

April 27, 2020 File: 26141

Associated Engineering Ltd. #500 - 2889 East 12th Avenue Vancouver, BC, V5M 4T5

Attention: Priscilla Tsang, P.Eng.

HIGHWAY 1 - 216 STREET TO 264 STREET WIDENING GEOTECHNICAL INVESTIGATION FACTUAL REPORT

Dear Priscilla:

1. INTRODUCTION

Thurber was retained by Associated Engineering Ltd. to provide geotechnical design input for the Functional Design of the BC Ministry of Transportation and Infrastructure's (MoTI) Highway 1 - 216 Street to 264 Street Widening project. The major components of the project include:

- Widening of approximately 10 km of Highway 1 to accommodate eastbound and westbound HOV lanes between the 216 Street and the 264 Street Interchanges;
- Widening of Highway 1 to support westbound truck climbing lane between the 232 Street and the 216 Street Interchanges;
- Reconfiguration of the 232 Street Interchange including replacement of the existing underpass structure and a new NB to WB flyover;
- Demolition and reconstruction of the existing Glover Road underpass structure; and
- Demolition and reconstruction of the existing Canadian Pacific Railway (CPR) underpass structure.

This letter provides Thurber's factual geotechnical data collected for the project. It is a condition of this letter that Thurber's performance of its professional services is subject to the attached Statement of Limitations and Conditions.

2. EXISTING GEOTECHNICAL INFORMATION

Existing geotechnical information available for the project includes the following:

• 232nd Street and 72nd Avenue Intersection Upgrade project completed by Thurber Engineering Ltd. on March 22, 2013. This letter includes seven test pits that were completed to depths of approximately 2.7 m to 3.0 m along the edge of the existing 232nd Street and 72nd Avenue embankments.



- Highway 1 Eastbound 232nd to 264th Truck Climbing Lane Project 100% Design Geotechnical Recommendations memo completed by Thurber on September 26, 2012. This report includes two test holes completed to approximately 20 m depth, one at each abutment for the 248th bridge replacement. 58 test pits were completed in the highway median to between 2 m and 5 m depth. Six solid stem auger and CPT holes were also completed within the highway median to depths between 15 m and 19 m (4 m to 18 for the CPTs).
- Final Geotechnical Design Report 232nd Street Grade Separation Overpass completed by EXP on November 22, 2011. This report is for a grade separation north of the Highway 1 / 232nd Street Interchange; the subsurface conditions are similar to those encountered closer to the highway. The report includes three cone penetration tests (CPTs) to 40 m depth, four auger test holes completed to between 9 m and 18 m depth. Four Shelby tube samples were collected for consolidation, water content, and Atterberg limits testing.
- Geotechnical Investigation Eastbound Climbing Lane Highway 1 232nd to 240th completed by Golder Associates on January 23, 2009. The report includes 11 test pits completed to between 2.4 m and 5.5 m depth.
- Geotechnical Report Highway 1 202 Street to 216 Street Highway Widening and 216 Street Interchange completed by Tetra Tech EBA Inc. on June 28, 2016. The report includes geotechnical investigation and design recommendations for the Highway 1 widening west of this project site. The geotechnical investigation includes three CPTs completed to between 16.4 m and 21.5 m depth, one seismic CPT completed to 16.8 m depth, two mud-rotary test holes drilled to between 27 m and 30 m depth and 20 solid stem auger test holes drilled to between 3 m and 6 m depths. Numerous other historical test holes between 202 Street and 208 Street were included in the report.
- Burnaby and Langley Freeway Sections of the Trans-Canada Highway by Foundation of Canada Engineering Corporation and the BC Department of Highway on August 15, 1965.
 The report describes the conditions encountered during construction within the Burnaby and Langley Freeway sections and provides insight regarding construction techniques as well as field and laboratory testing.
- Estimating Undrained Shear Strength of Clay from Cone Penetration Tests thesis
 completed by James Greig in September 1985 as part of his Masters of Applied Science
 Degree. This thesis provides cone penetration testing and correlations between the CPT
 and undrained shear strength of the silty clay at both the CP Rail crossing and the 232nd
 Interchange.

The historical test holes, CPTs and test pits have been included on our Investigation Location Plan drawings (Dwg. 26141-1 to -6). The test hole logs, CPT logs and test pit logs are attached.

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3. SURFICIAL GEOLOGY

According to the published surficial geology (Open File 3511, Geological Map of the Vancouver Metropolitan Area, 1998) the project is characterized by the following soil units:

- from 216 street to 236 Street: Capilano Sediments: Raised marine, deltaic and fluvial deposits. Mainly marine silt loam to clay loam with minor sand, silt and stony glacio-marine material, up to 60+ m thick.
- from 236 street to 238 Street: Upland Peat to 8 m or more thick.
- from 238 street to 252 Street: Fort Langley Formation: proglacial deltaic gravel and sand.
- from 252 street to 264 Street: Fort Langley Formation: glaciomarine stony silt to loamy clay, 8 to 100 m thick.

4. GEOTECHNICAL INVESTIGATION

4.1 Overview

Thurber prepared a geotechnical investigation work plan for review by MoTI. The work plan comprised of solid stem auger test holes, cone penetration testing, and test pitting. Thurber completed the geotechnical investigation between November 12 and November 23, 2019 following approval of the work plan.

During the investigation, the soil conditions were logged in the field by qualified personnel from Thurber. Representative disturbed samples were collected and subjected to laboratory testing in Thurber's laboratory.

The completed investigation locations were determined in the field using a hand-held GPS unit Elevations were estimated based on survey drawings provided to Thurber by AE. The coordinates and elevations of completed investigation locations are provided on the test hole and test pit logs.

4.2 Test Holes and CPTs

Eight solid-stem auger test holes and cone penetration tests (CPTs) were completed through the shoulder of Highway 1 or on gravel pull-outs as shown on the attached Investigation Location Plans (Dwg. 26141-1 to -2). The CPTs were completed at each location to depths ranging between approximately 37 m to 50 m. Following completion of the CPT, a solid stem auger was used to drill to 20 m depth within the same hole.

The test holes were completed with a truck-mounted rig operated by Southlands Drilling Co. Ltd. The CPT profiling and dissipation testing were completed by Schwartz Soil Tech Inc. using pushing equipment mounted on the Southlands rigs. Test holes were backfilled with soil cuttings with bentonite seals in accordance with the BC Groundwater Protection Regulations. The asphalt surface was reinstated with cold patch asphalt equal in thickness to the existing asphalt, compacted in two lifts.

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4.3 In-Situ Testing and Sampling

In-situ testing was completed to assess soil parameters such as permeability, strength and relative density. In-situ test results are presented on the relevant test hole and CPT logs.

4.3.1 Cone Penetration Test (CPT)

Conventional CPT profiling was completed at eight locations (TH/CPT19-01 to -08). The CPT logs are attached. Soil descriptions on the CPT profiles were provided by Schwartz and are interpreted from the CPT data based on published correlations. These interpreted soil conditions should be considered approximate and may differ from the actual soil conditions.

4.3.2 Pore Pressure Dissipation (PPD)

The advancement of the CPT cone was halted at selected depths in each of the eight CPTs (TH/CPT19-01 to -08) to conduct PPD tests. The pore pressure variation was measured and recorded every second typically until 50% or more of the excess pore pressure had dissipated. The dissipation test results are attached.

4.4 Test Pitting

16 test pits were completed within the median of Highway 1 as shown on the attached Plans (Dwg. 26141-1 to -6). The test pits were completed to about 3 m depth using an excavator operated by Backhoes Unlimited. The test pits were primarily used to identify stripping thickness in locations where test holes were not drilled. The test pits were also used to investigate embankment foundation conditions and characterize proposed cut materials.

The excavated soil was backfilled and bucket compacted in the test pit excavation upon completion of the test pit.

5. LABORATORY TESTING

Disturbed samples retrieved from the investigation were returned to our Vancouver laboratory for routine visual classification and moisture content determination. Atterberg Limits were completed on select disturbed samples in our laboratory.

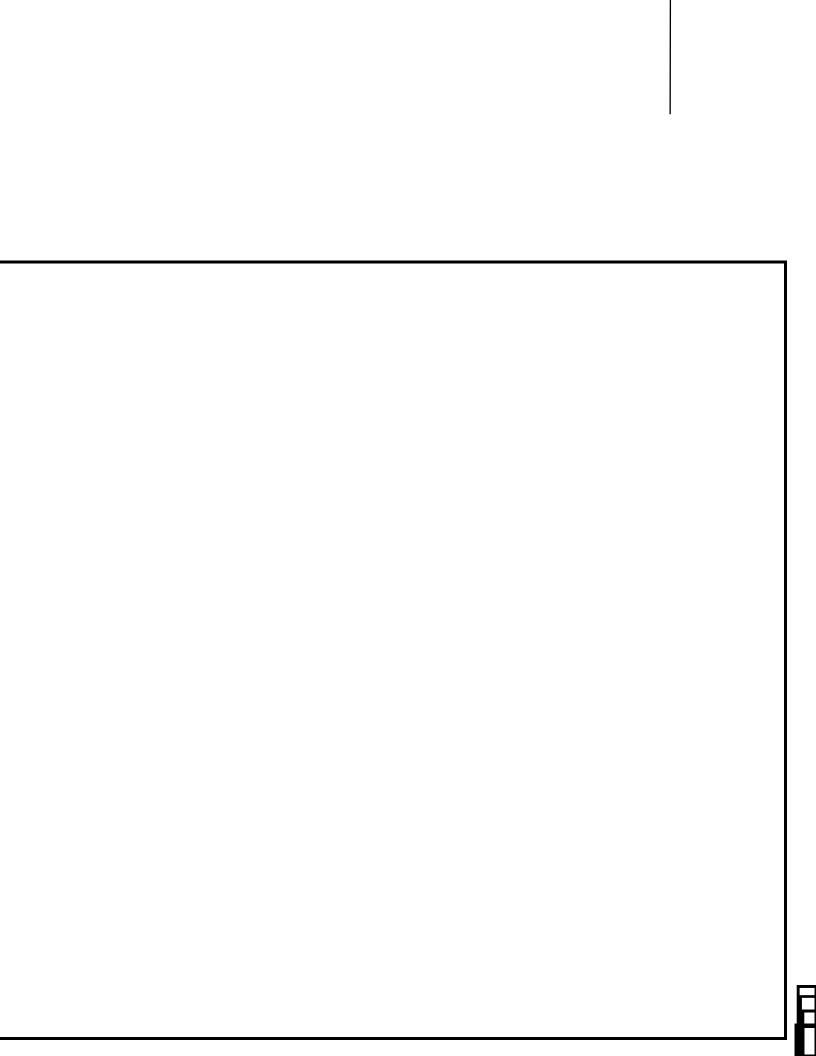
5.1 Soil Description and Classification

Samples were subject to routine classification assessment in our laboratory independent of the classification completed in the field. Classifications were based on visual and tactile assessment of samples in general accordance with the Canadian Foundation Engineering Manual (4th Edition). Soil samples were further classified under the Unified Soil Classification System (USCS) and the group symbols are reported in the comments column of the test hole logs.

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STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT THURBER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS THURBER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belong to Thurber. Any use which a third party makes of the Report, is the sole responsibility of such third party. Thurber accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Thurber's express written permission.

5. INTERPRETATION OF THE REPORT

- a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other persons making use of such documents or records with our express written consent should be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.
- b) Reliance on Provided Information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.
- c) Design Services: The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber should be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design detailed in the contract documents should be reported to Thurber immediately so that Thurber can address potential conflicts.
- d) Construction Services: During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions in order to confirm and document that the site conditions do not materially differ from those interpreted conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. RELEASE OF POLLUTANTS OR HAZARDOUS SUBSTANCES

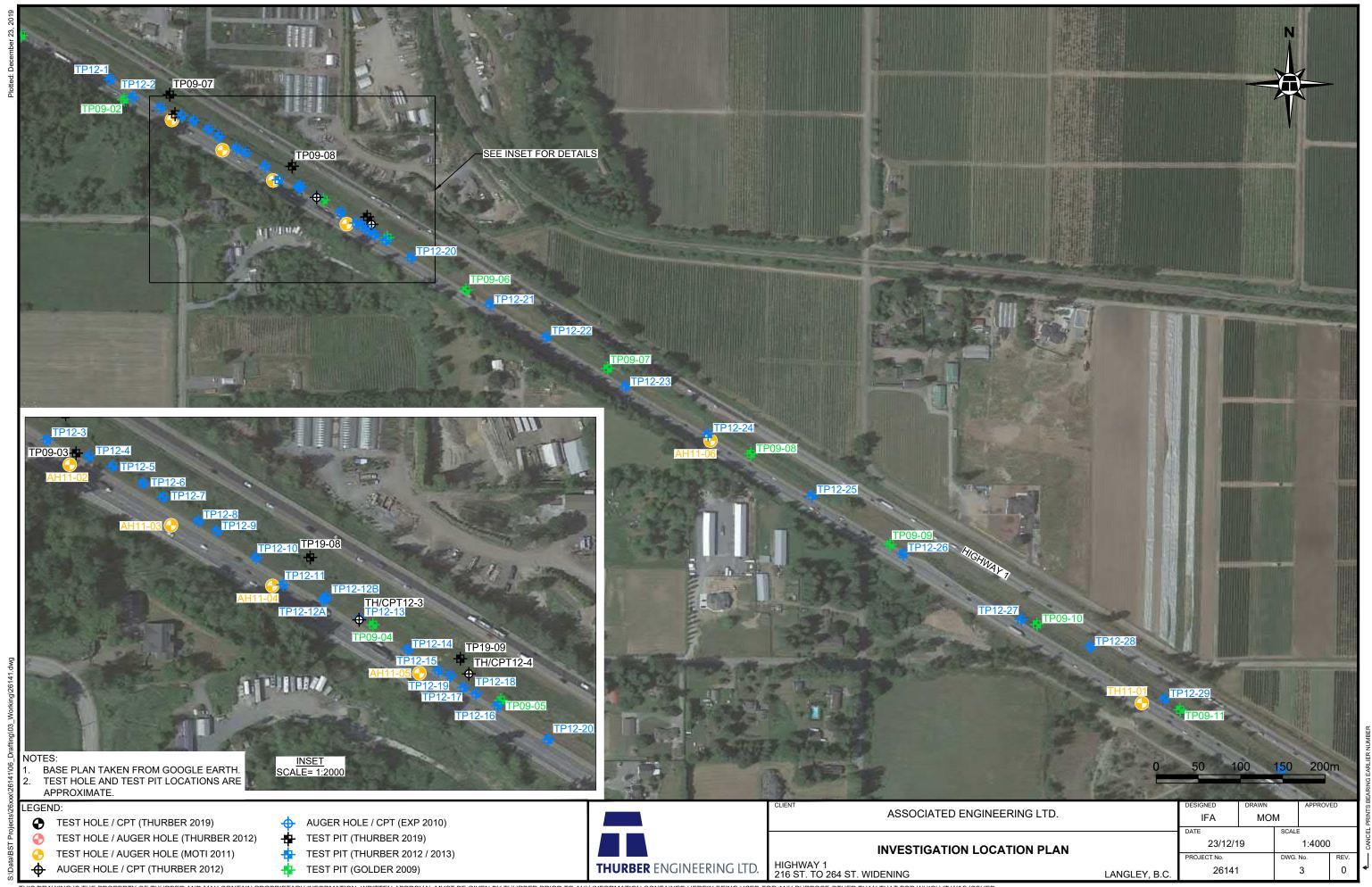
Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause the escape, release or dispersal of those substances. Thurber shall have no liability to the Client under any circumstances, for the escape, release or dispersal of pollutants or hazardous substances, unless such pollutants or hazardous substances have been specifically and accurately identified to Thurber by the Client prior to the commencement of Thurber's professional services.

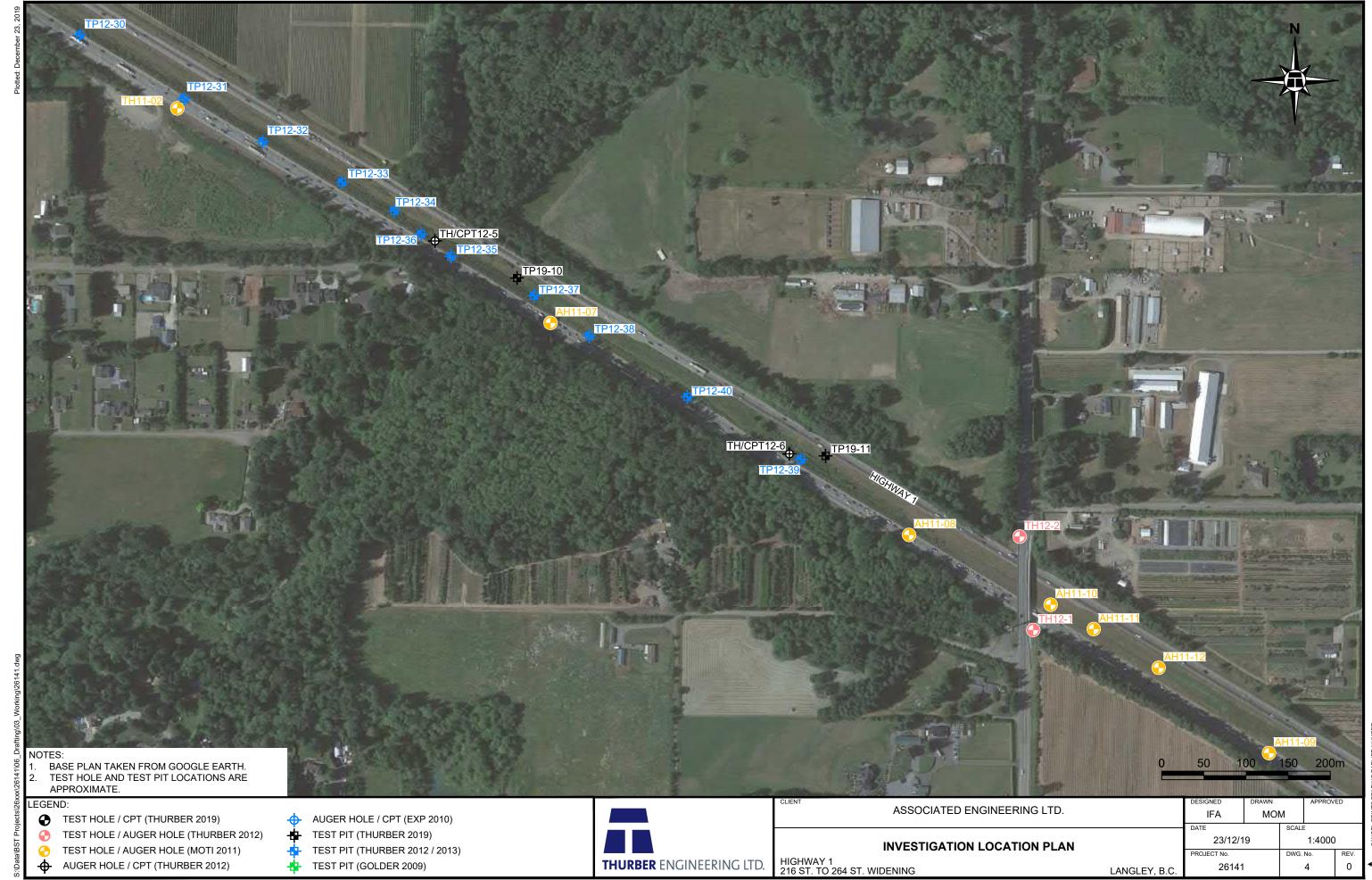
7. INDEPENDENT JUDGEMENTS OF CLIENT

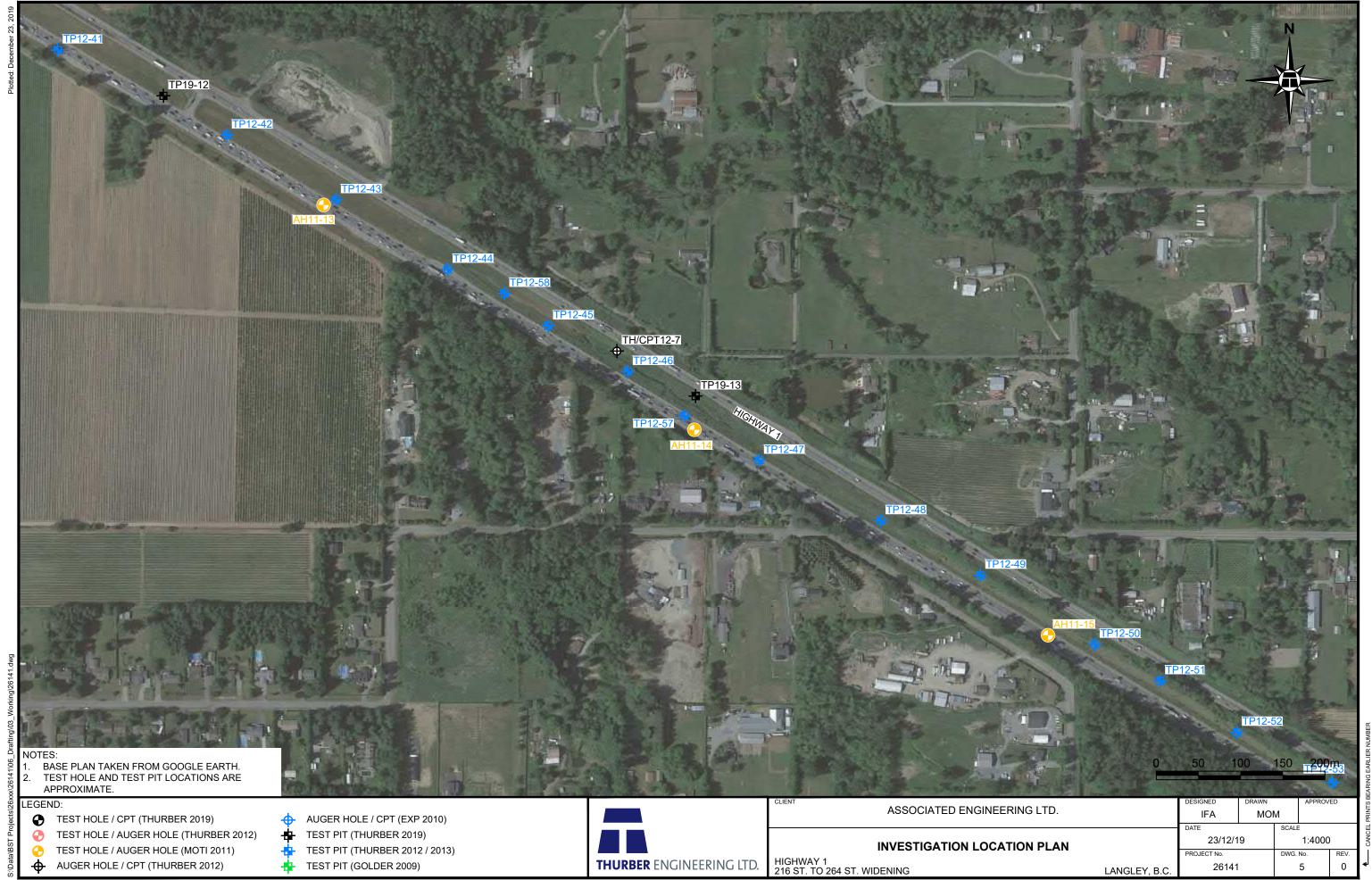
The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpretations and/or decisions of the Client, or others who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes but is not limited to decisions made to develop, purchase or sell land.















2019 Thurber Test Hole Logs

6		WITH THE PUBLISHED AND THE PUB				5	SU	MMARY LOG		Drill Hole #: TH19			
	ITISH	Ministry of Transportation	, , ,	-		216	St	reet to 264 Street Widening	1	Date(s) Drilled: November 15, 2019			
	umbia ared by:	and Infrastructure 26141	Location: Langley Datum: 10U	, B.C). 			Alignment:	-	ling Company: Southland Drilli ler: Jeremy Levy	ng		
l riep	Thurber E	ngineering Ltd.	Northing/Easting:	544	3585	5 , 52	908		1	I Make/Model: Truck Drill #8			
Logg	ed by: IFA		Elevation: 12.01						Dril	Drilling Method: Solid Stem Auger			
DEPTH (m)	DRILLING DETAILS	+ Natural Vane (KPa) ▲ SPT "N" (BLC W _P % W	300 400 (BLOWS/300 mm) ★ ⊕ Remold Vane (KPa) DWS/300 mm) ▲ 1% W _L %	SAMPLE TYPE	SAMPLE NO	RECOVERY (%)	SOIL SYMBOL	SOIL DESCRIPTION	CLASSIFICATION	COMMENTS TESTING Drillers Estimate {G % S % F %}	ELEVATION (m)		
- 0		20 40	60 80			LE.		ASPHALT (305 mm thick).		(8 70 8 70 1 70)			
-				 	1		. ◀	Grey-brown, gravelly SAND (ROADBASE).		-			
-		5.2		_	'		4. 4	(NOADBAGE).	SP		-		
- -1 - - -		46.8	• • • • • • • • • • • • • • • • • • •	IΣ	2			Firm to stiff, grey-brown, silty CLAY to SILT and CLAY with a trace of oxidation and organics.	1		11-		
- - -2 -				-					СН		10-		
- - - - -3			63.4·	IΣ	3					Atterberg (Sa#3): PL:29% LL:78%	- - - - - 9		
				-				Very soft to soft, grey, silty CLAY to SILT and CLAY with traces of oxidation and organics.			-		
- -4 - -		44.6		.ΙΣ	4						8		
- - - - 5									CH		7-		
- - - - -6		47		<u>.</u> ΙΣ	5						- - - - - 6-		
/20								End of hole at required depth. Hole open to 3.1 m depth. No water observed upon completion of drilling.					
ZEV2.GDT 7/1											5		
MOT-DRAFT-F				1							4-		
141 MOTI.GPJ				-							-		
MOT-SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-BRAFT-REV2.GDT 7/1/20 MOT-SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-BRAFT-REV2.GDT 7/1/20 SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-BRAFT-REV2.GDT 7/1/20													
MOT-SOIL-REVS	ole Type:	A-Auger C-C S-Split CorC (air		n)	v □, □,	-Vane -Shel ube				Final Depth of Hole: 6 Depth to Top of R Page 1	Rock:		

		American minutes				SI	JMMARY LOG		Drill Hole #: TH19	9-02		
	ITISH	Ministry of Transportation	, ,	-			Street to 264 Street Widening	Date(s) Drilled: November 15, 2019				
	umbia ared by:	and Infrastructure 26141	Location: Langley, B.C. Datum: 10U Alignment:						Drilling Company: Southland Drilling			
	Thurber E	Datum: 10U Alignment: Northing/Easting: 5443541, 529049 Station/Offset:						Driller: Jeremy Levy Drill Make/Model: Truck Drill #8				
Logg	ed by: IFA	Reviewed by: CJC	Elevation: 12.01			,			ling Method: Solid Stem Auger	г		
DEPTH (m)	DRILLING DETAILS	100 200 **DYNAMIC CONE + Natural Vane (KPa) ▲ SPT "N" (BLC	Shear Strength (kPa) 300 400 (BLOWS/300 mm) ★ ⊕ Remold Vane (KPa) DWS/300 mm) ▲	SAMPLE TYPE	SAMPLE NO	RECOVERY (%)		CLASSIFICATION	COMMENTS TESTING	ELEVATION (m)		
		20 W _P % W	/% W _L % 80	SAI	8	RECO		CLA	Drillers Estimate {G % S % F %}			
- 0 - - - - -		4:4		ΙΣ	1	0.	ASPHALT (150 mm thick). Brown SAND and GRAVEL (ROADBASE). 50 mm thick layer of silty SAND at 0.2 m depth Stiff to very stiff, grey-brown, silty CLAY to	CD	>_			
-1 -1 -		47.	7		2		SILT and CLAY with traces of oxidation and organics.			11-		
- -2 - -					3		- firm to stiff below 2.3 m depth	СН		10-		
-3 -3 -							Soft to firm, grey, silty CLAY to SILT and 3.35m CLAY.	1		9-		
- - -4 - -		47			4				Atterberg (Sa#4): PL:28% LL:70%	8-		
- - - - 5 - -							- soft to very soft, below 4.4 m depth	CL/CF		7-		
- - - -6		37,7			5		End of hole at required depth. 6.1m			6.		
7/1/20 1-1-1-1-7 1-1-1-1-7 1-1-1-1-7 1-1-1-1-7 1-1-1-1-							Hole open to 0.9 m depth. No water observed upon completion of drilling.			5-		
26141 MO I.GPJ MO I-DRAFI-REV2.GD 7/1/20										4-		
										3-		
-				1								
- 10			<u> </u>	1								
100%-100%-100%-100%-100%-100%-100%-100%	le Type:	A-Auger C-C e S-Split C-C Spoon (air		rn)		/-Vane -Shelby ube			Final Depth of Hole: 6 Depth to Top of F Page 1	Rock:		

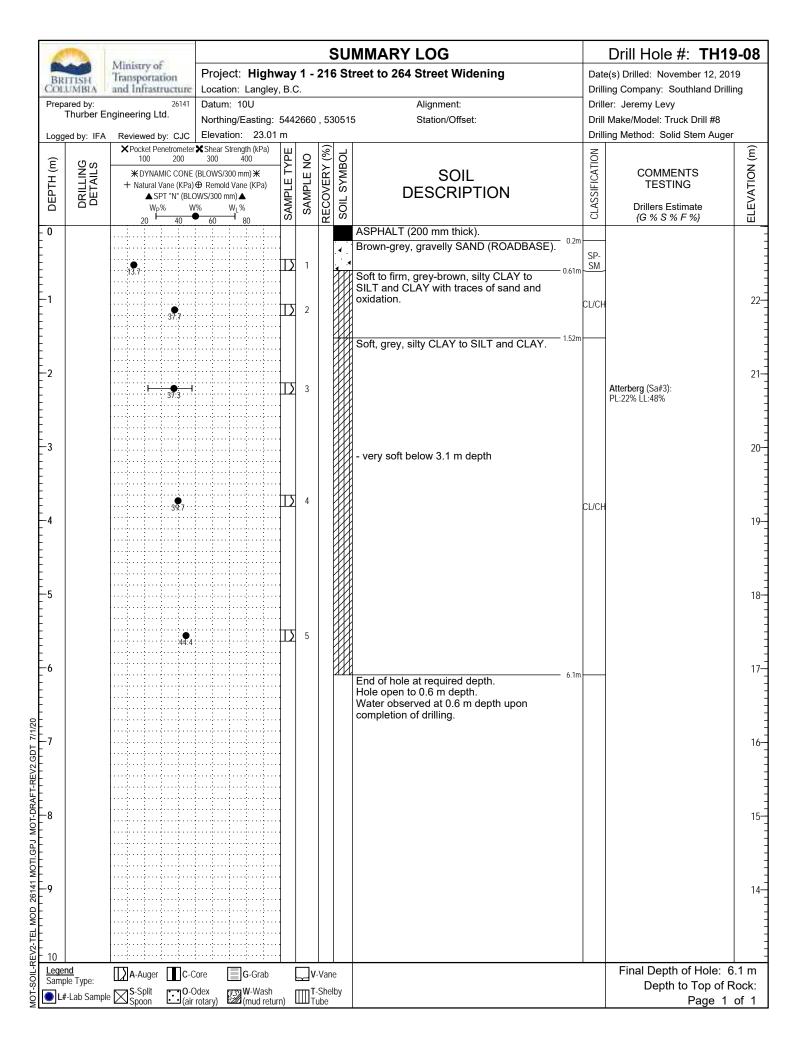
		Wiles Supplied to Service				S	U	MMARY LOG		Drill Hole #: TH19	9-03	
	ITISH	Ministry of Transportation		_				reet to 264 Street Widening	l .	Date(s) Drilled: November 16, 2019		
	ared by:	and Infrastructure 26141	5 7.							Drilling Company: Southland Drilling		
	Thurber E	Datum: 10U Alignment: Northing/Easting: 5443114 , 529781 Station/Offset:						Driller: Jeremy Levy Drill Make/Model: Truck Drill #8				
Logge	ed by: IFA	Reviewed by: CJC	Elevation: 13.01			,			Drill	ing Method: Solid Stem Auger	r	
DEPTH (m)	DRILLING DETAILS	100 200 **DYNAMIC CONE + Natural Vane (KPa) ▲ SPT "N" (BLC	Shear Strength (kPa) 300 400 (BLOWS/300 mm) ★ ⊕ Remold Vane (KPa) DWS/300 mm) ▲ T/S WL S 60 1 80	SAMPLE TYPE	SAMPLE NO	RECOVERY (%)	SOIL SYMBOL	SOIL DESCRIPTION	CLASSIFICATION	COMMENTS TESTING Drillers Estimate {G % S % F %}	ELEVATION (m)	
- 0				15	1	ļ		ASPHALT (150 mm thick). Grey-brown, gravelly SAND			_	
1 1 1 		13.1		ΙΣ	2			(ROADBASE). Compact to dense, grey-brown SAND with traces of silt and gravel.	SP- SM		12-	
-3		44.1			3			Very soft to soft, grey, silty CLAY to SILT and CLAY with a trace to some sand.			10-	
-4 - - - - - - - - 5 - - -		36.1			4				CH/CL		9- 8-	
26141 MOTI.GPJ MOT-DRAFT-REV2.GDT 7/1/20		28:5			5			End of hole at required depth. Hole open to 0.8 m depth. Water observed at 0.8 m depth upon completion of drilling.		Atterberg (Sa#5): PL:16% LL:30%	7- 6- 5-	
OON	le Type:	□ A-Auger □ C-C S-Split □ C-C (air		rn)		J -Vane Γ-Shelb Γube				Final Depth of Hole: 6 Depth to Top of F Page 1	Rock:	

-		Winds the State of				SI	JMMARY LOG		Drill Hole #: TH19	9-04		
	ITISH	Ministry of Transportation		_			Street to 264 Street Widening	1	Date(s) Drilled: November 14, 2019			
	umbia ared by:	and Infrastructure	0 17						Drilling Company: Southland Drilling			
		ngineering Ltd.	Datum: 10U Alignment: Northing/Easting: 5443124 , 529860 Station/Offset:						Driller: Jeremy Levy Drill Make/Model: Truck Drill #8			
Logg	ed by: IFA	Reviewed by: CJC	Elevation: 12.01			,		Dril	ling Method: Solid Stem Auger	r		
DEPTH (m)	DRILLING DETAILS	#DYNAMIC CONE + Natural Vane (KPa) A SPT "N" (BLC		SAMPLE TYPE	SAMPLE NO	RECOVERY (%)	SOIL DESCRIPTION	CLASSIFICATION	COMMENTS TESTING Drillers Estimate {G % S % F %}	ELEVATION (m)		
- 0		20 40					ASPHALT (175 mm thick).	n		 		
1 2 3 4 5 5 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7		94 27:			3 3		Grey-brown, gravelly SAND (ROADBASE). Very soft to soft, grey, silty CLAY to SILT and CLAY with a trace to some sand. End of hole at required depth. Hole open to 0.6 m depth. No water observed upon completion of drilling.	ML/CI	Atterberg (Sa#4): PL:18% LL:38%	11- 10- 9- 8- 7- 6- 5-		
MACHINA CAPATHA MACHINA CAPATH										3		
Leger		A-Auger C-C	Core G-Grab	_		/-Vane			Final Depth of Hole: 6	3.1 m		
Samp	ole Type:	e S-Split Spoon (air		rn)		-vane -Shelby ube			Depth to Top of F	Rock:		

-		Managaman se-				s	UI	MMARY LOG		Drill Hole #: TH19	9-05		
	ITISH	Ministry of Transportation		_				reet to 264 Street Widening		Date(s) Drilled: November 13, 2019			
COL	UMBIA	and Infrastructure 26141	0 1/							Drilling Company: Southland Drilling			
Prepared by: 26141 Thurber Engineering Ltd.			Datum: 10U Alignment: Northing/Easting: 5442028 , 530571 Station/Offset:							Driller: Jeremy Levy Drill Make/Model: Truck Drill #8			
Logg	ed by: IFA	Reviewed by: CJC	Elevation: 23.99		2020	, 550	071	Glation, Onset.		ling Method: Solid Stem Auger	r		
			Shear Strength (kPa) 300 400	Ä		(%)	ᅱ		_		_		
DЕРТН (m)	DRILLING DETAILS		(BLOWS/300 mm) **	SAMPLE TYPE	SAMPLE NO	RECOVERY (%)	SYMBOL	SOIL	CLASSIFICATION	COMMENTS	ELEVATION (m)		
ᇤ	ILLI	+ Natural Vane (KPa)	⊕ Remold Vane (KPa)	빌	필			DESCRIPTION	1 2 3	TESTING	₩		
DEF	R E		DWS/300 mm) ▲ /% W _L %	₽	SAN		SOIL	DESCRIPTION	ASS	Drillers Estimate	N		
		20 40	60 80	Ŝ	0)	~ ~	- 1	40DUALT (400		{G % S % F %}	<u> </u>		
- 0				1		ġ.	0	ASPHALT (100 mm thick). 0.11 Brown-grey SAND and GRAVEL	n -	-			
E]).	9	(ROADBASE).	GP/SF				
 		70			1		0		0.70.				
E ₁				-				Stiff to very stiff, brown-grey, silty CLAY to 0.91	n	-	23-		
- '		30		\square	2	1 1	\mathcal{A}	SILT and CLAY.					
E		<u> </u>		1			33						
]			#	- firm to stiff, grey below 1.5 m depth					
- -2							\mathcal{H}		CH/CI		22-		
		<u> </u>		-			#		011/01]	22		
Ė		33.6		\prod	3		\mathcal{A}						
-				1			\mathcal{H}						
F ,				-		1 1		- soft below 2.7 m depth			21-		
- 3				1			#	Very soft to soft, grey, silty CLAY to SILT 3.05	n —	-	21		
-				-				and CLAY with a trace of sand.					
E				1			11						
F .		43.9			4						20		
F-4		43.9	ļķļķķ	-			11				20-		
-				1									
-		<u></u>		-			11		CL/CH	•			
E				1									
-5 -				1			11				19-		
				-									
-		44.6		\square	5		3			Atterberg (Sa#5):			
-				1			\mathcal{A}			PL:20% LL:42%			
- 6]		2	24	End of hole at required depth.	m	_	18-		
F				1				Hole open to 2.7 m depth.					
				-				Water observed at 0.9 m depth upon completion of drilling.					
8				1				,					
_7 -				1							17-		
-				-									
-				1									
-				1									
-8]							16-		
-													
-				-									
-				1									
<u>-</u> 9				}							15-		
]									
[1									
; ; ; ;				-									
- 10 <u>Lege</u> i	nd	A-Auger C-C	Core G-Grab	1		/-Vane	\dashv			Final Depth of Hole: 6	3.1 m		
Samn	Ja Tyna:						,			Depth to Top of F	Rock:		
[[]L#	-Lab Sample	e S-Split 0-C Spoon (air	Odex W-Wash rotary) (mud retu	rn)	Шt	-Shelby ube	<i>'</i>			Page 1	of 1		

		WINDS THE PERSON				SU	Drill Hole #: TH19-06				
	ITISH	Ministry of Transportation	1 -	-			treet to 264 Street Widening	Date(s) Drilled: November 13, 2019			
	umbia ared by:	and Infrastructure 26141							ling Company: Southland Drilli ler: Jeremy Levy	ng	
	Thurber E	Datum: 10U Alignment: Northing/Easting: 5442726 , 530572 Station/Offset:						ler: Jeremy Levy l Make/Model: Truck Drill #8			
Logg	ed by: IFA	Reviewed by: CJC	Elevation: 23.99			,		Drill	ling Method: Solid Stem Auger	г	
DEPTH (m)	DRILLING DETAILS	#DYNAMIC CONE H Natural Vane (KPa) SPT "N" (BLC	r ★ Shear Strength (kPa) 300 400 (BLOWS/300 mm) ★ 1 ⊕ Remold Vane (KPa) 0WS/300 mm) ▲ 1 WL %	SAMPLE TYPE	SAMPLE NO	RECOVERY (%) SOIL SYMBOL	SOIL DESCRIPTION	CLASSIFICATION	COMMENTS TESTING Drillers Estimate {G % S % F %}	ELEVATION (m)	
- 0						ه ۰	ASPHALT (100 mm thick). Brown SAND and GRAVEL with some silt	1			
- - - - - 1		66			1		(ROADBASE).	GP/SF		23-	
-		24.2			2		Firm, brown-grey, silty CLAY to SILT and CLAY with a trace to some sand.	CL/CH			
-				:			Very soft to soft, grey, silty CLAY to SILT				
				:			and CLAY.			22-	
-											
-		43.1		. 2	3						
-											
<u></u> -3										21-	
Ė				.]							
-											
-4								CH/CI		20-	
-		39,3			4				Atterberg (Sa#4): PL:20% LL:42%		
Ė				:					T 2.20% 22.12%		
Ė				.							
<u></u> 5 -				:						19-	
-				.							
E		46:1			5						
-6		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					6.1m			18-	
-							Hole open to 3.1 m depth.	'			
F							Water observed at 0.9 m depth upon completion of drilling.				
71/20										17	
GDT /			· · · · · · · · · · · · · · · · · · ·							17-	
3EV2.											
AF 1-1											
8 - 8 - 8										16-	
- MC				.							
PH.GF		l									
26141 MOTI.GPJ MOT-DRAFT-REV2.GDT 7/1/20										15.	
				.]						15-	
J MOL											
72-TEI T T T											
MOT-SOIL-REV2-TEL MOD Body # data and a second control of the co	nd	MA Auger Mo 6	Coro Creb	1_	<u> </u>	/ Mana		1	Final Depth of Hole: 6	.1 m	
Samp	le Type:	A-Auger C-C				/ -Vane Γ-Shelby			Depth to Top of F	Rock:	
€ [-Lab Sample	$e \boxtimes_{Spoon}^{S-Split} \square_{(air)}^{O-C}$	Odex rotary) W-Wash (mud retu	ırn)	Шi	Γ-Shelby Γube			Page 1	of 1	

-		Wiles Supplied to the con-					SU	MMARY LOG		Drill Hole #: TH19	9-07	
	ITISH	Ministry of Transportation		-				reet to 264 Street Widening	Date(s) Drilled: November 14, 2019			
	ared by:	and Infrastructure 26141	3 37							Drilling Company: Southland Drilling Driller: Jeremy Levy		
	Thurber E	Northing/Easting: 5442825 , 530506 Station/Offset:							Drill Make/Model: Truck Drill #8			
Logg	ed by: IFA		Elevation: 26.0							ing Method: Solid Stem Auger	_	
DEPTH (m)	DRILLING DETAILS	100 200 ★ DYNAMIC CONE	300 400 (BLOWS/300 mm) **	SAMPLE TYPE	SAMPLE NO	RECOVERY (%)	SYMBOL	SOIL	CLASSIFICATION	COMMENTS	ELEVATION (m)	
EPTI	RILL SET/		⊕ Remold Vane (KPa) DWS/300 mm) ▲	/PLE	MPL	OVE	L S	DESCRIPTION	SSIFI	TESTING	VAT	
		W _P % W	/% W _L % 80	SAN	SA	REC	SOIL		CLA	Drillers Estimate {G % S % F %}		
- 0		4:6		. 17	1			Brown, moist SAND and GRAVEL to gravelly SAND (ROADBASE).	GW-			
-		4.6						Stiff to very stiff, brown-grey SILT and	\$M/SW \SM_/	-		
F								CLAY to silty CLAY with traces of sand and organics.				
<u>-</u> 1											25-	
E		38.6			2							
-2											24-	
-									CH/CL			
-		37.5			3							
-												
- 3		l									23-	
-				-							-	
-												
-4											22-	
-			<u></u>		4			Very soft to soft, grey SILT and CLAY to silty CLAY with a trace of oxidation.		Atterberg (Sa#4):		
-			63.8	. 12	1			Sity CLAT With a trace of Oxidation.		PL:27% LL:71%		
											-	
<u></u> 5									CL/CH		21-	
E											-	
E			64:4		5			- a trace of black-dark grey organic			-	
-6								staining below 5.7 m depth			20-	
<u> </u>				:				End of hole at required depth. Hole open to 1.5 m depth.			:	
[No water observed upon completion of drilling.			-	
₽											10	
											19-	
				:								
<u>-</u> 8				:							18	
<u></u>												
5-												
02111 100.129747-1-7471 100.1914 100.19											17-	
											'/-	
- MC											:	
MOI-SOIL-REVZ-TEL MOD Federal Park Tell MOD Federal Park Tell Park											:	
10 <u>Lege</u>	<u>nd</u>	A-Auger C-C	Core G-Grab	1_		/-Van	L е			Final Depth of Hole: 6	3.1 m	
Samp	ole Type: #-Lab Sample	e S-Split 0-C		,						Depth to Top of F	Rock:	
ĭ ĭ	Lan Sampli	∠Spoon 🗀(air	rotary) (mud retu	ırn)	ТШ	ube				Page 1	<u>ot 1</u>	





2019 Thurber CPT Logs

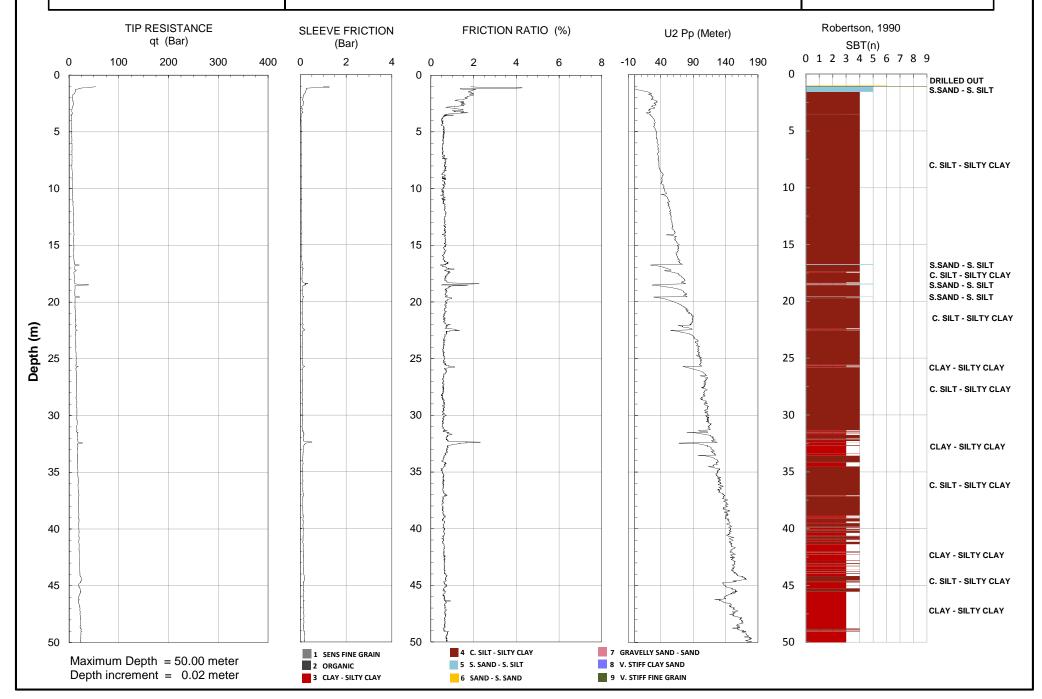


Sounding: CPT19 - 01

Cone ID: DPG1427

Date: November 14 - 15, 2019 Site: Hwy No 1 - 216 to 264 Street





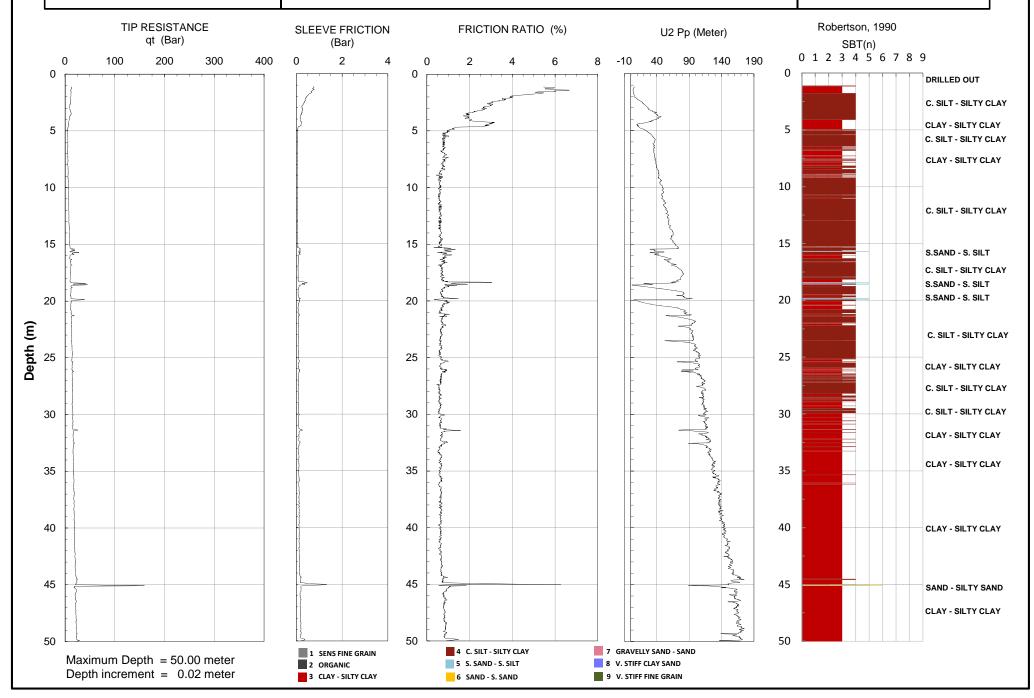


Sounding: CPT19 - 02

Cone ID: DPG1427

Date: November 15 - 16, 2019 Site: Hwy No 1 - 216 to 264 Street





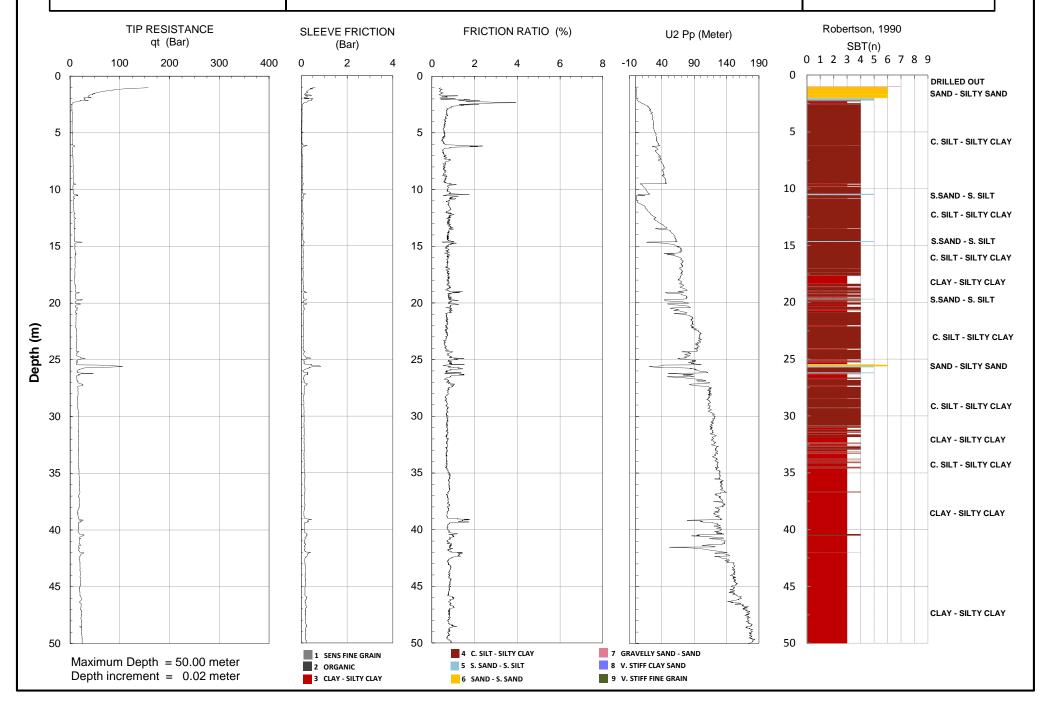


Sounding: CPT19 - 03

Cone ID: DPG1427 Thur

Date: November 15 - 16, 2019 Site: Hwy No 1 - 216 to 264 Street





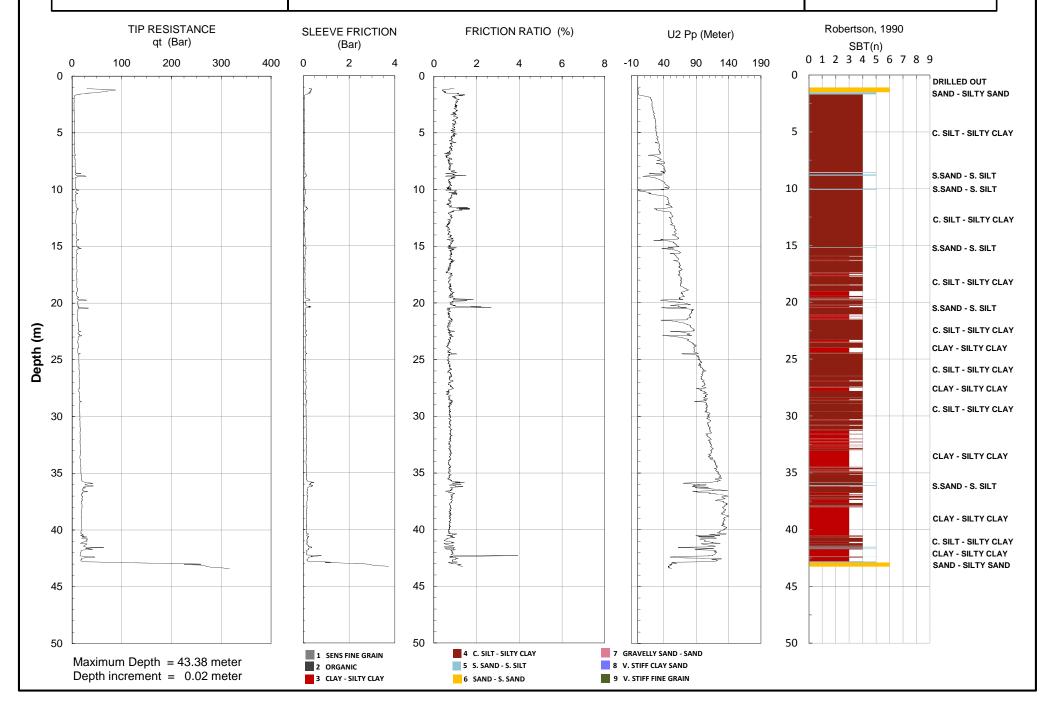


Sounding: CPT19 - 04

Cone ID: DPG1427

Date: November 14 - 15, 2019 Site: Hwy No 1 - 216 to 264 Street





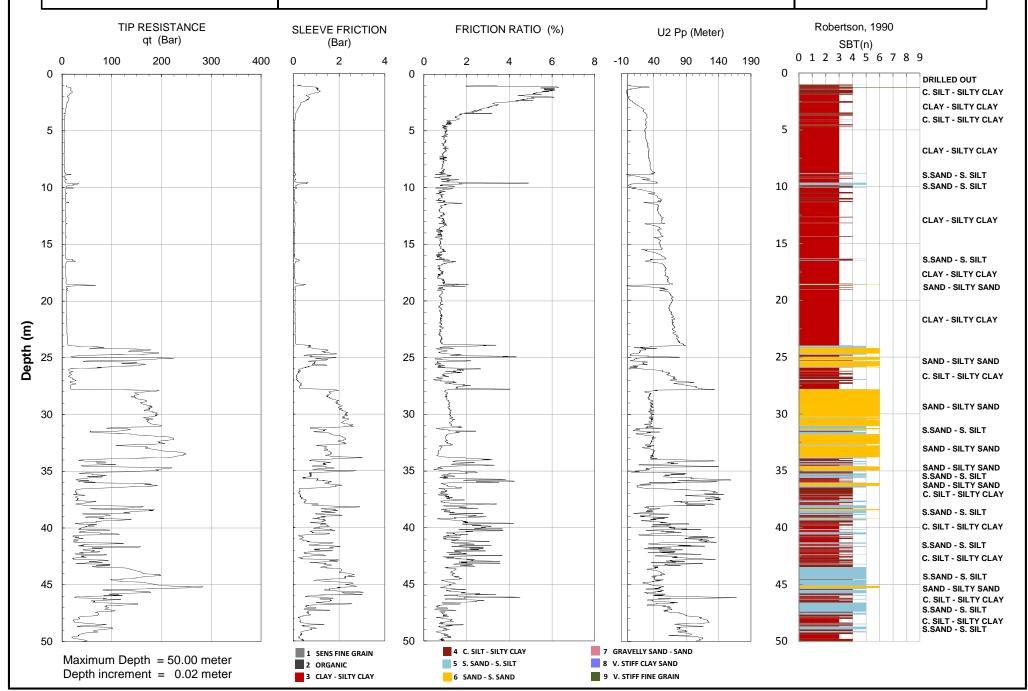


Sounding: CPT19 - 05

Cone ID: DPG1427 Th

Date: November 12 - 13, 2019 Site: Hwy No 1 - 216 to 264 Street





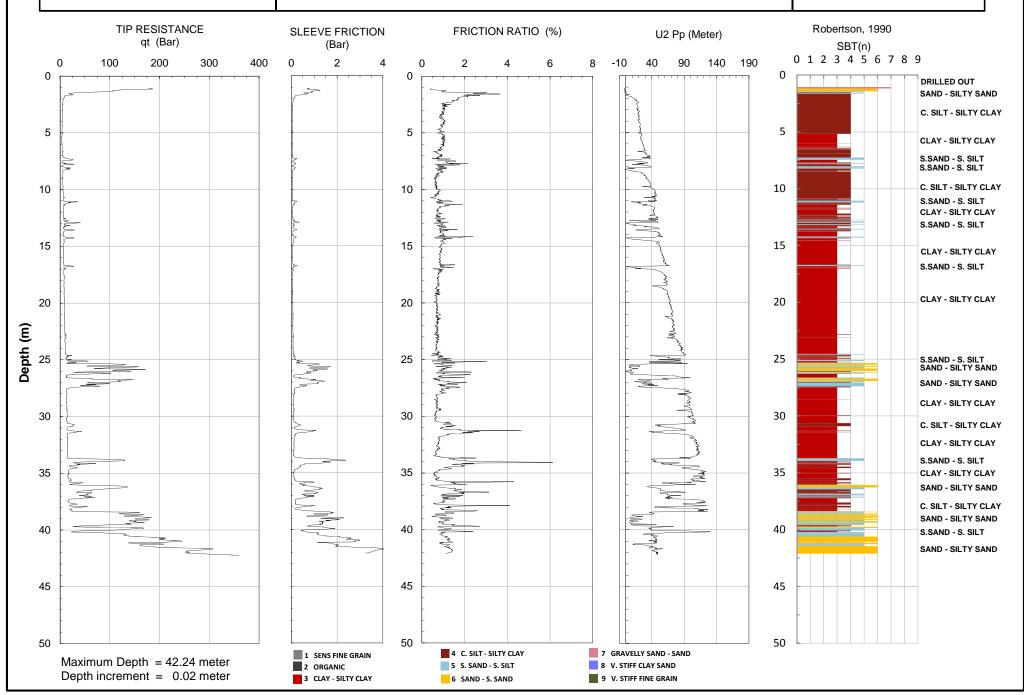


Sounding: CPT19 - 06

Cone ID: DPG1427 Thurber project no: 26141

Date: November 13 - 14, 2019
Site: Hwy No 1 - 216 to 264 Street
Thurber project no: 26141

Schwartz
S 0 1 L T E C H



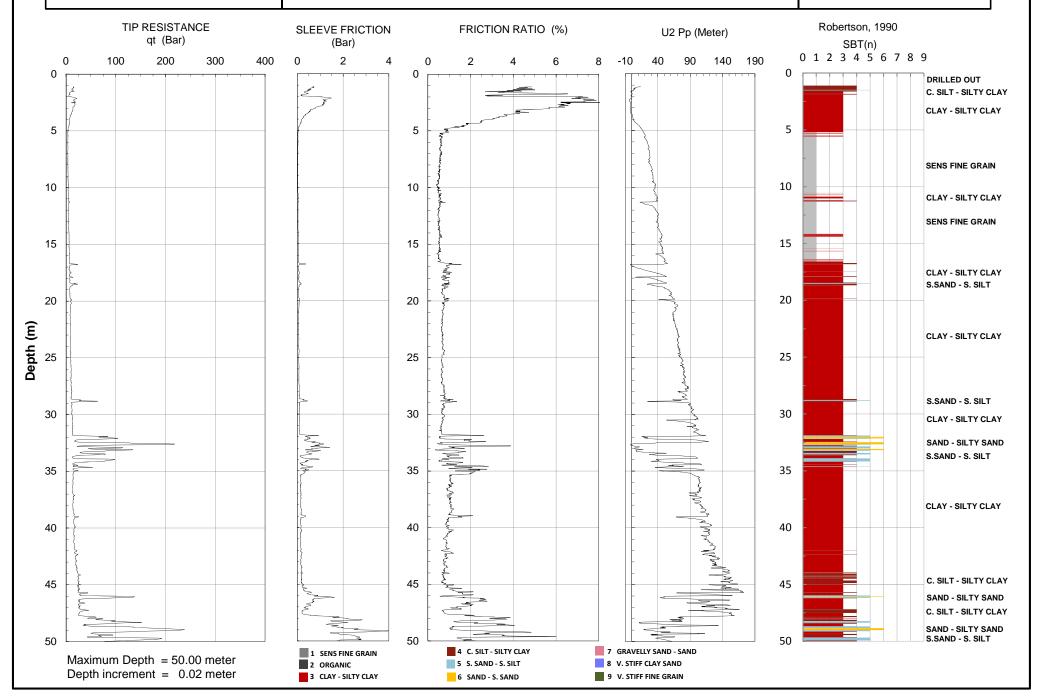


Sounding: CPT19 - 07

Cone ID: DPG1427

Date: November 13 - 14, 2019 Site: Hwy No 1 - 216 to 264 Street





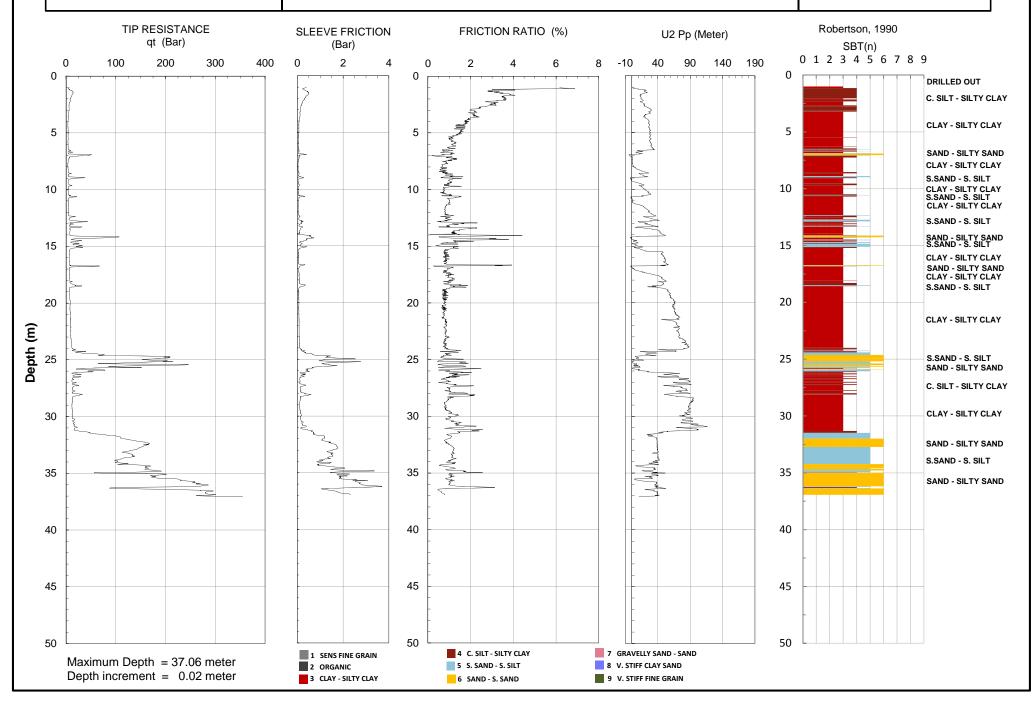


Sounding: CPT19 - 08

Cone ID: DPG1427

Date: November 12 - 13, 2019 Site: Hwy No 1 - 216 to 264 Street

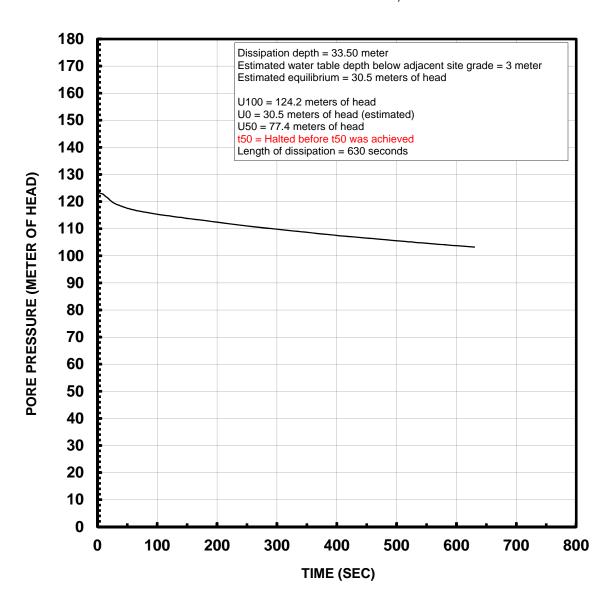






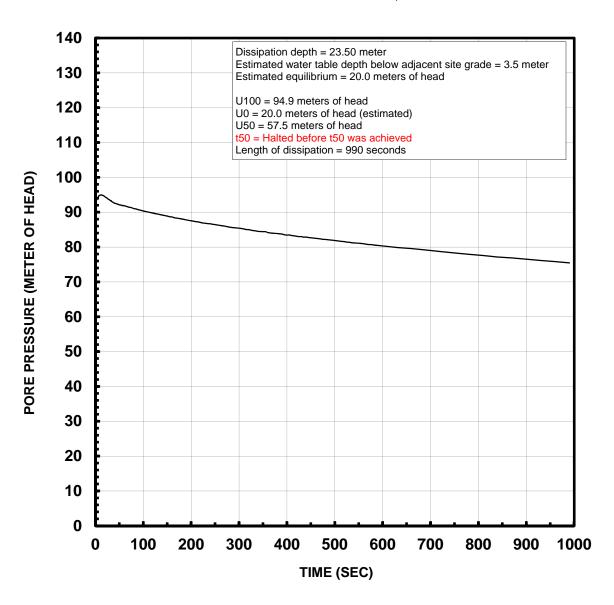
2019 Thurber CPT Dissipation Tests

U2 PORE PRESSURE DISSIPATION HWY NO 1 - 216 TO 264 STREET CPT19 - 01 33.50 METER DEPTH NOVEMBER 14 - 15, 2019



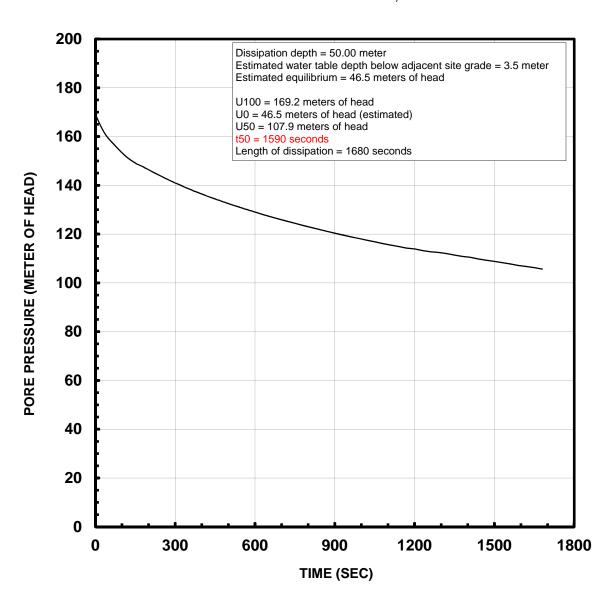


U2 PORE PRESSURE DISSIPATION HWY NO 1 - 216 TO 264 STREET CPT19 - 02 23.50 METER DEPTH NOVEMBER 14 - 15, 2019



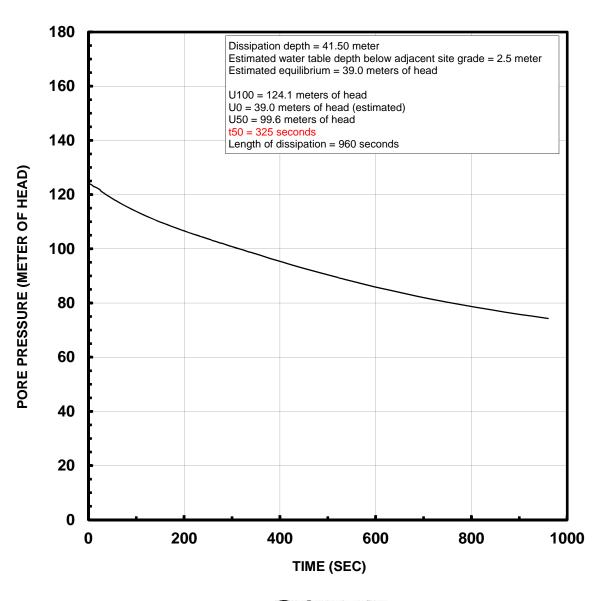


U2 PORE PRESSURE DISSIPATION HWY NO 1 - 216 TO 264 STREET CPT19 - 02 50.00 METER DEPTH NOVEMBER 15 - 16, 2019



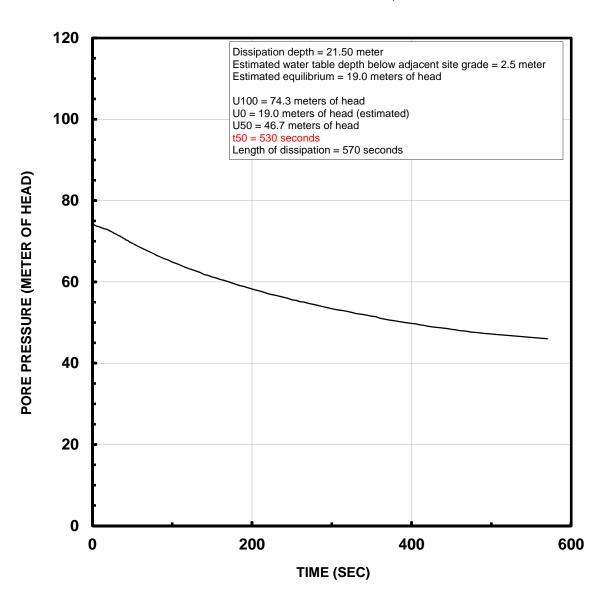


U2 PORE PRESSURE DISSIPATION HWY NO 1 - 216 TO 264 STREET CPT19 - 03 41.50 METER DEPTH NOVEMBER 15 - 16, 2019



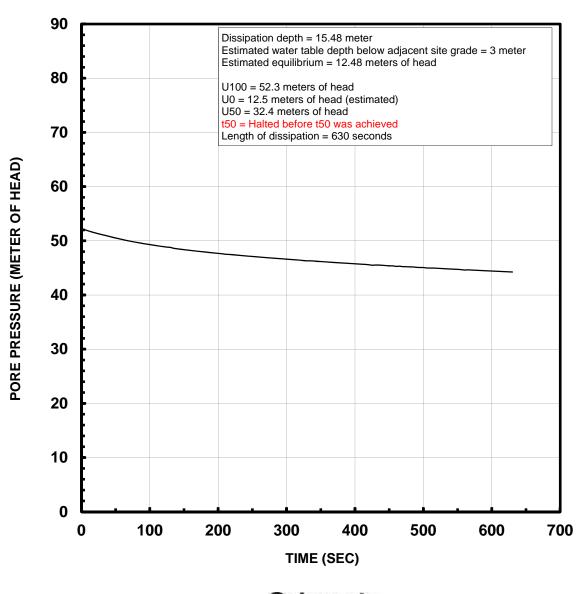


U2 PORE PRESSURE DISSIPATION HWY NO 1 - 216 TO 264 STREET CPT19 - 04 21.50 METER DEPTH NOVEMBER 14 - 15, 2019



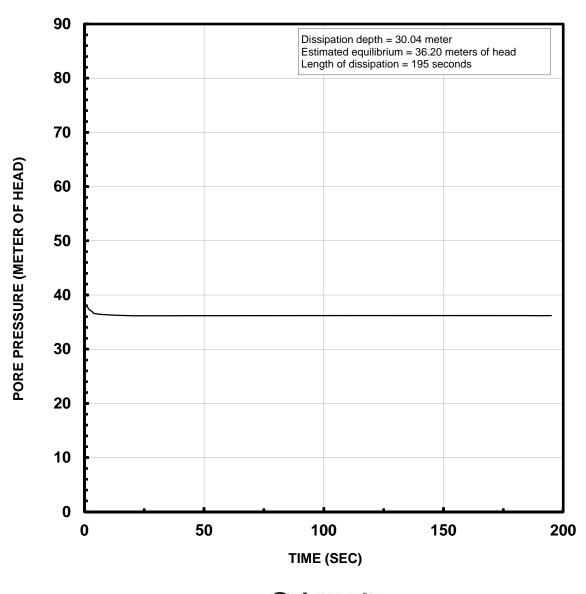


U2 PORE PRESSURE DISSIPATION HWY NO 1 - 216 TO 264 STREET CPT19 - 05 15.48 METER DEPTH NOVEMBER 12 - 13, 2019



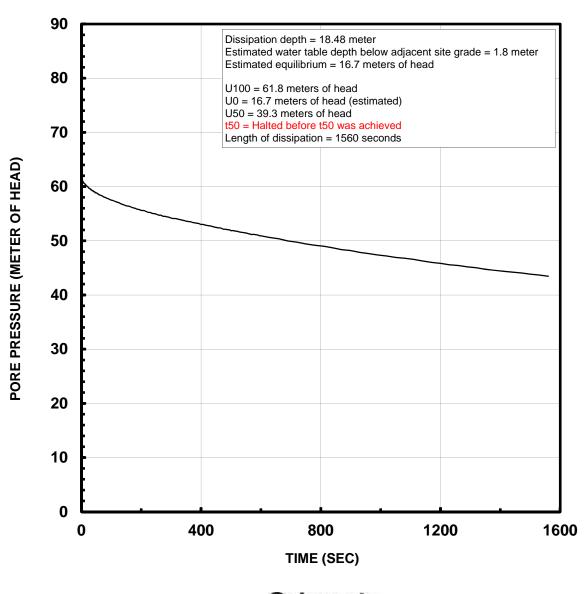


U2 PORE PRESSURE DISSIPATION HWY NO 1 - 216 TO 264 STREET CPT19 - 05 30.04 METER DEPTH NOVEMBER 12 - 13, 2019



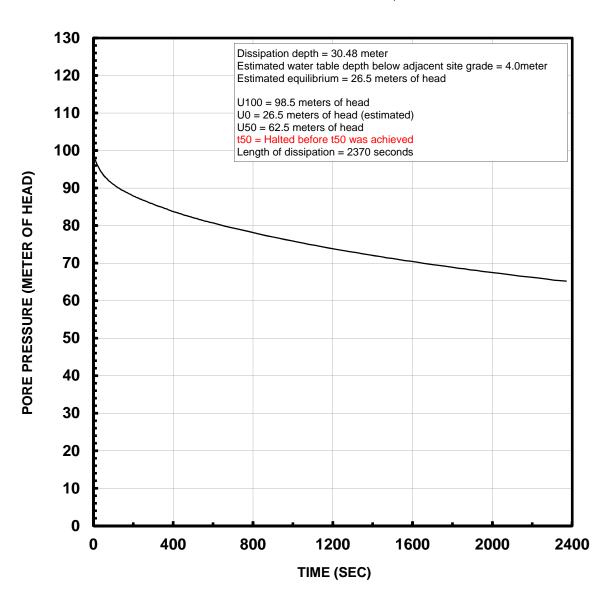


U2 PORE PRESSURE DISSIPATION HWY NO 1 - 216 TO 264 STREET CPT19 - 06 18.48 METER DEPTH NOVEMBER 13 - 14, 2019



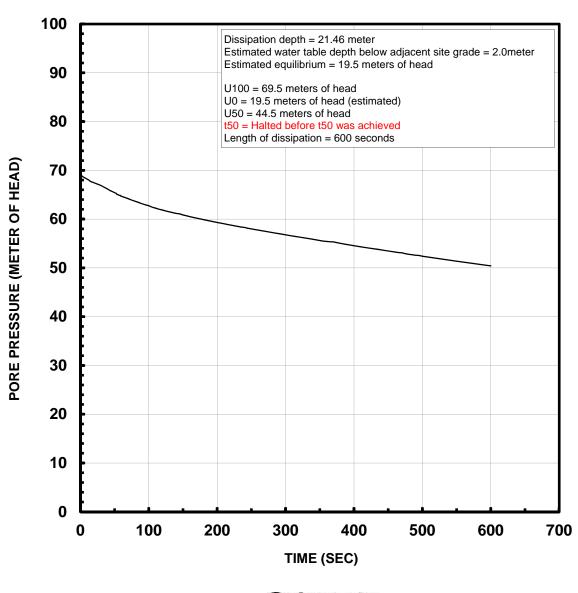


U2 PORE PRESSURE DISSIPATION HWY NO 1 - 216 TO 264 STREET CPT19 - 07 30.48 METER DEPTH NOVEMBER 13 - 14, 2019



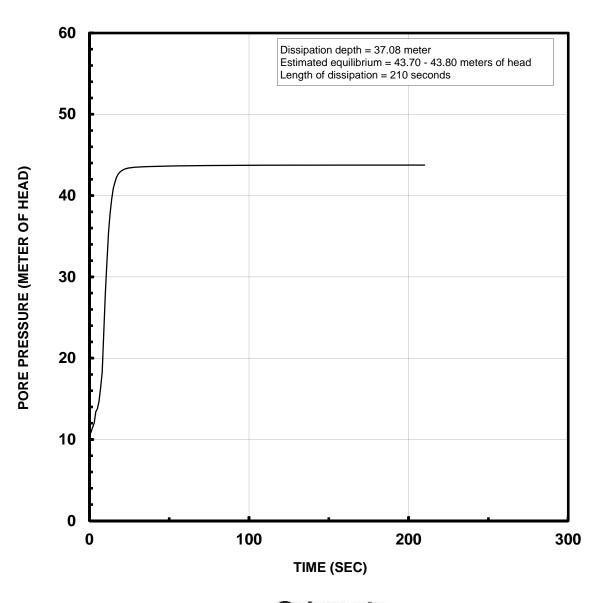


U2 PORE PRESSURE DISSIPATION HWY NO 1 - 216 TO 264 STREET CPT19 - 08 21.46 METER DEPTH NOVEMBER 12 - 13, 2019





U2 PORE PRESSURE DISSIPATION HWY NO 1 - 216 TO 264 STREET CPT19 - 08 37.08 METER DEPTH NOVEMBER 12 - 13, 2019







2019 Thurber Test Pit Logs

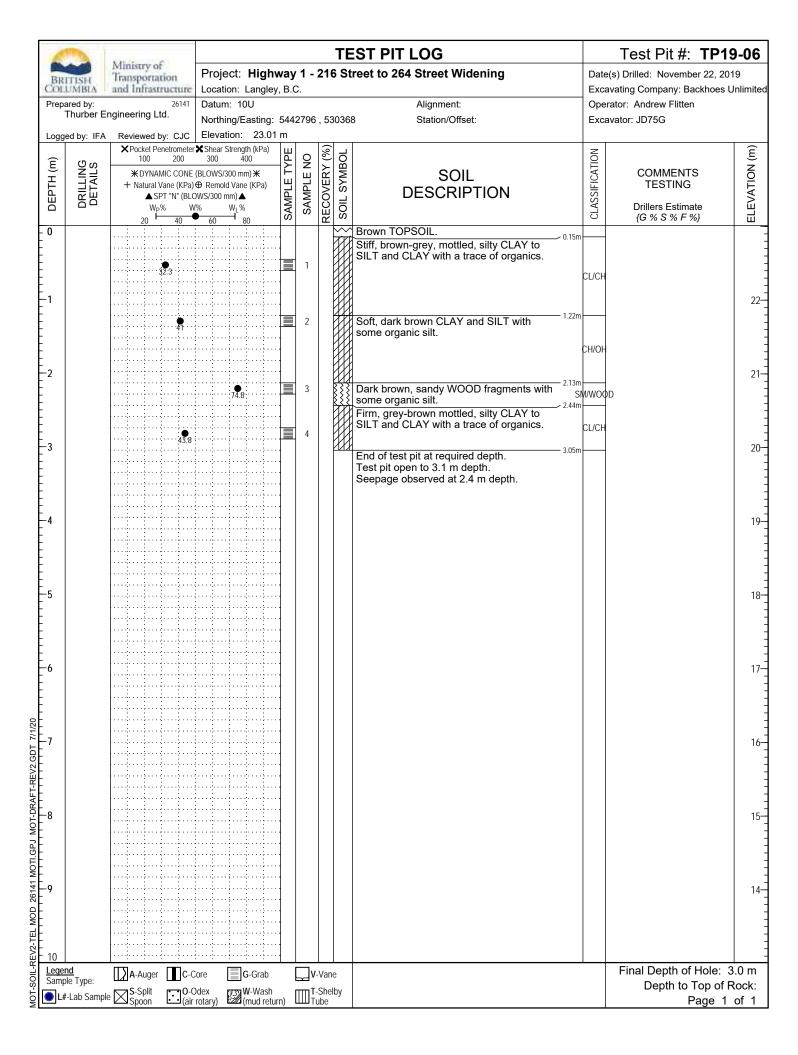
	The same					_	ΓF	ST PIT LOG		Test Pit #: TP19	n_01
120		Ministry of Transportation	Project: Highw	ay	1 - :			reet to 264 Street Widening	Date	e(s) Drilled: November 21, 201	
Co	LUMBIA	and Infrastructure	Location: Langley,	-				-	Exc	avating Company: Backhoes U	
Pre	pared by: Thurber E	26141 ngineering Ltd.	Datum: 10U Northing/Easting: 5	- 449	2704	E20	റാറ	Alignment: Station/Offset:	1 1	erator: Andrew Flitten avator: JD75G	
Log	ged by: IFA				3704	, 528	838	Station/Offset:	EXC	avator: JD/5G	
DEPTH (m)	DRILLING	➤ Pocket Penetrometer 100 200 ➤ DYNAMIC CONE + Natural Vane (KPa) ▲ SPT "N" (BLC		SAMPLE TYPE	SAMPLE NO		SOIL SYMBOL	SOIL DESCRIPTION	CLASSIFICATION	COMMENTS TESTING Drillers Estimate {G % S % F %}	ELEVATION (m)
- 0			<u> </u>			X	$\stackrel{\sim}{\sim}$	Brown TOPSOIL.			-
MOT-SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-DRAFT-REV2.GDT 7/1/20 S		39:3	61.2		3			with some mottling and a trace of organics. Firm to stiff, brown-grey CLAY and SILT with traces of oxidation and organics.	CH/CL		15—
REV2-TEL MOD 26141 MOT											7
Sam	e <u>nd</u> pple Type: _#-Lab Sample	A-Auger C-C e S-Split 0-C Spoon (air		_		-Vane -Shelby ube	y			Final Depth of Hole: 3 Depth to Top of R Page 1	lock:

						T	ſΕ	ST PIT LOG			Test Pit #: TP1	9-02
BRI	ITISH	Ministry of Transportation	1 -	-				reet to 264 Street Widening			e(s) Drilled: November 21, 20	19
COL	UMBIA	and Infrastructure	-	y, B.	C.						avating Company: Backhoes I	Unlimited
Prepa	ared by: Thurber E	ngineering Ltd.		- 4			400	Alignment:			rator: Andrew Flitten	
			Northing/Easting Elevation: 13.0		13527	7 , 529°	129	Station/Offset:		Exca	avator: JD75G	
Logge	ed by: IFA		er X Shear Strength (kPa)			10				_		T @
DEPTH (m)	DRILLING DETAILS	# DYNAMIC CONE + Natural Vane (KPa A SPT "N" (BL	300 400 E (BLOWS/300 mm) ★ a) ⊕ Remold Vane (KPa) LOWS/300 mm) ▲ W% W _L %	SAMPLE TYPE	SAMPLE NO	RECOVERY (%)	SOIL SYMBOL	SOIL DESCRIPTION		CLASSIFICATION	COMMENTS TESTING Drillers Estimate	ELEVATION (m)
_		20 40	60 80	S	ļ ,	E	- 1	Brown TOPSOIL.		Ö	{G % S % F %}	<u> </u>
- 0							\simeq		0.2			
- - - -1		42.3			1		뀖	Soft to firm, brown-grey, silty CLAY to SILT and CLAY with some mottling and a trace of organics.	0.3m -			12-
		42.1			2			- firm to stiff, no mottling below 1.5 m depth	C	CH/CL		
-2	Soft, grey SILT and CLAY with traces of							.59m -			11-	
-			59:8		3			organics and oxidation.		СН		
-3 - - -							14	End of test pit at required depth. Test pit open to 3.1 m depth. Seepage observed at 3.1 m depth.	.05m			10-
-								,				
-4												9-
-												
-												
_ _5												8-
E												
E												
[- ,												
- 6												7-
-												
Q-												
21E												
TGE '												0-
EV2.0												
FT-R												
8 - BA												_
MOT-) 5-
<u> </u>												
). F												
4-6 												,
7 261		<u> </u> <u> </u> <u> </u>										4-
MOL												
함												
10		<u> </u>	<u></u>									
Leger Samp	le Type:	A-Auger C-				/-Vane					Final Depth of Hole:	
MOT-SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-BRAFT-REV2.GDT 7/1/20 ■ SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-BRAFT-REV2.GDT 7/1/20 ■ SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-BRAFT-REV2.GDT 7/1/20	-Lab Sample	e S-Split Cai	Odex Two T-Shelby (mud return) Tube							Depth to Top of Rock: Page 1 of 1		

							TE	ST PIT LOG	Test Pit #: TP19-03		
BR	ITISH	Ministry of Transportation		_				reet to 264 Street Widening	Date	e(s) Drilled: November 21, 201	
COL	UMBIA	and Infrastructure	Location: Langley,	B.C).			A.I.	1	avating Company: Backhoes U	nlimited
Prepa	ared by: Thurber Eı	ngineering Ltd.	Datum: 10U Northing/Easting:	544	3385	52	037'	Alignment: Station/Offset:	l .	erator: Andrew Flitten avator: JD75G	
Logg	ed by: IFA	Reviewed by: CJC	Elevation: 12.01		3303	, 52	951	Station/Onset.	LXC	avalor. JD7 JG	
		X Pocket Penetrometer		Ä	_	(%)	٦		z		Ē
DEPTH (m)	DRILLING DETAILS	100 200 **DYNAMIC CONF	300 400 (BLOWS/300 mm) ※	SAMPLE TYPE	SAMPLE NO	RECOVERY (%)	SYMBOL	SOIL	CLASSIFICATION	COMMENTS	ELEVATION (m)
TH.] <u> </u>	+ Natural Vane (KPa)	⊕ Remold Vane (KPa)	٦LE	PLE	VE!	SYI	DESCRIPTION) IFIC	TESTING	¥
DEF	K H	W _P % W	OWS/300 mm) ▲ /% W _I %	AMF	SAN		SOIL	DESCINI HON	ASS	Drillers Estimate	, E
		20 40	60 80	Ś		22		Brown TOPSOIL.	ਹ	{G % S % F %}	<u> </u>
- 0							•••	Soft, grev-brown, silty CLAY to SILT and			
-								CLAY with traces of oxidation and	CL/CH		-
E								organics.	02,0.		
-1		47.	y		1			Soft to very soft, grey CLAY and SILT with 0.91m			11-
Ė								traces of oxidation and organics.			-
-											=
Ė			•		2						-
<u>-</u> 2			: 56.9		-				СН		10-
<u> </u>											
E											-
-											-
3					3						0
F								End of test pit at required depth. Test pit open to 3.1 m depth.			´=
Ē								Seepage observed at 2.1 m depth.			=
-											=
<u>-</u> 4											Ω
- '											"=
Ė											=
-											=
<u>-</u> 5											7_
F"											'=
E] =
-											-
<u>-</u> 6											6-
F											
E											
											=
7											
TG5											5 -
EV2.											-
FF											=
DRAI C] ,=
7-T-F											4-
- A											=
9.II.G											-
# - × ×											
2614											3-
QOP-											=
											-
											=
Lege	nd No Type:	A-Auger C-C	Core G-Grab		V	-Vane	Э			Final Depth of Hole: 3	
Samp	ole Type: t-Lab Sample	S-Split Co-C		, i	 Шт.					Depth to Top of R	
¥LL	- Lan Sample	∠⊔Spoon 🖳(air	rotary) (mud return	า) เ	ШΤι	ube				Page 1	<u>ot 1</u>

-	1					7	ΓE	ST PIT LOG	Test Pit #: TP19-04		
Du	•	Ministry of Transportation	Project: Highw	/ay	1 -			reet to 264 Street Widening	Dat	e(s) Drilled: November 21, 201	
	UMBIA	and Infrastructure	Location: Langley,	-					Exc	cavating Company: Backhoes U	
	ared by: Thurber E	26141 ngineering Ltd.	Datum: 10U					Alignment:		erator: Andrew Flitten	
			Northing/Easting: 5 Elevation: 11.0 m		331	, 529	465	Station/Offset:	Exc	avator: JD75G	
Logg	ed by: IFA					(a)					<u> </u>
(E)	ညီလ	100 200	300 400	SAMPLE TYPE	SAMPLE NO	RECOVERY (%)	SYMBOL	221	CLASSIFICATION	00040450450	ELEVATION (m)
DEPTH (m)	DRILLING DETAILS		(BLOWS/300 mm) ¥ ⊕ Remold Vane (KPa)	띫	厂	ER :	ڲؚٳ	SOIL	FICA	COMMENTS TESTING	은
l d	울님	▲ SPT "N" (BLC	OWS/300 mm) ▲	MPI	¥	Ś ;	ੂ	DESCRIPTION	ISSI	Daillean Fatinanta	×
		W _P % W	V% W _L % 80	SA	Ś	REC	SOIL		CL/	Drillers Estimate {G % S % F %}	
- 0					1	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	\sim	Brown TOPSOIL. 0.15m			
-		4.6		_	1	!:		Grey, brown SAND with a trace of silt (FILL).			-
Ė			<u> </u>]
-									SW- SM/GV	 -	-
⊢ 1 F		7.3	<u> </u>		2				GM		10-
E						:	ان العام	1.37m		_	-
-								Soft to firm, brown-grey, silty CLAY to SILT and CLAY with traces of oxidation			:
E								and organics.			-
<u>-2</u>											9-
Ė									СН		=
E							11				-
-		<u> </u> <u> </u> <u> </u>	57:7		3						-
-3						2	22	End of test pit at required depth. 3.05m		_	8-
-		l						Test pit open to 3.1 m depth.			-
-								Seepage observed at 1.4 m depth.			=
E											-
-4											7-
Ē]
-		<u>i</u> iii									-
-											-
F 5											6-
F "											-
E											-
-			<u> </u>								-
Ė,											-
<u></u> -6											-
<u> </u>											:
-											=
7/1/2			<u> </u>								
<u>-</u> 7											4-
V2.6											=
# <u> </u>											-
RAF											
-T-8		<u> </u>									3-
∑ _ M _											
11.GF											=
MO-											=
6141											2-
- I											=
ÄL I											=
V2-TE											=
MOT-SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-DRAFT-REV2.GDT 7/1/20 MOT-SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-DRAFT-REV2.GDT 7/1/20 SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-DRAFT-REV2.GDT 7/1/20	l nd		Coro Coro	Г	٦.,	-Vane				Final Depth of Hole: 3	.0 m
Samp	ole Type:	A-Auger C-C		_			,			Depth to Top of F	
\overline{\over	t-Lab Sample	S-Split Cair	Odex w-Wash rotary) (mud return	n) [Шτι	Shelby ube	,			Page 1	

						TE	ST PIT LOG		Test Pit #: TP19	 9-05
RP	ITISH	Ministry of Transportation					reet to 264 Street Widening	Date	e(s) Drilled: November 22, 20	
	UMBIA	and Infrastructure		3.C.				-	avating Company: Backhoes U	Jnlimited
	ared by: Thurber Ei	26141 ngineering Ltd.	Datum: 10U	14204	2 52	010	Alignment: Station/Offset:	1	erator: Andrew Flitten avator: JD75G	
	ed by: IFA		Northing/Easting: 54 Elevation: 15.0 m	14294	.ა , აა	00 104	4 Station/Offset.	EXC	avalor. JD/5G	
Logg	cu by. II A	X Pocket Penetrometer		ш	(%	ب		z		F
(E)	S G	100 200	Shear Strength (kPa) 300 400 (BLOWS/300 mm) ★ Remold Vane (KPa) SWS/300 mm) ▲ W W W W W W W W W W W W W	SAMPLE LTPI	RECOVERY (%)	SYMBOL	2011	CLASSIFICATION	COMMENTS	ELEVATION (m)
Ӗ			Remold Vane (KPa)		ÆR	₹	SOIL		TESTING	E
DEPTH (m)	DRILLING DETAILS		OWS/300 mm) ▲		S	SOIL 8	DESCRIPTION	ASS	Drillers Estimate	\{
	_	20 40	● 60 80 60	S v	RE	S		김	{G % S % F %}	
- 0						771	Brown TOPSOIL. 0.15n	1		
-							Stiff to very stiff, grey-brown, silty CLAY to SILT and CLAY with a trace of oxidation.			
-				1			0.2	CL/CH		
E		31.6		- '						
-1							Firm grov CLAV and SILT with traces of	, <u> </u>		14-
		l					Firm, grey CLAY and SILT with traces of organics and grey sand seams.			
		31.9	Įįįįį	2		W				
E							- soft to very soft below 1.5 m depth			
-2								CLUCI		13-
-								CH/CL		
E										
			11							
F _		36.5	iiii	3						
-3						rux	End of test pit at required depth.	1		12-
E							Test pit open to 3.1 m depth.			
+		l					Seepage observed at 1.5 m depth.			
-										
<u>-</u> 4										11-
E										
-			11111							
-										
-5		l								10-
-										10
		l								
E										
-										
-6										9-
E										
E										
120		l								
<u></u>										8-
E										
EV2			iiiii							
받										
-8 										7
Q -										'
2-										
E										
₹ E		ļ								
6-14			\$ \$							6-
		.								
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72-TE										
A 10	- d			<u>Ļ</u>					Final Danth of Lists 2	2.0 ==
MOT-SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-DRAFT-REV2.GDT 7/1/20 MOT-SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-DRAFT-REV2.GDT 7/1/20 S	le Type:	A-Auger C-C			V -Van				Final Depth of Hole: 3 Depth to Top of F	
₽ E	-Lab Sample	S-S-S-S-S-S-S-S-S-S-S-S-S-S-S-S-S-S-S-	Odex rotary) W-Wash (mud return)		T-Shel Tube	lby			Page 1	
		- (Gii	,, (1		٠ - و٠ - ١	

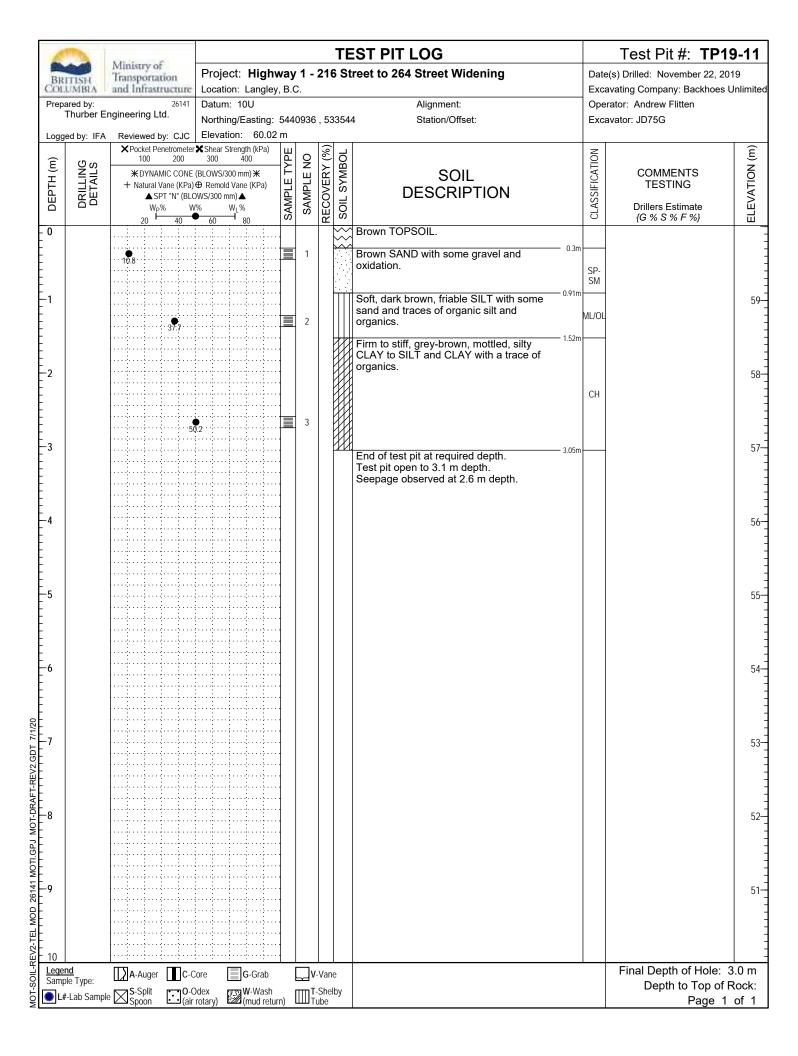


1						TE	ST PIT LOG			Test Pit #: TP19	 9-07		
Rus	ITISH	Ministry of Transportation	Project: Highwa	ıy 1			reet to 264 Street Widening		Date	e(s) Drilled: November 22, 20			
COL	UMBIA	and Infrastructure	9 ,	3.C.						avating Company: Backhoes U	Jnlimited		
	ared by: Thurber E	26141 ngineering Ltd.		14000		404	Alignment:			rator: Andrew Flitten			
	ed by: IFA		Northing/Easting: 54 Elevation: 31.0 m	14223	35 , 53	134	1 Station/Offset:		Exca	avator: JD75G			
Loggi	ed by. IFA	X Pocket Penetrometer		<u></u> Ц	9				z		Ē		
(E)	ည္ခ်လ္	100 200	r X Shear Strength (kPa) 300 400 E (BLOWS/300 mm) X □ ⊕ Remold Vane (KPa) OWS/300 mm) Δ W/% W/%	SAMPLE LIFT	RECOVERY (%)	SYMBOL	0011		CLASSIFICATION	COMMENTS	ELEVATION (m)		
DEPTH (m)	DRILLING DETAILS		E (BLOWS/300 mm) ₩	ᆝ片	빆뛔	λ	SOIL		FIC/	TESTING	₽		
	ISI PE'	▲ SPT "N" (BLC	OWS/300 mm) ▲		[Ś	=	DESCRIPTION		\SSI	Daillean Fationets	\		
		W _P % W	N% W _L % 80 8	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		SOIL			CL/	Drillers Estimate {G % S % F %}			
- 0						>>>	Brown TOPSOIL.						
-						\sim							
-						~).61m					
+		34.4	· · · · · · · · · · · · · · · · · · ·	1		32	Very soft to soft, grey-brown, mottled, clayey SILT to CLAY and SILT with some organic silt and organics.						
<u>-</u> 1		34.4					organic silt and organics.				30-		
₽ I									0. (0.				
									CL/OL				
E													
F ₋₂		40.3		2	!						29-		
[]						#	Soft to firm, grey, silty CLAY to SILT and	2.13m			-		
E							Soft to firm, grey, silty CLAY to SILT and CLAY with a trace of organics.						
									CH/CL				
 	38.7												
-3	38.7					ИХ	End of test pit at required depth.	3.05m			28-		
E							Test pit open to 3.1 m depth.						
-							Seepage observed at 2.1 m depth.						
 													
-4											27-		
E													
-		<u> </u> <u> </u>											
-5		l									26-		
F 1											20		
-													
E													
E													
-6											25-		
Ė													
E													
1/20													
[F7											24-		
E													
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Q -											23		
<u>a</u> t													
5.E													
- - - - - - - -											22-		
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12-TE													
A 10	1		<u>-iiiiii</u>							Final Donato (CLL)			
MOT-SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-DRAFT-REV2.GDT 7/1/20 MOT-SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-DRAFT-REV2.GDT 7/1/20 S	ole Type:	A-Auger C-C			V -Vane					Final Depth of Hole: 3			
₽ 	-Lab Sample	e ⊠S-Split Spoon ⊡(air	Odex rotary) W-Wash (mud return)		T-Shelby Tube					Depth to Top of Rock: Page 1 of 1			
ــــــا >			, (aa rotarri)							9- '	<u> </u>		

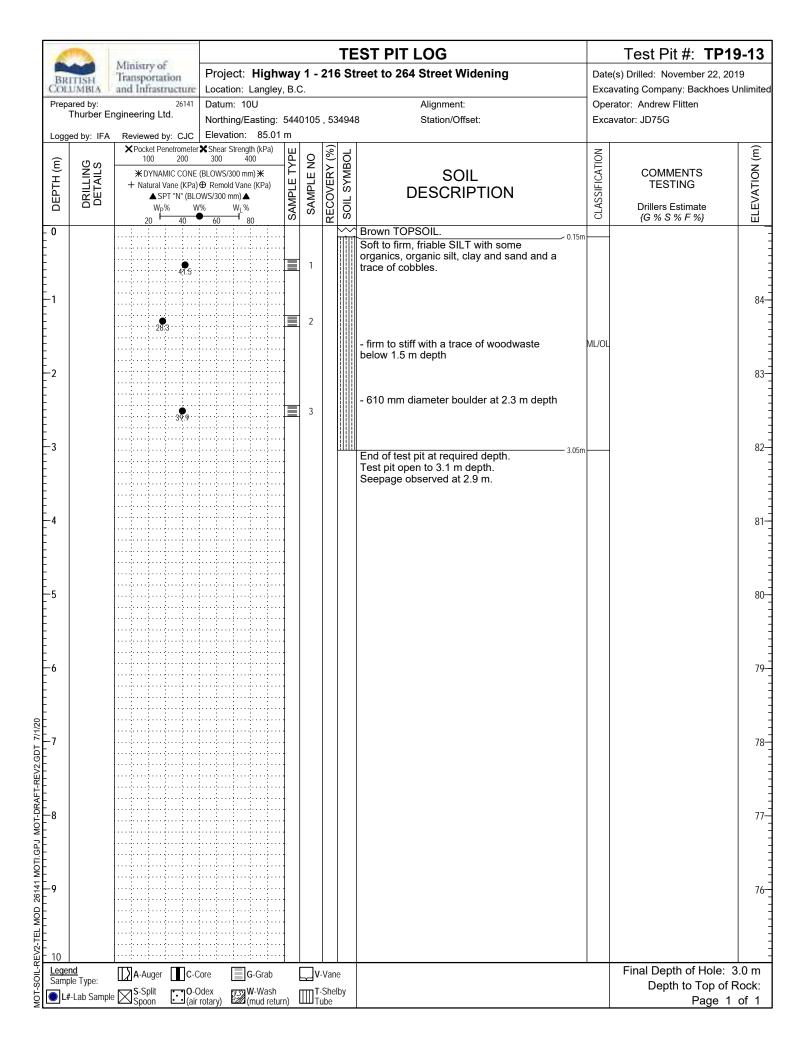
					Т	EST PIT LOG		Test Pit #: TP1 9	 9-08
BP	ITISH	Ministry of Transportation				Street to 264 Street Widening	Dat	te(s) Drilled: November 22, 20	
COL	UMBIA	and Infrastructure	Location: Langley, E	3.C.				cavating Company: Backhoes U	Jnlimite
	ared by: Thurber E	26141 ngineering Ltd.	Datum: 10U	14045	O 521	Alignment: Station/Offset:		erator: Andrew Flitten cavator: JD75G	
	ed by: IFA		Northing/Easting: 54 Elevation: 36.0 m	14215	00,5314	Station/Offset:	Exc	cavator: JD/5G	
Logg	ou by: II /	X Pocket Penetrometer			<u> </u>	يا	z		Ē
(m)	ဥမွ	100 200	Shear Strength (kPa) 300 400 (BLOWS/300 mm) ★ Remold Vane (KPa) SWS/300 mm) ▲ W W W W W W W W W W W W W	SAMPLE LTPI	RECOVERY (%)	0011	CLASSIFICATION	COMMENTS	ELEVATION (m)
DЕРТН (m)	DRILLING DETAILS		⊕ Remold Vane (KPa)	빌		SOIL	FIC	TESTING	2
EP	NH HH		OWS/300 mm) ▲		SECO.	DESCRIPTION	\SSI	Drillers Estimate	\
		W _P % W	V% W _L % 80 0	ξ <i>σ</i>			77	{G % S % F %}	
- 0			IIIII		\ \\ \\ \\ \\ \\ \	Brown TOPSOIL.	.15m		
-						Very soft, dark brown, friable ORGANIC SILT with some sand and organics and a			
-				▋.		trace of woodwaste.			
-		<u> </u> <u> </u> <u> </u>	138.4	1					
<u>-</u> 1									35-
-									
-									
E		······································				- trace to some silt and sand in lumps below 1.5 m depth	ОН		
-2	2 delow 1.5 m depth								34-
								34	
Ė						3			
E I		<u> </u>							
-			99.6	3		- some rootlets below 2.7 m depth			
- 3		<u> </u> <u> </u> <u> </u>				End of test pit at required depth.	.05m	_	33-
E						Test pit open to 3.1 m depth.			
E			<u> </u>			No seepage observed.			
ļ.									
-4									32-
E									
E		<u>i</u> <u>i</u> <u>i</u> i							
-									
+			įįįįį						31-
<u></u> 5									31-
-			<u> </u>						
-									
E									
-6									30-
E									
750		<u> </u>							
<u></u> }_7 │									29-
[GD]									
EV2									
딾									
AR									200
707- 									28-
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6141									27-
12									
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17.									
MOT-SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-DRAFT-REV2.GDT 7/1/20 ■		<u> </u>							
Leger Samp	<u>nd</u> ble Type:	A-Auger C-C			V -Vane			Final Depth of Hole: 3	
5 1	t-Lab Sample	$e \boxtimes_{Spoon}^{S-Split} \square_{(air)}^{O-C}$	Odex rotary) W-Wash (mud return)		T-Shelby Tube			Depth to Top of F Page 1	
تت⊒≊		alr) تا spoon ا	rotary) (mua return)	ш	rube	1		raye i	UI I

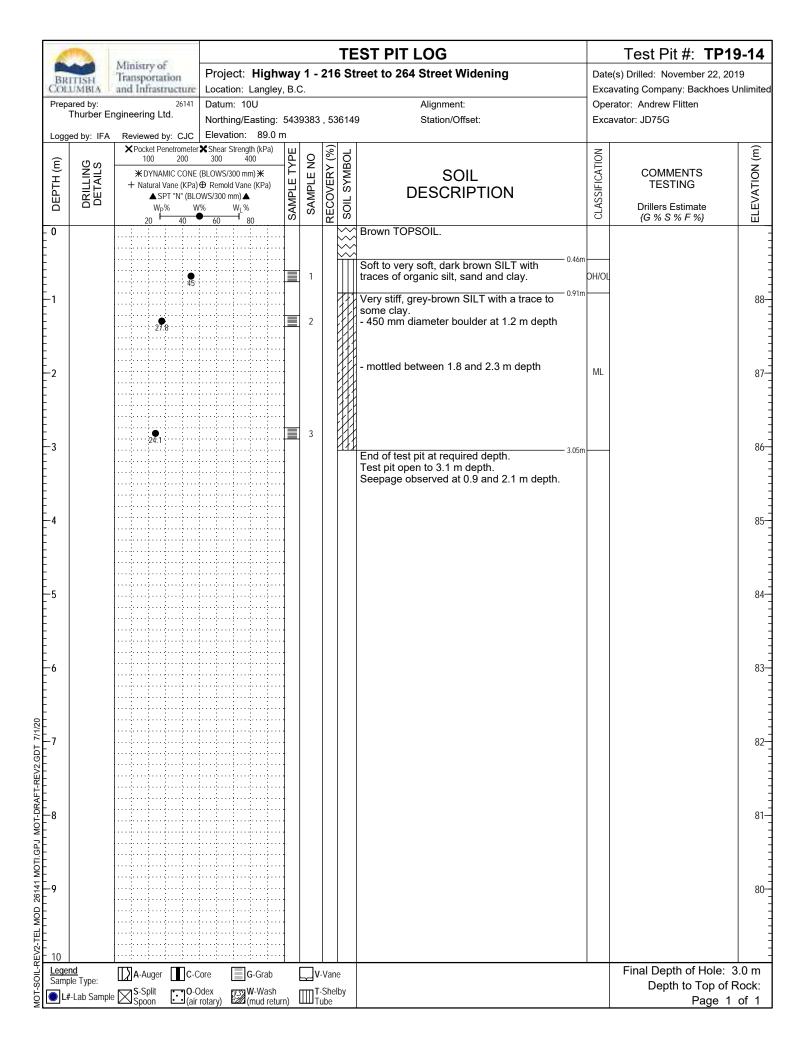
-	1					TI	EST PIT LOG		Test Pit #: TP19-09		
Du	•	Ministry of Transportation	Project: Highv	vay	1 -		treet to 264 Street Widening	Dat	e(s) Drilled: November 22, 201		
COL	UMBIA	and Infrastructure	Location: Langley					_	cavating Company: Backhoes U	nlimited	
	ared by: Thurber E	26141 ngineering Ltd.	Datum: 10U				Alignment:	1 '	erator: Andrew Flitten		
	ed by: IFA		Northing/Easting: Elevation: 39.99		2090	, 53157	'5 Station/Offset:	Exc	avator: JD75G		
Logg	ed by. IFA	X Pocket Penetrometer	r X Shear Strength (kPa)		_	[%] _		Z		Ê	
DЕРТН (m)	DRILLING DETAILS	+ Natural Vane (KPa) ▲ SPT "N" (BLC W _P % W	300 400 (BLOWS/300 mm) ★) ⊕ Remold Vane (KPa) DWS/300 mm) ▲ V% W _L %	SAMPLE TYPE	SAMPLE NO	RECOVERY (%)	SOIL DESCRIPTION	CLASSIFICATION	COMMENTS TESTING Drillers Estimate	ELEVATION (m)	
- 0		20 40	60 80	107		₩ «»	Dark brown TOPSOIL.	+	{G % S % F %}	Ш -	
-					1			ОН		-	
E			87:	Ξ	· ·		0.6	m		=	
-				-			Grey-brown SAND with a trace of silt.] =	
<u>-</u> 1]						39-	
-					2					=	
Ē		1.4		-			some gravel below 1.5 m depth			-	
-			1	1			:	SP		-	
-2				-						38-	
E			<u> </u>	1						=	
		9.6			3					-	
E		A'0		П							
-3				1			3.0	im		37-	
Ė				-			End of test pit at required depth. Test pit open to 3.1 m depth.	""		=	
-			\$ \$	1			No seepage observed.			=	
-			<u> </u>	-						-	
F -4				1						36-	
- "				1						50 -	
F]] =	
E				1] =	
-]						-	
<u></u> 5 -				1						35-	
-			<u> </u>	-						=	
-				1] =	
E			$[\cdots]\cdots[\cdots]\cdots[\cdots]\cdots$	1						-	
- 6]						34-	
E				1						-	
<u> </u>										=	
1/20				1						=	
F-7										33-	
72.GL				1						=	
- FE]						=	
ZAFT.				.						=	
8 - R										32-	
MO_										=	
GP.				1						=	
E L										=	
4 – 9				1						31—	
26										=	
MOL]] =	
함				1						=	
10				L							
MOT-SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-DRAFT-REV2.GDT 7/1/20 MOT-SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-DRAFT-REV2.GDT 7/1/20 SOIL-REV2-TEL MOD 26141 MOTI.GPJ MOT-DRAFT-REV2.GDT 7/1/20	nd ble Type:	A-Auger C-C	Core G-Grab		Ųν	-Vane			Final Depth of Hole: 3		
Sallip	t-Lah Samnli	S-Split Co-C				-Shelby ube			Depth to Top of R		
ĭĽĽ	Las Jampi	air)كى Spoon	rotary) (mud retur	n)	TШ	ube			Page 1	OT T	

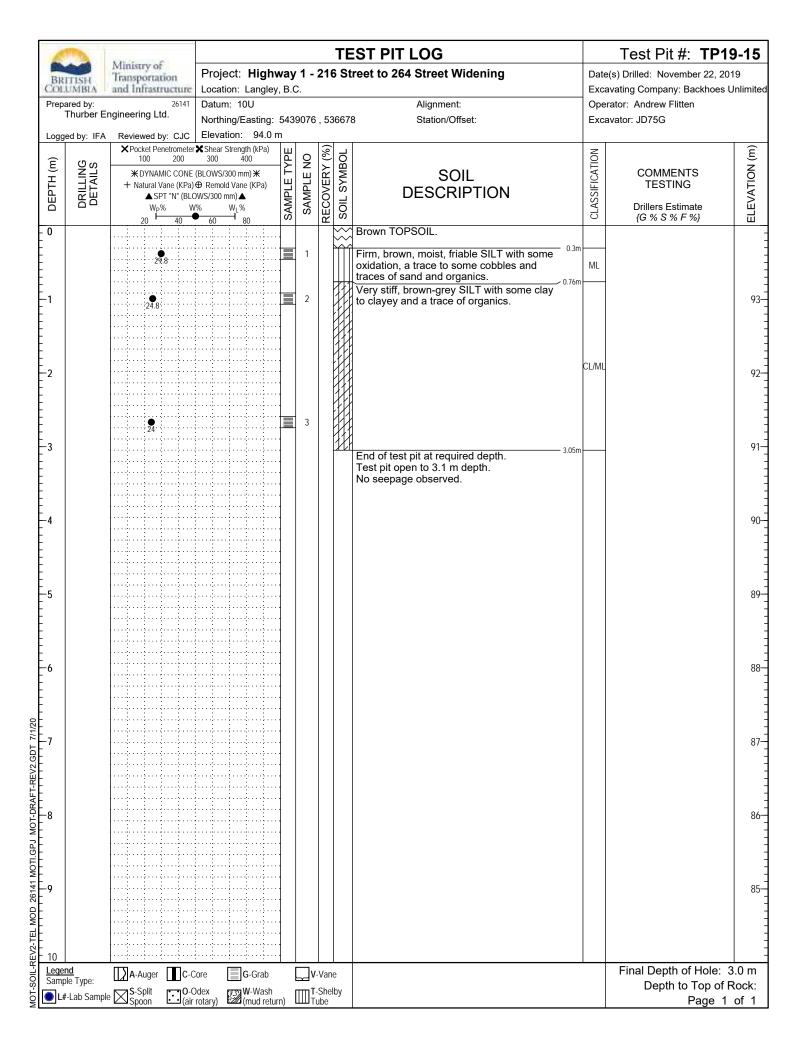
-	1110						TE	ST PIT LOG	Test Pit #: TP19-10		
Ru	ITISH	Ministry of Transportation	Project: Highw	vay	1 -			reet to 264 Street Widening	Dat	e(s) Drilled: November 22, 201	
COL	UMBIA	and Infrastructure	0 /	, B.C).				-	avating Company: Backhoes U	Jnlimited
Prepa	ared by: Thurber E	26141 ngineering Ltd.						Alignment:		erator: Andrew Flitten	
		-	Northing/Easting: Elevation: 54.99		1147	, 533	3178	Station/Offset:	Exc	avator: JD75G	
Logg	ed by: IFA		r X Shear Strength (kPa)			<u></u>	_				
DEPTH (m)	DRILLING DETAILS	100 200 **DYNAMIC CONE + Natural Vane (KPa) ▲ SPT "N" (BLC W _P % W	300 400 E (BLOWS/300 mm) ★ D Remold Vane (KPa) OWS/300 mm) ▲ V% W _L %	SAMPLE TYPE	SAMPLE NO	RECOVERY (%)	SOIL SYMBOL	SOIL DESCRIPTION	CLASSIFICATION	COMMENTS TESTING Drillers Estimate {G % S % F %}	ELEVATION (m)
- 0		20 40	60 80	0,		12	~	Brown TOPSOIL with some woodwaste.		{6 /6 3 /6 1 /6/	— —
-]			$\stackrel{\diamond \diamond}{\sim}$				-
-				-			$\stackrel{\sim}{\sim}$	0.41]
E]		[Compact, grey-brown SAND with a trace			-
<u></u> -1 │				1				to some gravel and traces of cobbles, oxidation, silt and organics.			54-
F .									SP		_
-		14:9:	······································		1						-
E				1		:					-
-		l		-			T1.P	Soft, grey-brown, sandy SILT with some		-	_
-2		31.6			2	ŀ		zones of clayey SILT and a trace of			53-
-				-				organics.			_
E				1					CL/ML		-
-					3						-
- -3		33:1			J			3.05m			52-
- 1			ļļļļ	-				End of test pit at required depth. Test pit open to 2.6 m depth.			-
-				-				Seepage observed at 1.5 m depth.			_
E]				1 3			-
-				-							-
<u>-4</u>]							51-
-				- 1							-
Ē				1]
E				-							-
<u>-</u> 5											50-
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-				1							_
Ē				1]
E				1							=
-6]							49-
											=
[1							=
/20		l									=
E-7]							48-
[GD]											-
EV2.				1] =
F-											=
JRA				1							, =
-T-0		 									47—
ΣĪ				1]
II.GF				-							=
- MO				1							=
4 <u>4</u> – 9		<u> </u>									46
D 26		1	······································	1							=
Θ <u>L</u>				-							=
計				<u> </u>							
10]							=
Lege	nd T	A-Auger C-C	Core G-Grab	[v	-Vane			•	Final Depth of Hole: 3	
Samp	ole Type:									Depth to Top of R	Rock:
₽ [!	r-Lab Sample	S-Split O -C (air	Odex w-W-Wash (mud return	n) l	Шт	-Shelb ube	,			Page 1	of 1

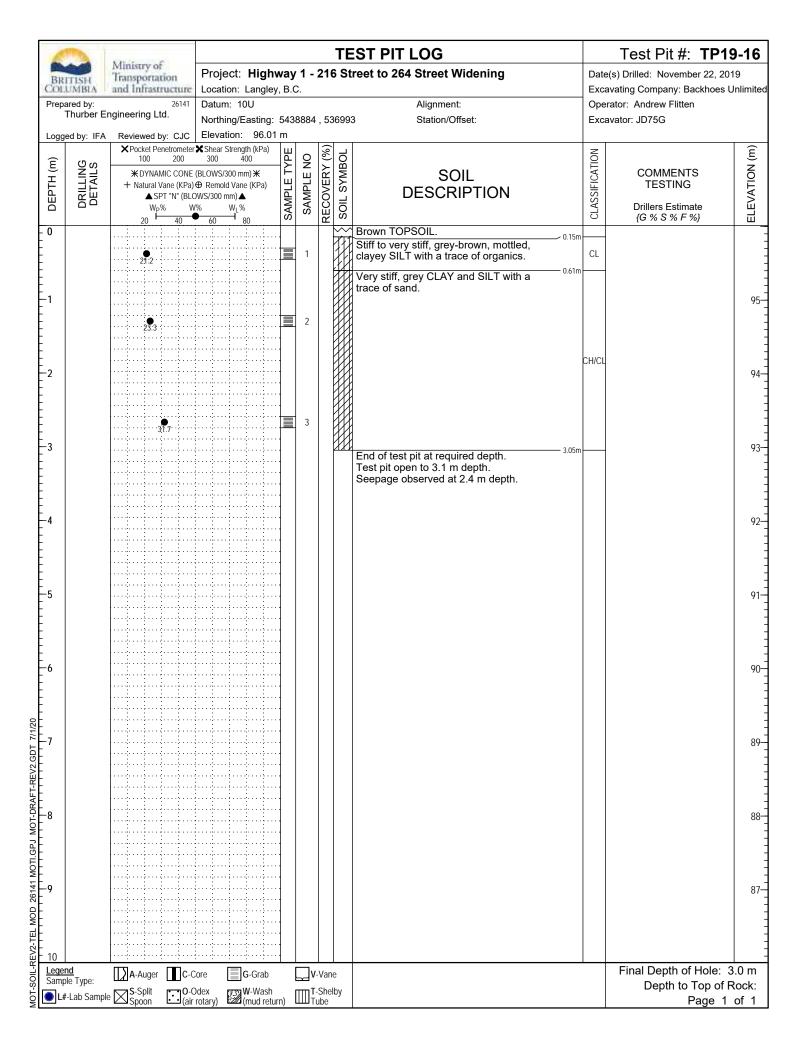


-						Т	EST PIT LOG	Test Pit #: TP19-12		
BR	ITISH	Ministry of Transportation		vay	1 -		treet to 264 Street Widening	Date	e(s) Drilled: November 22, 20	
COL	UMBIA	and Infrastructure		B.C	:			_	avating Company: Backhoes U	Jnlimited
	ared by: Thurber Er	26141 ngineering Ltd.	Datum: 10U Northing/Easting: 5	5440	1461	53/3	Alignment: Station/Offset:	1 '	erator: Andrew Flitten avator: JD75G	
Logg	ed by: IFA	Reviewed by: CJC) 4 01	, 5545	Tr Station/Onset.	LAC	avalor. JD7 JG	
		X Pocket Penetromete			_	(%)		Z		Ê
DEPTH (m)	DRILLING DETAILS	100 200 ₩ DYNAMIC CONF	300 400 E (BLOWS/300 mm) 米	SAMPLE TYPE	SAMPLE NO	RECOVERY (%)	SOIL	CLASSIFICATION	COMMENTS	ELEVATION (m)
TH] <u> </u>	+ Natural Vane (KPa	a)⊕ Remold Vane (KPa)	삗	F		DESCRIPTION	SIFIC	TESTING	H
DEF	K H		LOWS/300 mm) ▲ W% W _I %	¥	SAM	RECO	DESCRIPTION	ASS	Drillers Estimate	E N
		20 40	● 60 B0	Ś	0)			ᄀ	{G % S % F %}	ᆸ
F 0						\ <u>`</u>	Brown, moist TOPSOIL. Brown, gravelly SAND with some silt and a	n	-	-
E							trace of organics.			
-								GP/SF		-
+,										-
<u></u> -1					1		1.220			82-
-		18			2	0	Brown, gravelly SAND to SAND and	"		-
Ė		6.2			2		`. 			-
E						ک ا	1			=
<u>-2</u>						0	<u>ب</u>	SP		81-
E						0.0	[1]			-
<u> </u>						١١٥	Ż			=
-		5.1			3	0.0				-
-3		5.1				٥	End of test pit at required depth.	n		80-
-							Test pit open to 3.1 m depth.			-
-							No seepage observed.			=
E										=
-4										79-
F .										
E										=
-										-
+										70
<u></u> 5 -										78-
-										=
Ė										-
E										-
-6										77-
E										
Ė										=
1/20										-
È-7										76-
2.GD										=
J.RE										-
AFT.										
8 - 1										75-
OM -										-
3PJ										
Ē-										=
4 – 9 <u>A</u> –										74-
261										74-
MOD										=
										-
10 EV2-1										=
Legel	nd	A-Auger C-	Core G-Grab	Г		-Vane		1	Final Depth of Hole: 3	3.0 m
Samp	ole Type:			_					Depth to Top of F	Rock:
E L#	t-Lab Sample	S-Split □0- Spoon □(ai	-Odex ir rotary) W-Wash (mud return	_{n)} L	Ш'n	Shelby ube			Page 1	of 1



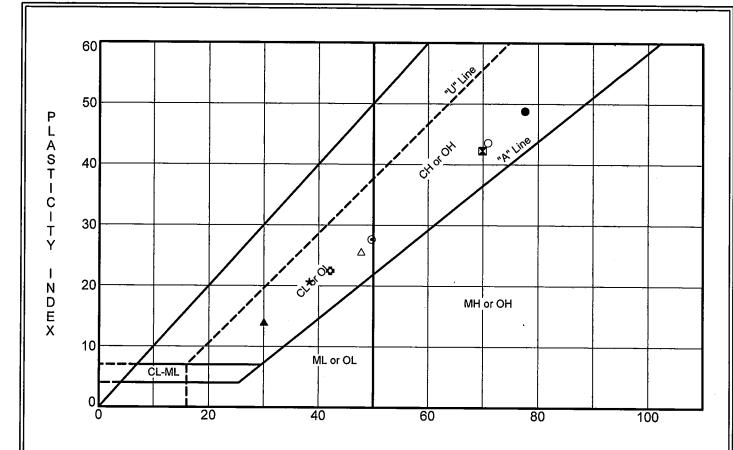








2019 Thurber Laboratory Test Results



LIQUID LIMIT

IL	Specimen Identific	cation	LL	PL	PI	MC%	USCS Classification
•	TH19-01, Sa. 3	8.0 m	78	29	49	63.4	
	TH19-02, Sa. 4	13.0 m	70	28	42	47.1	
	TH19-03, Sa. 5	18.5 m	30	16	14	28.5	
*	TH19-04, Sa. 4	13.0 m	38	18	20	38.7	
0	TH19-05, Sa. 5	18.0 m	50	22	28	44.6	
٥	TH19-06, Sa. 4	13.5 m	42	20	22	39.3	
0	TH19-07, Sa. 4	14.0 m	71	27	44	63.8	
Δ	TH19-08, Sa. 3	7.0 m	48	22	26	37.3	
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L					-		
L							



PLASTICITY CHART

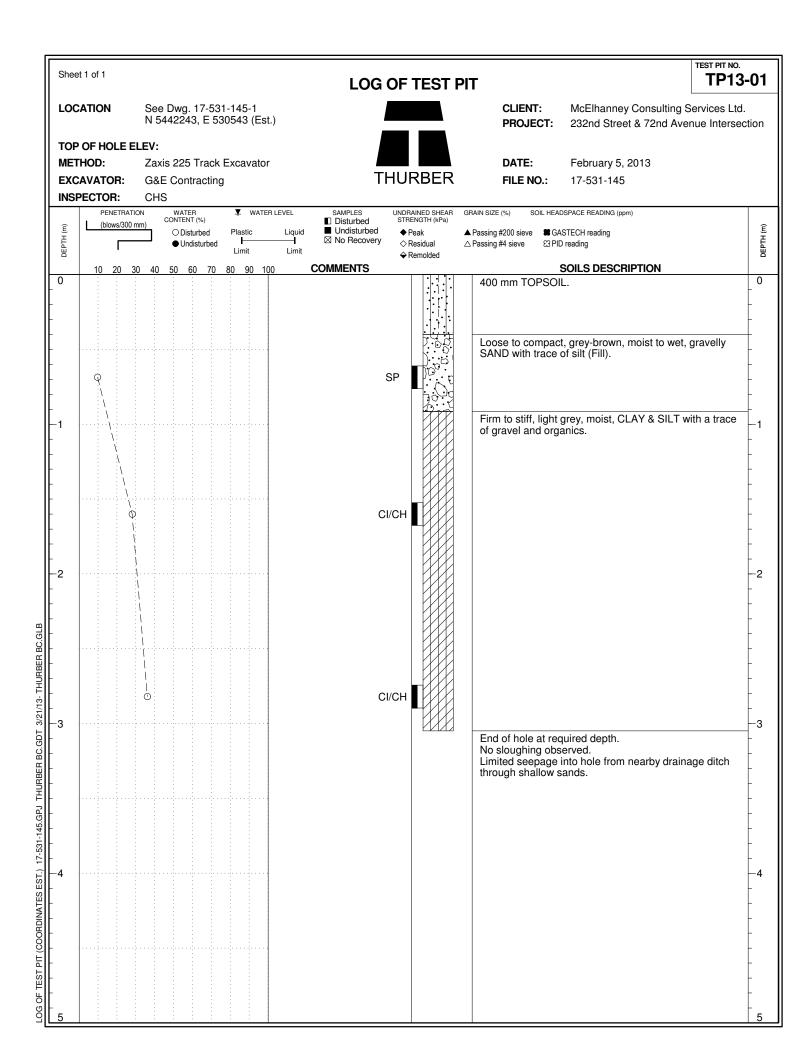
CLIENT: Associated Engineering Ltd.

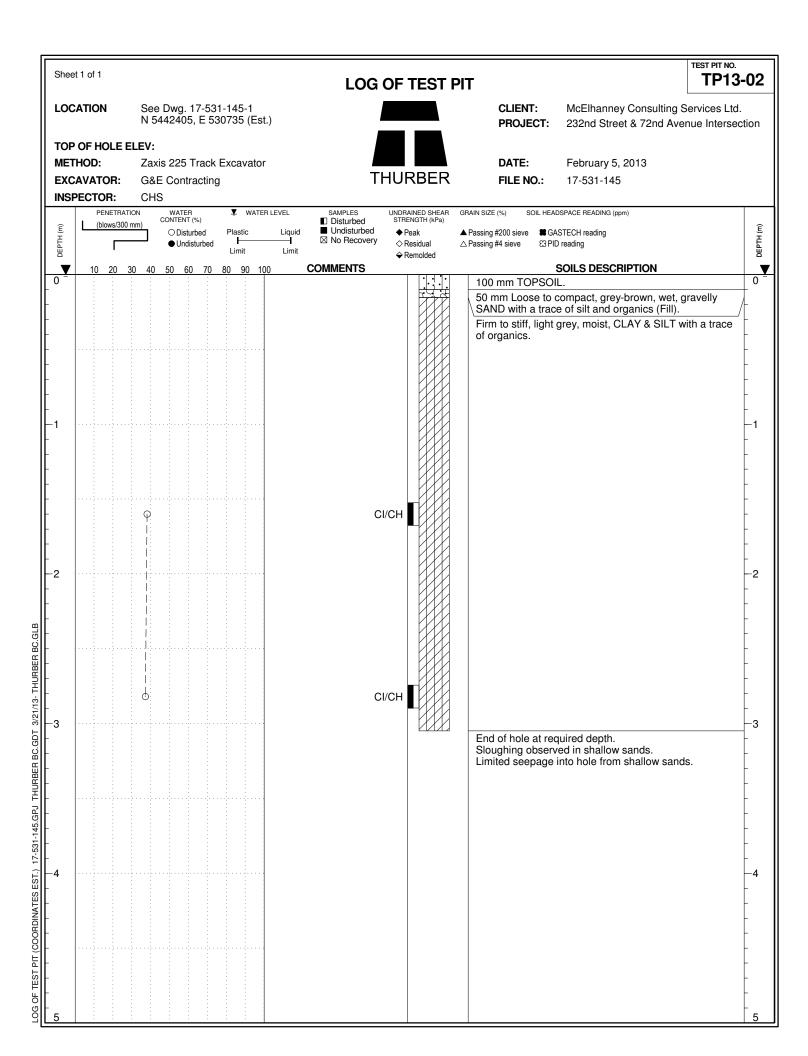
PROJECT: Highway 1 - 216 Street to 264 Street Widening

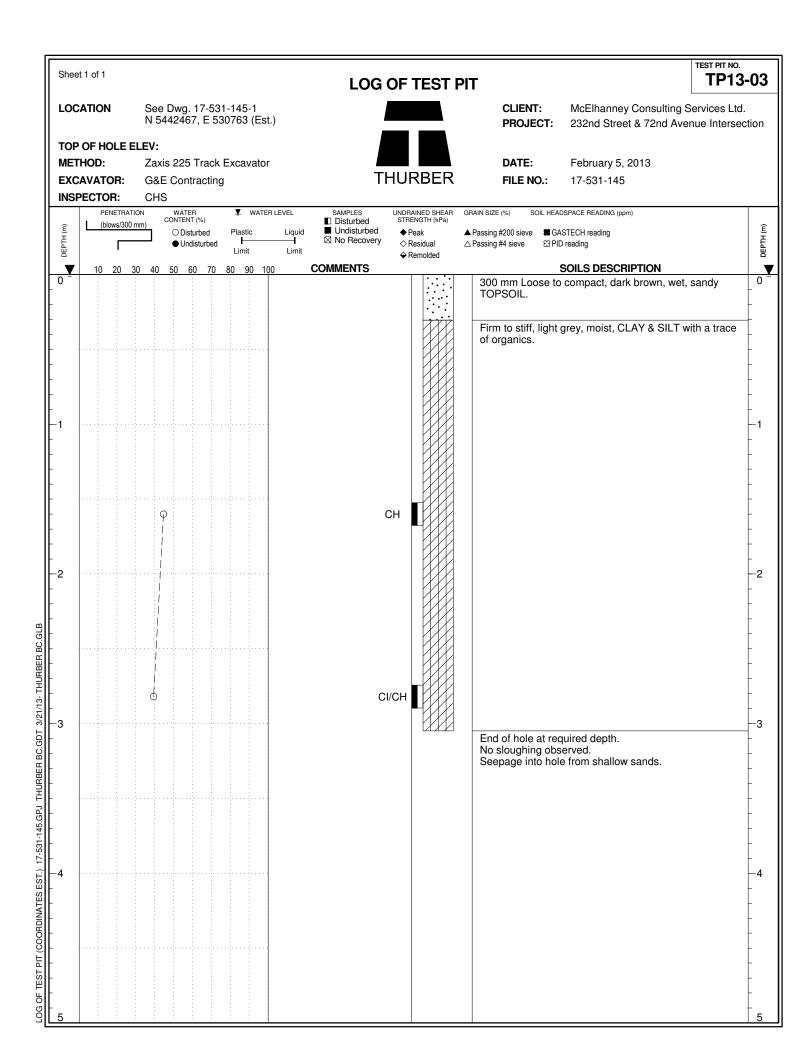
FILE NO.: 26141

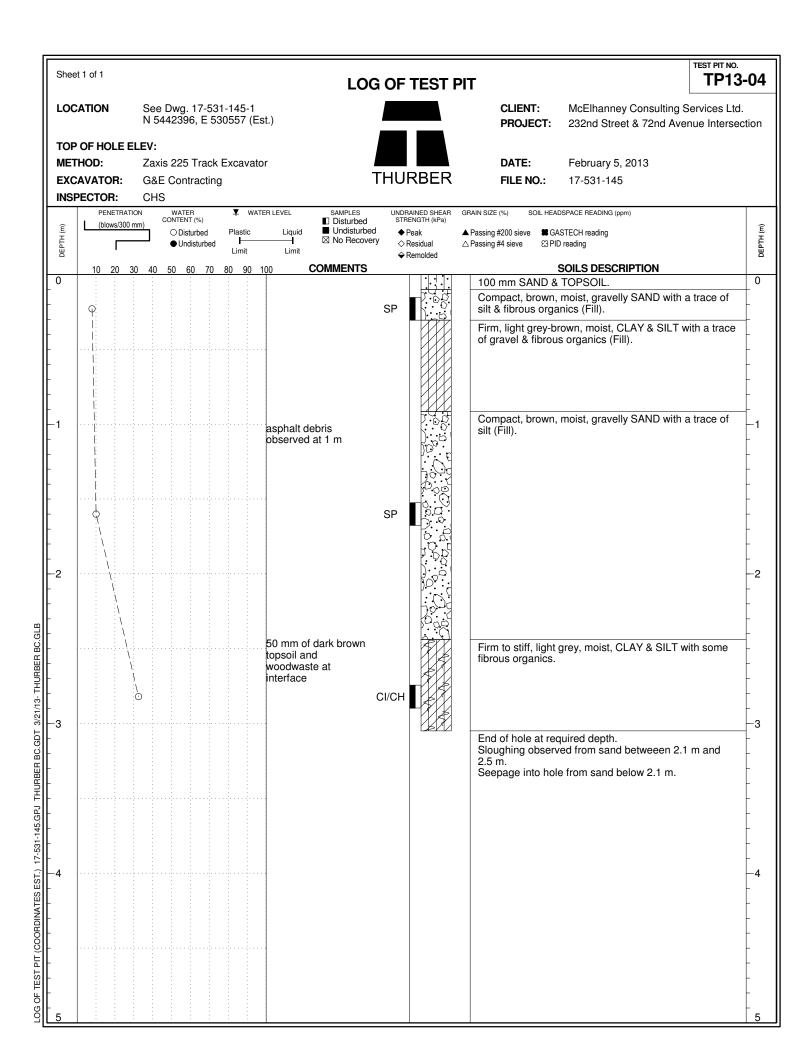


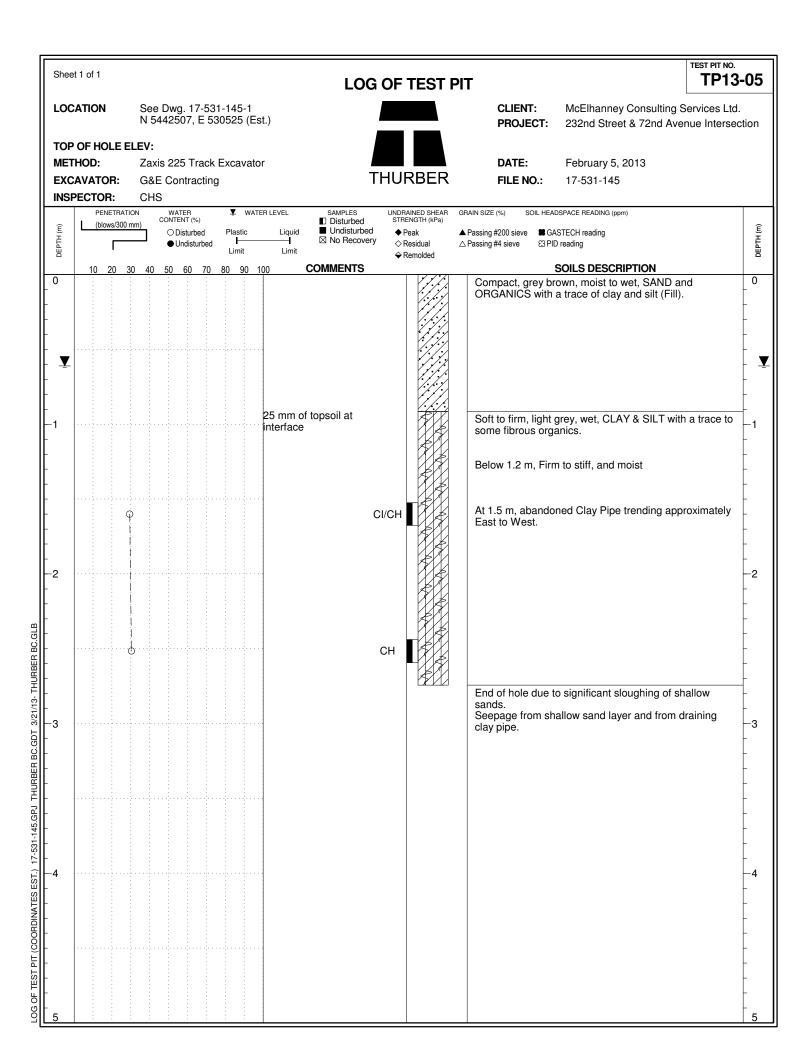
2013 Thurber Test Pit Logs

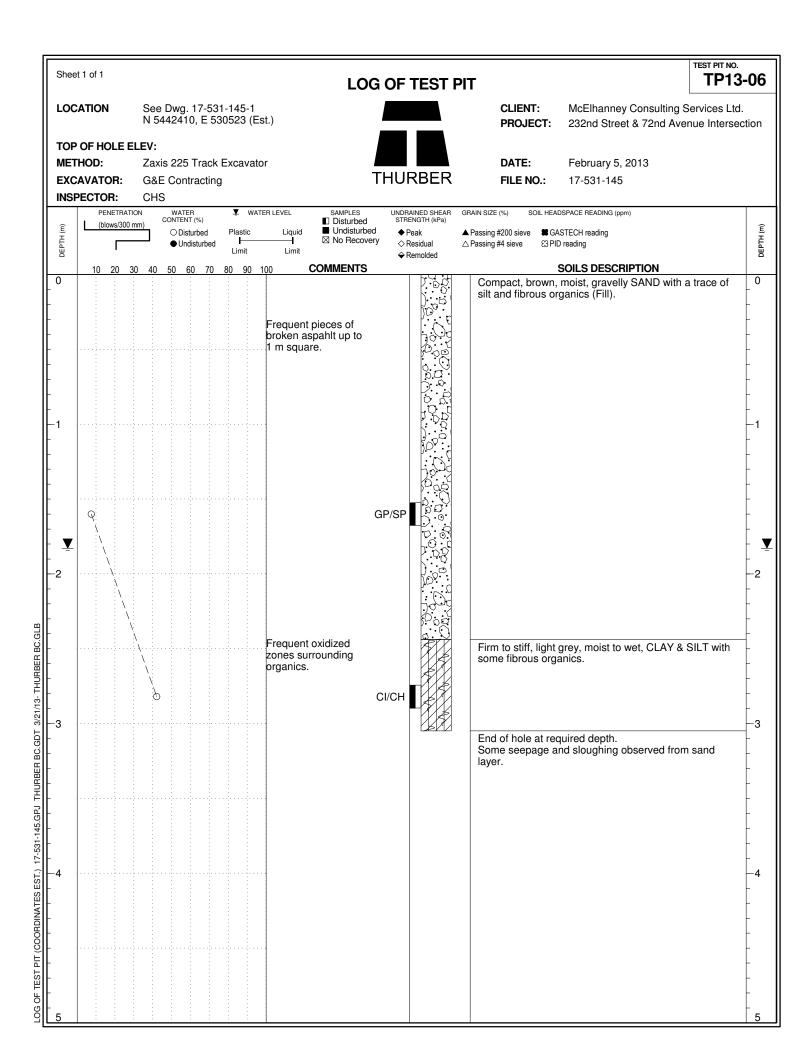


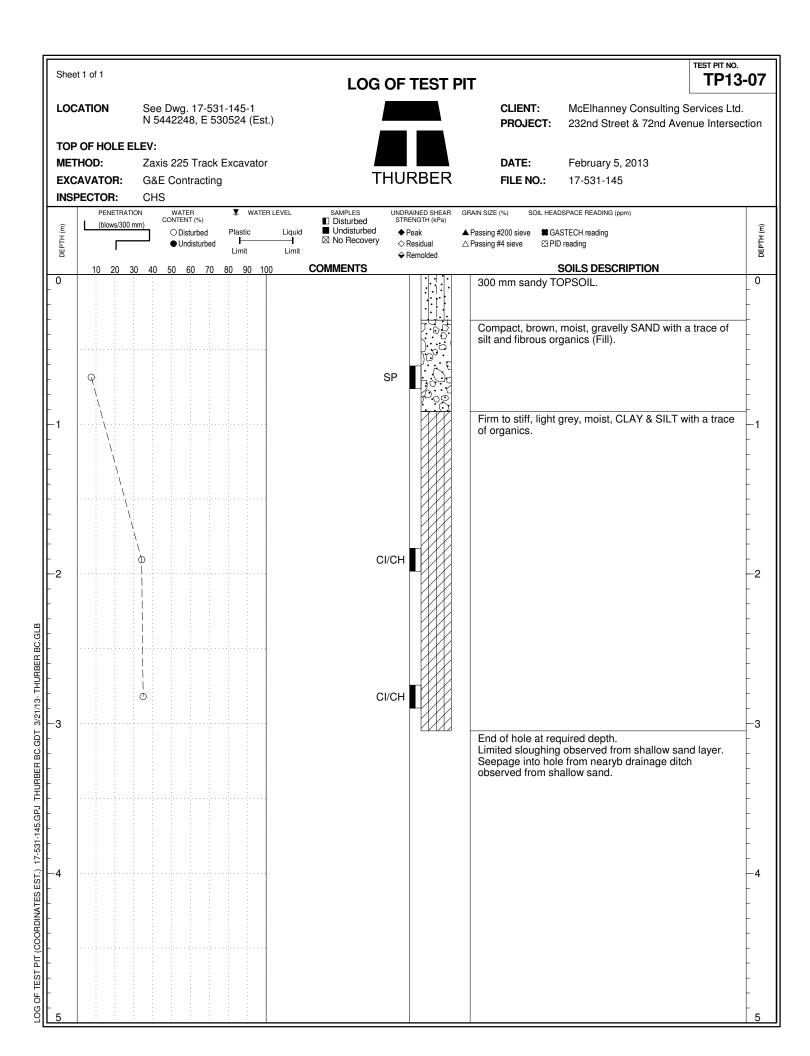














2012 Thurber Test Hole Logs

	Ministry of Tr	anspo	ortati	on			SI	JN	<u>///</u>	1 <u>A</u>	R	Y	LO	South Coast I	Region TEST HO	LE No.
	Drojoet		رمانه الـ	1	222 4							•			1	2-1
	Project Locatio		_	-		o 264 EE of the 24		_			erpa	ssN 5	5440728	, E 533789 Elevati	ion 79.5 m	
	Driller										-			m/Mud Rotary Dates	May 10, 20	12
			 e		(F)	(kPa)	Gra	datio	n %		Index	K	<u>_</u>			
	Drilling	(E)	Sample Type	unt	Recovery (m)	h (K				Pr	opert	ies	Classification	Descr	intion	(E)
	Details	Depth (m)	mple	Blowcount	COVE	Shear Strength (Gravel	Sand	Fines				assifi	2000.		ELEVATION (m)
		De	Sa	B	Re	S ts	ق	Sa	Fir	W _L	W _P	W	ర			
												5.1	SP	125 mm of ASPHALT		13m/ -79
		1	G									0.1	Oi	Dense, brown SAND gravel and a trace of	silt.	-78
		2										5.3	SP-SM	Some wood at 0.6 m No gravel below 1.8 r		Ē
		-3	G	32								0.0	OI -OW		•	-77
																66m 76
		-4	S	18	0.03							14.4	SP-SM	Compact, grey SAND traces of gravel and s		-75
		5														Ē
	7 S 22 10.03 20.0 SP															- 74
																73
		3 22 0.03														72
		8														71
		9	S	25	0.04							19.0	SM	Some silt below 8.5 m	1 depth9.	14m
		10												Dense, grey SAND w of gravel and silt.	ith traces	F-70
			S	36	0.03							17.3	SP	or graver and onto		69
		11														68
		12	S	38	0.04							19.2	SP-SM	Some silt between 11	.6 and	Ē
		13												13.4 m depth		67
l.B			S.	35	0.01							26.6	SM			66
R BC.6		-14											0.0			-65
IURBE		15	S.	35	0.01							19.4	SP			Ē
/12- TF		16														64
T 8/28			S	41	0.04							20.8	SP			63
BC.GD		-17														62
RBER		18	S	34	0.04							24.7	SP			E 04
J TH		19														E-61
40.GP															60 E-60	
7-531-1														59		
SAMPLE TYPE SHEAR STRENGTH kPa TESTS FILE No.																
														40		
ARY LC	D - Denison G - Grab	'n				L _v - R -	Lab V Remo	ane ulded					DS -	Consolidation Direct Shear	Thurber Engine INSPECTOR:	ering Ltd.
SUMMARY LOG	S - Split Spoo T - Shelby Tu W - Wash												W _L , W _P -	Liquid, Plastic Limits Moisture Content	CJC	
MOT 8	Blowcount =	Stanc	dard	Penetr	ation ⁻	Test (AS	TM-1	1586)		ПОИ	Е: В	racke	ets () de	note Driller's estimate	SHEET 1	of 1

Ministry of Transportation SUMMARY LO												South Coast F	Region TEST	HOLE N	No.		
	Draigat	Project Highway 1 - 232 to 264 EB Climbing Lane														12-2	
	Locatio		_	-				_			erpas	ssN 5	440836.	E 533780 Elevati	on 75.0 m		
	Driller										•		•	m/Mud Rotary Dates	May 10,	2012	
	Drilling	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gradation %			Index ੁ Properties ਜੋ		ıtion					
	Details						Gravel	Sand	6	Торск		ICS	Classification	Description			ELEVATION (m)
				Blow					Fines	W _L	W _P	w	Clas				ELEVA
													SP SP	125 mm of ASPHALT	. /	/\0.13m/	
		1	G /	G 38								4.1		Dense, brown SAND gravel and a trace of s			74
		1 2 3	G /									7.4		l *			-73
																3.51m	-72
		4	S	4	0.03							29.0	SM	Loose, reddish brown SAN with some silt and a trace of			-71
17-531-140.GPJ THURBER BC.GDT 8/28/12- THURBER BC.GLB		-5												gravel5.03m		70	
		6	S	46	0.04							16.6	SP		nse, grey SAND with a trace some gravel and a trace of		
		7	S	27	0.03							16.8	SP				-68
		8	S 39														67
		9		39	0.04							23.1	SP-SM SM	Trace gravel below 8.5 m depth			-66
		10	S	S 18 0.04	0.04									Compact, brown SAND with			65
		11												some silt.			64
		12	S	21	0.04	22.8 SM	12.19m 63										
		13	S	S 34	0.04							21.7	SP-SM	Dense, brownish grey SAND with a trace to some silt.			62
		-13 -14	5	- 34	0.04												61
		15	S	30	0.04							24.1	SP-SM	Grey below 14.6 m de	pth		60
		16			0.04							04.0	00.014				-59
		17	S	29	0.04							24.3	SP-SM				-58
		18	S	33	0.04							24.4	SP				-57
		19										15.6	CM/SM			19.05m	-56
-140.GP		20	S	45	0.04							15.6	GM/SM	Dense, grey, GRAVEI SAND with some silt.	_ and /	<u>19.66m</u>	-55
														End of testhole at requirements			
(ELEV.)	SAMPLE TYPI A - Auger	U -	Uncor	AR STRENGTH k Inconfined Compre			on			TESTS Mechanical Analysis	FILE No. 17-53	31-140					
F06	C - Core D - Denison		F _v - Field Vane L _v - Lab Vane					Q, R, S C			Triaxial Compression Consolidation	PREPARED Thurber Eng		g Ltd.			
SUMMARY		$ \begin{array}{cccccccccccccccccccccccccccccccccccc$								Liquid. Plastic Limits	INSPECTOR						
MOT SU	W - Wash														OUEET 4 of 4		

Ministry of Tra	anspo	rtatio	on		,	Sl	JN	/IN	1A	R	Y	LO	South Coast Region TEST HOLE N	lo.
Project	H	lighw	vay 1 -	232 to	o 264 EE	3 Clin	nbing	j Lan	е				TH 12-3	<u> </u>
Location Driller			2108, I				/lethc	٠d c	Solid	Stor	n Aug	or	Elevation 35.9 m	
Dille			ack Dr				datio						Dates July 11, 2012	
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel 6	Sand	Fines	l	Indexopert		Classification	Description	
	<u> </u>	Ö	B	<u>я</u>	<u> </u>	9	Š	<u> </u>			226.7		Soft, dark brown amorphous PEAT with some fibrous organics and silt and a trace of sand	-3
	2 2 3										23.9	SP-SM	50 mm thick layer of organics at	3
	-4										44.3	ОН/СН	2.75 m depth Some organic silt below 3 m depth Soft to firm, grey, silty CLAY with traces of fine sand and organics Soft to very soft below 4 m depth	
	5										44.0	ОН/СН	125 mm thick sand lens at 5 m depth	- - - - - - - - - - - - -
	- - - -7 - -										59.4	СН	7.60m	- - - - - - - -
	- -8 - - -												Compact, grey SAND with a trace to some silt and a trace of thin lenses of clayey silt	- -: - -
	9										37.0	CH/CL	150 mm thick layer of firm, grey, silty CLAY at 8.7 m depth	-
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab S - Split Spoor T - Shelby Tub	n				U - F _v - L _v -		nfined Vane ane	Com		on	(Q, R, S - C - DS - w _L , w _P -	TESTS - Mechanical Analysis - Triaxial Compression - Consolidation - Direct Shear - Liquid, Plastic Limits - Moisture Content FILE No. 17-531-140 PREPARED By: Thurber Engineering INSPECTOR: EPS	
W - Wash Blowcount = S	Stand	ard F	Penetra	ation -	Test (AS	TM-1	586)		NOT	E: B	racke	ets () de	enote Driller's estimate SHEET 1 of 2	

										.1\	•	LO	G	TH 12	2-3
Projec Location		_	vay 1 - 2108, l		o 264 EE	3 Clin	nbing	J Lan	е				Elovatio	on 35.9 m	
Driller			ack D			٨	/lethc	od S	olid	Stem	n Aug	er	Dates	July 11, 2012	2
							datio			Index				, , , , , , , , , , , , , , , , , , ,	
Drilling	<u></u>	Sample Type	±	Recovery (m)	Shear Strength (kPa)			,		opert		Classification			
Details	Depth (m)	ple	Blowcount	over	ar ngth	Ne	ס	S				ssific	Descri	ption	
	Dep	San	Blov	Rec	She Stre	Gravel	Sand	Fines	W _L	W _P	w	Clas			
	-										24.2	SM	Compact, grey SAND	with a	E
	-												trace to some silt and thin lenses of clayey s	a trace of ilt	Ė
	-11												(continued)		E
	F ''														Ė
	-										39.0	CH/CL	600 mm thick layer of silty CLAY at 11.3 m c	firm, grey, lepth	E
	- -12														Ē
	-														F
	-														Ē
	-13										21.3	SM			F
	-										21.0	Olvi			F
	-														Ē
	-14 -														F
	-														Ē
	- -15										30.3	CL	100 mm thick silty CL/ 14.6 m	AY layer at	Ė
	- 13														Ė
	-														Ē
	- -16														F
	Ē										23.0	SM			E
	-														Ē
	-17														F
	-														Ē
	-										22.7	SM			F
CPT Refusal at 18.05 m	-18													18.30r	m F
10.00 111	Ę E												End of hole at require	d depth	Ë
	-												Hole open to 2.1 m de drilling		Ė
	-19 -												Water at 2 m depth af	ter drilling	E
	-														Ė
	-														
<u>SAMPLE TYP</u> A - Auger	<u>E</u>				U - I	EAR S Uncor	nfined			on		М -	TESTS Mechanical Analysis	FILE No. 17-531-140)
C - Core D - Denison					F _v - L _v -	Field \ Lab V	√ane ane				(Q, R, S - C -	Triaxial Compression Consolidation	PREPARED By: Thurber Engineeri	ina
G - Grab S - Split Spoo					R -	Remo	ulded					W _L , W _P -	Direct Shear Liquid, Plastic Limits	INSPECTOR:	<u></u>
T - Shelby Tu V - Wash	npe											w -	Moisture Content	EPS	

Project Locatio Driller Drilling Details	n N	l 5442 On-Tra	/ay 1 - 2076, ack D	E 531	o 264 EE 580	3 Clin	nbing	j Lan	е					TH 12	
Driller Drilling	C	n-Tra	•		300								Elovati	on 37.2 m	
Drilling					Inc.	N	/lethc	od S	Solid	Stem	. Aug	er	Dates	July 11, 2012	2
<u> </u>	(m) r	$^{\circ}$					datio			Index				, ,	
	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	Pro w _L	opert w _P	ies w	Classification	Descri	ption	
	- - - -												Compact, brown to gr with some gravel (pos	ey SAND ssible fill)	Ē
	- - - -1										8.0	SP-SM			E
	- - - -										189.7	PT	Firm, dark brown, amo	1.20i orphic ous	m - - -
											91.9	PT/OH	organics (wood) Pockets of grey SANI trace of silt between 1	O with a .7 m depth	-
	- - - -										211.0	PT	and 2.1 m depth		
	3 3														
	4										27.8	SM/ML	Compact, grey SAND trace to some silt and organics	with a 4.10m a trace of	F
	- - - -5												Soft to very soft, grey with traces of fine san organics		m
	- - - -										21.2	SM	Compact, grey SAND traces of silt and thin	with	<u>"</u>
	6										42.2	CL/CH	lenses of silty clay 600 mm firm to stiff, b CLAY at 5.8 m depth	rown silty	-
	- - - - -7												Trace to some silt bet 6.4 m and 8.2 m deptl		-
	- ' - - - -										26.0	SP-SM			
	-8 -												900 mm thick layer of partially decomposed	brown,	
	9										33.0	SM	ORGANICS and SAN some silt and a trace 8.2 m depth		-
	- - - -														
SAMPLE TYPE A - Auger						EAR S Uncor				on		- M	TESTS Mechanical Analysis	FILE No. 17-531-140	
C - Core D - Denison G - Grab	n				F _v - L _v -	Field \	√ane ane			0 11	(Q, R, S - C - DS -	Triaxial Compression Consolidation Direct Shear	PREPARED By: Thurber Engineeri	
S - Split Spoo T - Shelby Tul W - Wash	be											W _L , W _P -	Liquid, Plastic Limits Moisture Content	EPS	

Ministry of Tr	anspo	ortati	on		1	Sl	JN	<u>///</u>	1A	R	Υ	LO	G South Coast R	Region TEST HOLE	No
Project		_	-		o 264 EE	3 Clin	nbing	j Lan	е					TH 12-	-4
Location Driller			2076, ack D				/lethc	\d 6	Solid	Ston	n Aug	or	Elevation Dates	on 37.2 m July 11, 2012	
Dille			ack Di				datio			Index			Dates	July 11, 2012	T
Drilling	<u></u>	Sample Type	nt L	y (m)	Shear Strength (kPa)	Ola	datio	II 70		opert		Classification			
Details	Depth (m)	Jple	Blowcount	Recovery	ar ingth	vel	ъ	ပ္လ		· 		ssific	Descri	ption	
	Dep	San	Blo	Rec	She	Gravel	Sand	Fines	W _L	W _P	W	Clas			
	-										23.3	SM	Compact, grey SAND traces of silt and thin (with	F
	-												lenses of silty clay (co	ntinued)	Ē
	- -11														Ė
	-														F
	<u> </u>										24.1	SM			E
	12														Ė
	Ė														E
	- -13														ŧ
	13										29.1	CL			F
	E												600 mm layer of soft to grey silty CLAY at 13.4	o firm,	F
	-14												grey siity CLAY at 13.4	4 m	Ē
	-														E
	-										20.0	SM			F
	15														E
															Ē
CPT refusal at	16														Ė
15.85 m	E 10														Ė
	-										23.2	SM		16.80m	ŧ
	17												End of hole at required Hole open to 5.2 m de		F
	-												drilling Water at 3 m depth after		F
													Water at 3 m deptir an	ter drilling	Ē
	-18 -														Ė
	Ė														E
	- 19														E
	E														F
	<u>-</u>														Ė
SAMPLE TYPE	<u> </u>	Ш				AR S				<u> </u>			TESTS	FILE No.	上
A - Auger C - Core					U - F _v -	Uncor Field \	nfined √ane			on	(Q, R, S -	- Mechanical Analysis - Triaxial Compression	17-531-140 PREPARED By:	
D - Denison G - Grab	n n				L _v - R -	Lab V Remo	ane ulded					DS -	 Consolidation Direct Shear 	Thurber Engineerin	g I
S - Split Spoc T - Shelby Tu W - Wash												w _L , w _P -	- Liquid, Plastic Limits - Moisture Content	EPS	
Blowcount =	Stand	dard I	Penetr	ation ·	Test (AS	TM-1	586)		TON	E: B	racke	ts () de	enote Driller's estimate	SHEET 2 of 2	2

Ministry of Tra	чор ч	, ran	J.1		,	St	J۱۷	/IIV	ΊΑ	K	Y	LO	G		No.
Project		_	-		o 264 EE	3 Clin	nbing	J Lan	е					TH 12	-5
Locatio Driller			1190, l ack Di				/lethc	'4 c	colid	Stor	n Aug	ıor	Elevation Dates	on 50.5 m July 10, 2012	
Dille			ack Di				datio						Dates	July 10, 2012	Τ
Drilling Details	(m) r	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)					Index opert		Classification	Descriț	otion	
2 0 100	Depth (m)	Samp	Blowe	Reco	Shea Stren	Gravel	Sand	Fines	W _L	W _P	w	Class			
	-										8.1	SM	Compact, brown, dry r fine SAND with a trace gravel and silt (probab backfill)	e to some	
	-1 - - - - - - -														
	- -2 - - - - - -										5.9	SP-SM			
	- -3 - - - -												Sand coarsens below depth	3.4 m	
	- -4 										16.0	SW-SM			
	- -5 - - - - -										16.9	SM	Some red staining bet 5.3 m and 5.6 m depth		
	- -6 - - -												·		
	- - 7 - -										13.1	SW-SM			
	- - - - 8 - -														
	- - - - 9 - - -										16.9	SM			
SAMPLE TYPE	- - -				OU.	AD C	TDE	ICT ^L I	kD-				TESTS	FILE No.	Ē
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab S - Split Spoo T - Shelby Tul	n					EAR S Uncor Field V Lab V Remo	nfined √ane	Com		on	•	Q, R, S - C - DS - w _ı , w _p -	Mechanical Analysis Triaxial Compression Consolidation Direct Shear	17-531-140 PREPARED By: Thurber Engineerin INSPECTOR: EPS	ng L
T - S⊓eiby Fui W - Wash	J-C			ation -								vv -	WOSTUTE COLLECT		

Ministry of T	Fransp	ortati	on		,	Sl	JN	/IN	1A	R	Y	LO	South Coast I	Region TEST HOLE	
Projec		_	-		o 264 EE	3 Clin	nbing	g Lan	е					TH 12	-5
Locati Driller			1190, ack D			N	/lethc	nd S	hilo	Sten	n Aug	er	Elevati Dates	ion 50.5 m July 10, 2012	
							datio			Inde			24,00		
Drilling	Ē	Sample Type	r	Recovery (m)	Shear Strength (kPa)					oper		Classification	Descri	intion	
Details	Depth (m)	mple	Blowcount	cove	ear ength	Gravel	<u>م</u> ا	Fines				ıssific	Descri	iption	
	De	Sal	Blo	Re	Str	یق	Sand	iE	W _L	W _P	W	S			
	Ė								55	23	38.6	СН	Firm, grey, silty CLAY	10.10m/ with a	E
	Ė								33	23	30.0	CIT	trace of fine sand		F
	-11												Soft to very soft below	w 11 m	Ė
	ŧ												depth		Ė
	-12										35.0	CL/CH			F
	F12														F
	Ē														F
	13											a. (a			Ė
	Ė								39	20	34.4	CL/CH			Ė
	Ė														Ė
	- 14														Ė
	F										36.7	CL/CH			F
	-15														Ē
CPT 12-5	-												End of hole at require	15.20m ed depth	E
stopped at 40 m	Ė												Hole open to 4.6 m de drilling	epth after	F
	16												Water at 4.4 m depth drilling	after	Ė
	Ė												J		Ė
	17														Ė
	ļ''														Ė
	Ē														F
	18														F
	Ē														Ē
															Ė
	- 19														ŧ
	Ė														Ė
04145: 5 = -	<u> </u>													TEILE NO	F
SAMPLE TYPE A - Auger	<u>-E</u>				U -	Uncor	nfined	NGTH Comp		on		M -	TESTS Mechanical Analysis	FILE No. 17-531-140	
C - Core D - Denison G - Grab					F _v - L _v - R -	Lab V	vane ane ulded					С -	Triaxial Compression Consolidation Direct Shear	PREPARED By: Thurber Engineering	ng I
S - Split Spo T - Shelby T					10 - 1		aidou					WL, WP -	Liquid, Plastic Limits Moisture Content	INSPECTOR: EPS	
<u>W - Wash´</u> Blowcount =		dard I	Penetr	ation .	Test (AS	TN/-1	15861	1	NOT	F. D	racko	ste () de	enote Driller's estimate	SHEET 2 of	2

Ministry of T	ransp	ortatio	on		,	Sl	JN	<u>///</u>	1A	R	Y	LO	South Coast Region	TEST HOLE N
Projec	t I	Highv	vay 1 -	232 t	o 264 EE	3 Clin	nbing	j Lan	е					TH 12-6
Location Driller			0937, l ack Di				/letho	٠d د	Solid	Ston	n Aug	or	Elevation 54. Dates Ju l	0 m ly 10, 2012
Dilliel	Τ,		ack Di				datio			Index			Dates Jul	19 10, 2012
Drilling	E	Sample Type	rut	Recovery (m)	Shear Strength (kPa)			,	l	opert		Classification	Description	
Details	Depth (m)	mple	Blowcount	cove	ear engtl	Gravel	Sand	Fines		\		assific	Description	
	D _C	Sa	BIG	Re	<u>හු භූ</u>	ق	Sa	ij	W _L	W _P	W	ర		0.00m -
	-												Firm, brown silty CLAY with some fine sand	0.00111
	-												Traces of red staining and organics to 0.15 m depth	-
	<u>-</u> 1										46.7	СН		-
	-												Soft to firm, grey below 1.4 m	1
	-2													-
	Ė								56	25	41.4	СН		-
	Ė								30	25	41.4	CIT		-
	- 3												Very soft, blueish grey, wet si	ilty
	-												CLÁY below 3 m depth	-
	4								45	21	43.0	CL		-
	-													-
	-													-
	-5 -													-
	-								0	0	25.7	MI/SM	Soft to very soft, grey, sandy	5.50m
	6								Ü	ľ	25.7	IVIL/SIVI	SILT with some clay	5.90m
	Ė												Compact, grey SAND with a trace of shells and lenses wit	h [
	Ė												some silt	- - -
	- 7										24.2	SM		-
	Ė													-
	-8													- - -
	Ē	H									24.5	SM		-
	ŧ.													- - -
	<u>-</u> 9													- - - -
	Ē													9.80m
SAMPLE TYP	<u>F</u> F	Ш			SHE	EAR S	TRF	IGTH	kPa				TESTS FILE No.	-
A - Auger C - Core	<u>-</u>					Uncor	nfined			on	(Q, R, S -	Mechanical Analysis Triaxial Compression PREPA	17-531-140 RED By:
D - Denison G - Grab					L _v -	Lab V Remo	ane					C - DS -	Consolidation Thurbe	er Engineering
S - Split Spoo T - Shelby Tu W - Wash												W _L , W _P -	Liquid, Plastic Limits Moisture Content	EPS
Blowcount =	Stand	dard [Penetr	ation ⁻	Test (AS	TM-1	586)		NOT	E: B	racke	ets () de	enote Driller's estimate	HEET 1 of 2

Projec	t F	liahw	av 1 -	232 to	o 264 EE						•	LO		TH 12	-6
Location		_	0937, I			J 01111	1151116	, Lan	•				Elevati	on 54.0 m	
Driller	T (n-Tr	ack D	rilling			/lethc		Solid	Sten	n Aug	jer 	Dates	July 10, 2012	Т
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)		datio		l	Inde: opert		Classification	Descri	ption	
	Depi	Sam	Blow	Rec	Shea	Gravel	Sand	Fines	W _L	W _P	w	Clas			
CPT 12-6 stopped at 40 m	-11 -12 -13 -14 -15 -16								41	20	36.3 30.8 31.1	CL/CH CL	End of hole at require Hole open to 5.3 m dedrilling Water at 3.5 m depth drilling	15.20m d depth epth after	
	-18 -18														
	19														
SAMPLE TYP	<u> </u>				SHF	L EAR S	TRE	l NGTH	kPa				TESTS	FILE No.	Ŀ
A - Auger C - Core D - Denison G - Grab S - Split Spor	on				U - F _v - L _v -	Uncor Field \ Lab Va Remo	nfined √ane ane	Com		on	,	Q, R, S - C - DS - w _i , w _p -	Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits	17-531-140 PREPARED By: Thurber Engineerir INSPECTOR:	ng
S - Spilt Spoo T - Shelby Tu V - Wash	ube											w _L , w _P -	· Liquid, Plastic Limits · Moisture Content	EPS	

Ministry of Tra	anspo	rtatio	on		,	Sl	JN	<u>///</u>	1A	R	Y	LO	South Coast Region TEST	HOLE No	0.
Project	Н	lighw	vay 1 -	232 to	o 264 EE	3 Clin	nbing	j Lan	е					TH 12-7	_
Locatior Driller			0154, I ack Dr				/lethc	۰4 د	colid	Storr	n Aug	ıor	Elevation 85.3 m Dates July 12	2012	
Dille	Ĭ		ack Di				datio			Index			Dates July 12	2012	
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines		opert		Classification	Description		(m) NOITAVA IB
		Ο̈́	B	<u>~</u>	<u> </u>	g	Š	Ħ				O	Loose to compact, brown, dry, silty SAND with a trace to some gravel	0.00m 0.30m	
 - - - - - - -	-1										60.2 27.8	SM/OL CL		1.10m	-8
	-2										22.2	CL	Stiff to very stiff, grey, moist CLAY with some silt and sand and a trace of gravel Some gravel between 2.1 m to 4 m depth		-8
	-3														-8
	-4										23.1	CL			-8
	-5 -6										21.5	CL	Trace of thin (>50 mm thick) sand lenses below 5.2 m depth		-8
- - - - - - - - - - - - - - - - - - -	-7								30	17	19.9	CL	Soft to firm between 6.5 m and 7.2 m depth		-7 -7
	-8														-7
	-9								34	18	20.5	CL		- - - - - - - - -	-7
- -														F	
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab S - Split Spoon T - Shelby Tub	1	•			U - F _v - L _v -	AR S Uncor Field \ Lab Va Remo	nfined Vane ane	Comp		on		Q, R, S - C - DS - w _L , w _P -	Triaxial Compression Consolidation Direct Shear Liquid. Plastic Limits PREPARED Thurber Eng INSPECTOR	gineering L	
W - Wash Blowcount = S	Stand	ard F	Penetra	ation ⁻	Γest (AS	TM-1	586)		NOT	E: B	racke	ets () de	enote Driller's estimate SHEET	1 of 2	_

Ministry of T	ransp	ortati	on		1	Sl	JN	<u>///</u>	1A	R	Y	LO	G South Coast Re	egion TEST HOLE	No.
Projec		_	-		o 264 EE	3 Clin	nbing	g Lan	е					TH 12-	7
Locati Driller			0154, ack D				/lethc	74 S	Solid	Ston	. Auc	ıor	Elevatior Dates	35.3 m July 12, 2012	
Dille	<u> </u>		ack D				datio						Dates	July 12, 2012	Г
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	ı	Index opert		Classification	Descript	ion	
CPT 12-7	Ĭ	Š	ā	ă	कं कं	ō	Š	证	W.	vv _P	23.8	_		10.10m/	
refusal at 9.9 m	-												Dense, brown, gravelly with a trace of silt	SAND	-7
	11										20.7	GP-GM			- - - - -
											20.7	OI -OIW			-
	12														
	-13														
	-										14.8	SW-SM			
	14														
	-										14.3	sw			
	15													15.20m	
	-												End of hole at required Hole open to 10 m depth Water at 6.4 m depth	depth h	
	16														
															Ė
	-17														
	-														Ė
	-18 -														E
	-19														
<u> </u>	<u>F</u>								<u> </u>					TI E No	E
SAMPLE TYF A - Auger C - Core D - Denison	<u>作</u>					EAR S Uncor Field \ Lab V	nfined √ane			ion		Q, R, S -	Mechanical Analysis Triaxial Compression P	TILE No. 17-531-140 PREPARED By:	
G - Grab S - Split Spo T - Shelby T					R -	Remo	ulded					DS -	Direct Shear	Thurber Engineering NSPECTOR: EPS	g l
<u>W - Wash</u> Blowcount =	: Stand	dard I	Penetr	ation .	Test (AS	TM-1	586)		רחע	F. B	racke	ets () de	enote Driller's estimate	SHEET 2 of 2	2

Ministry of T	ransp	ortati	on		,	Sl	JN	/IN	1A	R	Y	LO	G South Coast F	Region TEST HOLE	No.
Projec		_	-		o 264 EE	3 Clin	nbing	g Lan	е					TH 12	2-8
Locati Driller			9448, ack D			N	/lethc	nd S	Solid	Stem	n Aug	er	Elevati Dates	on 88.0 m July 12, 2012	
2111101			uoik Di				datio			Index			Duite	ouly 12, 2012	
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	l	opert		Classification	Descri	ption	
	-	Ø	B	R	σ io	9	Ø	i L				O	Stiff, grey, silty CLAY of sand and fibrous o	with traces 0.00m rganics	
	-1 -1										23.9	CL			
	-2 -2												Some dark brown stai an organic odour betw and 1.8 m depth		
	-3										38.0 99.2	OL/ML OH	Firm, brown, organicy some sand and a trac	SILT with	Ē
													Compact, grey SAND gravel and a trace of s	with some silt	
CPT 12-8	-4 - -										16.4	SM			
refusal at 4.45 m	-5 -5														
	-6										24.1	SP-SM	Compact to dense, wi gravel below 5.2 m de		
													Stiff, grey, silty CLAY	6.70m	
	-7 - - -										27.9	CL	sandy layers	and some	
	-8 -8														
	-9										22.5	CL			
													Firm below 9.1 m dep	th	
SAMPLE TYP A - Auger C - Core D - Denison	PE				U - F _v - L _v -	Field \	nfined Vane ane	Com	kPa oressi	on	(Q, R, S - C -	TESTS Mechanical Analysis Triaxial Compression Consolidation Direct Shear	FILE No. 17-531-140 PREPARED By: Thurber Engineerin	ng l
G - Grab S - Split Spo T - Shelby To					K -	keino	uiaea					W _L , W _P	Liquid, Plastic Limits Moisture Content	INSPECTOR: EPS	
<u>W - Wash´</u> Blowcount =	Stand	dard I	Penetr	ation -	Test (AS	TM-1	1586)		NOT	E: B	racke	ets () de	enote Driller's estimate	SHEET 1 of	2

Ministry of Ti	ranspo	ortatio	on		,	Sl	JN	<u>///</u>	1A	R	Υ	LO	G South Coast I	Region TEST HOLE	No.
Project		_	-		o 264 EE	3 Clin	nbing	j Lan	е					TH 12	-8
Location Driller			9448, l ack Di			N	/lethc	nd S	Solid	Sten	n Aug	er	Elevati Dates	on 88.0 m July 12, 2012	
2111101			uoit Di				datio			Inde			24.00	July 12, 2012	T
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel			Pr	opert	ies	Classification	Descri	ption	
	Del	Sar	Blo	Rec	She	Gra	Sand	Fines	W _L	W _P	W				
	- - - -										24.6	CL	Stiff, grey, silty CLAY sandy layers (continue	and some ed)	
	-11 -11												Trace of sand below 1	I1 m depth	
	E										23.3	CL			E
	12														
	13										24.9	CL			
	- - - - -														
	-14 -														
	15										24.0	CL		15.20m	
	- - - -												End of hole at require Hole open to 3 m dep	d depth	Ē
	-16 												drilling Water at 2.9 m depth drilling	after	
	-														Ė
	-17 -														
	- - -18														
	ļ . Š														
	-19														
															E
SAMPLE TYP	<u>E</u>					AR S Uncor				on		ŅΛ	TESTS Mechanical Analysis	FILE No. 17-531-140	
C - Core D - Denison G - Grab S - Split Spoo	on				F _v - L _v - R -	Field \ Lab Va	√ane ane		V1 (33)		(Q, R, S - C - DS -	Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits	PREPARED By: Thurber Engineerin INSPECTOR:	ıg l
T - Shelby Tu W - Wash												W -	Moisture Content	EPS	
Blowcount =	Stanc	lard I	Penetr	ation ⁻	Test (AS	TM-1	1586)		NOT	E: B	racke	ts () de	enote Driller's estimate	SHEET 2 of	2



2012 Thurber CPT Logs



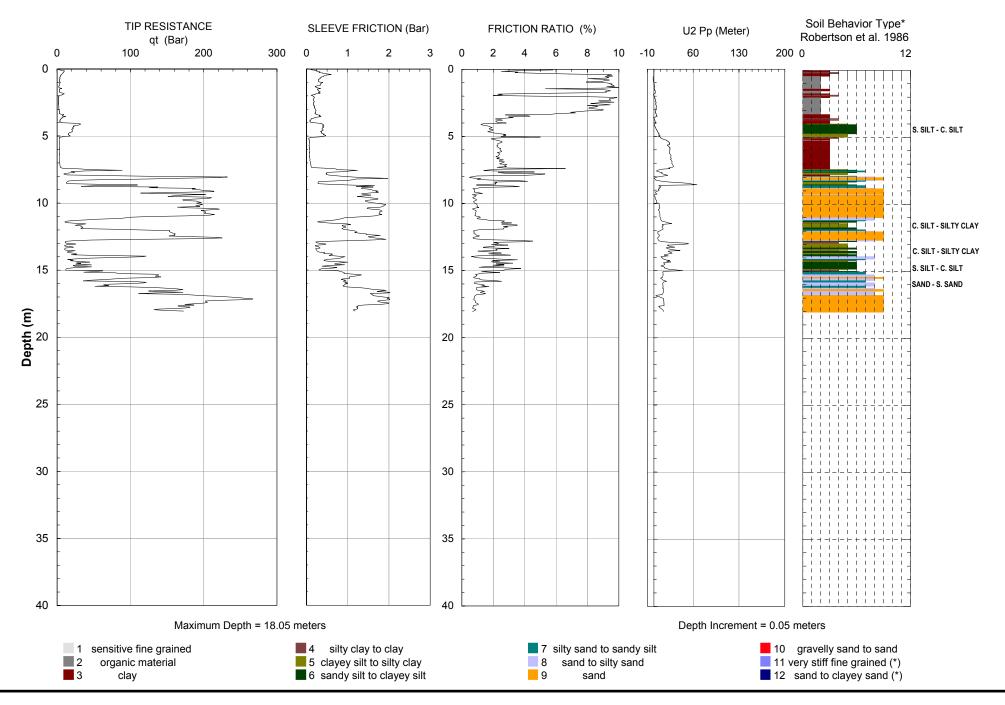
Operator: Schwartz Soil Technical

Sounding: CPT12 - 3 Cone Id: DPG1110 10 Ton Date: July 10 - 12, 2012

Site: Hwy 1 Eastbound climbing lane at 232nd Thurber Project Number: 17 - 531 - 140A

31 - 140A SOLL TE







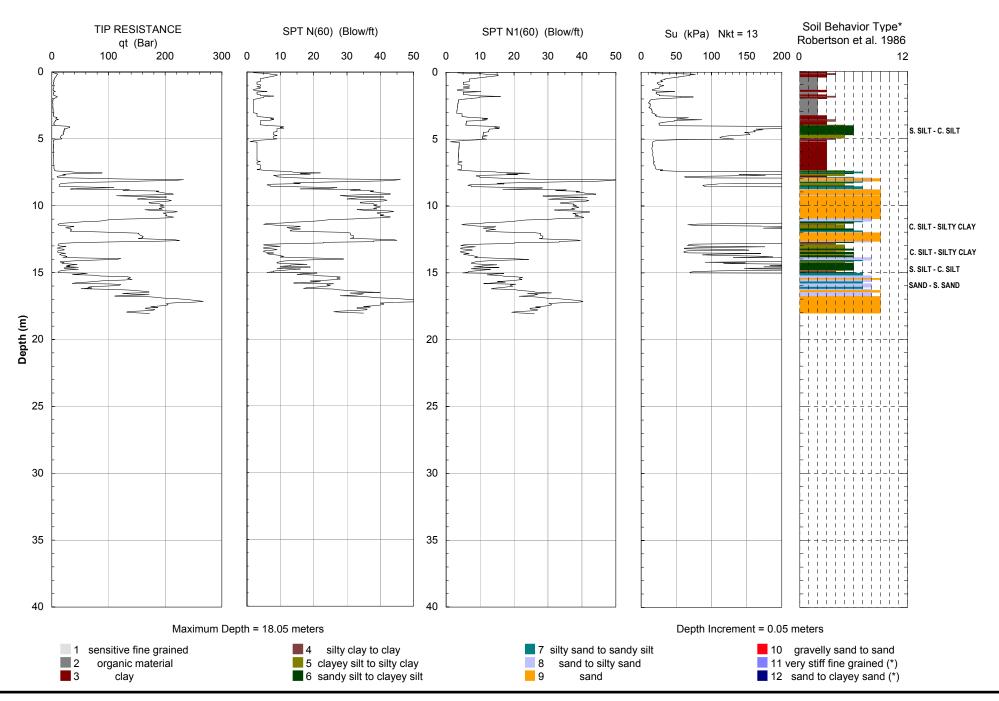
Operator: Schwartz Soil Technical

Sounding: CPT12 - 3 Cone Id: DPG1110 10 Ton Date: July 10 - 12, 2012

Site: Hwy 1 Eastbound climbing lane at 232nd

Thurber Project Number: 17 - 531 - 140A





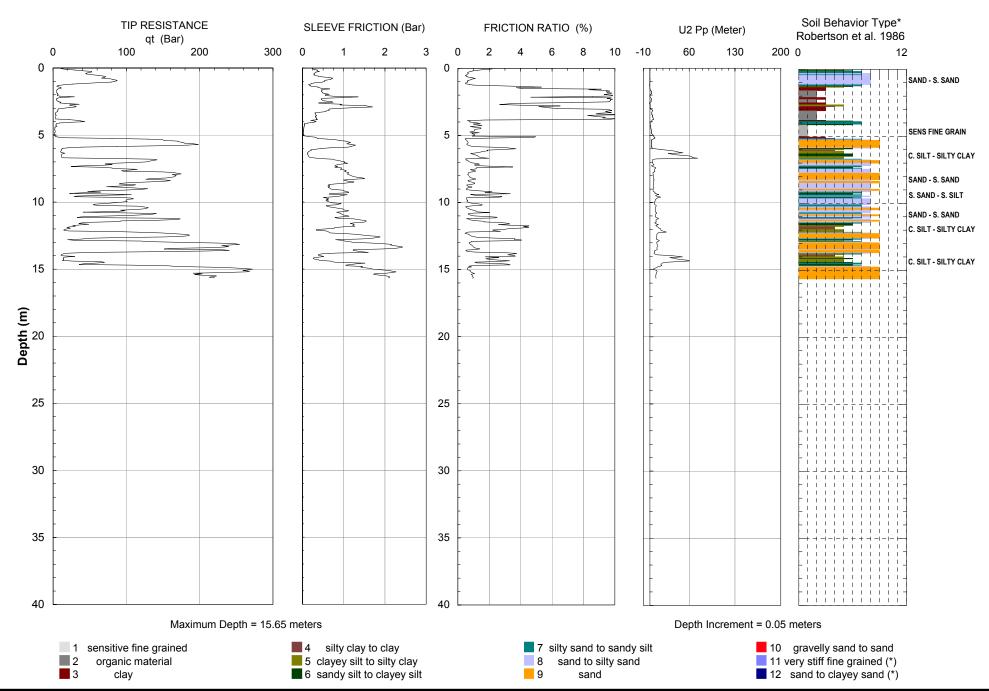


Operator: Schwartz Soil Technical

Sounding: CPT12 - 4 Cone Id: DPG1110 10 Ton Date: July 10 - 12, 2012

Site: Hwy 1 Eastbound climbing lane at 232nd Thurber Project Number: 17 - 531 - 140A

Schwartz

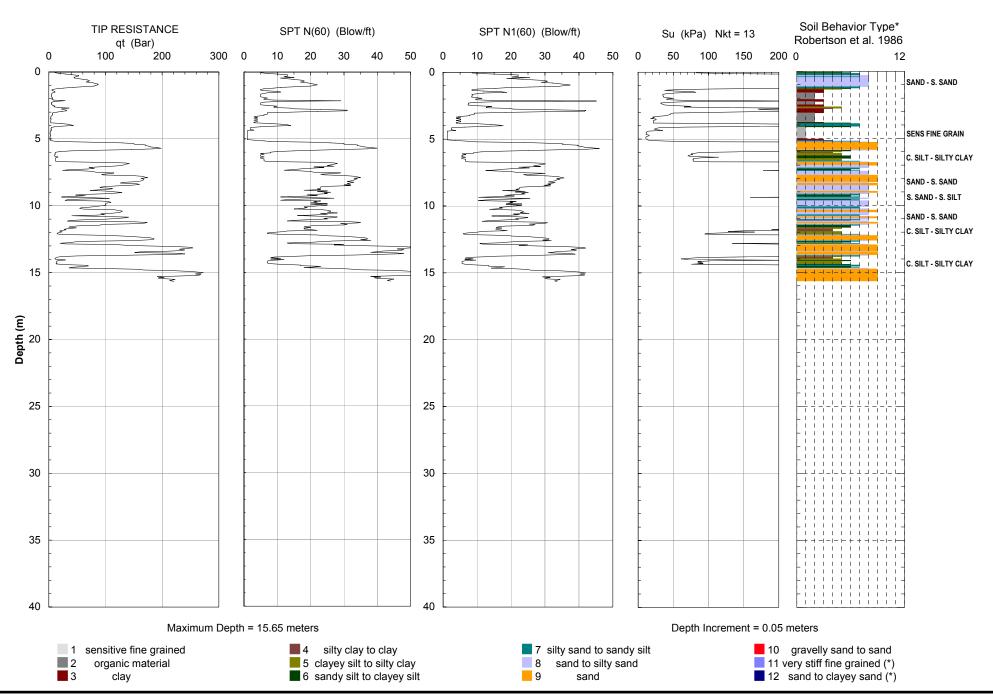




Operator: Schwartz Soil Technical

Sounding: CPT12 - 4 Cone Id: DPG1110 10 Ton Date: July 10 - 12, 2012



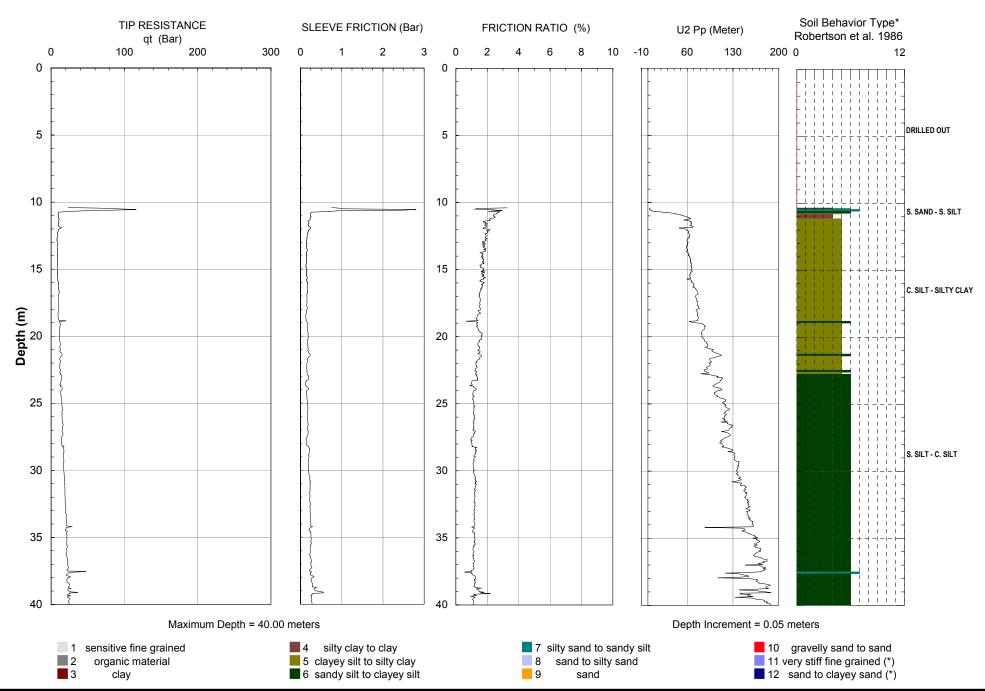




Operator: Schwartz Soil Technical

Sounding: CPT12 - 5 Cone Id: DPG1110 10 Ton Date: July 10 - 12, 2012



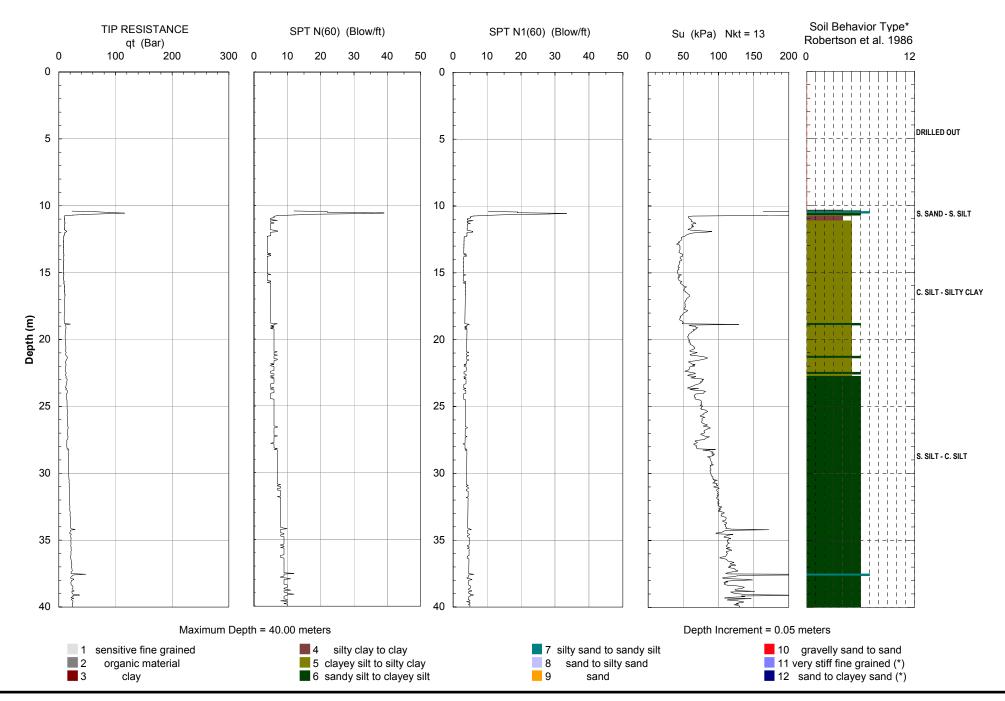




Operator: Schwartz Soil Technical

Sounding: CPT12 - 5 Cone Id: DPG1110 10 Ton Date: July 10 - 12, 2012



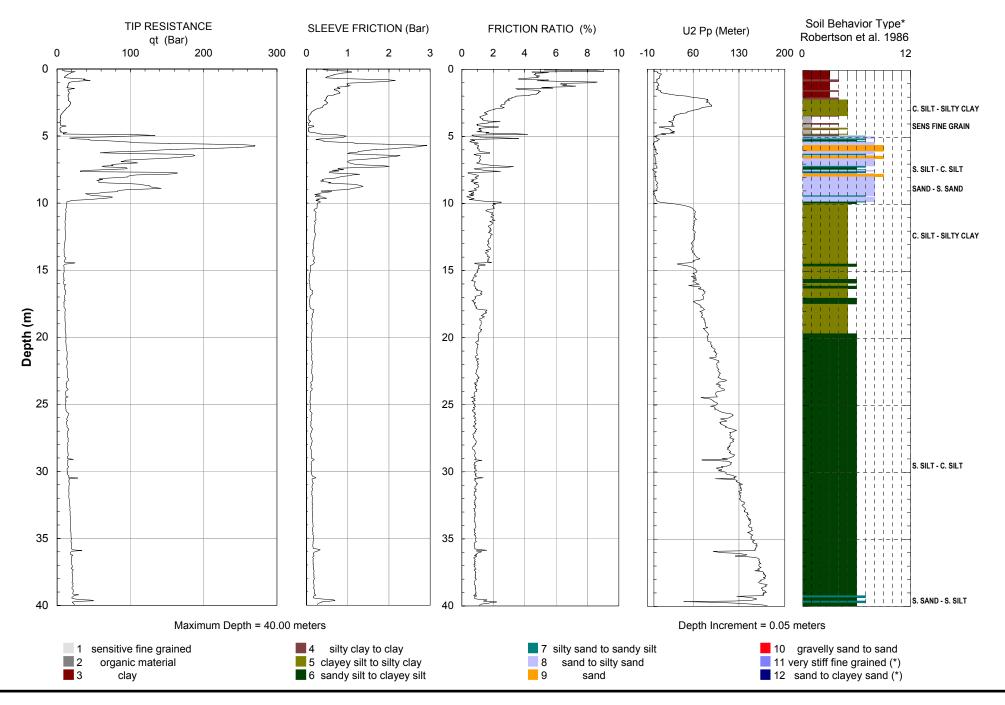




Operator: Schwartz Soil Technical

Sounding: CPT12 - 6 Cone Id: DPG1110 10 Ton Date: July 10 - 12, 2012



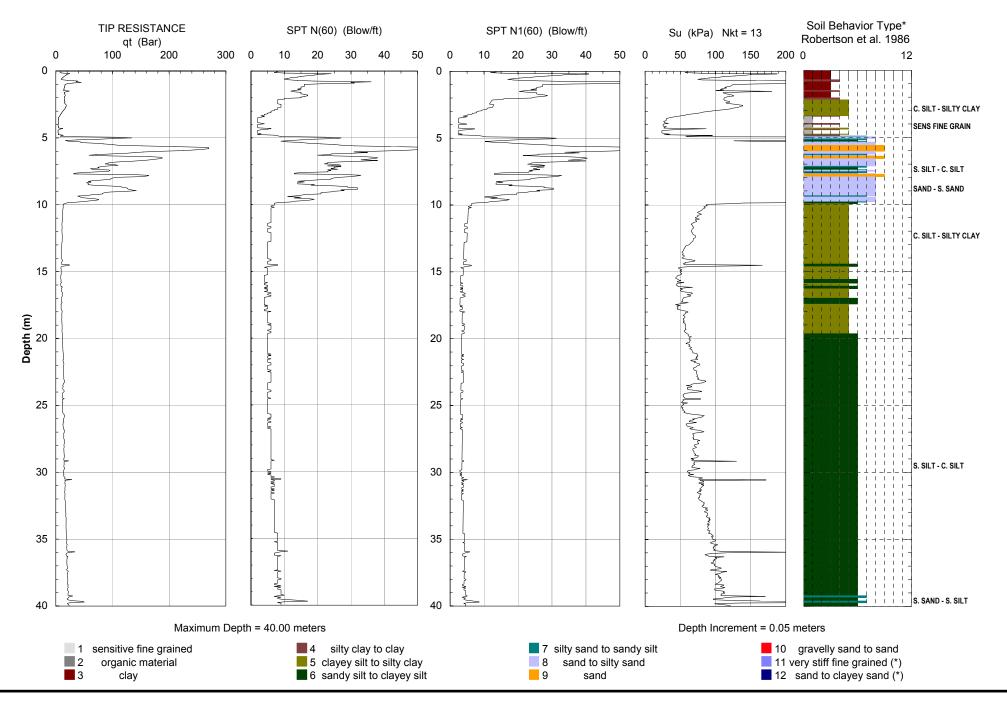




Operator: Schwartz Soil Technical

Sounding: CPT12 - 6 Cone Id: DPG1110 10 Ton Date: July 10 - 12, 2012





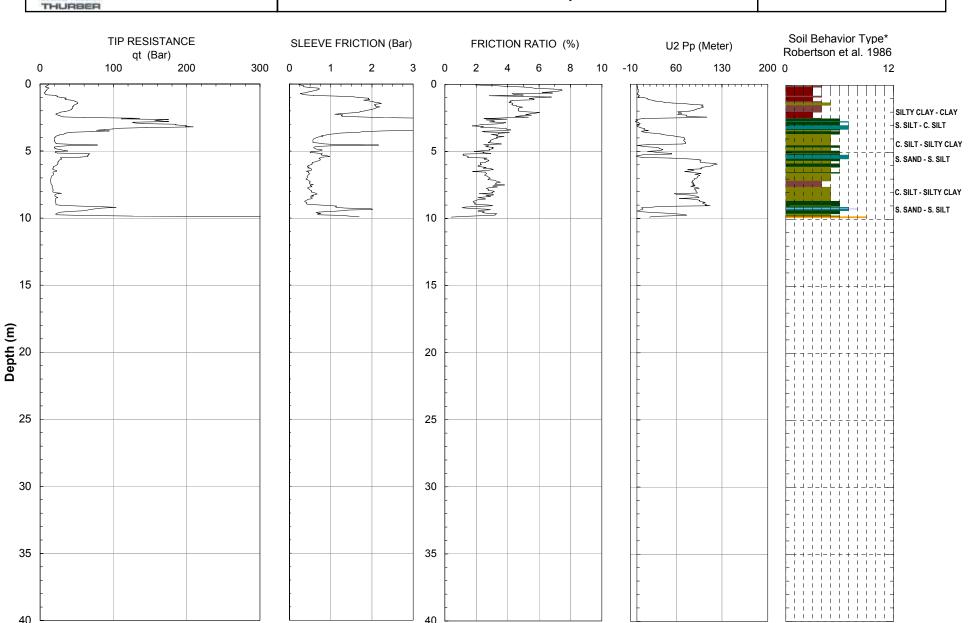


Operator: Schwartz Soil Technical

Sounding: CPT12 - 7 Cone Id: DPG1110 10 Ton Date: July 10 - 12, 2012

Site: Hwy 1 Eastbound climbing lane at 232nd

Schwartz SOIL TECH Thurber Project Number: 17 - 531 - 140A



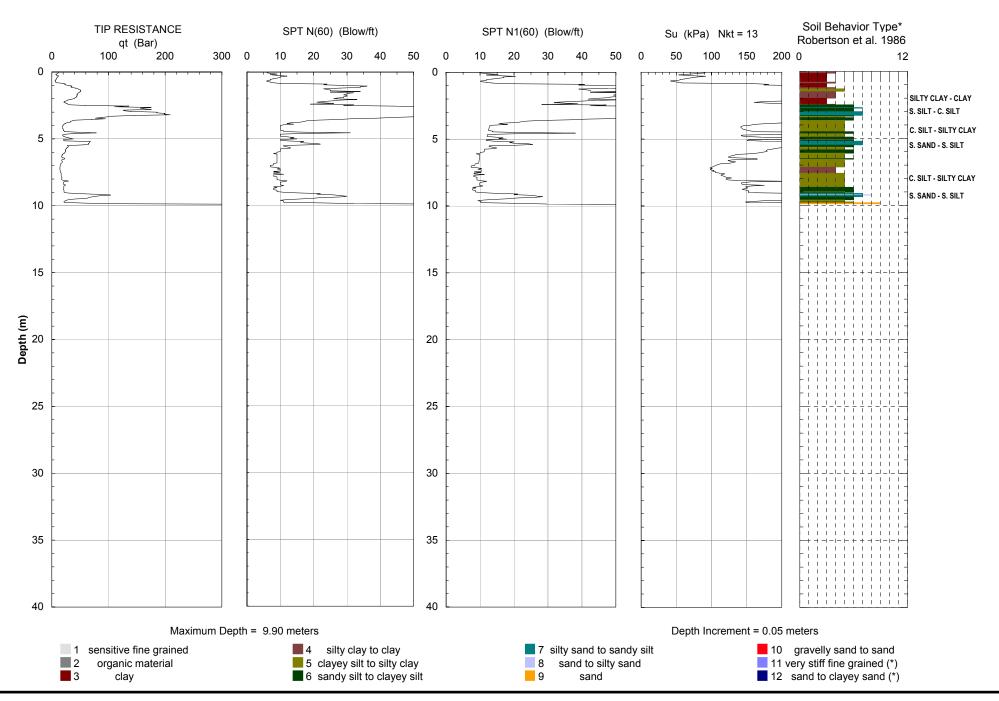
Maximum Depth = 9.90 meters Depth Increment = 0.05 meters 4 silty clay to clay 7 silty sand to sandy silt 10 gravelly sand to sand 1 sensitive fine grained 5 clayey silt to silty clay 11 very stiff fine grained (*) organic material 8 sand to silty sand 6 sandy silt to clayey silt 12 sand to clayey sand (*) clay 9 sand



Operator: Schwartz Soil Technical

Sounding: CPT12 - 7 Cone Id: DPG1110 10 Ton Date: July 10 - 12, 2012







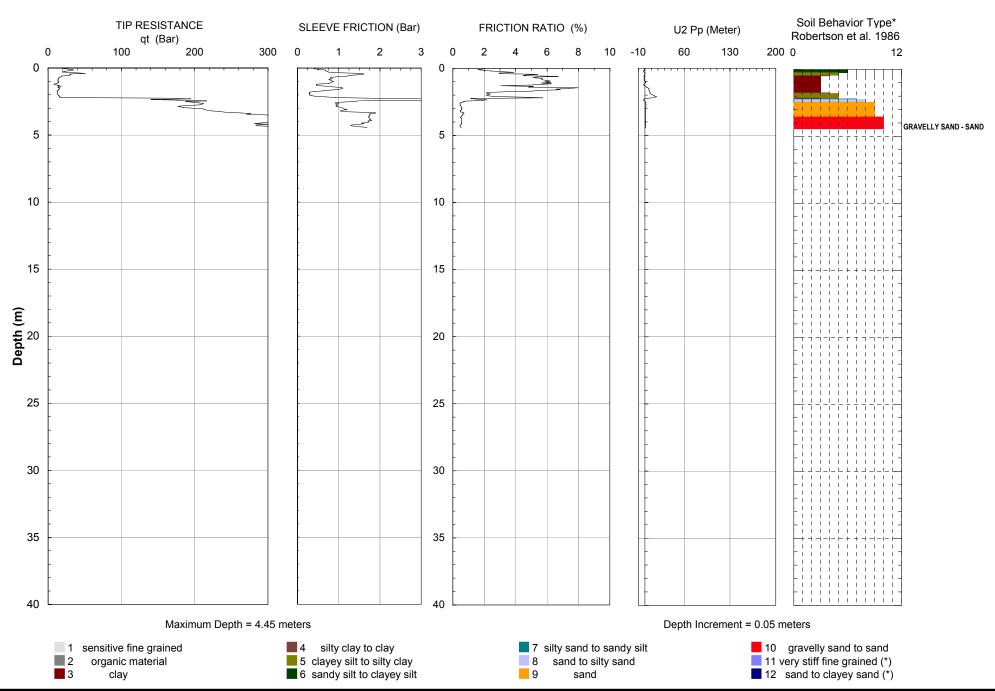
Operator: Schwartz Soil Technical

Sounding: CPT12 - 8 Cone Id: DPG1110 10 Ton Date: July 10 - 12, 2012

Site: Hwy 1 Eastbound climbing lane at 232nd

Thurber Project Number: 17 - 531 - 140A







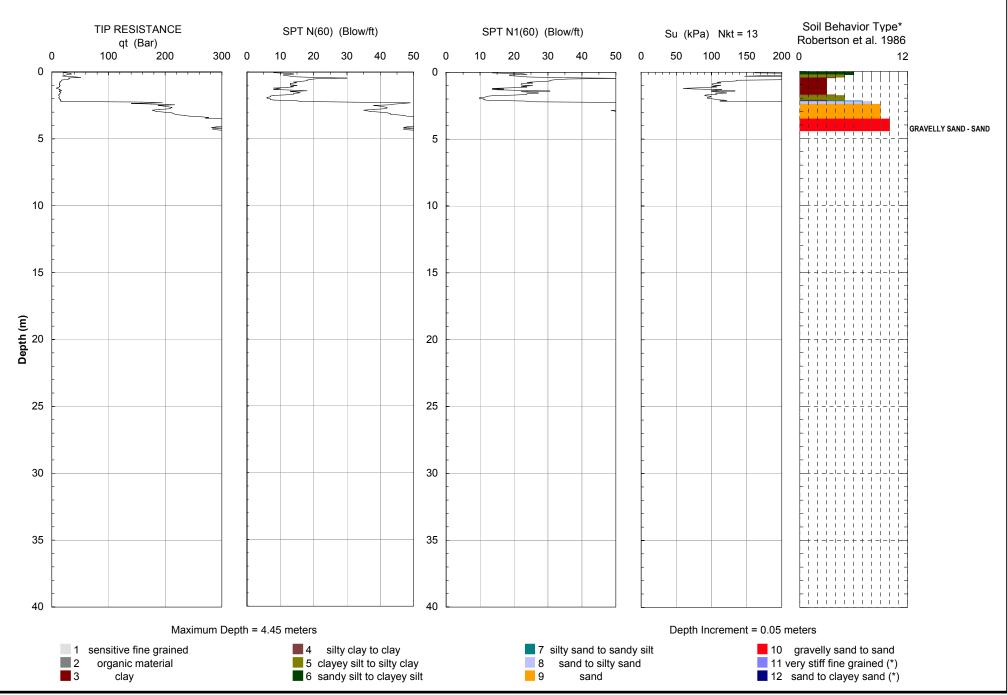
Operator: Schwartz Soil Technical

Sounding: CPT12 - 8 Cone Id: DPG1110 10 Ton Date: July 10 - 12, 2012

Site: Hwy 1 Eastbound climbing lane at 232nd

Thurber Project Number: 17 - 531 - 140A







2012 Thurber Test Pit Logs

Ministry of Tra	anspo	rtatio	on		,	Sl	JN	/ [N	1 A	\mathbb{R}	Y	LO	G South Coast F	Region TEST HOLE	No.
Project		_	-		o 264 EE	3 Clin	nbing	j Lan	е					TP12-0	01
Location Driller			2256, 10es U				/lethc	.d E	Evee	/ator			Elevation Dates	on 29.6 m May 23, 2012	
Dilliel	آ		1063 0				datio			Index		_	Dates	Way 25, 2012	Τ
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	l	opert		Classification	Descri	ption	
	- -	0,			0,0,		0,						Brown, moist, sandy S some organics.	SILT with 0.20m	-
	-												Loose to compact, bro SAND with some grav trace of silt. Grey below 0.6 m dep	el and a	
	-1 - - -	G											Firm, dark grey, moist some organics, a trace clay and a trace of sar	e to some	7-
	- - - - - -2												Stiff, grey and brown, sandy SILT with some Stiff, grey, moist CLAY with a trace to some s trace of organics.	moist, clay. Y and SILT	<u> </u>
	- - - - - - -	G													
	-													3.96m	
	-4 - - - -												End of test pit at 4.0 m No water seepage obs upon completion of tes	n depth. served	-
	- - - -5 -														
	- - - -														-
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab S - Split Spool T - Shelby Tul	n				U - F _v - L _v -	EAR S Uncor Field \ Lab V Remo	nfined √ane ane	Com		ion		Q, R, S - C - DS - w _L , w _P -	TESTS Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits Moisture Content	FILE No. 17-531-140 PREPARED By: Thurber Engineerin INSPECTOR: CJC	ng L
W - Wash Blowcount = \$		ard [Denetr	ation ⁻	Test (AS	TN/1-1	586\		NIOT	LE· Þ	racko		enote Driller's estimate	SHEET 1 of	1

Destant		حاسا	4	222.1						17	I	LO		TP12-0	2
Project Location		_	vay 1 - 2235,		o 264 EE 310	3 Clin	nbing	j Lan	е				Elevation 30.8 m	1	
Driller			noes L			Λ	/lethc	d E	xcav	ator			Dates May 23	3, 2012	_
Drilling Details	(m)	Sample Type	count	Recovery (m)	r gth (kPa)		datio			Index opert		Classification	Description		
Botallo	Depth (m)	Samp	Blowcount	Reco	Shear Strength (Gravel	Sand	Fines	W _L	W _P	w	Class	2 20 7		
	-												Brown, moist SILT with some organics and sand. Loose, brown, moist SAND with	0.15m	-
	-												some wood and a trace to some gravel.	0.61m 0.76m	1
	- - -1 -	G											Firm, brown and orange, moist SILT with some clay and a trace of sand. Some wood at 0.8 m depth.	0.7011	
	- - - -												Loose to compact, grey, moist to wet SAND with a trace of silt. Brown at 1.2 m depth	1	
	- -2 - -												Very soft, grey, wet, silty CLAY with a trace of organics.	1.98m	
	- -	G									46.9	CL			-
	- - -3 - -														
	-													3.66m	Ė
	- - -4 - - - -												End of test pit at 3.7 m depth. Water seepage at 1.5 m depth upon completion of test pit.		
	- - - -5														-
	- - -														
	- -														-
SAMPLE TYPE A - Auger C - Core					U - F _v -	EAR S Uncor Field	nfined √ane	Com		on	(Q, R, S -	Triaxial Compression PREPARED	531-140 D By:	_
D - Denison G - Grab S - Split Spool T - Shelby Tul	n oe				L _v - R -	Lab V Remo	ane ulded					DS -	Consolidation Direct Shear Liquid, Plastic Limits Thurber Er INSPECTO	ngineering	9
V - Wash Blowcount = \$		la sel ") = - · · ·	-4:-·-	Tast / ^ @	T. 4 4	E00'		NOT		·			T 1 of 1	_

Ministry of Tra	anspo	rialic	ווכ		,	Sl	JN	ΛIV	ΊA	R	Y	LO	G	Region TEST HOLE	
Project Location		_	⁄ay 1 - 2215, ∣		o 264 EE	3 Clin	nbing	j Lan	е				Flevat	TP12-	03
Driller			oes U			N	/lethc	od E	xcav	ator			Dates	May 23, 2012	
Drilling	ē	Гуре	nt	y (m)	(kPa)	Gra	datio	n %	l	Index opert		ation			
Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (Gravel	Sand	Fines	W _L	w _P	w	Classification	Descr	iption	
	- - -	G											Loose, brown, moist some silt, a trace to sand a trace of organic	ome gravel 0.30m	- -
	- - -	G											Soft to firm, grey, moi SILT with some sand		-
-	- - -1												Firm, dark brown, mo	0.91m	1
	- ' - - [G											ORGANIC SILT with sand.		- - 1
	- - -												Soft, grey, moist to was SILT with some clay to		-
	- -2 -	G											Loose to compact, we	1.98m et, grey	_
	- - -												SAND. Very soft, grey, wet, s with a trace of organic	silty CLAY	-
	- - - -	G									55.1	СН			-
	-3 - -														-
	- - -														-
	- - -4 -														-
-	-	\dashv											End of test pit at 4.3 r	4.27m n denth	1
	- - -												Water seepage at 0.9 upon completion of te) m depth	-
	- -5 - -														-
	- - -														-
	- - -														-
SAMPLE TYPE A - Auger					U - I	EAR S Uncor	nfined			on		М -	TESTS Mechanical Analysis	FILE No. 17-531-140	
C - Core D - Denison G - Grab S - Split Spool					F _v - L _v - R -	Field \ Lab V Remo	√ane ane ulded				(Q, R, S - C - DS - w _ı , w _p -	Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits	PREPARED By: Thurber Engineerin	ng
T - Shelby Tul V - Wash	be				Γest (AS				NOT			w -	Moisture Content	CJC SHEET 1 of	

	Ministry of Ti	ranspo	ortati	on			SI	J٨	<u>///</u>	/IA	R	Y	LO	South Coast I	Region TEST H	IOLE No.
	Projec		-liah	way 1 .	. 232 +	o 264 EE					\	•			TF	P12-04
	Location		_	2205,				JIIOIII	Lan					Elevati	on 31.6 m	
	Driller	E	Back	hoes l	Jnlimi		N	/letho	od E	Exca	/ator		1	Dates	May 23, 2	012
			be		Ξ	Ра)	Gra	datio	n %		Inde	K	uo			
	Drilling Details	(m)	le Ty	ount	/ery (ath (k				Pr	opert	ies	ficati	Descri	ption	(E) NO
	Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	W _L	W _P	w	Classification			ELEVATION (m)
		- - - - - -	G											Soft, brown, moist SIL some organics and a sand. Loose to compact, brogrey, moist, SILT and with some organics at Very soft, dark brown	own to SAND and clay.	.15m - - - - - -31
		1 - - -	G											ORGANICS and SILT sand. Firm, grey, moist SILT	with some 1	.07m = - - -
		Ė												CLAY with some orga	nics. 1	.52m
		- - -	G									67.2	ОН/СН	Very soft, grey, moist, CLAY with a trace to organics and a trace of	some	-30 - - -
		- 2														.13m
		-												Compact, grey, wet S a trace to some silt.	AND with	-
).GLB		-3 3 	G											End of test pit at 3.7 r Water seepage at 0.9 upon completion of te	n depth. m depth	-29 - - - - - - - - - - - - - - - - - -
SUMMARY LOG (ELEV.) 17-531-140.GPJ THURBER BC.GDT 7/20/12- THURBER BC.GLB	SAMPLE TYP	- - - - - - - - - - - - - - - - - - -					EAR S						M	TESTS	FILE No.	-27
OG (ELE	A - Auger C - Core					F_{v} -		Vane	Com	press	ion	(Q, R, S -	Mechanical Analysis Triaxial Compression	17-531- PREPARED By	' :
JMMARY LO	D - Denison G - Grab S - Split Spoo T - Shelby Tu						Lab V Remo						DS - W _L , W _P -	Consolidation Direct Shear Liquid, Plastic Limits Moisture Content	Thurber Engin INSPECTOR: CJC	_
MOT SU	W - Wash Blowcount =	Stanc	dard	Penetr	ation	Test (AS	STM-1	1586)		NO	ГΕ: В	racke	ets () de	note Driller's estimate	SHEET 1	of 1

Ministry of Tra	anspo	rtatio	on		,	Sl	JN	1N	1A	R	Y	LO	South Coast I	Region TEST HOLE	
Project		_	-		264 EE	3 Clin	nbing	J Lan	е					TP12-0	05
Location Driller			2199, I noes U			N	/lethc	nd F	Excav	/ator			Elevati Dates	ion 31.8 m May 23, 2012	
	Ī						datio			Inde	·	_		y 20, 2012	
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	l	opert		Classification	Descri	iption	
			B	Ä	<u> </u>	9	ιχ	证				Ö	Soft, brown, moist SIL some organics and a some sand.		1 - - -
	- - - - -	G									91.0	OH/PT	Firm to stiff, grey and moist SILT with some trace of organics.	brown, clay and a	<u> </u>
-	- -1 -												Very soft, dark brown ORGANICS with som	, wet, silty le wood. 1.07m	ŀ
- - -	- - - -	G											Stiff, grey, moist, silty some organics.	CLAY with 1.52m	-
	- - - - -2 -	G											Loose to compact, greating to medium SAND silt and some zones of SILT. Wet below 2.0 m depring the street of the silt and some zones of silt and some zones of silt and some zones.	with some of clayey	-
	- - - - - - -3	G									48.0	СН	Very soft, grey, wet, s with traces of organic sand.	2.59m silty CLAY s and fine	- - - - - - - -
	- - - - - - -4														
	- - - -												End of test pit at 4.3 r Water seepage at 2.0 upon completion of te) m depth	<u> </u>
	- - - -5 - -														- - - -
	- - - -														-
SAMPLE TYPE A - Auger C - Core O - Denison G - Grab G - Split Spool T - Shelby Tub	n	•				Field \ Lab Va	ifined /ane ane	Com	kPa pressi	ion	(Q, R, S - C - DS - w _L , w _P -	TESTS Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits Moisture Content	FILE No. 17-531-140 PREPARED By: Thurber Engineerin INSPECTOR: CJC	ng l
V - Wash Blowcount = \$		ard F	Danatr	ation "	Γ _Φ ς+ /Λ ^Q	TN/ 1	586)		NOT	E. D	racko		enote Driller's estimate	SHEET 1 of	1

_										1	I	LO	G	TP12-0	06
Project Locatio		_	vay 1 - 2189,∃		o 264 EE 887	3 Clin	nbing	J Lan	е				Elevation 3		
Driller			noes U			N	/lethc	od E	Excav	ator				May 23, 2012	
		Φ		(c	a)	Gra	datio	n %		Index	(Ē			
Drilling	Œ	Sample Type	unt	Recovery (m)	h (kPa)				Pr	opert	ies	Classification	Description		
Details	Depth (m)	mple	Blowcount	COVE	Shear Strength (Gravel	Sand	Fines				assifi	Восопраст		
	De	Sa	B	Re	ਲ ਸ਼੍ਰ	ي	Sa	ij	W _L	W _P	W	రొ			
	-												Soft, brown, moist SILT with some organics and a trace		L
	-												some sand.	0.46m	
	-												Firm, grey and brown, mois SILT with some clay and a	trace	ŀ
	-	G											to some sand.	0.76m	‡
	- -1	G									52.7	OH/CH	Loose, grey, wet SAND wit some organics and a trace	th of	F
	-												silt.	1.22m	£
	-												Soft, grey to brown, moist to SAND and SILT with some	e clay.	ŀ
	-	G									40.5	СН	A vertical section of organi runs parallel to the highway	v.	ŧ
	-												Brown, moist ORGANICS		¦
	-2 -												grey, moist, clayey SILT wi some wood and a trace of		F
	-												Soft, grey, wet, silty CLAY some organics and zones		+
	-												SAND.	OI	E
	-												Compact, grey, moist to we SAND with some silt and a	et utrace	ŀ
	- −3												to some clay.	3.05m	ŀ
	-												Very soft, grey, wet, silty C	LAY.	ŀ
	-												End of test pit at 3.0 m dep Water seepage at 0.8 and	oth. 2.3 m	F
	-												depth upon completion of t pit.	est	F
	-														E
	-4 -														ŀ
	-														ŀ
	-														ŧ
	-														F
	-														F
	-5 - -														Ē
	-														E
	-														F
	-														F
2005: 5 = 5	-							10=:	<u> </u>					. No	ŀ
SAMPLE TYPE A - Auger	1				U - I	EAR S Uncor	nfined			on			TESTS Mechanical Analysis	17-531-140	
C - Core D - Denison					F _v - L _v -	Lab V	ane				(С -	Consolidation Thu	PARED By: rber Engineerin	ıg l
G - Grab S - Split Spoo T - Sholby Tul					K -	Remo	uided					WL, WP -	Direct Spear	PECTOR: CJC	
T - Shelby Tul V - Wash					Γest (AS							w -	IVIOISTUIE CONTENT	SHEET 1 of 1	

Ministry of Tra	anspo	ortatio	on		,	Sl	JN	/IN	1A	R	Y	LO	South Coast Region TE		
Project Locatio		_	-		o 264 EE	3 Clin	nbing	g Lan	е				Elevation 32.6 i	TP12-0	7
Driller			2181, I noes U			N	/lethc	od E	Excav	ator/				23, 2012	
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel Ba	Sand	Fines		Inde: operi w _P		Classification	Description		
	- - -	0)		<u> </u>	0,0,	0	07					0	Soft, brown, moist SILT with \some sand and organics.	0.15m	-
	- - - -	G									372.1	OH/PT	Very soft, brown, wet ORGANICS and WOOD with some zones of grey, clayey SILT.		:
	-1 - - -	G											Soft, grey, wet, silty CLAY with some organics to organicy.	1.07m 1.52m	-
	- - - - -2	G											Loose, grey, wet SAND with some silt and a trace to some organics.	1.98m	-
		G									48.6	СН	Very soft, grey, wet, silty CLAY with traces of organics and sand.	2.59m	-
	- - - -3	G											Loose to compact, grey, wet SAND with a trace of silt.	3.05m	-
	- - - -	G											Very soft, grey, wet, silty CLAY.	3.66m	-
	- - -4 - -												End of test pit at 3.7 m depth. Water seepage at 0.8, 1.5 and 2.6 m depth upon completion of test pit.	f	
	- - - - - -5														
	- - - - -														
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab S - Split Spoo T - Shelby Tul	n				U - F _v - L _v -		nfined Vane ane	Com		on		Q, R, S - C - DS - w _L , w _P -	Triaxial Compression PREPARE	Engineering	
W - Wash Blowcount = \$	Stand	lard F	Penetr	ation ⁻	Test (AS	TM-1	586))	NOT	E: R	racke	ets () de	enote Driller's estimate	ET 1 of 1	

	Ministry of Tr	ranspo	ortati	on			<u>SI</u>	JΝ	<u>///</u> /	<u>1Δ</u>	R'	Y	LO	South Coast F	Region TEST	T HOLE I	No.
	D estroy		г. г		000 (•		0		TP12-0	8
	Project Locatio		_	way 1 - I2167,		o 264 EE 420	s Clin	nbing	j Lan	е				Flevati	on 33.0 m		
	Driller			hoes l			Λ	/letho	d E	xca	ator			Dates	May 23	, 2012	
			l e		Ê	Pa)	Gra	datio	n %		Index	(u.				
	Drilling	(E)	Sample Type	ount	Recovery (m)	Shear Strength (kPa)				Pr	opert	ies	Classification	Descri	ption		(E) Z
	Details	Depth (m)	Jdmg	Blowcount	Nooe	near reng	Gravel	Sand	Fines	W _L	W _P	W	assif				ELEVATION (m)
		۵	ιχ	В	Ř	क्र क्र	Ō	Š	ΙĒ	***	WP		ਹ	2.1			Щ
														Soft, brown, moist to with some organics ar	vet SIL1 nd a trace	0.23m	
		-												∖of sand. Firm, brown to grey, n	/	0.46m	-
		-												with some clay, a trac sand and a trace of or	e to some		-
		<u> </u>										070.0	OLL/DT	Very soft, brown, wet,	silty		-
		 	G									376.0	OH/PT	ORGANICS and WO	OD.	1.07m	-32 -
		-	_									40.7	011/011	Soft, grey, wet SILT a with some organics.	nd CLAY		-
		-	G									48.7	OH/CH				- -
		-															- -
		-2															- -31
		_															_
		-															- -
		-															- -
		-3														3.05m	- -30
		-3												Compact, grey, wet S	AND with	3.03111	-30 -
		-												a trace of silt. End of test pit at 3.4 n	n donth	3.35m	- -
		-												Water seepage at 0.5	m depth		- -
В														upon completion of te	st pit.		
BC.GL		-4															-29 -
JRBER		-															-
2- THL		-															-
17-531-140.GPJ THURBER BC.GDT 7/20/12- THURBER BC.GLB		-															
C.GDT		-5															_ 28
BER B		-															- -
THUR		-															- -
40.GPJ		-															-
-531-1																	
	SAMPLE TYPI	<u> </u> <u>E</u>				SHE	AR S	TREN	NGTH	kPa				<u> </u>	FILE No.		
OG (ELEV.)	A - Auger C - Core					U - F _v -	Uncor Field \	nfined √ane			on	(Q, R, S -	Mechanical Analysis Triaxial Compression	17-5	31-140 By:	
4RY LC	D - Denison G - Grab					L _V - R -	Lab V Remo						DS -	Consolidation Direct Shear	Thurber Eng	gineering	Ltd.
SUMMARY LOG	S - Split Spoo T - Shelby Tu W - Wash	on ibe											W _L , W _P -	Liquid, Plastic Limits Moisture Content		CIC 	
MOT 8	Blowcount =	Stand	dard	Penetr	ation	Test (AS	TM-1	586)		NOT	E: B	racke	ets () de	enote Driller's estimate	SHEET	Γ 1 of 1	

5				000						17	I	LO	J	TP12-0)9
Project Location		_	vay 1 - 2161,∃		o 264 EE 431	3 Clin	nbing	j Lan	е				Elevati	ion 33.4 m	
Driller			oes U			N	/lethc	d E	xcav	ator			Dates	May 23, 2012	
Drilling	Œ.	Type	unt	ery (m)	h (kPa)		datio	n %	l	Index opert		cation	Descri	intion	
Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (Gravel	Sand	Fines	W _L	W _P	w	Classification			
	- - 	G											Soft, brown, moist SIL some organics and a sand.	T with 0.15m trace of 0.23m	
	- - -												Loose, brown, moist S some silt.	0.01111	+
	- -1 -												Firm, brownish grey, r with some sand and a clay.		-
	- - -	G									190 9	OH/PT	Very soft, brown, wet ORGANICS with som	e silt.	-
-	- - -2										190.9	01/// 1			-
	·												Loose to compact, gre	2.29m	-
-	-	G									45.0	C.	SAND with some silt a to some organics.	and a trace 2.74m	F
	-3 -	G									45.6	CL	Very soft, grey, wet, s with a trace to some s organics.		-
	- - -													3.66m	-
	- - - -4												Compact, grey, wet S a trace of silt.	AND with	-
	- - -												End of test pit at 4.3 r	4.27m m depth.	-
	- - -												Water seepage at 1.5 upon completion of te		-
	- -5 -														-
	- - -														-
	- - -													THE N-	-
SAMPLE TYPE A - Auger C - Core O - Denison G - Grab	<u> </u>					EAR S Uncor Field \ Lab Va Remo	nfined √ane	Com		on	(Q, R, S - C -	TESTS Mechanical Analysis Triaxial Compression Consolidation Direct Shear	FILE No. 17-531-140 PREPARED By: Thurber Engineerin	ıg l
S - Grab S - Split Spoor T - Shelby Tul V - Wash					11 1	COMO	aiu c u					W _L , W _P -	Liquid, Plastic Limits Moisture Content	INSPECTOR: CJC	
v - vvasn Blowcount = 9	Stand	ard F	Penetra	ation ⁻	Test (AS	TM-1	586)		NOT	E: B	racke	ets () de	enote Driller's estimate	SHEET 1 of	1

Project		liaby	/a\/ 1 -	232 te	o 264 EE						•	LO	_	TP12-1	10
Locatio		_	2145, I			Ciiii	ion ig	Lan	C				Elevati	ion 34.2 m	
Driller	E	Backh	noes U	Inlimit	ed	N	/lethc	od E	xcav	ator			Dates	May 23, 2012	
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)		datio		l	Index opert		Classification	Descri	iption	
	Deptl	Sam	Blow	Reco	Shea	Gravel	Sand	Fines	W _L	W _P	w	Class			
	- - - -	G											Soft, brown, moist SIL some organics and a sand.		
	- - - -												Firm to stiff, grey and moist SILT with some clay, a trace of organi occasional sandy zon	sand and control of the sand and control of the sand control of the sand control of the sand and contr	
	-1 - - -	G									153.4	OH/PT	Very soft, brown, wet ORGANICS and WO some silt.	OD with	
	- - - -												Loose, grey, wet SAN some silt and clay.	ID with 1.83m	
	- -2 -												Very soft, brown, wet WOOD with some silt	PEAT and	-
	-													2.44m	ŀ
	- - -	G											Firm, grey, wet SILT a with some organics.	and CLAY	-
	- -3 - - -												Soft below 2.9 m dept	th	-
	- - - - -4														
	- -													4.27m	Ł
	- - - - -												End of test pit at 4.3 r Water seepage at 1.5 upon completion of te	n depth. 5 m depth	
	- -5 - - -														-
	- - - -														
SAMPLE TYPE		Ш				EAR S					<u> </u>		TESTS	FILE No.	
A - Auger C - Core D - Denison G - Grab S - Split Spoo	Auger Core Denison Grab Split Spoon				F _v - L _v -		/ane ane		oressi	on		Q, R, S - C - DS - w _L , w _P -	Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits	17-531-140 PREPARED By: Thurber Engineerin INSPECTOR:	ıg l
T - Shelby Tul W - Wash	be											w -	Moisture Content	CJC SHEET 1 of 1	_

Drainet		li ada.		2224							I	LO	G	TP12-1	11
Project Locatio		_	vay 1 - 2129,		o 264 EE 470	s Clin	gnian	Lan	е				Elevati	on 35.0 m	
Driller			noes L			N	/lethc	d E	xcav	ator			Dates	May 23, 2012	
Drilling Details	(m)	Sample Type	ount	Recovery (m)	Shear Strength (kPa)		datio		l	Index opert		Classification	Descr	iption	
Details	Depth (m)	Samp	Blowcount	Reco	Shear	Gravel	Sand	Fines	WL	W _P	W	Class			
	- - -												Soft, dark brown, moi with some organics to and a trace of sand.	st SILT organicy <u>0.30m</u> 	
	- - -												Stiff, brown and grey, with some clay and sa	and.	-
	- - 1 -	G									246.7	OH/PT	Very soft, dark brown SILT and ORGANICS to 1.5 m depth on the of the pit.	, moist 6. Extends north side 1.07m	
	- - -												Loose to compact, bro		-
	- - -	G											Wet below 1.5 m dep	th	
	-2 - -												Brown below 2.0 m de	epth	-
	- - -												End of test pit at 2.4 r	2.44m n depth	-
	- - - -3												due to sloughing. Water seepage at 1.5 upon completion of te	m depth st pit.	-
	- - -														-
	- - -														-
	- 4 -														F
	- - -														-
	- - - 5														-
	- - -														-
	- - -														F
	-													Leu e M	-
<u>SAMPLE TYPE</u> A - Auger C - Core D - Denison	Ē						nfined √ane			on	(Q, R, S -	TESTS Mechanical Analysis Triaxial Compression Consolidation	PREPARED By:	·~ '
G - Grab S - Split Spoo T - Shelby Tu	n be				Ř-	Remo	ulded					DS - W _L , W _P -	Direct Shear Liquid, Plastic Limits Moisture Content	Thurber Engineerin INSPECTOR: CJC	ıy I
<u>V - Wash</u> Blowcount = 3	Stana	lard I	Danatr	ation -	Tact (AC	TN/ 4	506/		NIOT	E. D	racks	te () de	enote Driller's estimate	SHEET 1 of 1	1

Ministry of Tr	anspo	ortatio	on		,	Sl	JΝ	ΛN	lΑ	R	Y	LO	South Coast Reg	TP12-12	
Project Locatio		_	-		o 264 EE	3 Clin	nbing	g Lan	е				Elevation		<u>za</u>
Driller			2120, 10es U			N	/lethc	od E	Exca	/ator			Dates	May 23, 2012	
		g e		Ĉ	(kPa)	Gra	datio	n %		Index	(٦			
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kF	Gravel	Sand	Fines	Pr w _L	opert	ies w	Classification	Descripti	on	
	- - -	0)		ш.	0,0,	0	0)	<u> </u>				0	Soft, brown, moist SILT some organics and a transand.	with ce of 0.30m	-
	- - -												Firm, grey, moist SILT w some clay and sand.		-
	- - -1 - -	G									193.7	OH/PT	Very soft, dark brown, m ORGANIC SILT and ORGANICS with some v Extends to 2.4 m depth o north side.	wood.	
	- - - - - - -2	G											Loose to compact, brown grey, wet SAND.	nish	
	- - - - -												End of test pit at 2.4 m d due to sloughing.	<u>2.44m</u> depth	
	- - - -3 - -												Water seepage at 1.2 m upon completion of test	depth pit.	
	- - - - -														
	-4 - - - -														
	- - - - -5 -														
	- - - -														
04451 5 7 7 5	-				6::-			107						I E No	L
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab S - Split Spoo T - Shelby Tu	n					EAR S Uncor Field \ Lab V Remo	nfined √ane	Com		ion	,	Q, R, S - C - DS - w _L , w _P -	Mechanical Analysis Triaxial Compression Consolidation Tirect Shear	LE No. 17-531-140 REPARED By: hurber Engineering ISPECTOR: CJC	g I
Wash Blowcount = 3		ا احدا	Dan - 1	-4i =	Fact (AC	TN4 4	E00\		NOT				enote Driller's estimate	SHEET 1 of 1	

Davids of		li ed	4	000 1							•	LO		TP12-1	12b
Project Locatio		_	vay 1 - 2121, l		o 264 EE 196	3 Clin	nbıng	J Lan	е				Flevati	ion 35.8 m	
Driller			hoes U			٨	/lethc	od E	Excav	ator			Dates	May 23, 2012	
		Φ		(-	a)	Gra	datio	n %		Index		۵			
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	Pr	opert	w	Classification	Descri	iption	
	- - -												Soft, brown, moist SIL some organics and a sand.	T with 0.15m trace of 0.30m	
	- - -												Firm, grey, moist SILT some sand and clay.		-
	- - -1 -												Very soft, dark brown ORGANICS mixed wi grey, moist SILT and	th soft, CLAY.	<u>n</u> -
	- - -												Very soft, brown, mois ORGANICS and WO	st OD.	
	- - - -2														-
	- - -														-
	- - -												Very soft, grey, moist	2.74n	_ - n
	- 3 -												silty CLAY with a trace organics.	e of	-
	- - -												End of test pit at 3.4 r No water seepage ob	served	<u>n -</u> -
	- - - -4												upon completion of te	est pit.	-
	- - -														-
	- - - -														
	5 - -														-
	- - -														-
	-														F
SAMPLE TYPE A - Auger					U -	EAR S Uncor	nfined			on			TESTS Mechanical Analysis	FILE No. 17-531-140	
C - Core D - Denison G - Grab S - Split Spoo	n				F _v - L _v -	Field \	√ane ane				(Q, R, S - C - DS - w _L , w _P -	Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits	PREPARED By: Thurber Engineerin	ng I
T-Shelby Tu V-Wash	be											W -	Moisture Content	CJC SHEET 1 of	

Ministry of Tra	·									K	Y	LO	G	Region TEST HOLE	
Project Location		_	vay 1 - 2108, l		o 264 EE	3 Clin	nbing	J Lan	е				Flevati	ion 36.8 m	
Driller			noes U			N	/lethc	od E	Exca	/ator			Dates	May 23, 2012	
		Ф		(ر	a)	Gra	datio	n %		Inde	ĸ	_			
Drilling Details	(m) r	Sample Type	Blowcount	Recovery (m)	r gth (kPa)	<u></u>			Pr	oper	ies	Classification	Descr	iption	
	Depth (m)	Samp	Blow	Reco	Shear Strength (Gravel	Sand	Fines	W _L	W _P	w	Class			
-	-												Soft, brown, moist SII some organics to orga	_T with anicy. _{0.30m}	1
	- - -												Soft, brown, moist OF with some zones of sa stiff, grey silt with son	and and	-
	- - -1 - -												Loose to compact, grifine to medium SAND trace of silt (South Sid Very soft, brown ORG (North Side).	ey, moist,) with a de).	-
	- - -												Very soft, brown, moi ORGANICS and WO some zones of grey s	OD with	-
	- -2 - - - -	G									466.9	PT	Moist, grey SAND is encountered on the s at 1.5 m depth. Wet below 1.8 m dep		
	- - - -3 -														-
	-												Very soft, grey, wet, s with some zones of sa	3.35m silty CLAY and and	1
	-	G									55.9	СН	some organics.	aa	E
	- -4 - -														-
	- -													4.57m	1
	- - -5 -												End of test pit at 4.6 r Water seepage at 1.8 upon completion of te	3 m depth	-
	- - -														
	- - -														
SAMPLE TYPE						EAR S				ior		<u> </u>	TESTS Machanical Analysis	FILE No. 17-531-140	
A - Auger C - Core O - Denison G - Grab					F _v - I L _v - I	Uncor Field \ Lab V Remo	√ane ane	Com	press	IUN	(Q, R, S - C - DS -	 Mechanical Analysis Triaxial Compression Consolidation Direct Shear 	PREPARED By: Thurber Engineerin	ng
S - Split Spoor T - Shelby Tub												W _L , W _P	Liquid, Plastic LimitsMoisture Content	CJC	
<u>V - Wash</u> Blowcount = \$	Stand	ard [Denetr	ation "	Test (AS	TN/1_1	526\		NO	LE· D	racko	ate () 44	enote Driller's estimate	SHEET 1 of	1

Ministry of Tr	anspo	ortatio	on		,	Sl	JN	ΛN	1A	R	Y	LO	G South Coast F	Region TEST HOLE	
Project Locatio		_	vay 1 - 2091, I		o 264 EE 544	3 Clin	nbing	g Lan	е				Flevati	TP12-1	14
Driller			noes U			Λ	/lethc	od E	xca	ator			Dates	May 23, 2012	
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel Bra	Sand	Eines n	l	Index opert		Classification	Descri	ption	
	- - - -	ő	<u>B</u>	α̈́	<u>~~~~</u>	Ð	Š	ΙĒ	•••		"	Ō	Soft, dark brown, mois with some organics ar of sand.		-
	- - - -	G									435.7	PT	Loose, grey, moist SA some silt. (Varies fron thick)	n 0-0.3 m	\ - - -
	1 - - -												Very soft, dark brown, ORGANICS and WOO some silt.	, moist OD with	-
	- - - - -2												Compact, grey, moist below 1.5 m depth on side beneath the emb	the south	
	- - - - -	G									563.4	PT			-
	- -3 - - - -												Very soft, grey, moist SILT and CLAY with s	3.35m to wet	- - - - - -
	- - - -4 -	G									42.8	CL/CH	OILT AND OLD IT WATER	omo sana.	-
	- - - -												End of test pit at 4.3 n No water seepage ob- upon completion of te	served	<u> </u>
	- - -5 -														
	- - - -														-
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab S - Split Spoo	on				U - F _v - L _v -	EAR S Uncor Field \ Lab V Remo	nfined Vane ane	Com		ion		Q, R, S - C - DS - w _L , w _P -	TESTS Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits	FILE No. 17-531-140 PREPARED By: Thurber Engineerin INSPECTOR:	ng I
T - Shelby Tu W - Wash					Γest (AS								Moisture Content	CJC SHEET 1 of	_

Ministry of Tra	anspo	italic	JI I		,	St	JN	/IIV	ΊA	R	Y	LO	G	Region TEST HOLE	
Project		_	-		o 264 EE	3 Clin	nbing	J Lan	е				_,	TP12-	15
Location Driller			2078, I noes U			N	/lethc	od E	Excav	ator			Elevat Dates	ion 37.8 m May 23, 2012	
							datio			Index	·	_			
Drilling	ε	Sample Type	unt	Recovery (m)	h (kPa)				Pr	opert	ies	Classification	Descr	intion	
Details	Depth (m)	lmple	Blowcount	эсоле	Shear Strength (Gravel	Sand	Fines	W _L	W _P	w	assifi	20001	,paon	
	۵	Š	B	Re	क्र क्र	ত	S	這	WL	WP	VV	Ö		ND and \(\sigma 0.08n	n
-	- - -												Soft, brown, moist SA SILT with a trace of o	NND and /	-
-	-	G											Loose, brown, moist some silt zones and a	SAND with 0.46n a trace of	<u>n</u> -
-	-												∖clay.		F
-	- - -1												Loose to compact, gr SAND with a trace of	ey, moist silt.	F
-	-													1.22n	n
-	-												Dark brown, moist mi ORGANICS, SILT an		F
	- -	G									373.4	PT			F
-	-												Compact, grey, moist	SAND	F
-	-2 -												below 1.8 m depth on side beneath the emb	the south	Ė
	-														E
-	-														ŀ
-	- -														Ė
-	-3 -														ŀ
-	-														Ė
-	-													3.66n	n -
-	- -												Soft to very soft, grey wet clayey SILT with		Ī
-	- -4 -	G									27.7	OL/CL	organics and some zo sand.	ones of	Ē
-	-												Saria.		ŀ
-	-													4.57n	n
	- -												End of test pit at 4.6 r No water seepage ob		E
-	- -5												upon completion of te	est pit.	-
	-														Ė
	-														-
-	-														F
-	-														F
SAMPLE TYPE A - Auger					U - I	AR S Uncor	nfined			on		М -	TESTS - Mechanical Analysis	FILE No. 17-531-140	
C - Core D - Denison					F _v - L _v -	Field \	√ane ane				(Q, R, S - C -	Triaxial CompressionConsolidation	PREPARED By: Thurber Engineering	ng
G - Grab S - Split Spoor T - Shelby Tul					K - I	kemo	uiaed					WL, WP -	 Direct Shear Liquid, Plastic Limits Moisture Content 	INSPECTOR: CJC	
V - Wash Blowcount = \$! T	2000	-4:-· "	Fast / ^ C	T. 4 4	F00'		NOT				enote Driller's estimate	CUEET 4 of	1

Ministry of Tr	anspc	ortatio	on			Sl	JN	1N	1A	R	Y	LO	G South Coast I	Region TEST HOLE	
Project					o 264 EE	3 Clin	nbing	J Lan	е					TP12-	16
Locatio Driller			2057, 10es U			N	/lethc	nd F	Excav	rator			Elevati Dates	on 39.8 m May 23, 2012	
Dillici			1003 0				datio			Index	,		Dates	Way 20, 2012	
Drilling	(r	Sample Type	Ħ	Recovery (m)	Shear Strength (kPa)	Oia		11 /0	l	opert		Classification	_		
Details	Depth (m)	aldu	Blowcount	over	ar ingth	vel	ъ	ပ္သ		· 		ssific	Descri	ption	
	Dep	San	Blo	Rec	She Stre	Gravel	Sand	Fines	W∟	W _P	W	Clas			
	- - -												Loose, brown, moist some silt and organicatrace of gravel.	SAND with 0.15ms and a	1 - -
	- - -												Compact, brown, mois with some silt and a transpared.		7
	- - 1 -												Compact, grey, moist with traces of silt and	SAND gravel.	-
	-	G													ŀ
	-														Ė
	-														F
	- -2														Ė
	-														F
	-														-
	- -														Ė
	- -3													3.05m	ŀ
	-												End of test pit at 3.0 r due to sloughing.	n depth	ŀ
	- -												No water seepage ob- upon completion of te	served st pit.	F
	-													•	F
	- - 4														E
	- -														ŀ
	-														F
	-														E
	-														F
	-5 - -														E
	-														F
	-														ŀ
	-														F
SAMPLE TYPE						AR S							<u>TESTS</u>	FILE No.	
A - Auger C - Core D - Denison					F _v -	Uncor Field \	√ane		oressi	on	(Q, R, S -	Mechanical AnalysisTriaxial CompressionConsolidation	17-531-140 PREPARED By:	
G - Grab S - Split Spoo	n				L _v - R -	Remo	ulded					DS -	Direct Shear Liquid, Plastic Limits	Thurber Engineering INSPECTOR:	ng l
T - Shelby Tu V - Wash	be											W -	Moisture Content	CJC	

Ministry of Tr	anspo	ortati	on		,	Sl	JN	ΛN	lΑ	R	Y	LO	G South Coast I	Region TEST HOLE	
Project		_	-		o 264 EE	3 Clin	nbing	g Lan	е				Et	TP12-	17
Locatio Driller			2064, noes U			N	/lethc	od E	Exca	/ator			Elevati Dates	ion 39.8 m May 23, 2012	
							datio			Index	(_			
Drilling	m)	Sample Type	nut	Recovery (m)	h (kPa)				Pr	opert	ies	Classification	Descri	intion	
Details	Depth (m)	eldu	Blowcount	соле	Shear Strength (Gravel	Sand	Fines	\	<u> </u>	.,,	assifi	200011	puon	
	De	Sa	Bic	Re	<u>က် အို</u>	ত	Sa	늍	W _L	W _P	W	ਠੁੱ		0.00-	
	-												Loose, brown, moist S SAND with some orga	SILT and $\int_{0.08m}^{0.08m}$	1
													Compact, brown, mois	st, silty 0.46m	1
	_												Compact, grey, moist	/ SAND	ŀ
	-												with some gravel and silt.	a trace of	F
	- 1 -														Ė
	-														-
	-	G													ŀ
															Ė
	-2														E
	-														ŀ
	-														F
															E
	- −3													3.05m	ŀ
	_												End of test pit at 3.0 r No water seepage ob	n depth.	-
													upon completion of te		Ē
	-														ŀ
	-														F
	-4 -														Ė
															E
	-														ŀ
	-														F
	- -5 -														E
	<u> </u>														F
	-														F
															Ė
														I	F
SAMPLE TYPE A - Auger	Ī				U - I	EAR S Uncor	nfined			ion		M -	TESTS Mechanical Analysis	FILE No. 17-531-140	
C - Core D - Denison G - Grab					F _v - L _v - R -	Field \ Lab V	√ane ane					С -	Triaxial Compression Consolidation Direct Shear	PREPARED By: Thurber Engineering	ng I
5 - Grab S - Split Spoo T - Shelby Tu	n be				K -	Keino	uiuea					WI, WP -	Liquid, Plastic Limits Moisture Content	INSPECTOR: CJC	
V - Wash Blowcount =		la! '	Da : 1	-4:-· "	Fast / ^ C	T. 4 4	E00'		NOT	rr. r			enote Driller's estimate	SHEET 1 of	1

Project		liabe	vav 1	. 222 £	o 264 EE					11	1	LO	•	TP12	-18
Locatio			vay 1 - 2068,∃			Cilli	JIIIUII U	Lan	e				Elevati	ion 38.9 m	
Driller	Е	Backl	noes U	Inlimit	ed	N	/lethc	od E	xcav	ator			Dates	May 23, 2012	2
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Rines n %		Index opert w _P		Classification	Descr	iption	
	 - -	0,			0,0,	Ū							Loose, brown, moist, with some organics.	silty SAND	- m -
	- - - - - - - - - - -												Compact, grey, moist with some gravel and silt.	SAND	-
	- - -2 - - - -														- - - - -
	-														F
	-3 - - - - - -												End of test pit at 3.0 r No water seepage ob upon completion of te	served	- - - - - -
	- -4 - - - - -														-
	- -5 - - - - -														- - - - -
	<u>-</u>														- - -
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab S - Split Spoo T - Shelby Tu	on				U - F _v - L _v -	EAR S Uncor Field \ Lab V Remo	nfined Vane ane	Com		on	(Q, R, S - C - DS - w _ı , w _p -	TESTS Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits Moisture Content	FILE No. 17-531-140 PREPARED By: Thurber Engineer INSPECTOR: CJC)
T - Shelby Fu <u>V - Wash</u>					Γest (AS				NOT			w -		SHEET 1 of	

Projec	√+ L	Jiahy	vov 1 -	. 222 +	o 264 EE						•	LO	•	TP12-	19
Locati	on I	_	2075,			Cilli	JIIIIII	Lan	C				Elevat	ion 37.6 m	
Driller	E	Backl	hoes U	Jnlimit			/lethc		xca	/ator			Dates	May 23, 2012	Т
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel B	Sand	Fines u		Index opert w _P		Classification	Descr	iption	
	-												Loose, brown, moist, with some organics.	silty SAND	-
	- - - - - - - 1												Compact, grey, moist with a trace to some a trace of silt.	SAND	-;
	- - - - - - - -													2.13m	
	-3												Brown, moist PEAT/0 and WOOD. Faint hy odour.		
	- - - - - - - -													407.	- - - - -
	- - - - -												Soft to very soft, grey and CLAY with some End of test pit at 4.4 I No water seepage ob upon completion of te	sand. m depth. eserved	7-
	-5 - - - - - -													•	
SAMPLE TYPA - Auger C - Core D - Denison G - Grab S - Split Spo					U - F _v - L _v -		nfined Vane ane	Com		ion		Q, R, S - C - DS -	TESTS - Mechanical Analysis - Triaxial Compression - Consolidation - Direct Shear - Liquid, Plastic Limits	FILE No. 17-531-140 PREPARED By: Thurber Engineerin INSPECTOR:	ng l

Ministry of Tra	anspo	пап	ori		,	Sl	JN	ΛN	1A	R	Y	LO	G South Coast I	Region TEST HOLE	
Project		_	-		o 264 EE	3 Clin	nbing	j Lan	е				Et	TP12-	-20
Locatio Driller			2037, I noes U			N	/lethc	od E	Exca	/ator			Elevati	on 41.2 m May 23, 2012	2
							datio			Index		_			
Drilling	آ آ	Sample Type	nut	Recovery (m)	ו (кРа)					opert		Classification	Dagari	intina	
Details	Depth (m)	nple	Blowcount	ove	Shear Strength (Gravel	<u>م</u>	န္				ssific	Descri	ption	
	Dep	Sar	Blo	Rec	She	Gra	Sand	Fines	W _L	W _P	w	Cla			
	-												Firm, brown, moist SI	LT with	Ŀ
	-												some sand and organ Trace of organics belo	ow 0.2 m 0.46r	ŀ
	-												depth Compact, grey, moist		Ϊ.
-	-												with a trace to some ga trace of silt.	gravel and	F
	- -1												a trace of silt.		F
	-	G													F
	- - -	-													E
	-														ŀ
-	-														-
	-2 -														-
	-														F
	-														F
	- - -														E
	- -3	G													ŀ
	-														Ł
	- -														F
	-														F
	-													2 06r	_ [
	-4 -											-	End of test pit at 4.0 r	3.96r n depth.	"-
	-												No water seepage ob upon completion of te	served	F
-	-												, ap		F
-	- -														F
	-														F
	-5 - -														E
	-														F
	-														F
	- -														F
PAMPI E TVDE	- <u> </u>				CLIF	- AD 0	TDE	JCT!!	 -				TESTS	FILE No.	
<u>SAMPLE TYPE</u> A - Auger C - Core	_				U - I	EAR S Uncor	nfined			ion		M -	TESTS - Mechanical Analysis - Triavial Compression	17-531-140	١
D - Core D - Denison G - Grab					F _v - L _v - R -	Lab V Remo	vane ane ulded					С -	Triaxial Compression Consolidation Direct Shear	PREPARED By: Thurber Engineeri	ing l
S - Split Spoo T - Shelby Tul	n be				10 - 1		aiacu					WL. Wp	Liquid, Plastic Limits Moisture Content	INSPECTOR: CJC	
V - Wash Blowcount = \$.	_4: -	F / ^ ^	T	E00'		NOT	-			enote Driller's estimate	SHEET 1 of	1

Ministry of Tra										K	Y	LO	G	Region TEST HOLE	
Project Location		_	⁄ay 1 - 1981,∃		o 264 EE 720	3 Clin	nbing	J Lan	е				Flevati	on 47.6 m	
Driller			noes U			N	/lethc	od E	xca	/ator			Dates	May 24, 2012	
Drilling	(m)	Sample Type	ount	Recovery (m)	Shear Strength (kPa)		datio	n %	l	Index opert		Classification	Descri	iption	
Details	Depth (m)	Sampl	Blowcount	Recov	Shear	Gravel	Sand	Fines	W _L	W _P	w	Classif			
	- - -												Compact, brown, mois with some organics ar of silt.	st SAND nd a trace 0.30m	-
	- - - - - -1												Compact, brown, mois with a trace to some g a trace of silt. Grey below 0.8 m dep	gravel and	
	- ' 	G													
	- - - -2 -												Some gravel below 1.	8 m depth	-
	- - - -														-
	- -3 - -	G													
	- - - - -														-
-	-4 - -													4.27m	F
	- - - -												End of test pit at 4.3 n No water seepage ob- upon completion of te	served .	-
	- -5 - - -														
	- - - -														-
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab S - Split Spool T - Shelby Tul	n	1				EAR S Uncor Field \ Lab V Remo	fined /ane	Com		ion		Q, R, S - C - DS - w _L , w _P -	TESTS Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits Moisture Content	FILE No. 17-531-140 PREPARED By: Thurber Engineerin INSPECTOR: CJC	ıg I
V - Wash Blowcount = \$) a	-4: - · -	Fast / ^ C	T. 4 4	F00'		NICT				enote Driller's estimate	SHEET 1 of	1

											•	LO	G	TP12-	22
Project Locatio		_	vay 1 - 1942, ∣		o 264 EE 787	3 Clin	nbing	j Lan	е				Elevati	ion 50.8 m	
Driller			noes U			Λ	/lethc	d E	xcav	ator			Dates	May 24, 2012	
Drilling Details	(m)	Sample Type	ount	Recovery (m)	gth (kPa)		datio		l	Index opert		Classification	Descr	iption	
Details	Depth (m)	Samp	Blowcount	Recov	Shear Strength (Gravel	Sand	Fines	W _L	W _P	w	Class			
	- - -	G											Loose, brown, moist some silt and organic trace to some gravel.	s and a	- n -
	- - - -	G											Compact, grey, moist with a trace to some gome zones of silt.	SAND gravel and 0.91n	- n
	-1 - - -												Compact, grey, moist with a trace to some ga trace of silt.	SAND gravel and	-
	- - - - - -2												Trace to some silt bet and 1.8 m depth	tween 1.5	-
	- - - - -	G											Trace to some silt bet and 2.7 m depth	tween 2.4	
	- -3 - - - -												Some reddish brown 3.0 and 3.7 m depth	zones at	
	- - -	G													E
	- -4 -													407	-
	- - - -												End of test pit at 4.3 r No water seepage ob upon completion of te	served	n - - -
	- - - -5 -												·	•	-
	- - - -														
SAMPLE TYPE	<u> </u> <u>=</u>					AR S							TESTS	FILE No.	
A - Auger C - Core O - Denison G - Grab S - Split Spool					U - F _v - L _v - R -	Uncor Field \ Lab V Remo	√ane		oressi	on		Q, R, S - C - DS - w _ı , w _p -	Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits	17-531-140 PREPARED By: Thurber Engineerin INSPECTOR: CJC	ng
T - Shelby Tul V - Wash					Γest (AS					E: B		w -	Moisture Content	SHEET 1 of	

	Ministry of Ti	ranspo	ortati	on			SI	JN	<u>///</u>	ΛΛ	R	Y	LO	South Coast	Region TEST HOLE	No.
	Project		-liah	way 1 .	. 222 +	o 264 EE						•			TP12-2	23
	Locatio		_	11884,				, indiring	Lan					Elevati	ion 53.4 m	
	Driller	E	Back	hoes l	Jnlimi		N	Metho	od E	Exca	vator		1	Dates	May 24, 2012	
			be		(E)	Pa)	Gra	datio	n %	l	Index		u O			
	Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Ъ	es		opert		Classification	Descr	iption	ELEVATION (m)
		De	Saı	Blo	Re	Str	ğ	Sand	Fines	W _L	W _P	W	Cla			ELE
		- - -												Loose, brown, moist some silt and a trace gravel and organics.	to some	- - -53
		- - - - -1 -												Compact, grey, moist with some gravel and silt.	SAND a trace of	- - - - - -
		- - -	G													- -52 -
		- - -2 -												Gravelly with a trace of between 1.8 and 2.4 in	of cobbles m depth	- - - -
		- - -														- 51 - -
		- -3 -	G													- - - -
		- - - -														-50 -
BER BC.GLB		-4 -4														- - - -
- THUR		-													4.57m	-49
SUMMARY LOG (ELEV.) 17-531-140.GPJ THURBER BC.GDT 7/20/12- THURBER BC.GLB		- - - -5												End of test pit at 4.6 r No water seepage ob upon completion of te	n depth. served	- - - -
SPJ THURBE		- - -														- -48
17-531-140.0		-													T	-
ELEV.)	SAMPLE TYP A - Auger	<u>E</u>				U -	EAR S Uncor	nfined						TESTS Mechanical Analysis	FILE No. 17-531-140	
, LOG (C - Core D - Denison					F _v - L _v -	Field ` Lab V	Vane 'ane				(Q, R, S - C -	Triaxial Compression Consolidation	PREPARED By: Thurber Engineerin	g Ltd.
MMARY	G - Grab S - Split Spoo T - Shelby Tu					R -	Remo	ulded					WL, WP -	Direct Shear Liquid, Plastic Limits Moisture Content	INSPECTOR: CJC	
MOT SU	W - Wash Blowcount =		dard	Penetr	ation	Test (AS	STM-1	1586)		NO	ГЕ: В	racke		enote Driller's estimate	SHEET 1 of	1

Ministry of Tra	анзро	rianc	711		,	St	JN	/IIV	ΊA	R	Y	LO	G	Region TEST HOLE	
Project		_	-		264 EE	3 Clin	nbing	J Lan	е				Florest		24
Locatio Driller			1827, I noes U			N	/lethc	od E	Exca	/ator			Elevati Dates	ion 55.4 m May 24, 2012	
							datio			Index	(_			
Drilling	m)	Sample Type	unt	Recovery (m)	h (kPa)				Pr	opert	ies	Classification	Descr	intion	
Details	Depth (m)	mple	Blowcount	эсоле	Shear Strength (Gravel	Sand	Fines	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	\.,,		assifi	20001	puon	
	Ď	S	B	Re	क्र क्र	ত	Sa	這	W _L	W _P	W	Ö		noist silty \(\sigma 0.08n	1
													Loose, dark brown, m SAND with some orga	ioiot, oiity /	1
	-	G											Compact, brown, moi with some silt and a to	st SAND 0.46m	1
	-												organics.		ŀ
	- - -1												Compact to dense, gr SAND with a trace to	some	F
	- -												gravel and a trace of	silt.	F
	-														Ŀ
	-														Ė
	-	G													ŀ
	-2 -														ŀ
	-														F
	-														-
	-														ŀ
	-3														Ė
	-														-
	- [G													-
	-														E
	- -4														ŀ
	-													4.27m	1
	-												End of test pit at 4.3 r No water seepage ob	n depth. served	F
	-												upon completion of te		ŀ
	- - -5														ŧ
	-														F
	-														F
															F
	-														F
SAMPLE TYPE	<u> </u>					EAR S							TESTS	FILE No.	
A - Auger C - Core D - Denison					F _v -	Uncor Field \	√ane		oressi	ion	(Q, R, S -	Mechanical Analysis Triaxial Compression Consolidation	17-531-140 PREPARED By:	
G - Grab S - Split Spoo	n				L _v - R -	Remo	ulded					DS - W _L , W _P -	Direct Shear Liquid, Plastic Limits	Thurber Engineering INSPECTOR:	ng l
T - Shelby Tul V - Wash	be											, w -	Moisture Content	CJC	

										K	Y	LO	G	TP12-	25
Project Locatio		_	vay 1 - 1754,		o 264 EE 102	3 Clin	nbing	J Lan	е				Flevati	on 55.5 m	
Driller			noes L			Λ	/lethc	od E	Exca	/ator			Dates	May 24, 2012	
		be		(m	Ра)	Gra	datio	n %		Index	(uo			
Drilling Details	(m) u	le Ty	Blowcount	Recovery (m)	r gth (k	_			Pr	opert	ies	Classification	Descri	ption	
Dotailo	Depth (m)	Sample Type	Blowe	Reco	Shear Strength (kPa)	Gravel	Sand	Fines	W _L	W _P	w	Class			
	-												Loose, dark brown, m SAND with some orga	oist, silty 0.08m	ν <u> </u>
	- - -	G											Firm, brown, moist SII some sand and traces	 LT with	-
	-												organics and gravel.		Ė
	_ _1												Compact, grey, moist	0.91m	+
	- - -												with some gravel and		-
-	-														F
	_												Trace of silt below 1.5	m depth	F
	- -2 -														Ė
	-	G													ŀ
	- -														F
	-														Ė
	-3 -														F
	-														-
	- -													3.66m	1
	-												End of test pit at 3.7 n No water seepage obs	served	ŀ
	-4 - -												upon completion of te	st pit.	Ē
	-														Ė
	- -														F
	- - -5														ŧ
	-														-
	- -														ŀ
	-														ŀ
	-								<u> </u>					Ell E Ma	F
<u>SAMPLE TYPE</u> A - Auger C - Core	<u> </u>					EAR S Uncor Field \	nfined			ion		M -	TESTS Mechanical Analysis Triaxial Compression	FILE No. 17-531-140	
D - Denison G - Grab					L _v - R -	Lab V Remo	ane ulded					C - DS -	Consolidation Direct Shear	PREPARED By: Thurber Engineerin	ng l
S - Split Spoo T - Shelby Tul	n be											W _L , W _P -	Liquid, Plastic Limits Moisture Content	INSPECTOR: CJC	
<u>V - Wash</u> Blowcount = \$	Stand	lard [[]	Penetr	ation -	Γest (ΔS	TM-1	586)		NO	F. B	racke	ets () de	enote Driller's estimate	SHEET 1 of	1

Design-t		- دمامه	.o., 4	222.4						17	I	LO	G	TP1	2- <u>2</u> 6
Project Locatio		_	⁄ay 1 - 1690,∃		o 264 EE 211	Ciin	gniar	Lan	е				Elevati	ion 55.5 m	
Driller			noes U			N	/letho	d E	xcav	ator			Dates	May 24, 201	2
Drilling	(m.	Type	unt	ery (m)	h (kPa)		datio	n %	l	Index opert		cation	Descr	intion	
Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (Gravel	Sand	Fines	W _L	W _P	w	Classification	2000.		
	- - - -												Stiff, brown, dry to mo SILT with some organ trace to some gravel.	nics and a	-
	- - - - -1	G											Firm below 0.6 m dep Some wood at 0.6 m	oth depth 1.0	- - 7m
	- - -												Compact to dense, gr gravelly SAND with tr cobbles and silt.	aces of	-
	- - - -2 -												Some gravel betweer 1.8 m depth.	i i.ə anu	-
	 	G													- - - -
	- -3 -												Dense, brown, moist		-
	- - - -												Compact to dense, gr gravelly SAND with tr cobbles and silt.	3.39 rey, moist, races of	om - - -
	- -4 - -	G													-
	- - -												End of test pit at 4.6 r		7m -
	- - -5 - -												No water seepage ob upon completion of te	served est pit.	-
	- - - -														-
SAMPLE TYPE	- <u> </u> :				SHE	AR S	TRF	IGTH	kP2				TESTS	FILE No.	
A - Auger C - Core D - Denison G - Grab S - Split Spoo	n					Uncor Field \	fined /ane	Com		on	(Q, R, S - C - DS - w _L , w _P -	Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits	17-531-14 PREPARED By: Thurber Enginee INSPECTOR:	
T - Shelby Tul V - Wash	be								-			w -	Moisture Content	CJC	

Ministry of Tr	anspo	ortati	on			Sl	JN	ΛN	1A	R	Y	LO	G South Coast F	Region TEST HOLE	
Project		_	-		o 264 EE	3 Clin	nbing	g Lan	е					TP12-2	27
Locatio Driller			1612, hoes l			N	/lethc	nd F	Evcav	vator			Elevati Dates	on 52.2 m May 24, 2012	
Dillio			1000				datio			Index	,		Datos	May 24, 2012	T
Drilling	(c)	Sample Type	Ħ	Recovery (m)	(кРа)			/o	l	opert		Classification			
Details	Depth (m)	nple	Blowcount	over	Shear Strength (Gravel	<u> </u>	မြ				ssific	Descri	ption	
	рер	Sar	Blo	Rec	She Stre	Gra	Sand	Fines	W _L	W _P	w	Cla			
	_												Firm to stiff, dark brow moist SILT with some		Ł
	_												a trace to some clay a of sand.		+
	-	G											Loose, brown, moist S		F
													some silt to silty and a gravel.	a trace of 0.76m	+
	-1 -												Grey below 0.5 m dep		F
	-												Compact, grey, moist, SAND with some cobb	gravelly <u>1.22m</u> oles.	+
													Compact, grey, moist with traces of cobbles		F
													gravel.	.	E
	- 2	G													F
	-	G											Some roots at 2.0 m c		╁
													Stiff, grey, moist, claye with a trace of sand.	2.44m	ŧ
	-												Compact, grey, moist with a trace to some g	SAND gravel and	ŀ
	-												a trace of silt.	navor and	F
	−3 -														Ė
															E
	-														ŧ
	-														þ
	-4														E
	-													4.27m	╘
	-												End of test pit at 4.3 n No water seepage obs	served	F
													upon completion of te	st pit.	F
	_ _5														F
															Ł
	 -														F
															E
	_														ŀ
SAMPLE TYPE	L ≣			I		AR S						l	<u>TESTS</u>	FILE No.	_
A - Auger C - Core					F _v -	Uncor Field \	√ane	Com	press	ion		Q, R, S -	Mechanical Analysis Triaxial Compression	17-531-140 PREPARED By:	
D - Denison G - Grab S - Split Spoo	n				L _v - R -	Lab V Remo	ane ulded					DS -	Consolidation Direct Shear Liquid, Plastic Limits	Thurber Engineering INSPECTOR:	ng l
S - Spill Spoo T - Shelby Tu V - Wash												w _L , w _P -	Moisture Content	CJC	
Blowcount =	Stand	lard I	Penetr	ation '	Test (AS	TM-1	586)		NO	ГЕ: В	racke	ets () de	enote Driller's estimate	SHEET 1 of	1

Ministry of Tra										K	Y	LO	G	Region TEST HOLE	
Project Locatio		_	vay 1 - 1580, l		o 264 EE 133	3 Clin	nbing	j Lan	е				Elevati	on 50.4 m	
Driller			noes U			Λ	/lethc	d E	xcav	ator			Dates	May 24, 2012	
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)		datio		l	Index opert		Classification	Descri	iption	
	Dept	Sam	Blow	Reco	She Stre	Gravel	Sand	Fines	W _L	W _P	W	Clas			
	-												Loose, brown, moist, with some organics.	silty SAND 0.23m	-
	- - -												Compact, grey, moist with some gravel, a tr some silt and a trace	ace to	-
	- - -1														-
	- - -														-
	- - -	G													F
	- - -														-
	-2 - -														F
	- - -														F
	- - -														E
	-3 - -	G													-
	- - -														-
	- - -														-
	- 4 -														-
	- - -												End of test pit at 4.3 r		-
	- - -												No water seepage ob upon completion of te	est pit.	F
	- - -5 -														-
	- - -														-
	- - -														F
	- -													I eu e v	-
<u>SAMPLE TYPE</u> A - Auger C - Core					U - F _v -	EAR S Uncor Field \	nfined √ane	Com		on		Q, R, S -	TESTS Mechanical Analysis Triaxial Compression	FILE No. 17-531-140 PREPARED By:	
D - Denison G - Grab S - Split Spoo	n				L _v - R -	Lab Va Remo	ane ulded					C - DS - W ₁ , W ₂ -	Consolidation Direct Shear Liquid. Plastic Limits	Thurber Engineerin	ıg l
T-Shelby Tul V-Wash Blowcount=S									TON			W -	Moisture Content	SHEET 1 of	_

	Ministry of Tr	anspo	ortati	on			SI	IN	<u>///</u>	<u>1</u> Δ	R	\overline{Y}	LO	South Coast I	Region TEST HOLE	No.
												•	LO	O	TP12-2	29
	Project		_	-		o 264 EE	3 Clin	nbing	J Lan	е				Flovet		
	Location Driller			1520, hoes L			N	/lethc	nd F	YCa\	/ator			Dates	on 48.3 m May 24, 2012	
	Dillion	_		1000 0				datio						Datos	May 24, 2012	
	Drilling		ype	+=	(m)	(кРа	Gra	datio	N %	l	Index opert		tion			
	Details	E)	le T	cour	very	r gth	<u></u>				open	163	ifica	Descri	ption	NOI (m
	2 0100	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	w _L	W _P	w	Classification			ELEVATION (m)
			(O)	ш	ız.	00 00	0	Ø	Ш				0	0	· · OAND	+ -
		-												Compact, brown, moi- with traces of silt and	organics.	F 40
		-														⊢48 -
		-														F
		-														F
		- -1														ļ.
		-												Some gravel below 1.	1 m depth	ļ
		-														-47 -
		-	G													-
		-														F
		- 2														Ł
		_														Ŀ
		_														-46
																F
		-														F
		-														F
		−3 -	G													F
		-													3.35m	_ 45
		-												End of test pit at 3.4 r	n depth	ļ.
		-												due to sloughing. No water seepage ob	served	ļ
щ		-												upon completion of te		ļ.
BC.GI		-4														Ł
BER		-														- -44
Ę		_														- 44
20/12-		-														F
)T 7/;		-														F
BC.GI		- 5														F
3BER		-														F
를 기		<u>-</u>														-43 -
J.GPJ		 -														ļ.
17-531-140.GPJ THURBER BC.GDT 7/20/12- THURBER BC.GLB		-														ţ
		-													T	-
:LEV.)	SAMPLE TYPI A - Auger	<u>E</u>					EAR S Uncor				ion		М -	TESTS Mechanical Analysis	FILE No. 17-531-140	
-0G (E	C - Core D - Denison					F _v - L _v -	Field \	√ane		- 23		(Q, R, S -	Triaxial Compression Consolidation	PREPARED By:	ا- ۱ ا م
ARY L	G - Grab S - Split Spoo	n				R -	Remo	ulded					DS -	Direct Shear Liquid, Plastic Limits	Thurber Engineerin INSPECTOR:	g Ltd.
SUMMARY LOG (ELEV.)	T - Shelby Tu W - Wash	be											W -	Moisture Content	CJC	
MOT 8	Blowcount =	Stanc	lard	Penetr	ation -	Test (AS	TM-1	586)		NOT	ГЕ: В	racke	ets () de	enote Driller's estimate	SHEET 1 of	1

	Ministry of Ti	ranspo	ortati	on		,	SI	JΛ	<u>///</u>	<u>/</u> ΙΔ	R	Y	LO	South Coast I	Region TEST HOLE	No.
	Project		-liah	way 1 .	. 222 +	o 264 EE						•			TP12-	30
	Locatio		_	Nay 1 . 11437,			Cilli	IIDIII	J Lan	E				Elevati	on 48.2 m	
	Driller		Back	hoes l	Jnlimi	ted	N	/letho	od E	Exca	/ator			Dates	May 24, 2012	
) e		ε	Pa)	Gra	datio	n %		Index	(L C			
	Drilling	(E)	е Туј	ount	ery (i	= 국				Pr	opert	ies	icati	Descri	iption	Œ Z
	Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	W _L	W _P	w	Classification		•	ELEVATION (m)
		۵	Š	丽	Ř	क क	Ö	ΐ	证		,	<u> </u>	ō			
														Loose, brown, moist S some silt and a trace		-48
		-												organics. Compact, grey, moist	SAND	-
		-												with a trace to some of a trace of silt.	gravel and	-
		- - -1												aacc c. c		-
		-														-47
		-														-
		-	G											Some gravel below 1.	5 m depth	-
		-2														-
		-														-46 -
		-														-
		- -3														-
		-	G													- -45
		-												Trace of gravel below depth	3.2 m	-
		-														
В		-													3.96m	-
RC.G		-4 -												End of test pit at 4.0 r No water seepage ob	n depth.	-
IURBEI		-												upon completion of te		-44 -
/12- TF		-														
T 7/20		-														-
BC.GD		- -5														-
IRBER		-														-43
J THL		-														
140.GF		-														-
17-531-		-														-
SUMMARY LOG (ELEV.) 17-531-140.GPJ THURBER BC.GDT 7/20/12- THURBER BC.GLB	SAMPLE TYP A - Auger	<u>E</u>	•		•		EAR S Uncor				ion	•		TESTS Mechanical Analysis	FILE No. 17-531-140	•
LOG (E	C - Core D - Denison					F _v - L _v -	Field \	Vane	COIII	hi c 99	IUII		Q, R, S -	Triaxial Compression Consolidation	PREPARED By:	va 1 4 d
MARY	G - Grab S - Split Spoo						Remo						DS -	Direct Shear Liquid, Plastic Limits	Thurber Engineerin	ıy LIG.
T SUM	T - Shelby Tu <u>W - Wash</u>													Moisture Content	CJC SHEET 1 of	1
MOT	Blowcount =	Stand	dard	Penetr	ation	rest (AS	TM-1	1586)		NO	IE: B	racke	ets () de	enote Driller's estimate	STILLT I OF	•

	Ministry of Tr	anspo	ortati	on			<u>SI</u>	ΙN	<u>///</u> /	<u>1</u> Δ	R	Y	LO	South Coast I	Region TEST HOLE	No.
	Donie et		l'ada	4	000.4						\	•		0	TP12-3	3 1
	Project Locatio		_	way 1 ⋅ I1361,		o 264 EE 788	3 Clin	nbing	J Lan	е				Flevati	on 48.2 m	
	Driller			hoes l			٨	/letho	d E	xca	vator			Dates	May 24, 2012	
								datio			Index		Ľ		•	
	Drilling	(E)	Sample Type	unt	Recovery (m)	Shear Strength (kPa)				Pr	opert	ies	Classification	Descri	ption	(E)
	Details	Depth (m)	mple	Blowcount	COVE	ear	Gravel	Sand	Fines		Ī		assifi	2000	p.1.0	ELEVATION (m)
		۵	Sa	В	Re	रू <u>क</u> ्	ত	Sa	Fir	W _L	W _P	W	ਠੌ			31
		- - -												Loose, brown, moist so a trace to some silt are of organics.		- -48
		_ - -												Compact, grey, moist with traces of gravel, and silt.	SAND cobbles	[- -
		- 1 -														- - - -47
		_ - -												Some silt at 1.2 m de		-47 - -
		- - -	G											Some gravel below 1.	5 m depth	- - -
		-2 - - -														- -46
		- - -														- - -
		- - -3														-
		- - -	G													-45 -
		- - -														-
R BC.GLB		- 4 -														-
- THURBEI		-												End of test pit at 4.3 r No water seepage ob	4.27m n depth. served	44 - -
OT 7/20/12		- - -												upon completion of te		- - -
BER BC.G		-5 -5														- - -43
GPJ THUF		_														-
17-531-140.GPJ THURBER BC.GDT 7/20/12- THURBER BC.GLB		- - -														- - -
	SAMPLE TYPI A - Auger	<u> </u>	•		•		EAR S Uncor					•	N.A	TESTS Mechanical Analysis	FILE No. 17-531-140	•
.OG (E	C - Core D - Denison					F _v - L _v -	Field \	Vane	COM	J1622	1011	(Q, R, S -	Triaxial Compression Consolidation	PREPARED By:	
SUMMARY LOG (ELEV.)	G - Grab S - Split Spoo T - Shelby Tu	on ibe					Remo						DS - W _L , W _P -	Direct Shear Liquid, Plastic Limits Moisture Content	Thurber Engineerin INSPECTOR: CJC	g Ltd.
MOT SU	W - Wash Blowcount =		dard	Penetr	ation	Test (AS	STM-1	1586)		NO	ГЕ: В	racke		enote Driller's estimate	SHEET 1 of	1

	Ministry of Ti	ransp	ortati	on			SI	JΛ	<u>///</u>	1Δ	R	Y	LO	South Coast I	Region TEST HOLE	No.
	Project		-liah	waw 1 .	. 232 +	o 264 EE						•			TP12-3	32
	Locatio		_	1310,				JIIOIII	Lan	C				Elevati	ion 47.9 m	
	Driller	E	Back	hoes l	Jnlimi		I N	/letho	od E	Exca	vator		ı	Dates	May 24, 2012	
			/pe		(E)	(Ра)	Gra	datio	n %	l	Index		io			
	Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	r gth (i	<u></u>			Pr	opert	ies	Classification	Descri	iption	ELEVATION (m)
		Deptl	Sam	Blow	Reco	Shear Strength (kPa)	Gravel	Sand	Fines	W _L	W _P	w	Class			ELEVAI
		-												Loose, brown, moist, with some organics.	silty SAND / 0.08m	ι <u>.</u>
		-												Compact, grey, moist	SAND	-
		[with some gravel and silt. Trace of gravel below		-
		- - -1												depth	0.6 111	- -47
		F'														F
		_												Some reddish brown between 1.2 and 1.5 i		-
		_	G													-
		- -2														- -46
																-
																-
		-														-
		- -3														- -45
		-	G													-
		-														-
GLB.		- -4														-44
BER BC		- '														-
- THUR																-
7/20/12		-	G													-
C.GDT														End of test pit at 4.9 r	4.88m n depth.	43
RBER B		-												No water seepage ob upon completion of te	served	-
J THU		_														-
-140.GI		-														-
17-531		-														- -42
(ELEV.)	SAMPLE TYP A - Auger	<u>E</u>				U -	EAR S Uncor	nfined						TESTS Mechanical Analysis	FILE No. 17-531-140	
Y LOG	C - Core D - Denison G - Grab					L _v -	Field ' Lab V Remo	ane					C -	Triaxial Compression Consolidation Direct Shear	PREPARED By: Thurber Engineerin	ng Ltd.
SUMMARY LOG (ELEV.) 17-531-140.GPJ THURBER BC.GDT 7/20/12- THURBER BC.GLB	S - Split Spoo T - Shelby Tu							J.404					WL, WP -	Liquid, Plastic Limits Moisture Content	INSPECTOR: CJC	
MOT SU	W - Wash Blowcount =	Stand	dard	Penetr	ation	Test (AS	STM-1	1586)	1	NO	ГЕ: В	racke	ets () de	enote Driller's estimate	SHEET 1 of	1

5			_	000						1/	I	LO	J	TP12-	33
Project Locatio		_	-	· 232 to E 5329	o 264 EE 970	3 Clin	nbing	j Lan	е				Elevati	on 49.2 m	
Driller				Jnlimit		N	/lethc	od E	xcav	ator			Dates	May 24, 2012	
Drilling	(m)	Sample Type	ount	ery (m)	Shear Strength (kPa)		datio	n %		ndex opert		Classification	Descri	iption	
Details	Depth (m)	Sampl	Blowcount	Recovery	Shear	Gravel	Sand	Fines	W _L	W _P	w	Classif			
	- - -												Firm, dark brown, moi with some organics ar to some sand.		ν <u>-</u>
	- - -												Compact, grey, moist with some silt.	SAND	-
	- -1 - -	G													-
	- - - -	G											Wet below 1.5 m dept		-
	- - -2 -	G											Stiff, grey, dry to mois some clay and some	at SILT with sand. 2.13m	1
	- - -												Compact, grey to brow SAND with some silt.	wn, wet,	-
	- - - -3 -	G											Trace of silt below 2.7	' m depth	-
	- - - -	G											Stiff, grey, moist SILT clay and sand.	3.51m with some	- - - -
	- - 4												-	3.96m	1
	- - - -												End of test pit at 4.0 n Water seepage at 1.5 upon completion of te	m depth	- - - -
	- - - -5 -														-
	- - -														-
	- -														F
SAMPLE TYPE A - Auger				•		EAR S			<u>kPa</u> pressi	on		М -	TESTS Mechanical Analysis	FILE No. 17-531-140	
C - Core D - Denison G - Grab S - Split Spoo					F _v - L _v -	Field \	√ane ane		P10331	J11	•	Q, R, S - C - DS - w _L , w _P -	Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits	PREPARED By: Thurber Engineerin INSPECTOR:	ng l
T - Shelby Tu W - Wash Blowcount = 3									NOT			w -	Moisture Content	CJC SHEET 1 of	

Ministry of Tr	ransp	ortatio	on		,	Sl	JN	<u>///</u>	<u>1A</u>	\overline{R}	Y	LO	South Coast Re	egion TEST HOLE	No.
Project	t I	Highv	vay 1 -	232 to	o 264 EE	3 Clin	nbing	g Lan	е					TP12-3	34
Location Driller			1224, 10es U				/lethc	nd F	Evca	vator			Elevation Dates	n 51.1 m May 24, 2012	
Dilliel	Ι.		1063 0				datio			Index			Dates	Way 24, 2012	Τ
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	l	opert		Classification	Descrip	tion	
	-												Soft, brown, moist SILT some sand and organic		<u></u> ;
	- - -	G									52.0	СН	Stiff over firm, grey, mo and CLAY with a trace layers.	oist SILT of sand 0.76m	-
	- -1 - - - - -	G									35.3	CL/ML	Stiff to very stiff, grey to moist, clayey SILT with to some sand.	o brown, a trace	- - - - - -
	- - - -2 - -												Soft, grey, moist to wet with some fine sand and to some clay.	d a trace	- - - - 4
	- - - -3 - -	G									24.6	ML	Sandy below 2.3 m dep	om	
	- - - -4 - -	G												4.27m	- - - - - -
	- - - - -5 - -												End of test pit at 4.4 m No water seepage obseupon completion of test	erved	- - - - - - -
SAMPLE TYPI A - Auger C - Core	- - - - - - <u>E</u>					EAR S Uncor	nfined			ion		M -	Mechanical Analysis	FILE No. 17-531-140	- - - - -
D - Core D - Denison G - Grab S - Split Spoo T - Shelby Tu W - Wash					L _v - 1		ane				,	C - DS - W _L , W _P -	Consolidation Direct Shear	PREPARED By: Thurber Engineerin INSPECTOR: CJC	g L
W - Wash Blowcount =	Stand	dard F	Penetr	ation 7	Γest (AS	TM-1	586))	NOT	 ГЕ: В	racke	ets () de	enote Driller's estimate	SHEET 1 of 1	1

Ministry of Tra	anspC	niall	JII		,	Sl	JN	/II\/	ΊA	R'	Y	LO	G	Region TEST HOLE	
Project		_	-		o 264 EE	3 Clin	nbing	J Lan	е				Florest	TP12-3	35
Locatio Driller			1170, 10es U			N	/lethc	od E	xca	ator			Elevati Dates	ion 50.5 m May 24, 2012	
							datio			Index	,	_		, ,	
Drilling	É.	Sample Type	ır	Recovery (m)	ו (кРа)				l	opert		Classification	Dagas	intina	
Details	Depth (m)	nple	Blowcount	ove	Shear Strength (Gravel	þ	Se		Ι		ssific	Descr	iption	
	Dep	Sar	Blo	Red	She Stre	Gra	Sand	Fines	W _L	W _P	W	Cla			
													Soft, dark grey, moist some organics and a	SILT with 0.15m	1
	-												sand.	trace or	ŀ
	-												Compact, grey, moist with a trace to some of	SAND	F
	-												Will a trace to come §	gravon.	F
	- -1														F
	-														Ē
	-														L
	-	G													ŀ
-	-														ŀ
•	-2 -														ŀ
	-														F
	-														Ē
	-														ŀ
	- −3													lumber et 3.05m	<u>.</u>
-	- -	G											Piece of dimensional 2.9 m depth	Tumber at	ŀ
	-												Firm, grey, moist, san with some gravel.	ody SILT $\int_{-}^{3.35 \text{m}}$	+
	-												Compact, grey, moist	SAND	E
	-												with some gravel. Some wood to 3.7 m		ŀ
-	-4 -													·	ŀ
	-														ŀ
	- -													4.57m	_
	-														E
	- - -5														F
	-														+
	-														F
	-														F
	-														Ė
SAMPLE TYPE					SHE	AR S	TREN	l NGTH	kPa				TESTS	FILE No.	
A - Auger C - Core	_				U - F _v -	Uncor Field \	nfined √ane	Com		on		Q, R, S -	Mechanical Analysis Triaxial Compression	17-531-140 PREPARED By:	
D - Denison G - Grab					L _v - R -	Lab V Remo	ane ulded					C - DS -	Consolidation Direct Shear	Thurber Engineerin	ng l
S - Split Spoo T - Shelby Tul	n be											W _L , W _P -	Liquid, Plastic Limits Moisture Content	INSPECTOR: CJC	
<u>V - Wash</u> Blowcount = \$	Stand	ard [Penetr	ation ⁻	Test (AS	TM-1	586\		NO	F· B	racke	ats () de	enote Driller's estimate	SHEET 1 of	1

Projec	.† L	diaba	vav 1 -	222 +	o 264 EE	R Clin	nhine	ılan	Δ.					TP1	2-36
Locati		_	1196, I			Cilli	JIDIII	J Laii	E				Elevat	ion 50.5 m	
Driller			hoes U				/lethc	od E	Exca	vator			Dates	May 24, 201	2
Drilling Details	Depth (m)	Sample Type	Slowcount	Recovery (m)	Shear Strength (kPa)	Gravel Gra	datio	Rines	1	Index opert w _P		Classification	Descr	iption	
	-	Ö	B	α_	ช ช	O	ισ	正				O	Soft, brown, moist SA \SILT with some organ	ND and 0.19	5m -
	- - - - -												Loose to compact, gravelly SAND with a silt. Compact, brown, moi SAND with some silt	ey, moist, 0.40 trace of 0.70 st, gravelly	1
	-1 - - - - - -												Compact, grey, moist SAND with traces of scobbles.	, gravelly	- - - - - -
	- -2 - - - - - - - - - - - - - - - - -														- - - - - - - - - - - - - - - - - - -
	- - - - - - -4 -												End of test pit at 3.4 r No water seepage ob upon completion of te	served	5m - - - - - - -
	- - - - - - - 5														- - - - -
	- - - - -														- - - - -
SAMPLE TYF A - Auger C - Core D - Denison G - Grab S - Split Spo T - Shelby T	on				U - F _v - L _v -	EAR S Uncor Field \ Lab V Remo	nfined Vane ane	Com			l	Q, R, S - C - DS - w _L , w _P -	TESTS Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits Moisture Content	FILE No. 17-531-14 PREPARED By: Thurber Enginee INSPECTOR: CJC	

											I	LO	G	TP12-3	37
Project Locatio		_	vay 1 - 1123,		o 264 EE 198	3 Clin	nbing	j Lan	е				Elevati	ion 50.8 m	
Driller			noes L			Λ	/lethc	od E	xca	ator			Dates	May 24, 2012	
Drilling	(m)	Sample Type	ount	Recovery (m)	ith (kPa)		datio	n %	l	Index opert		Classification	Descri	iption	
Details	Depth (m)	Sampl	Blowcount	Recov	Shear Strength (Gravel	Sand	Fines	W _L	W _P	w	Classi			
	- - -												Soft, brown, moist SIL some organics and a sand.	trace of 0.30m	TL.
	- - -												Loose, grey, moist, gr SAND with some silt. Loose, brown, moist to		-
	- -1 - - - -	G											SAND with a trace of (east side of pit). Loose, brown, moist to gravelly SAND with so (west side of pit).	gravel 1.07m	- - - -
	- - - - -2	G									32.0	CL/ML	Swampy ground to the this test pit. Wet below 0.9 m dept	th	-
	- - -												Stiff, grey to brown, m SILT with some clay a layers. Soft to firm, grey, moi	and sand	<u>-</u>
	- - -												clayey SILT with some	e sand.	-
	- -3 - - -	G									31.9	ML/CL			-
	- - - - -4														-
	- -													4.27m	1
	- - -												End of test pit at 4.3 r Water seepage at 0.9 upon completion of te) m depth	-
	- - - -5 -														-
	- - -														-
	-													Ten e v	-
SAMPLE TYPE A - Auger C - Core O - Denison G - Grab S - Split Spoo	n				U - F _v - L _v -	EAR S Uncor Field \ Lab V Remo	nfined Vane ane			on	,	Q, R, S - C - DS - w _L , w _P -	TESTS - Mechanical Analysis - Triaxial Compression - Consolidation - Direct Shear - Liquid, Plastic Limits	FILE No. 17-531-140 PREPARED By: Thurber Engineerin INSPECTOR:	ng l
T - Shelby Tul V - Wash												w -	- Moisture Content	CJC SHEET 1 of	_

Ministry of Tra	anspo	rialic	וזכ		,	Sl	JN	ΛIV	1A	R	Y	LO	G South Coast I	Region TEST HOLE	
Project Location		_	<i>ı</i> ay 1 - 1075, I		o 264 EE 263	3 Clin	nbing	J Lan	е				Elevati	ion 53.8 m	
Driller			noes U			Ν	1ethc	od E	xcav	ator			Dates	May 24, 2012	
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel Ba	Sand	Rines n %	l	Indexopert		Classification	Descri	iption	
-		o	В	<u> </u>	<i>თ</i> თ	9	8	ш				0	Soft, brown, moist SIL some sand and organ Stiff, dry, grey to brow SILT with some thin la	nics/ vn, clayey	┸
- - - -	-1	G									38.8	СН	sand.		- - - - -
- - - - -	- - -2 -													2.29m	
-	-3	G											Loose, grey, wet SILT SAND with some clay Silty below 2.6 m dep Loose to compact, grewet, SAND with some	/. th	
- - - - -	- - - - -	G											wet, SAND with some	3.66m	
- - - - - -	-4 -4 												End of test pit at 3.8 r No water seepage ob upon completion of te	served	
- - - - - -	- -5 -5 -														
ļ	: :														F
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab S - Split Spoor T - Shelby Tub	า					EAR S Uncor Field \ Lab Va Remo	fined /ane	Com		on	(Q, R, S - C - DS - w _L , w _P -	TESTS - Mechanical Analysis - Triaxial Compression - Consolidation - Direct Shear - Liquid, Plastic Limits - Moisture Content	FILE No. 17-531-140 PREPARED By: Thurber Engineerin INSPECTOR: CJC	ng L
V - Wash Blowcount = S		ord F)onet-	otion "	Foot / ^ C	TN# 4	E00\		NOT	-E - D	rook-		enote Driller's estimate	011555 4 4	1

Project	L	liaby	vav 1 -	. 222 +	o 264 EE						•	LO	•	TP12-	39
Location		_	vay 1 - 0928,			Cilli	JIDIII	Lan	C				Elevati	ion 54.8 m	
Driller	Е	Backl	noes l	Jnlimit	ed	٨	/lethc	d E	xcav	ator			Dates	May 24, 2012	_
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)		datio			Index opert		Classification	Descr	iption	
	Dep	San	Blo	Rec	She	Gravel	Sand	Fines	W _L	W _P	W	Clas			
	-												Soft, brown, moist, sa with some organics.	indy SILT \(\int_0.08m\)	<u>ا</u>
-	- - -												Loose to compact, gro	ey, moist 0.46m gravel and	1
-	- - - -1	G									53.5	СН	Firm to stiff, grey to b moist, clayey SILT wi sand and a trace of o	rown, th some rganics.	-
-	- - -												Trace of sand below depth	1.2 m	-
	- - - -2 -												Soft, grey, moist to we CLAY.	1.83m et SILT and	<u>1</u> -
-	- - - -	G									47.7	СН			-
	- -3 -												Very soft, grey, wet, s with traces of sand ar organics.	2.90m silty CLAY nd	1
-	- - -	G									52.6	СН			-
-	-													3.96m	<u> </u>
	-4 - - - -												End of test pit at 4.0 r No water seepage ob upon completion of te	served	-
	- - - -5 -														
	- - - -														-
0.000 5 700	-				01:-			107.						FILE No.	<u> </u>
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab S - Split Spool T - Shelby Tub	n				U - F _v - L _v -	EAR S Uncor Field V Lab V Remo	nfined Vane ane	Com		on	(Q, R, S - C - DS - w _L , w _P -	TESTS - Mechanical Analysis - Triaxial Compression - Consolidation - Direct Shear - Liquid, Plastic Limits - Moisture Content	PREPARED By: Thurber Engineerin INSPECTOR: CJC	ng
V - Wash					Гest (AS				NOT			vv -	MOISIUIG OUTIGIII	SHEET 1 of	_

Drainet		liah	10V 4	222 +						11 \	•	LO		TP12-4	40
Project Locatio		_	/ay 1 - 1003,∃		o 264 EE 379	Ciin	gniar	j Lan	е				Elevation	55.6 m	
Driller			oes U			N	1ethc	od E	xcav	ator			Dates	May 24, 2012	
Drilling	(m)	Sample Type	ount	ery (m)	Shear Strength (kPa)		datio	n %		Inde: opert		Classification	Descripti	on	
Details	Depth (m)	Sampl	Blowcount	Recovery	Shear	Gravel	Sand	Fines	W _L	W _P	w	Classit			
	- - -												Soft, dark brown, moist swith some sand to sandy		
	-													0.61m	+
	- - - –1	G											Stiff, grey to brown, wet and SILT.	SAND	-
	- -	G												1.22m	+
	- -												Loose to compact, grey, wet SAND with some sil	moist to t to silty	E
	-	G											and a trace of gravel.		-
	- - -2												Very soft, grey, wet SILT CLAY with a trace of org	1.83m T and panics.	+
	- - -													,	F
	- - -	G									41.5	CL/CH			Ė
	- - -3													3.05m	-
	- - - - -												End of test pit at 3.0 m of due to sloughing. Water seepage at 1.2 m upon completion of test	depth depth	
	- -4 - - - -														
	- - - - -5 -														-
	- - - -														-
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab S - Split Spoo	_				U - F _v - L _v -		ifined /ane ane	Com		on	(Q, R, S - C - DS -	Mechanical Analysis Triaxial Compression Consolidation Direct Shear	ILE No. 17-531-140 REPARED By: 'hurber Engineerin ISPECTOR:	ıg l
T - Shelby Tul W - Wash												w, w _P -	Moisture Content	CJC	_

	0.
Driller Backhoes Unlimited Method Excavator Dates May 25, 2012 Drilling Details G G G G G G G G G	
Drilling Details Drilling Gw Details Details	
Compact, brown, moist SAND with some organics and a trace to some gravel and silt. Trace of organics below 0.3 m depth O.91m Compact, grey, moist, gravelly	
Compact, brown, moist SAND with some organics and a trace to some gravel and silt. Trace of organics below 0.3 m depth O.91m Compact, grey, moist, gravelly	
Compact, brown, moist SAND with some organics and a trace to some gravel and silt. Trace of organics below 0.3 m depth O.91m Compact, grey, moist, gravelly	Œ N
Compact, brown, moist SAND with some organics and a trace to some gravel and silt. Trace of organics below 0.3 m depth O.91m Compact, grey, moist, gravelly	ELEVATION (m)
with some organics and a trace to some gravel and silt. Trace of organics below 0.3 m depth Output Compact, grey, moist, gravelly	<u> </u>
Trace of organics below 0.3 m depth Output Compact, grey, moist, gravelly	
- 1 Compact, grey, moist, gravelly	
Compact, grey, moist, gravelly	
SAND with a trace of silt.	-83
- G - 35.8 63.3 0.8 5.9 5.9	-82
-3 A trace to some clayey SILT	-81
clumps below 3.0 m depth	
3.96m	-80
End of test pit at 4.0 m depth. No water seepage observed	
일 - Upon completion of test pit	
	-79
트립	
[
F	
SAMPLE TYPE A - Auger C - Core C - Grab D - Denison D - Denison D - Grab S - Split Spoon T - Shelby Tube SHEAR STRENGTH kPa U - Unconfined Compression F _V - Field Vane L _V - Lab Vane B - Remoulded B - Remoulded B - Remoulded B - Remoulded B - August - Blle No. TESTS M - Mechanical Analysis Q, R, S - Triaxial Compression C - Consolidation DS - Direct Shear W _L , W _P - Liquid, Plastic Limits W - Moisture Content SPECTOR: CJC	
C - Core F _V - Field Vane Q, R, S - Triaxial Compression C - Consolidation PREPARED By: Thurber Engineering	Ltd.
G - Grab R - Remoulded DS - Direct Shear S - Split Spoon W _L , W _P - Liquid, Plastic Limits T - Shelby Tube w - Moisture Content INSPECTOR: CJC	
W - Wash Blowcount = Standard Penetration Test (ASTM-1586) NOTE: Brackets () denote Driller's estimate SHEET 1 of 1	

Ministry of Tr	ansp	ortatio	on			Sl	JN	/ N	1A	R	Y	LO	G South Coast F	Region TEST HOLE	
Project Locatio		_	vay 1 - 0410,		o 264 EE 393	3 Clin	nbing	J Lan	е				Flevati	on 84.9 m	+2
Driller			noes L			N	/lethc	od E	xca	/ator			Dates	May 25, 2012	
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Lines n %	Pr	Index opert	ies	Classification	Descri	ption	
	De	Sa	B	Re	- St.	ö	Sa	ijĒ	WL	W _P	W	ర	Loose, dark brown, m and SAND with some		-
	- - -	G											Loose, brown, moist, swith some gravel and organics.	silty SAND	7
	- - - -1												Compact, grey, moist, SAND with a trace of	gravelly silt.	-
	- - - -														-
	- - - - -2	G				41.4	57.4	1.2			5.1	GP/SP			-
	- - - -														-
	- - - -3														-
	- - - -	G				37.0	61.4	1.6				GP/SP			-
	- - - -													3.96m	-
	-4 - - - - -												End of test pit at 4.0 n No water seepage obsupon completion of te	served	-
	- - - 5 -														-
	- - - -														
0.115.	<u></u>							10-						EII E Na	
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab S - Split Spoo T - Shelby Tu	n				U - F _v - L _v -		nfined Vane ane	Com		ion	,	Q, R, S - C - DS - w _L , w _P -	TESTS Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits Moisture Content	FILE No. 17-531-140 PREPARED By: Thurber Engineerin INSPECTOR: CJC	ıg
W - Wash Blowcount = 3		lard [Denetr	ation -	Test (AS	TN/-1	5861		NOT	E. b	racko		enote Driller's estimate	SHEET 1 of 1	1

Ministry of Tra	op 0					St	J۱۷	/IIV	ΊA	K	Y	LO	G	Region TEST HOLE	
Project Location		_	vay 1 - 0333,		o 264 EE	3 Clin	nbing	J Lan	е				Flevati	on 84.7 m	10
Driller			noes L			N	/lethc	d E	xca	ator			Dates	May 25, 2012	
Drilling Details	(m) u	Sample Type	Blowcount	Recovery (m)	r gth (kPa)		datio		l	Index opert		Classification	Descri	ption	
Botallo	Depth (m)	Samp	Blowd	Reco	Shear Strength (Gravel	Sand	Fines	WL	W _P	W	Class			-
	- -	G											Soft, dark brown, mois	ics.	<u> </u> -
	- - -												Loose to compact, bro SAND with some silt t traces of organics and	o silty and $\frac{0.53 \text{m}}{1}$	-
	- - −1												Compact, grey, moist with traces of silt and	SAND gravel.	-
	-												Compact, grey, moist, SAND with a trace to	1.22m , gravelly some silt.	-
	- - -														-
	- -2 -	G				24.5	66.6	8.9			9.0	SP-SM			
	- - -														
-	- - -														-
	-3 - - -														
	- - -														
-	-													3.96m	ŀ
	-4 - - -												End of test pit at 4.0 n No water seepage ob- upon completion of te	served	-
	- - -														
	-5 - - -														
	- - -														
-	-		_												F
SAMPLE TYPE A - Auger C - Core	_				U - F _v -	EAR S Uncor Field \	nfined Vane	Com		on		Q, R, S -	TESTS Mechanical Analysis Triaxial Compression	FILE No. 17-531-140 PREPARED By:	
D - Denison G - Grab S - Split Spool T - Shelby Tul	n oe				L _v - R -	Lab V Remo	ane ulded					DS - W _I , W _P -	Consolidation Direct Shear Liquid, Plastic Limits Moisture Content	Thurber Engineerin INSPECTOR: CJC	ıg l
V - Wash Blowcount = \$		a! "	2	_4! - · •	Tast / 4 C	т	LEOO'		NICT				note Driller's estimate	SHEET 1 of	1

Ministry of Tr										K	Y	LO	G	Region TEST HOLE	
Project Locatio		_	vay 1 - 0251,		o 264 EE 654	3 Clin	nbing	J Lan	е				Elevati	ion 85.2 m	
Driller			noes L			N	/lethc	d E	xcav	ator			Dates	May 25, 2012	_
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel Bra	Sand	n %	l	Index opert w _P		Classification	Descr	iption	
		S	<u> </u>	~	σ σ	Ю	S	ш		·		0	Soft, dark brown, moi with some organics a to some sand.		_
	- - - -												Very stiff, grey, moist some clay to clayey a of sand and organics.	ind traces	-
	-1 - - -	G									19.1	CL/ML	Soft, grey, moist, clay	1.22m rey SILT	<u> </u> - - - -
	- - - -												with a trace to some s trace of organics.	sand and a	-
	-2 - - -	G									26.5	CL			- - - -
	- - - - -3														-
	- - -												Soft, grey, moist SILT clay to clayey and a to		_ _ - -
	- - - -4	G									19.9	CL/ML	some sand and brown sandy SILT with a tra- wood/organics.	n, wet,	-
	- - - -													4.57m	-
	- - - -5												End of test pit at 4.6 r No water seepage ob upon completion of te	served	-
	- - - -														-
SAMPLE TYPE	- - - -				CUI	EAR S	TDE	JGTL!	kDa.				TESTS	FILE No.	<u>-</u>
A - Auger C - Core D - Denison G - Grab S - Split Spoo	on				U - F _v - L _v -	Uncor	nfined Vane ane	Com		on	(Q, R, S - C - DS - w _L , w _P -	Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits	17-531-140 PREPARED By: Thurber Engineerin INSPECTOR: CJC	ng l
T - Shelby Tu W - Wash Blowcount =									:				Moisture Content	SHEET 1 of	1

Ministry of Tra	anspo	ortatio	on		,	Sl	JN	<u>///</u>	1 A	R	Y	LO	G South Coast F	Region TEST HOLE	No.
Project		_	-		264 EE	3 Clin	nbing	j Lan	е				Et	TP12-4	45
Locatio Driller			0184, 10es U			N	/lethc	od E	Exca	vator			Elevati Dates	on 85.2 m May 25, 2012	
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	datio	Rines u	l	Index opert		Classification	Descri		
		S	В	α.	σ o	O	S	IL.		<u>'</u>		O	Compact, brown, mois	st SAND	Ė,
	- -	G											Very stiff, grey, moist, SILT with a trace to so	sandy	-
	- - -												Compact, brown, mois SAND with some silt.	5 0.01111	\ \ -
	-1 - - -												Compact, grey, moist	1.22m	-
	- - -												and SAND with a trac	e of silt.	-
	- -2 - - - -	G				56.2	41.6	2.2			4.3	GP	Some gravel below 2.	3 m depth	
	- - - -3 - - -														
	- - -	G											Stiff, grey, moist to we	3.66m et, silty	-
	- -4 - - -												CLAY. Compact, grey, moist SAND with some silt.	3.96m to wet	-
	- - -	G												4.88m	-
	- -5 - - - - - -												End of test pit at 4.9 n No water seepage ob- upon completion of te	n depth. served	-
SAMPLE TYPE	- - <u>-</u>					EAR S							TESTS	FILE No.	<u> </u>
A - AugerC - CoreD - DenisonG - GrabS - Split SpooT - Shelby Tul					F_{V} - L_{V} -	Uncor Field \ Lab V Remo	Vane ane		press	ion	(Q, R, S - C - DS - w _L , w _P -	Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits Moisture Content	17-531-140 PREPARED By: Thurber Engineerin INSPECTOR: CJC	ng l
W - Wash Blowcount = \$		lard [Denetr	ation T	Test (AS	TN/1_1	15861		NO.	TE. D	racko		enote Driller's estimate	SHEET 1 of	1

Butter			. 4	000 (I	LO	G	TP12-4	46
Project Locatio		_	-	· 232 to E 534	o 264 EE 867	3 Clin	nbing	j Lan	е				Flevati	ion 82.9 m	
Driller				Jnlimit		Λ	/lethc	od E	xcav	ator			Dates	May 25, 2012	
		φ		(u	(kPa)	Gra	datio	n %		Inde	<	<u>_</u>			
Drilling	m)	Sample Type	nut	Recovery (m)	h (kF				Pr	opert	ies	Classification	Descri	intion	
Details	Depth (m)	mple	Blowcount	соле	Shear Strength (Gravel	Sand	Fines				ıssifi	20001		
	De	Sa	Blo	Re	Str	D	Sa	Fin	W _L	W _P	W	Cla			
	-												Soft, brown, moist SIL some organics and sa	_T with $\int_{0.08m}^{0.08m}$	И <u>.</u>
	-												Very stiff, grey, moist	SILT with	E
	-	G											some clay and traces sand and organics.	or graver,	ŀ
	-														Ė
	-1 -													1.22m	ŀ
	-												Soft, brown, wet SILT	with some	Ė
	-	G											clay and traces of org sand.	janics and 1.52m	+
	-												Soft, brown, wet SILT wood, organics and o	with some	F
	- 2	G									56.3	ОН	and a trace to some s		F
	-														F
	-														Ē
	-													2.74m	E
	- - -3												Soft to firm, grey, wet some clay to clayey.		ŀ
	- -												Very stiff, brown, mois	st SILT	†
	-												with a trace to some s clay.	sand and	F
	-													3.66m	_
	_	G											F. 1. (4 4 7 4. 0. 0	or to all	
	-4 -												End of test pit at 3.8 r Water seepage at 1.2	? m depth	E
	-												upon completion of te	est pit.	F
	-														ŧ
	-														F
	- -5														-
	-														F
	-														-
	-														ŧ
	-														F
SAMPLE TYPE	[] [SHF	AR S	TREN	L IGTH	kPa				TESTS	FILE No.	
A - Auger C - Core	_				U - F _v -	Uncor Field \	nfined Vane	Com		on	(M - Q, R, S -	- Mechanical Analysis - Triaxial Compression	17-531-140 PREPARED By:	
D - Denison G - Grab					L _v - R -	Lab V Remo	ane ulded					C - DS -	ConsolidationDirect Shear	Thurber Engineerin	ng l
S - Split Spoo T - Shelby Tul	n be											W _L , W _P ·	Liquid, Plastic LimitsMoisture Content	INSPECTOR: CJC	
<u>V - Wash</u> Blowcount = \$	Stand	lard [Danatr	ation -	Tact (AC	TN/ 1	1586)		NOT	E. D	racka	te () 4	enote Driller's estimate	SHEET 1 of	1

Project Location Driller Drilling Details	n N	1 544	Blowcount Blowcount	E 5350		<u>N</u>	Metho datio	od E	Pro	vator Index		Classification	Elevation 86.4 m Dates May 25, 20 Description	12
Drilling		Sample Type			İ	Gra	datio	n %	Pro	Index		cation		12
	Depth (m)		Blowcount	Recovery (m)	Shear Strength (kPa)				Pro			cation	Description	
Details	Depth		Blowc	Recov	Shear	Grave	Sand	Fines				ij	pesoribilori	
- - - - - - - - - - - - - - - - - - -		G							W _L	W _P	w	Classi		
-	-1	G											Soft, brown, moist SILT with some organics and a trace to some sand.	30m
[· ·								43	23	24.7	CL	Very stiff, grey and brown, moist SILT with some clay to clayey, a trace to some sand and traces of gravel and cobbles.	- - - -
-														- - - - -
-	-2 -2 -	G							38	20	21.5	CL		-
-													,	90m
-	-3												End of test pit at 2.9 m depth. No water seepage observed upon completion of test pit.	-
	-4 -4 -													-
-	- - - -5													- - - - - -
 - - - - -														- - - - -
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab	-				U - F _v - L _v -		nfined Vane ane	Com		on	(Q, R, S - C -	TESTS Mechanical Analysis Triaxial Compression Consolidation Direct Shear TESTS FILE No. 17-531-1 PREPARED By: Thurber Engine	
S - Glab S - Split Spoon T - Shelby Tub W - Wash					ΙΧ -	. COITIO	aiu c u					W _L , W _P -	Liquid, Plastic Limits Moisture Content INSPECTOR: CJC	

Project Highway 1 - 232 to 264 EB Climbing Lane Location N 5439958, E 535167 Driller Backhoes Unlimited Method Excavator Drilling Details Project Highway 1 - 232 to 264 EB Climbing Lane Location N 5439958, E 535167 Drilling Details W Highway 1 - 232 to 264 EB Climbing Lane Elevation 90.2 m Dates May 25, 200 Properties Project Highway 1 - 232 to 264 EB Climbing Lane Location N 5439958, E 535167 Drilling Details W Highway 1 - 232 to 264 EB Climbing Lane Elevation 90.2 m Dates May 25, 200 Description	ELEVATION (m)
Location N 5439958, E 535167 Elevation 90.2 m Driller Backhoes Unlimited Method Excavator Dates May 25, 201	ELEVATION (m)
Driller Backhoes Unlimited Method Excavator Dates May 25, 201	ELEVATION (m)
Drilling Details Under Details Under Details Details Details Under Detai	m/_
Drilling Details (k) Lyk Description Description	m/_
Details the property of the	m.
	m/_
Soft, brown, moist SILT with some organics and a trace to	
some sand.	ļ
Stiff to very stiff, brown, moist SILT with some clay and traces	<u> </u>
G G G G G G G G G G G G G G G G G G G	m
Soft, brown, moist to wet SILT	Ŧ
with some organics and a trace to some sand and gravel.	-89 -
	ŀ
- G 46 41 41.3 ML/OL	-
	-
	F
2.4	-88 m -
Firm, grey and brown, moist to	<u>"</u>
L	-
	-
G 42 23 31.1 CL Very stiff below 3.0 m depth	- -87
End of test pit at 3.4 m depth.	<u>"</u>
Water seepage at 2.4 m depth upon completion of test pit.	[
	-
17-531-140.GPJ THURBER BC.GDT 7/20/12- THURBER BC.GLB	-
	-86 -
	-
	-
	E
	- 85
	-
	-
-	-
A - Auger U - Unconfined Compression M - Mechanical Analysis 17-531-14	1
C - Core F _V - Field Vane Q, R, S - Triaxial Compression D - Denison L _V - Lab Vane C - Consolidation Thurber Engineer C - Grab R - Remoulded DS - Direct Shear	ing Ltd.
G - Grab R - Remoulded DS - Direct Shear W _L , w _P - Liquid, Plastic Limits W - Moisture Content CJC	
W - Wash Blowcount = Standard Penetration Test (ASTM-1586) NOTE: Brackets () denote Driller's estimate SHEET 1 (1

Ministry of Ti	ransp	ortatio	on		,	Sl	JN	ΛN	1A	R	Y	LO	G South Coast Region		
Project		_	-		o 264 EE	3 Clin	nbing	j Lan	е					TP12-4	19
Location Driller			9893, 10es L			ı	/lethc	nd F	xcav	rator			Elevation Dates	92.1 m May 25, 2012	
Dille	<u> </u>		1063 0				datio						Dates	Way 25, 2012	Τ
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel 6		Fines	Pro	Index opert	ies	Classification	Description	1	
	De	Sa	Blo	Re	St. St.	Gr	Sand	Ē	W _L	W _P	W	S	Soft to firm, brown, moist s with traces of sand and	SILT	<u> </u>
	- - - - -	G											organics.	0.91m	
	1 - - - -												Stiff, brown, moist SILT wi some sand to sandy.	1.52m	
	-2 -	G							31	19	23.1	CL	Very stiff, grey, dry to mois with some sand and a trac some clay.	et SILT	
	- - - -														
	-3 - - -												End of test pit at 3.0 m dep No water seepage observe upon completion of test pit	ed	
	- - - - -4 -														-
	- - - -														
	5 5 														
	- - - -														
SAMPLE TYP A - Auger C - Core D - Denison G - Grab S - Split Spoo T - Shelby Tu	on				U - F _v - L _v -		nfined Vane ane	Com		on	•	Q, R, S - C - DS - w _L , w _P -	Consolidation Direct Shear	No. 17-531-140 PARED By: Irber Engineerin PECTOR: CJC	g
W - Wash			7	-4:-·· "	Γest (AS	T	F00°		NICT	·			enote Driller's estimate	SHEET 1 of 1	1

Projec	t I	liahv	vav 1 -	232 to	264 EE						-	LO		TP12-50
Location		_	9814,			· • • • • • • • • • • • • • • • • • • •		, _ u					Elevation 93.5 r	n
Driller	-	Backl	noes L	Inlimit	ed	N	1ethc	od E	xcav	ator		ı	Dates May 2	25, 2012
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)		datio			Index opert		Classification	Description	
	Dept	Sam	Blow	Reco	Shea Strer	Gravel	Sand	Fines	W _L	W _P	w	Class		
	- - - - - -												Firm, brown, moist SILT with some organics and a trace of sand.	-
	-1 -1	G									68.4	ОН		1.22m
	- - - -												Stiff, grey and brown, moist SIL with some clay and traces of sand and organics.	T - - - - - -
	-2 - - - -	G							41	23	32.5	CL	Some zones of firm, wet, dark brown SILT with some organics below 2.1 m depth	_/
	- - -3	G							37	19	22.1	CL	Very stiff, grey, moist CLAY and SILT with a trace to some sand and a trace of gravel.	 - - -
	-	G							31	19	22.1	CL		3.35m -
	- - - -												End of test pit at 3.4 m depth. No water seepage observed upon completion of test pit.	-
	-4 - -													-
	- - - -													-
	-5 -													-
	- - -													-
SAMPLE TYP A - Auger C - Core D - Denison G - Grab S - Split Spoo					U - F _v - L _v -		ifined /ane ane	Comp		ion	(Q, R, S - C - DS - w _L , w _P -	- Triaxial Compression PREPARE	ngineering

Ministry of Tr	ansp	ortatio	on		,	Sl	JN	ΛN	1A	R	Y	LO	G South Coast Reg	gion TEST HOLE	
Project Locatio		_	vay 1 - 9771,		o 264 EE 499	3 Clin	nbing	J Lan	е				Elevation		<u>' </u>
Driller			noes L			N	/lethc	od E	xcav	/ator			Dates	May 25, 2012	
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)		datio		l	Inde:		Classification	Descriptio	on	
	Dept	Sam	Blow	Rec	She. Strei	Gravel	Sand	Fines	W _L	W _P	w	Clas			
	- - - -												Soft, brown, moist SILT v some sand to sandy and organics.	some	-
	- - - -1												Trace of organics below depth	0.5 m	-
	- - - -	G									54.8	ОН		1.52m	-
	- - - - -2	G							40	21	25.8	CL	Firm, grey and brown, mo SILT with some sand and of organics and clay.	oist d traces	
	- - - -												Very stiff, grey, moist (we cracks) CLAY and SILT vertace to some sand.	2.29m et in with a	-
	- - -3 -	G							43	21	23.9	CL			-
	-													0.00	F
	- - - - -4												End of test pit at 3.7 m do No water seepage obser- upon completion of test p	ved	
	- - - -														-
	- - - -5 -														
	- - - -														
	-														F
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab		!			U - F _v - L _v -	AR S Uncor Field \ Lab Va Remo	nfined Vane ane	Com		ion	. (Q, R, S - C - DS -	- Mechanical Analysis - Triaxial Compression - Consolidation - Direct Shear	LE No. 17-531-140 REPARED By: hurber Engineerin SPECTOR:	g
S - Split Spoo T - Shelby Tu W - Wash												W _L , W _P ·	- Liquid, Plastic Limits - Moisture Content	CJC	
Blowcount = 3	Stand	dard F	Penetr	ation -	Test (AS	TM-1	586)		NOT	ΓE: B	racke	ets () de	enote Driller's estimate	SHEET 1 of 1	1

Project	_	liahu	/a\/ 1 -	232 +	o 264 EE					\ \	•	LO		TP12-	52
Location		_	7ay 1 - 9710, ∣			Cilli	DITIE	J Laii	e				Elevation	on 94.9 m	
Driller	Е	Backh	oes U	Inlimit	ed	N	/lethc	d E	xcav	ator			Dates	May 25, 2012	_
Drilling	(m)	Sample Type	ount	Recovery (m)	Shear Strength (kPa)		datio	n %	l	Index opert		Classification	Descrip	otion	
Details	Depth (m)	Sampl	Blowcount	Recov	Shear Streng	Gravel	Sand	Fines	W _L	W _P	w	Classif			
	- - -												Firm, dark brown, mois with some organics an of sand.	st SILT ad a trace 0.61m	-
	- - - - -1												Very stiff, grey and bro SILT with some clay to and traces of sand and	own, moist o clayey	<u>-</u> - - -
	- - -	G							47	24	26.7	CL			-
	- - - - 2												End of test pit at 2.0 m	1.98m n depth.	- - - - -
	- - -												No water seepage obsupon completion of tes	servea st pit.	-
	- - -3 -														-
	- - - -														
	- -4 - - -														-
	- - - - -5														- - - -
	- - - -														-
	- - -														-
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab S - Split Spool	n	1			U - F _v - L _v -		ifined /ane ane	Com	kPa pressi	on		Q, R, S - C - DS - w _L , w _P -	Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits	FILE No. 17-531-140 PREPARED By: Thurber Engineerin INSPECTOR:	ng l
T - Shelby Tul W - Wash	эе											w -	Moisture Content	CJC SHEET 1 of	

Drilling (w) Holder Details (w) Location N 5 Drilling (w) Holder Details (w) Location Details	ghway 1 - 5439650, ackhoes L	E 53570 Inlimite	03	N	Methodatio Sand	od E	xcav	Index	w	P O Classification	Elevation 93.8 m Dates May 25, 2012 Description Firm, brown, moist SILT with some sand to sandy and some organics. 0.91n Stiff, grey with some brown zones, moist CLAY and SILT with traces of sand and	- - - - -
Drilling Details (a) Holder (b) Holder (c) H	Sample Type Blowcount			Gra	datio	n %	Pro WL	Index	w		Description Firm, brown, moist SILT with some sand to sandy and some organics. 0.91n Stiff, grey with some brown zones, moist CLAY and SILT with traces of sand and	
-1 -2 -3 -	G	Recovery (m)	Shear Strength (kPa)				Pro W _L	w _P	w		Firm, brown, moist SILT with some sand to sandy and some organics. 0.91n Stiff, grey with some brown zones, moist CLAY and SILT with traces of sand and	n
-1 -2 -3 -	G	Recove	Shear	Gravel	Sand	Fines					Firm, brown, moist SILT with some sand to sandy and some organics. 0.91n Stiff, grey with some brown zones, moist CLAY and SILT with traces of sand and	
-1 -1 -2 -3 -3							40		45.1	ML/OL	some sand to sandy and some organics. 0.91n Stiff, grey with some brown zones, moist CLAY and SILT with traces of sand and	n
-1 -2 -3							40		45.1	ML/OL	Stiff, grey with some brown zones, moist CLAY and SILT with traces of sand and	n -
-3	G						40				Stiff, grey with some brown zones, moist CLAY and SILT with traces of sand and	
-3	G						40				organics.	- 1-
-3								19	24.4	CL	Very stiff below 1.4 m depth	ŀ
- - - - - - -												-
-												-
-4											2.74n End of test pit at 2.7 m depth. No water seepage observed	n - - -
-4											upon completion of test pit.	-
-4												-
-												- - -
												-
- -5 -												-
[- - -												
-												-
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab			SHE U - U F _v - F L _v - L R - F	Field \ ∟ab Va	ifined /ane ane	Comp		on	(Q, R, S - C -	TESTS Mechanical Analysis Triaxial Compression Consolidation Direct Shear FILE No. 17-531-140 PREPARED By: Thurber Engineerin	
S - Grab S - Split Spoon T - Shelby Tube W - Wash			κ-1	/G11101	uiued					WL, WP -	Liquid, Plastic Limits Moisture Content INSPECTOR: CJC	

Project		liahv	/av 1 -	232 to	o 264 EE						•	LO	TP12-5	54
Locatio		_	9593, I			, Сіпі	ibii ig	Lair	C				Elevation 94.1 m	
Driller	E	Backh	noes U	Inlimit	ed	N	/lethc	d E	xcav	ator			Dates May 25, 2012	
Drilling	(m)	Sample Type	onut	Recovery (m)	Shear Strength (kPa)		datio	n %	l	Inde: opert		Classification	Description	
Details	Depth (m)	Sample	Blowcount	Recove	Shear Streng	Gravel	Sand	Fines	W _L	W _P	w	Classif	'	
	- - -	G											Firm, brown, moist SILT with some organics.	-
	- - -												0.76m	7_
	- -1 -												Stiff, brown, moist SILT with some clay and a trace to some organics.	-
	- - - -	G							44	24	31.1	CL	Very stiff, grey and brown, moist, clayey SILT with traces of sand and gravel.	-
	- - -2 -													-
	- - -												Grey below 2.1 m depth 2.44m	-
	- - -	G							31	23	25.4	CL/ML	Very stiff, grey, moist SILT with a trace to some sand and a trace of clay.	-
	-3 - - - -												3.05m End of test pit at 3.0 m depth. No water seepage observed upon completion of test pit.	
	- - - - -4													-
	- - - -													-
	- - - -5													
	- - - -													-
	- - -													-
SAMPLE TYPE A - Auger C - Core D - Denison G - Grab	_				U - F _v - L _v -		fined /ane ane	Comp		on		Q, R, S - C - DS -	TESTS - Mechanical Analysis - Triaxial Compression - Consolidation - Direct Shear - Liquid Plactic Limits - INSPECTOR:	g l
S - Split Spoo T - Shelby Tul W - Wash												W _L , W _P -	- Liquid, Plastic Limits - Moisture Content CJC	

Ministry of Tra	·									K	Y	LO	3	Region TEST H	212-5	
Project Locatio		_	vay 1 - 9499,		o 264 EE 946	3 Clin	nbing	J Lan	е				Flevati	on 91.7 m		_
Driller			10es L			N	/lethc	od E	Excav	ator			Dates	May 25, 2	012	
		Ф		(r	a)	Gra	datio	n %		Index	(ū				
Drilling	Œ	Sample Type	nut	Recovery (m)	h (kPa)				Pr	opert	ies	Classification	Descri	ntion		
Details	Depth (m)	mple	Blowcount	cove	Shear Strength (Gravel	g	Fines				ıssıfi	Descri	puon		
	De	Sal	Blo	Re	Str	D	Sand	ij	W _L	W _P	W	S				L
	- -												Soft, brown, wet ORG and SILT.	SANICS 0	.15m	- -
	-												Firm, grey, moist, clay with a trace of organic	vey SILT		Ē
-	-	G											with a trace of organic		.76m	
	-												Soft, brown, moist WO	OOD and	.7 0111	- -
	-1 -												SILT with some organ	nics.	}	- -
	-															- -
	-	G									48.00	H/WOOI				_
	-															
	- -2												Wet below 1.8 m dept	th 1	.98m	Ē
	- - -												Loose to compact, gresilty SAND.	ey, wet,		- -
	-	G												2	.59m	- -
	-												Very stiff, brown and	grey, moist	.53111	L
	- - -3	G											SILT with a trace to so and clay and a trace of	of araval	.05m	Ē
	- - -												End of test pit at 3.0 r Water seepage at 1.8	m depth		-
-	-												upon completion of te	st pit.	-	-
-	-														İ	ŀ
	- - -4															-
	- 4 - -															Γ
-	-														}	Ē
-	-														}	- -
	-														ļ	ŀ
	- 5														ļ	-
	-														ŀ	- [
	-															Ē
	-															Ē
-	-														}	- -
SAMPLE TYPE	<u> </u>			<u> </u>		EAR S							<u>TESTS</u>	FILE No.	442	_
A - Auger C - Core					F _v -	Uncor Field \	√ane		oressi	on		Q, R, S -	Mechanical Analysis Triaxial Compression	17-531- PREPARED By	:	-
D - Denison G - Grab S - Split Spoo	n				L _v - R -	Remo	ane ulded					DS -	Consolidation Direct Shear Liquid, Plastic Limits	Thurber Engin INSPECTOR:	eering	<u> </u>
S - Spill Spool T - Shelby Tul V - Wash	be											w _L , w _P -	Moisture Content	CTC	;	_
Blowcount = \$	Stand	lard F	Penetr	ation -	Γest (AS	TM-1	586)		NOT	E: B	racke	ets () de	note Driller's estimate	SHEET 1	of 1	

Project Location Driller Drilling	on N	_	-	ZUZ U		s cann	nhina	J Lan	6					•	56
Drilling	E		9457,	E 5360		, Сіііі	ibirig	Lan	C				Elevati	ion 88.8 m	
-		Backl	noes L	Jnlimit	ed	N	/letho	d E	xca	ator			Dates	May 25, 2012	_
Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel B	Sand	Fines %	l	Index opert w _P		Classification	Descri	iption	
	- -	0)	ш	<u> </u>	0,0,	0	0)	ш				0	Soft, brown, moist SIL some organics.	_T with	
	- - - -	G									23.5	CL	Firm to stiff, grey, moi and SILT with traces and organics.	ist CLAY of sand	
	- -1 - - - -										20.0	02	Wet with a trace to so below 0.9 m depth	ome sand	
	- - - - -2	G											Soft to firm, brown, m	1.98m oist SILT	
	- - - - -	G									42.1	ОН	traces of sand and cla		-
	-3 - - - - -												Very stiff, grey, moist some organics and cl	3.35m SILT with	
	- - - -4	G											trace to some sand.		
	- - - -	G											Loose to compact, gre SAND with some zon	es of silt.	-
	-5 -5 - - - -												End of test pit at 4.9 r Water seepage at 4.3 upon completion of te	3 m depth	
	- - -													,	-
SAMPLE TYP A - Auger C - Core D - Denison G - Grab S - Split Spoo T - Shelby Tu	on				U - I F _v - I L _v - I	Uncor Field \	ane	Comp		on	(Q, R, S - C - DS - w _L , w _P -	TESTS - Mechanical Analysis - Triaxial Compression - Consolidation - Direct Shear - Liquid, Plastic Limits - Moisture Content	FILE No. 17-531-140 PREPARED By: Thurber Engineerin INSPECTOR: CJC	g l

	Ministry of Tr	anspo	ortati	on			<u>SI</u>	IN	<u>///</u>	1Δ	R	Υ	LO	South Coast I	Region TEST HOLE	No.
	Б.,													0	TP12-	57
	Project Locatio		_	way 1 ⋅ l0094,		o 264 EE	3 Clin	nbing	j Lan	е				Flevati	on 85.3 m	
	Driller			hoes l			١	/lethc	od E	Exca	/ator			Dates	May 25, 2012	
								datio			Inde				,,	
	Drilling	<u> </u>	Гуре	ت ت	/ (m)	(kP;	Uia —	l	TI 70	l	oper		ation			€
	Details	h (π	ple -	noo,	over	ar ngth	<u></u>		ر س		1		sifica	Descri	ption	ELEVATION (m)
		Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	WL	W _P	w	Classification			ELEVA
														Firm, brown, moist SI	LT with \(\sigma^{0.08m} \)	1
		-												some organics.		- -85
		-												Stiff to very stiff, grey, CLAY and SILT with t	, moist races of	F
														sand and organics.		F
		_ _1	G									19.5	CL			E
		<u></u> '										10.0	02			-
		-												Brown and grey below depth	v 1.2 m	-84 -
		-												deptii		-
		-													1.83m	}
		- -2												Soft, brown, wet SILT organic silt, sand and	with some	-
		-	G									58.4	ОН	wood/organics.		-
																-83 -
														Very stiff, grey, moist	SILT with	-
		_												some clay to clayey a	nd a trace	-
		-3 -	G											of sand.		-
		- -														- -82
		-														-
		-												End of test pit at 4.3 r	3.66m	-
3LB		-												Water seepage at 1.8 upon completion of te	m depth	-
R BC.(-4 -												upon completion of te	st pit.	-
IURBE																-81
12- TF																E
- 7/20/		_														-
C.GDJ		- 5														-
BER B		-														-
17-531-140.GPJ THURBER BC.GDT 7/20/12- THURBER BC.GLB		<u>-</u>														-80 -
0.GPJ		-														<u> </u>
531-14		-														ļ.
	CAMPLE TYPE	<u> </u>				01.15		TDE	ICT' '	 				TESTS	FILE No.	
SUMMARY LOG (ELEV.)	SAMPLE TYPI A - Auger	Ξ.				U -	EAR S Uncor	nfined			ion	,		TESTS Mechanical Analysis Triovial Compression	17-531-140	
Y LOG	C - Core D - Denison G - Grab					L _v -	Field \ Lab V Remo	ane				(C -	Triaxial CompressionConsolidationDirect Shear	PREPARED By: Thurber Engineerin	g Ltd.
MMAR	S - Split Spoo T - Shelby Tu	n be				Ν-	I CHIO	uiueu					WL, WP -	Liquid, Plastic Limits Moisture Content	INSPECTOR: CJC	
MOT SUI	W - Wash Blowcount =		hard	Panatr	ation -	Tost (AS	TN1_1	1586\		NO	re. b	racko		enote Driller's estimate	SHEET 1 of	1
ž	בווטאייסיום =	otalic	aaru	ı GIIGI	auUH	i est (AS	, i ivi- i	000)	1	INO	. L. D	IUCKE	is () ut	more princi a cannidle		

Butter				000 (Sl					•		0	TP12-5	58
Project Locatio		_	vay 1 - 0222,		o 264 EE 721	s Clin	nbing	j Lan	е				Elevati	ion 84.2 m	
Driller			noes L			٨	/lethc	od E	Exca	ator			Dates	May 25, 2012	
Drilling Details	Depth (m)	Sample Type	Slowcount	Recovery (m)	Shear Strength (kPa)	Gravel Gra	datio			Index opert		Classification	Descr	iption	
	Dep	Sar	Blo	Rec	She Stre	Gra	Sand	Fines	W _L	W _P	W	Cla			
													Loose, brown, moist, SAND.	gravelly 0.15m 0.30m	ᆫ
	-	G											Firm, grey, moist SIL some organics and a	Γ with	+
	-												sand.	0.76m	1 -
	- - -1												Loose to compact, brogravelly SAND.	own, moist, 0.91m	+
	-												Stiff, grey, moist SILT clay and a trace of sa	with some and.	F
	-												Compact, grey, moist and SAND with some	GRAVEL cobbles.	F
	-	G													F
	- -2 -												Some gravel below 2.	.0 m depth	Ė
	-													·	E
	-														F
	-														Ė
	-3 -														Ŀ
	- - -	G											Compact grov maint	3.35m	
	- - -												Compact, grey, moist with a trace of silt.	SAND	Ė
	-													3.96m	1
	-4 - -												End of test pit at 4.0 r No water seepage ob	served	E
	-												upon completion of te	est pit.	Ė
	-														ŀ
	- - -5														F
	- - -														F
	-														ŀ
	- - -														F
SAMPLE TYPE					SHI	EAR S	TRF	NGTH	kPa				TESTS	FILE No.	
A - Auger C - Core	=				U - F _v -	Uncor Field \	nfined Vane			on		Q, R, S -	Mechanical Analysis Triaxial Compression	17-531-140 PREPARED By:	
D - Denison G - Grab S - Split Spoo	n				L _v - R -	Lab V Remo	ane ulded					C - DS -	Consolidation Direct Shear Liquid, Plastic Limits	Thurber Engineerin	ng I
T - Shelby Tul V - Wash	be											, .vp	Moisture Content	CJC	



2012 Thurber Laboratory Testing



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IP



DIRECT SHEAR TEST REPORT DS 12-1 TP 12-42, Sa.2 & 3 combined Normal Stress = 50 kPa

McElhanney Consulting Services Ltd. Hwy#1 232 - 264 EB Climbing Lane

Report Date: July 11, 2012 File Number: 17-531-140

Peak Shear Stress = 47 kPa

Sample Preparation

The original sample consisted of clean, well graded gravelly Sand. This material was screened over a 4.75 mm sieve. The test specimen was formed by compacting -4.75 mm material directly into the shearbox. Water was added until the material appeared to be near optimum moisture content. The material was compacted in 3 layers of 10 mm each to produce a dense specimen.

	Specimen Data	
	As	As
	Set Up	Tested
Wet Density (kg/cu.m.):	1,851	
Dry Density (kg/cu.m.):	1,710	1,727
Moisture Content:	8.2%	
Void Ratio:	0.608	0.592
Saturation:	37.3%	

After Test Data

There was no misalignment of the top and bottom halves of the shearbox.

The load cap was tilted approximately 3⁰ from front to back.

The gap between the shearbox halves was 2.5 mm at the front and 3 mm at the back.

There was no extruded material between the shearbox halves.

At the end of the test there was a 5 mm thick shear zone in plane with the split in the shearbox.

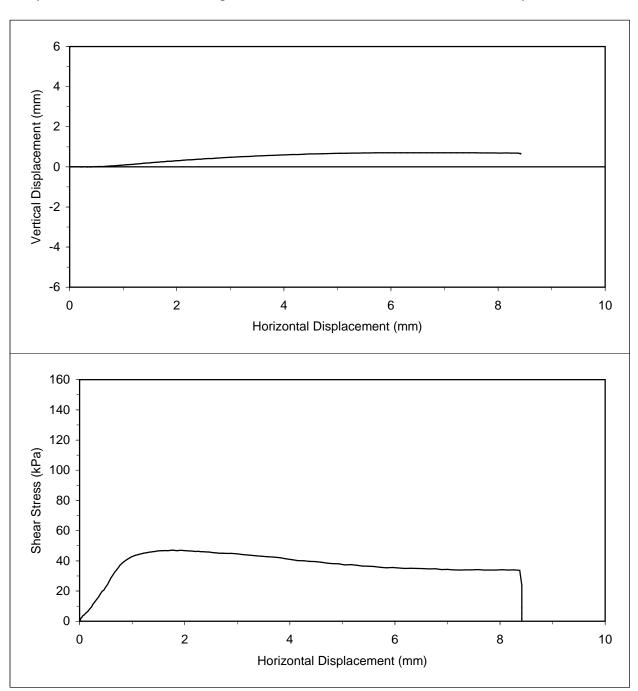
Test Procedure

ASTM D 3080 Direct Shear Test of Soils Under Consolidated Drained Conditions



DIRECT SHEAR TEST REPORT DS 12-1 TP 12-42, Sa.2 & 3 combined @ Normal Stress = 50 kPa

McElhanney Consulting Services Ltd. Hwy#1 232 - 264 EB Climbing Lane File Number: 17-531-140 Test Dates: July 10 - 11, 2012



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THURBER ENV. CONSULTANTS LTD.

ATTN: PAUL EVANS

900 - 1281 West Georgia Street

Vancouver BC V6E 3J7

Date Received: 31-AUG-12

Report Date: 06-SEP-12 15:56 (MT)

Version: FINAL

Client Phone: 604-684-4384

Certificate of Analysis

Lab Work Order #: L1202866

Project P.O. #: NOT SUBMITTED

Job Reference: 17-531-140 C of C Numbers: 10-253856

Legal Site Desc:

Brian Morgan Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: #819-58th St E., Saskatoon, SK S7K 6X5 Canada | Phone: +1 306 668 8370 | Fax: +1 306 668 8383 ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company



L1202866 CONTD....

PAGE 2 of 3 06-SEP-12 15:56 (MT)

Version: FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	SOIL 10-MAY-12	L1202866-2 SOIL 10-MAY-12 TH12-2 SA#4		
Grouping	Analyte				
SOIL					
Anions and Nutrients	Water Soluble Sulfate (%)	<0.010	<0.010		

L1202866 CONTD....
PAGE 3 of 3
06-SEP-12 15:56 (MT)

FINAL

Version:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
SO4-WATER-SOL-SK	Soil	Water Soluble Sulfate (6 hour 1:10)	CSA A23.2-3B (CONCRETE)
** ALS test methods may incor	porate mod	ifications from specified reference methods to	improve performance.
The last two letters of the abo	ove test cod	de(s) indicate the laboratory that performed an	alytical analysis for that test. Refer to the list below:
Laboratory Definition Code	Labor	atory Location	
SK	ALS E	NVIRONMENTAL - SASKATOON, SASKATO	HEWAN, CANADA

Chain of Custody Numbers:

10-253856

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L1202866 Report Date: 06-SEP-12 Page 1 of 2

Client: THURBER ENV. CONSULTANTS LTD.

900 - 1281 West Georgia Street

Vancouver BC V6E 3J7

Contact: PAUL EVANS

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-WATER-SOL-SK	Soil							
Batch R2430948								
WG1538563-1 DUP Water Soluble Sulfate		L1202866-1 <0.010	<0.010	RPD-NA	%	N/A	0.1	05-SEP-12
WG1538563-3 IRM Water Soluble Sulfate		NA2SO4_SOI	L 108.3		%		70-130	05-SEP-12
WG1538563-2 MB Water Soluble Sulfate			<0.010		%		0.01	05-SEP-12

Quality Control Report

Workorder: L1202866 Report Date: 06-SEP-12 Page 2 of 2

Legend:

Limit ALS Control Limit (Data Quality Objectives)

DUP Duplicate

RPD Relative Percent Difference

N/A Not Available

LCS Laboratory Control Sample SRM Standard Reference Material

MS Matrix Spike

MSD Matrix Spike Duplicate

ADE Average Desorption Efficiency

MB Method Blank

IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

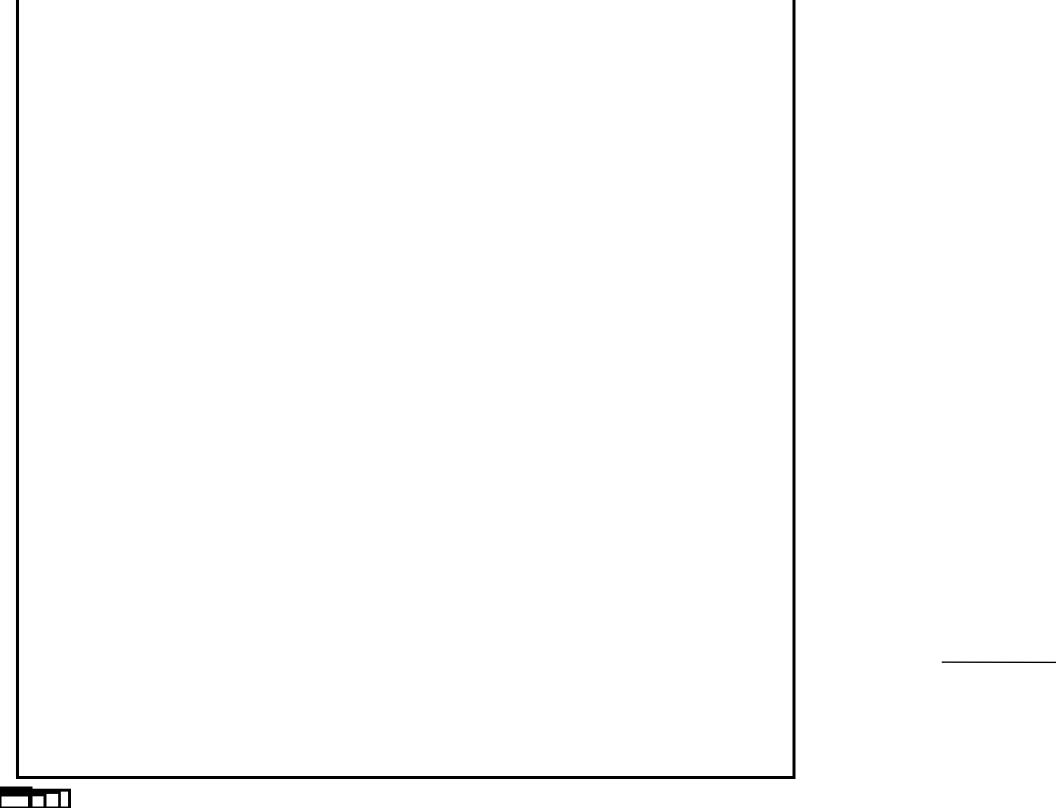
Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.





2011 BC MoTI Test Hole Logs

Ministry of Tra	anspo	rtatio	n	(SUI	M۱	ΛA	R	Y	L	<u>)(</u>	<u> </u>	Geotechnic Materials Engin		ST HOLE	No
Project					BOUNI		RUC	KC	LIM	BIN	G L	ANE	-		AH11-0 ²	<u>1</u>
Locatio Driller		-	42,3. To S		531,11		/lethc	od S	Solid	d St	em .	Auger	Elevatio Dates		m -10-16	
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	datio	Rines "n		Index operti		Classification	Descrip	otion		
	٥	Bag	- - -	- -	<u> </u>	(50)		(0) (0)	-	-		(SP-GP)	Asphalt Pavement compact moist brown (SAND (12mm diamete	r gravel)		
_	1												compact moist brown S GRAVEL (40mm diamo	SAND and eter gravel	0.76m	1
_	2	Bag	-	-		(0)	(0)	(100)	-	-	-	(ML)	stiff moist brown CLAY	EYSILT		
	3	Bag	-	-		(0)	(0)	(100)	-	-	-	(ML)	End of Borehole		3.05m	ո
-	4															
- -	5															
-	6															
-	7															
- _	8															
-																
-	9															
SAMPLE TYPE A - Auger C - Core D - Denison S - Split Spoo T - Shelby Tul V - Wash	n				U -	EAR S Uncor Field \ Lab Va Remo	ifined /ane			on		Q, R, S - C - DS - w _i , w _p -	Mechanical Analysis Triaxial Compression	PREPAR	2366 ED By: J/SK	

	Ministry of Tra	anspo	rtatio	n		<u>SI II</u>	\ <u>/</u> IN	ΛΔ	LOG Geotechnical and Materials Engineering					No.		
														Materials Engineer	ing AH11-0 2	2
	Project					BOUNI		RUC	KC	LIM	BIN	G L	ANE	Etc. vita		
	Locatio Driller			142,2 To S		531,34		/letho	۰d (Solid	4 St	am	Auger	Elevation Dates	32.7m 2011-10-16	
	Dillie		Jea	100	, Ky								Augei	Dates	2011-10-10	П
	D. 307		/pe		Œ	Shear Strength (kPa)	Gra	datio	n %		Index		ion			ts
	Drilling Details	Œ	e T	onu	ery) ff	_			Pr	opert	ies	ficat	Description	n	Tes
	Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	hear	Gravel	Sand	Fines	w _L	W _P	w	Classification			Other Tests
		۵	Ö	՝	Ř	ช ช	ŋ	ίχ	证				Ö			0
	-		Bag	-	-		(15)	(85)	(0)	-	-	-	(SP-GP)	compact moist brown SAN	ID, some	1
	_	1												gravel (25mm diameter gra	aves)	
	-													stiff moist grey-brown CLA	1.52m YEY SILT,	7 1
	_	2	Bag	-	-		(0)	(10)	(90)	-	-	-	(ML)	some sand	1.83m	┦╶
		_	Pag				(0)	(OE)	(E)				(CD)	compact moist grey SAND gravel		
	-		Bag Bag	-	-		(0)	(95) (0)	(5) (80	-	- -	- -	(SP) (Pt)	soft moist brown PEAT, so	2.44m ome silt 2.74m	7 4
		3					` ′		Peat)						2.7411	'
		٦														
	_															
	_	4														
	_		Bag	-	-		(0)	(0)	(100)	-	-	-	(CL)	firm moist grey SILTY CLA	·Υ	
	_	5														-
	_															
	_	6	Bag	-	-		(0)	(0)	(100)	-	-	-	(CL)	End of Borehole	6.1m	니 -
	_													End of Boronoic		
	_	7														-
	_	8														-
-2-15	_															1
DT 12	_	9														
OT.G																
BC_M	-															
SUMMARY LOG 232 TO 264.GPJ BC_MOT.GDT 12-2-15							<u> </u>	<u> </u>	<u> </u>	<u> </u>					- N	
0 264	SAMPLE TYPE A - Auger						EAR S Uncor				n		М -	Mechanical Analysis	E No.	
232 T	C - Core D - Denison					F_v -	Field \Lab V	√ane					Q, R, S -	Triaxial Compression	12366 EPARED By:	
LOG	S - Split Spoor						Remo						DS -	Direct Shear Liquid, Plastic Limits	JJ/SK	
MARY	W - Wash	_											W -	Moisture Content		1
SUMI	Blowcount =	Stand	lard I	Penetra	ation T	est (AS	ΓM-15	586)		NC	TE:	Bracl	kets () d	enote Driller's estimate	SHEET 1 of	Т

	Ministry of Transportation SUMMARY I Project HWY 1 EASTBOUND TRUCK CLIMB Location N5,442,164/E531,404												<u> </u>		cal and TEST HOLE	No.
١														Materials Engir	neering AH11-0	3
١								RUC	KC	LIM	BIN	G L/	ANE	Et al		
١	Locatio Driller			To S		331,40		/lethc	nd S	Solid	d Sta	em .	Auger	Elevation Dates	2011-10-16	
ı	Dillici		Jea	100		_							Augei	Dates	2011-10-10	Т
١	Drilling		ype	٠,	Recovery (m)	Shear Strength (kPa)	Gra	datio	n %		Index		tion			sts
١	Drilling Details	(m)	le T	uno	very	gth (PI	opert	es	ifica	Descri	ption	Tes
١	Detaile	Depth (m)	Sample Type	Blowcount	eco	hear	Gravel	Sand	Fines	w _L	W _P	w	Classification			Other Tests
			S	В	~	တတ	9	ဟ	Ш	_	· ·		O			0
١																
١	=															-
١	_	1														_
١			Bag				(15)	(85)	(0)	_	_	_	(SP)			
١	_		Dag	_			(13)	(00)	(0)		_	_	(31)	compact moist brown gravel (20mm diamete	SAND, some	-
١	_	2												graver (20111111 diamete	r graveis)	_
١		_														
١	_															-
١	_	3														
١															3.2n	n
١														firm moist grey SILTY	CLAY, some	-
١	_	4												sand	0 = 2, 1.1, 000	
١		7	Bag	-	-		(0)	(10) (75)	(90) (25)	-	-	-	(CL) (SP-SC)	Jacob to compact wat	4.27n	<u>n</u>
١	-							(- /					(3P-30)	loose to compact wet g SAND	4.57n	<u> </u>
١		5														
١		5														
١	_		Bag				(0)	(0)	(100)	_		_	(CL)	firm moist grey SILTY	CLAY	-
١			Dag	_			(0)	(0)	(100)		_	_	(OL)			
١	_	6													6.25n	┙┐
١	=															-
١		_												compact to dense wet trace gravel (13mm dia		
١		7	Bag	-	-		(5)	(95)	(0)	-	-	-	(SP)	adoc graver (Torrini die	,	
	=														7.47n	4
		,												compost wet CAA	ID com = =:#	
		8												compact wet grey SAN	ND, SOME SIIT	
15	Bag (0)							(15) (0)	(85) (100)	-	-	-	(SC)		8.53n	ᆈ -
12-2-							(0)	(0)	(100)				(OL)	stiff moist grey SILTY	CLAY	
T.GDT		9												End of Borehole	9.14n	┩╡
MO	-															-
232 TO 264.GPJ BC_MOT.GDT 12-2-15																
264.G	SAMPLE TYPE	<u> </u>		•					NGTH			•		TESTS	FILE No.	
32 TO	A - Auger C - Core					F_{v} -	Field \	/ane	Comp	ressio	n		Q, R, S -	Mechanical Analysis Triaxial Compression	12366	
	D - Denison S - Split Spoor						Lab V Remo						DS -	Consolidation Direct Shear	PREPARED By:	
ARY LI	T - Shelby Tul W - Wash	oe											W _L , W _P -	Liquid, Plastic Limits Moisture Content	JJ/SK	
SUMMARY LOG	Blowcount =	Stand	lard F	Penetra	ation T	est (AS	ΓM-15	586)		NC	OTE: I	Brack	kets () d	enote Driller's estimate	SHEET 1 of	1

	Ministry of Tra	anspo	rtatio	n		<u>SI II</u>	\ <u>/</u> IN	// _	\R	Y LOG				Geotechnical and TEST HOLE No Materials Engineering		No.
١		_												Materials Engir	neering AH11-0	4
١	Project					BOUNI		RUC	KC	LIM	BIN	G L	ANE			-
١	Locatio					531,46		4 - 41	(امد	4 Ct	om.	Vitaor	Elevation		
١	Driller	•	<u> </u>	To S	Ky			/lethc		SOIIC	3 30	em z	Auger	Dates	2011-10-16	\top
١			g B		Ê	Shear Strength (kPa)	Gra	datio	n %		Index	(LO C			ر س
١	Drilling	(E)	Sample Type	ůnt	Recovery (m)	는 왕				Pr	opert	ies	Classification	Descri	ption	Other Tests
١	Details	Depth (m)	nple	Blowcount	ŏ	sar	Gravel	рı	Se				ssifi		F *****	er J
١		Dep	Sar	Bo	Re	She	Grã	Sand	Fines	W _L	W _P	W	Cla			₽
١														Asphalt Pavement	0.13n	n,
١	=															
١																
١	_	1	Bag	_	_		(15)	(85)	(0)	_	_	_	(SP)	compact moist brown gravel (25mm diamete	SAND, some r gravels)	-
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١	-														4.00	-
١		2												stiff moist grey-brown s	1.83n SILT and	7 1
١			Bag	-	-		(0)	(45)	(55)	-	-	-	(SC-CL)	SAND	2.13n	<u>n</u>
١	-		Bag	_	_		(0)	(30)	(70)	_	_	_	(SC-ML)	compact to dense moi	st grey-brown	-
١			Dug				(0)	(30)	(10)				(OO-IVIL)	SILTY SAND		
١	_	3													3.05n	<u>n</u> –
١	_															
١																
١	_	4	Bag		_		(0)	(95)	(5)			_	(SP)	compact to dense moi	st grey-brown	-
١			Бау	-	-		(0)	(93)	(5)	-	-	-	(3F)	SAND, trace silt		
١	=															
١	_	5														
١		3					(10	(0)	(90)				(CL)	stiff moist grey-brown S	5.18n SILTY CLAY, <u>5.33n</u>	
١	-						Peat)							trace peat		7 -
١																
١		6												stiff moist grey SILTY (CLAY	
١	_															
١							(0)	(0)	(400)				(01.)			
١		7	Bag	-	-		(0)	(0)	(100)	-	-	-	(CL)	End of Borehole	7.01n	<u>n</u> _
١														Life of Boronolo		
١	=															1
١	_	8														
-15	=															-
12-2		_														
.GDT	_	9														
MO	_															
J BC																
232 TO 264.GPJ BC_MOT.GDT 12-2-15	SAMPLE TYPE	 <u>=</u>				LSH	EAR S	L STREN	I NGTH	kPa	<u> </u>	<u> </u>		<u>TESTS</u>	FILE No.	1
TO 2	A - Auger	_				U -	Uncor	nfined			n			Mechanical Analysis	12366	
3 232	C - Core D - Denison	_				L _v -	Field \Lab V	ane				,	C -	Triaxial Compression Consolidation	PREPARED By:	
7 LOG	S - Split Spoor T - Shelby Tub	n oe				К-	Remo	uided					W _L , W _P -	Direct Shear Liquid, Plastic Limits	JJ/SK	
SUMMARY LOG	W - Wash													Moisture Content	SHEET 1 of	1
SUM	Blowcount = 3	Stand	lard I	Penetra	ation T	est (AS	ΓM-15	586)		NC	TE:	Brack	kets () d	enote Driller's estimate	OTILL I OF	1

Ministry of Tra					SUI								Geotechnic Materials Engin	eering Al	HOLE 111-0	
Project Location Driller	n I	N5,4		76/E	531,55	1	/lethc					Auger	Elevation Dates	on 40.0m 2011-1	0-16	
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel Gra	datio	n %		Index opert w _P		Classification	Descri	otion		F : - 1
-		Bag	-	-		(40)	(60)	(0)	-	-	-	(SP-GP)	Asphalt Pavement compact moist brown GRAVEL (25mm diam		0.08m 0.15m	1
-	1	Bag	-	-		(10)	(90)	(0)	-	-	-	(SP)	compact moist brown s gravel (25mm diamete			
_	2															
_	3	Bag	-	-		(0)	(90)	(10)	-	-	-	(SM-SP)	compact moist brown silt End of Borehole	SAND, some	2.59m 3.05m	1
-	4															
-	5															
-	6															
-	7															
	8															
-	9															
SAMPLE TYPE A - Auger C - Core D - Denison S - Split Spoor T - Shelby Tub W - Wash	1				U - F _v - L _v -	EAR S Uncon Field \ Lab Va Remo	ifined /ane ane			on		Q, R, S - C - DS - w _I , w _P -	TESTS Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits Moisture Content	FILE No. 123 PREPARED JJ/S SHEET	Ву:	<u></u>

	Ministry of Tra	anspo	ortatio	n		SUI	\/IN	// /	\R	Υ	1 (7(Geotechnic		TEST HC	LE No.
	5			/ 4 F										Materials Engir	neering	AH11	-06
	Project Locatio					BOUNI 531,98		KUC	N C	LIIVI	DIN	G L	ANE	Elevatio	on 54	.4m	
	Driller			To S				Neth c	od 🕄	Soli	d St	em .	Auger			11-10-1	6
			be .		(E)	Shear Strength (kPa)	Gra	datio	n %		Index		no				S
	Drilling Details	(E)	e Ty	ount	ery (ft (x				Pr	ropert	ies	ficati	Descri	ption		Test
	Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	hear	Gravel	Sand	Fines	W _L	W _P	w	Classification				Other Tests
			Bag	<u>B</u>	<u> </u>	တ တ	(50)	(50)	(0)		 	-	(SP-GP)	Asphalt Pavement		10	08m
	_		bag				(00)	(00)	(0)				(SF-GF)	compact moist brown GRAVEL (25mm diam		and /Lo).2m -
		,	Bag	-	-		(5)	(95)	(0)	-	-	-	(SP)	compact moist brown	SAND,	trace	
		1												gravel (13mm diamete	r gravel)	
	-															1.	68m
	_	2	Bag	-	-		(0)	(25)	(75)	-	-	-	(ML)	stiff moist brown SANI	DY SILT	2.	13m -
	_													compact to dense moi	st arev-	hrown	
			Bag	-	-		(0)	(100)	(0)	-	-	-	(SP)	SAND	or groy		_
		3												End Of Borehole		3.	<u>05m</u> _
	_																-
		4															
		4															
	-																-
	_	5															-
	_	6															-
	-																-
	_	7															
		′															
	-																-
	_	8															-
12-2-15																	
GDT.	_	9															-
C_MOT	-																-
3PJ B(
232 TO 264.GPJ BC_MOT.GDT 12-2-15	SAMPLE TYPE A - Auger	Ī					EAR S Uncor				 on		М -	TESTS Mechanical Analysis	FILE N		
232 T						F _v - L _v -	Field \ Lab V	√ane ane	T				Q, R, S - C -	Triaxial Compression Consolidation	PREP	12366 ARED By:	
Y LOG	S - Split Spoor					R -	Remo	ulded					W_{l}, W_{p} -	Direct Shear Liquid, Plastic Limits		JJ/SK	
SUMMARY LOG	W - Wash	Cta	امتداا	70m c t :	otio= 7	Foot /ACT	TN 1 4 1	-06\		k 1/)TF:	Dr 1		Moisture Content	SHE	EET 1 (of 1
S	Blowcount = 3	Siano	iaiù l	enetr	aแบท l	est (AS	IVI-T	(טסט		IN(JIE:	DISC	keis () 0	lenote Driller's estimate			

Ministry of Tra	inspo	rtatio	n	•	SUI	M۱	ΛA	R	Y	L()(3	Geotechnic Materials Engin	al and TEST HOLE eering	
Project Location			1 E		BOUNI	D TF	RUC	KC	LIM	BIN	G L	ANE	Elevatio	AH11-06)A
Driller			To S			N	/letho	d S	Soli	d St	em .	Auger		2011-10-16	_
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Lines n %	Pr	Index	ies	Classification	Descrip	otion	H
	De	Sa	<u> </u>	- Re	Str	يَ	Sa	這	W _L	W _P	W	ర	Asphalt Pavement	0.2n	-
-		Bag/ Bag	-	-		(30)	(70) (95)	(0)	-	-	-	(SP-GP)	compact moist brown C SAND (25mm diameter compact moist brown S gravel (13mm diamter of	GRAVELLY 0.28n r gravel) GAND, trace 0.76n	m
_	1	Bag	-	-		(0)	(100)	(0)	-	-	-	(SP)	compact moist grey SA		n
_	2												End Of Borehole		
-	3														
-	4														
-	5														
-	6														
-	6														
-	7														
_	8														
_	9														
SAMPLE TYPE A - Auger C - Core D - Denison S - Split Spoor T - Shelby Tub W - Wash	1				U - F _v - L _v -	EAR S Uncor Field \ Lab Va Remo	nfined Vane ane			on		Q, R, S - C - DS - w _i , w _p -	Mechanical Analysis Triaxial Compression	FILE No. 12366 PREPARED By: JJ/SK SHEET 1 of	

Γ	Ministry of Tra	anspo	rtatio	n	(SUI	\ <u>/</u> IN	ΛΔ	\R	\overline{V}	Ι (7(<u> </u>	Geotechnic		ST HOLE	No.
ı														Materials Engir	neering	AH11-07	7
ı	Project					BOUNI		RUC	KC	LIM	BIN	G L	ANE	<u>-,</u>	_		
ı	Locatio Driller		•	To S		533,21		Metho	nd §	Solid	d St	em	Auger	Elevation Dates		-10-17	
H	Dille			100	ľ								Augei	Dates	2011	-10-17	Π
ı	Drilling		ype	.	Recovery (m)	Shear Strength (kPa)	Gra	datio	n %		Index opert		tion				gt
ı	Details	(m)	le T	nno	/ery	gth (PI	open	ies 	ifica	Descri	ption		Tes
ı	Botano	Depth (m)	Sample Type	Blowcount	eco	heal	Gravel	Sand	Fines	W _L	W _P	w	Classification				Other Tests
H			_	В		တ တ	-	_			<u> </u>			Asphalt Pavement		/ 0.08m	
ı			Bag	-	-		(40)	(60)	(0)	-	-	-	(SP-GP)	compact moist brown		0.23m	4
ı	_		Bag				(5)	(05)	(0)				(SP)	GRAVEL (25mm diam compact moist brown	SAND, trad	ce	-
ı	_	1	Бау	-	-		(5)	(95)	(0)	-	-	-	(3P)	gravel (13mm diamter	gravel)	0.91m	┨_
ı			Bag	-	-		(0)	(75)	(25)	-	-	-	(SM)				
ı	-																-
ı		2												compact moist to wet I	orown SIL	ΓΥ	_
ı		-												SAND			
ı																	-
ı																3.05m	
r	_															3.0311	-
ı	_																-
ı																	
ı	_	4															-
ı	_								-								
ı																	
ı	_	5															-
ı																	Ι.
ı																	
ı	_	6															-
ı																	
ı	_																-
ı	_	7															-
ı																	
ı	-																-
ı	_	8															_
2-15	-																-
T 12-;		9															_
T.GD																	
O W	-																-
PJ B																	
Ō.	SAMPLE TYPE						EAR S							TESTS	FILE No.		
32 10						F_v -	Uncor Field	√ane	Comp	ressio	on		Q, R, S -	Mechanical Analysis Triaxial Compression		2366	
06 2	D - Denison B - Split Spoo					L _v - R -	Lab V Remo	ane ulded					DS -	Consolidation Direct Shear	PREPAR	•	
N Y L	Γ - Shelby Tul V - Wash	be												Liquid, Plastic Limits Moisture Content	J	J/SK	
SUMMARY LOG	Blowcount =	Stand	lard F	Penetra	ation T	est (AST	ΓM-1	586)		NO	OTE:	Bracl	kets () d	enote Driller's estimate	SHEE	T 1 of	1

Ministry of Tra	anspo	rtatio	n	,	SUI	MIN	ΛA	R	Y	L)C	3	Geotechnica Materials Engine	al and TEST Feering	HOLE
Project					BOUNI	D TF	RUC	КC	LIM	BIN	G L	ANE	Ţ.	AH1	1-07
Location Driller			Stake To S			N	/lethc	od S	Soli	d St	em .	Auger	Elevatior Dates	1 2011-10	-17
2)a)		datio			Index			2 5.05		
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	Pr	opert	ies w	Classification	Descrip	tion	
				<u>ır</u>	000	(40)	(60)					(SP-GP)	Asphalt Pavement	AND	0.18m
-		Bag	-	-		(5)	(95)	(0)	-	-	-	(SP-GP)	GRAVEL (50mm diame compact moist brown S gravel (13mm diamter g	ter gravel) AND, trace ravel)	0.41m 0.76m
_	1	Bag	-	-		(5)	(80)	(15)	-	-	-	(SM)	compact moist brown S sand, trace gravel (25m gravel)	AND, some	1.52m
_	2												End of Borehole		
-	_														
	3														
-	4														
-	-														
	5														
_	6														
-	_														
	7														
-	8														
-	9														
CAMPLE TYPE	-				011)TD:-	ICT: :	kD-				TESTS	FILE No.	
C - Core D - Denison S - Split Spoor T - Shelby Tub	1				U - F _v -	Field \	nfined Vane			on		Q, R, S - C - DS - w _I , w _P -	Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits	1236 PREPARED E	Ву:
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$															

ſ	Ministry of Tra	anspo	rtatio	n		SUI	\1\	1/	\R	V	Ι (70	<u> </u>			EST HOLE	No.
١														Materials Engir	eering	AH11-08	3
١	Project					BOUNI		RUC	KC	LIM	BIN	G L	ANE	- 1	CE.		
١	Locatio Driller			To S		533,64		Metho	nd 9	Soli	d St	em	Auger	Elevation Dates		1-10-17	
ŀ	Dillici	<u> </u>	l	100		_							Auger	Dates	201	1-10-17	
١	Drilling		ype	.	Œ	кРа	Gra	datio	n %		Index		tion				şţ
١	Drilling Details	(m)	le T	nno	/ery	gth (PI	opert	ies 	ifica	Descri	ption		Tes
١	Botano	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	w _L	W _P	w	Classification				Other Tests
ŀ				<u> </u>		တတ	-	-			<u> </u>			Asphalt Pavement		△ 0.1m	
١			Bag	-	-		(50)	(50)	(0)	-	-	-	(SP-GP)	compact moist brown		1d 0.46m	1
١	_													GRAVEL (75mm diam compact moist brown	SAND, tra	ace] -
١	_	1	Bag	-	-		(5)	(95)	(0)	-	-	-	(SP)	gravel (13mm diamete compact moist brown		0.91m	<u> </u> _
ı														sand, trace gravel (113			
ı	_		Bag	-	-		(5)	(85)	(10)	-	-	-	(SP-SM)	gravel)		1.68m	1 -
ı	_	2															_
ı	compact mo													compact moist brown	SVND		
١														Compact moist brown	SAND		-
١		2	Bag	-	_		(0)	(100)	(0)	_	-	_	(SP)			3.05m	_
ľ														End of Borehole		0.00.	
١	_																-
١		,															
١	_	4															-
١	_																-
١																	
١	_	5															-
١	_																_
١																	
١	_	6															-
ı	_																_
ı																	
١	_	7															-
١																	
١	_																
	_	8															-
-2-15	_																-
DT 12	_	9															-
OT.G																	
Ğ BC	_																-
GPJ L																	
232 TO 264.GPJ BC_MOT.GDT 12-2-15	SAMPLE TYPE A - Auger						EAR S Uncor				on		М -	TESTS Mechanical Analysis	FILE No		
232 Tt	C - Core D - Denison					F_v -	Field \	√ane		. 50010			Q, R, S -	Triaxial Compression Consolidation	PREPA	12366 RED By:	
00	S - Split Spoor T - Shelby Tul					R -	Remo	ulded					DS -	Direct Shear Liquid, Plastic Limits		JJ/SK	
SUMMARY LOG	W - Wash													Moisture Content			4
SUMI	Blowcount =	Stanc	lard F	Penetra	ation T	est (AS	ΓM-1	586)		NO	OTE:	Brac	kets () d	enote Driller's estimate	SHE	ET 1 of	1

	Ministry of Tra	anspo	rtatio	n		SUI	<u>///</u>	ΛΔ	R	Y	1 (7(<u> </u>		and TEST HOLE	E No.
														Materials Engine	ering AH11-()9
	Project Locatio					BOUNI 534,07		KUC	KC	LIIVI	RIN	G L	ANE	Elevation	83.1m	
	Driller			To S		JJ-1,0 <i>1</i>		Netho	od (Soli	d St	em	Auger		2011-10-17	
						- F		datio			Index					
	Drilling		ype	+	(E)	(K Pa	Gie	ıualio	11 /0		opert		ıtion			sts
	Details	ш) ц	ole T	cour	ver)	r igth	<u> </u>	_			ı) jijič	Descript	ion	Ę
		Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	W _L	W _P	w	Classification			Other Tests
						0,0,							(SP-GP)	Asphalt Pavement	Q 13	m
	_		Bag	_	-		(50)	(30)	(0)	-	-	-	(SP-GP)	compact moist brown SA GRAVEL (38mm diamet	AND and 0.33	m -
			Bag	-	-		(0)	(100)	(0)	-	-	-	(SP)	compact moist brown SA	AND 0.76	m
	_	1														-
			Bag				(0)	(400)	(0)				(CD)			
			Бау	-	-		(0)	(100)	(0)	-	-	-	(SP)			
	_	2												compact to dense moist	grey SAND	-
						-										
	_	3_	Bag	End of Borehole	3.05	<u>m</u> _										
				Life of Borenole												
	_					-										
	_	4														-
	_															-
	_	5														-
	_															-
	_	6														_
	_															-
	_	7														_
	-															-
	_	8														_
2-15	_															-
T 12-	_	9														_
OT.GD																
3C_MC	-															-
GPJ E																
J 264.	SAMPLE TYPE A - Auger							STREN ofined		<u>kPa</u> oressio	on		М -	TESTS F Mechanical Analysis	ILE No.	
232 T	C - Core D - Denison					F _v - L _v -	Field \	√ane					Q, R, S -	Triaxial Compression	12366 PREPARED By:	
L0G	S - Split Spoor	n be				Ř-	Remo	ulded					DS -	Direct Shear Liquid, Plastic Limits	JJ/SK	
SUMMARY LOG 232 TO 264.GPJ BC_MOT.GDT 12-2-15	W - Wash													Moisture Content		4
SUMI	Blowcount =	Stanc	lard F	Penetra	ation T	est (AST	ΓM-1	586)		NC	DTE:	Brac	kets () d	enote Driller's estimate	SHEET 1 of	1

	Ministry of Tra	anspo	rtatio	n		SUI	<u>///</u>	ΛΔ	R	\overline{Y}	Ι (7(<u> </u>		cal and TEST HOLE	E No.
١														Materials Engir	neering AH11-1	10
١	Project					BOUNI		RUC	KC	LIM	BING	G L	ANE	El. at		
١	Locatio Driller			To S		533,81		/letho	d S	Solid	l Sta	am /	Auger	Elevation Dates	2011-10-18	
ł	Dille		Jea	100	ky 								Augei	Dates	2011-10-10	Т
١	D 300		/pe		(m)	Shear Strength (kPa)	Gra	datio	n %		Index 		ion			ts
١	Drilling Details	(m)	le T	ouni	ery	th (_			Pro	operti	es	ficat	Descri	iption	Tes
١	Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	near reng	Gravel	Sand	Fines	W _L	W _P	w	Classification			Other Tests
ļ		۵	Š	B	ď	क्र क्र	Ō	Š	证	W.	WP	•••	_	Tongoil/Maga		
١													(TS)	Topsoil/Moss	0.03	m
١	=															-
١		1														
١		,	D				(0)	(400)	(0)				(OD)			
١	-		Bag	-	-		(0)	(100)	(0)	-	-	-	(SP)			-
١		2														
١																
Bag (SP)															-	
- 3 Bag (SP) - 4 Bag - (O) (100) (O) (SP)																
															-	
															-	
- 4 Bag (0) (100) (0) (SP) compact to dense moist brown SAND																
- 4 Bag (0) (100) (0) (SP) compact to dense moist brown																-
- 4 Bag (0) (100) (0) (SP) compact to dense moist brown SAND														ist brown		
١	Bag (0) (100) (0) (SP) compact to dens															
١	_	5														-
١																
١																
١		6	Bag	-	-		(0)	(100)	(0)	-	-	-	(SP)			-
١																
١	_															
١	_	7														_
١																
١	-		Bag	-	-		(0)	(100)	(0)	-	-	-	(SP)			-
١		8														_
١																
2-15	-															-
T 12-2		9	Bag	_	_		(0)	(100)	(0)	_	_		(SP)			
T.GD		9		_			(0)	(100)	(0)	_	_	_	(51)	End of Borehole	9.14	m
C_MO	-															-
3PJ B																
232 TO 264.GPJ BC_MOT.GDT 12-2-15	SAMPLE TYPE							TREN					B 4	TESTS Machanical Anglysis	FILE No.	
32 TO	A - Auger C - Core					F _v -	Field \	nfined Vane	COMP	1 ESSIO	11	(Q, R, S -	Mechanical Analysis Triaxial Compression	12366	
0G 2	D - Denison S - Split Spoor					L _v -	Lab V Remo	ane ulded					DS -	Consolidation Direct Shear	PREPARED By:	
4RY L	T - Shelby Tub W - Wash	ре											W _L , W _P -	Liquid, Plastic Limits Moisture Content	JJ/SK	
SUMMARY LOG	Blowcount = 3	Stand	ard F	Penetra	ation T	est (AST	M-15	586)		NC	TE: I	Brack	ets () d	enote Driller's estimate	SHEET 1 of	1

	Ministry of Tra	anspo	rtatio	n	(SUI	\	ΛΔ	R	V	1 (70	<u> </u>		cal and TEST HOL	E No.
														Materials Engir	neering AH11-	-11
	Project					BOUNI		RUC	K C	LIM	BIN	G L	ANE	Etc. at		
	Locatio Driller			To S		533,86		Netho	nd 9	Solid	d Sta	em.	Auger	Elevation Dates	on 60.5111 2011-10-18	ł
	Dilliei			100	l l	_							Augei	Dates	2011-10-10	<u>'</u>
	Drilling		ype	٠.	(E)	Shear Strength (kPa)	Gra	datio	n %		Index opert		tion			sts
	Details	(E)	le T	uno	very	gth (<u></u>			FI	open		ifica	Descr	iption	les Les
	2 0100	Depth (m)	Sample Type	Blowcount	Recovery (m)	hea	Gravel	Sand	Fines	W _L	W _P	w	Classification			Other Tests
			S	<u> </u>	<u>~</u>	တ တ	0	S	ш		·		(IS)	Topsoil/Moss	0.0	
													1.57	(open in the co		5111
	_															-
		1														_
			Bag	_	_		(0)	(100)	(0)	_	_	_	(SP)			
	-							(100)					(5.)			-
		2														_
		_														
																-
																_
	_															-
	-		Bag	-	-		(0)	(100)	(0)	-	-	-	(SP)	compact to dense mo	ist brown	-
		_												SAND		
		5														-
	-															-
							(0)	(400)	(0)				(OD)			
		6	Bag	-	-		(0)	(100)	(0)	-	-	-	(SP)			-
	-															_
	_	7														-
	_		Bag	_	_		(0)	(100)	(0)	_	_	_	(SP)			
								(100)					(5.)			
	_	8														
2-2-15	_															
DT 12		9	Bag	-	-		(0)	(100)	(0)	-	-	-	(SP)		9.1	4m –
10T.G														End Of Borehole	; -	
BC_N	_															-
.GPJ	044515	<u> </u>							107: 1						Ten e M-	
0 264	SAMPLE TYPE A - Auger	Ξ.				U -	Uncor			<u>kPa</u> pressio	n			TESTS Mechanical Analysis	FILE No. 12366	
232 T	C - Core D - Denison					F _v - L _v -	Field \	√ane	·				Q, R, S -	Triaxial Compression Consolidation	PREPARED By:	
LOG	S - Split Spoo T - Shelby Tul					Ř-	Remo	ulded					DS -	Direct Shear Liquid, Plastic Limits	JJ/SK	
SUMMARY LOG 232 TO 264.GPJ BC_MOT.GDT 12-2-15	W - Wash												W -	Moisture Content		f 1
SUMI	Blowcount =	Stanc	lard I	enetra	ation T	est (AST	ΓM-1	586)		NC	TE: I	Bracl	kets () d	enote Driller's estimate	SHEET 1 o	1 1

	Ministry of Tra	anspo	rtatio	n		SUI	<u>///</u>	ΛΔ	R	V	Ι (7(<u> </u>		cal and TEST HOLE	No.
														Materials Engir	neering AH11-1	2
	Project					BOUNI		RUC	KC	LIM	BIN	G L/	ANE	Etc. at		_
	Locatio Driller			140,60 To S		533,94		/letho	d S	Solid	d Sta	em .	Auger	Elevation Dates	on 82.2m 2011-10-18	
	Dilliel		Jea	100	ky 								Augei	Dates	2011-10-10	П
	D. 101		/pe		Œ	Shear Strength (kPa)	Gra	datio	n %		Index		ion			ts
	Drilling Details	(m)	le T	onul	ery	jth (_			Pr	opert	es	ficat	Descr	iption	Tes
	Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	near reng	Gravel	Sand	Fines	W _L	W _P	w	Classification			Other Tests
		ă	Š	B	ď	क्र क्र	Ō	Š	证	**[WP	•••	_	Tongoil/Maga	A	
													(18)	Topsoil/Moss		n
	=															
		1														
			Dan				(0)	(400)	(0)				(OD)			
	_		Bag	-	-		(0)	(100)	(0)	-	-	-	(SP)			
		١														
- 3 Bag (SP)															-	
- 4 Bag (0) (100) (0) (SP) compact to dense moist brown SAND																
	- 4 Bag (0) (100) (0) (SP) compact to dense moist															$ \neg $
															ist brown	
															ist brown	
	_	5														-
		6	Bag	-	-		(0)	(100)	(0)	-	-	-	(SP)			-
	_															11
		7														14
	=		Bag	-	-		(0)	(100)	(0)	-	-	-	(SP)			
	_	8														
-15	-															-
12-2			Pog				(0)	(400)	(0)				(CD)			
T.GD.T	_	9	Bag	-	-		(0)	(100)	(U)	-	-	-	(SP)	End Of Borehole	9.14r	끡
OW	-															
PJ B(
232 TO 264.GPJ BC_MOT.GDT 12-2-15	SAMPLE TYPE	<u> </u>						STREN				<u> </u>	_	<u>TESTS</u>	FILE No.	'
32 TO	A - Auger C - Core					F_{v} -	Field \	√ane	Comp	ressic	n		Q, R, S -	Mechanical Analysis Triaxial Compression	12366	
JG 23	D - Denison S - Split Spoor					L _v -	Lab V Remo	ane					C - DS -	Consolidation Direct Shear	PREPARED By:	
RY LC	T - Shelby Tul W - Wash												W ₁ , W _D -	Liquid, Plastic Limits Moisture Content	JJ/SK	
SUMMARY LOG	Blowcount =	Stand	lard [Denetra	ation T	est (AST	TN/L-11	5861		NIC)TF:	Brack		enote Driller's estimate	SHEET 1 of	1
S	ים אוואססטים –	otaliu	aru F	CHEU	auvii I	COL (MO I	IVIT I	,00)		INC	/ I L.	יםטור	icis () u	CHOIC DIMEI 9 COMMINDE		

	Ministry of Tra	anspo	rtatio	n		SUI	\ <u>/</u> IN	1/2	R	V	1 (7(<u> </u>		nd TEST HOLE	No.
				, ,										Materials Engineerii	ng AH11-1 :	3
	Project Locatio					BOUN 534,50		KUC	KC	LIIVI	RIN	G L	ANE	Elevation	85.6m	
	Driller			To S		JJ4,JU		/lethc	od (Soli	d St	em	Auger		2011-10-17	
					Ī	- F		datio			Index					
	Drilling		Sample Type	 	Recovery (m)	Shear Strength (kPa)	Oie	ıualio	11 /0		opert		Classification			sts
	Details	h (n	ple 7	coni	ver	r lgth	<u></u>	_	, ,		T) sific	Description	1	r Te
		Depth (m)	Sam	Blowcount	Seco	Shea	Gravel	Sand	Fines	W_L	W _P	w	Class			Other Tests
			Bag		 -	0,0,	(40)	(60)	(0)	_	_	_	(SP-GP)	Asphalt Pavement	∧ 0.1m	
	_		رويع				(13)	(,						compact moist brown SAN GRAVEL (25mm diameter		, ,
														compact to dense moist bro	0.0111	†
	_	1												SAND and GRAVEL (75mi	m	-
	_		Bag	-	-		(60)	(40)	(0)	-	-	-	(GP)	diameter cobbles)	1.52m	<u>l</u> .
	_	2												compact maint grov CAND	and	-
	_													compact moist grey SAND GRAVEL (100mm diamete	r cobbles)	
																-
		3	Bag	-	-		(65)	(35)	(0)	-	-	-	(GP)	End of Borehole	3.05m	ㅣ _
														End of Boronoic		
	_															
	_	4														-
																-
	_	5														-
	_															-
		6														-
	-															-
	_	7														-
	-															-
	_	8														-
2-2-15	_															-
DT 12		9														-
10T.G																
BC	-	-														-
4.GPJ		<u></u>)TDC.	ICT!	In -				TESTS FILL	E No.	
232 TO 264.GPJ BC_MOT.GDT 12-2-15	SAMPLE TYPE A - Auger	Ξ.				U -	EAR S Uncor	nfined			on			Mechanical Analysis	= NO. 12366	
232	C - Core D - Denison					L _v -	Field \Lab V	ane					C -	Triaxial Compression Consolidation PRI	EPARED By:	
Y LOG	S - Split Spoo T - Shelby Tul					R -	Remo	uided					WI, WP -	Direct Shear Liquid, Plastic Limits	JJ/SK	
SUMMARY LOG	W - Wash													Moisture Content S	HEET 1 of	1
S	Blowcount =	Stand	lard F	Penetra	ation T	est (AS	ΓM-15	586)		NC	DTE:	Brac	kets () d	enote Driller's estimate		-

	Ministry of Tra	anspo	rtatio	n		SUI	\/IN	// _	R	Υ	Ι (7(cal and TEST	HOLE N	10.
	Project		HW	/ 1 F.		BOUNI								Materials Engir	neering AH	111-14	
	Locatio					534,93					D •			Elevation	on 87.6m		
	Driller		Sea	To S	ky	ı	<u> </u>	/lethc	od \$	Soli	d St	em	Auger	Dates	2011-10)-17	
	Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)		datio			Index		Classification	Descri	ption		Other Tests
		Dept	Sam	Blow	Reco	Shea	Gravel	Sand	Fines	W _L	W _P	w	Class				Othe
	_		Bag	-	-		(50)	(50)	(0)	-	-	-	(SP-GP)	Asphalt Pavement compact moist brown GRAVEL (50mm diam		0.61m 0.61m	_
	_	1	Bag	-	_		_	-	_	-	-	-	(ML)	stiff moist grey-brown	CLAYEY SILT	1.07m	_
	-	i i	Bag	-	-		(0)	(20)	(80)	-	-	-	(ML)	very stiff moist brown S	SANDY SILT		_
	_	2												vory still moist brown c	JAND I OIL I	2.29m	_
	-	2	Bag	_	_		(0)	(5)	(95)	_	_	_	(ML)	very stiff moist grey-bro	own SILT,	3.05m	-
		3						()	,				, ,	End of Borehole		3.03111	
	_																-
	_	4															_
	_																-
	_	5															
	-																-
	_	6															_
	_																-
	_	7															
	_																-
	_	8															_
2-15	_																-
3DT 12-2	_	9															_
MOT.G	_																-
3PJ BC																	
232 TO 264.GPJ BC_MOT.GDT 12-2-15	SAMPLE TYPE A - Auger	፟			_	U -	EAR S	nfined			on	_		TESTS Mechanical Analysis	FILE No. 1236	 66	_
)G 232	C - Core D - Denison S - Split Spoor	n				F _v - L _v - R -	Field \\ Lab V Remo	vane ane ulded					С -	Triaxial Compression Consolidation Direct Shear	PREPARED I	Ву:	
SUMMARY LOG	T - Shelby Tul W - Wash	be				-		. , .					W_{l}, W_{P} -	Liquid, Plastic Limits Moisture Content	JJ/S		_
SUMM	Blowcount =	Stand	lard F	Penetra	ation T	est (AS	ΓM-1	586)		NC	DTE:	Brac	kets () d	enote Driller's estimate	SHEET '	1 of 1	1

	Ministry of Tra	anspo	rtatio	n		SUI	<u>///</u>	ΛΔ	R	Y	Ι (<u>)</u> (<u> </u>		cal and TES	ST HOLE N	۷o.
	Drainet			/ 1 E		BOUN								Materials Engir	eering	H11-14/	4
	Project Locatio			i i E Stake		BOUN	יו כ	100	ΚC		DIIN	GL	AINL	Elevation	on		
	Driller		Sea	To S	ky			/lethc	d S	Soli	d St	em	Auger	Dates	2011-	-10-17	
			g g		Ē	ра <u>)</u>	Gra	datio	n %		Index	(<u> </u>				
	Drilling	(E)	Tyl	unt	ery (r	th (K				Pr	opert	ies	icatic	Descri	ption		[ests
	Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines	W _L	W _P	w	Classification		•		Other Tests
		۵	Š	ă	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	रुं छ	Ō	Š	证	**[WP	, vv	ō	Asabalt Dayanant			ō
			Bag	-	-		(40)	(60)	(0)	-	-	-	(SP-GP)		SAND and	0.25m	
	_													GRAVEL (13mm diam	eter gravel)	0.61m	
	_	1												stiff moist brown SILT,	some sand		-
	_		Bag	-	-		(0)	(10)	(90)	-	-	-	(ML)	E. I. (Dl.		1.52m	_
														End of Borehole			
	_	2															_
	-					-											
	_	3					_										
	-					_											
	_	4				_											
	_																_
	_	5															_
	-																-
	_	6															_
	-																_
	_	7															_
	_																_
	_	8															
-15	-																-
.GPJ BC_MOT.GDT 12-2-15	_	9															_
OT.GD																	
BC_M	-																_
¥.GPJ	SAMPLE TYPE	 =				SH	EAR S	TRFN	IGTH	kPa				<u>TESTS</u>	FILE No.		
232 TO 264.	A - Auger C - Core	=				U -	Uncor Field \	fined			on			Mechanical Analysis Triaxial Compression		2366	
	D - Denison S - Split Spoor					L _v -	Lab Va Remo	ane					C - DS -	Consolidation Direct Shear	PREPARE	•	
SUMMARY LOG	T - Shelby Tub W - Wash												W _L , W _P -	Liquid, Plastic Limits Moisture Content		I/SK	_
SUMM	Blowcount = 3	Stanc	lard I	Penetra	ation T	est (AS	ΓM-15	586)		NO	OTE:	Brac	kets () d	enote Driller's estimate	SHEET	「 1 of 1	1

	Ministry of Tra	anspo	ortatio	n		SUI	<u>//</u> N	// _	R	V	1 (7(TEST HOL	E No.
														Materials Engir	eering	AH11-	15
	Project Locatio					BOUNI 535,36		RUC	KC	LIM	BIN	G L	ANE	Elevatio	., <u>20</u>).2m	
	Driller			To S		JJJ,JU		Metho	od \$	Soli	d St	em .	Auger)11-10-17	
						a)		adatio			Index						
	Drilling	ű.	Sample Type	ij	Recovery (m)	Shear Strength (kPa)					opert		Classification	Dagari	-4:		ests
	Details	Depth (m)	nple	Blowcount	ove	sar ength	Gravel	٩	Se			<u> </u>	ssific	Descri	puon		Other Tests
		Dep	Sar	Blo	Rec	She	Gra	Sand	Fines	W _L	W _P	W	Cla				Ð ∯
			Bag	-	-		(55)	(45)	(0)	-	-	-	(GP)	Asphalt Pavement compact moist brown	SAND a	and <u>0.36</u>	lmr Sm
	_		Bag	-	_		(0)	(100)	(0)	_	_	_	(SP)	GRAVEL (25mm diam compact moist brown	eter gra	ovel) 0.61	
	_	1												Compact more visual	07 12		_
	-		Bag	-	-		(0)	(0)	(100)	-	-	-	(CL)				-
	_	2												firm to stiff moist grey S	SILTYC	CLAY	-
	_																-
		3	Bag	-	-		(0)	(0)	(100)	-	-	-	(CL)	End of Borehole		3.05	<u>m</u> _
	_																.
	_	4															-
	-																-
		_															
	_	5															-
	-																-
	_	6															_
	-																-
	_	7															-
	_	8															-
2	-																-
12-2-1																	
GDT.	_	9															-
MOT	-																-
PJ BC																	
SUMMARY LOG 232 TO 264.GPJ BC_MOT.GDT 12-2-15	SAMPLE TYPE A - Auger				•			STREM offined			nn.		N.4	TESTS Mechanical Analysis	FILE N		
232 TC	C - Core D - Denison					F_v -	Field ' Lab V	Vane	JUIT	n 6991(J11		Q, R, S -	Triaxial Compression Consolidation	PRED	12366 ARED By:	
, 50J	S - Split Spoor						Remo						DS -	Direct Shear Liquid, Plastic Limits	I INEP	JJ/SK	
MARY	W - Wash												W -	Moisture Content	СПI	EET 1 of	F 1
SUM	Blowcount =	Stand	dard F	enetr	ation T	est (AS	ΓM-1	586)		NC	OTE:	Bracl	kets()d	enote Driller's estimate	JIII	1 01	

	Ministry of Tra	anspo	rtatio	n		SUI	<u>//N</u>	// /	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	V	1 (7	<u> </u>			TEST HOL	E No.
														Materials Engir	eering	AH11-	16
	Project Locatio					BOUNI 535,79		RUC	KC	LIM	BIN	G L	ANE	Elevatio	., Q ().8m	
	Driller			To S		JJJ, 1 J		Neth c	od \$	Soli	d St	em .	Auger) 11-10-17	
						a a		datio			Index						
	Drilling	<u>ج</u>	Sample Type	Ħ	Recovery (m)	A R R		I	, ₀		opert		Classification	_			sts
	Details	Depth (m)	ple -	Blowcount	over	ar ngth	<u>_</u>	 	ဟ		· 	Ι	sific	Descri	ption		Other Tests
		Dep	Sam	Blow	Rec	Shear Strength (kPa)	Gravel	Sand	Fines	W _L	W _P	w	Clas				Othe
			Bag	_	-		(55)	(45)	(0)	-	-	-	(GP)	Asphalt Pavement compact moist brown	CAND	∧0.1	m
	-													GRAVEL (50mm diam	eter gra	ariu avel) <u>0.51</u>	<u>m</u> .
			Bag	-	-		(0)	(10)	(90)	-	-	-	(ML)		/E\	_	
	_	1												stiff moist brown CLAY some sand	'EY SIL	Ι,	-
	-															1.68	m -
		2															\Box
		2												atiff maniat array CILTY	21.437		
	-													stiff moist grey SILTY	JLAY		-
	_	3	Bag	-	-		(0)	(0)	(100)	-	-	-	(CL)			3.05	im _
														End Of Borehole			
	_																-
	_	4															_
	-																-
	_	5															-
	_																-
	_	6															-
																	١.
	_	7															-
	_																.
	_	8															-
2	_																-
12-2-1																	
-GDT	_	9															-
MOT	-																-
PJ BC																	
SUMMARY LOG 232 TO 264.GPJ BC_MOT.GDT 12-2-15	SAMPLE TYPE				•		EAR S						N.A	TESTS Machanical Analysis	FILE N		
232 TO	A - Auger C - Core D - Denison					F_v -	Uncor Field \ Lab V	√ane	Comp	n essi(ווע		Q, R, S -	Mechanical Analysis Triaxial Compression Consolidation	DDED	12366 ARED By:	
LOG ;	S - Split Spool T - Shelby Tul						Remo						DS -	Direct Shear Liquid, Plastic Limits		JJ/SK	
MARY	W - Wash												W -	Moisture Content	eni		
SUMI	Blowcount =	Stanc	lard F	Penetr	ation 1	est (AS	ΓM-1	586)		NO	OTE:	Bracl	kets () d	enote Driller's estimate	ЭНІ	EET 1 of	1

	Ministry of Tra	anspo	rtatio	n	,	SUI	M	ΛA	\R	Y	L	<u>)(</u>	3	Geotechnio Materials Engir	I .	EST HOLI	E No.
	Project		HW	Y 1 F		BOUNI								Materials Erigii		AH11-	17
	Locatio					536,22		.00		v.	ווע			Elevation	on 92.1	m	
	Driller			To S				/letho	od S	Soli	d St	em	Auger	Dates	201	1-10-17	
) be		(m)	Shear Strength (kPa)	Gra	datio	n %		Index		ion				ပ္သ
	Drilling Details	(m)	le T)	ount	/ery	gth (I				Pr	opert	ies	ficat	Descri	ption		Test
	Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	hear	Gravel	Sand	Fines	W _L	W _P	w	Classification				Other Tests
				Δ.	+	တ တ	-		+	_				Asphalt Pavement		^ 0.1	_
			Bag	-	-		(60)	(40)	(0)	-	-	-	(GP)	compact moist brown GRAVEL, with cobble	SAND and	d	
	_													diameter gravel to 150	mm diame	eter 0.61	<u>m</u> -
	_	1	Bag	-	_		(0)	(10)	(90)	-	_	-	(ML)	cobbles)			-
	_																
														stiff moist brown CLAY	ΈΥ SILT,	trace	
	_	2												to some sand			-
	_																.
			Pag				(0)	(0)	(400)				(NAL.)				
		3	Bag	-	-		(0)	(0)	(100)	-	-	-	(ML)	End of Borehole		3.05	<u>m</u> –
	_																-
	_	4															-
	-																-
		_															
	_	5															-
	_																-
		6															
		6															-
	_																-
	_	7															_
		Ġ															
	=																-
	_	8															_
-2-15	=																-
DT 12	_	9															_
AOT.G																	
BC_N	_																-
4.GPJ	SAMPLE TYPE	 =			<u> </u>	<u> </u>	FAR S	L STRF1	NGTH	kPa		<u> </u>		<u>TESTS</u>	FILE No.		
TO 26	A - Auger C - Core	=				U -		nfined	Comp		on			Mechanical Analysis Triaxial Compression		12366	
G 232	D - Denison S - Split Spool	n				L _v -	Lab Va Remo	ane				,	C -	Consolidation Direct Shear	PREPAR	RED By:	
RY LO	T - Shelby Tul W - Wash						5.110						WI, WP -	Liquid, Plastic Limits Moisture Content	J	JJ/SK	
SUMMARY LOG 232 TO 264.GPJ BC_MOT.GDT 12-2-15	Blowcount =	Stand	lard I	Penetr	ation 1	Test (AST	ΓM-15	586)		NO	OTE:	Brack		enote Driller's estimate	SHEE	T 1 of	1

Willingtry Of Th	anspo	rtatio	n	(SUI	M۱	ΛA	\overline{R}	Y	L	<u>)</u> (3	Geotechnic Materials Engin	al and TES	
Project					BOUNI	D TF	RUC	КC	LIM	BIN	G L/	ANE	_	A	H11-17
Location Driller			Stake To S			N	/letho	od \$	Soli	d St	em <i>i</i>	Auger	Elevation Dates	on 2011-	10-17
Drilling Details	(m)	Sample Type	ount	Recovery (m)	Shear Strength (kPa)		datio			Index opert		Classification	Descri	ption	
Details	Depth (m)	Samp	Blowcount	Recov	Shear	Gravel	Sand	Fines	WL	W _P	w	Classi	Asphalt Pavement		0.18m
-		Bag	-	-		(70)	(30)	(0)	-	-	-	(GP)	compact moist brown s GRAVEL, with cobbles	(63mm	0.46m
_	1												diameter gravel to 150 of cobbles) Refusal	mm diamete	r
_	2														
-	3														
-	4														
-	5														
-	6														
-	7														
-	8														
-	9														
-) 														
SAMPLE TYPI A - Auger C - Core D - Denison S - Split Spoo T - Shelby Tu V - Wash	n				U -	EAR S Uncor Field \ Lab Va Remo	fined /ane			<u>I</u> on	(Q, R, S - C - DS - w _I , w _P -	TESTS Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits Moisture Content	PREPAREI	366 D By: /SK

	поро	rtatio	OFI	•	SUI	M۱	ΛA	١R	Y	L(\mathcal{C}	3	Geotechnical and TE Materials Engineering		
Project Location					3OUNI 532,50		RUC	KC	LIM	BIN	G L	ANE	 Elevation 55.1	<u>TH11-0</u> ′ m	1
Driller			To S		,		/letho	d \	<u>Nas</u>	h R	otar	у	Dates 201 1	1-10-16	_
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Fines u		Index opert w _P		Classification	Description		
	_	0,			0,0,	J	,						Asphalt Pavement	^ 0.1m	2
-															
Oriving a	1														
rock (plug – sampler)		s	55	0.076		(60)	(40)	(0)	-	-	-	(GP)			
_	2														
-													very dense moist grey SAND and GRAVEL, with cobbles (25mm	t	
_	3	s	42	0		-	-	-	-	-	-	(GP)	diameter gravel, cobbles diamete unknown)	er	
-															
_	4														
-		s	47	0.102		(70)	(30)	(0)	_	_	-	(GP)			
_	5														
-														5.49n	
_	6	s	29	0.305		(20)	(80)	(0)	_	_	_	(SP)	CDAVELLY		
-				0.000		(20)	(00)	(0)				(6.)	compact moist grey GRAVELLY SAND		
_	7													7.01m	[
-															
	8	S	30	0.305		(0)	(100)	(0)	-	-	-	(SP)			
-	-												compact to dense moist brown SAND		
-	9	S	65	0.406		(0)	(100)	(0)	_	_	_	(SP)			
-														9.75m	1
SAMPLE TYPE A - Auger C - Core D - Denison S - Split Spoor T - Shelby Tub V - Wash	1				U - F _v - L _v -	Uncor Field \	ane) on		Q, R, S - C - DS - w _I , w _P -	Consolidation PREPAR Direct Shear	2366	_

Ministry of Tra	nspo	rtatio	n	(SUI	M۱	ΛA	R	Y	L	<u> </u>	3	Geotechnic Materials Engir	cal and TEST HOLE	N
Project	H	HW)	/ 1 E		BOUNI								Matchais Engli	TH11-0	1
Location					532,50		4 - 4l	\	Moo	h D	otor	.,	Elevation	on 55.1m 2011-10-16	
Driller		bea	To S				/letho			h Ro		<u>у</u>	Dates	2011-10-16	T
Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)		datio			Index opert		Classification	Descri	iption	
	Dep	Sam	Blow	Rec	She	Gravel	Sand	Fines	W _L	W _P	W	Clas			
-		S	>62	0		-	-	-	-	-	-	(GP)	very dense moist grey cobbles (cobbles diam (continued)	SAND, with neter unknown) _{1<u>0.67</u>r}	n
-	11												End of Borehole		
_	12														
-															
_	13														
_	14														
-	15														
-															
-	16														
-	17														
-	18														
-	19														
-															
SAMPLE TYPE A - Auger C - Core D - Denison S - Split Spoon T - Shelby Tub	ı				U - F _v - L _v -	Uncor Field \	√ane ane			on	(Q, R, S - C - DS - w, w _p -	TESTS Mechanical Analysis Triaxial Compression Consolidation Direct Shear Liquid, Plastic Limits	FILE No. 12366 PREPARED By: JJ/SK	
W - Wash Blowcount = S	Stond	ord [Ponotro	ation T	oct (ACT	-N/1 47	5061		NIC)TE+	Droo!		Moisture Content lenote Driller's estimate	SHEET 2 of	4

	Ministry of Tra	anspo	ortatio	n	(SUI	\overline{MN}	ΛA	R	Y	Ι (7	<u> </u>		cal and TEST	HOLE N	Ю.
	Droject	. 1	⊔\∧∧	V 1 E		BOUN								Materials Engir	Tł	 111-02	
	Project Locatio					532,78		NOC	ΝC		DIIN	G L	AINE	Elevation	on 54.5m		
	Driller			To S		,		/lethc	od \	Nas	h Ro	otar	у	Dates	2011-1	0-17	
			a a		(ر	a)	Gra	datio	n %		Index	(u				
	Drilling	<u>۔</u>	Sample Type	ţ	Recovery (m)	Shear Strength (kPa)		<u> </u>			opert		Classification	Descri	ntion		ests
	Details	Depth (m)	nple	Blowcount	ove	ar ength	Gravel	ַפַ	S				ssific	Descri	puori		Other Tests
		Dep	San	Bo	Rec	She	Gra	Sand	Fines	W _L	W _P	w	Cla				등
														Asphalt Pavement		0.15m	
	-																-
		1															
														dense moist grey-brow SAND (40mm diameter	/n GRAVELL\ er gravel)	′	
	-		s	49	0.305		(20)	(80)	(0)	-	-	-	(SP-GP)	,	,		-
		2														0.40	_
		_														2.13m	
	-																-
	_	3	s	24	0.205		(0)	(400)	(0)				(CD)				_
				21	0.305		(0)	(100)	(0)	-	-	-	(SP)				
	-																-
		4															_
	-		s	17	0.305		(0)	(100)	(0)	-	-	-	(SP)	compact moist grey S	AND		-
	_	5															_
	-																-
	_	6	s	44	0.254		(0)	(100)	(0)	_	_	-	(SP)				_
	-																-
	- Committee	7														7.16m	_
	Sampler Refusal - 1						(00)	(0.0)	(0)				(05, 05)				_
	Cobble found -		S 	95	0.229		(20)	(80)	(0)	-	-	-	(SP-GP)				
		8															_
10	_													very dense moist grey	GRAVELLY		_
12-2-1														SAND (50mm diameter			
GDT		9	s	67	0.254		(30)	(70)	(0)	_	_	_	(SP-GP)				-
MOT	-						\		` '								_
J BC																	
232 TO 264.GPJ BC_MOT.GDT 12-2-15	SAMPLE TYPE	<u> </u>		<u> </u>			EAR S				<u> </u>			<u>TESTS</u>	FILE No.		
32 TO 2	A - Auger C - Core					F_v -	Uncor Field \	√ane	Comp	ressio	n		Q, R, S -	Mechanical Analysis Triaxial Compression	123		
JG 23	D - Denison S - Split Spoo					L _v -	Lab V Remo	ane					C - DS -	Consolidation Direct Shear	PREPARED	•	
SUMMARY LOG	T - Shelby Tu W - Wash	be											W _L , W _P -	Liquid, Plastic Limits Moisture Content	JJ/S		
SUMM,	Blowcount =	Stanc	dard I	Penetr	ation T	est (AS	ΓM-15	586)		NC	DTE:	Bracl	kets () d	enote Driller's estimate	SHEET	1 of 2	

1	Ministry of Tra	anspo	rtatio	n	(SUI	<u> </u>	ΛΔ	R	V	1 (7(TEST HOLE	No.
	Drainet			/ 1 E		BOUNI								Materials Engir	neering	TH11-02	2
	Project Locatio					532,78		XUC	N C	LIIVI	DIIN	G L/	AINE	Elevation	on 54	.5m	
	Driller			To S		,		Netho	od \	Nas	h R	otar	у	Dates		11-10-17	
	Drilling Details	Depth (m)	Sample Type	Blowcount	Recovery (m)	Shear Strength (kPa)	Gravel	Sand	Rines n	l .	Index opert w _P		Classification	Descri	ption		Other Tests
			S		ľ	တ တ	0	S	ш				0			1 0 .06m	_
	_		s	46	0.356		(0)	(100)	(0)	-	-	-	(SP)	dense moist grey SAN	D	10.97m	-
	_	11												End of Borehole		10.07111	1 -
	- -	12															- - -
	_	13															_
		10															
	_																-
	_	14															_
	_																_
	_	15															-
	_																-
		16															
	_	10															-
	_																-
	_	17															_
	_																
	_	18															-
15	_																-
12-2-		10															
T.GD		19															
BC_MC	_																-
4.GPJ	SAMPLE TYPE					СП	END	STREN	ICTH	kPa				<u>TESTS</u>	FILE N	lo.	
SUMMARY LOG 232 TO 264.GPJ BC_MOT.GDT 12-2-15	A - Auger C - Core	=					Uncor	nfined			n		M -	Mechanical Analysis Triaxial Compression		1 2366	
G 232	D - Denison S - Split Spool	n				L _v - R -	Lab V Remo	ane ulded				,	С -	Consolidation Direct Shear	PREP	ARED By:	
ARY LC	T - Shelby Tul W - Wash	be											W_I, W_P	Liquid, Plastic Limits Moisture Content		JJ/SK	
SUMM	Blowcount =	Stand	lard I	Penetra	ation T	est (AST	ΓM-1	586)		NC	DTE:	Brack	kets () d	lenote Driller's estimate	SHI	EET 2 of	2



2010 EXP Test Hole and CPT Logs

Appendix A

Geotechnical Testhole Records

2010: AH10-1 though 10-4

2010: CPT10-1, 10-2, & 10-4BH10-01, AH10-02 through 10-05



Equipment: Truck mounted drill rig, piston Augerhole no. : AH10-1 sampler

Location: See Location Plan Method of sampling: ○ GRAB

Ground Surface Elevation : +25.5m (±) [Geodetic, approx.]

PISTON TUBE

(3.5")

Ground Water Elevation: Water not observed at time of drilling (at time of investigation)

(a	t tim	e of	inves	tigation)			
Depth (ft)	Depth (m)	SPT 'N'	symbol	Description	sample no.	moisture content %	Remarks
 	-0-		00	brown SAND & GRAVEL trace silt (FILL)	S1	7	Asphalt Thickness = 6" (±)
-	1			stiff grey CLAEY SILT occasional organics	S2	34	Hala assed in at 2.7m death
5-	_ ' _		0	v.stiff to stiff, mottled grey-rust CLAYEY SILT / SILTY CLAY	S3	33	Hole caved in at 2.7m depth
-	-2 - -3		0	-reduced mottling with depth, becomes grey -softens with depth	S4	41	
10-]		0	firm to soft, blue-grey SILTY CLAY	S5	58	
- 15-	 4 		0		S6	76	
- - -	<u>-</u> 5				0.7	F.4	
20-	-6 -		0		S7	54	
-	7		0		S8	50	
25- - -	-8						
30-	- 9		0		S9	46	
	- 10			End of Hole @ 9.1m (30')			
35-	- - - 11						
- - -	- - - -12						
40-	<u></u>						
- -	—13 -						
45— - -	14						
- - 50-	15						
	_						

AECOM	*	TROW ASSO	CIATES INC.
PROPOSED CANADIAN PACIFIC RAILWAY	Augerhole No.	Logged by: MB	Date of Drilling: 2010-FEB-04
OVERPASS; 232 STREET, LANGLEY, B.C.	AH10-1	Sheet: 1 of 1	Dwg No. 091-02125-AH1



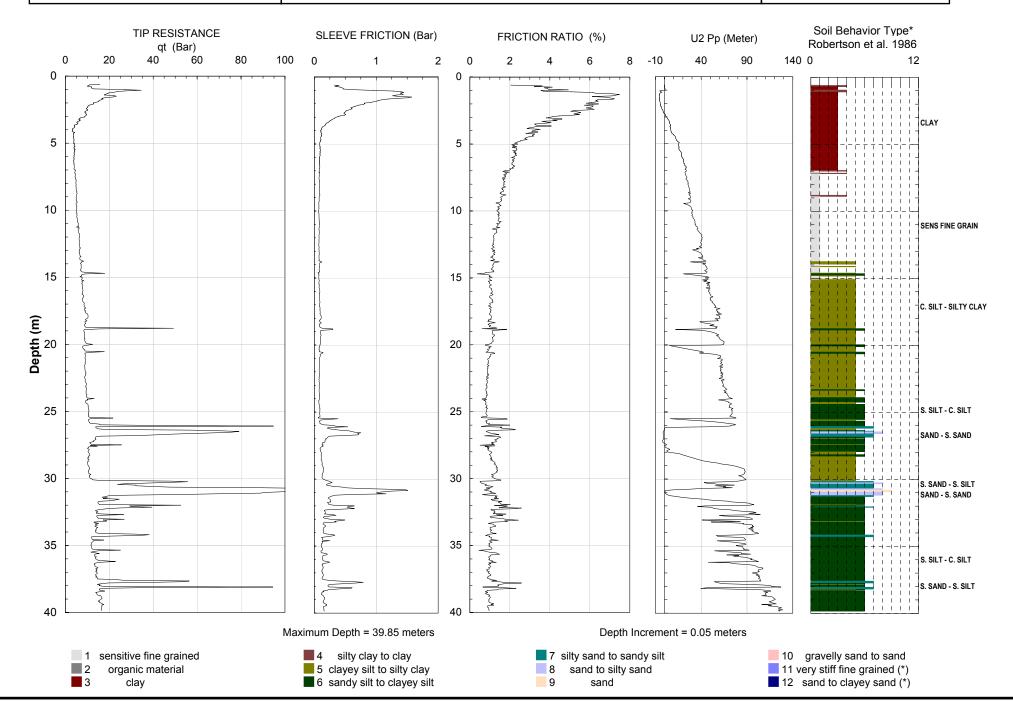
Operator: Dynamic Drilling Inc.

Sounding: CPT10 - 1 Cone ID: HT1094 10 Ton Site: 232nd Street Grade Separation

Date: February 3, 2010

Trow Project No: 091 - 02125





Equipment: Truck mounted drill rig, piston Augerhole no. : AH10-2

sampler

Location: See Location Plan Method of sampling: OGRAB

Ground Surface Elevation: +24.5m (±) [Geodetic, approx.]

PISTON TUBE

(3.5")

Ground Water Elevation: Water not observed at time of drilling

(at tii	ne of	inves	stigation)	,		
bepth (ft)	SPT 'N'	symbol	Description	sample no.	moisture content %	Remarks
00-			brown SAND & GRAVEL trace silt (FILL)			Asphalt Thickness = 3" (±)
		0	stiff grey CLAEY SILT occasional organics v.stiff to stiff, mottled grey-rust CLAYEY SILT / SILTY CLAY	S10	33	
10-3			-reduced mottling with depth, becomes grey -softens with depth			Consolidation Test Limits: L(w) = 54% P(w) = 22%
		0	firm to soft, blue-grey SILTY CLAY	S11	50	
15—		0		S12	47	
-5 -						Consolidation Test Limits: L(w) = 35% P(w) = 16%
20-6						
25— 25— 3—8		0		S13	42	
30-9		0	-small sand pocket @8.8m depth	S14	51	
35 - 10			-occasional small sand pockets below 10m depth			Consolidation Test Limits: L(w) = 39% P(w) = 17%
40 - 12		0	-occasional black horizons visible within silty clay material	S15	44	
45 — 14 ——14 ——15			End of Hole @ 14.3m (47')			Consolidation Test Limits: L(w) = 38% P(w) = 13%

AECOM	*	TROW ASSO	CIATES INC.
PROPOSED CANADIAN PACIFIC RAILWAY	Augerhole No.	Logged by: MB	Date of Drilling: 2010-FEB-04
OVERPASS; 232 STREET, LANGLEY, B.C.	AH10-2	Sheet: 1 of 1	Dwg No. 091-02125-AH2



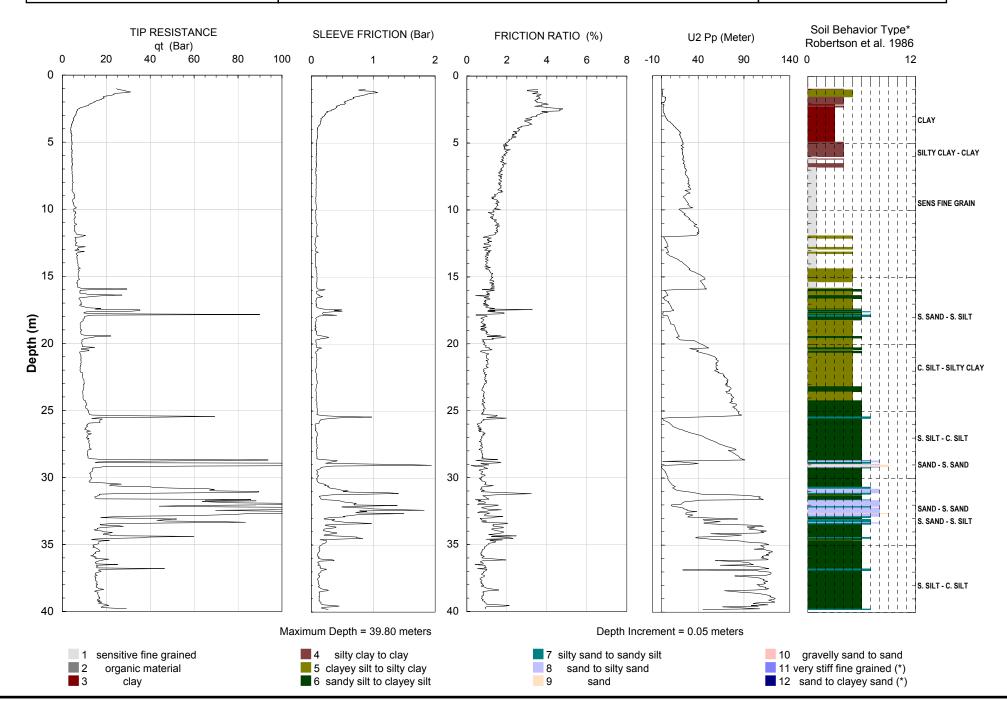
Operator: Dynamic Drilling Inc.

Sounding: CPT10 - 2 Cone ID: HT1094 10 Ton Site: 232nd Street Grade Separation

Trow Project No: 091 - 02125

Date: February 3, 2010





Augerhole no. : AH10-3 Equipment : Truck mounted drill rig, piston sampler

Location: See Location Plan

Method of sampling: OGRAB

Ground Surface Elevation : +23.7m (±) [Geodetic, approx.]

PISTON TUBE

(3.5")

Ground Water Elevation: Water not observed at time of drilling

(at time of investigation)

(at tim	ne of	inves	itigation)			
Depth (ft)	SPT 'N'	symbol	Description	sample no.	moisture content %	Remarks
00-			brown SAND & GRAVEL trace silt (FILL)			Asphalt Thickness = 3" (±)
5 - 1		0	stiff grey CLAEY SILT occasional organics v.stiff to stiff, mottled grey-rust CLAYEY SILT / SILTY CLAY	S16	36	
10-3		0	-reduced mottling with depth, becomes grey -softens with depth	S17	38	
 		0	firm to soft, blue-grey SILTY CLAY	S18	38	
20-6		0		S19	37	
		0		S20	43	
25—		0	-occasional sand pockets below 7m	S21	25	
		0		S22	40	
309			End of Hole @ 9.1m (30')			
35-11						
40 - 12						
13						
45-14						
5015						

AECOM	TROW ASSOCIATES INC.					
PROPOSED CANADIAN PACIFIC RAILWAY	Augerhole No.	Logged by: MB	Date of Drilling: 2010-FEB-04			
OVERPASS; 232 STREET, LANGLEY, B.C.	AH10-3	Sheet: 1 of 1	Dwg No. 091-02125-AH3			

Augerhole no. : AH10-4 Equipment : Truck mounted drill rig, piston

sampler

Location: See Location Plan

Method of sampling:

GRAB

Ground Surface Elevation : +23.0m (±) [Geodetic, approx.]

PISTON TUBE

(3.5")

Ground Water Elevation: Water not observed at time of drilling

(at time of investigation)

(at tim	(at time of investigation)									
Depth (ft)	SPT 'N'	symbol	Description	sample no.	moisture content %	Remarks				
		0	0.15m of SAND & GRAVEL trace silt (FILL) underlain by stiff grey CLAEY SILT occasional organics	S23	33	Hole caved at 5.0m				
52		0	v.stiff to stiff, mottled grey-rust CLAYEY SILT / SILTY CLAY -reduced mottling with depth, becomes grey -softens with depth	S24	45					
		0	firm to soft, blue-grey SILTY CLAY	S25	48					
155		0		S26	44					
7		0		S27	35					
258		0	-occasional sand pockets below 8m	S28	30					
30 - 9			-irregular zones of SILTY material below 9m							
35— 11		0		S29	39					
40 - 12		0		S30	38					
13		0		S31	42					
45-14		0		S32	40					
50-15										

AECOM		TROW ASSOCIATES INC.					
PROPOSED CANADIAN PA	ROPOSED CANADIAN PACIFIC RAILWAY VERPASS; 232 STREET, LANGLEY, B.C.	Augerhole No.	Logged by: MB	Date of Drilling: 2010-FEB-04			
OVERPASS; 232 STREET, L		AH10-4	Sheet: 1 of 2	Dwg No. 091-02125-AH4			

Equipment: Truck mounted drill rig, piston Augerhole no. : AH10-4 sampler

Location: See Location Plan Method of sampling: ○ GRAB

Ground Surface Elevation : +23.0m (±) [Geodetic, approx.]

PISTON TUBE Water not observed at time of drilling

(3.5")

Ground Water Elevation : (at time of investigation)

(ut till	16 01	1111063	digation)			
5 Depth (ft) Depth (m)	SPT 'N'	symbol	Description	sample no.	moisture content %	Remarks
-50 - - -			firm to soft, blue-grey SILTY CLAY			
55 - 17		0	-occasional sand pockets -irregular zones of SILTY material	S33	39	
18		0		S34	38	
19			End of Hole @ 18.3m (60')			
65						
70 - 21						
75——23						
80 - 24						
— 25 —						
85—26						
9027						
95 - 29						
100—						

	AECOM	TROW ASSOCIATES INC.					
	PROPOSED CANADIAN PACIFIC RAILWAY OVERPASS; 232 STREET, LANGLEY, B.C.	Augerhole No.	Logged by: MB	Date of Drilling: 2010-FEB-04			
		AH10-4	Sheet: 2 of 2	Dwg No. 091-02125-AH4			



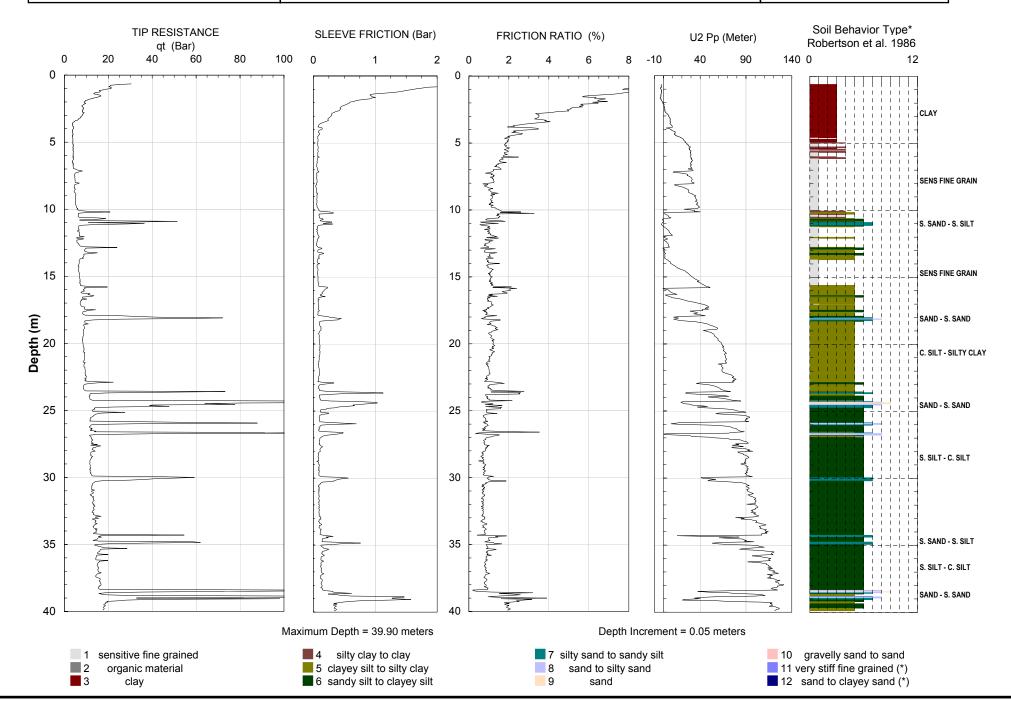
Operator: Dynamic Drilling Inc.

Sounding: CPT10 - 4 Cone ID: HT1094 10 Ton Site: 232nd Street Grade Separation

Date: February 3, 2010

Trow Project No: 091 - 02125





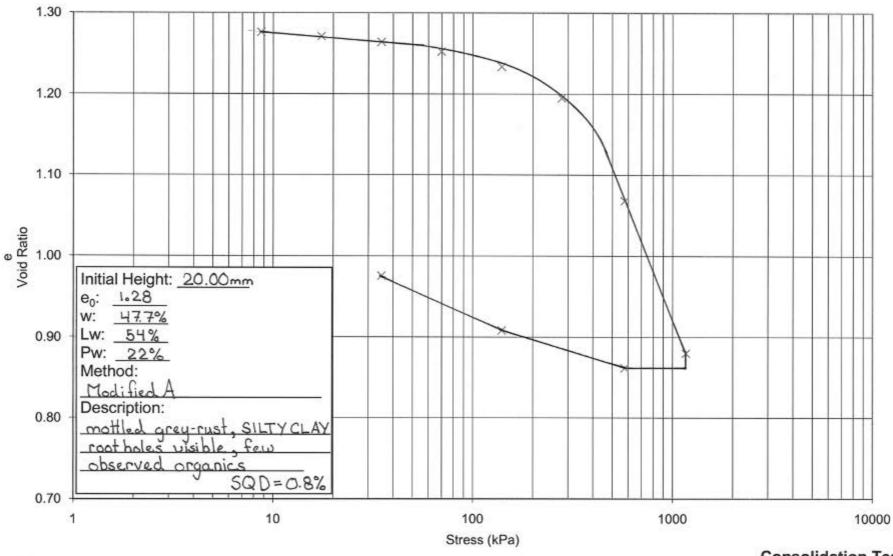


2010 EXP Laboratory Test Results

Appendix B

Consolidation Test Results





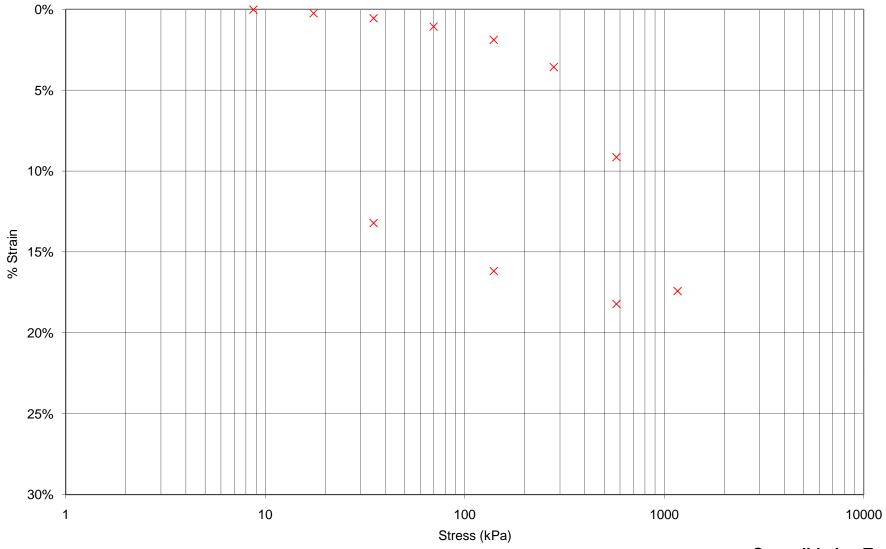


Consolidation Test e – log p Graph

Borehole: AH10-2 Sample: S1

Depth: 2.60m

Project #: 091-02125 Date: 2010-02-09



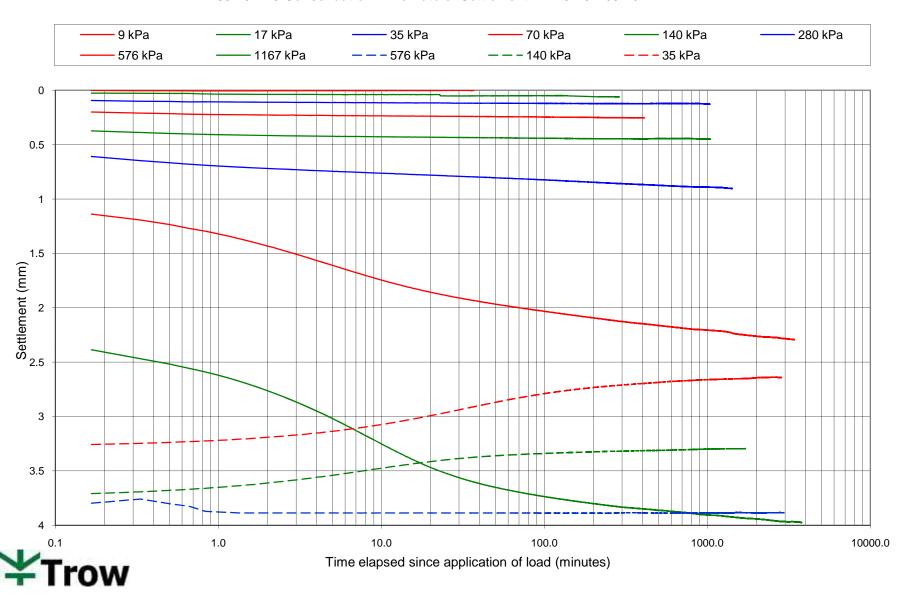


Consolidation Test % strain – log p Graph

Borehole: AH10-2 Sample: S1 Depth: 2.60m

Project #: 091-02125 Date: 2010-02-09

091-02125 Consolidation Time Rate of Settlement: AH10-2 / 2.60m / A



Sample Dimensions

			(Initial)	(End)					
H _o =	20 mm	Ring	65.27	65.27	g				
D _o =	63.5 mm	Soil+Ring (w)	178.06	171.32	g				
A =	31.67 cm ²	Soil+Ring (d)	141.78	141.78	g				
V _o =	63.34 cm ³	Water	36.28	29.54	g				
G _s =	2.75	Soil	76.51	76.51	g				
H _s =	8.79 mm	w(%)	47.4%	38.6%					
		Saturation		1.02					

Moisture Content of Cuttings

Tin	157.84	g
Tin+Soil (w)	285.77	g
Tin+Soil (d)	246.1	g
Water	39.67	g
Soil	88.26	g
w(%)	44.9%	

Total Load (kg)	Pressure (kPa)	Correction (mm)	Deformation (mm)	delta-H (mm)	Strain %	H (H _o - delta-H)	H-H _s	e (H-H _s)/H _s	t ₁₀₀ for e-log(p)	t ₉₀ for Cv	Cv (cm²/s)
			0	0	0.0%	20	11.21	1.28			
0.375	8.7309	0.0011	0.0066	0.01	0.0%	19.99445357	11.21	1.28	40		
0.75	17.4618	0.0011	0.0517	0.05	0.3%	19.94942069	11.16	1.27	40		
1.5	34.9236	0.0072	0.1187	0.11	0.6%	19.88847692	11.10	1.26	40	0.36	3.88E-02
3	69.8472	0.0261	0.2415	0.22	1.1%	19.78457647	11.00	1.25	40	1	1.38E-02
6	139.793	0.0577	0.4358	0.38	1.9%	19.62186667	10.84	1.23	40	0.7225	1.88E-02
12	279.585	0.0840	0.7981	0.71	3.6%	19.2859	10.50	1.20	40	1	1.31E-02
24	575.847	0.1145	1.9435	1.83	9.1%	18.1709875	9.39	1.07	40	6.76	1.73E-03
50	1167.39	0.1311	3.6150	3.48	17.4%	16.51612674	7.73	0.88	40	16	6.02E-04
24	575.847	0.1145	3.7591	3.64	18.2%	16.3553875	7.57	0.86			
6	139.793	0.0577	3.2938	3.24	16.2%	16.76386667	7.98	0.91			
1.5	34.9236	0.0072	2.6503	2.64	13.2%	17.35687692	8.57	0.98			



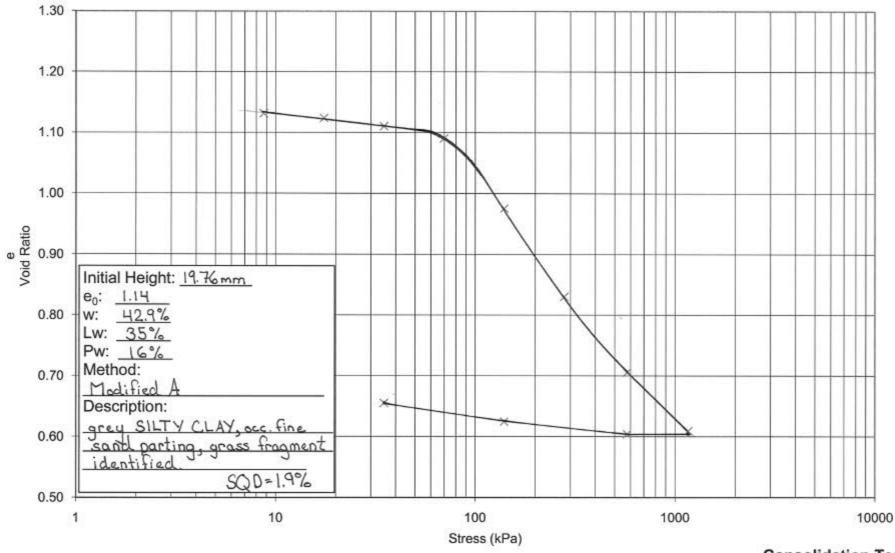
Project: 091-02125

Borehole: AH10-2 **Sample:** S1 **Depth:** 2.60m

Consolidometer: A Linear Voltmeter: J15487

Method: Modified A

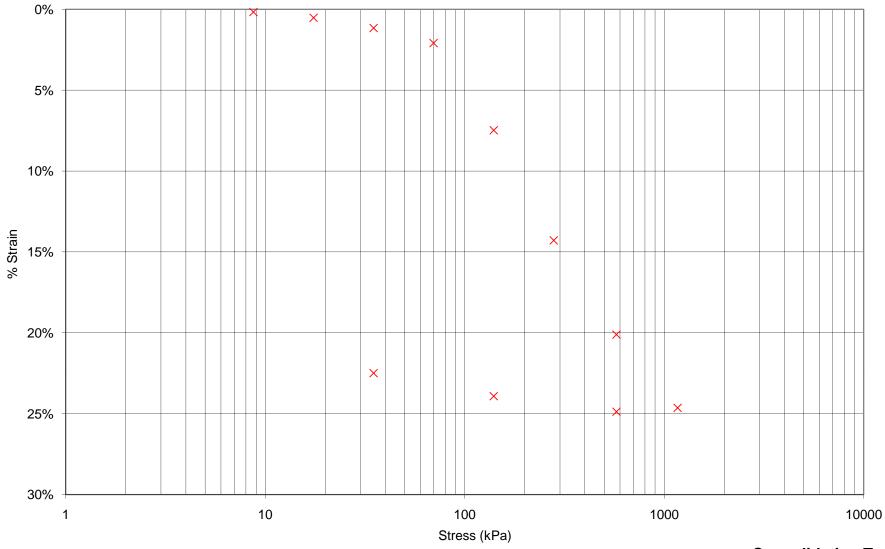
Comments:





Consolidation Test e – log p Graph

Borehole: AH10-2 Sample: S2 Depth: 5.35m Project #: 091-02125 Date: 2010-02-09



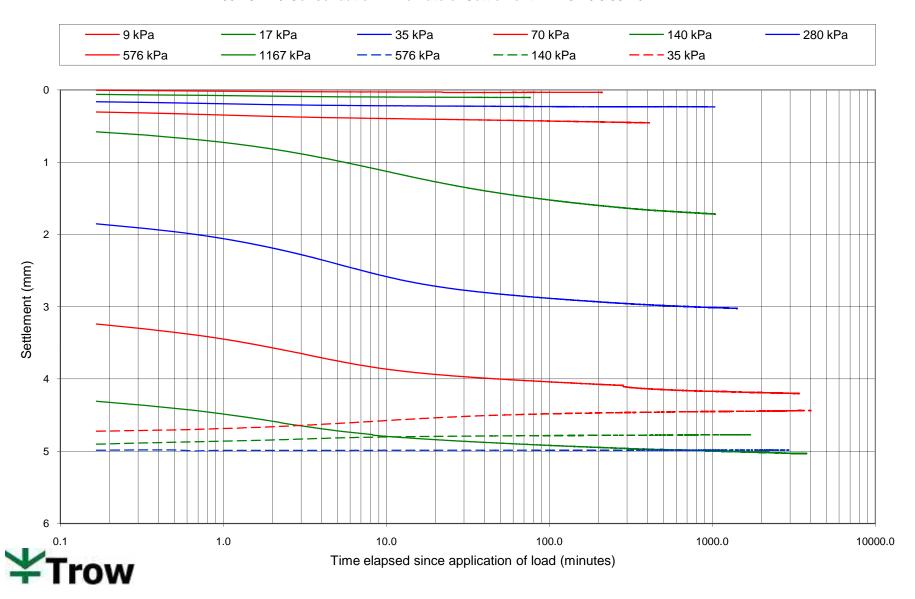


Consolidation Test % strain – log p Graph

Borehole: AH10-2 Sample: S2 Depth: 5.35m

Project #: 091-02125 Date: 2010-02-09

091-02125 Consolidation Time Rate of Settlement: AH10-2 / 5.35m / B



Sample Dimensions

			(Initial)	(End)	
H _o =	19.76 mm	Ring	65.29	65.29	g
D _o =	63.54 mm	Soil+Ring (w)	180.56	167.22	g
A =	31.71 cm ²	Soil+Ring (d)	145.97	145.97	g
V _o =	62.66 cm ³	Water	34.59	21.25	g
G _s =	2.75	Soil	80.68	80.68	g
H _s =	9.25 mm	w(%)	42.9%	26.3%	
		Saturation		1.04	

Moisture Content of Cuttings

Tin	148.45	g
Tin+Soil (w)	275.21	g
Tin+Soil (d)	229.23	g
Water	45.98	g
Soil	80.78	g
w(%)	56.9%	

Total Load (kg)	Pressure (kPa)	Correction (mm)	Deformation (mm)	delta-H (mm)	Strain %	H (H _o - delta-H)	H-H _s	e (H-H _s)/H _s	t ₁₀₀ for e-log(p)	t ₉₀ for Cv	Cv (cm²/s)
			0	0	0.0%	19.76	10.51	1.14			
0.375	8.7309	0.0005	0.034	0.03	0.2%	19.72652083	10.47	1.13	100		
0.75	17.4618	0.0010	0.1059	0.10	0.5%	19.65507931	10.40	1.12	100		
1.5	34.9236	0.0028	0.2315	0.23	1.2%	19.53125	10.28	1.11	100		
3	69.8472	0.0180	0.4306	0.41	2.1%	19.34738125	10.10	1.09	100	1	1.32E-02
6	139.793	0.0450	1.5241	1.48	7.5%	18.28092667	9.03	0.98	100	9	1.31E-03
12	279.585	0.0619	2.884	2.82	14.3%	16.93785	7.69	0.83	100	10.24	9.90E-04
24	575.847	0.0661	4.0402	3.97	20.1%	15.78590952	6.53	0.71	100	6.76	1.30E-03
50	1167.39	0.0509	4.9198	4.87	24.6%	14.89111081	5.64	0.61	100	6.25	1.25E-03
24	575.847	0.0661	4.9811	4.91	24.9%	14.84500952	5.59	0.60			
6	139.793	0.0450	4.7708	4.73	23.9%	15.03422667	5.78	0.62			
1.5	34.9236	0.0028	4.4465	4.44	22.5%	15.31625	6.06	0.66			



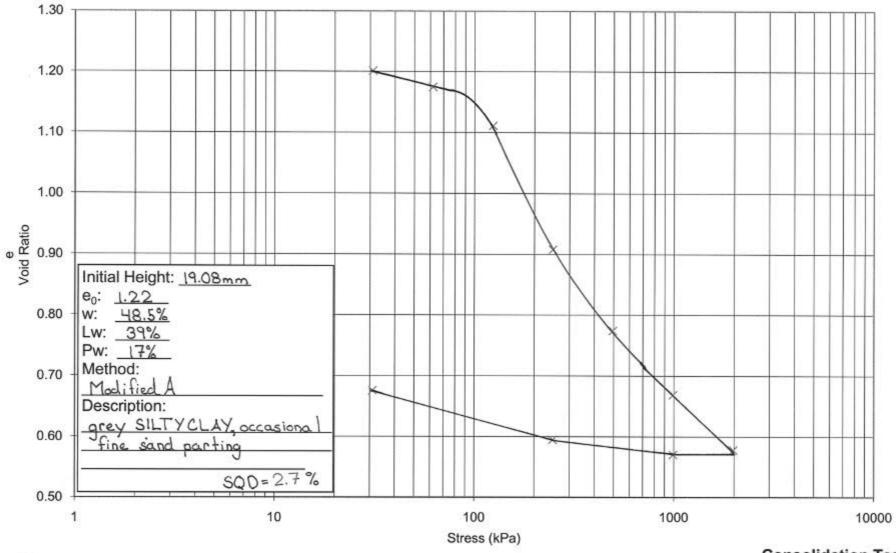
Project: 091-02125

Borehole: AH10-2 **Sample:** S2 **Depth:** 5.35m

Consolidometer: B Linear Voltmeter: J15192

Method: Modified A

Comments:

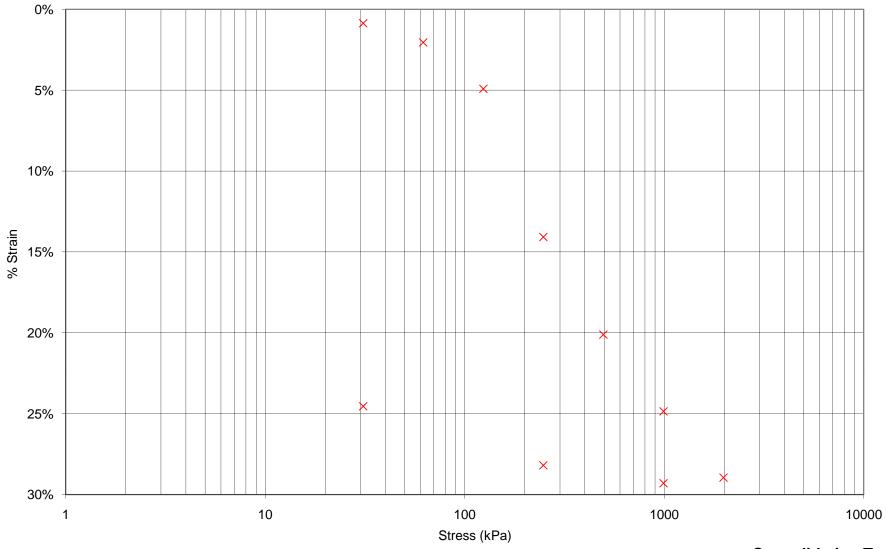




Consolidation Test e - log p Graph

Borehole: AH10-2 Sample: S3 Depth: 10.26m

Project #: 091-02125 Date: 2010-02-09



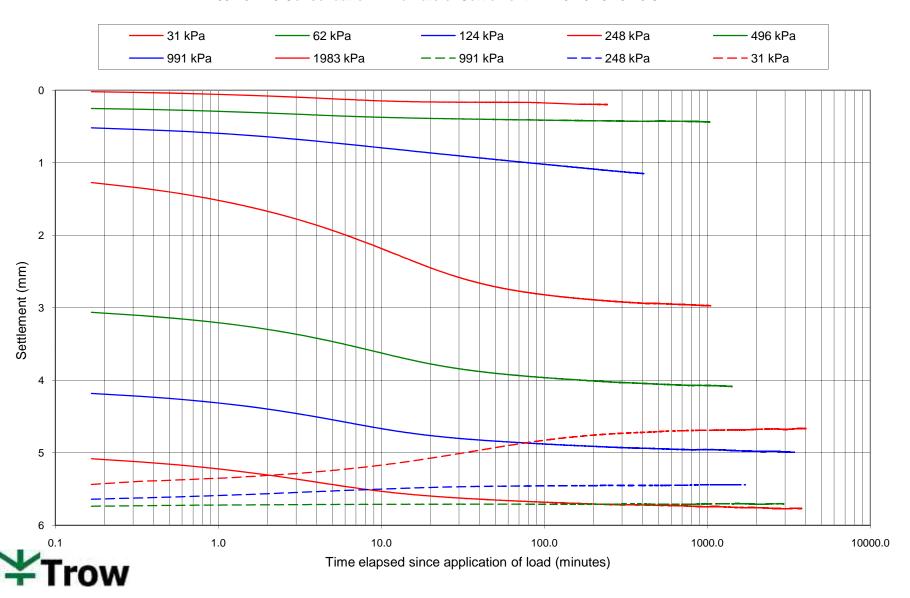


Consolidation Test % strain – log p Graph

Borehole: AH10-2 Sample: S3 Depth: 10.26m

Project #: 091-02125 Date: 2010-02-09

091-02125 Consolidation Time Rate of Settlement: AH10-2 / 10.23m / C



Sample Dimensions

			(Initial)	(End)	
H _o =	19.08 mm	Ring	134.64	134.64	g
D _o =	63.05 mm	Soil+Ring (w)	244.14	228.71	g
A =	31.22 cm ²	Soil+Ring (d)	208.4	208.4	g
V _o =	59.57 cm ³	Water	35.74	20.31	g
G _s =	2.75	Soil	73.76	73.76	g
H _s =	8.59 mm	w(%)	48.5%	27.5%	
		Saturation		1.09	

Moisture Content of Cuttings

Tin	158.23	g
Tin+Soil (w)	258.38	g
Tin+Soil (d)	227.43	g
Water	30.95	g
Soil	69.2	g
w(%)	44.7%	

Total Load (kg)	Pressure (kPa)	Correction (mm)	Deformation (mm)	delta-H (mm)	Strain %	H (H _o - delta-H)	H-H _s	e (H-H _s)/H _s	t ₁₀₀ for e-log(p)	t ₉₀ for Cv	Cv (cm²/s)
			0	0	0.0%	19.08	10.49	1.22			
1	30.98	0.0006	0.1661	0.17	0.9%	18.91447778	10.32	1.20	60		
2	61.96	0.0130	0.4053	0.39	2.1%	18.68771563	10.10	1.18	60	4	3.08E-03
4	123.92	0.0341	0.9721	0.94	4.9%	18.14201111	9.55	1.11	60	10.89	1.07E-03
8	247.84	0.0599	2.7453	2.69	14.1%	16.3945871	7.80	0.91	60	22.54	4.21E-04
16	495.68	0.0847	3.9208	3.84	20.1%	15.24395	6.65	0.77	60	19.36	4.24E-04
32	991.36	0.1083	4.85	4.74	24.9%	14.33831429	5.75	0.67	60	13.3225	5.45E-04
64	1982.72	0.1350	5.6591	5.52	29.0%	13.55586774	4.97	0.58	60	9	7.21E-04
32	991.36	0.1083	5.6980	5.59	29.3%	13.49031429	4.90	0.57			
8	247.84	0.0599	5.4386	5.38	28.2%	13.7012871	5.11	0.59			
1	30.98	0.0006	4.682	4.68	24.5%	14.39857778	5.81	0.68			



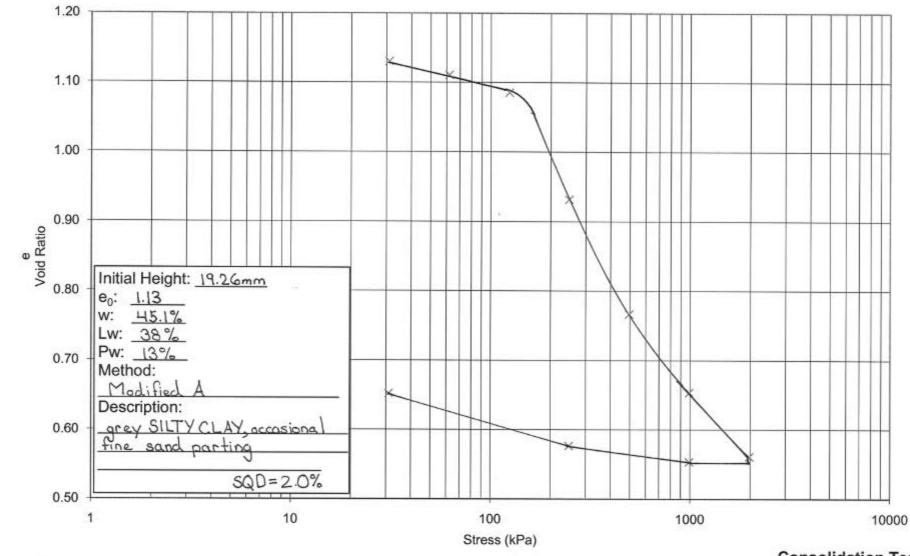
Project: 091-02125

Borehole: AH10-2 Sample: S3 Depth: 10.23m

Consolidometer: C Linear Voltmeter: J15484

Method: Modified A

Comments:



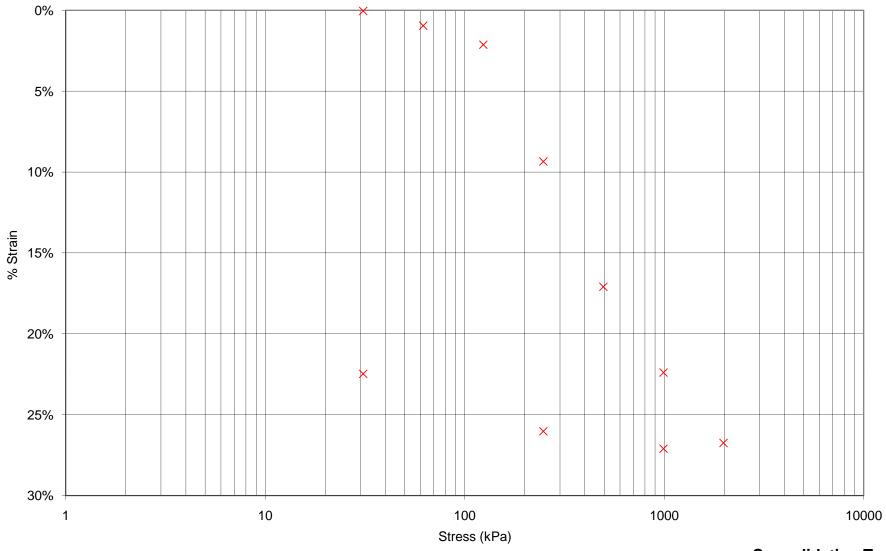


Consolidation Test e – log p Graph

Borehole: AH10-2 Sample: S4

Depth: 14.36m Date: 2010-02-09

Project #: 091-02125



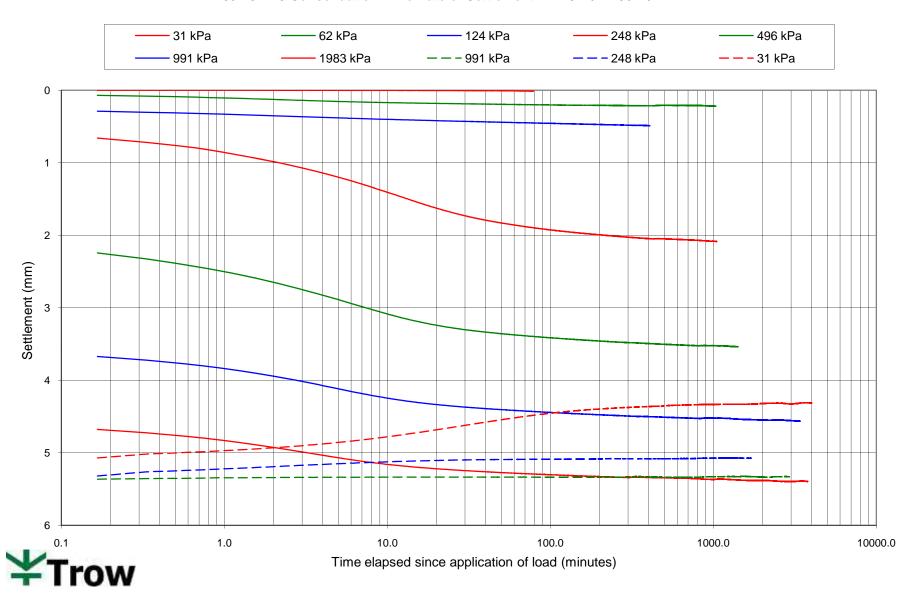


Consolidation Test % strain – log p Graph

Borehole: AH10-2 Sample: S4 Depth: 14.36m

Project #: 091-02125 Date: 2010-02-09

091-02125 Consolidation Time Rate of Settlement: AH10-2 / 14.36m / D



Sample Dimensions

			(Initial)	(End)	
H _o =	19.26 mm	Ring	132.66	132.66	g
D _o =	63.6 mm	Soil+Ring (w)	247.19	233.35	g
A =	31.77 cm ²	Soil+Ring (d)	211.61	211.61	g
V _o =	61.19 cm ³	Water	35.58	21.74	g
G _s =	2.75	Soil	78.95	78.95	g
H _s =	9.04 mm	w(%)	45.1%	27.5%	
		Saturation		1.10	

Moisture Content of Cuttings

Tin	148.85	g
Tin+Soil (w)	246.02	g
Tin+Soil (d)	219.18	g
Water	26.84	g
Soil	70.33	g
w(%)	38.2%	

Total Load (kg)	Pressure (kPa)	Correction (mm)	Deformation (mm)	delta-H (mm)	Strain %	H (H _o - delta-H)	H-H _s	e (H-H _s)/H _s	t ₁₀₀ for e-log(p)	t ₉₀ for Cv	Cv (cm²/s)
ν σ,	,	, ,	0	0	0.0%	19.26	10.22	1.13	3 (1 /		
1	30.98	0.0005	0.0086	0.01	0.0%	19.25187183	10.22	1.13	60		
2	61.96	0.0128	0.1958	0.18	1.0%	19.07702692	10.04	1.11	60		
4	123.92	0.0357	0.4453	0.41	2.1%	18.85040455	9.81	1.09	60	3.4225	3.67E-03
8	247.84	0.0586	1.8584	1.80	9.3%	17.46018065	8.42	0.93	60	16	6.73E-04
16	495.68	0.0818	3.3739	3.29	17.1%	15.96792258	6.93	0.77	60	9	1.00E-03
32	991.36	0.1028	4.4162	4.31	22.4%	14.94661667	5.91	0.65	60	9	8.77E-04
64	1982.72	0.1308	5.2815	5.15	26.7%	14.1092963	5.07	0.56	60	6.25	1.13E-03
32	991.36	0.1028	5.3216	5.22	27.1%	14.04121667	5.00	0.55			
8	247.84	0.0586	5.0706	5.01	26.0%	14.24798065	5.21	0.58			
1	30.98	0.0005	4.3276	4.33	22.5%	14.93287183	5.90	0.65			



Project: 091-02125

Borehole: AH10-2 Sample: S4 Depth: 14.63m

Consolidometer: D Linear Voltmeter: J2664

Method: Modified A

Comments:



2009 Golder Test Pit Logs

EASTBOUND CLIMBING LANE HIGHWAY 1 - 232ND TO 240TH STREET

APPENDIX I

Test Pit Summary Log Sheets



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2009 Golder Laboratory Test Results



EASTBOUND CLIMBING LANE HIGHWAY 1 - 232ND TO 240TH STREET

APPENDIX II

Laboratory Test Results





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