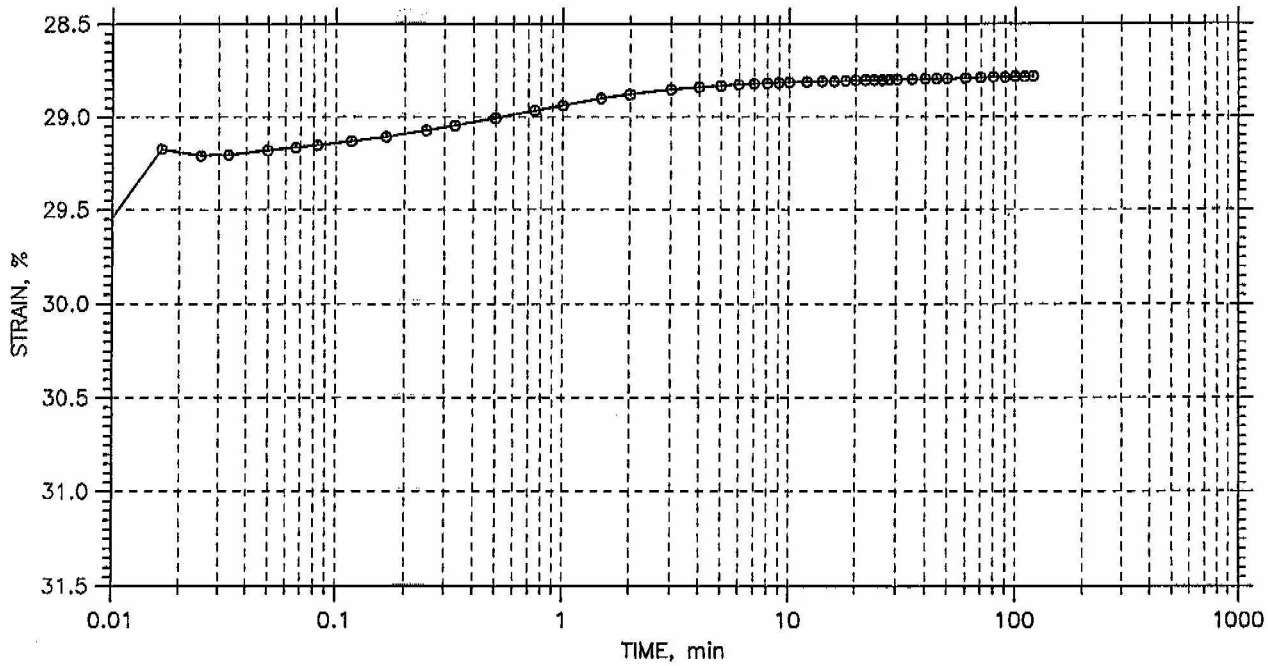
VIL_RESP02564

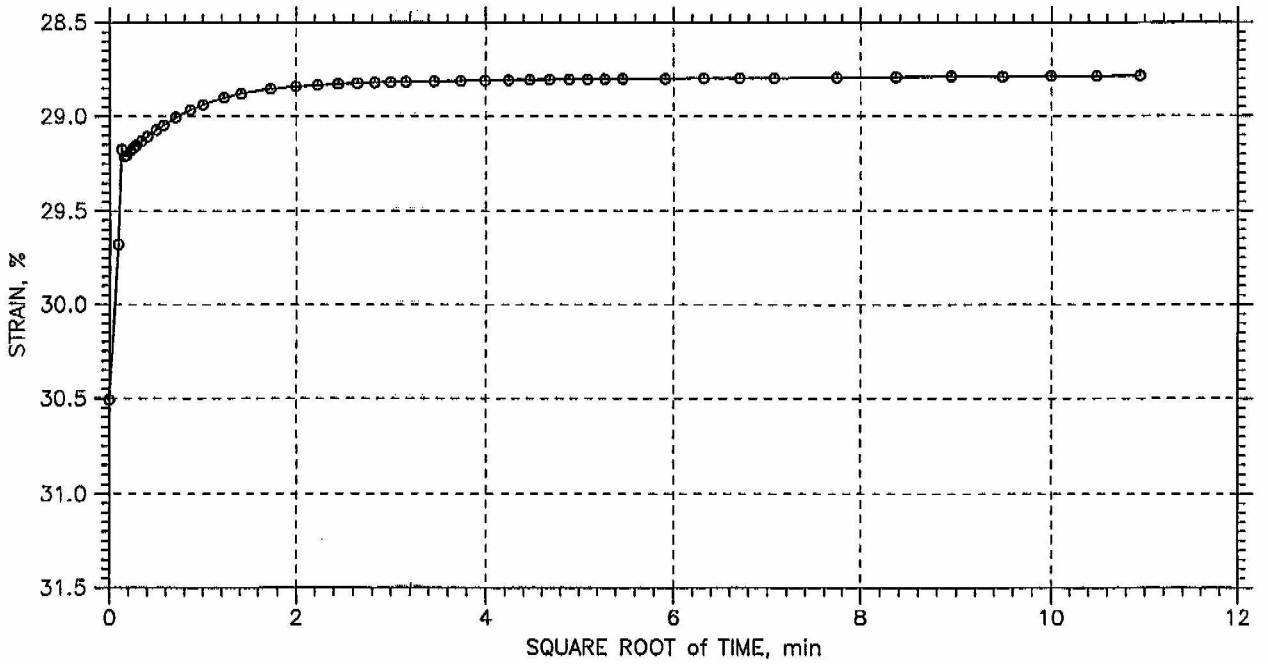
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 10 of 12

Stress: 8. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: So. Windham	Location: ---	Project No.: GTX-7434
	Boring No.: ~~B-105~~ ☆	Tested By: md	Checked By: jdt
	Sample No.: ---	Test Date: 05/02/07	Depth: 17-19 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Wet, gray clayey silt, very soft		
	Remarks: System C		

Fri, 11-MAY-2007 12:22:16 ☆B208 D.E.G.

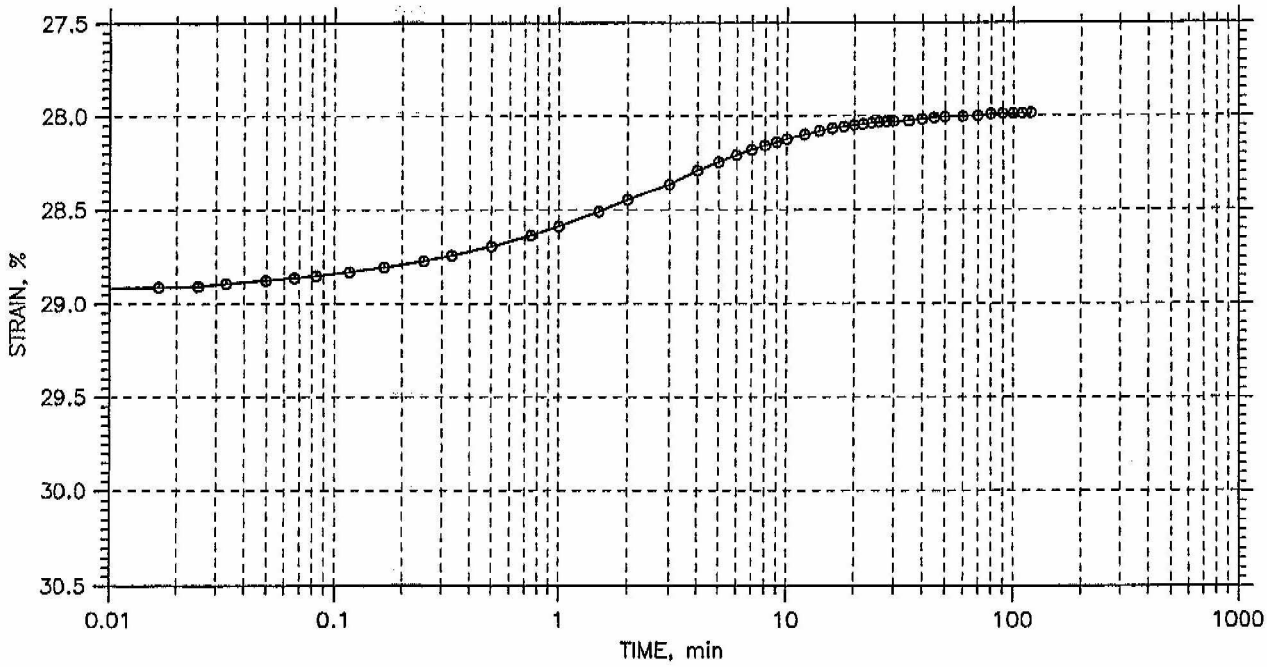
VIL_RESP02565

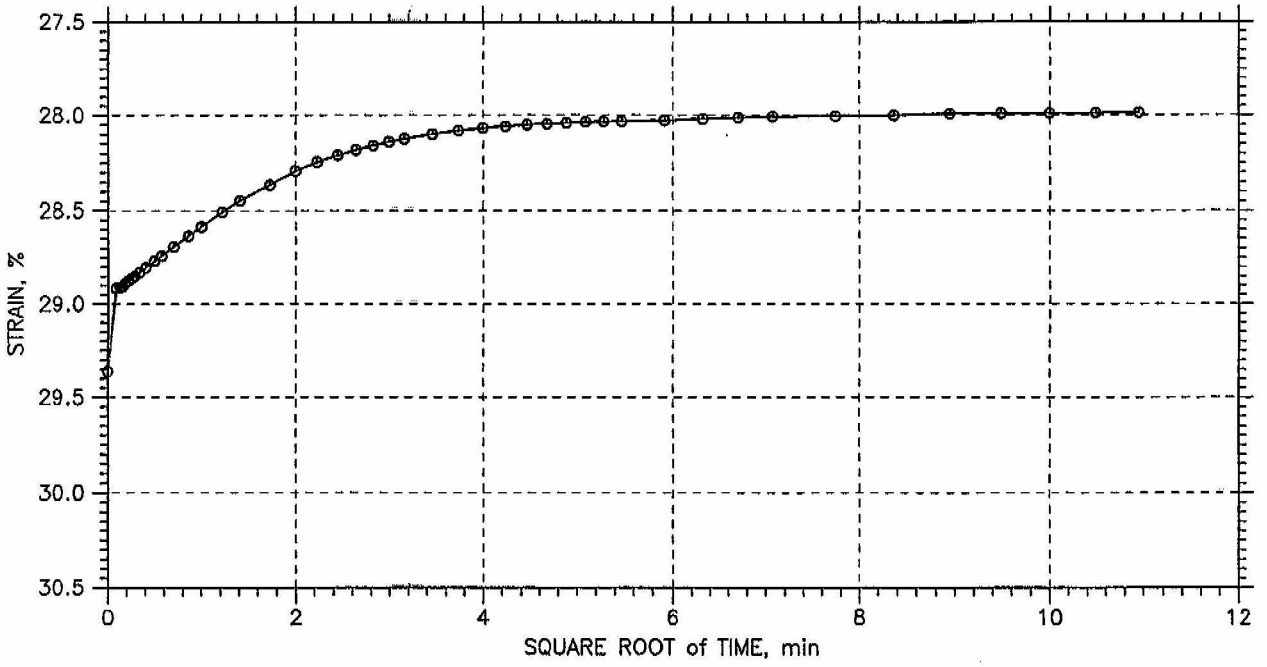
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 11 of 12

Stress: 2. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: So. Windham	Location: ---	Project No.: GTX-7434
	Boring No.: ~~B-105~~ ☆	Tested By: md	Checked By: jdt
	Sample No.: ---	Test Date: 05/02/07	Depth: 17-19 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Wet, gray clayey silt, very soft		
	Remarks: System C		

Fri, 11-MAY-2007 12:22:16 ☆ B208 D.E.G.

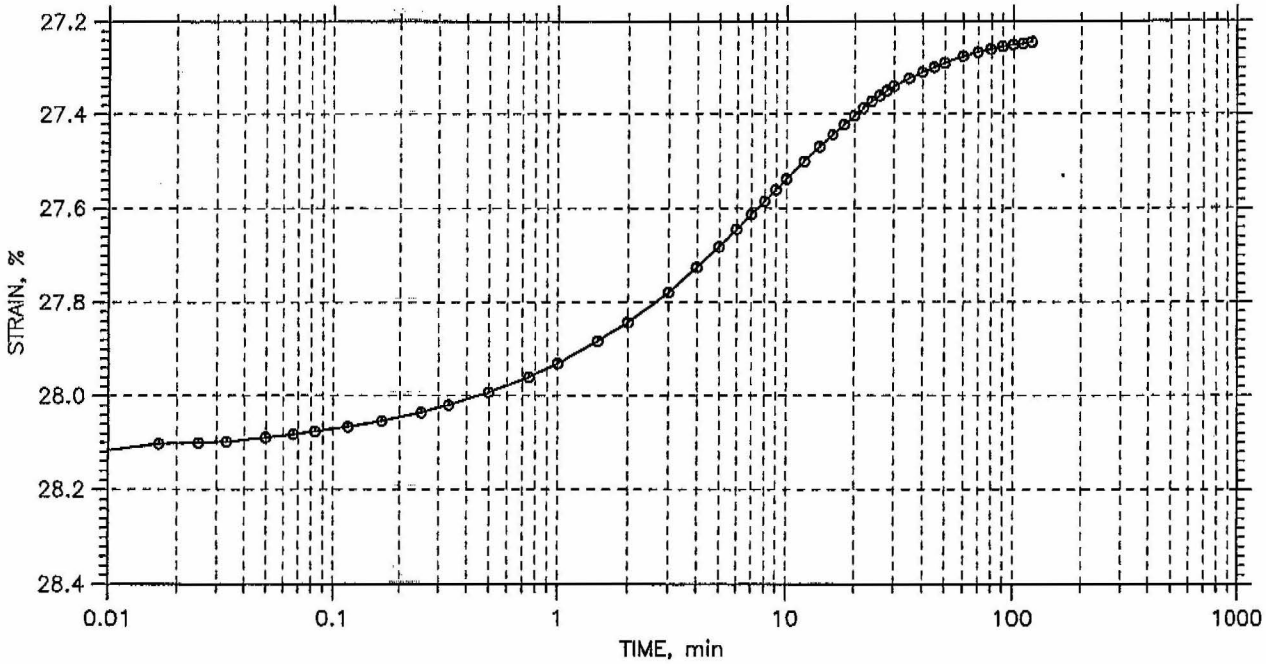
VIL_RESP02566

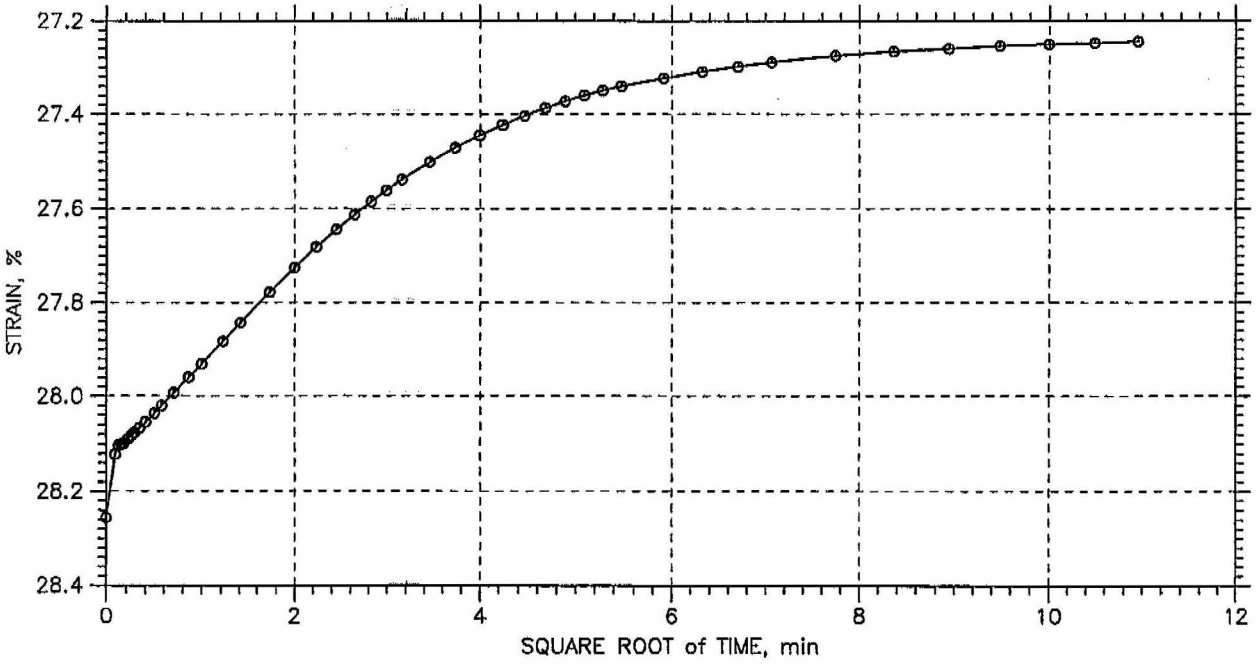
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 12 of 12

Stress: 0.5 tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: So. Windham	Location: ---	Project No.: GTX-7434
	Boring No.: ~~B-105~~ ☆	Tested By: md	Checked By: jdt
	Sample No.: ---	Test Date: 05/02/07	Depth: 17-19 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Wet, gray clayey silt, very soft		
	Remarks: System C		

Fri, 11-MAY-2007 12:22:16 ★B208 DEG.

VIL_RESP02567