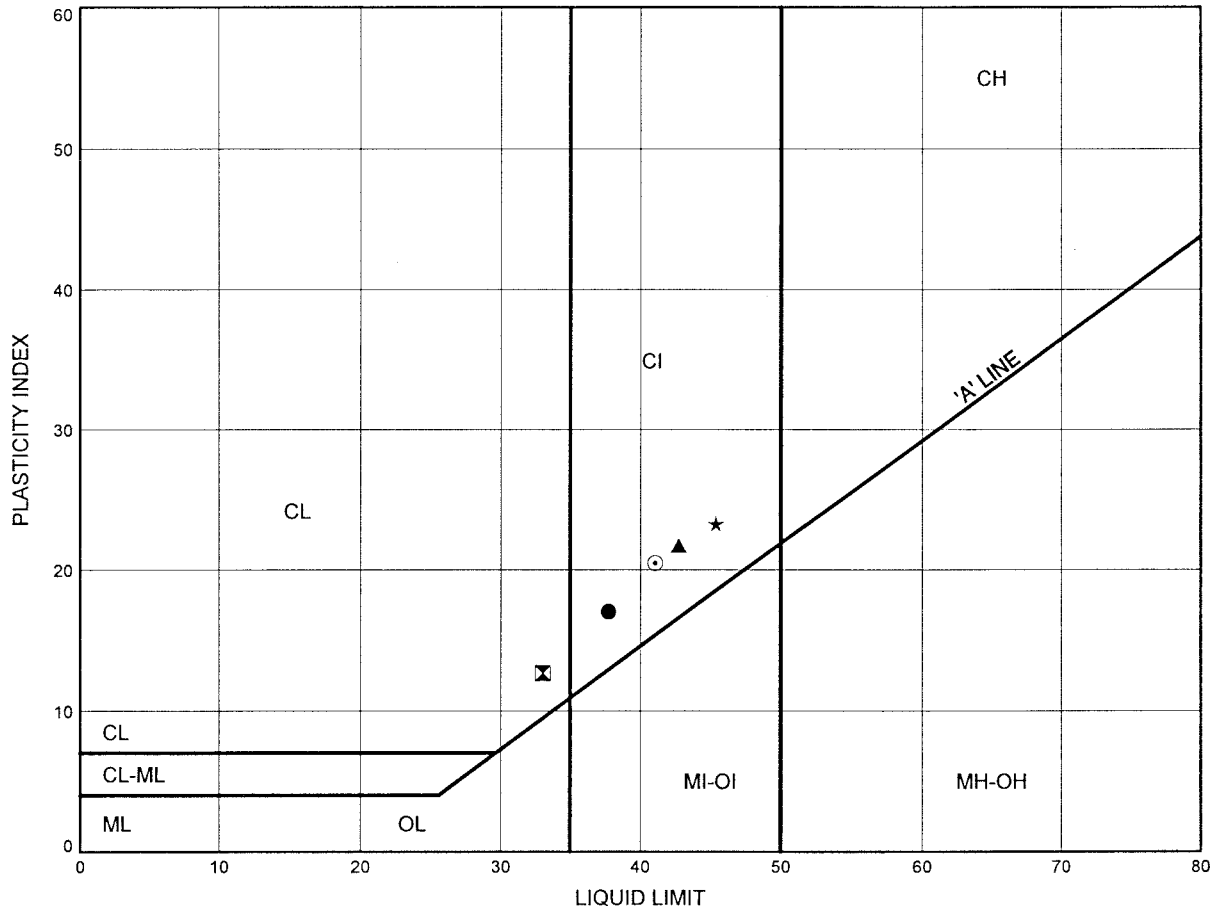


## **Appendix B**

### **Laboratory Test Results**

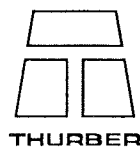
Gullwing River Bridge  
**ATTERBERG LIMITS TEST RESULTS**

FIGURE B1



SYMBOL	BH	DEPTH (m)	ELEV. (m)
●	03-1	7.92	
⊠	03-1	17.07	
▲	03-3	7.92	
★	03-5	4.88	
⊙	03-8	3.35	

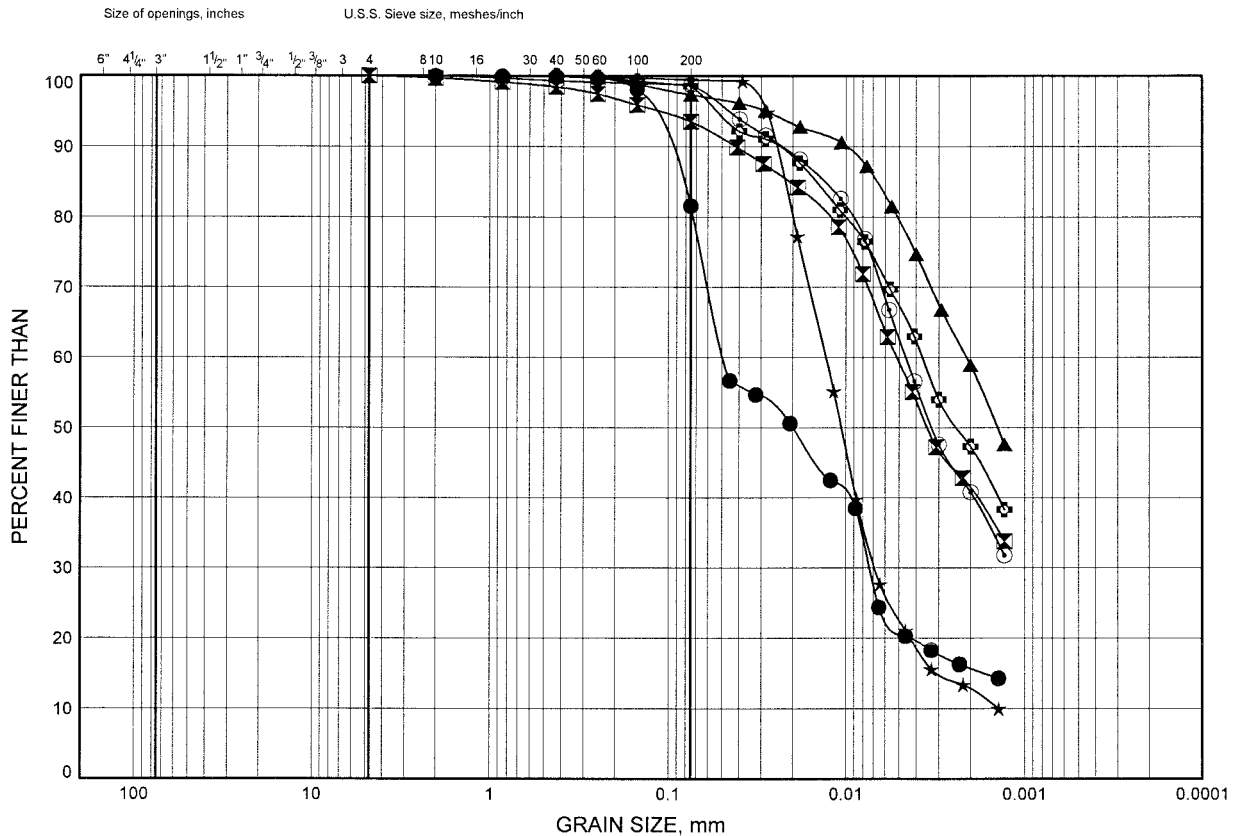
Date July 2003  
Project 143-94-00



Prep'd WM  
Chkd. SMS

# Gullwing River Bridge GRAIN SIZE DISTRIBUTION

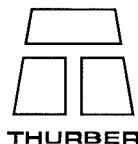
FIGURE B2



SYMBOL	BH	DEPTH (m)	ELEV. (m)
●	03-2	3.35	
⊠	03-2	7.92	
▲	03-2	15.54	
★	03-2	30.78	
⊙	03-3	3.35	
⊗	03-3	6.40	

Date July 2003

Project 143-94-00

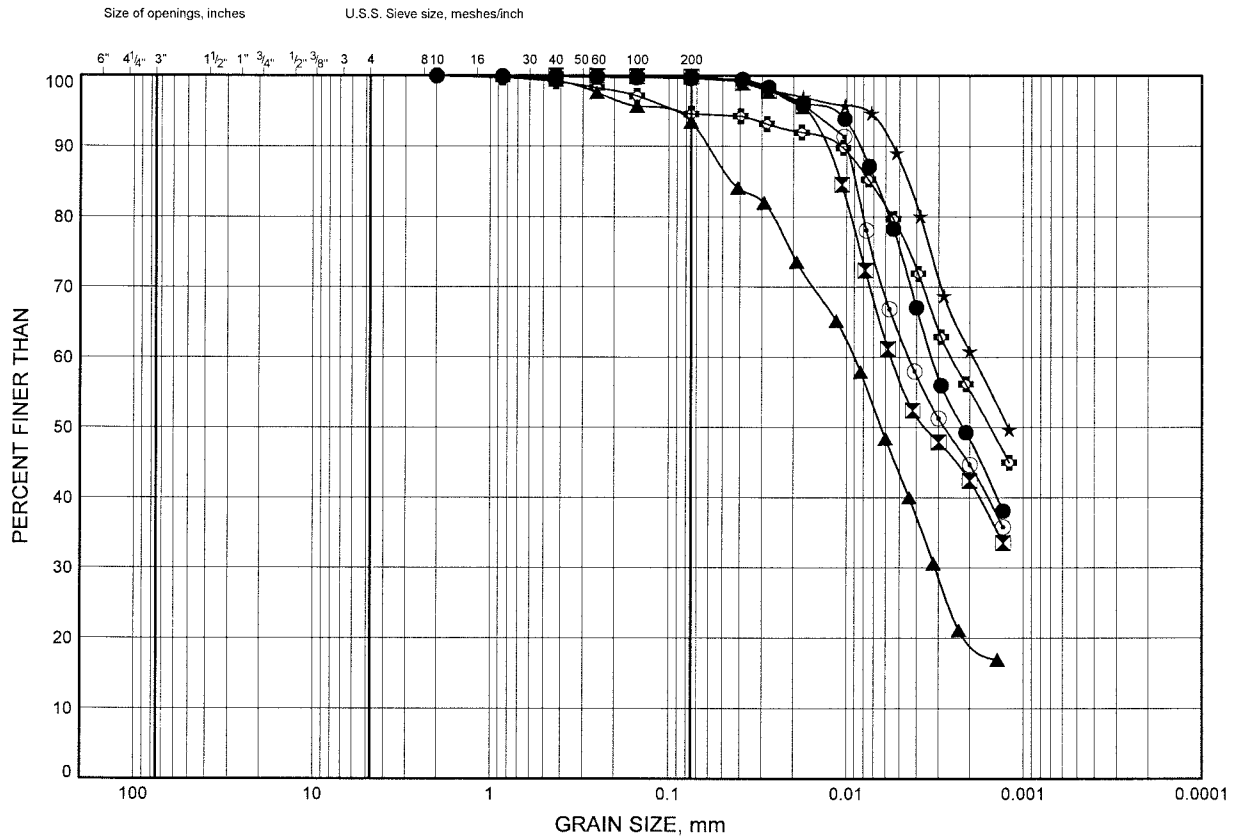


Prep'd WM

Chkd. SMS

# Gullwing River Bridge GRAIN SIZE DISTRIBUTION

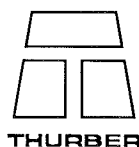
FIGURE B3



SYMBOL	BH	DEPTH (m)	ELEV. (m)
●	03-3	10.97	
⊠	03-3	15.54	
▲	03-4	3.35	
★	03-4	12.50	
⊙	03-4	18.59	
⊛	03-5	4.88	

Date July 2003

Project 143-94-00

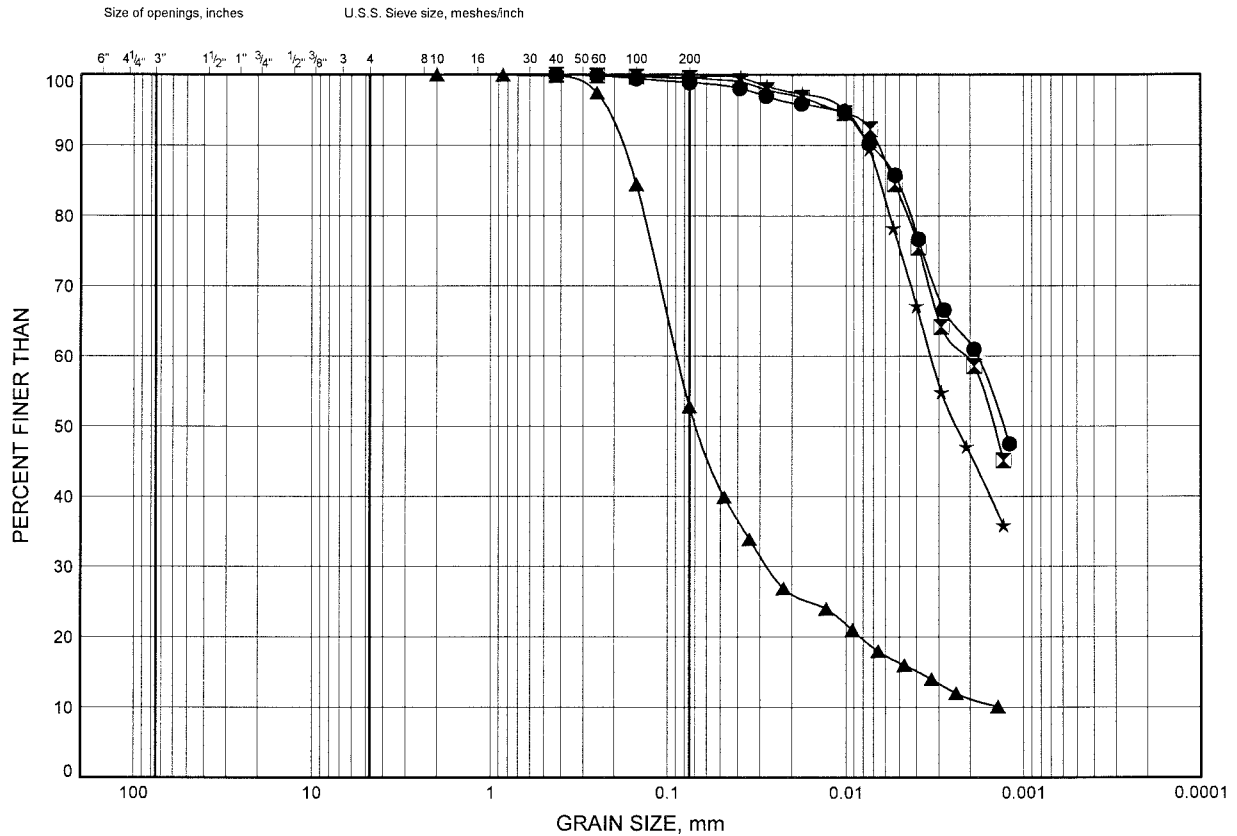


Prep'd WM

Chkd. SMS

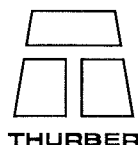
# Gullwing River Bridge GRAIN SIZE DISTRIBUTION

FIGURE B4



SYMBOL	BH	DEPTH (m)	ELEV. (m)
●	03-5	10.97	
⊠	03-6	4.88	
▲	03-7	3.35	
★	03-8	3.35	

Date July 2003  
Project 143-94-00



Prep'd WM  
Chkd. SMS

## OEDOMETER CONSOLIDATION SUMMARY

### SAMPLE IDENTIFICATION

Project Number	031-116026	Sample Number	1
Borehole Number	03-2	Sample Depth, m	10.7-11.3

### TEST CONDITIONS

Test Type	Standard	Load Duration, hr	24
Oedometer Number	7		
Date Started	03-07-16		
Date Completed	03-07-31		

### SAMPLE DIMENSIONS AND PROPERTIES - INITIAL

Sample Height, cm	1.90	Unit Weight, kN/m <sup>3</sup>	16.04
Sample Diameter, cm	6.34	Dry Unit Weight, kN/m <sup>3</sup>	10.07
Area, cm <sup>2</sup>	31.57	Specific Gravity, measured	2.76
Volume, cm <sup>3</sup>	59.98	Solids Height, cm	0.707
Water Content, %	59.31	Volume of Solids, cm <sup>3</sup>	22.31
Wet Mass, g	98.09	Volume of Voids, cm <sup>3</sup>	37.67
Dry Mass, g	61.57	Degree of Saturation, %	96.9

### TEST COMPUTATIONS

Pressure kPa	Corr. Height cm	Void Ratio	Average Height cm	t <sub>90</sub> sec	cv, cm <sup>2</sup> /s	mv m <sup>2</sup> /kN	k cm/s
0.00	1.900	1.689	1.900				
4.84	1.898	1.686	1.899	218	3.51E-03	2.39E-04	8.22E-08
9.48	1.893	1.679	1.895	197	3.87E-03	5.55E-04	2.10E-07
19.56	1.881	1.662	1.887	304	2.48E-03	6.22E-04	1.51E-07
39.01	1.857	1.628	1.869	563	1.32E-03	6.47E-04	8.34E-08
77.76	1.814	1.567	1.835	433	1.65E-03	5.91E-04	9.55E-08
155.27	1.684	1.383	1.749	1283	5.05E-04	8.81E-04	4.36E-08
309.98	1.494	1.114	1.589	2391	2.24E-04	6.46E-04	1.42E-08
620.07	1.349	0.909	1.422	1390	3.08E-04	2.46E-04	7.42E-09
1241.02	1.228	0.738	1.289	960	3.67E-04	1.02E-04	3.68E-09
2481.58	1.123	0.589	1.176	658	4.45E-04	4.47E-05	1.95E-09
1241.02	1.140	0.613	1.131				
309.98	1.189	0.683	1.165				
77.76	1.251	0.770	1.220				
19.56	1.303	0.844	1.277				
4.84	1.342	0.899	1.322				

Notes:

k calculated using cv based on t<sub>90</sub> values.

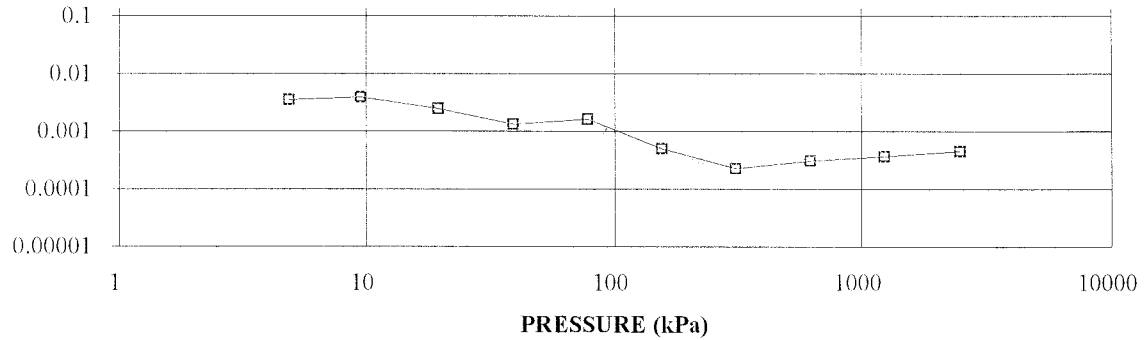
### SAMPLE DIMENSIONS AND PROPERTIES - FINAL

Sample Height, cm	1.34	Unit Weight, kN/m <sup>3</sup>	18.86
Sample Diameter, cm	6.34	Dry Unit Weight, kN/m <sup>3</sup>	14.25
Area, cm <sup>2</sup>	31.57	Specific Gravity, measured	2.76
Volume, cm <sup>3</sup>	42.36	Solids Height, cm	0.707
Water Content, %	32.30	Volume of Solids, cm <sup>3</sup>	22.31
Wet Mass, g	81.46	Volume of Voids, cm <sup>3</sup>	20.06
Dry Mass, g	61.57		

## OEDOMETER CONSOLIDATION SUMMARY

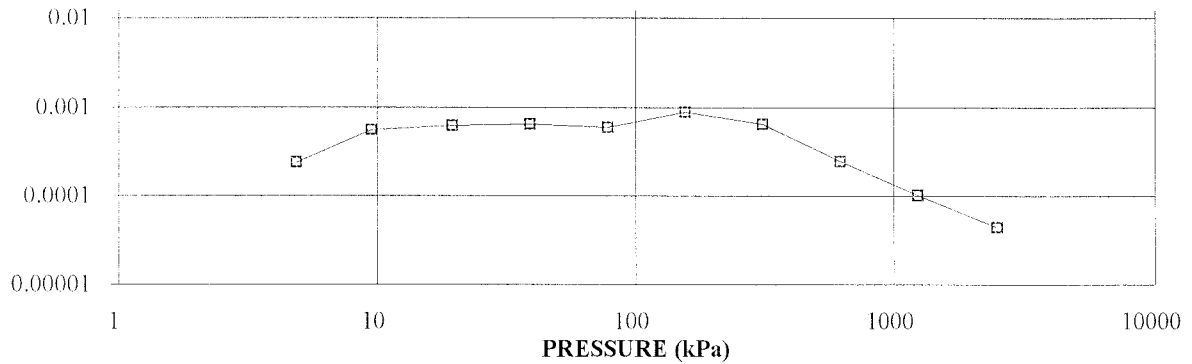
COEFFICIENT OF CONSOLIDATION,  $\text{cm}^2/\text{s}$

CONSOLIDATION TEST  
 $c_v$   $\text{cm}^2/\text{s}$  vs PRESSURE (kPa)  
BH 03-2 SA 1



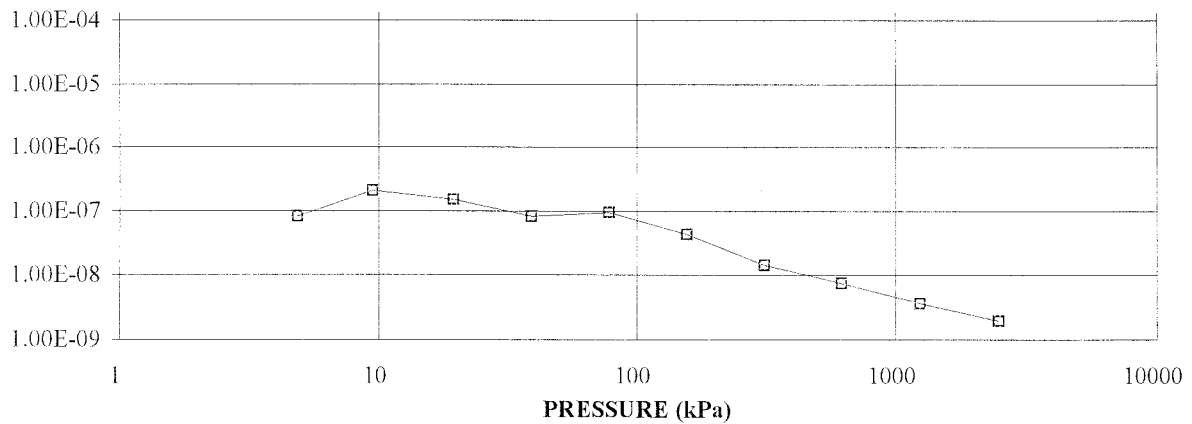
VOLUME  
COMPRESSIBILITY,  
 $\text{m}^2/\text{kN}$

CONSOLIDATION TEST  
 $m_v$ ,  $\text{m}^2/\text{kN}$  vs PRESSURE (kPa)  
BH 03-2 SA 1



HYDRAULIC  
CONDUCTIVITY,  $\text{cm}/\text{s}$

CONSOLIDATION TEST  
HYDRAULIC CONDUCTIVITY vs PRESSURE  
BH 03-2 SA 1

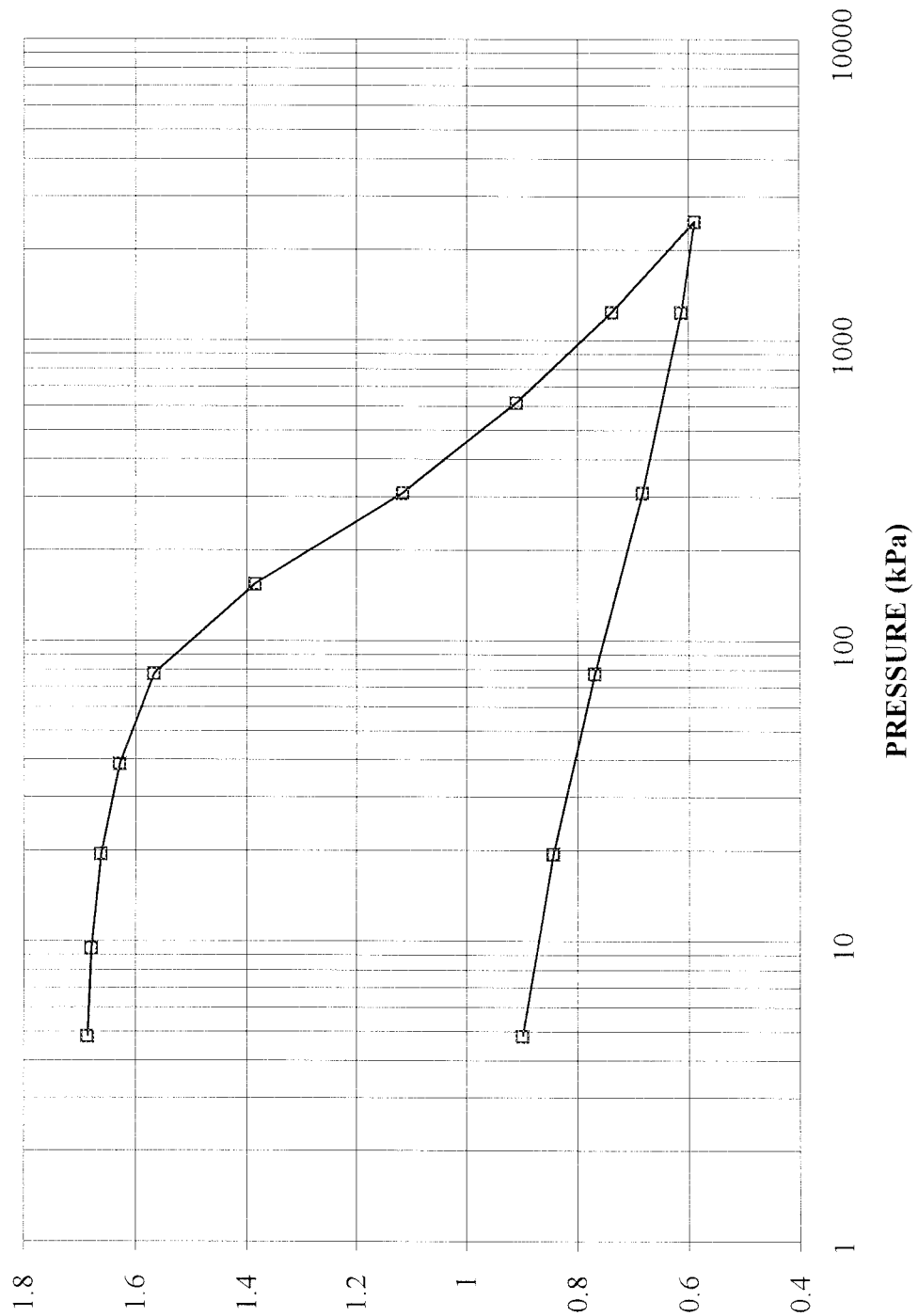


Project No. 031-116026

CONSOLIDATION TEST  
VOID RATIO VS. LOG PRESSURE

FIGURE

CONSOLIDATION TEST  
VOID RATIO vs PRESSURE  
BH 03-2 SA 1



Project No. 031-116026

VOID RATIO



## OEDOMETER CONSOLIDATION SUMMARY

### SAMPLE IDENTIFICATION

Project Number	031-116026	Sample Number	2
Borehole Number	03-2	Sample Depth, m	16.8-17.4

### TEST CONDITIONS

Test Type	Standard	Load Duration, hr	24
Oedometer Number	6		
Date Started	03-07-16		
Date Completed	03-07-31		

### SAMPLE DIMENSIONS AND PROPERTIES - INITIAL

Sample Height, cm	1.90	Unit Weight, kN/m <sup>3</sup>	15.44
Sample Diameter, cm	6.34	Dry Unit Weight, kN/m <sup>3</sup>	9.04
Area, cm <sup>2</sup>	31.57	Specific Gravity, measured	2.79
Volume, cm <sup>3</sup>	59.98	Solids Height, cm	0.628
Water Content, %	70.79	Volume of Solids, cm <sup>3</sup>	19.82
Wet Mass, g	94.43	Volume of Voids, cm <sup>3</sup>	40.16
Dry Mass, g	55.29	Degree of Saturation, %	97.4

### TEST COMPUTATIONS

Pressure kPa	Corr. Height cm	Void Ratio	Average Height cm	t <sub>90</sub> sec	cv, cm <sup>2</sup> /s	mv m <sup>2</sup> /kN	k cm/s
0.00	1.900	2.027	1.900				
4.77	1.895	2.019	1.898	10	7.63E-02	5.19E-04	3.88E-06
9.58	1.890	2.011	1.893	40	1.90E-02	5.58E-04	1.04E-06
19.31	1.878	1.991	1.884	40	1.88E-02	6.76E-04	1.25E-06
38.80	1.859	1.961	1.868	60	1.23E-02	5.05E-04	6.10E-07
77.63	1.824	1.905	1.841	72	9.98E-03	4.79E-04	4.68E-07
155.17	1.729	1.754	1.776	158	4.23E-03	6.45E-04	2.67E-07
310.53	1.473	1.346	1.601	2836	1.92E-04	8.67E-04	1.63E-08
620.68	1.324	1.109	1.398	1390	2.98E-04	2.52E-04	7.38E-09
1240.88	1.213	0.933	1.269	696	4.90E-04	9.39E-05	4.51E-09
2482.11	1.114	0.775	1.164	255	1.13E-03	4.20E-05	4.64E-09
1240.88	1.130	0.800	1.122				
310.53	1.176	0.874	1.153				
77.63	1.237	0.970	1.206				
19.31	1.289	1.053	1.263				
4.77	1.333	1.123	1.311				

Notes:

k calculated using cv based on t<sub>90</sub> values.

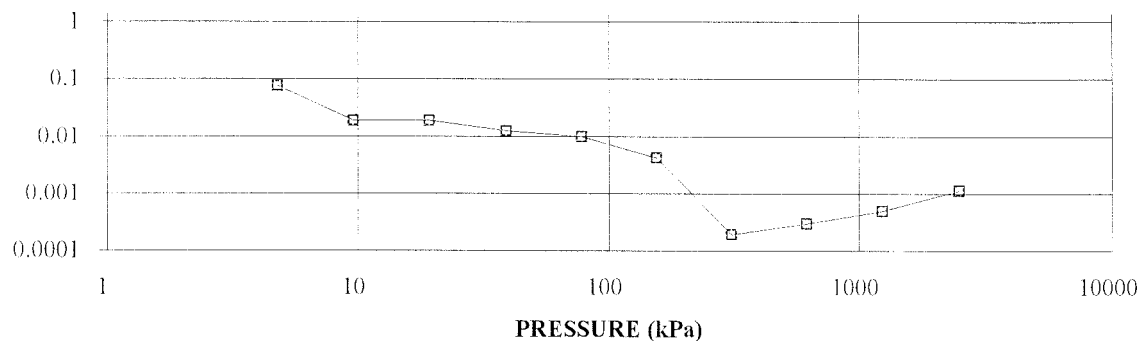
### SAMPLE DIMENSIONS AND PROPERTIES - FINAL

Sample Height, cm	1.33	Unit Weight, kN/m <sup>3</sup>	18.26
Sample Diameter, cm	6.34	Dry Unit Weight, kN/m <sup>3</sup>	12.89
Area, cm <sup>2</sup>	31.57	Specific Gravity, measured	2.79
Volume, cm <sup>3</sup>	42.07	Solids Height, cm	0.628
Water Content, %	41.69	Volume of Solids, cm <sup>3</sup>	19.82
Wet Mass, g	78.34	Volume of Voids, cm <sup>3</sup>	22.25
Dry Mass, g	55.29		

# OEDOMETER CONSOLIDATION SUMMARY

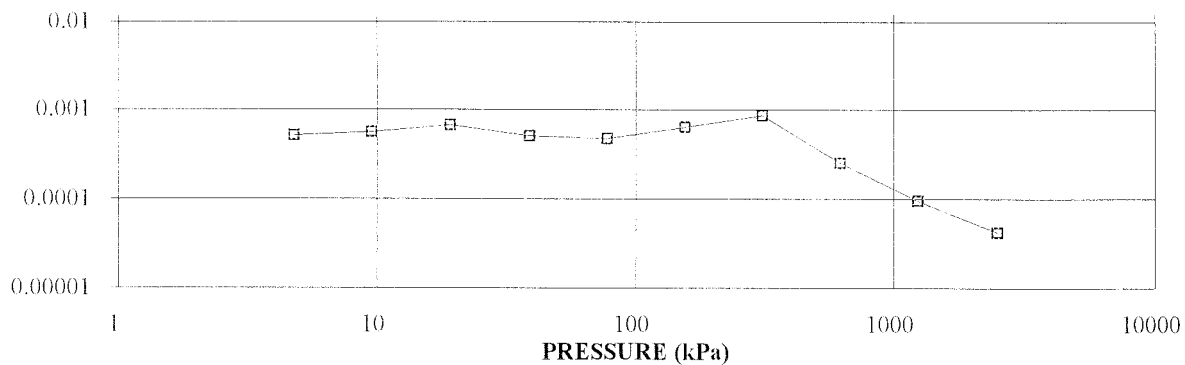
COEFFICIENT OF CONSOLIDATION,  $\text{cm}^2/\text{s}$

**CONSOLIDATION TEST**  
 $c_v$   $\text{cm}^2/\text{s}$  vs PRESSURE (kPa)  
 BH 03-2 SA 2



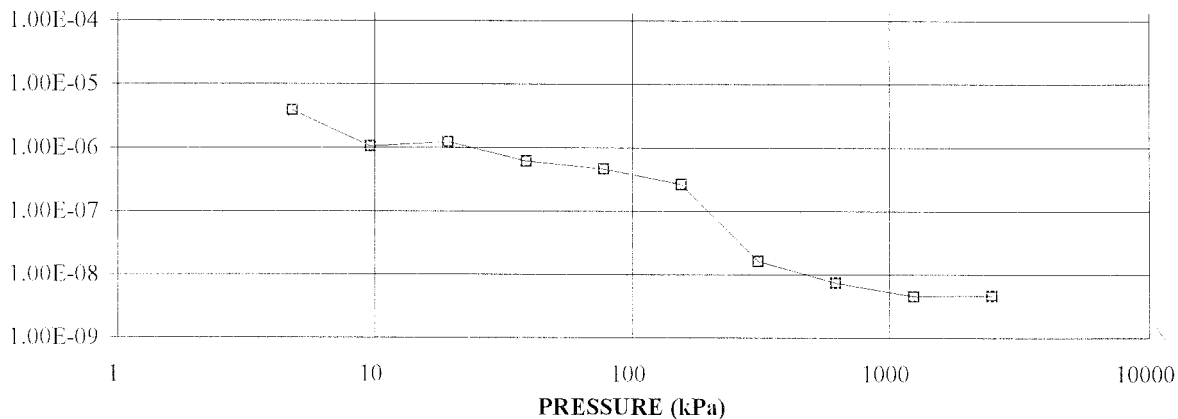
VOLUME  
COMPRESSIBILITY,  
 $\text{m}^2/\text{kN}$

**CONSOLIDATION TEST**  
 $m_v$ ,  $\text{m}^2/\text{kN}$  vs PRESSURE (kPa)  
 BH 03-2 SA 2



HYDRAULIC  
CONDUCTIVITY,  $\text{cm}/\text{s}$

**CONSOLIDATION TEST**  
 HYDRAULIC CONDUCTIVITY vs PRESSURE  
 BH 03-2 SA 2

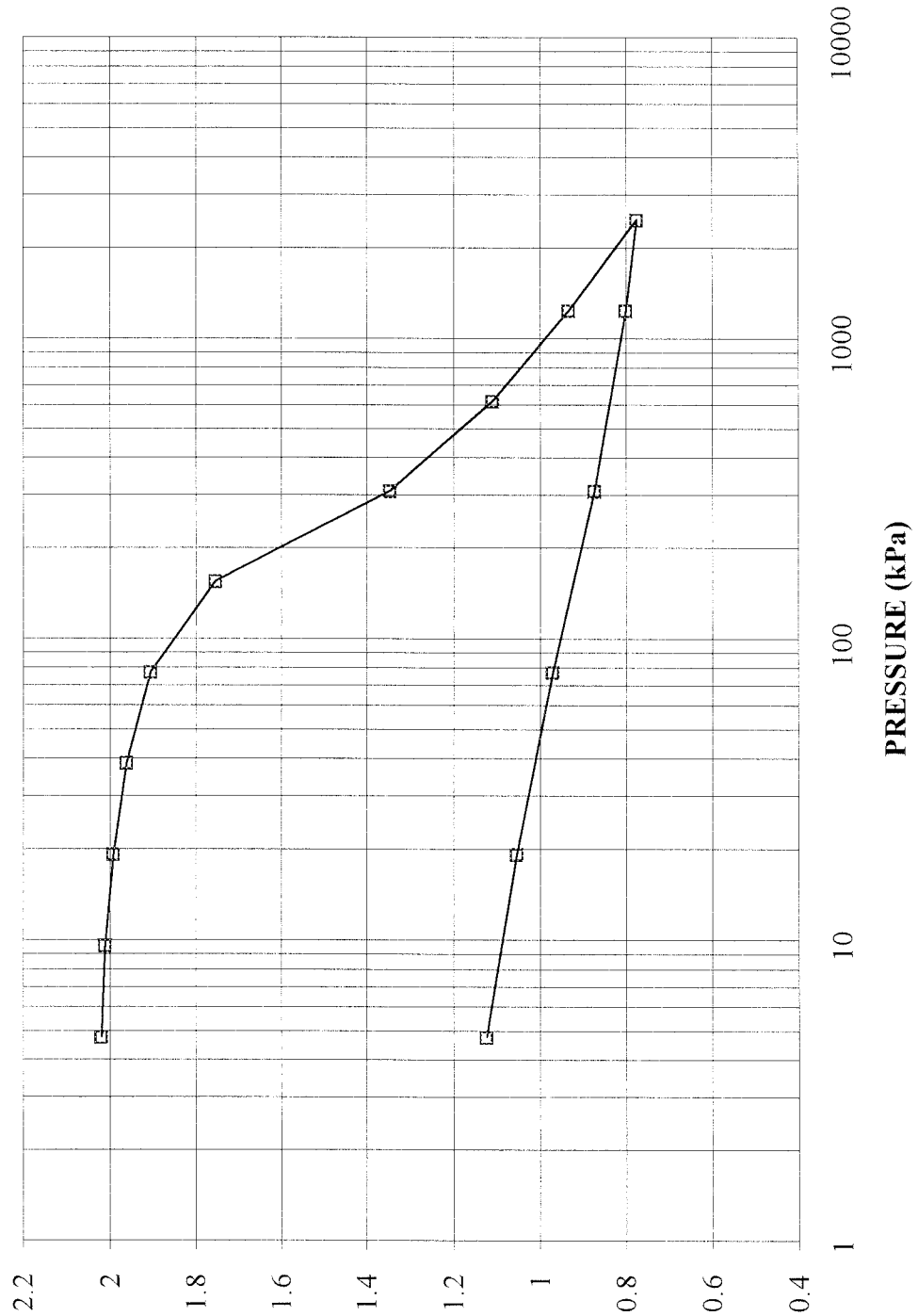


Project No.      031-116026

CONSOLIDATION TEST  
VOID RATIO VS. LOG PRESSURE

FIGURE

CONSOLIDATION TEST  
VOID RATIO vs PRESSURE  
BH 03-2 SA 2



## SPECIFIC GRAVITY TEST RESULTS

### ASTM D 854-00 TEST METHOD A

PROJECT NUMBER	031-116026	
PROJECT NAME	Thurber / Lab Testing / 19-4078-0	
DATE TESTED	July, 2003	
Borehole No.	Sample No.	Specific Gravity
03-2	1	2.76
03-2	2	2.79

Note: Test carried out on soil particles <4.75mm using distilled water.

27-Aug-2003

THURBER ENGINEERING LTD.  
2010 Winston Park Drive, Suite 103  
Oakville, ON  
L6H 5R7

Page: 1  
Copy: 1 of 2

Attn: Steve Sather  
Project: 19-4078-0

Received: 11-Aug-2003 16:39

PO #:

Job: 2357625

Status: Final

## Soil Samples

Sample Id	pH SM 4500B pH Units	SO4= SM 4110B ppm
03-1 SS#5 (25-27')	7.55	100
03-3 SS#2 (10-12')	8.05	62
Blank	---	<5
QC Standard (found)	7.66	461
QC Standard (expected)	7.60	500
Repeat 03-1 SS#5 (25-27')	7.54	98

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies and QA/QC procedures. Philip Analytical is limited in liability to the actual cost of the pertinent analyses done unless otherwise agreed upon by contractual arrangement. Your samples will be retained by PASC for a period of 30 days following reporting or as per specific contractual arrangements.

Job approved by:

Signed:

.....  
Malgorzata Dancziger  
Project Manager