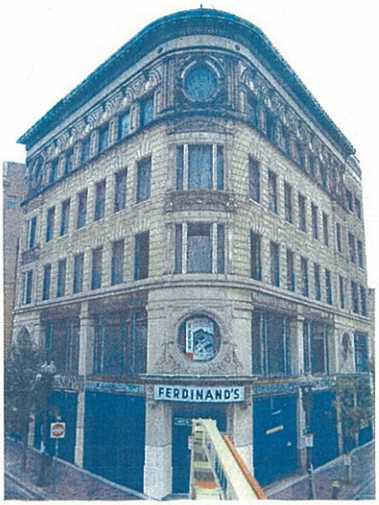
JACOBS

Presented to:

Boston Redevelopment Authority



Report for:

Engineering Design Services for Environmental Remediation and Building Demolition at Dudley Square

Geotechnical Data Report Roxbury, MA.

In Reference to:
BRA Contract No. 5076

October 2007

Submitted by:

Jacobs Engineering Group Inc.
Two Center Plaza
Boston, Massachusetts 02108

Geotechnical Data Report

Engineering Design Services for Environmental Remediation and Site Clearance at Dudley Square

Roxbury, Massachusetts

October 2007

Prepared for:

Boston Redevelopment Authority
22 Drydock Avenue
Boston, Massachusetts 02210

Prepared by:

Jacobs Engineering Group Inc.
Two Center Plaza
Boston, Massachusetts 02108

Table of Contents

INTRODUCTION

This geotechnical report presents the procedures and the results of the subsurface investigation performed at the Dudley Square "Ferdinand Building" project site. The general location of the site is shown in Figure 1, the Locus Map. The results of the subsurface investigation are provided to support (1) the bracing design to salvage the Ferdinand Building's façade, (2) building demolition, and (3) future design and construction work at the project site.

Four test borings were drilled and four test pits were excavated as part of the field investigation. Three of the borings were drilled on the paved sidewalk adjacent to the building; the fourth boring was drilled in the vacant lot at the rear of the building. The test pits were excavated to expose the building foundation. Two of the test pits were excavated from inside the basement of the building to expose the bottom of the building foundation from the interior. The other two test pits were excavated at the outside rear of the building.

PROJECT INFORMATION

The City of Boston, through the Boston Redevelopment Authority (BRA), plans to construct a new office building at the location of the Ferdinand Building. The BRA plans to demolish the interior and rear portions of the Ferdinand Building and to salvage the façade at the front corner and two sides of the building for incorporation it into the new office building. The building façade will be braced and supported in place while the interior and rear portions of the building are demolished.

The work being performed under this Contract is obtaining information relating to the existing building foundation and subsurface conditions at the project site as necessary to support (1) building demolition design (2) design of the bracing and salvage system for the façade.

SCOPE OF WORK

This report has been prepared by Jacobs in accordance with the scope of work for the contract between Jacobs and BRA for the Dudley Square project.

This report does not address the environmental characterization of soils at the site. These issues will be addressed at a later stage of project development. If waste soils are generated during future site activities these soils will need to be environmentally characterized to determine the presence of oil and/or hazardous materials in accordance with applicable requirements of 310 CMR 40.000 Massachusetts Contingency Plan.

GEOTECHNICAL INVESTIGATION

Jacobs planned a subsurface investigation program and hired a drilling contractor, New Hampshire Boring Company, to drill four borings and excavate four test pits at the project site. The borings were drilled using a CME-50T drill-rig between June 28 and July 13, 2007. A boring location plan is included as Figure 2. The borings were advanced by wash boring with casing techniques to refusal. After refusal rock coring was employed. Standard penetration tests (SPT) with split spoon sampling were typically performed at five-foot intervals of depth to establish the density or consistency of in-situ soils and to obtain soil samples in accordance with ASTM D-1586 "Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils. Small representative samples were obtained during these tests and were used to classify the soils encountered.

Within the clay stratum, undisturbed samples were obtained using a thin wall sampler (Shelby tube) in accordance with ASTM D-1587 "Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes.

The bedrock was cored to obtain rock samples. Core runs were generally 5 ft in length. Cores were placed in wooden core boxes for transport and storage by the drilling contractor for later laboratory testing and future examination. The core boxes and the rock core samples will be stored by the drilling contractor (New Hampshire Boring) for two years.

The subsurface conditions encountered at the boring locations are shown on the test boring logs in Attachment A. These test boring logs represent our interpretation of the subsurface conditions based on visual examination of field samples and laboratory test completed on the field obtained samples. Any use of this information is the responsibility of the user. The lines designating the interfaces between the various strata on the boring logs represent the approximate interface locations. Water levels shown on the boring logs represent the conditions only at the time the measurements were made. The as-built boring and test pit locations and elevations were surveyed by Nitsch Engineering on July 23, 2007. The survey results are shown in Figure 3.

SUBSURFACE CONDITIONS

The soil test borings reveal a soil profile consisting of successive layers of Fill, Sand/Silty-Sand, Clay, Glacial Till, and Bedrock. Each of the strata is briefly discussed in the paragraphs that follow:

Stratum I "Fill" consist of man made Fill with materials that include sand, silt, gravel, asphalt, bricks, boulders, and miscellaneous construction debris. The

thickness of the Fill varies from 11-ft to 25-ft from the ground surface. Standard penetration test (SPT) resistances in Stratum I ranged widely from 8 to over 90 blows per foot.

Stratum II "Sand/Silt" is predominantly Sand, Silt, some Gravel and occasional thin lenses of Clay. The Clay was only encountered in Boring B4. The thickness of the Sand and Silt stratum varies from 15-ft to 35-ft. SPT resistances ranged from 10 to over 70 blows per foot.

Stratum III "Clay" is predominantly Clay with thickness of about 8 to 15 ft. SPT resistances in the Clay stratum ranged from no resistance at all to the Weight of the Hammer to over 30 blows per foot.

Stratum IV "Glacial Till" is predominantly glacial till with a uniform thickness of about 15 to 20 ft across the borings. SPT resistances in the Till stratum ranged from 35 blows per foot to SPT refusal.

The top of bedrock ranges from 60-ft to 80-ft below ground surface. At three of the boring locations, conglomerate type sedimentary rocks consisting of pebbles and consolidated gravel was encountered. Argillaceous sedimentary rock composed mainly of clay particles was encountered at the fourth boring location.

The driller experienced some difficulty driving the casing through obstructions in the fill stratum while installing the three borings on the paved sidewalk. These obstructions are assumed to be boulders and building materials such as granite blocks. On two occasions, the casing were so badly damaged that the driller had to extract the casing and replace the lead casing as the split-spoon could not be advanced through the damaged casing.

The groundwater depth varied from 13-ft to 17-ft below the ground surface.

LABORATORY TESTING

The scheduled laboratory tests were conducted in accordance with ASTM Specifications by GeoTesting Express of Boxborough, Massachusetts to determine the physical and engineering characteristics of selected split-spoon samples. Details of laboratory testing and test results are presented in Attachment 2.

Environmental field screening and laboratory analysis of soil samples to determine the presence of oil and/or hazardous materials were not completed at this time. Environmental investigations have been completed by previously completed by others to address oil and/or hazardous materials per 310 CMR 40.000 the Massachusetts Contingency Plan.

FOUNDATION RECOMMENDATIONS

We understand that a future 10- to 14-story office building is planned for the site. The alluvial sand and silt layer underlying the fill layer is suitable for supporting the proposed building. Based on the anticipated building load, individual footings designed with a low enough bearing pressure to avoid overstressing the subgrade soils would occupy a large proportion of the foundation area. Therefore a mat foundation will be more economical and is recommended for the building. In addition, a mat foundation will distribute column and wall loads more evenly to the underlying soils and thus reduce differential settlements, especially with the potential for loose soil pockets existing within the subgrade.

The mat foundation should be supported on the sand/silt stratum with a maximum bearing pressure of 2 tons per square foot (tsf). We estimate the maximum mat settlement of 2 inches under this bearing pressure, to produce a tolerable differential settlement of ¾ inches or less between adjacent columns. We anticipate that over half of these settlements will occur during construction as the building loads are added. The perimeter of the mat should be founded at least 4 feet below finished exterior grade for frost protection.

For subsurface building basement with lower foundation elevation, some of the compressible sand/silt stratum would be removed (i.e. less sand/silt settlement), but the bearing surface would now be that much closer to the clay stratum (i.e. more clay settlement). Therefore for preliminary design purpose, the same maximum bearing pressure of 2 tsf should be used regardless of basement depth.

For the final design, we recommend additional subsurface investigation and testing be conducted for the remaining site to confirm the subsurface condition, and to estimate the final design parameters such as the mat subgrade reaction modulus. The net stress increase from the proposed building and its impact or resulting settlement on the existing nearby buildings should be evaluated. The liquefaction susceptibility of the soils at the site during a seismic event should also be investigated.

Laboratory Test Result Summary
Table - 1

Boring and Sample ID		Depth (ft)	Sample Type	Soil Description	Soil Class	% Retained No. 4 Sieve	% Finer No. 200 Sieve	Moist Content (%)	Atterberg Limits			
									Liquid Limit (LL)	Plastic Limit (PL)	Plastic Index (PI)	Liquidity Index (LI)
JE-B1 -	S-7	30-31.5	Jar	Fine Sand		0	7					
JE-B2 -	S-14	62-64	Jar	Silty gravel and sand		6	28					
JE-B3 -	ST1	66-68	Shelby Tube	Greenish gray clay	CL	0	96	38	43	17	26	1
JE-B4 -	ST1	62-64	Shelby Tube	Greenish gray clay	CL	0	100	35	52	22	30	0
JE-B4 -	S-15	75-76.5	Jar	Olive clay		0	100					

Bulk density and compressive strenght of rock core specimen by ASTM D 2938

Boring and Sample ID		Depth (ft)	Bulk Density,	Compressive Strength, (psi)	Comment
JE-B1 -	RC-1	64-69	162	2,705	

Figure 1

Locus Map

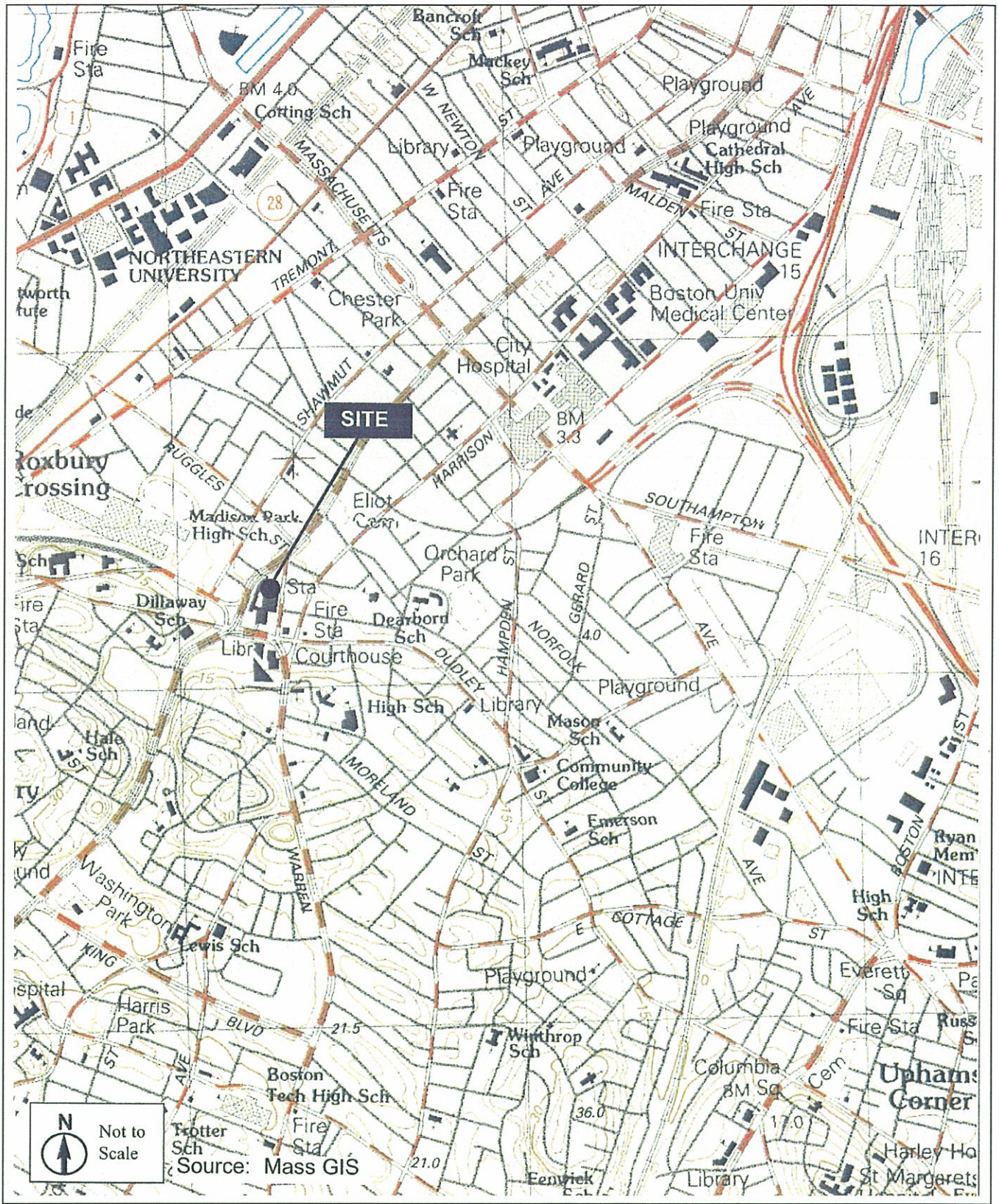


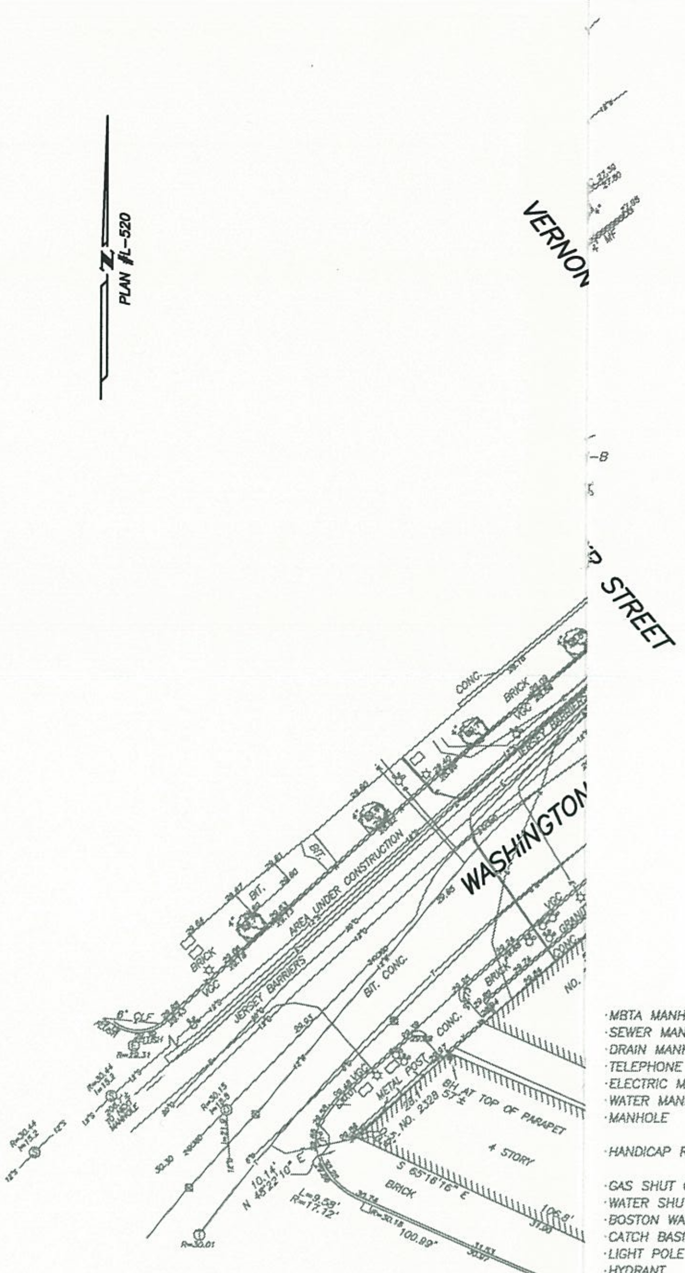
FIGURE 1 - Locus Map

Figure 2

Boring Location Map

Figure 3

As-Built Boring Location Survey Plan



LEGEND:

·MBTA MANHOLE
·SEWER MANHOLE
·DRAIN MANHOLE
·TELEPHONE MANHOLE
·ELECTRIC MANHOLE
·WATER MANHOLE
·MANHOLE

·HANDICAP RAMP

·GAS SHUT OFF
·WATER SHUT OFF
·BOSTON WATER VALVE
·CATCH BASIN
·LIGHT POLE
·HYDRANT
·SIGN
·TRAFFIC SIGNAL
·ELECTRIC HANDHOLE
·GATE POST
·FIRE ALARM
·INVERT ELEVATION
·RIM ELEVATION
·SHUT OFF
BORING
TEST PIT

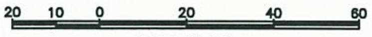
·	·DECIDUOUS TREE
N/F·	·NOW OR FORMERLY
TBM·	·TEMPORARY BENCH MARK
TT·	·TOP OF TRAP
N.V.P.·	·NO VISIBLE PIPES
BH·	·BUILDING HEIGHT
FPA·	·FOOTPRINT AREA
T.·	·TOP
B.·	·BOTTOM
BIT.·	·BITUMINOUS
CONC.·	·CONCRETE
VGC·	·VERTICAL GRANITE CURB
CLF·	·CHAIN LINK FENCE
MF·	·METAL FENCE
——X——	FENCE
——S——	SEWER
——D——	DRAIN
——CS——	COMBINED SEWER
——W——	WATER
——G——	GAS
——E——	ELECTRIC
——M——	MBTA
——T——	TELEPHONE

NOTES:

1.) EXISTING CONDITIONS FROM PLAN PREPARED BY HARRY R. FELDMAN, INC. ENTITLED "ALTA/ACSM LAND TITLE SURVEY AND EXISTING CONDITIONS PLAN, DUDLEY SQUARE, BOSTON (ROXBURY DISTRICT), MASS" SCALE: 1"=20', DATED APRIL 28, 2005.

2.) ELEVATIONS REFER TO BOSTON CITY BASE (BCB).

GRAPHIC SCALE



SCALE: 1"=20'

Nitsch Engineering

www.nitscheng.com
186 Lincoln Street, Suite 200
Boston, MA 02111-2403
T: (617) 338-0063
F: (617) 338-6472

► C
► L
► T
► Pl
► G

ORING LOCATION PLAN
RDINAND BUILDING
STON (ROXBURY), MASSACHUSETTS

PREPARED FOR:
NGINEERING GROUP, INC.
, BOSTON, MASSACHUSETTS 02108

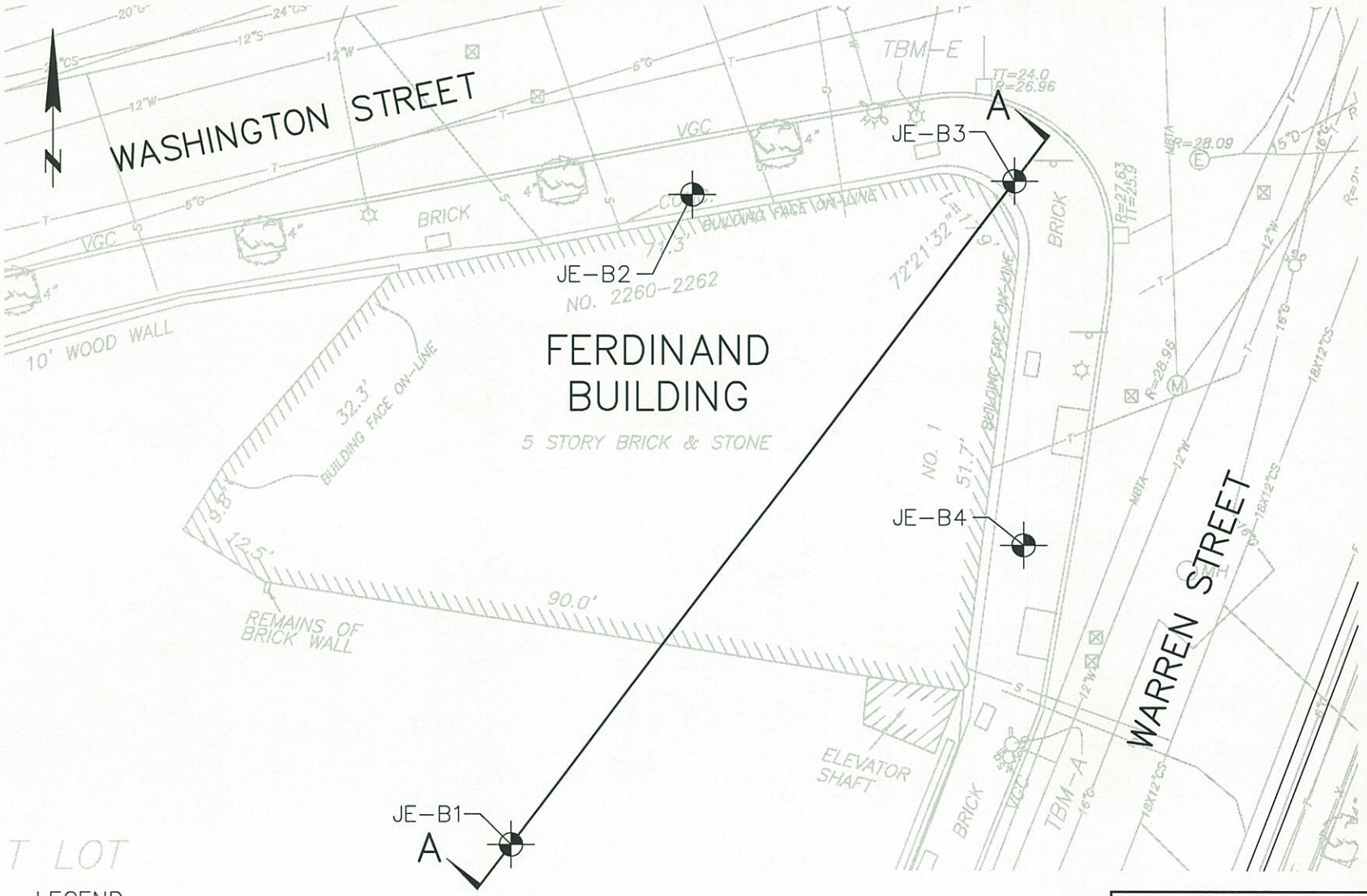
SHEET:
EX-1
OF 1
REV.

Attachment A

Boring Logs and Test Pit Logs

Figure 4

Plan and Soil Profile Cross-Section A-A



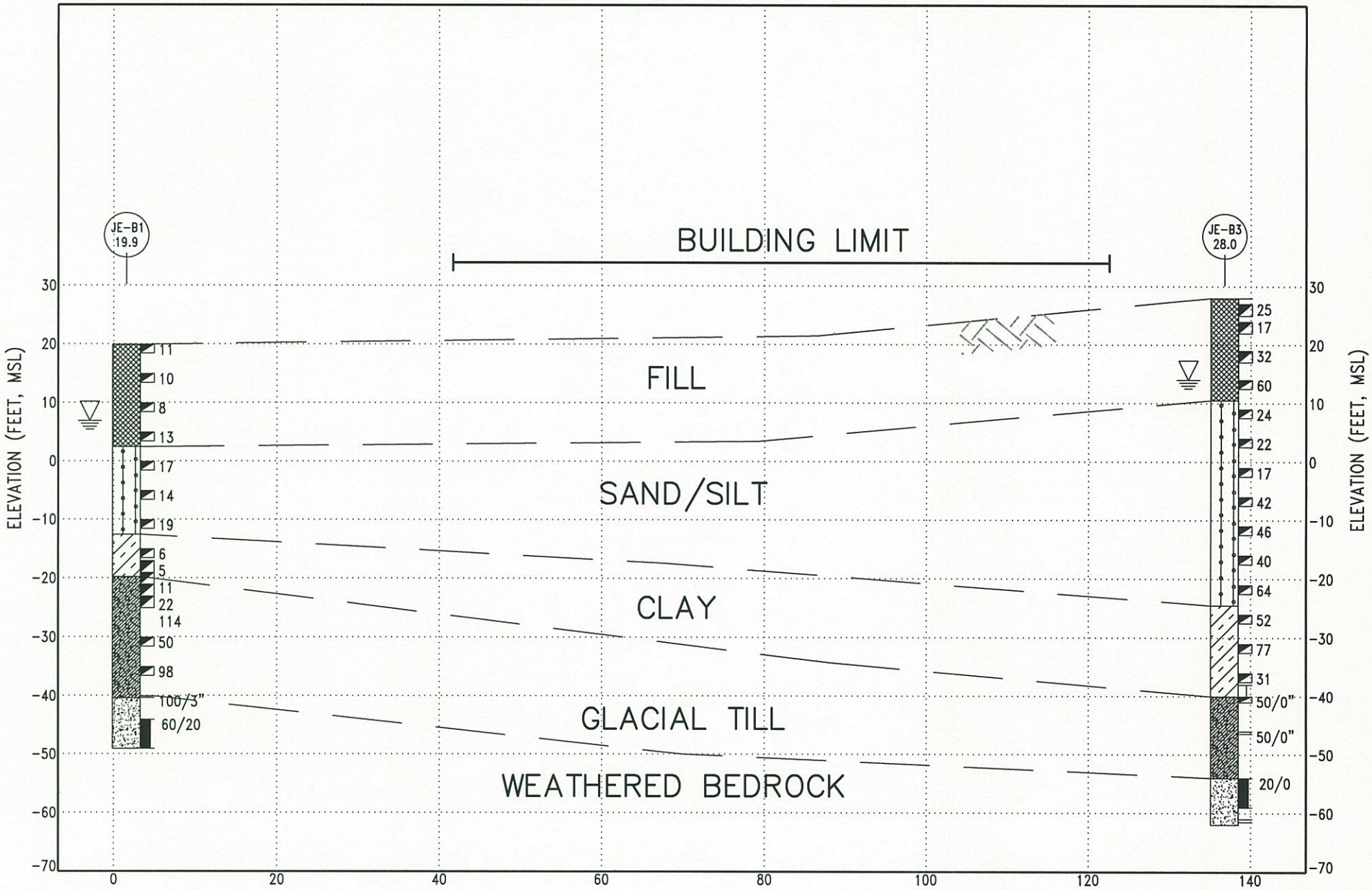
LEGEND

BORING

CROSS SECTION A–A
SCALE: 1" = 20'–0"

BRA
DUDLEY SQUARE

PLAN
SECTION A–A
FIGURE 4A



BOSTON REDEVELOPMENT AUTHORITY

DUDLEY SQUARE DEMOLITION PROJECT

ROXBURY, MASSACHUSETTS

E2X26200

JE® JACOBS

Jacobs Civil Inc.

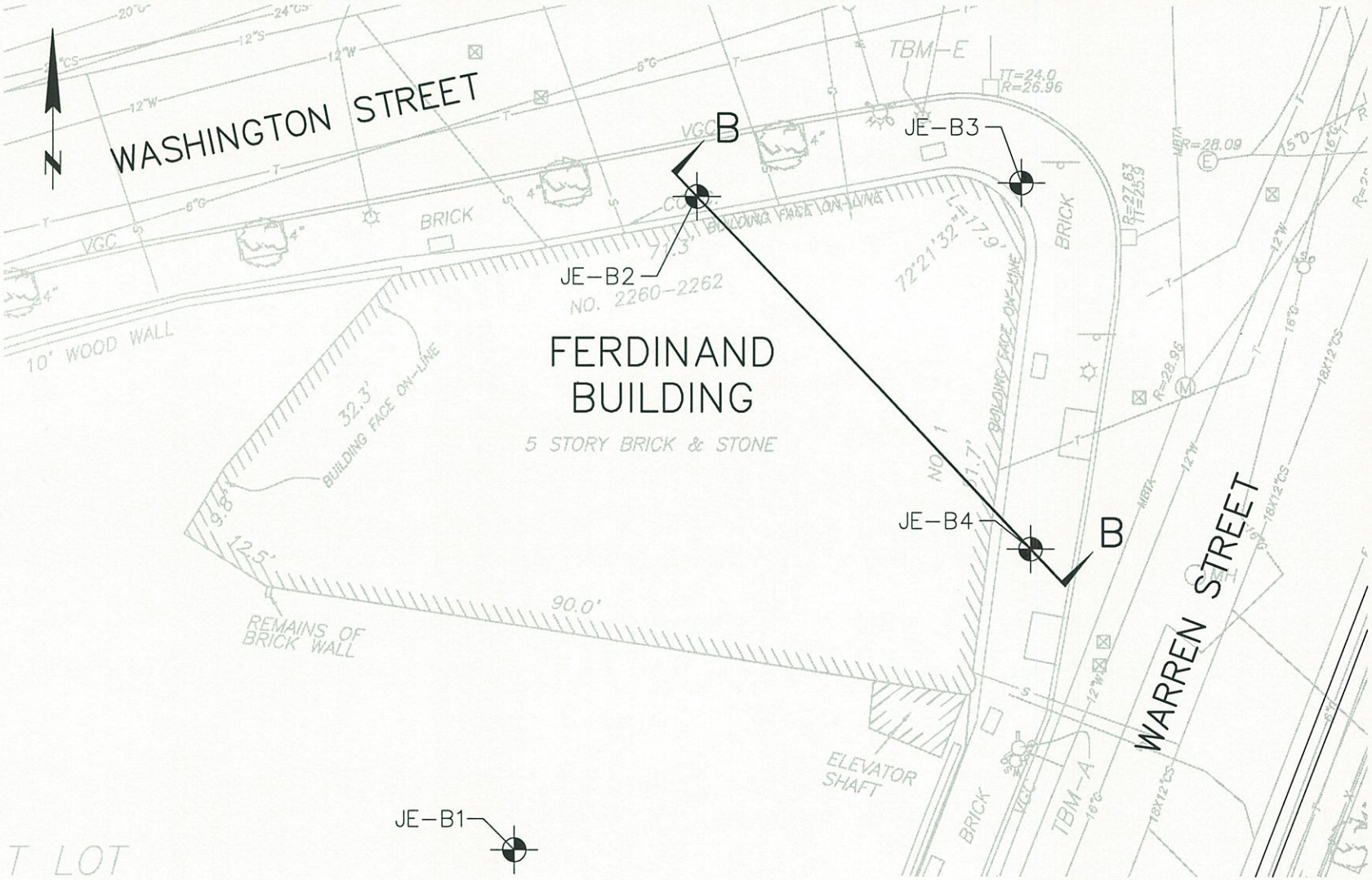
SUBSURFACE PROFILE

SECTION A – A

FIGURE 4B

Figure 5

Plan and Soil Profile Cross-Section B-B



LEGEND

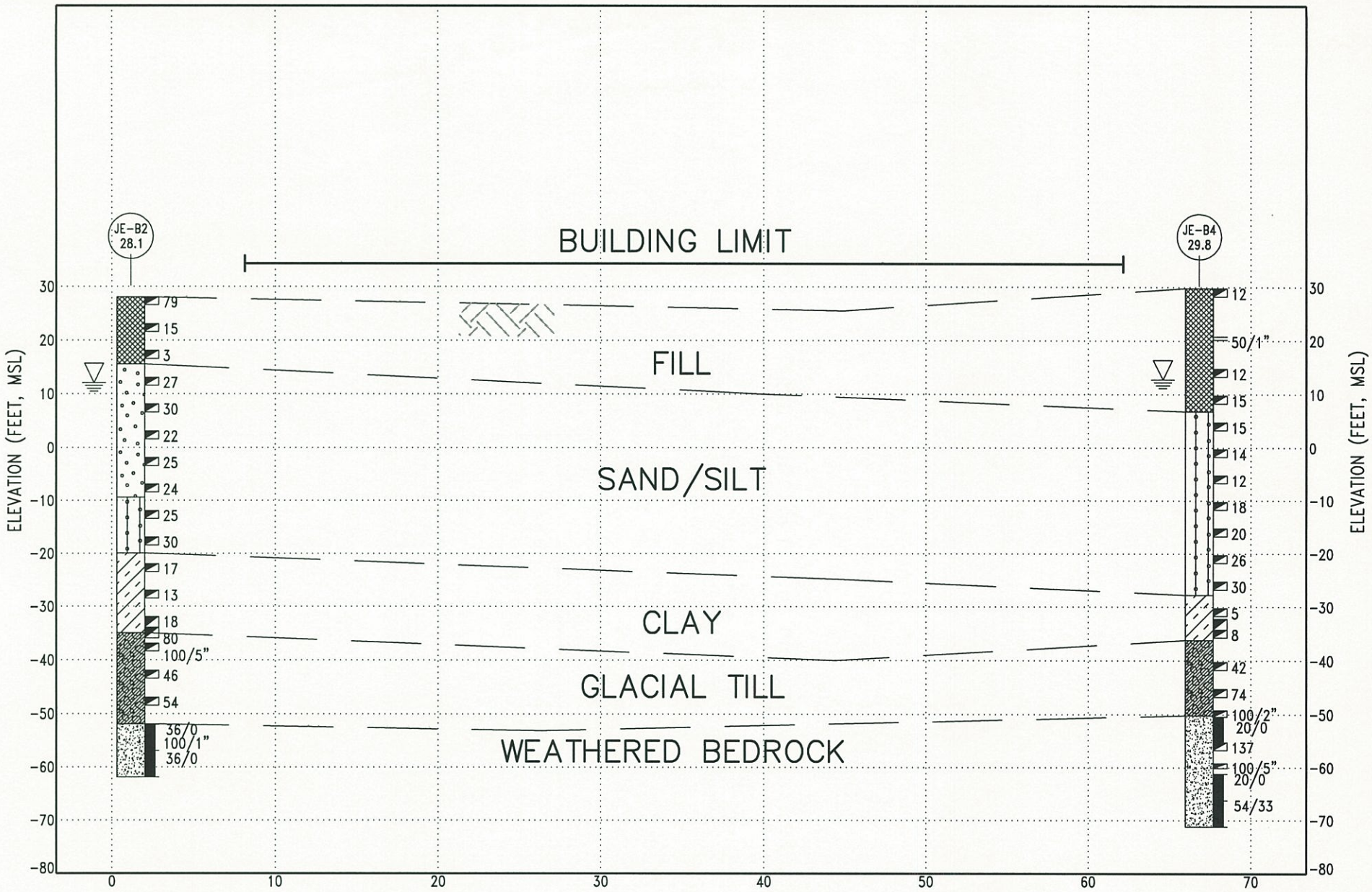
BORING

CROSS SECTION B–B

SCALE: 1" = 20'–0"

BRA
DUDLEY SQUARE

PLAN
SECTION B–B
FIGURE 5A



BOSTON REDEVELOPMENT AUTHORITY

DUDLEY SQUARE DEMOLITION PROJECT

ROXBURY, MASSACHUSETTS

E2X26200

JE® JACOBS

Jacobs Civil Inc.

SUBSURFACE PROFILE

SECTION B – B

FIGURE 5B

LOG OF TEST BORING

JACOBS	PROJECT	DUDLEY SQUARE DEMOLITION PROJECT	BORING NO.	JE-B1	
	LOCATION	2262 Washington Street		SHEET 1 OF 2	
	OWNER	BOSTON REDEVELOPMENT AUTHORITY			
	JOB NUMBER	E2X26200			

INSPECTOR	B. Marquis	CONTRACTOR	NH Boring Inc	DRILLER	B. Thompson	ELEVATION	19.9
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	CME-50T	DATUM	FT MSL
64.0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER	140 lb Auto	GRID N	4859.0163
69.0	NX Core	7/13/2007	13 / 24 hour Reading			COORD E	5080.3991
						DATE START	7/12/07
						DATE END	7/13/07

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		4 5 6	S-1	0 - 1.5	16		Brown well graded SAND with miscellaneous debris, trace root, loose (FILL)
5		4 5 5	S-2	5 - 6.5	10		Brown poorly graded fine SAND
10		4 4 4	S-3	10 - 11.5	16		SAME
15		4 5 8	S-4	15 - 16.5	14		SAME
						2.4	
20		5 7 10	S-5	20 - 21.5	16		Brown SILTY SAND, loose to medium dense
25		5 6 8	S-6	25 - 26.5	10		SAME
30		6 7 12	S-7	30 - 31.5	14		Same as above except trace gravel
						-12.6	
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. JE-B1

LOG OF TEST BORING

JACOBS			BORING NO.	JE-B1
	PROJECT	DUDLEY SQUARE DEMOLITION PROJECT		
	LOCATION	2262 Washington Street		
	OWNER	BOSTON REDEVELOPMENT AUTHORITY		
	JOB NUMBER	E2X26200		SHEET 2 OF 2

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		2 2 4	S-8	35 - 36.5	18		CLAY, olive gray, soft
		WOH 2 3 3	S-9	37 - 39	24		SAME
40		3 3 8 8	S-10	39 - 41	24	-19.8	CLAY, olive green, mostly clay with sand (Top 8-inch = clay; Bottom 16-inch=clay with sand)
		7 8 14 55	S-11	41 - 43	24		Olive green SILTY SAND, medium dense, some medium gravel, top 2-inch is predominantly clay with sand
45		21 70 44 62	S-12	43 - 45	12		Rusty brown very dense GRAVEL, little fresly crushed rock fragments. Probable cobble. (TILL) (Wash boring to 50ft below ground surface.)
50		23 23 27	S-13	50 - 51.5	8		SAME
55		34 48 50	S-14	55 - 56.5	14		SAME
60		100/3"	S-15	60 - 60.25	3	-40.4	Light gray to brown GRAVEL with silty sand. (Refusal at 60-ft 3-in. Probable top of bedrock.)
65		RQD=20	RC-1	64 - 69	60		(Wash boring to 64' BGS) Brown, gray and black conglomerate SANDSTONE, highly fractured, severely weathered.
						-49.1	
70							Bottom of Hole at 69'.

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. JE-B1

LOG OF TEST BORING

JACOBS							
		PROJECT	DUDLEY SQUARE DEMOLITION PROJECT			BORING NO.	JE-B2
		LOCATION	2262 Washington Street				SHEET 1 OF 3
		OWNER	BOSTON REDEVELOPMENT AUTHORITY				
		JOB NUMBER	E2X26200				
INSPECTOR	B. Marquis	CONTRACTOR	NH Boring Inc	DRILLER	B. Thompson	ELEVATION	28.1
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	CME-50T	DATUM	FT MSL
80.0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER	140 lb Auto	GRID N	4940.9919
90.0	NX Rock Core	7/24/2007	16 / 24 hour reading			COORD E	5135.3344
						DATE START	7/10/07
						DATE END	7/11/07

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		41 39 40	S-1	0 - 1.5	14		Brown SAND with miscellaneous material such as asphalt, gravel, concrete debris used as bedding beneath sidewalk pavement (FILL)
5		6 5 10	S-2	5 - 6.5	15		Brown well graded SAND with gravel, trace silt
10		4 2 1	S-3	10 - 11.5	4		SAME
						15.6	
15		15 13 14	S-4	15 - 16.5	6		Brown, fine to coarse SAND, little gravel
20		8 10 20	S-5	20 - 21.5	10		Brown fine to coarse SAND, medium dense
25		6 11 11	S-6	25 - 26.5	10		Same as above, trace gravel
30		11 12 13	S-7	30 - 31.5	14		SAME
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. JE-B2

LOG OF TEST BORING

JACOBS			BORING NO.	JE-B2
	PROJECT	DUDLEY SQUARE DEMOLITION PROJECT		
	LOCATION	2262 Washington Street		
	OWNER	BOSTON REDEVELOPMENT AUTHORITY		
	JOB NUMBER	E2X26200		SHEET 2 OF 3

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		8 10 14	S-8	35 - 36.5	14		Rusty brown medium dense fine SAND, little silt
						-9.4	
40		8 10 15	S-9	40 - 41.5	15		Rusty brown medium dense silty fine SAND with occasional clumps of clay
45		9 17 13	S-10	45 - 46.5	16		SAME
						-19.9	
50		4 7 10	S-11	50 - 51.5	18		Brownish gray CLAY, stiff (Top 6-inches=silty sand)
55		9 7 6	S-12	55 - 56.5	18		SAME
60		WOH 5 13 14	S13	60 - 62	24		Olive gray stiff CLAY with rusty brown medium gravel.
		7 56 24 47	S-14	62 - 64	24		Rusty brown GRAVEL and CLAY, top 8-inch=clay, bottom of spoon = Till
						-34.9	
65		48 54 100/5"	S-15	65 - 66.4	9		Brown, GRAVEL with sand, clay and silt (TILL)
70		25 24 22	S-16	70 - 71.5	13		SAME

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. JE-B2

LOG OF TEST BORING

JACOBS				
PROJECT	DUDLEY SQUARE DEMOLITION PROJECT	BORING NO.	JE-B2	
LOCATION	2262 Washington Street			
OWNER	BOSTON REDEVELOPMENT AUTHORITY			
JOB NUMBER	E2X26200		SHEET 3 OF 3	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
75		30 31 23	S-17	75 - 76.5	14		ARGILITE, gray, soft (probable decomposed cobble/boulder)
80		100/1" RQD=0	S-18 RC-1	80 - 80.1 80.1 - 85	1 36	-52.0	(Refusal at 80.33-ft Probable top of bedrock) ARGILITE, gray, soft severely weathered and decomposed
85		RQD=0	RC-2	85 - 90	36		SAME (Driller had difficulty extracting cored sample from the core barrel due to the soft nature of the rock)
90						-61.9	Bottom of Hole at 90'.
95							
100							
105							
110							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. JE-B2

LOG OF TEST BORING

JACOBS	PROJECT	DUDLEY SQUARE DEMOLITION PROJECT	BORING NO. JE-B3
	LOCATION	2262 Washington Street	
	OWNER	BOSTON REDEVELOPMENT AUTHORITY	
	JOB NUMBER	E2X26200	SHEET 1 OF 3

INSPECTOR	B. Marquis	CONTRACTOR	NH boring Inc	DRILLER	B. Thompson	ELEVATION	28.0
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	CME-50T	DATUM	FT MSL
82.0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER	140 lb Auto	GRID N	4941.715
90.0	NX Rock Core	7/2/2007	14 / Upon Completion (In Casing)			COORD E	5187.3648
						DATE START	6/28/07
						DATE END	7/2/07

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
							Removed Sidewalk brick and mortar
		20 15 10 11	S-1	1 - 3	8		Brown well graded SAND, fine to coarse, medium dense, trace asphalt (FILL).
5		9 9 8 5	S-2	4 - 6	6		Brown well graded SAND, fine to coarse, medium dense, trace gravel
10		12 16 16 16	S-3	9 - 11	12		Brown well graded SAND, fine to coarse, medium dense
15		32 29 31	S-4	14 - 15.5	0		No Recovery
						10.5	
20		8 10 14	S-5	19 - 20.5	5		Brown Silty fine SAND
25		7 8 14	S-6	24 - 25.5	8		SAME
30		7 7 10	S-7	29 - 30.5	3		SAME
35		12	S-8	34 - 35.5	10		SAME

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. JE-B3

LOG OF TEST BORING

JACOBS			BORING NO.	JE-B3
	PROJECT	DUDLEY SQUARE DEMOLITION PROJECT		SHEET 2 OF 3
	LOCATION	2262 Washington Street		
	OWNER	BOSTON REDEVELOPMENT AUTHORITY		
	JOB NUMBER	E2X26200		

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		15 27					
40		18 18 28	S-9	39 - 40.5	11		Brown fine SAND , dense
45		11 16 24	S-10	44 - 45.5	18		Brown fine SAND, trace silt
50		23 29 35	S-11	49 - 50.5	13		Brown silty fine SAND with rusty thin layer of very fine sand, trace clumps of clay
						-24.5	
55		16 16 36	S-12	54 - 55.5	18		CLAY
60		28 34 43	S-13	59 - 60.5	13		SAME
65		14 14 17	S-14	64 - 65.5	16		CLAY with a thin lense of sand (Top 8"= clay, middle 4"=sand, bottom 4"=clay).
			U-1	66 - 68			(Wash boring to 66 ft. Shut down for the day) (Shelby tube)
						-40.0	
70		40 40 50/0"	S-15	68 - 69	14		Clayey TILL (gravel, sand and rock fragment)
		50	S-16	74 - 74.5	1		SAME (Refusal)

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. JE-B3

LOG OF TEST BORING

JACOBS			BORING NO.	JE-B3
	PROJECT	DUDLEY SQUARE DEMOLITION PROJECT		SHEET 3 OF 3
	LOCATION	2262 Washington Street		
	OWNER	BOSTON REDEVELOPMENT AUTHORITY		
	JOB NUMBER	E2X26200		

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
75							Wash boring to 82 ft.
80							(Probable to of Bedrock)
		RQD=0	RC-1	82 - 87	20	-54.0	Rock fragments and gravel, severely weatherered CONGLOMERATE rock. (Hole caved in at recovery of the barrel. Pull rod and capped pavement for the day.)
85							(Resume work on Monday 7/2/07. Dificulty dropping core barrel or driving casing beyond 87ft. Attempted to drive casing without luck. Telescope with 3" casing to 89ft. 3" core barrel could not be advanced. Took spilt spoon sample instead)
			120/6"	89 - 89.5	6		
90						-62.0	Gray decomposed rock, soft.
							Bottom of Hole at 89.5'.
95							
100							
105							
110							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. JE-B3

LOG OF TEST BORING

JACOBS	PROJECT	DUDLEY SQUARE DEMOLITION PROJECT	BORING NO. JE-B4
	LOCATION	2262 Washington Street	
	OWNER	BOSTON REDEVELOPMENT AUTHORITY	
	JOB NUMBER	E2X26200	SHEET 1 OF 3

INSPECTOR	B. Marquis	CONTRACTOR	NH Boring Inc	DRILLER	B. Thompson	ELEVATION	29.8
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	CME-50T	DATUM	FT MSL
80.2	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER	140 lb Auto	GRID N	4894.7989
101.0	NX Rock Core	7/9/2007	17 / 24 hour reading			COORD E	5182.0003
						DATE START	7/3/07
						DATE END	7/9/00

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		28 6 6	S-1	0 - 1.5	16		Brown and black SAND with miscellaneous construction debris. (FILL) (Sidewalk base material - brick and asphalt)
5							(Probable boulder and granite blocks. Difficulty driving casing. Changed out casing when the sampling spoon could not be driven through pinched casing. Unable to take sample . Roller bit to 9.0ft)
10		46 50/1"	S-2	9 - 9.6	5		Brown GRAVEL with sand. Trace crushed granite fragments, probable granite boulder (FILL)
15		6 7 5	S-3	15 - 16.5	10	▼	Brown well graded SAND, trace gravel. (Lost drilling fluid) (Difficulty driving casing below 16-ft)
20		5 7 8	S-4	20 - 21.5	13		SAME (Due to damage and difficulty driving casing, extract 4-in ch casing and replaced with 5-inch casing and driven to 25-ft)
						6.8	
25		6 7 8	S-5	25 - 26.5	12		Brown SILTY SAND, trace gravel
30		6 7 7	S-6	30 - 31.5	16		SAME
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. JE-B4

LOG OF TEST BORING

JACOBS

PROJECT	DUDLEY SQUARE DEMOLITION PROJECT
LOCATION	2262 Washington Street
OWNER	BOSTON REDEVELOPMENT AUTHORITY
JOB NUMBER	E2X26200

BORING NO. JE-B4

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		3 4 8	S-7	35 - 36.5	8		SAME
40		4 6 12	S-8	40 - 41.5	18		Olive green SILTY SAND with 5-inch clay lense at top of spoon.
45		6 8 12	S-9	45 - 46.5	14		Brown SILTY SAND
50		4 10 16	S-10	50 - 51.5	16		Brown SILTY SAND with clumps of clay
55		9 12 18	S-11	55 - 56.5	18		SAME
						-27.7	
60		6 2 3	S-12	60 - 61.5	18		CLAYEY SAND TTop 9 inches) Bottom 9-inches = clay
			U-1	62 - 64	24		CLAY
65		WOR 4 4	S-13	64 - 65.5	18		CLAY (Top 15-inch = clay, Bottom 3-inch = clayey sand and gravel)
						-36.2	
70		25 20 22	S-14	70 - 71.5	17		Brown to black GRAVEL with silty coarse sand (TILL)

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. JE-B4

LOG OF TEST BORING

JACOBS	PROJECT	DUDLEY SQUARE DEMOLITION PROJECT	BORING NO.	JE-B4
	LOCATION	2262 Washington Street		
	OWNER	BOSTON REDEVELOPMENT AUTHORITY		
	JOB NUMBER	E2X26200		SHEET 3 OF 3

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
75		24 40 34	S-15	75 - 76.5	10		SAME with rust iron stain
		65 61 100/2"	S-16	79 - 80.2	9		Rust to brown TILL, very dense, intact. (Refusal may be possible top of Bedrock)
80		RQD=0	RC-1	80.2 - 85	20	-50.2	CONGLOMERATE - Rust to brown, coarse grained with pebbles. Mostly gravel recovery or dissintigrated weak sedementary rock. (Take split spoon sample)
85		27 66 71	S-17	85 - 86.5	14		Intact possible sedimentary bedrock CONGLOMERATE with pebblescoarse sand and silt
		38 100/5"	S-18	89 - 89.9	9		Gray to brown CONGLOMERATE (Possible decomposed bedrock)
90		RQD=0	RC-2	91 - 96	20		CONGLOMERATE - brown, soft and fragile, disintegrates when squeezed by hand
95		RQD=33	RC-3	96 - 101	54		SAME
100						-71.2	Bottom of Hole at 101'.
105							
110							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. JE-B4

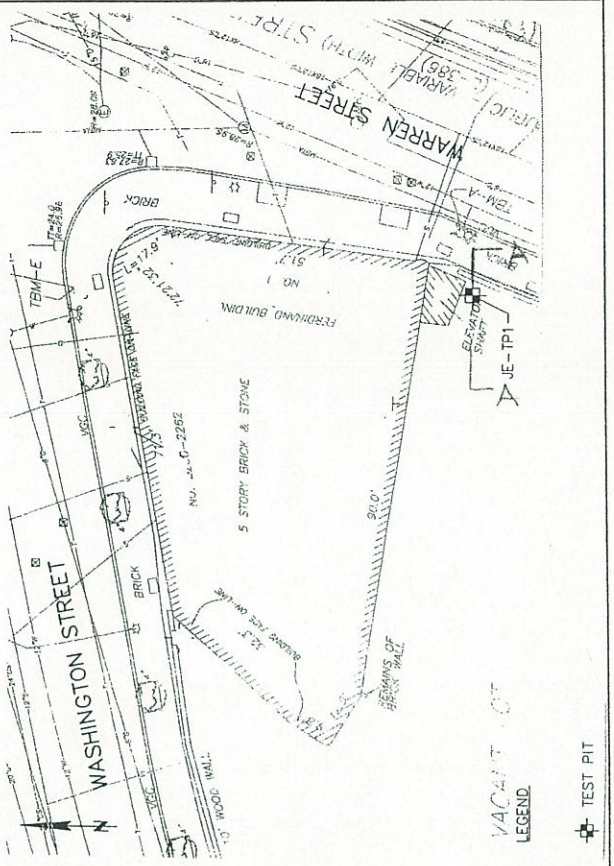
LOG OF TEST PIT

JACOBS	PROJECT	DUDLEY SQUARE	TEST PIT NO.	JE-TP1
	LOCATION	2262 Washington Street		
	OWNER	BOSTON REDEVELOPMENT AUTHORITY		SHEET 1 OF 1
	JOB NUMBER	E2X26200		

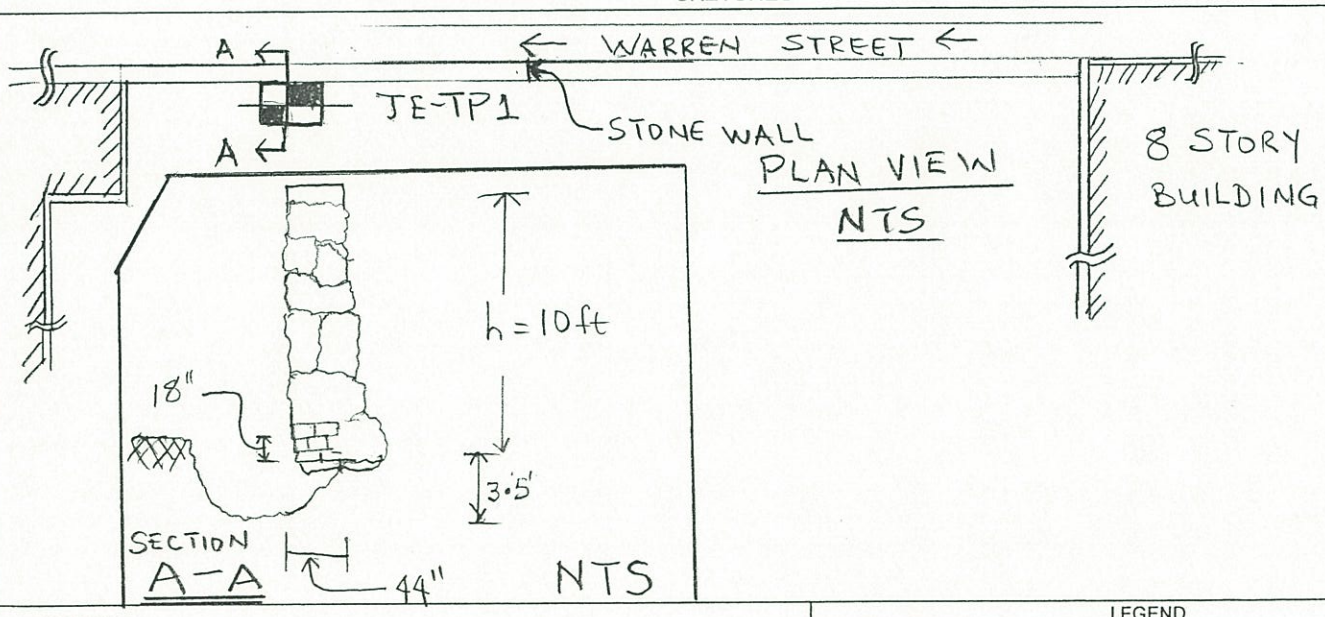
CONTRACTOR	NH Boring Inc	GROUNDWATER READING			OPERATOR	D Thompson	ELEVATION	20.6
EXCAVATOR	Mini Excavator	DATE/TIME	DEPTH(ft)	REMARKS	INSPECTOR	B. Marquis	DATUM	FT MSL
BUCKET	0.25 cy				DATE START	7/12/2007	GRID N	4847.0668
					DATE END	7/12/2007	COORD E	5159.3732

DEPTH (ft)	STRATA SYMBOL	ELEV (ft)	FIELD CLASSIFICATION AND REMARKS
		17.10	FILL, consisting of well graded sand, gravel boulders and construction debris.
5			
10			
15			TEST PIT DIMESION 8'X 6' X 3.5' Bottom portion of wall is Comprised of Red mason bricks which is adjoined to the north with Concrete Slab
20			

PLAN VIEW



SKETCHES



REMARKS:

LEGEND

WATER LEVEL | JAR SAMPLE | BAG SAMPLE

RELATIVE PROPORTIONS		TEST PIT NO.	JE-TP1
< 10%	TRACE		
15 - 25%	LITTLE		
30 - 45%	SOME		
50 - 100%	MOSTLY		

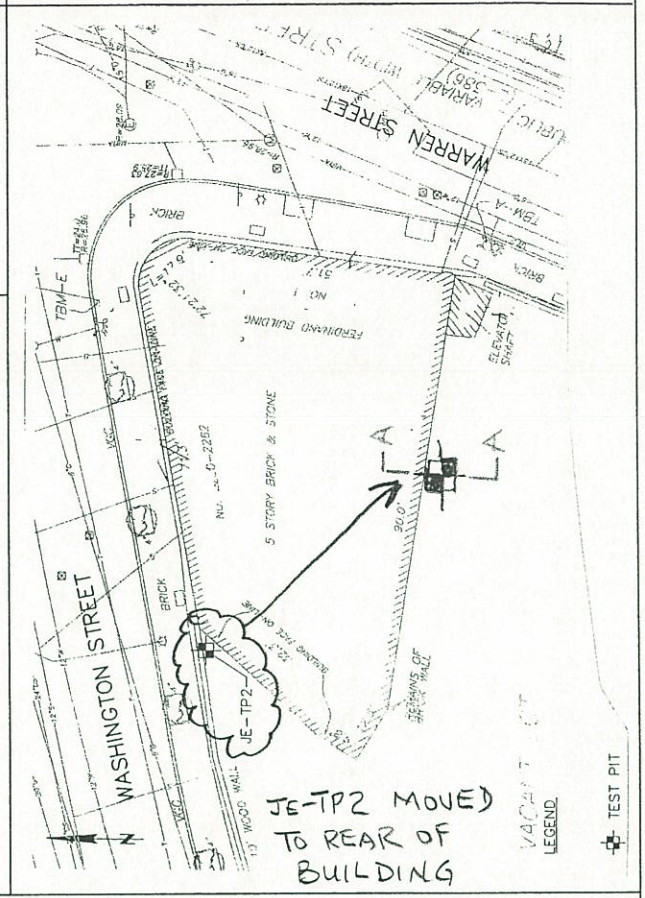
LOG OF TEST PIT

JACOBS	PROJECT	DUDLEY SQUARE	TEST PIT NO.	JE-TP-2
	LOCATION	2262 Washington Street		
	OWNER	BOSTON REDEVELOPMENT AUTHORITY		SHEET 1 OF 1
	JOB NUMBER	E2X26200		

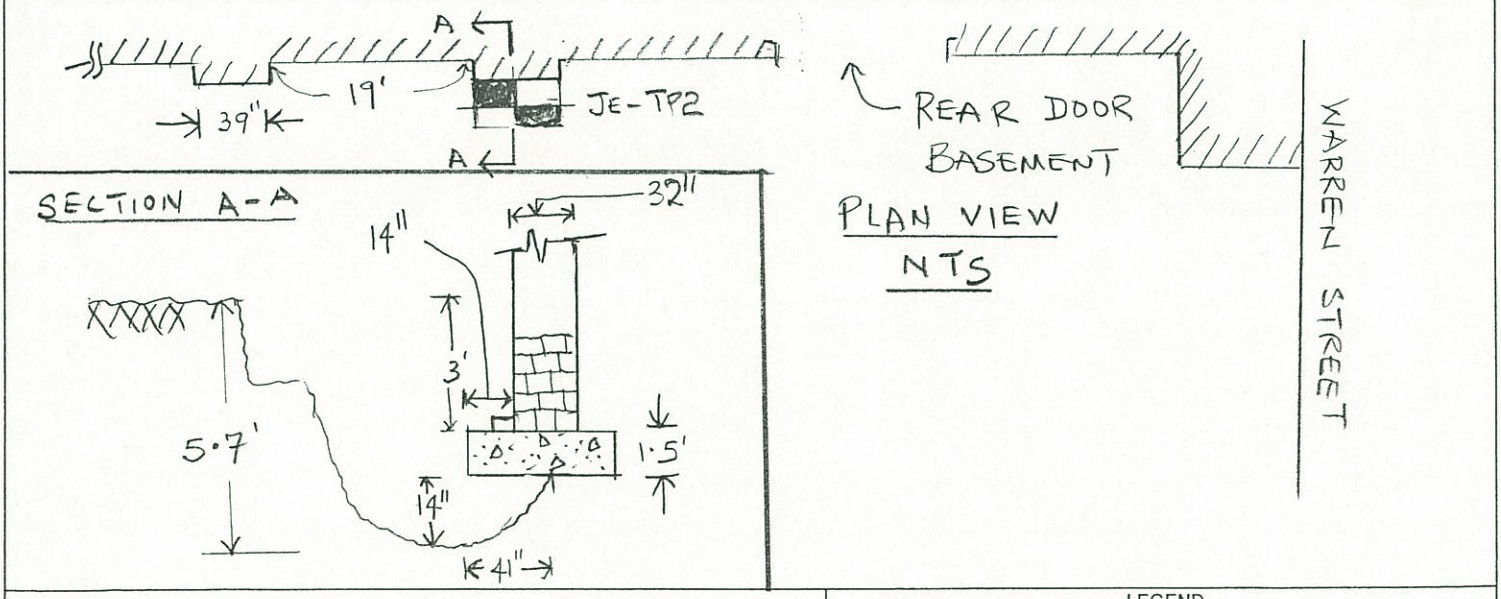
CONTRACTOR	NH Boring Inc	GROUNDWATER READING			OPERATOR	D Thompson	ELEVATION	19.3
EXCAVATOR	Mini Excavator	DATE/TIME	DEPTH(ft)	REMARKS	INSPECTOR	B. Marquis	DATUM	FT MSL
BUCKET	0.25 cy				DATE START	7/12/2007	GRID N	4881.0855
					DATE END	7/12/2007	COORD E	5123.5457

DEPTH (ft)	STRATA SYMBOL	ELEV (ft)	FIELD CLASSIFICATION AND REMARKS
5			FILL, well graded sand and miscellaneous construction debris
		12.80	Excavated TP to expose bottom of footing. Undermine bottom of footing with Shovel
10			
15			
20			

PLAN VIEW



SKETCHES



REMARKS:

LEGEND

WATER LEVEL | JAR SAMPLE | BAG SAMPLE

RELATIVE PROPORTIONS		TEST PIT NO.	JE-TP-2
< 10%	TRACE		
15 - 25%	LITTLE		
30 - 45%	SOME		
50 - 100%	MOSTLY		

LOG OF TEST PIT

JACOBS	PROJECT	DUDLEY SQUARE	TEST PIT NO.	JE-TP-3
	LOCATION	2262 Washington Street		SHEET 1 OF 1
	OWNER	BOSTON REDEVELOPMENT AUTHORITY		
	JOB NUMBER	E2X26200		

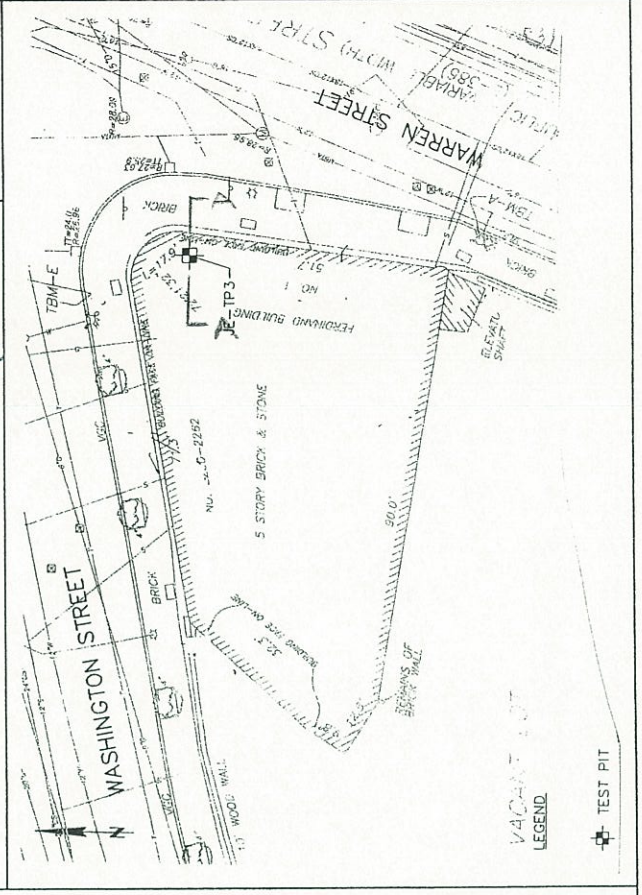
CONTRACTOR	NH Boring Inc	GROUNDWATER READING			OPERATOR	D Thompson	ELEVATION	20
EXCAVATOR	Mini Excavator	DATE/TIME	DEPTH(ft)	REMARKS	INSPECTOR	B. Marquis	DATUM	FT MSL
BUCKET	0.25 cy				DATE START	7/12/2007	GRID N	NOT
					DATE END	7/12/2007	COORD E	SURVEYED

DEPTH (ft)	STRATA SYMBOL	ELEV (ft)	FIELD CLASSIFICATION AND REMARKS
			FILL, consisting of well graded sand, gravel boulders and construction debris.
		15.50	
5			
10			
15			
20			

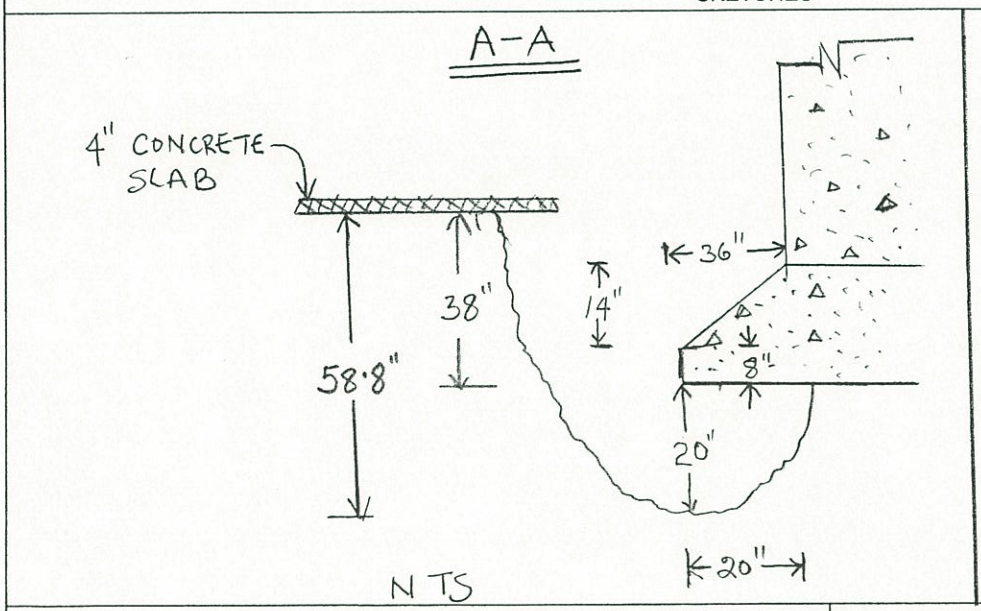
Test Pit is Located in the basement Level. Excavated TP to expose bottom of footing. Undermine bottom of footing with shovel

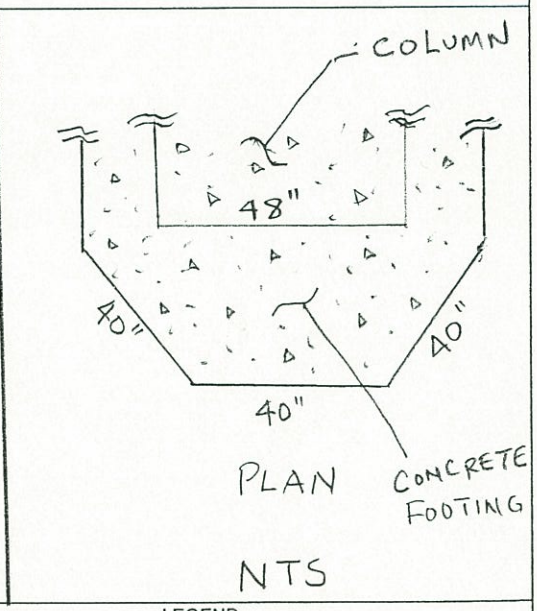
Test Pit Dimension
103" X 60" X 58"

PLAN VIEW



SKETCHES





REMARKS:

LEGEND

WATER LEVEL | JAR SAMPLE | BAG SAMPLE

RELATIVE PROPORTIONS		TEST PIT NO.	JE-TP-3
< 10%	TRACE		
15 - 25%	LITTLE		
30 - 45%	SOME		
50 - 100%	MOSTLY		

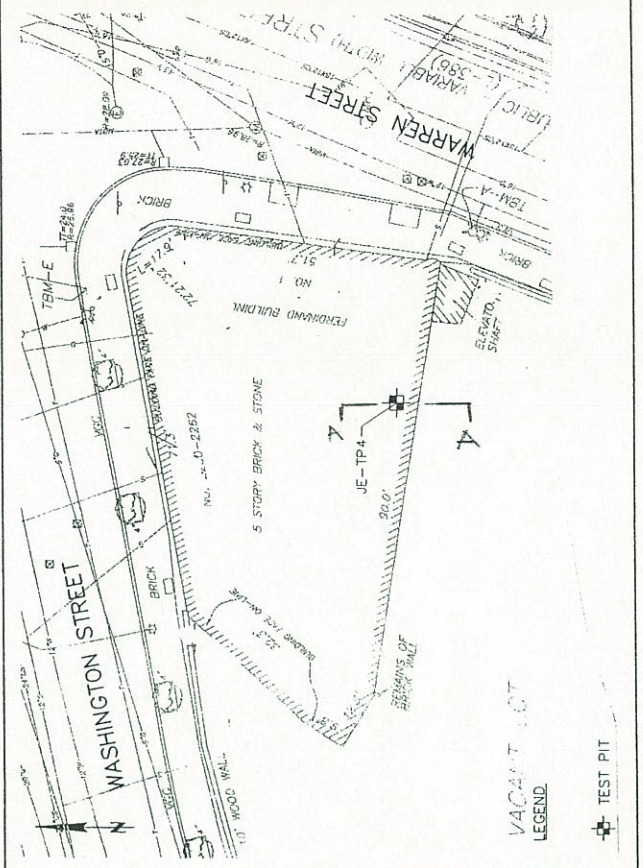
LOG OF TEST PIT

JACOBS	PROJECT	DUDLEY SQUARE	TEST PIT NO.	JE-TP-4
	LOCATION	2262 Washington Street		
	OWNER	BOSTON REDEVELOPMENT AUTHORITY		SHEET 1 OF 1
	JOB NUMBER	E2X26200		

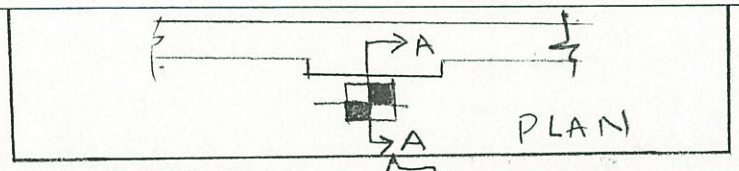
CONTRACTOR	NH Boring Inc	GROUNDWATER READING			OPERATOR	D Thompson	ELEVATION	20
EXCAVATOR	Mini Excavator	DATE/TIME	DEPTH(ft)	REMARKS	INSPECTOR	B. Marquis	DATUM	FT MSL
BUCKET	0.25 cy				DATE START	7/12/2007	GRID N	NOT
					DATE END	7/12/2007	COORD E	SURVEYED

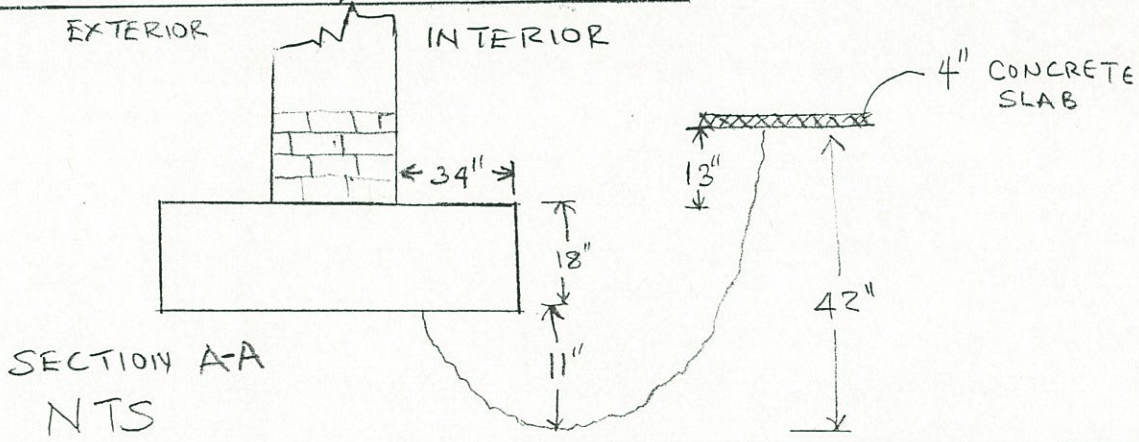
DEPTH (ft)	STRATA SYMBOL	ELEV (ft)	FIELD CLASSIFICATION AND REMARKS
			FILL, well graded sand
		16.50	
5			JE-TP4 is Located in the basement and Installed on the opposite side of JE-TP2
10			TEST PIT DIMENSION 7' x 5' x 3.5'
15			
20			

PLAN VIEW



SKETCHES





REMARKS:

LEGEND

WATER LEVEL | JAR SAMPLE | BAG SAMPLE

RELATIVE PROPORTIONS		TEST PIT NO.	JE-TP-4
< 10%	TRACE		
15 - 25%	LITTLE		
30 - 45%	SOME		
50 - 100%	MOSTLY		

Attachment B

Lab Results

GeoTesting
express
a subsidiary of Geocomp Corporation

1145 Massachusetts Avenue
Boxborough, MA 01719
978 635 0424 Tel
978 635 0266 Fax

Geotechnical Test Report

August 21, 2007

GTX-7642
BRA/Dudley Square – E2X26200 Project

Prepared for:

Jacobs Civil, Inc.

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	BRA/Dudley Square-E2X26200				
Location:				Project No:	GTX-7642
Boring ID: ---		Sample Type: ---		Tested By:	jbr
Sample ID:---		Test Date:	08/20/07	Checked By:	n/a
Depth : ---		Sample Id: ---			

Moisture Content of Soil - ASTM D 2216

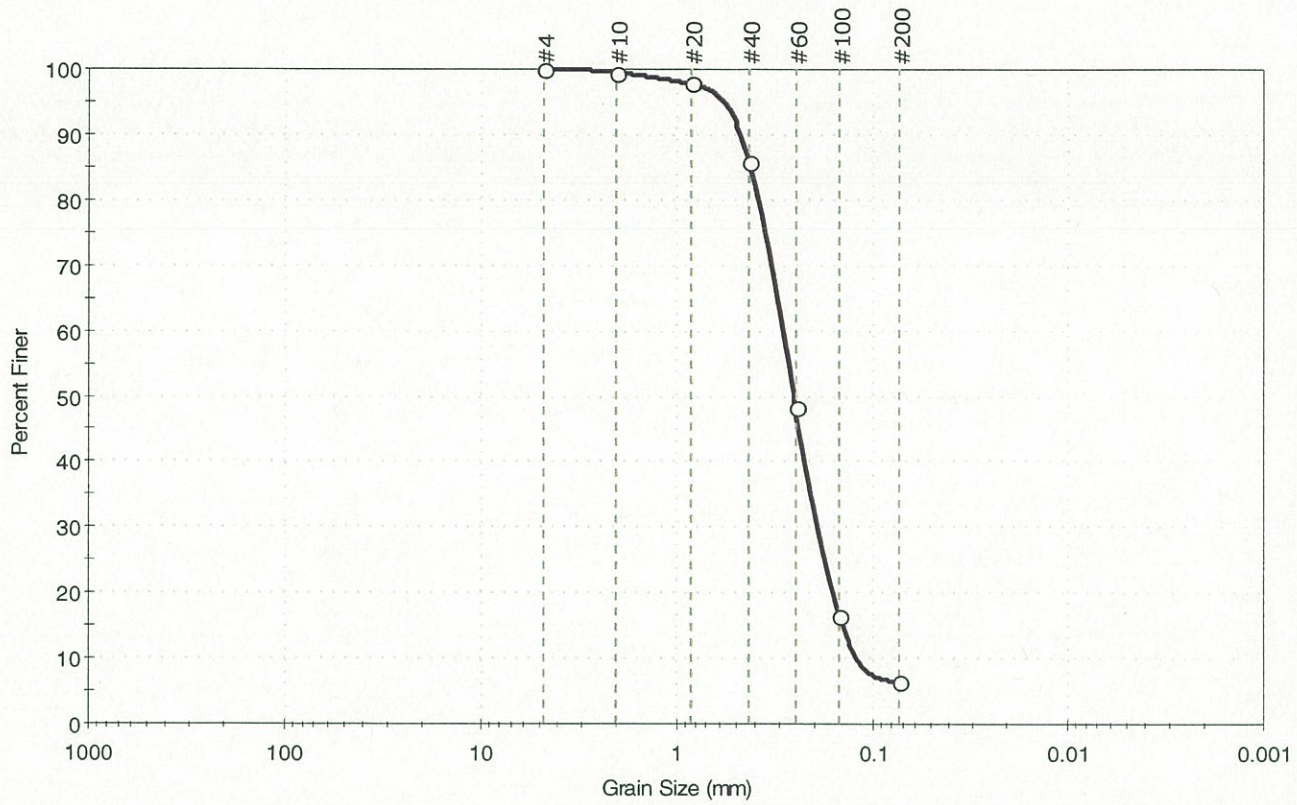
Boring ID	Sample ID	Depth	Description	Moisture Content,%
JE-B3	JE-B3-ST1	66-68 ft	Moist, greenish gray clay	38
JE-B4	JE-B4-ST1	62-64 ft	Moist, greenish gray clay	35

Notes: Temperature of Drying : 110º Celsius

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.		
Project:	BRA/Dudley Square-E2X26200		
Location:		Project No:	GTX-7642
Boring ID: JE-B1	Sample Type: jar	Tested By:	jbr
Sample ID:S-7	Test Date: 08/07/07	Checked By:	njh
Depth : 30-31.5 ft	Test Id: 116666		
Test Comment:	---		
Sample Description:	Moist, medium olive brown sand with silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	--	93.4	6.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	98		
#40	0.42	86		
#60	0.25	48		
#100	0.15	17		
#200	0.074	7		

Coefficients

D_{85} =0.4201 mm	D_{30} =0.1861 mm
D_{60} =0.2946 mm	D_{15} =0.1345 mm
D_{50} =0.2556 mm	D_{10} =0.0944 mm
C_u =3.121	C_c =1.245

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

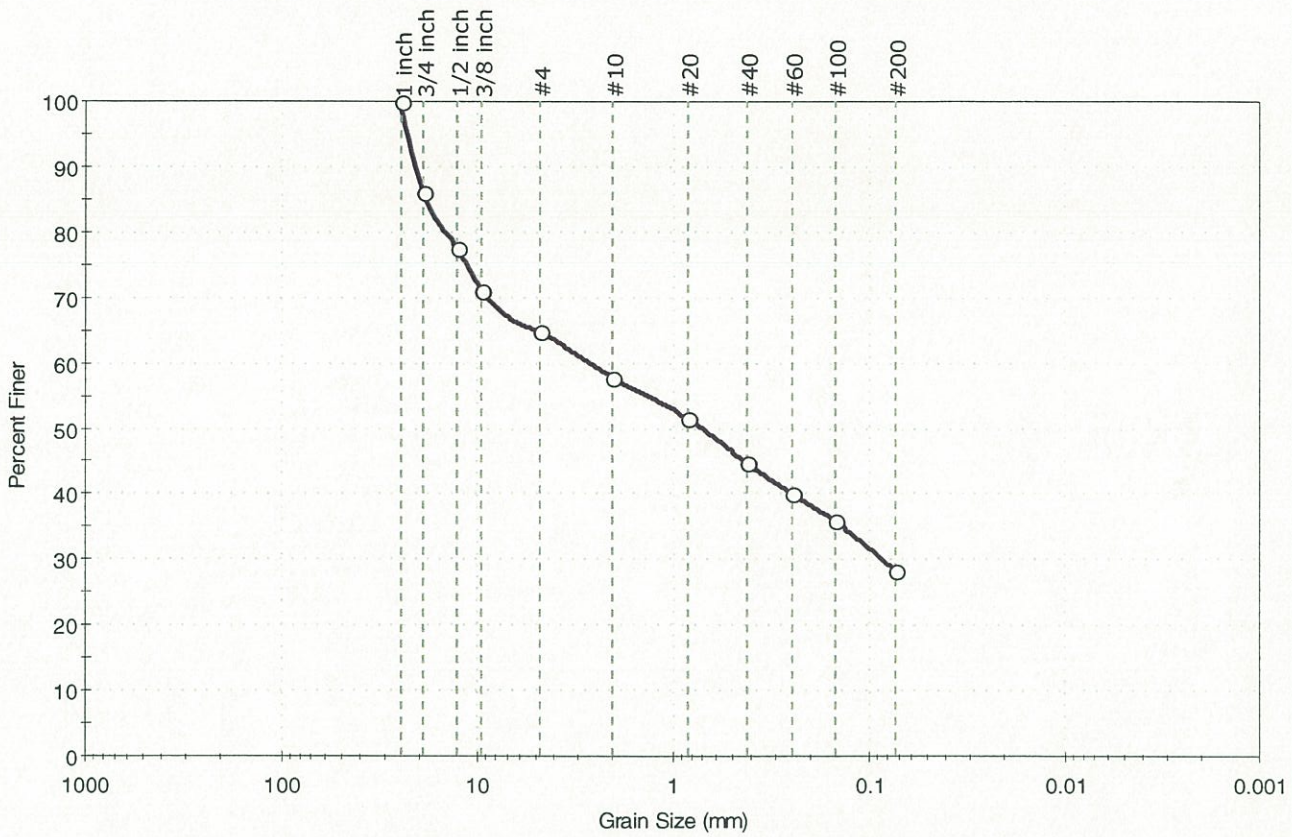
Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.		
Project:	BRA/Dudley Square-E2X26200		
Location:		Project No:	GTX-7642
Boring ID: JE-B2	Sample Type: jar	Tested By:	jbr
Sample ID:S-14B	Test Date: 08/12/07	Checked By:	njh
Depth : 62-64 ft	Test Id: 116667		
Test Comment:	---		
Sample Description:	Moist, dark yellowish brown clayey sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	35.2	36.5	28.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 inch	25.00	100		
3/4 inch	19.00	86		
1/2 inch	12.70	78		
3/8 inch	9.51	71		
#4	4.75	65		
#10	2.00	58		
#20	0.84	52		
#40	0.42	45		
#60	0.25	40		
#100	0.15	36		
#200	0.074	28		

Coefficients

D_{85} = 18.0553 mm	D_{30} = 0.0868 mm
D_{60} = 2.6399 mm	D_{15} = N/A
D_{50} = 0.7152 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

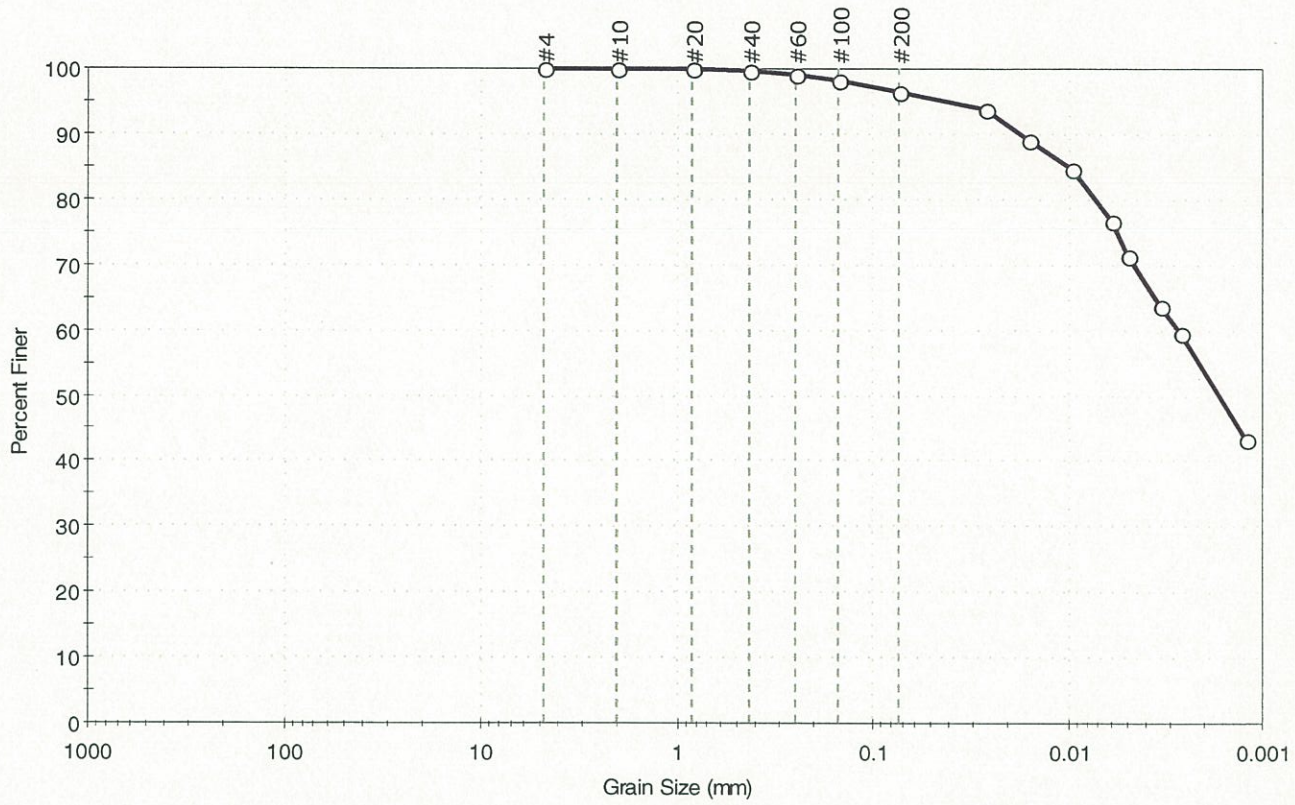
Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.		
Project:	BRA/Dudley Square-E2X26200		
Location:		Project No:	GTX-7642
Boring ID: JE-B3	Sample Type: tube	Tested By:	jbr
Sample ID:JE-B3-ST1	Test Date: 08/14/07	Checked By:	njh
Depth : 66-68 ft	Test Id: 116668		
Test Comment:	---		
Sample Description:	Moist, greenish gray clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	3.5	96.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	98		
#200	0.074	96		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0260	94		
---	0.0158	89		
---	0.0097	85		
---	0.0060	77		
---	0.0049	71		
---	0.0034	64		
---	0.0027	59		
---	0.0012	43		

Coefficients

D_{85} = 0.0100 mm	D_{30} = N/A
D_{60} = 0.0028 mm	D_{15} = N/A
D_{50} = 0.0017 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM lean clay (CL)

AASHTO Clayey Soils (A-7-6 (28))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

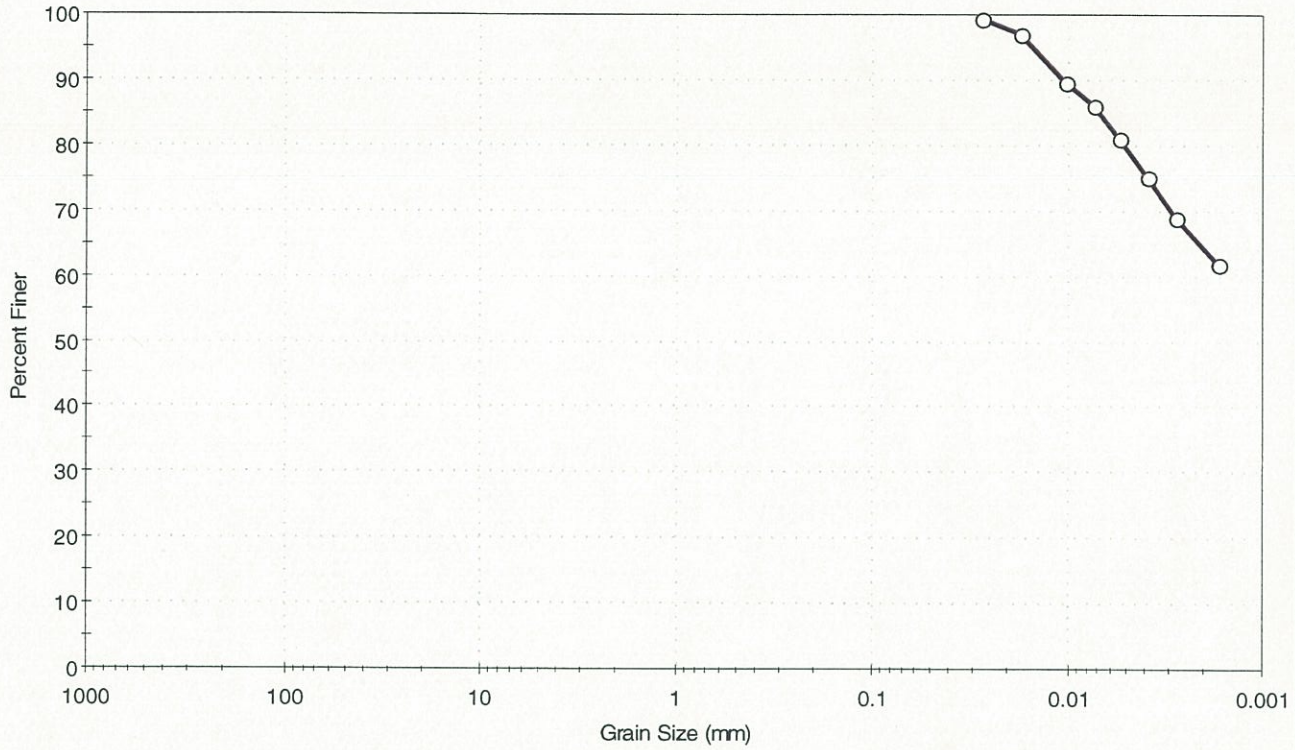
Sand/Gravel Hardness : HARD

printed 8/20/2007 9:58:51 AM

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.		
Project:	BRA/Dudley Square-E2X26200		
Location:		Project No:	GTX-7642
Boring ID: JE-B4	Sample Type: tube	Tested By:	jbr
Sample ID:JE-B4-ST1	Test Date: 08/15/07	Checked By:	jdt
Depth : 62-64 ft	Test Id: 116669		
Test Comment:	Hydrometer portion only as requested.		
Sample Description:	Moist, greenish gray clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	--	--	--

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0276	99		
---	0.0176	97		
---	0.0105	90		
---	0.0075	86		
---	0.0054	81		
---	0.0039	75		
---	0.0028	69		
---	0.0017	62		

Coefficients

D_{85} = 0.0070 mm	D_{30} = N/A
D_{60} = N/A	D_{15} = N/A
D_{50} = N/A	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO ()

Sample/Test Description

Sand/Gravel Particle Shape :

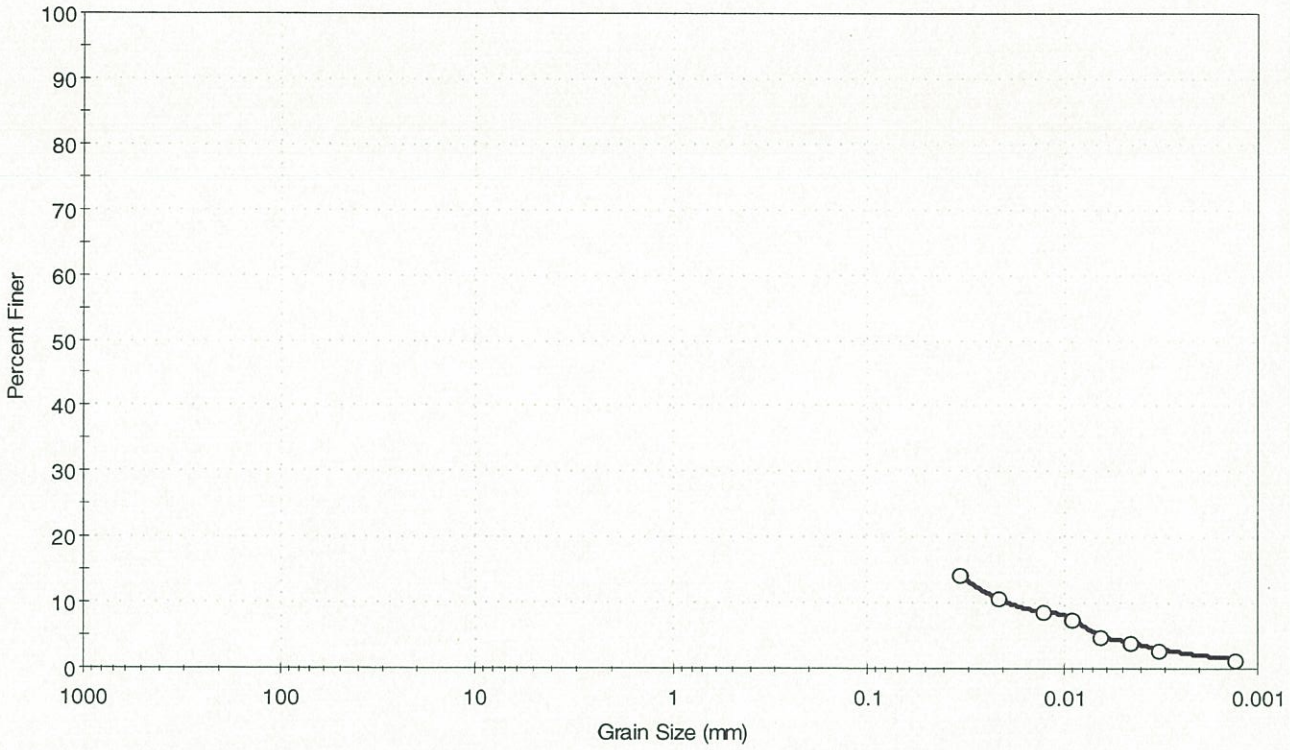
Sand/Gravel Hardness :

printed 8/21/2007 11:21:22 AM

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.		
Project:	BRA/Dudley Square-E2X26200		
Location:		Project No:	GTX-7642
Boring ID: JE-B4	Sample Type: jar	Tested By:	jbr
Sample ID:S-15	Test Date: 08/09/07	Checked By:	jdt
Depth : 75-76.5 ft	Test Id: 116670		
Test Comment:	Hydrometer portion only as requested.		
Sample Description:	Moist, olive clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	--	--	--

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0340	14		
---	0.0220	11		
---	0.0128	9		
---	0.0091	8		
---	0.0065	5		
---	0.0046	4		
---	0.0033	3		
---	0.0013	2		

Coefficients

D_{85} = N/A	D_{30} = N/A
D_{60} = N/A	D_{15} = N/A
D_{50} = N/A	D_{10} = 0.0179 mm
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO ()

Sample/Test Description

Sand/Gravel Particle Shape :

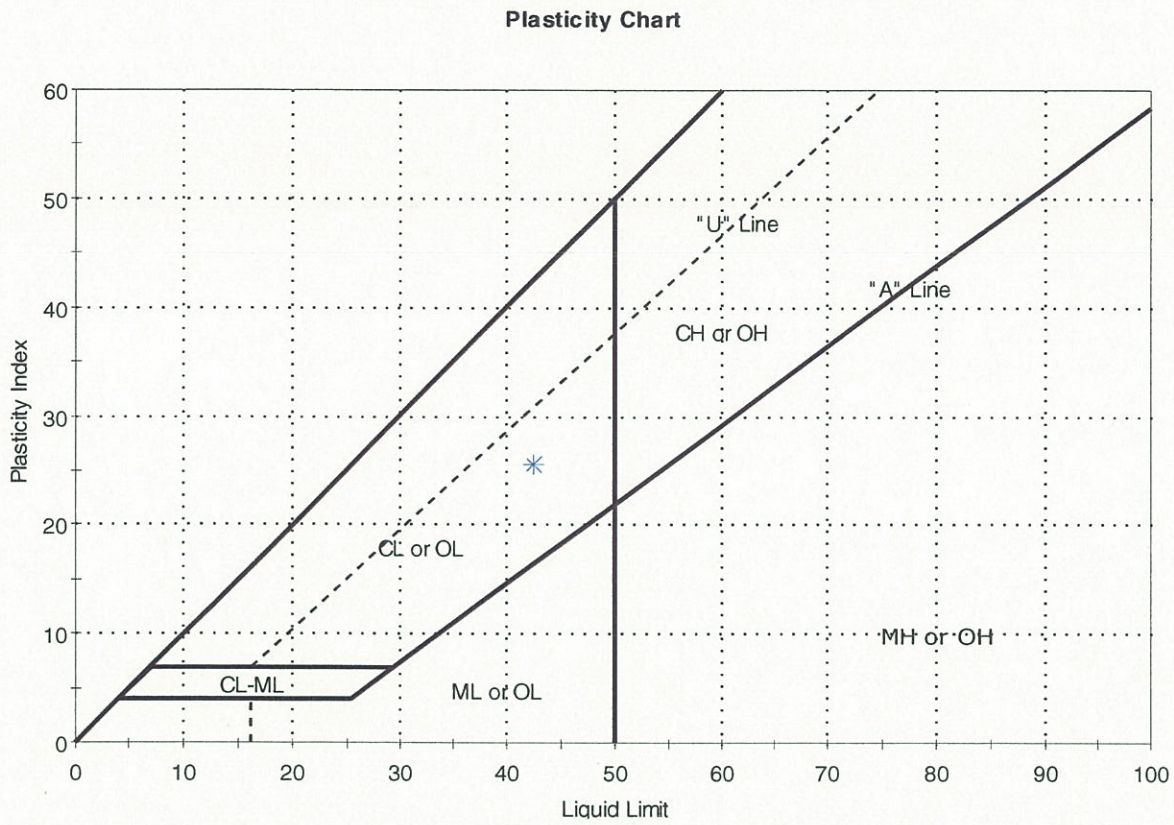
Sand/Gravel Hardness :

printed 8/21/2007 11:21:37 AM

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.		
Project:	BRA/Dudley Square-E2X26200		
Location:		Project No:	GTX-7642
Boring ID: JE-B3	Sample Type: tube	Tested By:	ap
Sample ID:JE-B3-ST1	Test Date: 08/15/07	Checked By:	njh
Depth : 66-68 ft	Test Id: 116664		
Test Comment:	---		
Sample Description:	Moist, greenish gray clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318



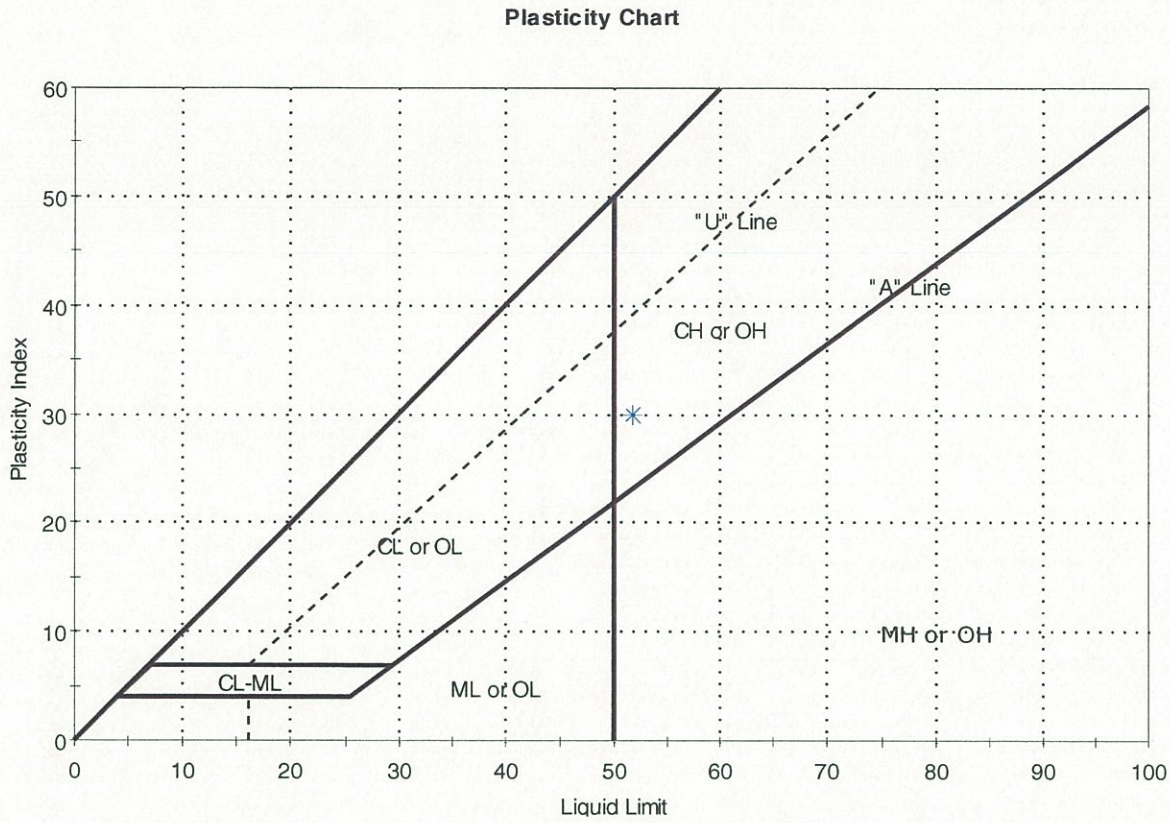
Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	JE-B3-ST1	JE-B3	66-68 ft	38	43	17	26	1	lean clay (CL)

Sample Prepared using the WET method
0% Retained on #40 Sieve
Dry Strength: VERY HIGH
Dilentancy: SLOW
Toughness: LOW

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.		
Project:	BRA/Dudley Square-E2X26200		
Location:		Project No:	GTX-7642
Boring ID: JE-B4	Sample Type: tube	Tested By:	ap
Sample ID:JE-B4-ST1	Test Date: 08/06/07	Checked By:	njh
Depth : 62-64 ft	Test Id: 116665		
Test Comment:	---		
Sample Description:	Moist, greenish gray clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	JE-B4-ST1	JE-B4	62-64 ft	35	52	22	30	0	

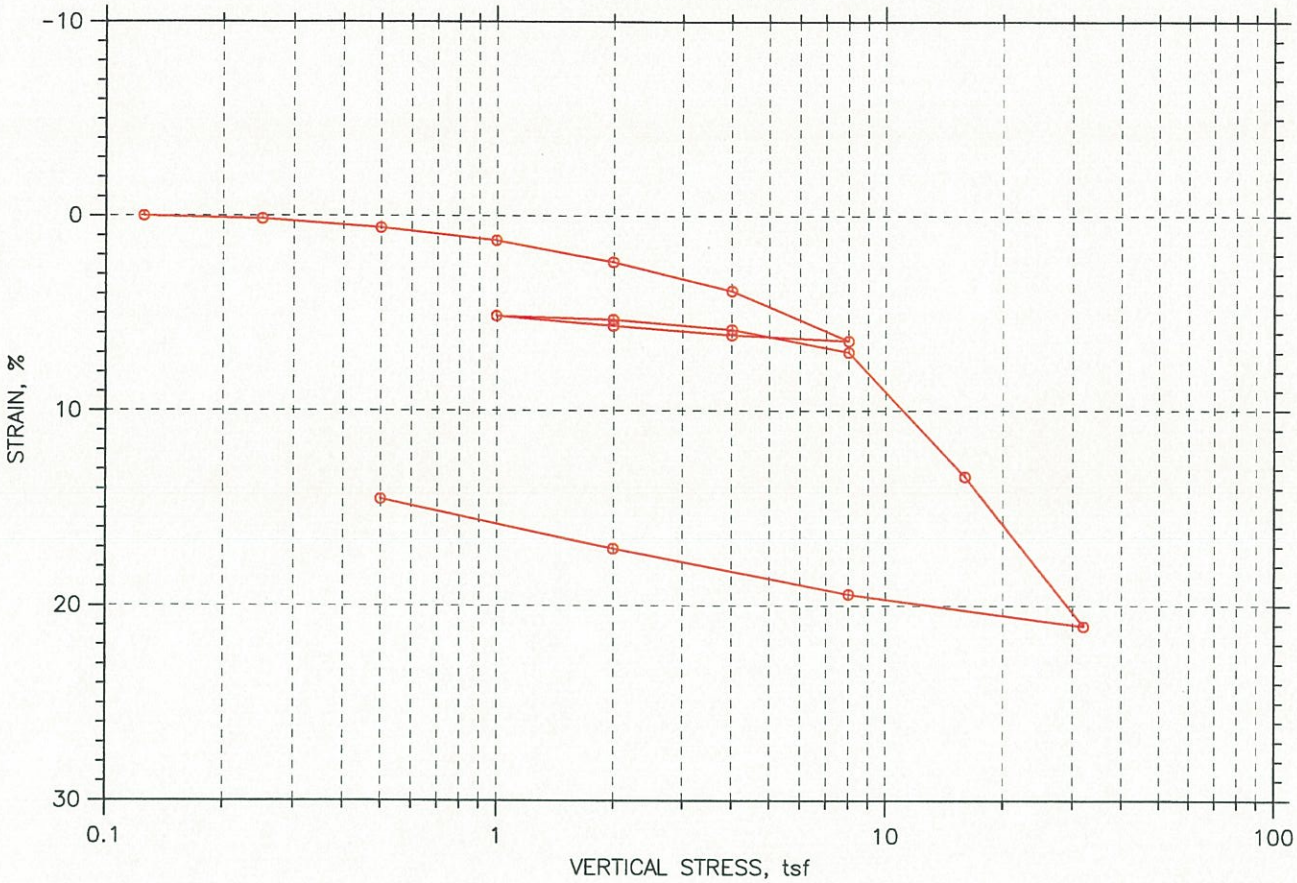
Sample Prepared using the WET method

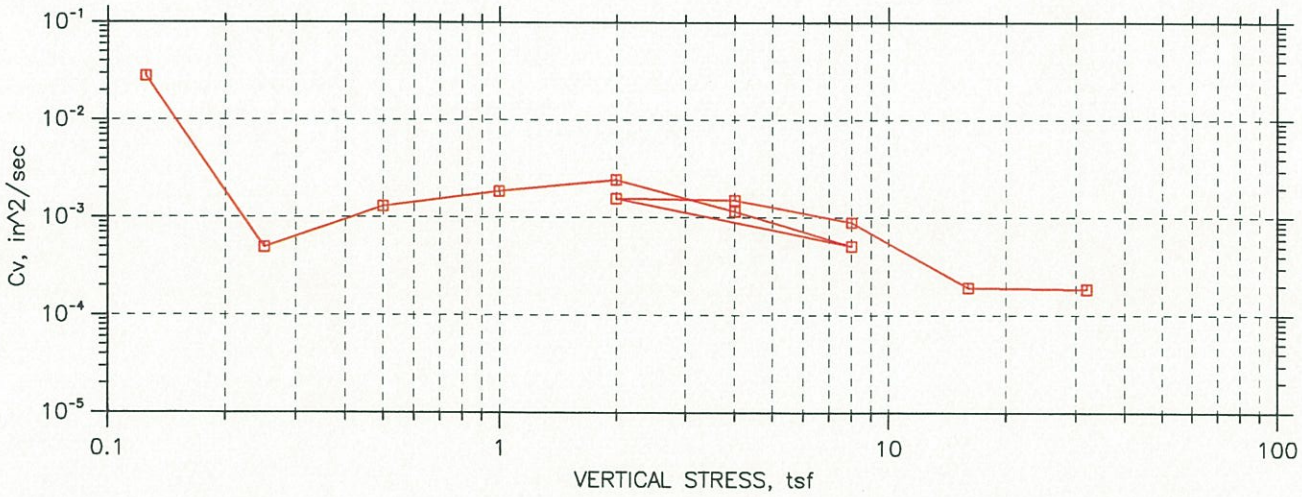
Dry Strength: VERY HIGH
Dilentancy: SLOW
Toughness: LOW

printed 8/20/2007 11:00:17 AM

CONSOLIDATION TEST DATA

SUMMARY REPORT



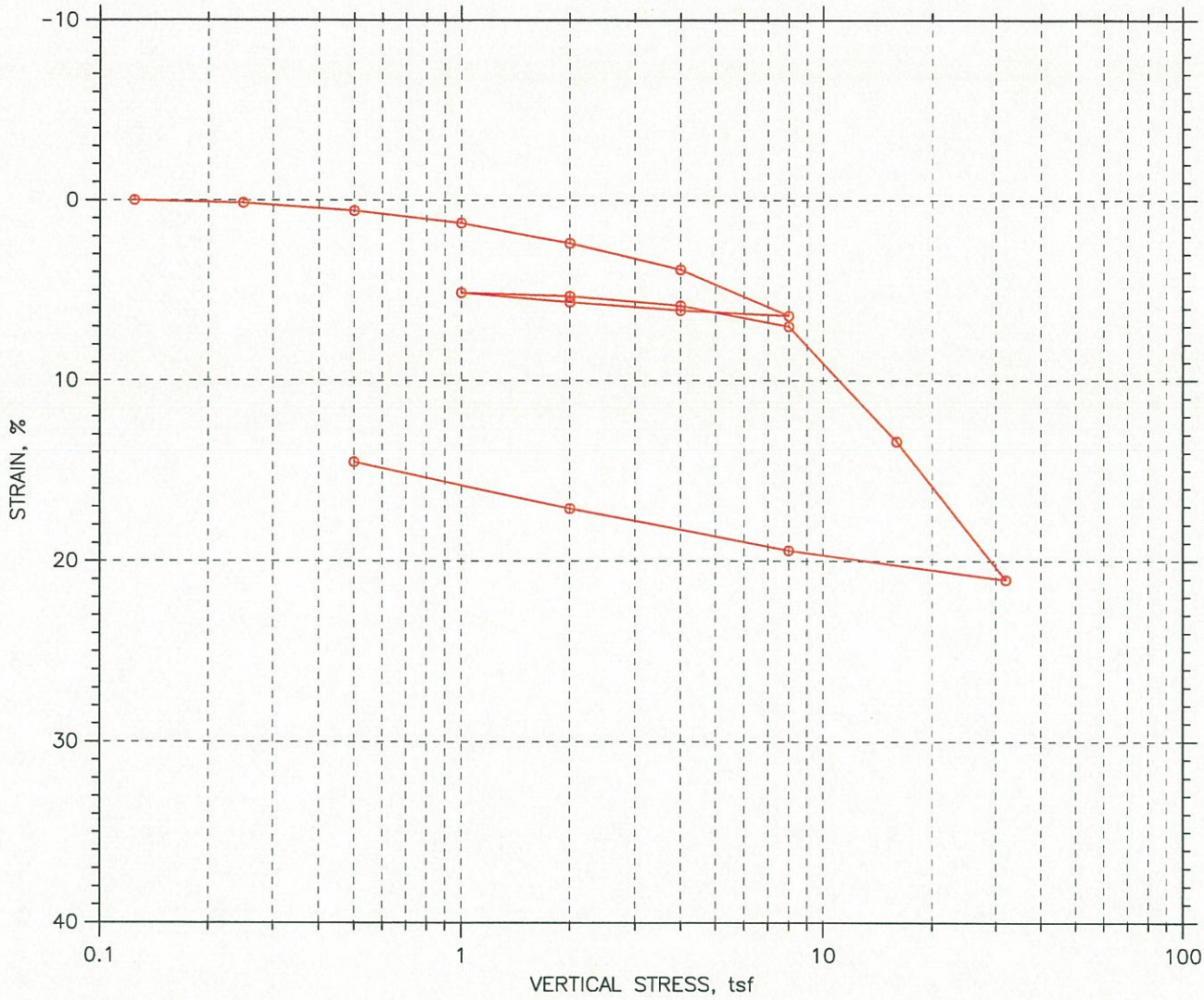


GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

Mon, 20-AUG-2007 10:35:48

CONSOLIDATION TEST DATA

SUMMARY REPORT



					Before Test	After Test
Overburden Pressure: ---				Water Content, %	46.41	34.54
Preconsolidation Pressure: ---				Dry Unit Weight, pcf	76.3	89.26
Compression Index: ---				Saturation, %	99.99	100.00
Diameter: 2.5 in		Height: 1 in		Void Ratio	1.31	0.98
LL: 52	PL: 22	PI: 30	GS: 2.82			

GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

Mon, 20-AUG-2007 10:35:50

CONSOLIDATION TEST DATA

Project: BRA/Dudley Square
Boring No.: JE-B-4
Sample No.: JE B4 ST-1
Test No.: C-1

Location: ---
Tested By: md
Test Date: 08/02/07
Sample Type: Tube

Project No.: GTX-7642
Checked By: jdt
Depth: 62-64 ft
Elevation: ---

Soil Description: Moist, greenish gray clay
Remarks: System C

Estimated Specific Gravity: 2.82
Initial Void Ratio: 1.31
Final Void Ratio: 0.98

Liquid Limit: 52
Plastic Limit: 22
Plasticity Index: 30

Initial Height: 1.00 in
Specimen Diameter: 2.50 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	3	RING		2050
Wt. Container + Wet Soil, gm	131.7	254.94	243.27	141.61
Wt. Container + Dry Soil, gm	97.58	209.31	209.31	107.35
Wt. Container, gm	8.08	110.99	110.99	8.16
Wt. Dry Soil, gm	89.5	98.32	98.32	99.19
Water Content, %	38.12	46.41	34.54	34.54
Void Ratio	---	1.31	0.98	---
Degree of Saturation, %	---	99.99	100.00	---
Dry Unit Weight, pcf	---	76.305	89.258	---

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.

CONSOLIDATION TEST DATA

Project: BRA/Dudley Square
Boring No.: JE-B-4
Sample No.: JE B4 ST-1
Test No.: C-1

Location: ---
Tested By: md
Test Date: 08/02/07
Sample Type: Tube

Project No.: GTX-7642
Checked By: jdt
Depth: 62-64 ft
Elevation: ---

Soil Description: Moist, greenish gray clay
Remarks: System C

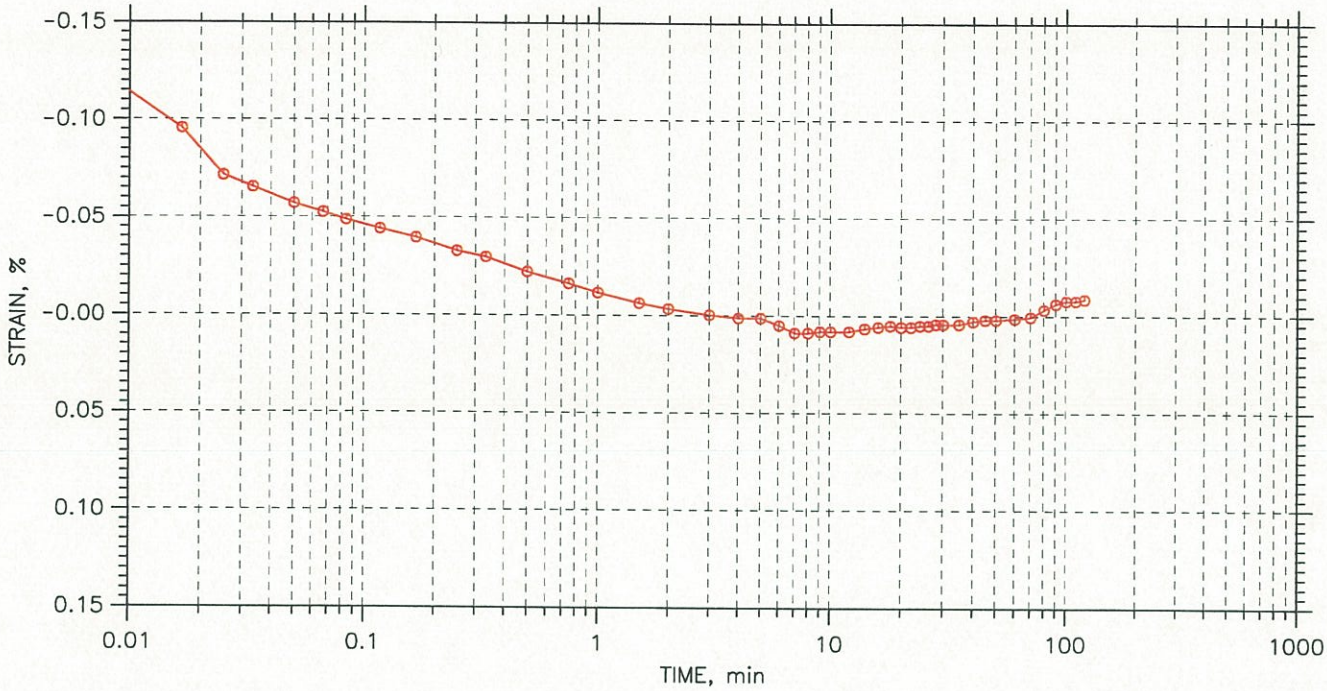
	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. in^2/sec	Coefficient of Consolidation Log in^2/sec	Coefficient of Consolidation Ave. in^2/sec
1	0.125	-8.741e-005	1.311	-0.01	0.0	0.0	2.79e-002	0.00e+000	2.79e-002
2	0.25	0.001457	1.308	0.15	1.7	0.0	4.90e-004	0.00e+000	4.90e-004
3	0.5	0.005896	1.297	0.59	0.6	0.0	1.30e-003	0.00e+000	1.30e-003
4	1	0.01254	1.282	1.25	0.4	0.0	1.86e-003	0.00e+000	1.86e-003
5	2	0.02361	1.256	2.36	0.3	0.0	2.43e-003	0.00e+000	2.43e-003
6	4	0.03834	1.222	3.83	0.7	0.0	1.15e-003	0.00e+000	1.15e-003
7	8	0.06395	1.163	6.40	1.3	1.6	5.52e-004	4.70e-004	5.07e-004
8	4	0.06095	1.170	6.10	0.3	0.0	2.89e-003	0.00e+000	2.89e-003
9	2	0.05624	1.181	5.62	0.9	0.0	7.72e-004	0.00e+000	7.72e-004
10	1	0.05121	1.193	5.12	2.1	2.5	3.49e-004	2.92e-004	3.18e-004
11	2	0.05307	1.188	5.31	0.5	0.0	1.56e-003	0.00e+000	1.56e-003
12	4	0.05819	1.177	5.82	0.5	0.0	1.50e-003	0.00e+000	1.50e-003
13	8	0.0698	1.150	6.98	0.9	0.8	8.32e-004	9.56e-004	8.90e-004
14	16	0.1336	1.002	13.36	3.3	3.7	2.03e-004	1.81e-004	1.92e-004
15	32	0.2104	0.825	21.04	2.8	3.3	2.01e-004	1.71e-004	1.85e-004
16	8	0.1941	0.863	19.41	0.5	0.0	9.92e-004	0.00e+000	9.92e-004
17	2	0.1707	0.916	17.07	4.7	5.7	1.16e-004	9.64e-005	1.05e-004
18	0.5	0.1451	0.976	14.51	18.5	16.9	3.15e-005	3.45e-005	3.29e-005

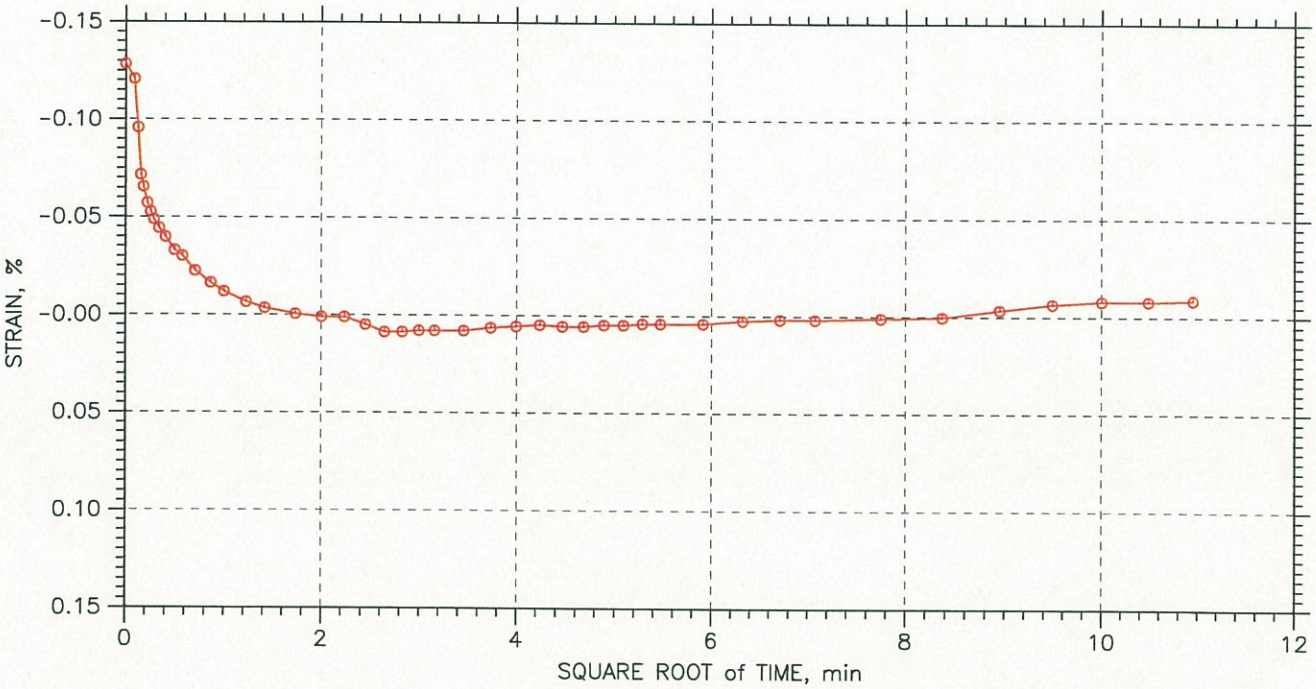
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 1 of 18

Stress: 0.125 tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

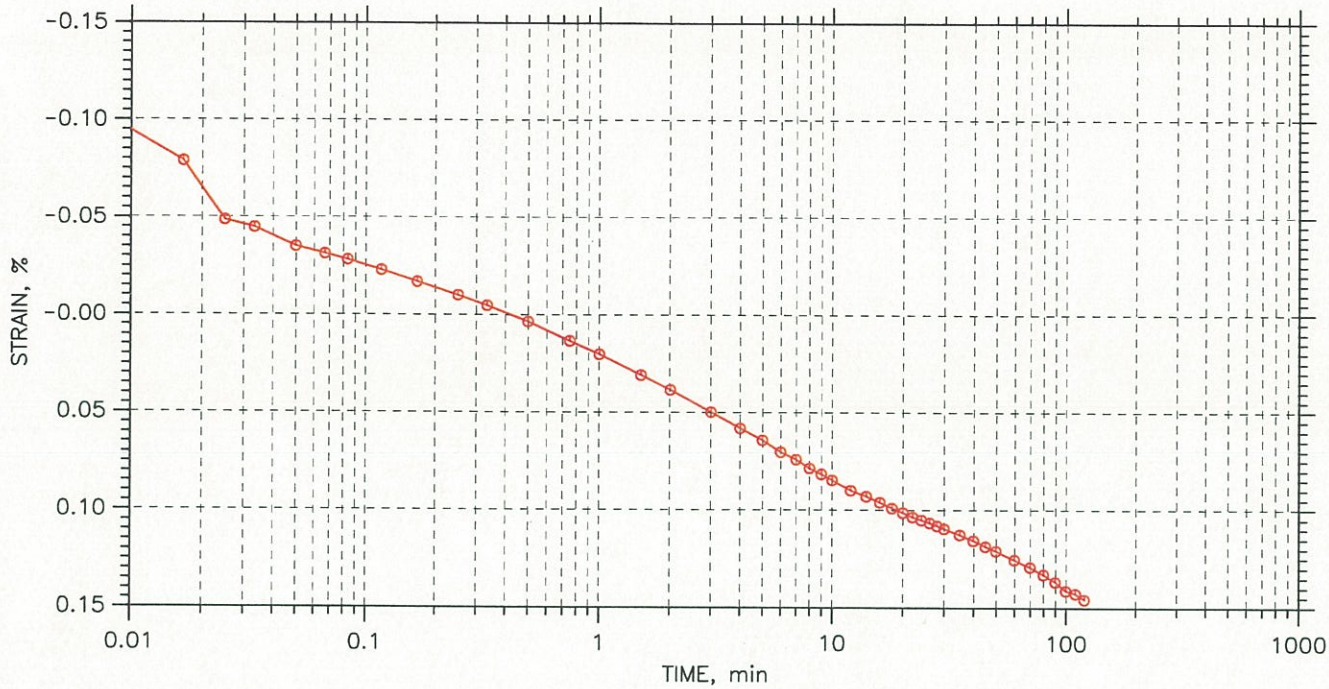
Mon, 20-AUG-2007 10:35:53

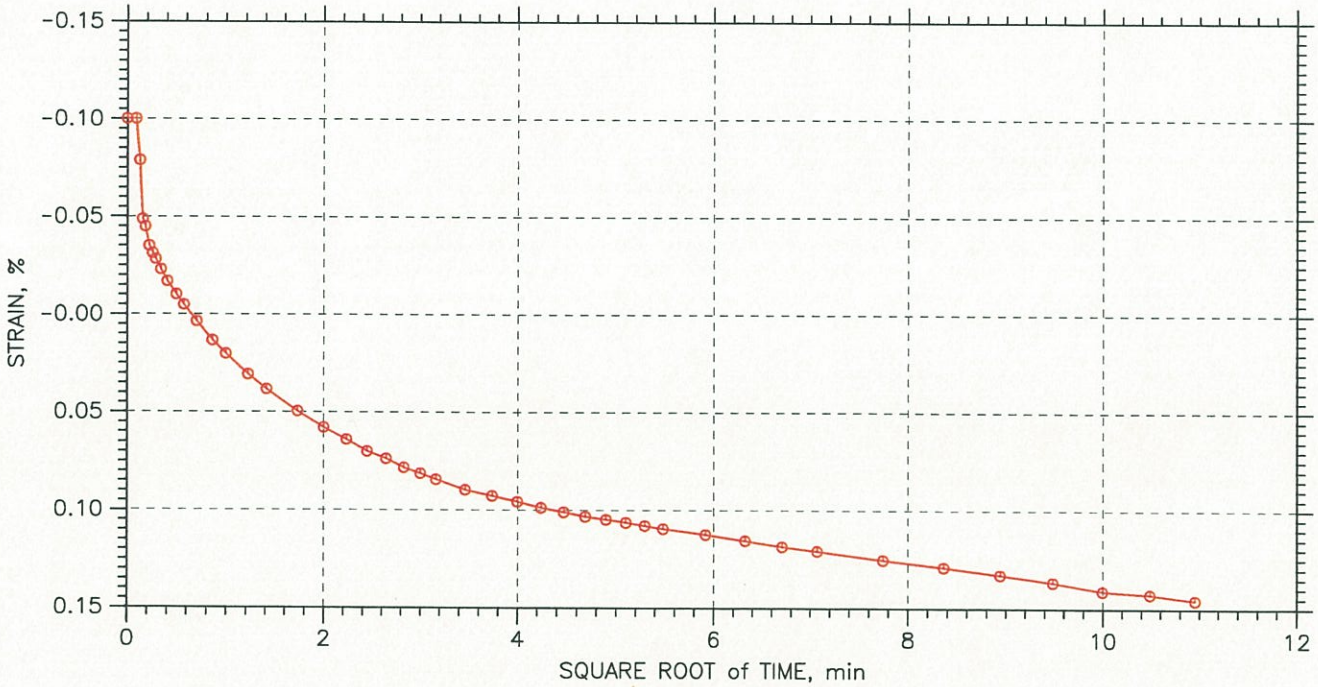
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 2 of 18

Stress: 0.25 tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

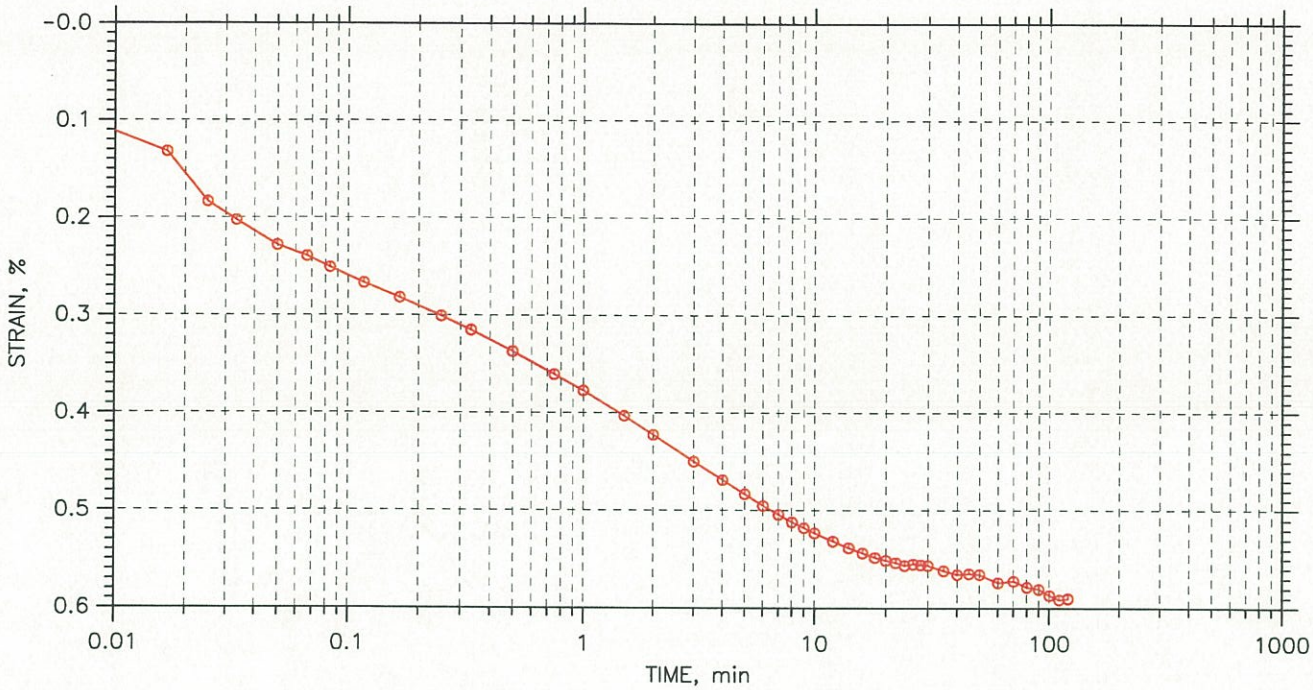
Mon, 20-AUG-2007 10:35:57

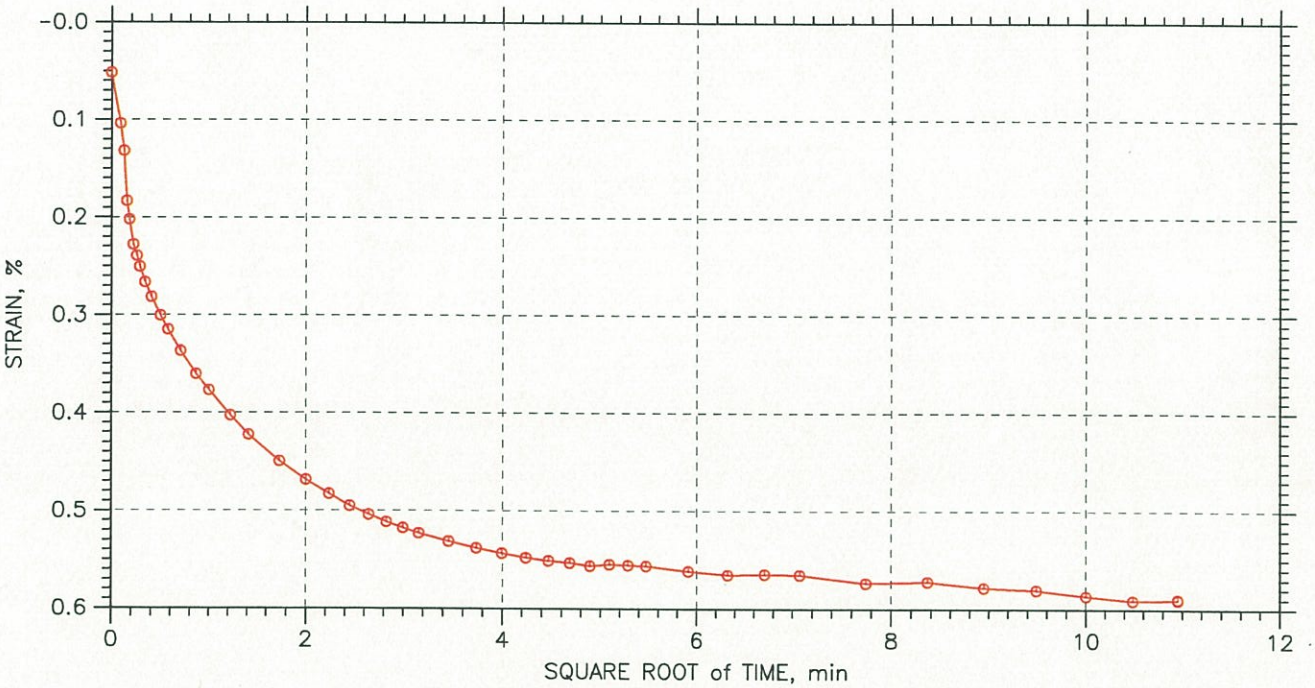
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 3 of 18

Stress: 0.5 tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

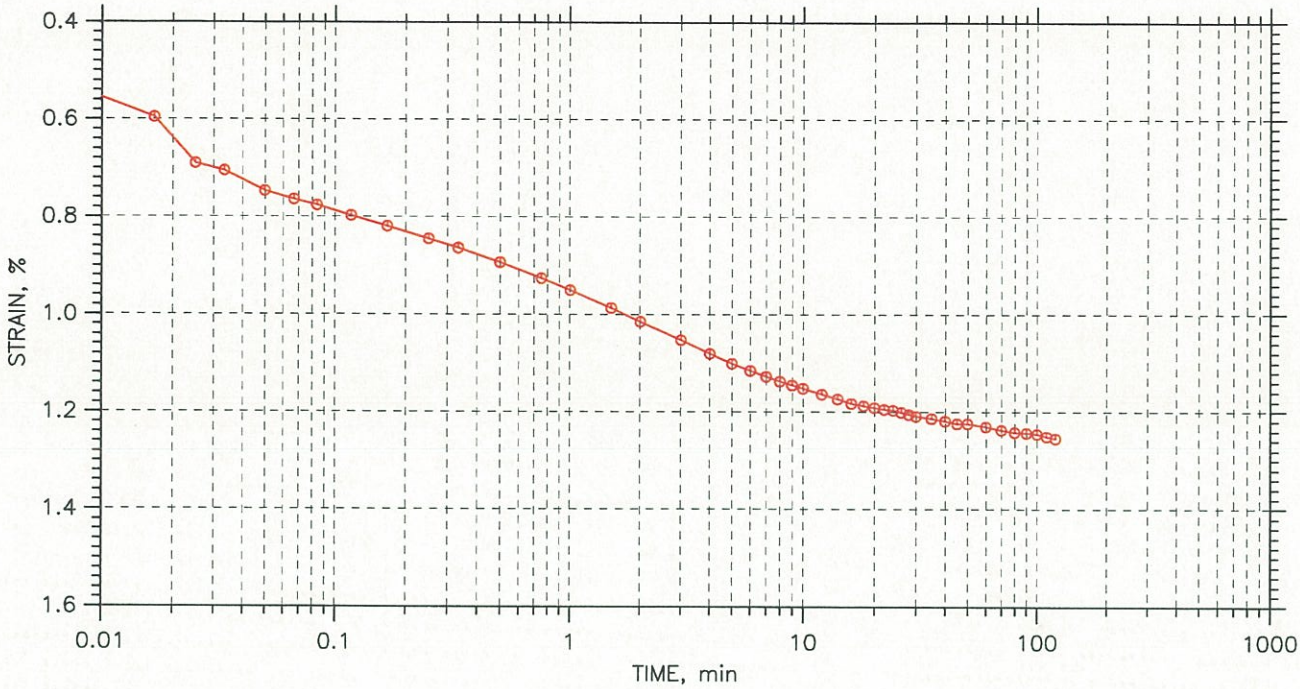
Mon, 20-AUG-2007 10:36:00

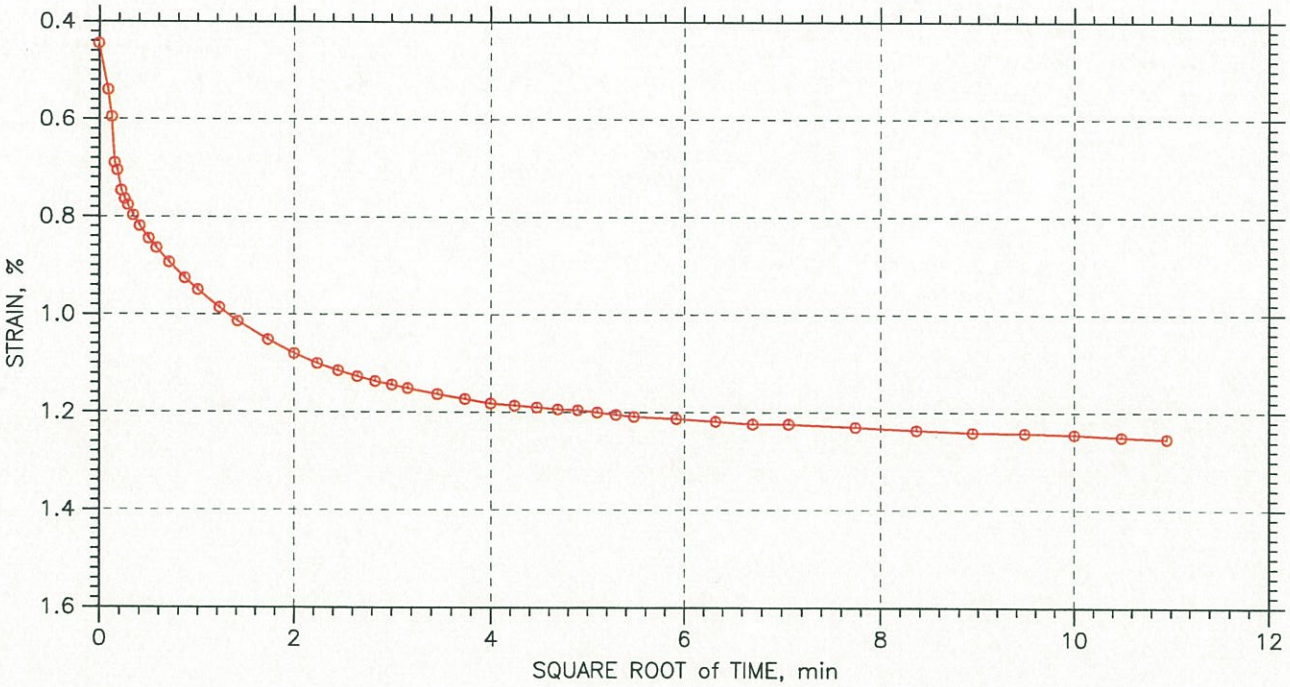
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 4 of 18

Stress: 1. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

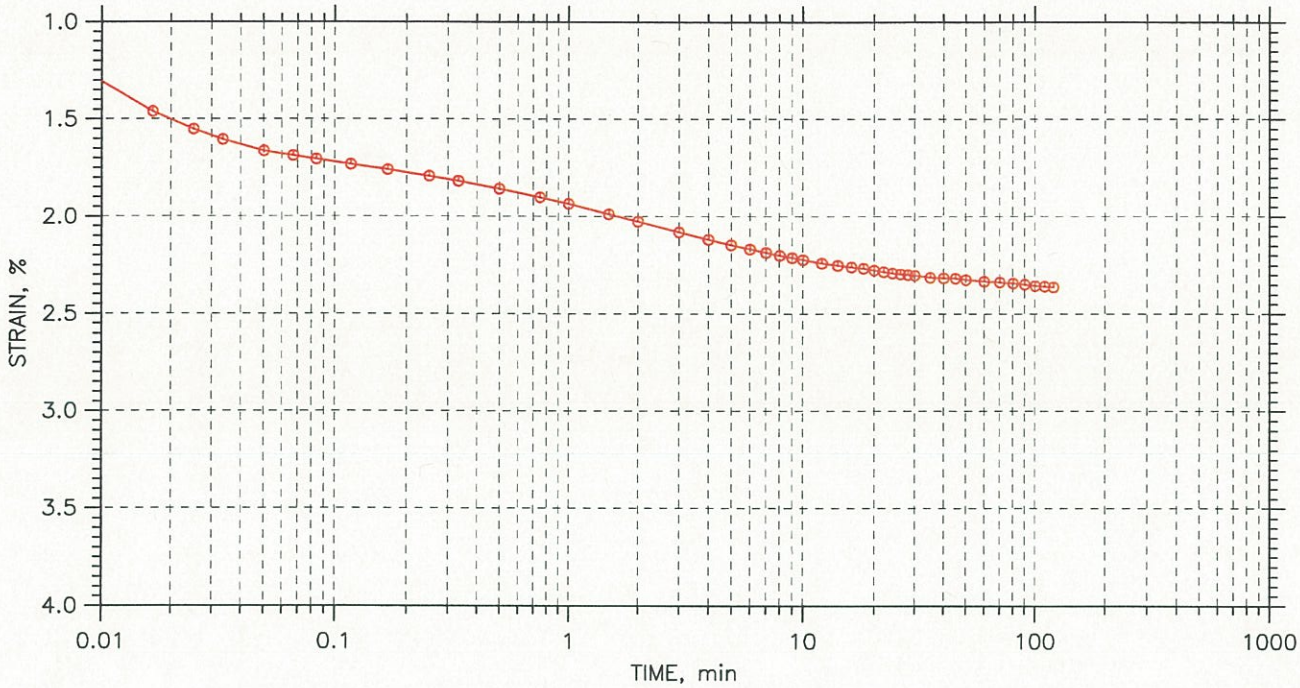
Mon, 20-AUG-2007 10:36:04

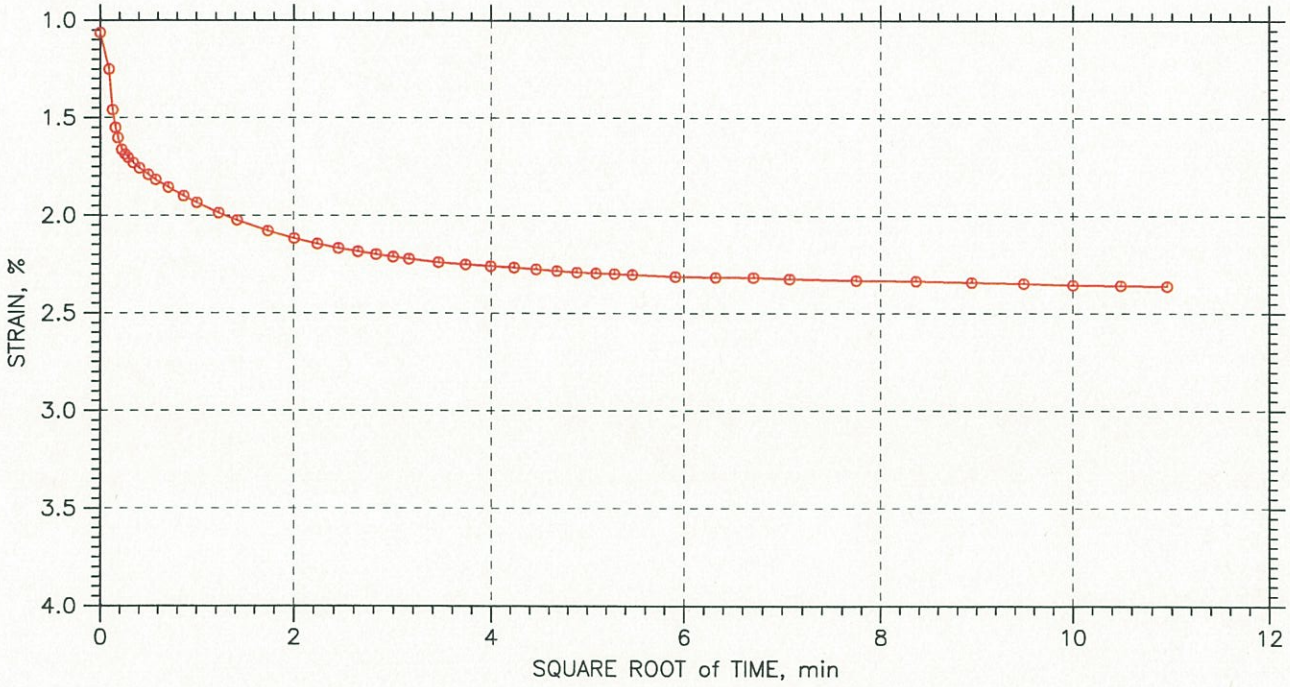
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 5 of 18

Stress: 2. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

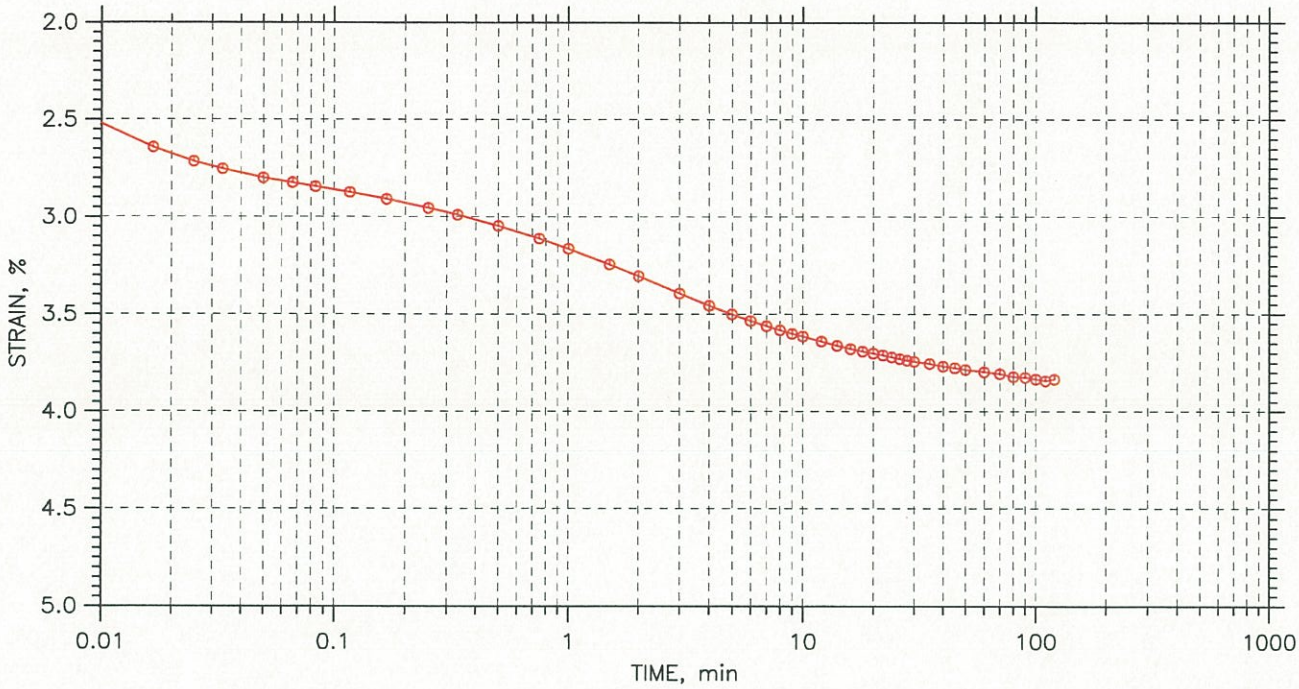
Mon, 20-AUG-2007 10:36:07

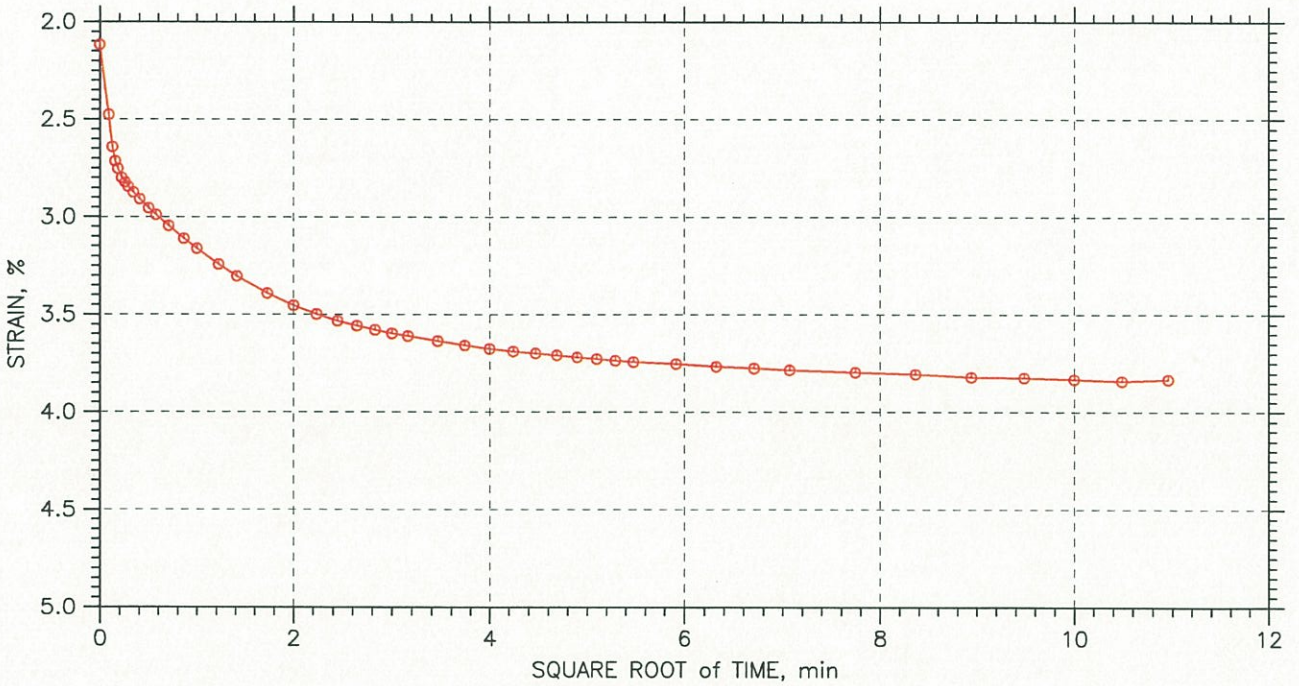
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 6 of 18

Stress: 4. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

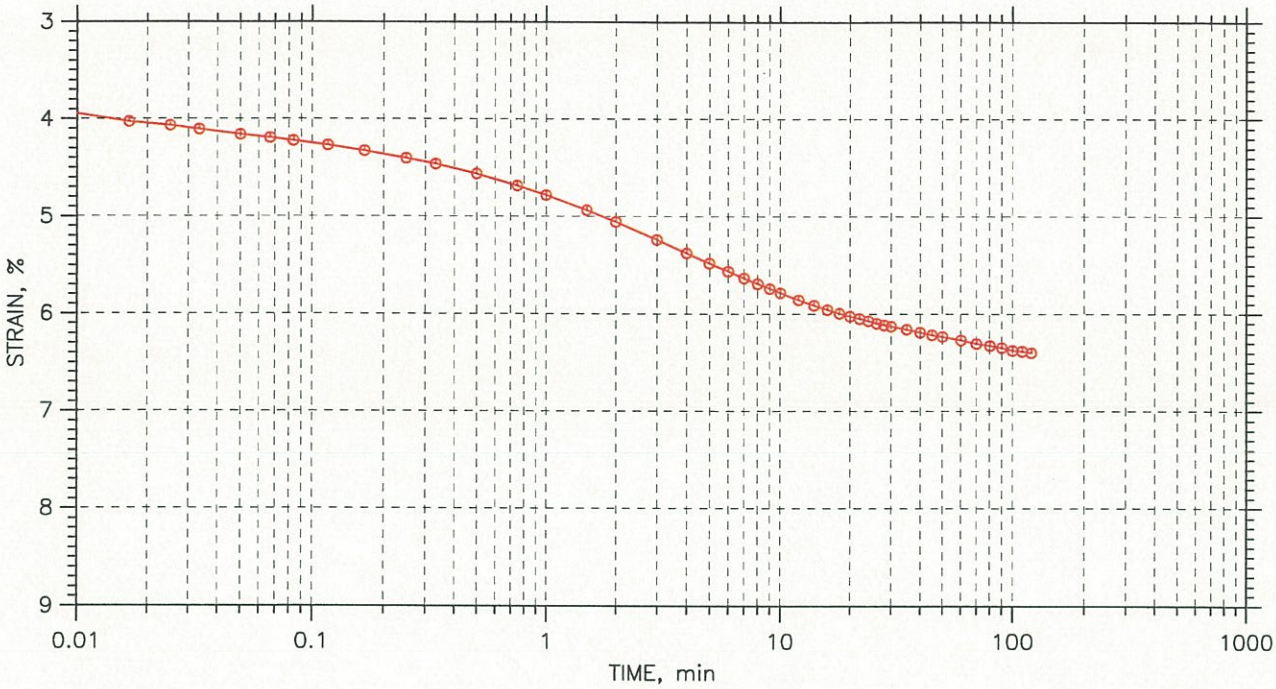
Mon, 20-AUG-2007 10:36:10

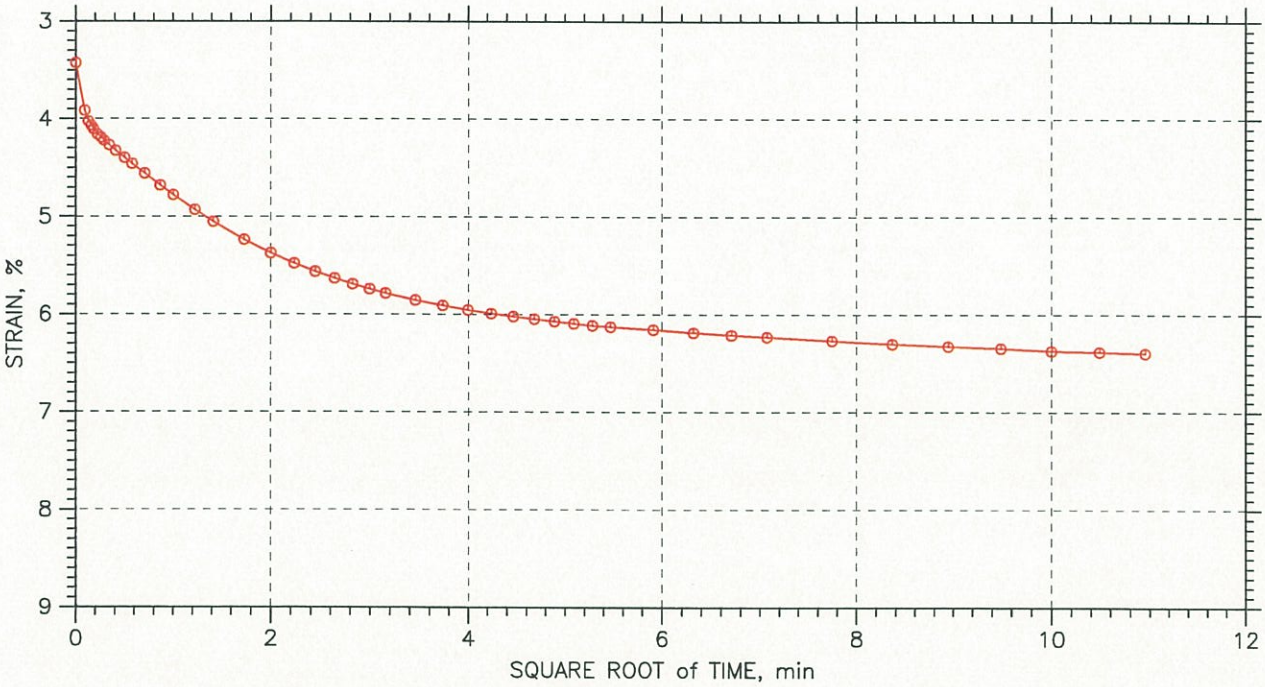
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 7 of 18

Stress: 8. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

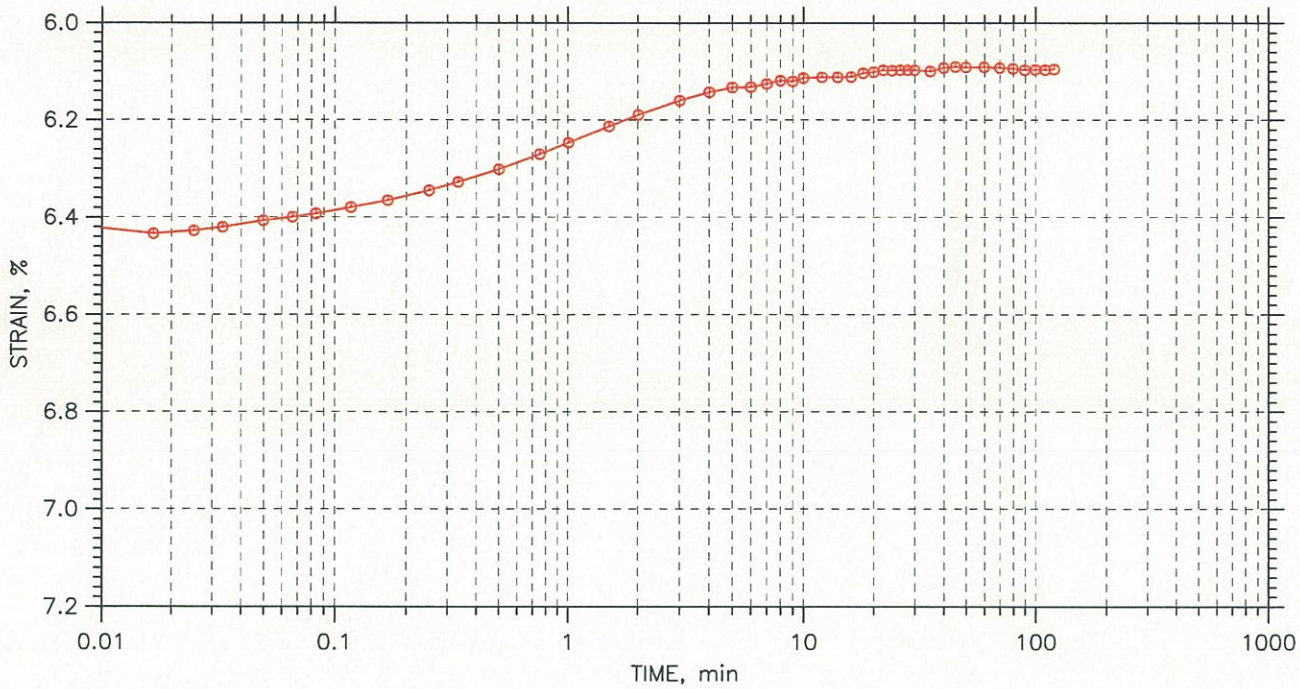
Mon, 20-AUG-2007 10:36:13

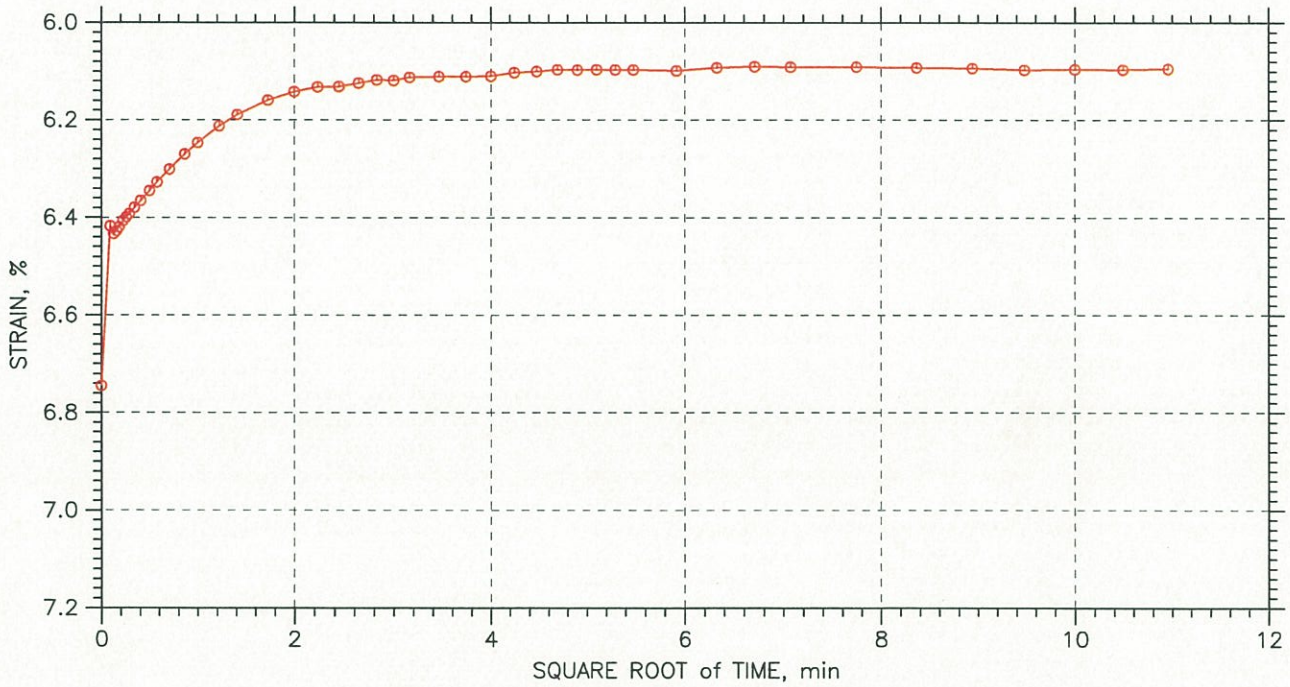
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 8 of 18

Stress: 4. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

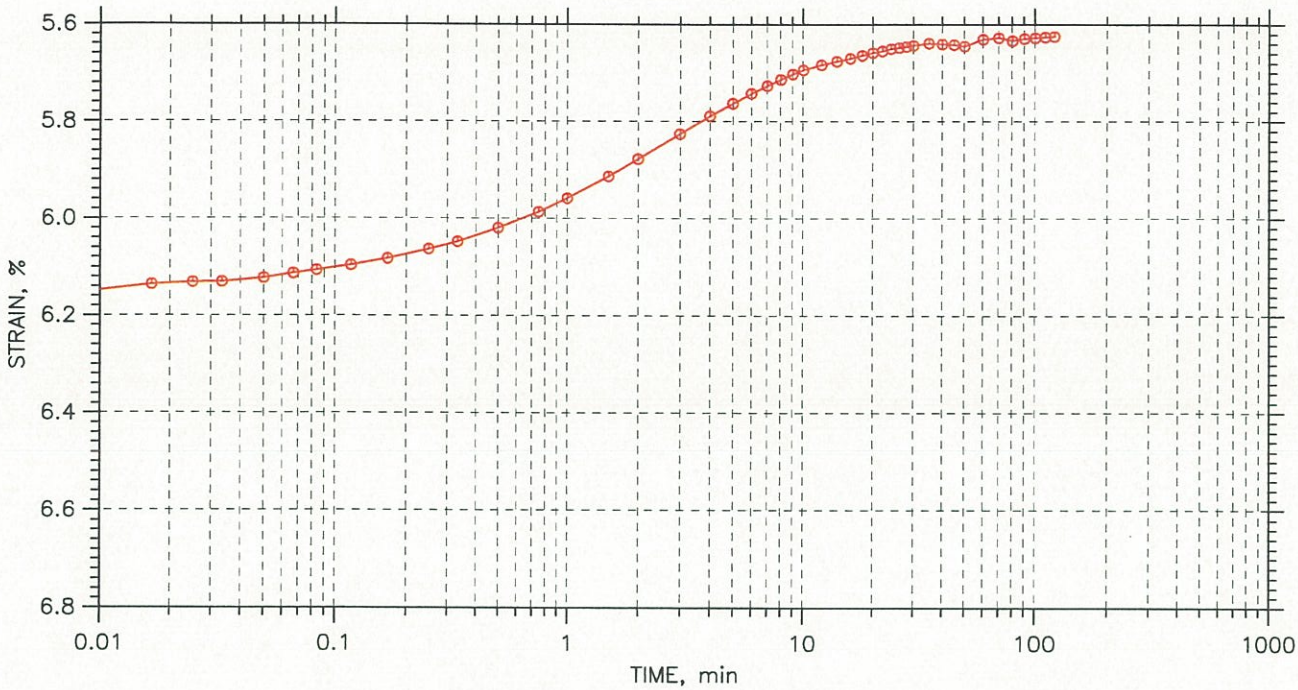
Mon, 20-AUG-2007 10:36:16

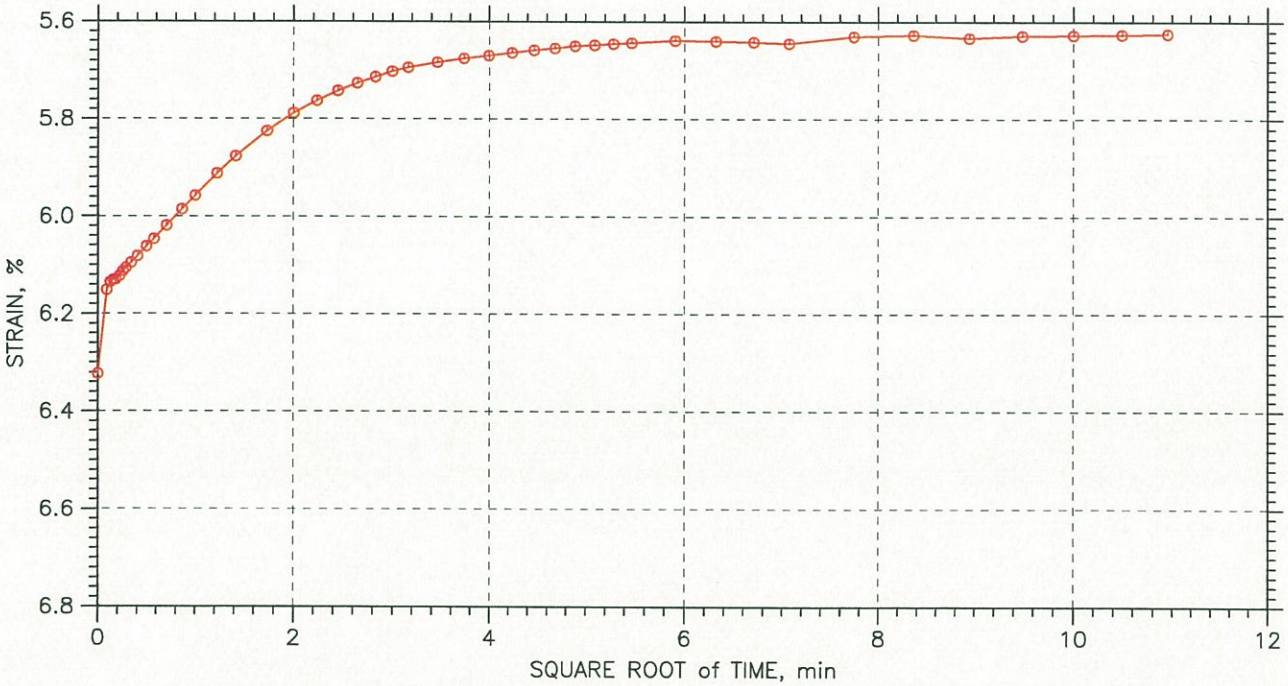
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 9 of 18

Stress: 2. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

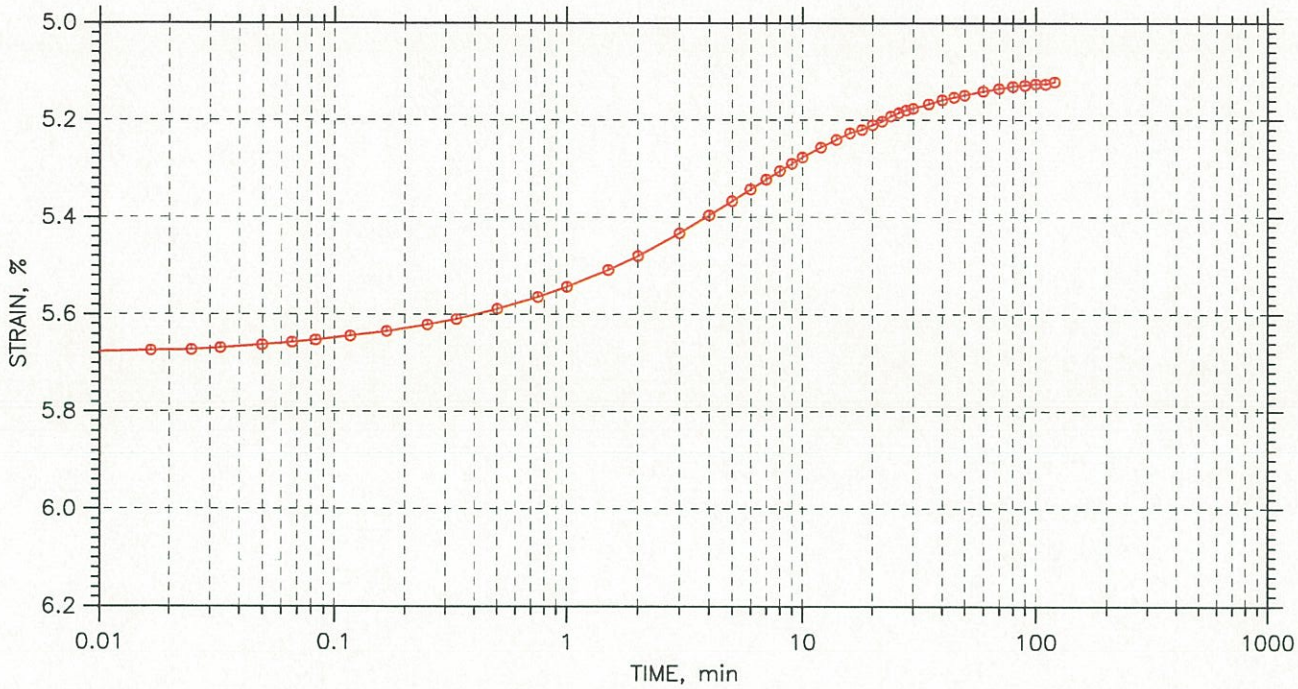
Mon, 20-AUG-2007 10:36:20

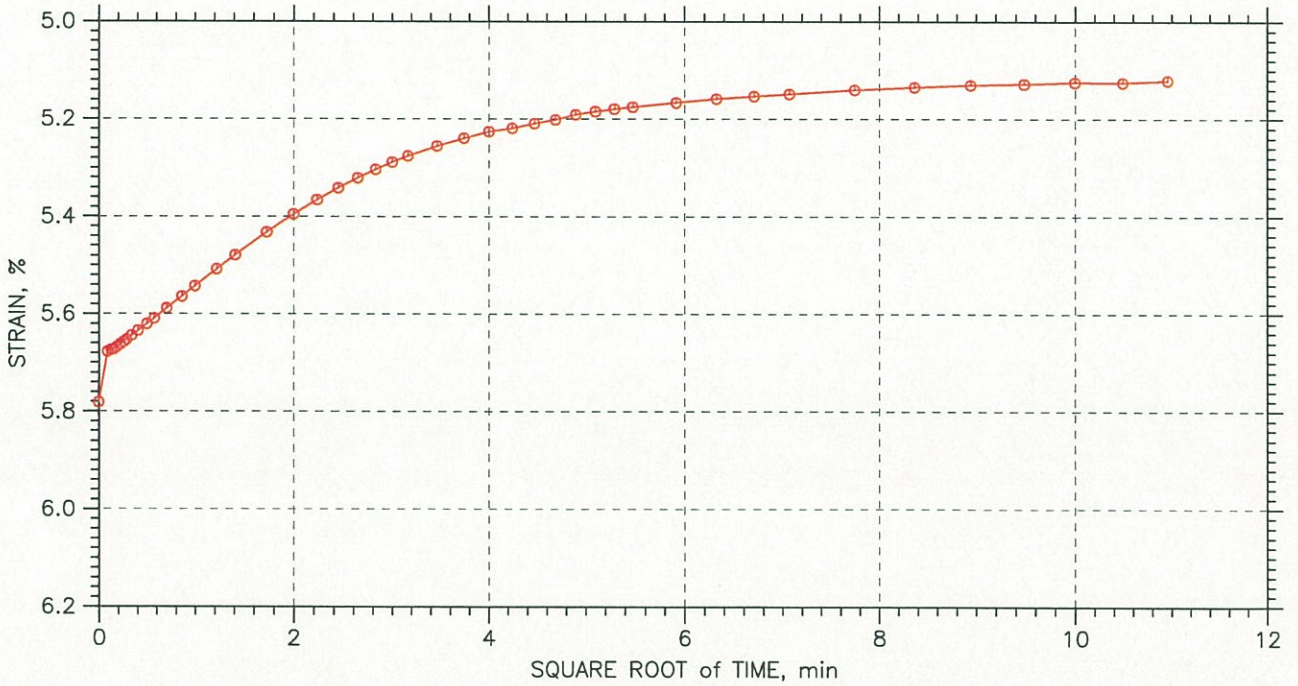
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 10 of 18

Stress: 1. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

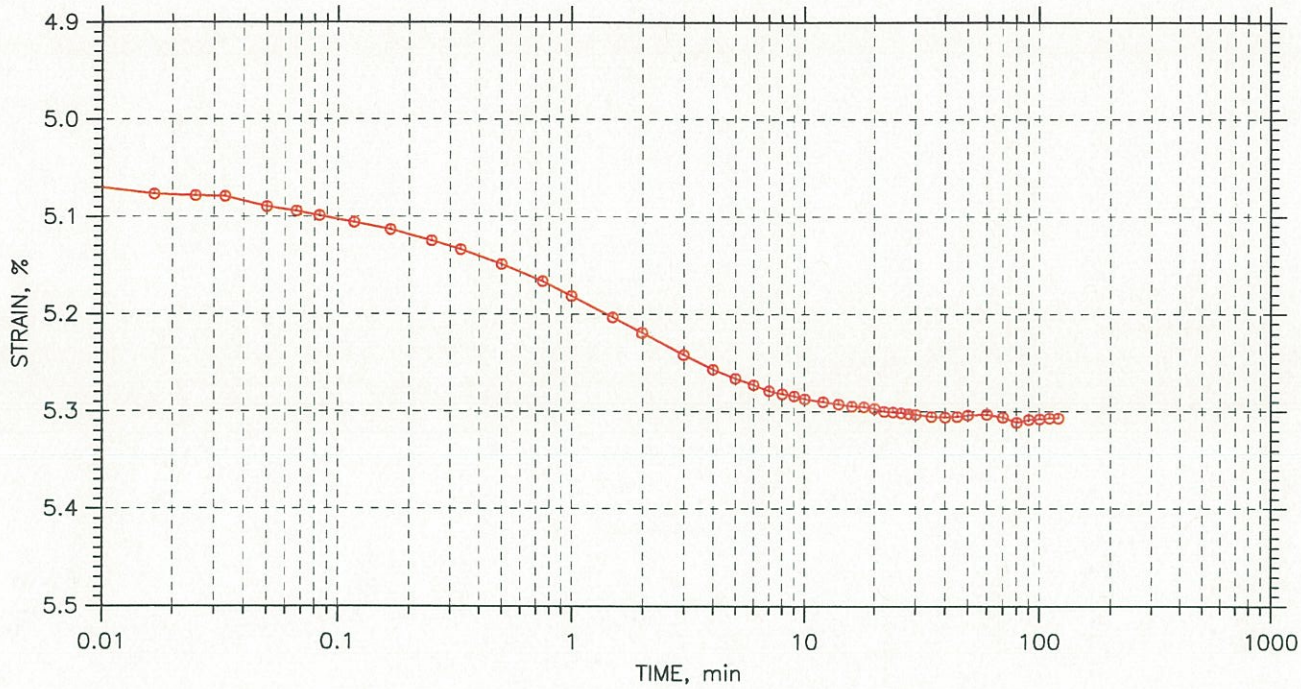
Mon, 20-AUG-2007 10:36:23

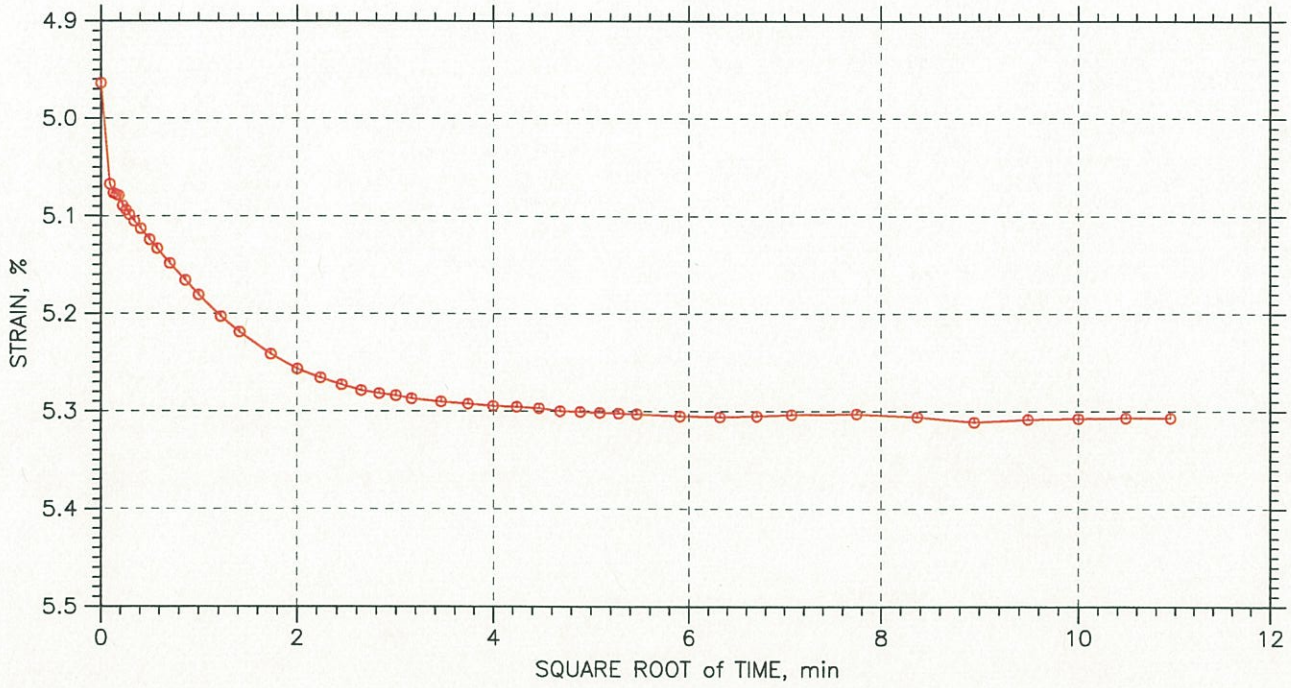
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 11 of 18

Stress: 2. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

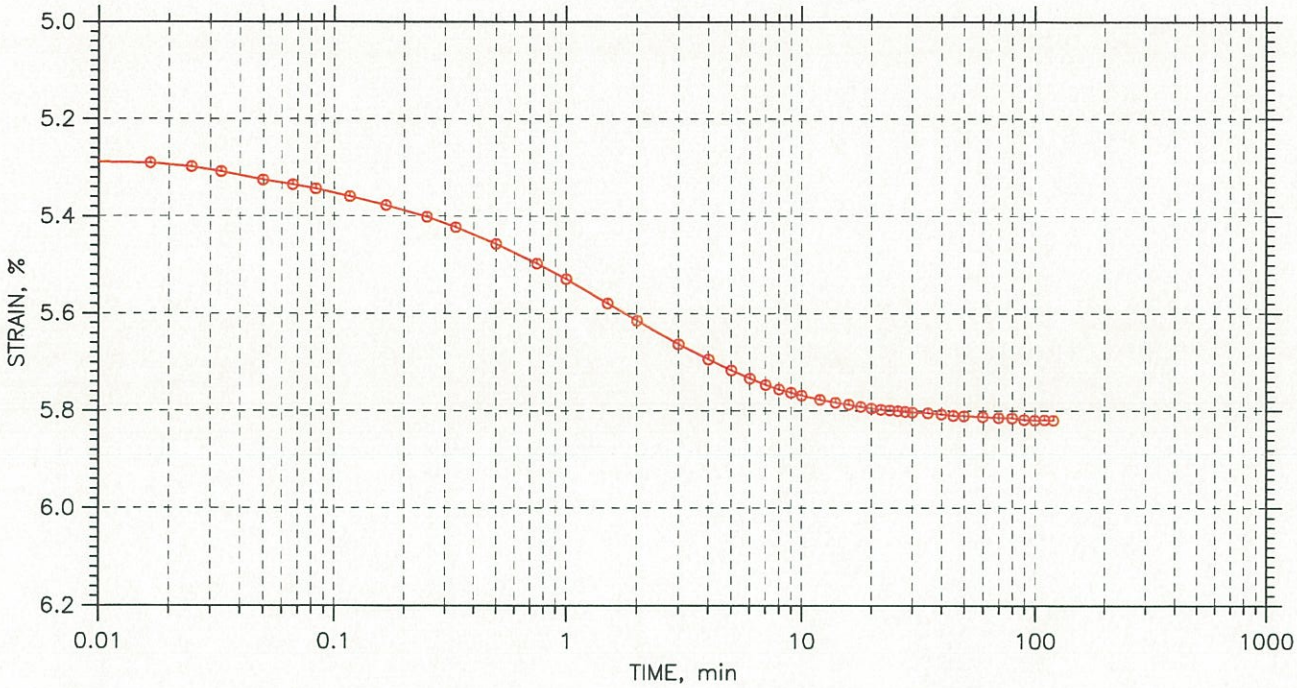
Mon, 20-AUG-2007 10:36:27

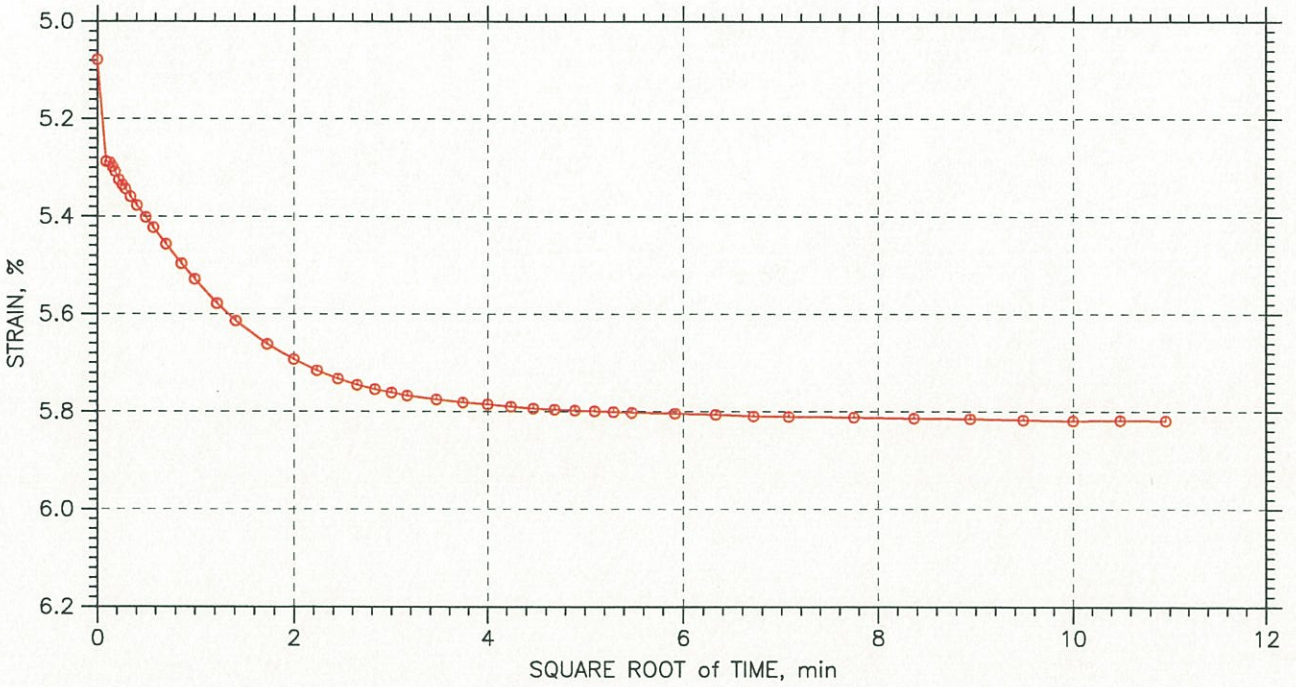
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 12 of 18

Stress: 4. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

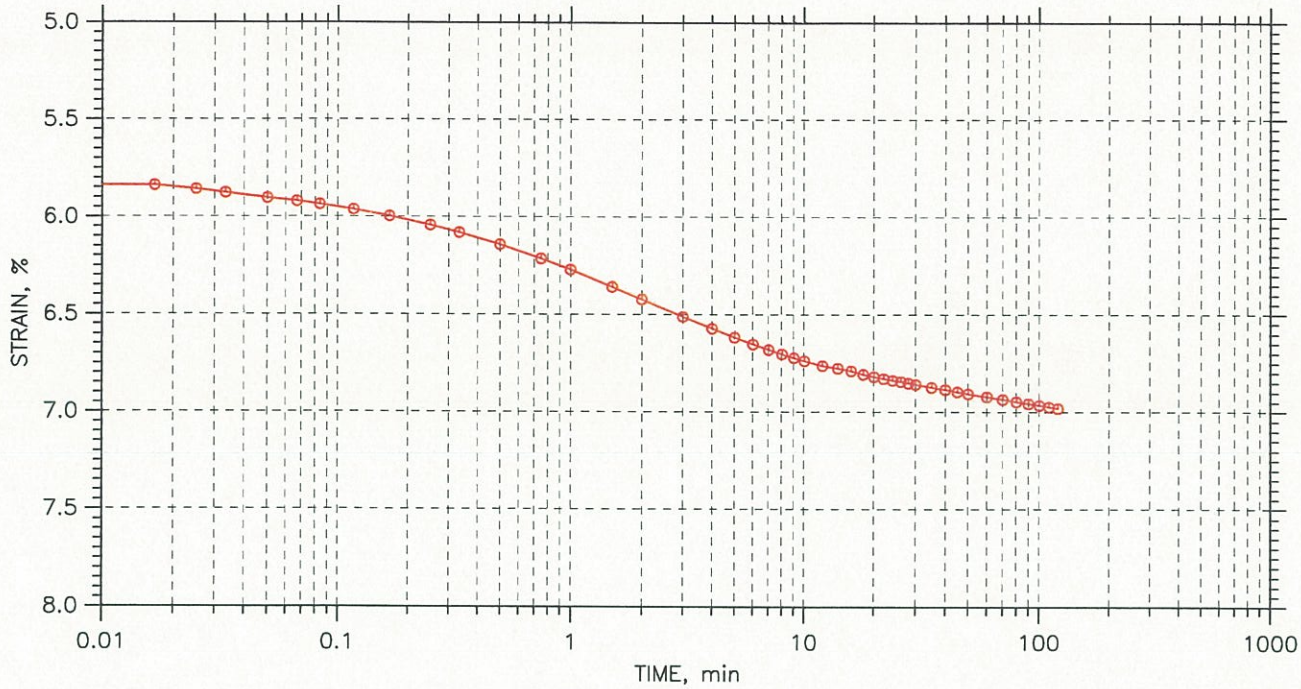
Mon, 20-AUG-2007 10:36:30

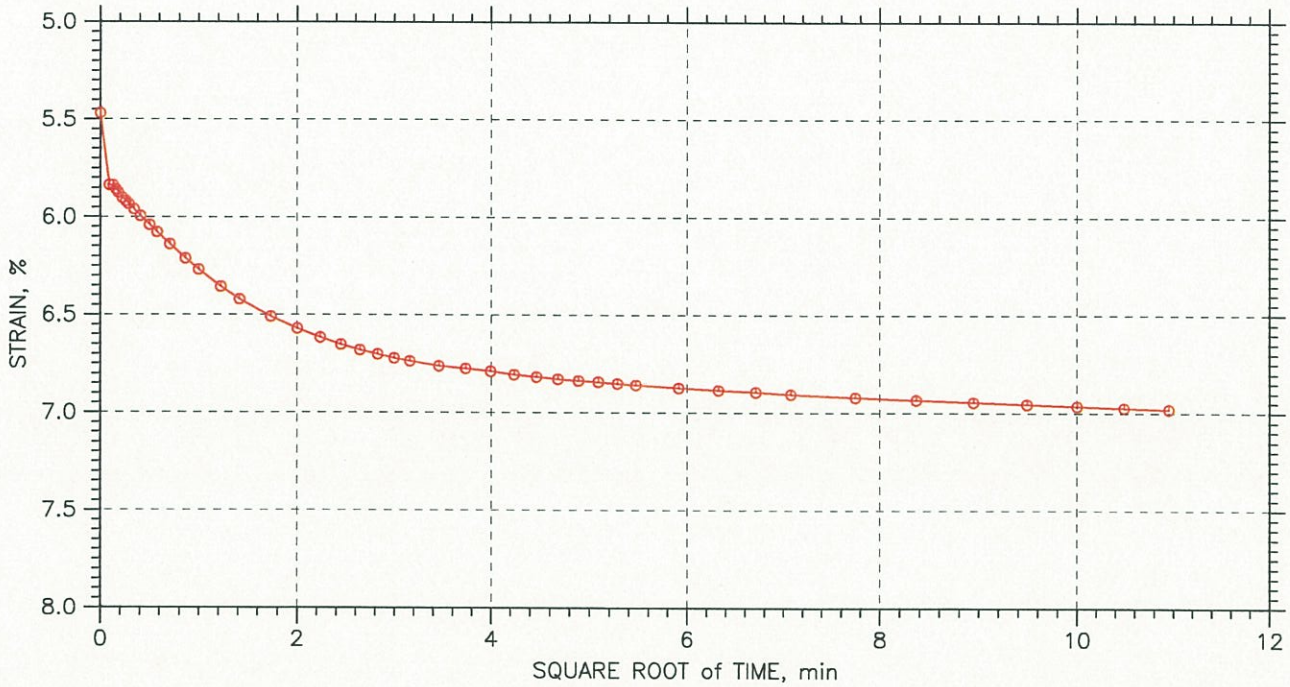
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 13 of 18

Stress: 8. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

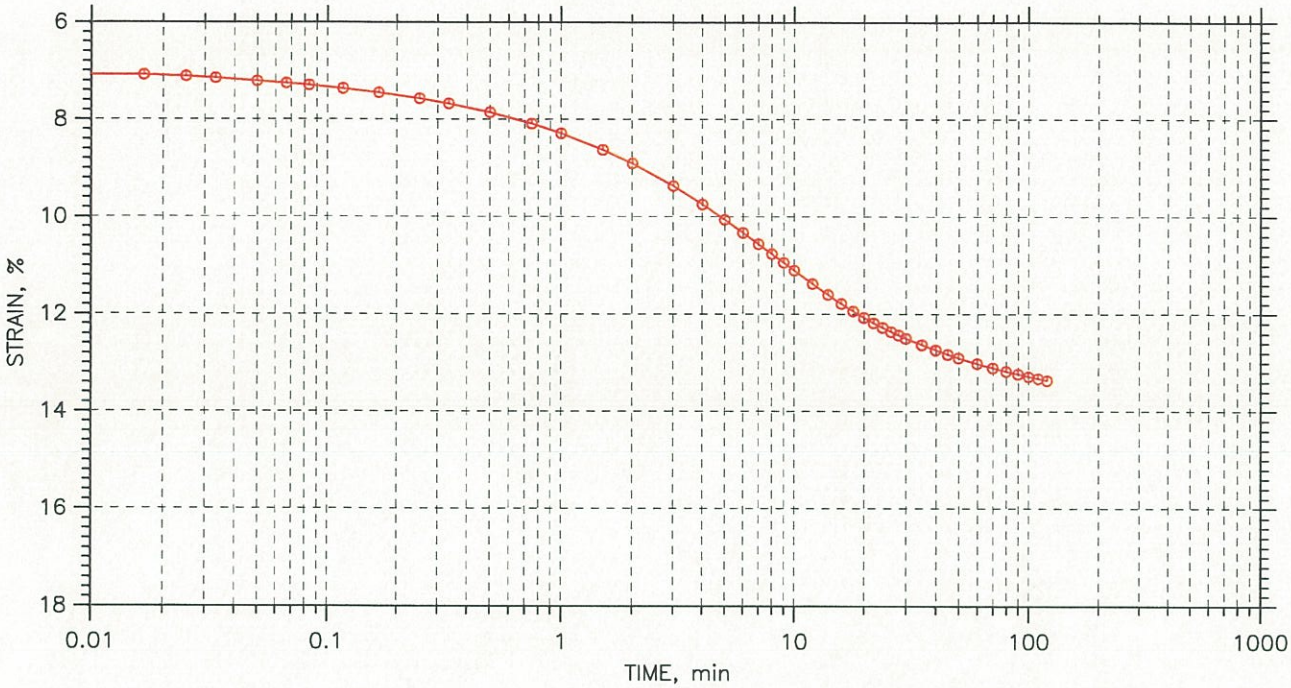
Mon, 20-AUG-2007 10:36:33

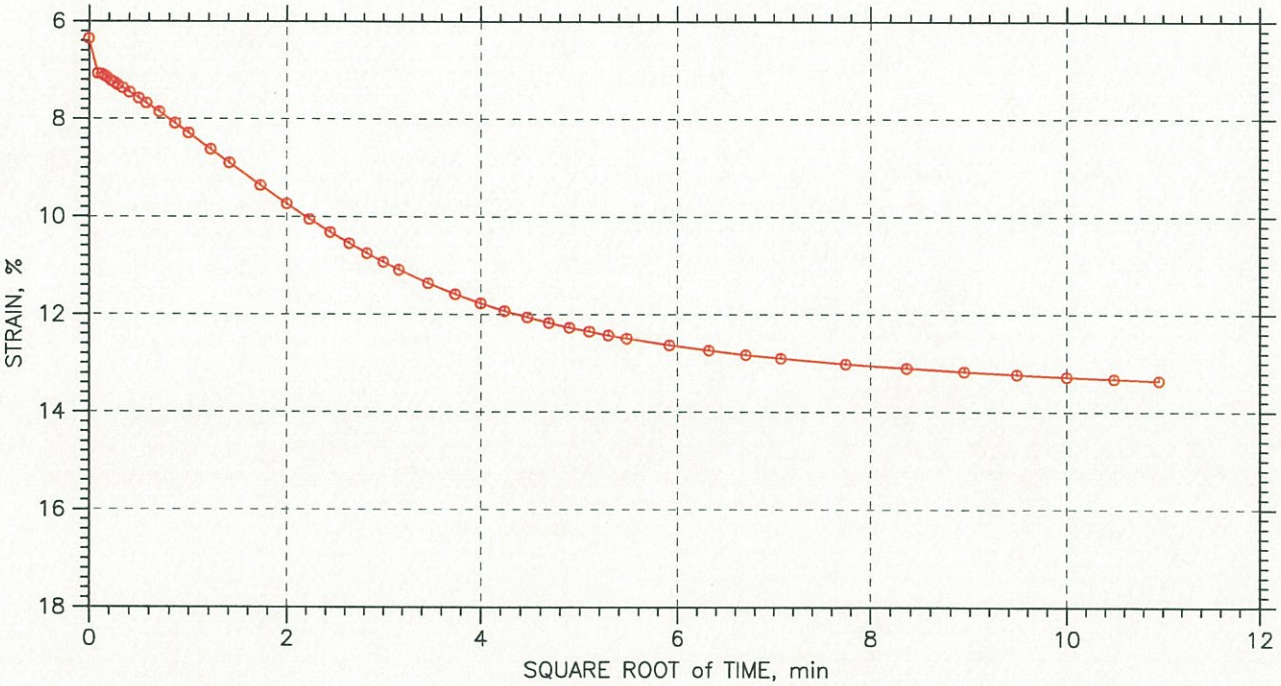
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 14 of 18

Stress: 16. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

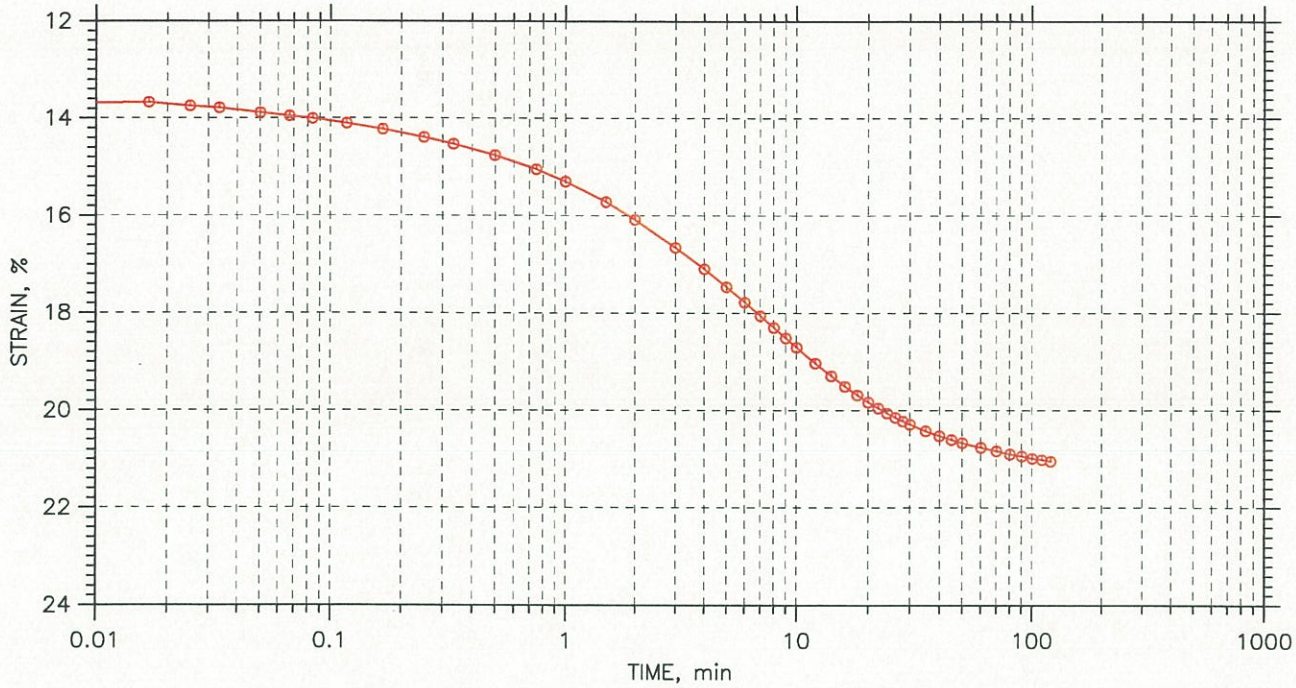
Mon, 20-AUG-2007 10:36:36

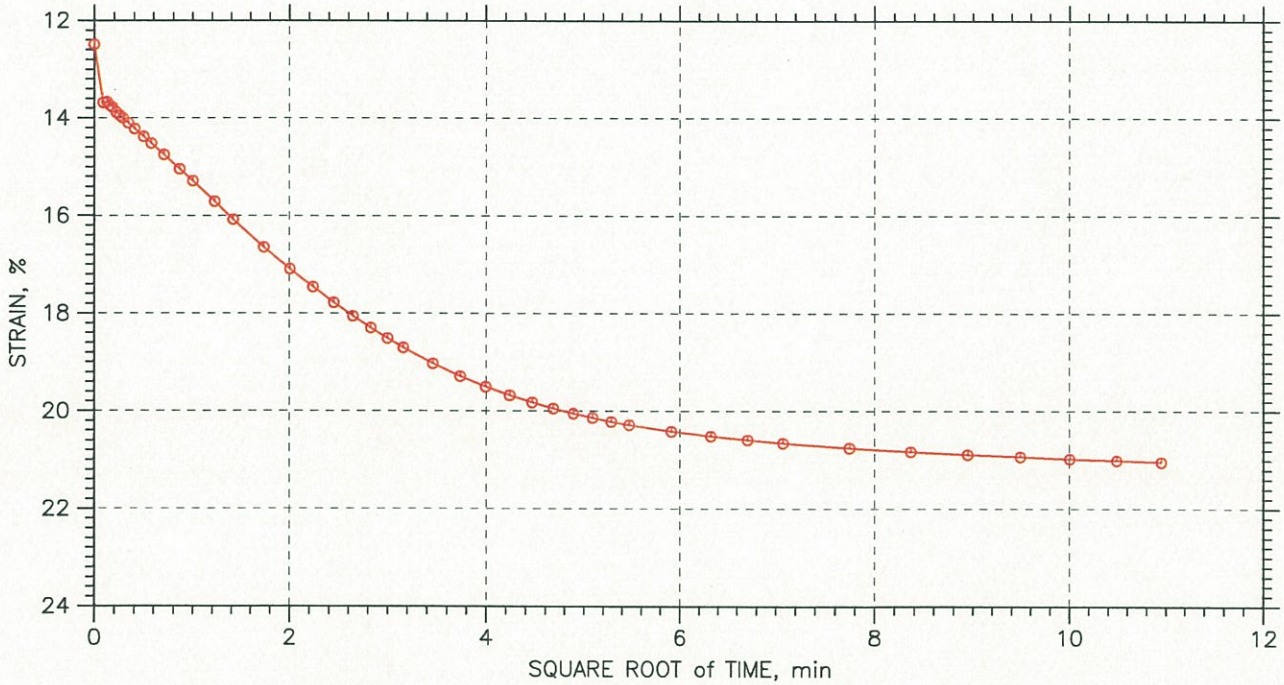
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 15 of 18

Stress: 32. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

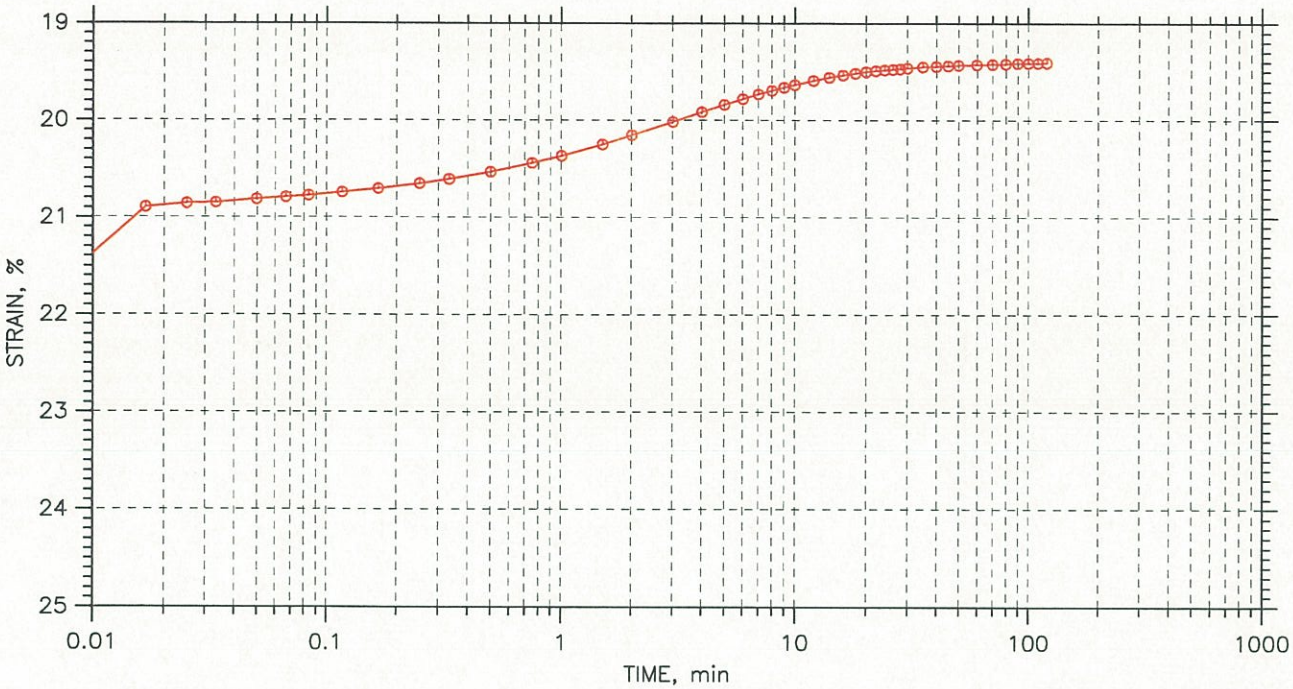
Mon, 20-AUG-2007 10:36:39

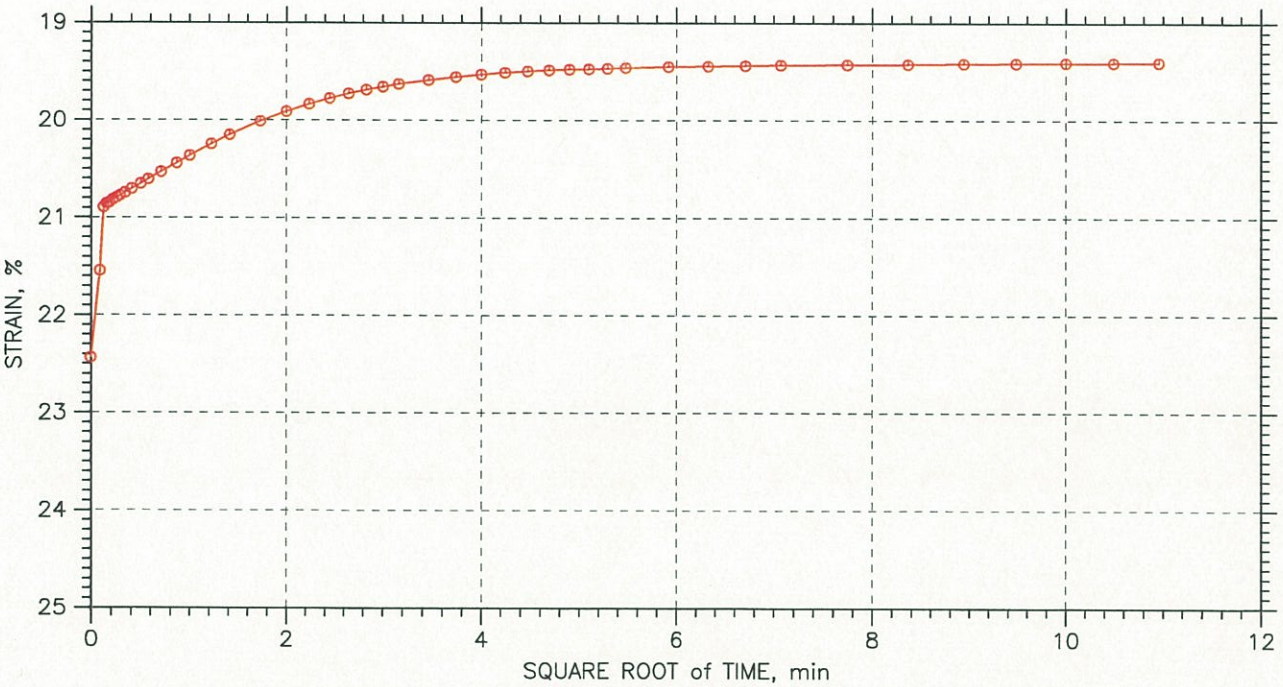
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 16 of 18

Stress: 8. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

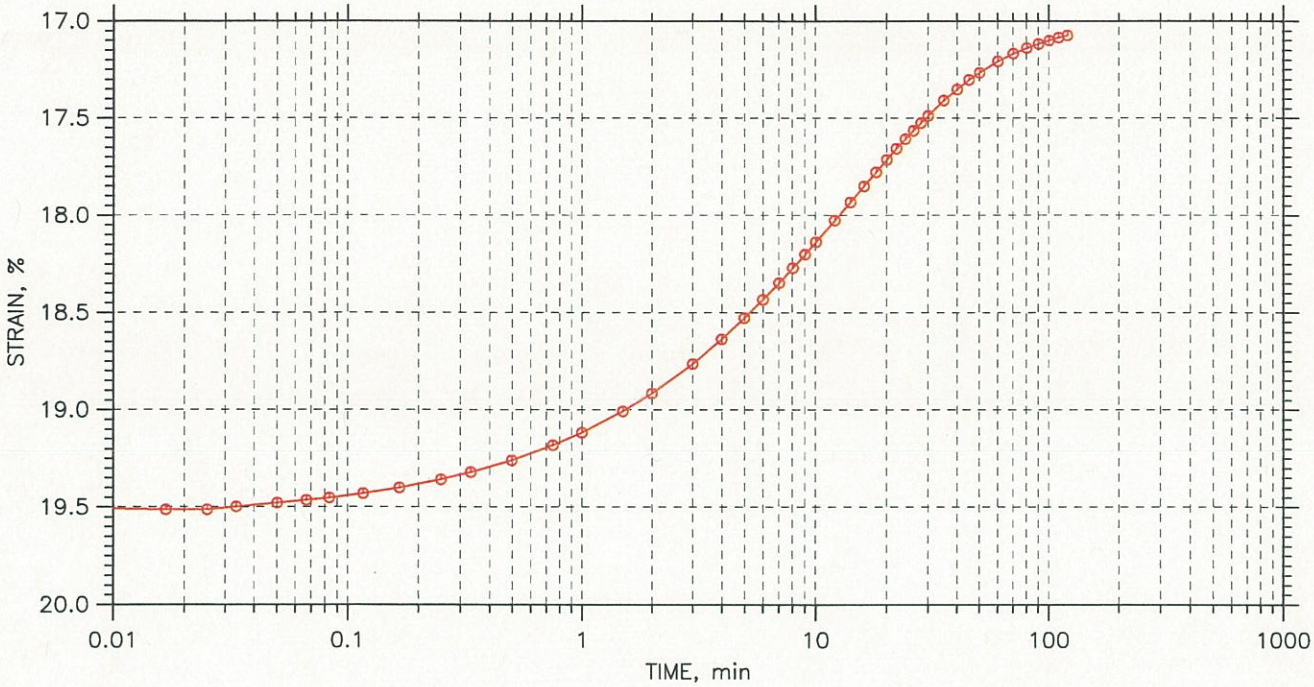
Mon, 20-AUG-2007 10:36:43

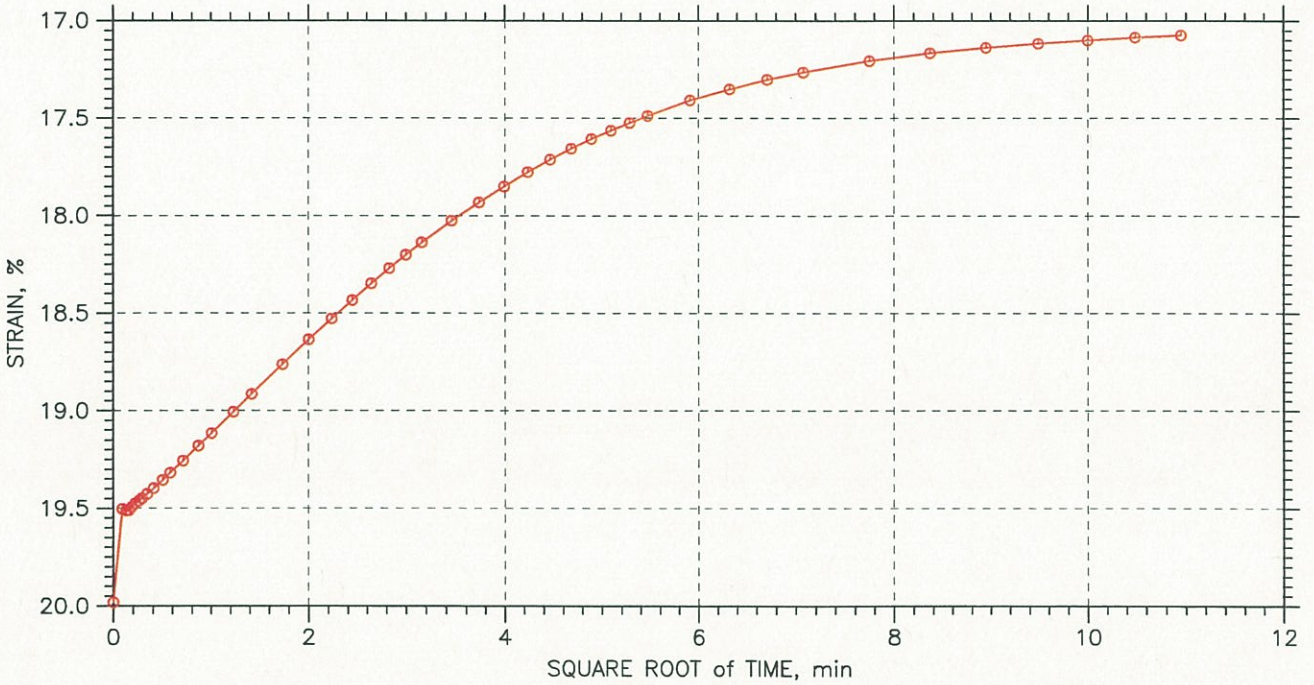
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 17 of 18

Stress: 2. tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

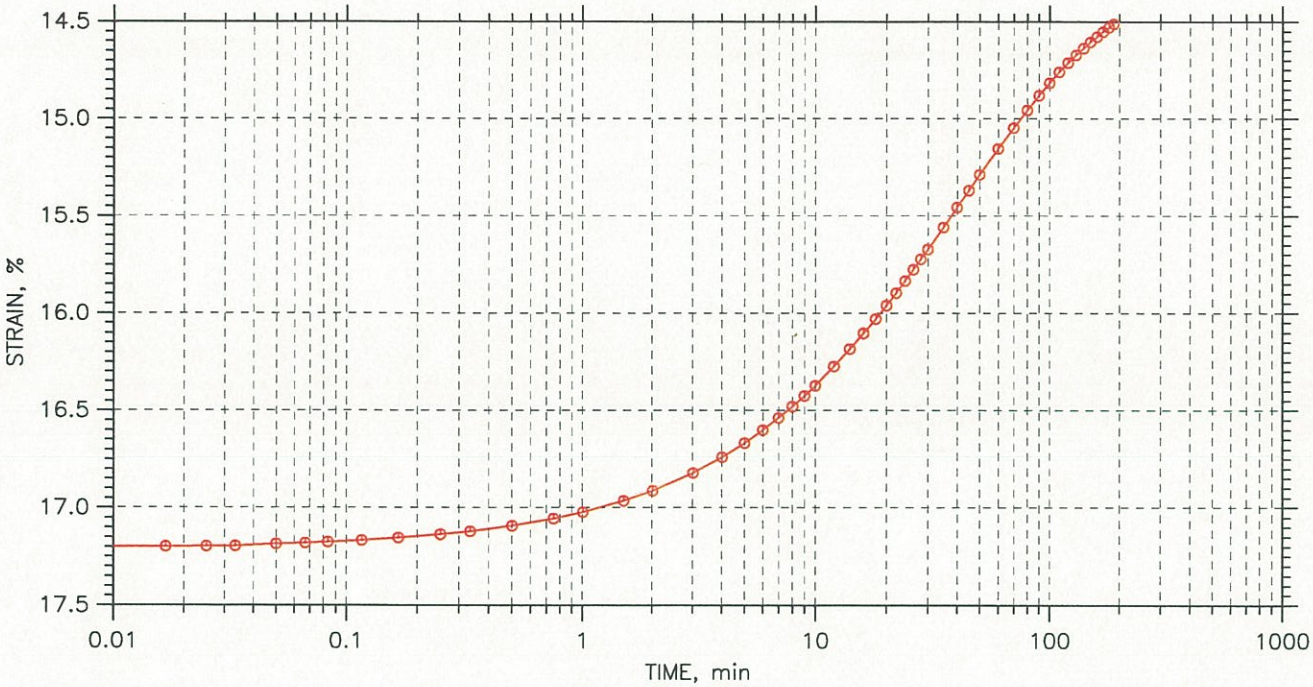
Mon, 20-AUG-2007 10:36:46

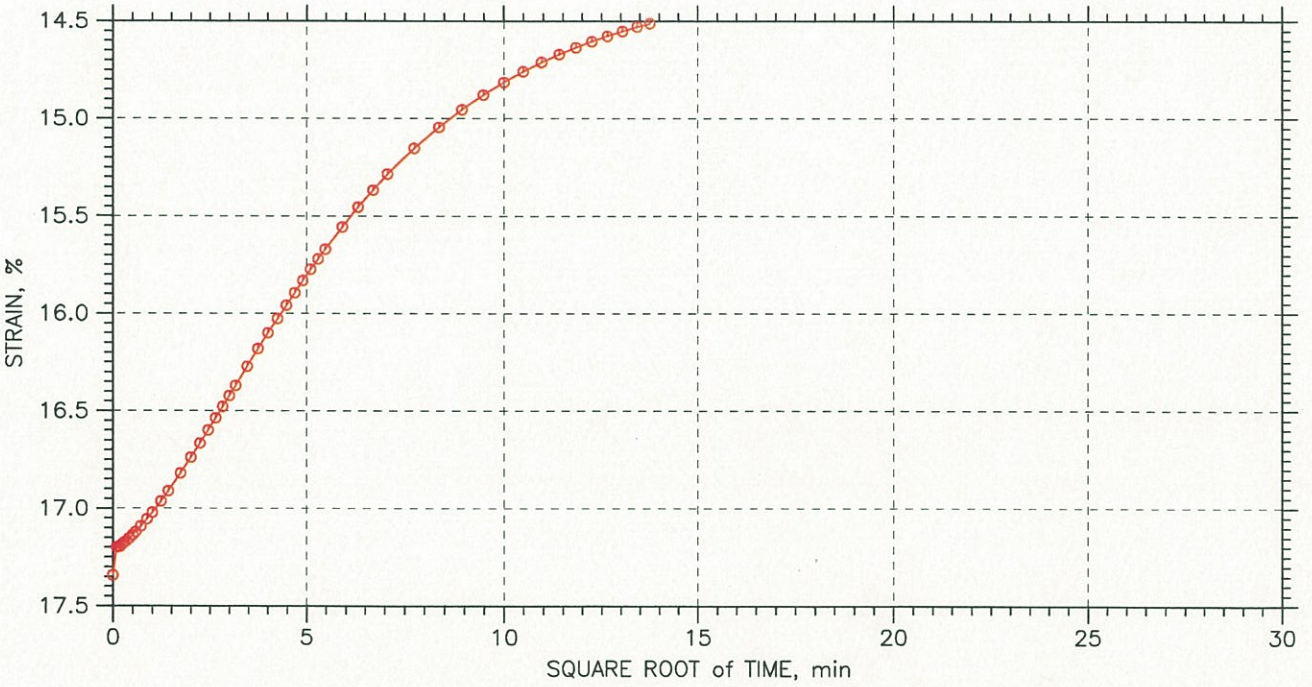
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 18 of 18

Stress: 0.5 tsf





GeoTesting express a subsidiary of Geocomp Corporation	Project: BRA/Dudley Square	Location: ---	Project No.: GTX-7642
	Boring No.: JE-B-4	Tested By: md	Checked By: jdt
	Sample No.: JE B4 ST-1	Test Date: 08/02/07	Depth: 62-64 ft
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, greenish gray clay		
	Remarks: System C		

Mon, 20-AUG-2007 10:36:50

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.
Project Name:	BRA/Dudley Square - E2X26200
Project Location:	---
GTX #:	7642
Test Date:	08/10/07
Tested By:	md
Checked By:	jdt

Bulk Density and Compressive Strength of Rock Core Specimens by ASTM D 2938

Boring ID	Sample ID	Depth, in	Bulk Density, lb/ft^3	Compressive Strength, psi	In conformance with ASTM D 4543
JE-B1	RC-1	64-69 ft	162	2,705	NO

Notes: Density determined on rock core samples by measuring dimensions and weight and then calculating.

All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.

See attached photographs for specimen break type

Sample did not meet requirements of ASTM D 4353 because of pitted and uneven sides.

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.	Test Date:	08/07/07
Project Name:	BRA/Dudley Square - E2X26200	Tested By:	md
Project Location:	---	Checked By:	jdt
GTX #:	7642		
Boring ID:	JE-B1		
Sample ID:	RC-1		
Depth:	64-69 ft		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D 4543

SAMPLE PREPARATION ---

MOISTURE CONTENT

Tare ID:	---
Wet Mass & Tare, g:	---
Dry Mass & Tare, g:	---
Mass Tare, g:	---
Moisture Content, %	---

BULK DENSITY

	1	2	3	Average
Specimen Length, in:	3.97	3.97	3.97	3.970
Specimen Diameter, in:	1.98	1.98	1.96	1.973
Specimen Mass, g:	---	---	516	516
Bulk Density, lb/ft^3	162			
Dry Density, lb/ft^3	---			

DEVIATION FROM STRAIGHTNESS	Max	Min	Difference
Measurements at 0°, in	0.00780	-0.01895	0.02675
Measurements at120°, in	0.02670	-0.00505	0.03175
Measurements at 240°, in	0.00180	-0.01555	0.01735

Maximum difference must be < 0.020 in.

Straightness Tolerance Met? NO

FLATNESS	-1/2"	-3/8"	-1/4"	-1/8"	0	+1/8"	+1/4"	+3/8"	+1/2"
END 1									
Measurements at 0°, in	---	---	---	-0.00070	0	0.00055	---	---	---
Measurements at 120°, in	---	---	---	-0.00055	0	0.00080	---	---	---
Measurements at 240°, in	---	---	---	-0.00090	0	0.00010	---	---	---

Difference between max and min readings, in: 0° = 0.00125 120° = 0.00135 240° = 0.001

Maximum difference must be < 0.0015 in.

END 2									
Measurements at 0°, in	---	---	---	-0.00040	0	0.00030	---	---	---
Measurements at 120°, in	---	---	---	-0.00035	0	0.00075	---	---	---
Measurements at 240°, in	---	---	---	-0.00080	0	0.00050	---	---	---

Difference between max and min readings, in: 0° = 0.0007 120° = 0.0011 240° = 0.0013

Maximum difference must be < 0.0015 in.

Flatness Tolerance Met? YES

PERPENDICULARITY

Maximum Gap Between Square and Top of Specimen, in 0.028 Angle of Departure,°: 0.40

Maximum angle of departure must be < 0.25°

Perpendicularity Tolerance Met? NO

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.
Project Name:	BRA/Dudley Square - E2X26200
Project Location:	---
GTX #:	7642
Test Date:	08/10/07
Tested By:	md
Checked By:	jdt
Boring ID:	JE-B1
Sample ID:	RC-1
Depth, ft:	64-69 ft

After cutting and lapping

After break

GeoTesting express

a subsidiary of Geocomp Corporation

WARRANTY and LIABILITY

GeoTesting Express (GTX) warrants that all tests it performs are run in general accordance with the specified test procedures and accepted industry practice. GTX will correct or repeat any test that does not comply with this warranty. GTX has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GTX may report engineering parameters that require us to interpret the test data. Such parameters are determined using accepted engineering procedures. However, GTX does not warrant that these parameters accurately reflect the true engineering properties of the *in situ* material. Responsibility for interpretation and use of the test data and these parameters for engineering and/or construction purposes rests solely with the user and not with GTX or any of its employees.

GTX's liability will be limited to correcting or repeating a test which fails our warranty. GTX's liability for damages to the Purchaser of testing services for any cause whatsoever shall be limited to the amount GTX received for the testing services. GTX will not be liable for any damages, or for any lost benefits or other consequential damages resulting from the use of these test results, even if GTX has been advised of the possibility of such damages. GTX will not be responsible for any liability of the Purchaser to any third party.

Commonly Used Symbols

A	pore pressure parameter for $\Delta\sigma_1 - \Delta\sigma_3$
B	pore pressure parameter for $\Delta\sigma_3$
CIU	isotropically consolidated undrained triaxial shear test
CR	compression ratio for one dimensional consolidation
C_c	coefficient of curvature, $(D_{30})^2 / (D_{10} \times D_{60})$
C_u	coefficient of uniformity, D_{60}/D_{10}
C_c	compression index for one dimensional consolidation
C_α	coefficient of secondary compression
c_v	coefficient of consolidation
c	cohesion intercept for total stresses
c'	cohesion intercept for effective stresses
D	diameter of specimen
D_{10}	diameter at which 10% of soil is finer
D_{15}	diameter at which 15% of soil is finer
D_{30}	diameter at which 30% of soil is finer
D_{50}	diameter at which 50% of soil is finer
D_{60}	diameter at which 60% of soil is finer
D_{85}	diameter at which 85% of soil is finer
d_{50}	displacement for 50% consolidation
d_{90}	displacement for 90% consolidation
d_{100}	displacement for 100% consolidation
E	Young's modulus
e	void ratio
e_c	void ratio after consolidation
e_o	initial void ratio
G	shear modulus
G_s	specific gravity of soil particles
H	height of specimen
PI	plasticity index
i	gradient
K_o	lateral stress ratio for one dimensional strain
k	permeability
LI	Liquidity Index
m_v	coefficient of volume change
n	porosity
PI	plasticity index
P_c	preconsolidation pressure
p	$(\sigma_1 + \sigma_3) / 2$, $(\sigma_v + \sigma_h) / 2$
p'	$(\sigma'_1 + \sigma'_3) / 2$, $(\sigma'_v + \sigma'_h) / 2$
p'_c	p' at consolidation
Q	quantity of flow
q	$(\sigma_1 . \sigma_3) / 2$
q_f	q at failure
q_o, q_i	initial q
q_c	q at consolidation
S	degree of saturation
SL	shrinkage limit
s_u	undrained shear strength
T	time factor for consolidation
T	temperature
t	time
U, UC	unconfined compression test
UU, Q	unconsolidated undrained triaxial test
u_a	pore gas pressure
u_e	excess pore water pressure
u, u_w	pore water pressure
V	total volume
V_g	volume of gas
V_s	volume of solids
V_v	volume of voids
V_w	volume of water
V_o	initial volume
v	velocity
W	total weight
W_s	weight of solids
W_w	weight of water
w	water content
w_c	water content at consolidation
w_f	final water content
w_l	liquid limit
w_n	natural water content
w_p	plastic limit
w_s	shrinkage limit
w_o, w_i	initial water content
α	slope of q_f versus p_f
α'	slope of q_f versus p_f'
γ_t	total unit weight
γ_d	dry unit weight
γ_s	unit weight of solids
γ_w	unit weight of water
ε	strain
ε_{vol}	volume strain
ε_h, ε_v	horizontal strain, vertical strain
μ	Poisson's ratio, also viscosity
σ	normal stress
σ'	effective normal stress
σ_c, σ'_c	consolidation stress in isotropic stress system
σ_h, σ'_h	horizontal normal stress
σ_v, σ'_v	vertical normal stress
σ_1	major principal stress
σ_2	intermediate principal stress
σ_3	minor principal stress
τ	shear stress
φ	friction angle based on total stresses
φ'	friction angle based on effective stresses
φ'_r	residual friction angle
φ_{ult}	φ for ultimate strength

Attachment C

Photographs

Approximate Boring Locations on Paved Sidewalk

BRA DUDLEY SQUARE

Approximate Test Pit Location (Retaining Wall Warren Street Side)

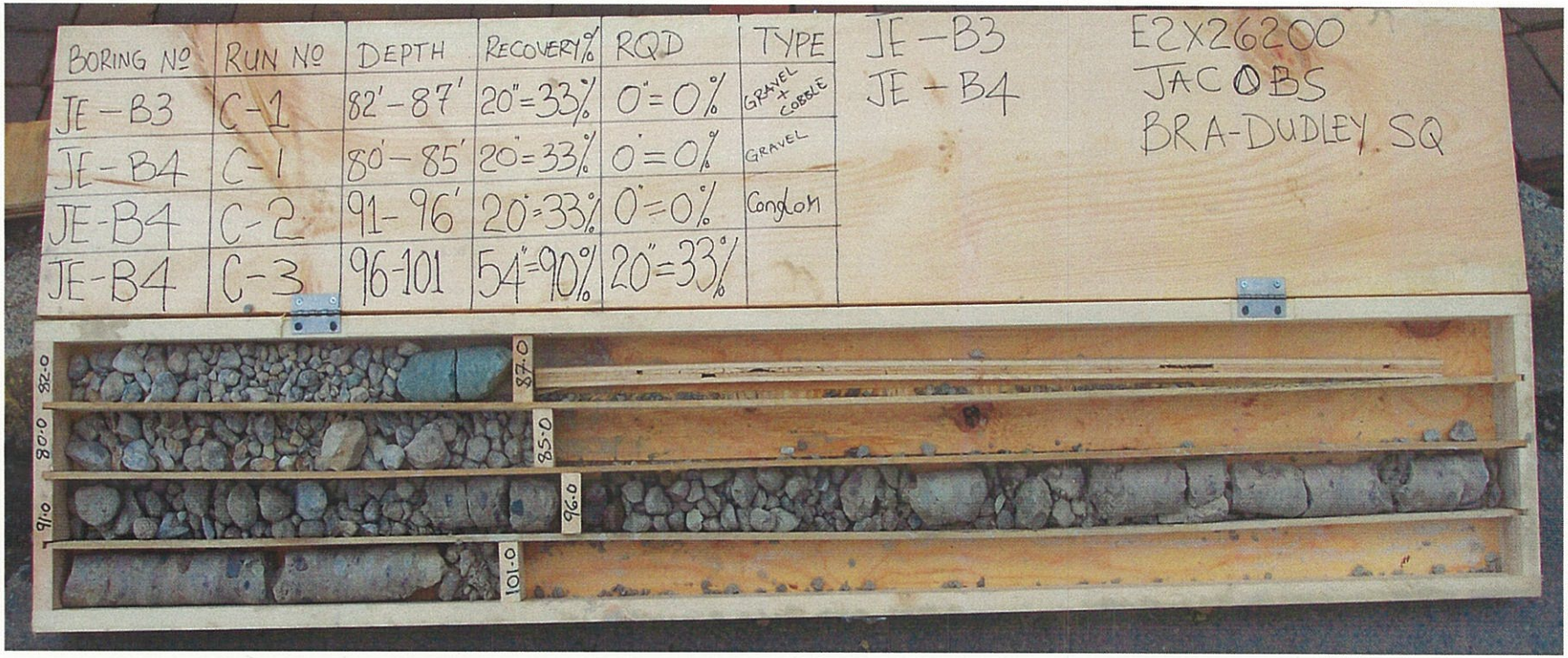
BRA DUDLEY SQUARE

Approximate Test Pit and Boring Locations

BRA DUDLEY SQUARE

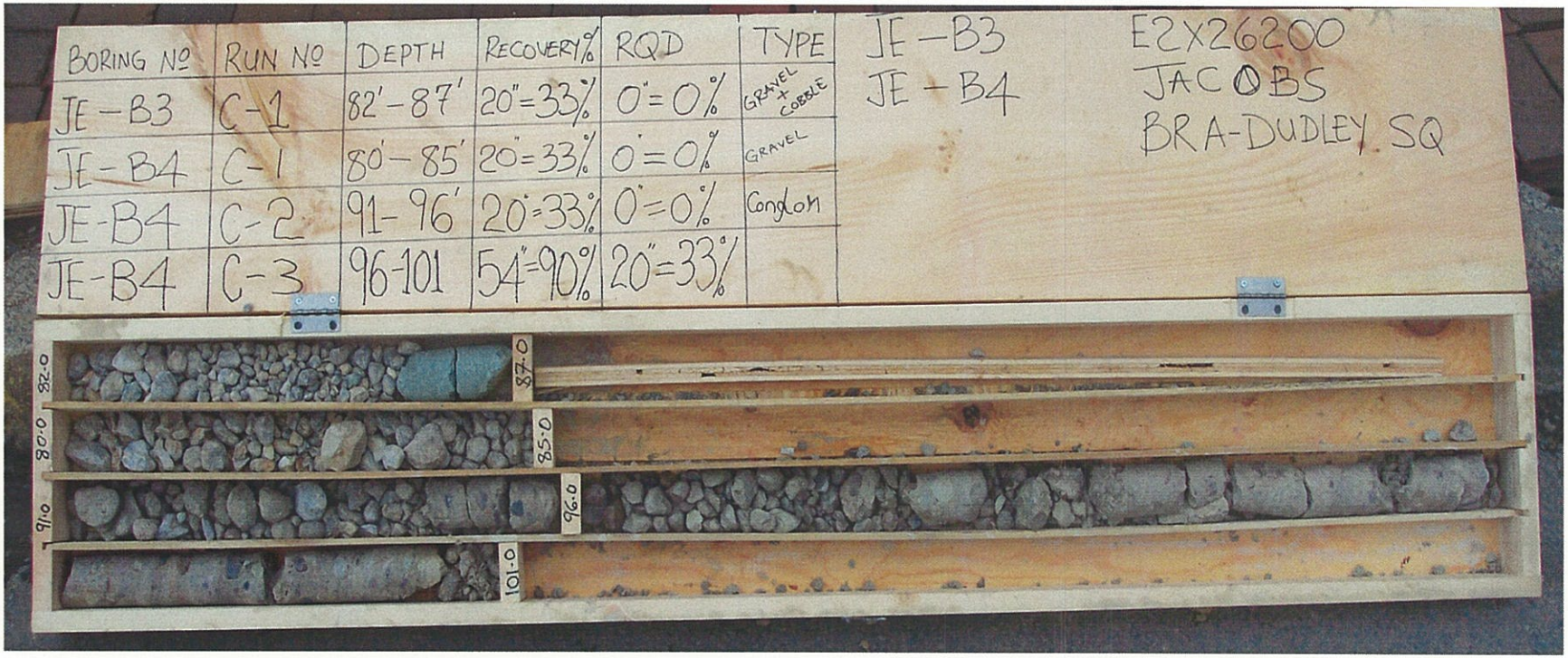
Approximate Test Pit Location (Basement)

BRA DUDLEY SQUARE



Rock Core Box No. 1
JE-B3 Depth = 82-87ft
JE-B4 Depth = 80 – 85ft and 91 – 101ft

Rock Core Box No. 2
JE-B2 Depth = 80-90ft
JE-B1 Depth = 64 – 69ft



Rock Core Box No. 1
JE-B3 Depth = 82-87ft
JE-B4 Depth = 80 – 85ft and 91 – 101ft

Rock Core Box No. 2
JE-B2 Depth = 80-90ft
JE-B1 Depth = 64 – 69ft

Test Boring and Test Pit Excavation in Progress

Damaged Casing Pipes

Test Pit JE-TP1 Exposed Foundation and Exposed Bottom of Foundation
Retaining Wall at Rear of Building on Warren Street Side

Test Pit JE-TP2 Exposed Foundation and Exposed Bottom of Foundation
Rear of Building

Test Pit JE-TP3 Exposed Foundation and Footing Geometry
Test Pit Excavated in the Basement Front Corner of Building