ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

ATTERBERG LIMITS TEST BY CONE PENETROMETER METHOD

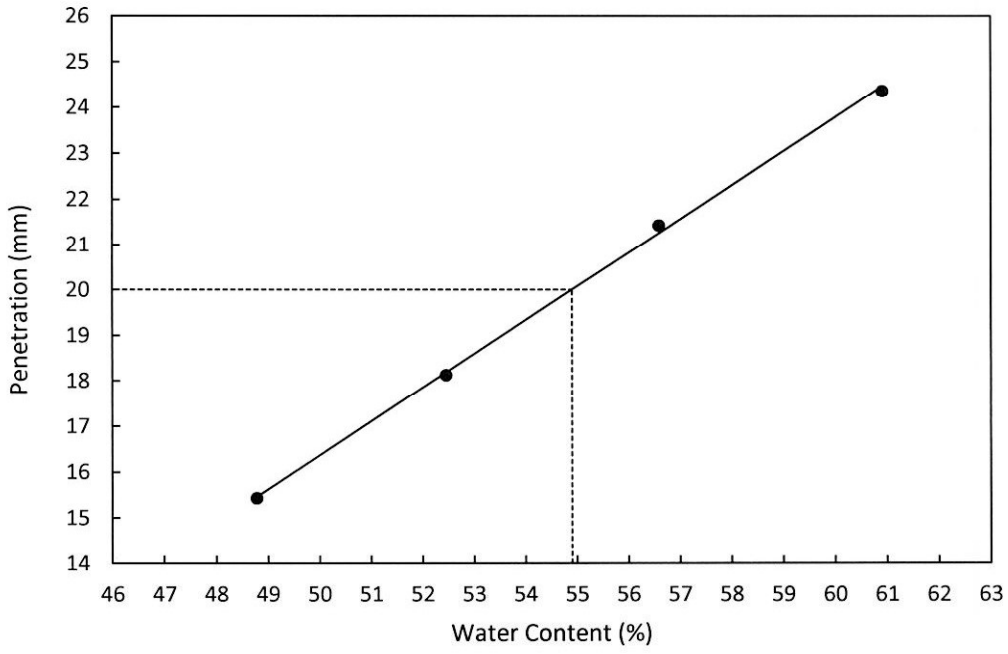
(TEST METHOD- BS 1377 : Part 2 : 1990 - Method 4.3 & 5)

PROJECT	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
JOB NO.	: K5728
BOREHOLE NO.	: BH-5
SAMPLE NO.	: SPT09
DEPTH(M)	: 22.00-22.45m
SOIL DESCRIPTION	: Greenish grey slightly sandy CLAY
SAMPLE CONDITION	: Natural
% OF PASSING 0.425mm SIEVE	: -
TEST DATE	: 30.05.2018

		LIQUID LIMIT				PLASTIC LIMIT	
WET WEIGHT + CUP	(g)	20.31	20.30	20.19	20.28	20.43	20.09
DRY WEIGHT + CUP	(g)	16.52	16.34	15.98	15.70	17.67	17.58
CUP WEIGHT	(g)	8.75	8.79	8.54	8.18	8.22	9.05
WATER CONTENT	(%)	48.8	52.5	56.6	60.9	29.2	29.4
PENETRATION	(mm)	15.4	18.1	21.4	24.4	-	-

LIQUID LIMIT	(%)	**54.9**
PLASTIC LIMIT	(%)	**29.3**
PLASTICITY INDEX		**26**

NOTE:
M : SILT
C : CLAY
L : LOW PLASTICITY
I : INTERMEDIATE PLASTICITY
H : HIGH PLASTICITY
V : VERY HIGH PLASTICITY
E : EXTREMELY HIGH PLASTICITY



TESTED BY :	APPROVED BY :	DATE :
	(Authorised Signatory - Min Win Htut)	11.6.2018

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

ATTERBERG LIMITS TEST BY CONE PENETROMETER METHOD

(TEST METHOD- BS 1377 : Part 2 : 1990 - Method 4.3 & 5)

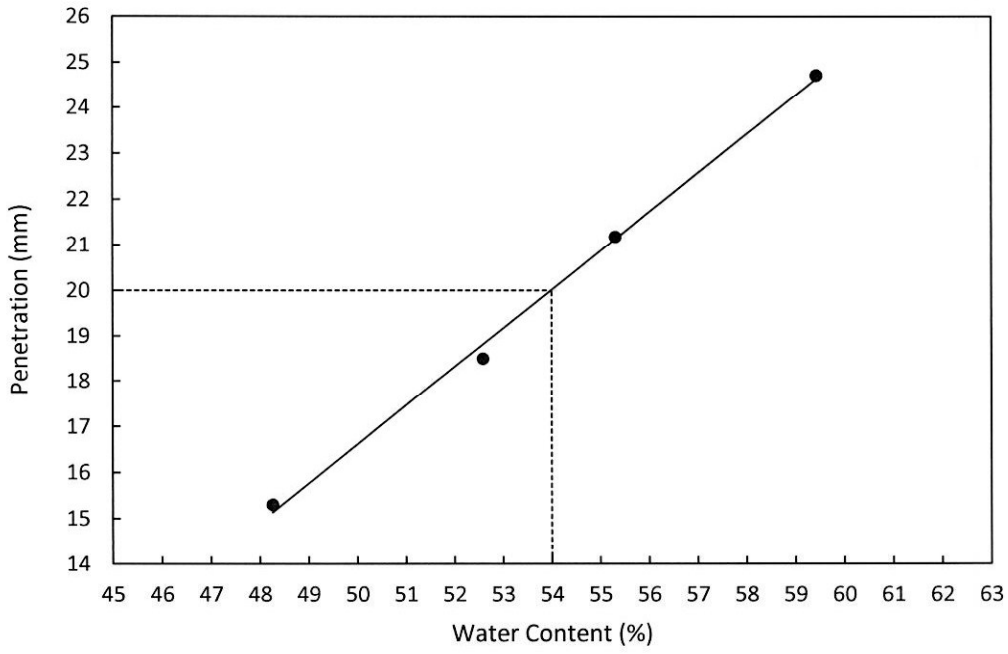
PROJECT	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
JOB NO.	: K5728
BOREHOLE NO.	: BH-5
SAMPLE NO.	: TW03
DEPTH(M)	: 24.00-24.90m
SOIL DESCRIPTION	: Greenish grey and yellowish brown sandy CLAY
SAMPLE CONDITION	: Natural
% OF PASSING 0.425mm SIEVE	: 99
TEST DATE	: 31.05.2018

		LIQUID LIMIT				PLASTIC LIMIT	
WET WEIGHT + CUP	(g)	20.18	20.21	20.56	20.41	20.87	20.73
DRY WEIGHT + CUP	(g)	16.30	16.34	15.92	16.06	18.43	18.44
CUP WEIGHT	(g)	8.26	8.98	7.53	8.74	8.55	9.13
WATER CONTENT	(%)	48.3	52.6	55.3	59.4	24.7	24.6
PENETRATION	(mm)	15.3	18.5	21.2	24.7	-	-

LIQUID LIMIT	(%)	**54.0**
PLASTIC LIMIT	(%)	**24.6**
PLASTICITY INDEX		**29**

NOTE:

M : SILT
C : CLAY
L : LOW PLASTICITY
I : INTERMEDIATE PLASTICITY
H : HIGH PLASTICITY
V : VERY HIGH PLASTICITY
E : EXTREMELY HIGH PLASTICITY



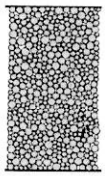
TESTED BY :	APPROVED BY :	DATE :
	(Authorised Signatory - Min Win Htut)	11.6.2018

Total Stress Triaxial Compression

Unconsolidated Undrained (Multiple Specimen)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth			8.00-8.90m		
Description			Light grey very clayey very gravelly SAND		
Type			Undisturbed Sample		
			Spm. 1	2	3
Initial Sample Length	L_0	(mm)	76.0	76.0	76.0
Initial Sample Diameter	D_0	(mm)	38.0	38.0	38.0
Initial Sample Weight	W_0	(gr)	184.4	181.6	174.4
Bulk Density	ρ_0	(Mg/m3)	2.14	2.11	2.02
Particle Density	ρ_s	(Mg/m3)	2.59	2.59	2.59

Initial Conditions

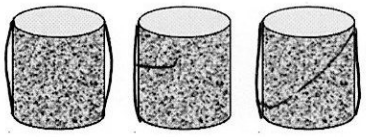
Specimen			Spm. 1	2	3
Initial Cell Pressure	σ_3	(kPa)	75	150	300
Strain Rate	m_s	(mm/min)	0.76000	0.76000	0.76000
MembraneThickness	m_b	(mm)	0.20	0.20	0.20
Initial Moisture	$\omega_i\%$	(%)	16	18	23
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.84	1.79	1.65
Initial Voids Ratio	e_0	.	0.41	0.44	0.57
Initial Degree of Saturation	S_o	(%)	100	100	100

Final Conditions

			Spm. 1	2	3
Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	272.01	273.00	286.40
MembraneCorrection	m_c	(kPa)	1.700	1.890	1.820
Strain At Max Stress	$\varepsilon_f\%$	(%)	16.17	18.75	17.87
Shear Strength	c_u	(kPa)	136.01	136.50	143.20
Final Moisture	$\omega_f\%$	(%)	16	18	23
Final Dry Density	ρ_{df}	(Mg/m3)	1.84	1.79	1.65
Final Voids Ratio	e_f	.	0.41	0.44	0.57
Final Degree of Saturation	S_f	(%)	100.0	100.0	100.0

Notes

Soil parameters in final condition are assumed the same with the initial condition.



Failure Sketch

(surface inclination)

Test Method	BS1377: Part 7 1990 : Clause 8	Test Name	UU5-AVA-B5T1
Database: .\SQLEXPRESS \ RyobiG-L3-2017		Test Date	31/5/2018
Site Reference	AVA-Neo Tiew Crescent (5BHs)	Borehole	BH-5
Jobfile	AVA - Neo Tiew Crescent	Sample	TW01
Client	AVA	Depth	8.00-8.90m
Operator		Checked	Min Win Htut
		Approved	Sio Keong Kong

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0823-B

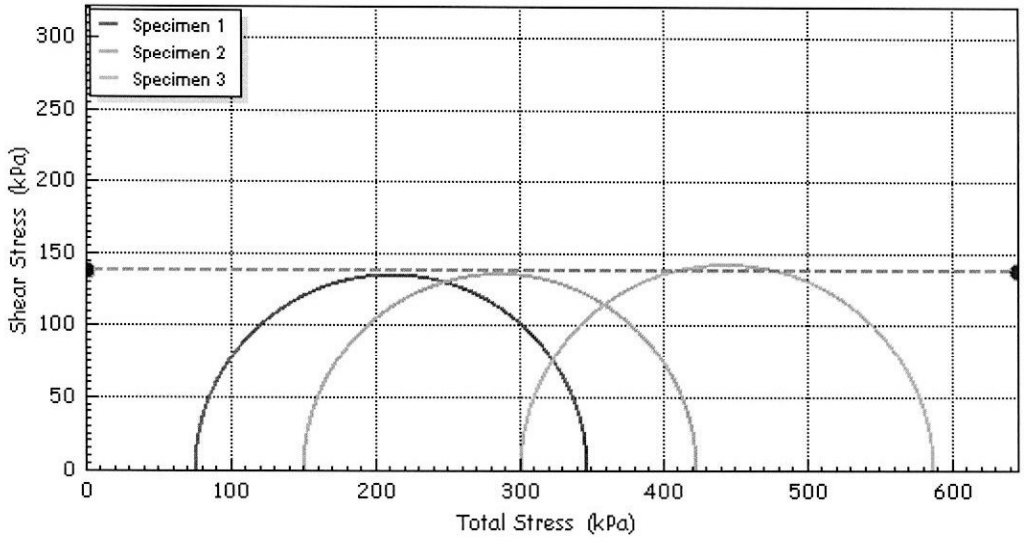
Ryobi Geotechnique International Pte Ltd

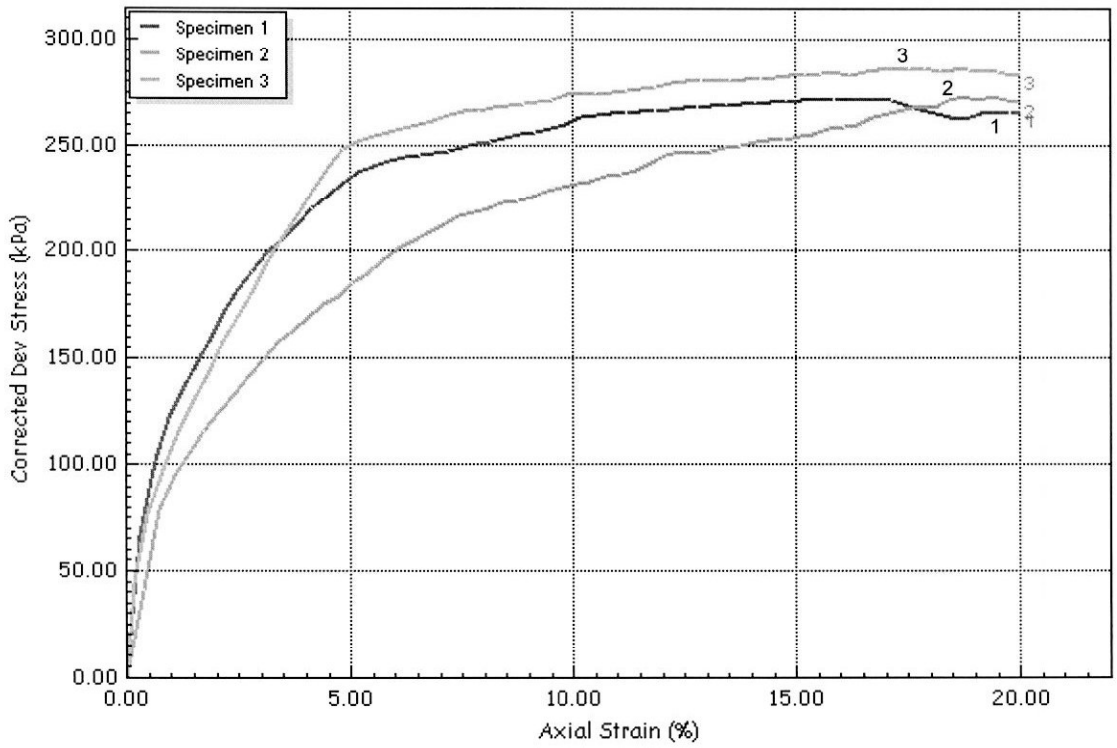
Total Stress Triaxial Compression

Unconsolidated Undrained (Multiple Specimen)

Test Results Plots

Cohesion Level	c	(kPa)	138.6
Friction Angle	ϕ	(deg)	0.0





Test Method	BS1377: Part 7 1990 : Clause 8			Test Name	UU5-AVA-B5T1
Database: .\SQLEXPRESS \ RyobiG-L3-2017				Test Date	31/5/2018
Site Reference	AVA-Neo Tiew Crescent (5BHs)			Borehole	BH-5
Jobfile	AVA - Neo Tiew Crescent			Sample	TW01
Client	AVA			Depth	8.00-8.90m
Operator		Checked	Min Win Htut	Approved	Sio Keong Kong

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0023-B

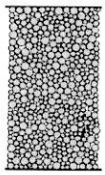
Ryobi Geotechnique International Pte Ltd

Total Stress Triaxial Compression

Unconsolidated Undrained (Multiple Specimen)

Summary Report

Sample Details



sketch showing specimen location in original sample

			Spm. 1	2	3
Depth			16.00-16.90m		
Description			Light greenish grey very clayey SAND		
Type			Undisturbed Sample		
Initial Sample Length	L_0	(mm)	76.0	76.0	76.0
Initial Sample Diameter	D_0	(mm)	38.0	38.0	38.0
Initial Sample Weight	W_0	(gr)	172.0	172.1	173.6
Bulk Density	ρ_0	(Mg/m3)	2.00	2.00	2.01
Particle Density	ρ_s	(Mg/m3)	2.60	2.60	2.60

Initial Conditions

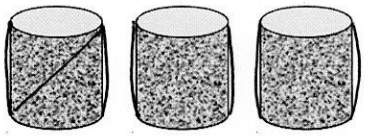
Specimen			Spm. 1	2	3
Initial Cell Pressure	σ_3	(kPa)	150	300	600
Strain Rate	m_s	(mm/min)	0.76000	0.76000	0.76000
MembraneThickness	m_b	(mm)	0.20	0.20	0.20
Initial Moisture	$\omega_i\%$	(%)	25	25	24
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.59	1.59	1.62
Initial Voids Ratio	e_0	.	0.63	0.63	0.60
Initial Degree of Saturation	S_o	(%)	100	100	100

Final Conditions

			Spm. 1	2	3
Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	142.35	165.79	189.68
MembraneCorrection	m_c	(kPa)	1.280	1.870	1.980
Strain At Max Stress	$\varepsilon_f\%$	(%)	10.99	18.39	19.91
Shear Strength	c_u	(kPa)	71.17	82.89	94.84
Final Moisture	$\omega_f\%$	(%)	25	25	24
Final Dry Density	ρ_{df}	(Mg/m3)	1.59	1.59	1.62
Final Voids Ratio	e_f	.	0.63	0.63	0.60
Final Degree of Saturation	S_f	(%)	100.0	100.0	100.0

Notes

Soil parameters in final condition are assumed the same with the initial condition.



Failure Sketch

(surface inclination)

Test Method	BS1377: Part 7 1990 : Clause 8	Test Name	UU6-AVA-B5T2
Database: .\SQLEXPRESS \ RyobiG-L3-2017		Test Date	31/5/2018
Site Reference	AVA-Neo Tiew Crescent (5BHs)	Borehole	BH-5
Jobfile	AVA - Neo Tiew Crescent	Sample	TW02
Client	AVA	Depth	16.00-16.90m
Operator		Checked	Min Win Htut
		Approved	Sio Keong Kong

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

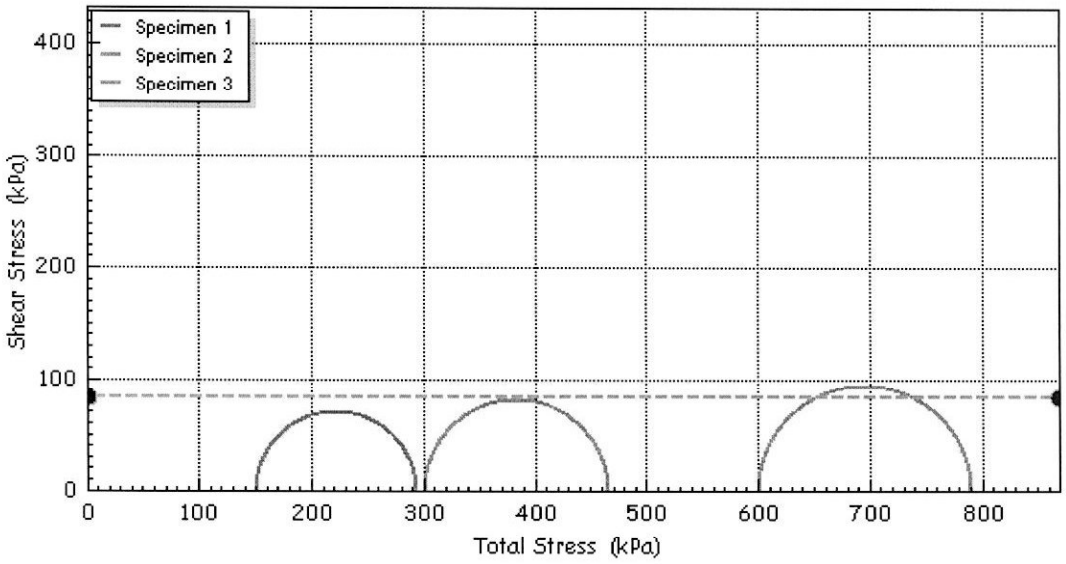
Ryobi Geotechnique International Pte Ltd

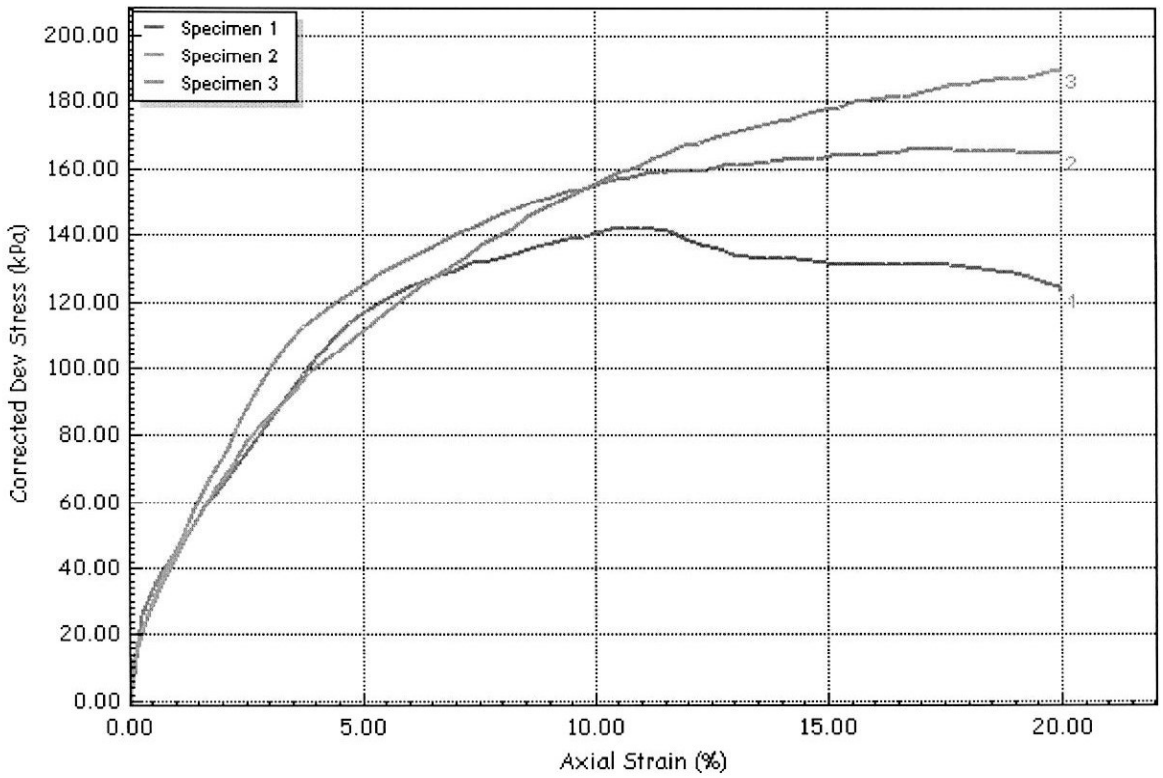
Total Stress Triaxial Compression

Unconsolidated Undrained (Multiple Specimen)

Test Results Plots

Cohesion Level	c	(kPa)	83.0
Friction Angle	ϕ	(deg)	0.0





Test Method	BS1377: Part 7 1990 : Clause 8		Test Name	UU6-AVA-B5T2	
Database: .\SQLEXPRESS \ RyobiG-L3-2017			Test Date	31/5/2018	
Site Reference	AVA-Neo Tiew Crescent (5BHs)		Borehole	BH-5	
Jobfile	AVA - Neo Tiew Crescent		Sample	TW02	
Client	AVA		Depth	16.00-16.90m	
Operator		Checked	Min Win Htut	Approved	Sio Keong Kong

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

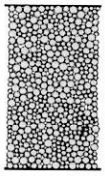
Ryobi Geotechnique International Pte Ltd

Effective Stress Triaxial Compression

Consolidated Undrained

Summary Report

Sample Details



sketch showing specimen location in original sample

			Spm. 1	2	3
Depth			24.00-24.90m		
Description			Greenish grey and yellowish brown sandy CLAY		
Type			Undisturbed Sample		
Initial Sample Length	L_0	(mm)	76.0	76.0	76.0
Initial Sample Diameter	D_0	(mm)	38.0	38.0	38.0
Initial Sample Weight	W_0	(gr)	178.7	180.7	187.0
Initial Bulk Density	ρ_0	(Mg/m3)	2.07	2.10	2.17
Particle Density	ρ_s	(Mg/m3)	2.64	2.64	2.64

Initial Conditions

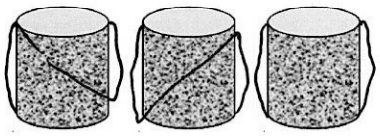
			Spm. 1	2	3
Initial Cell Pressure	σ_{3i}	(kPa)	315	430	660
Initial Back Pressure	U_{bi}	(kPa)	200	200	200
Strain Rate	m_s	(mm/min)	0.06000	0.06000	0.06000
Membrane Thickness	m_b	(mm)	0.200	0.200	0.200
Initial Moisture	$\omega_i\%$	(%)	25	25	21
Initial Dry Density	ρ_{di}	(Mg/m3)	1.66	1.68	1.79
Initial Voids Ratio	e_i	.	0.589	0.575	0.474
Initial Degree of Saturation	S_i	(%)	100	100	100
B Value	B	.	0.98	0.97	0.97

Final Conditions

			Spm. 1	2	3
Final Moisture	$\omega_f\%$	(%)	25	24	21
Final Dry Density	ρ_{df}	(Mg/m3)	1.72	1.76	1.91
Final Voids Ratio	e_f	.	0.535	0.498	0.382
Final Degree of Saturation	S_f	(%)	100.0	100.0	100.0
Failure Criteria		.	Max. Stress Ratio	Max. Stress Ratio	Max. Stress Ratio
Strain At Failure	$\varepsilon\%$	(%)	4.59	6.71	6.28
Stress At Failure	$(\sigma_1-\sigma_3)$	(kPa)	239.0	355.4	618.4
Minor Stress At Failure	σ_3'	(kPa)	55.7	103.0	207.4
Major Stress At Failure	σ_1'	(kPa)	294.7	458.4	825.8
Principal Stress Ratio At Failure	σ_1'/σ_3'	(kPa)	5.290	4.450	3.981

Notes

-



Ryobi G

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

Test Method	BS1377-8 : 1990 : Clause 7	Test Name	CU1-NeoTiew-B5T03
Database: .\SQLEXPRESS \ Ryobi-2017		Test Date	30/5/2018
Site Reference	AVA - Neo Tiew Crescent (5BHs)	Borehole	BH-5
Jobfile	K5728 Neo Tiew Crescent	Sample	TW03
Client	AVA	Depth	24.00-24.90m

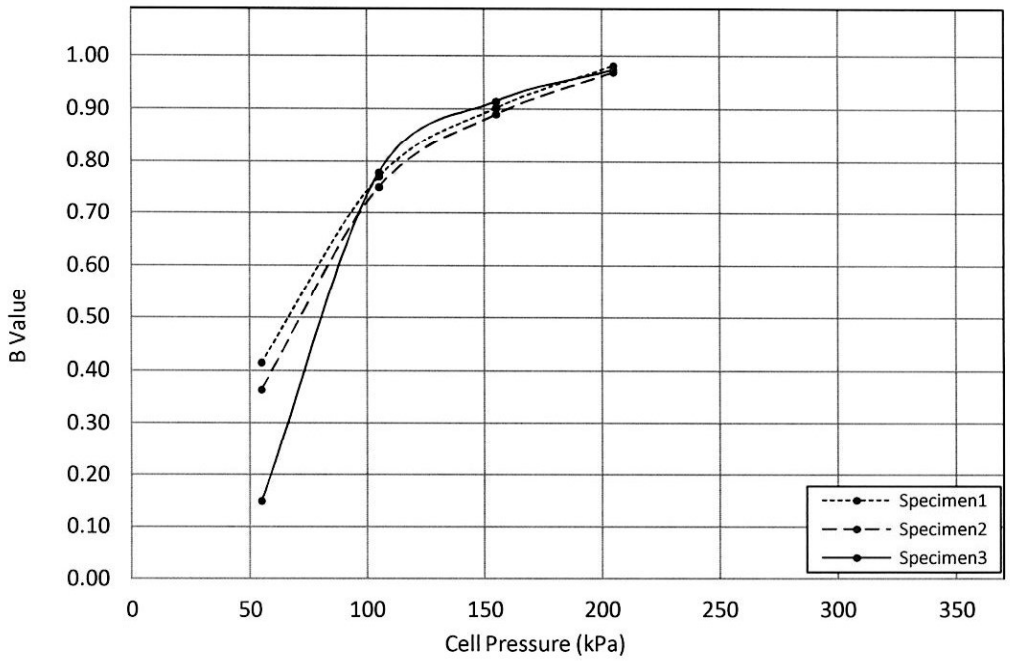
Operator | Checked Min Win Htut | Approved Sio Keong Kong

Ryobi Geotechnique International Pte Ltd

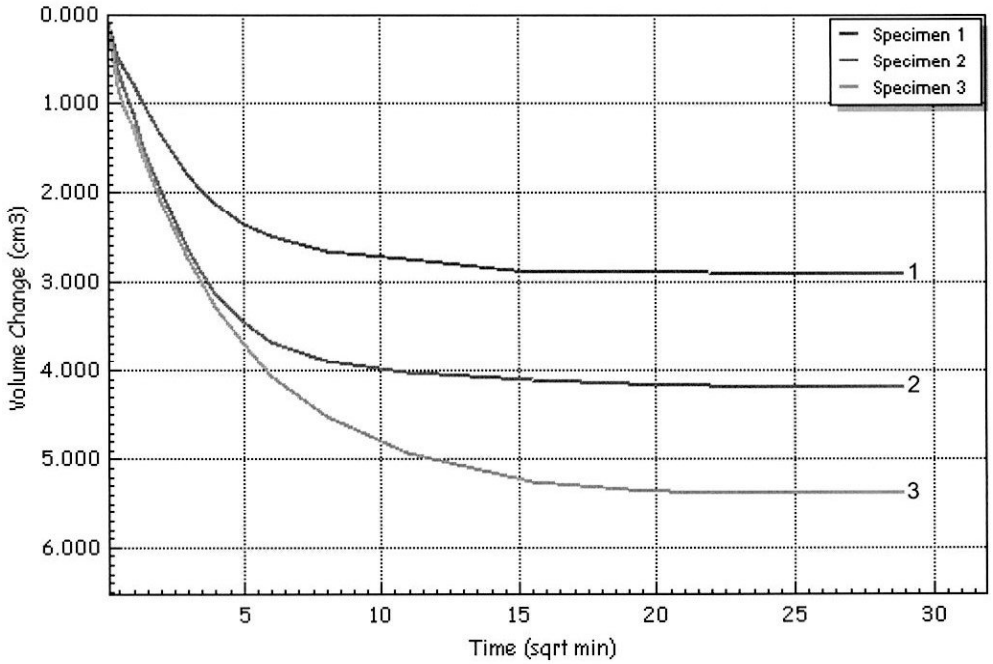
Effective Stress Triaxial Compression

Consolidated Undrained

Saturation and Consolidation Plots



Drainage Method : Both End and Side Drain



Test Method	BS1377-8 : 1990 : Clause 7	Test Name	CU1-NeoTiew-B5T03
Database: .\SQLEXPRESS \ Ryobi-2017		Test Date	30/5/2018
Site Reference	AVA - Neo Tiew Crescent (5BHs)	Borehole	BH-5
Jobfile	K5728 Neo Tiew Crescent	Sample	TW03
Client	AVA	Depth	24.00-24.90m
Operator		Checked	Min Win Htut
		Approved	Sio Keong Kong

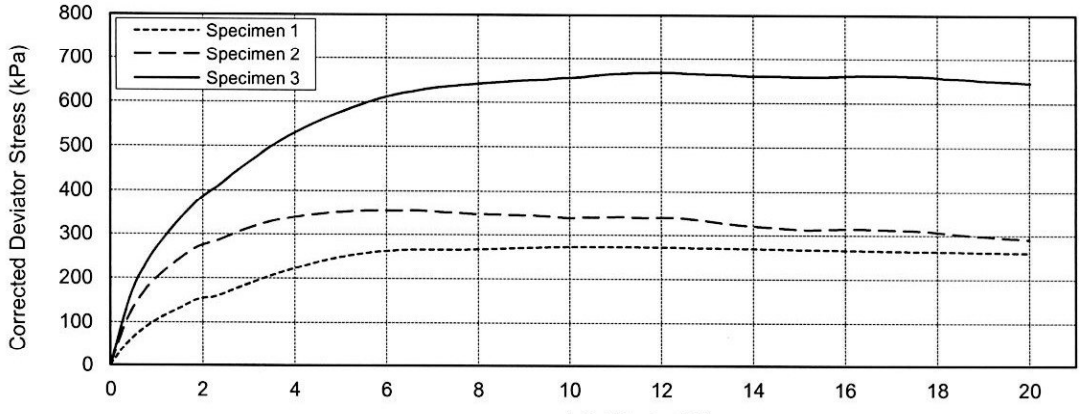
ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2018-0623-B

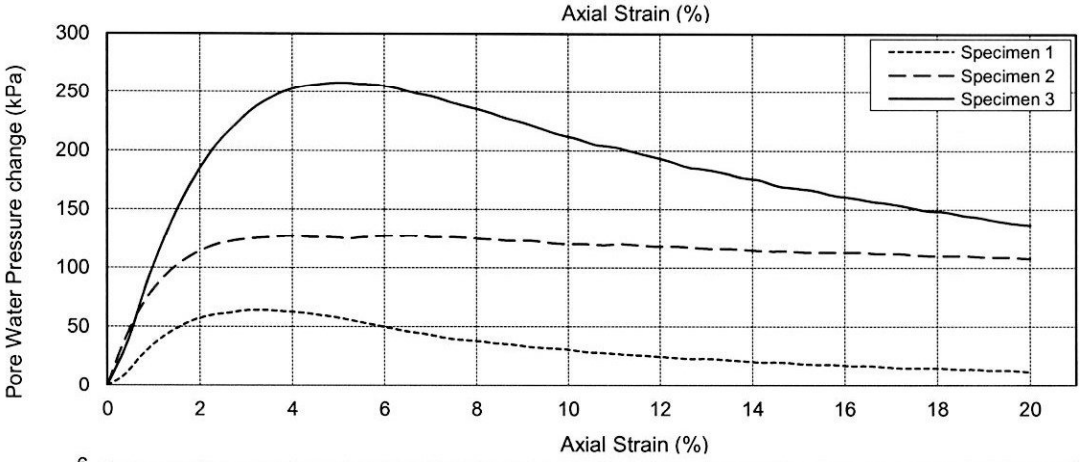
Ryobi Geotechnique International Pte Ltd

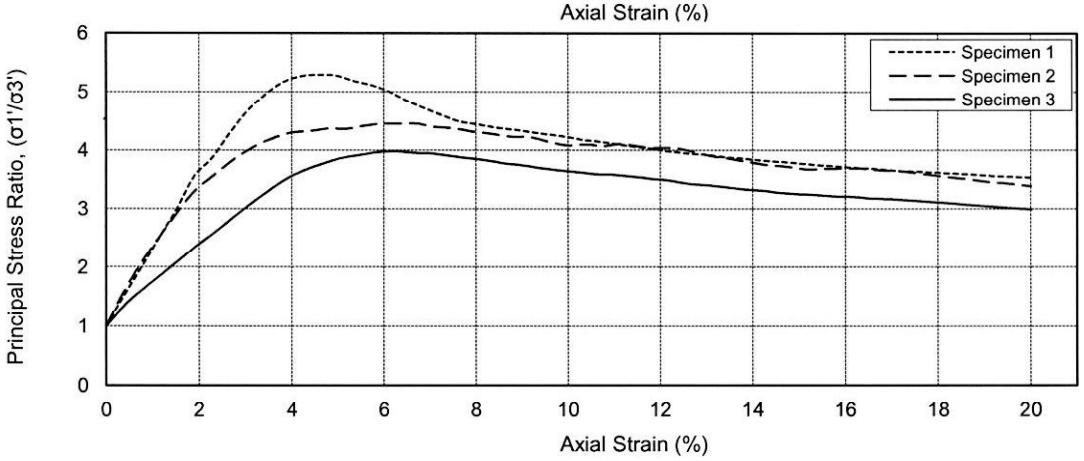
Effective Stress Triaxial Compression

Consolidation Undrained

Shear Stage Plots







Initial and Final Values	Spm.1	Spm.2	Spm.3
Pore Water Pressure at start of shear stage (kPa)	200	200	200
Pore Water Pressure at Max. Stress Ratio (kPa)	259	327	453
A Value at Max. Stress Ratio	0.247	0.357	0.409

Note : Side drain correction has been applied to strain exceeding 2% according to BS 1377.

Test Method	BS1337-8 : 1990 : Clause 7	Test Name	CU1-NeoTiew-B5T03
Database :.\SQLEXPRESS\Ryobi-2017		Test Date	30/5/2018
Site Reference	AVA - Neo Tiew Crescent (2BHs)	Borehole	BH-5
Jobfile	K5728 Neo Tiew Crescent	Sample	TW03
Client	AVA	Depth	24.00-24.90m
Operator		Checked	Min Win Htut
		Approved	Sio Keong Kong

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

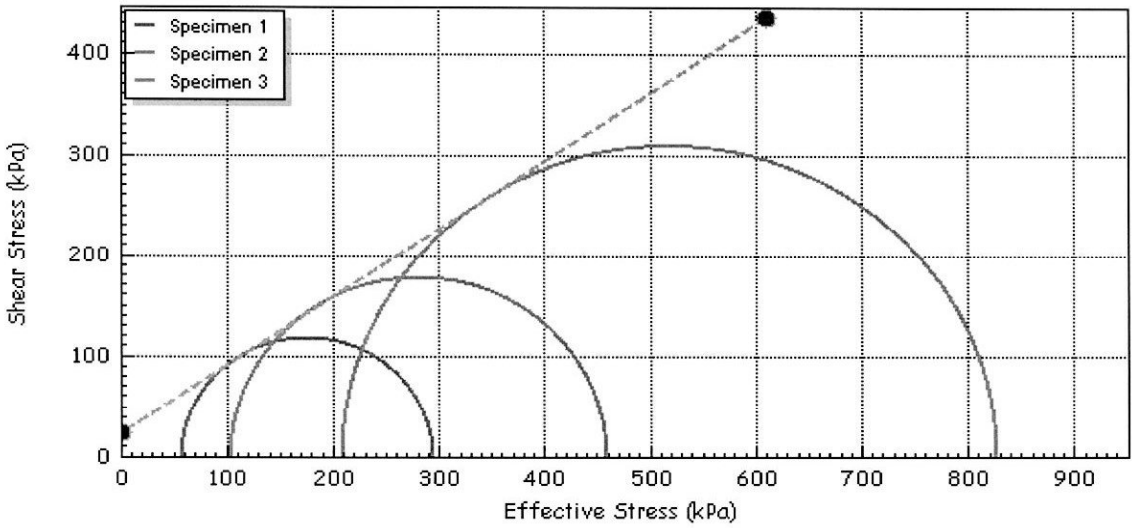
Ryobi Geotechnique International Pte Ltd

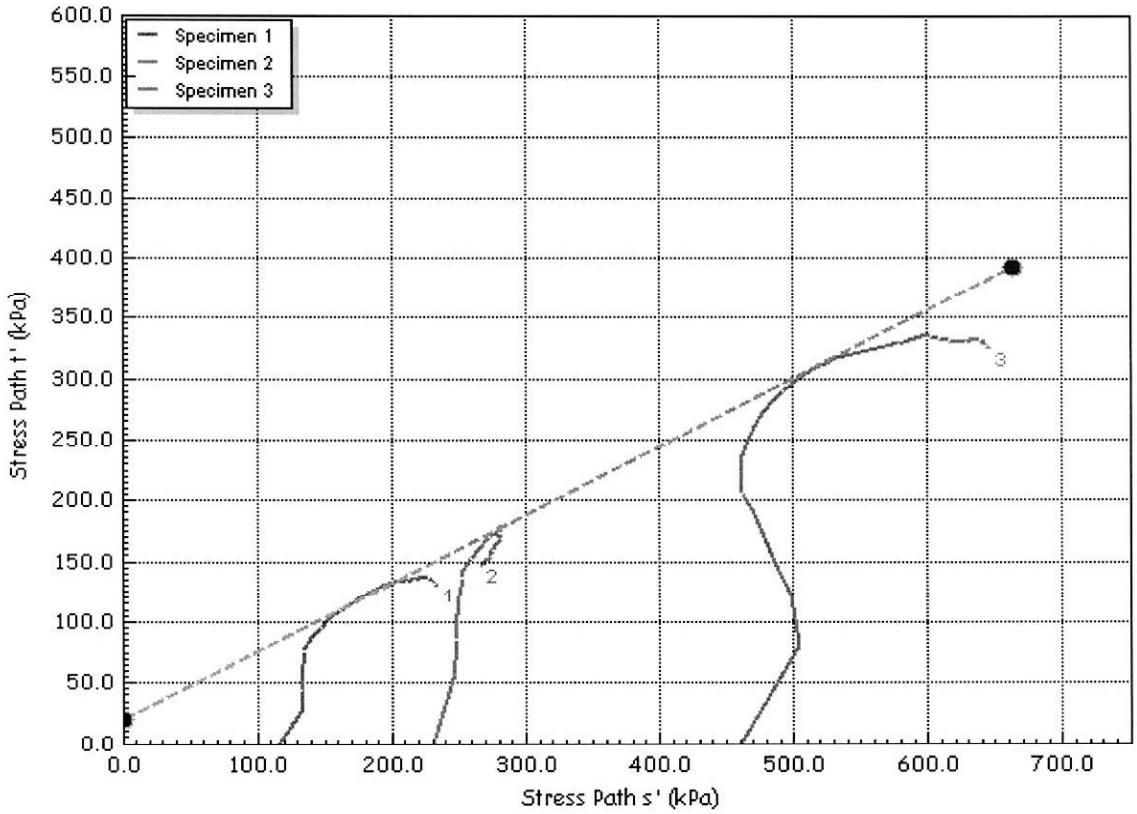
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots

Effective Cohesion	c'	(kPa)	24.9	Stress Path Intercept	t_0'	(kPa)	20.6
Effective Friction Angle	ϕ'	(deg)	34.0	Stress Path Inclination	θ	(deg)	29.2





Test Method	BS1377-8 : 1990 : Clause 7	Test Name	CU1-NeoTiew-B5T03
Database: .\SQLEXPRESS \ Ryobi-2017		Test Date	30/5/2018
Site Reference	AVA - Neo Tiew Crescent (5BHs)	Borehole	BH-5
Jobfile	K5728 Neo Tiew Crescent	Sample	TW03
Client	AVA	Depth	24.00-24.90m
Operator	Kay	Checked	Min Win Htut
		Approved	Sio Keong Kong

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

Ryobi Geotechnique International Pte Ltd

One-Dimensional Consolidation Test

Test Method - BS1377 Part 5 : 1990 (Method 3)

Initial Height	L_o	(mm)	20.0	
Initial Diameter	D_o	(mm)	50.0	
Initial Weight	W_o	(gr)	78.75	
Bulk Density	ρ_o	(Mg/m^3)	2.01	
Particle Density	ρ_s	(Mg/m^3)	2.60	(Measured)

Initial Conditions

Settlement Input	L_{IP}	(mm)	Oedo 6
Initial Moisture	w_i %	(%)	23.6
Initial Dry Density	ρ_{di}	(Mg/m^3)	1.62
Initial Voids Ratio	e_i	.	0.602
Initial Degree of Saturation	S_i	(%)	100.0
Average room temperature		°C	25

Final Conditions

Final Moisture	w_f %	(%)	20.2
Dry Density	ρ_{df}	(Mg/m^3)	1.73
Voids Ratio	e_f	.	0.502
Saturation	S_f	(%)	100
Height Settlement	ΔL_s	(mm)	1.514

Vertical Stress σ' i (kPa)	Voids Ratio e_f .	Corrected Change in Height ΔL_s (mm)	Consolidation C_v (m^2/year)	Consolidation C_v at 20°C (m^2/year)	Compressibility m_v (m^2/MN)	t_{90} Time t_{90} (min)
25	0.581	0.263	36.364	32.400	0.526	1.205
50	0.572	0.381	32.439	28.903	0.239	1.325
100	0.559	0.537	31.678	28.225	0.159	1.338
200	0.543	0.742	29.054	25.888	0.105	1.432
400	0.522	1.001	27.113	24.157	0.067	1.498
800	0.495	1.338	25.134	22.394	0.044	1.566
1600	0.458	1.796	21.380	19.050	0.031	1.764
400	0.466	1.704				
100	0.481	1.514				
25	0.502	1.247				

Pre-Consolidation Pressure, P_c (kPa) = 295

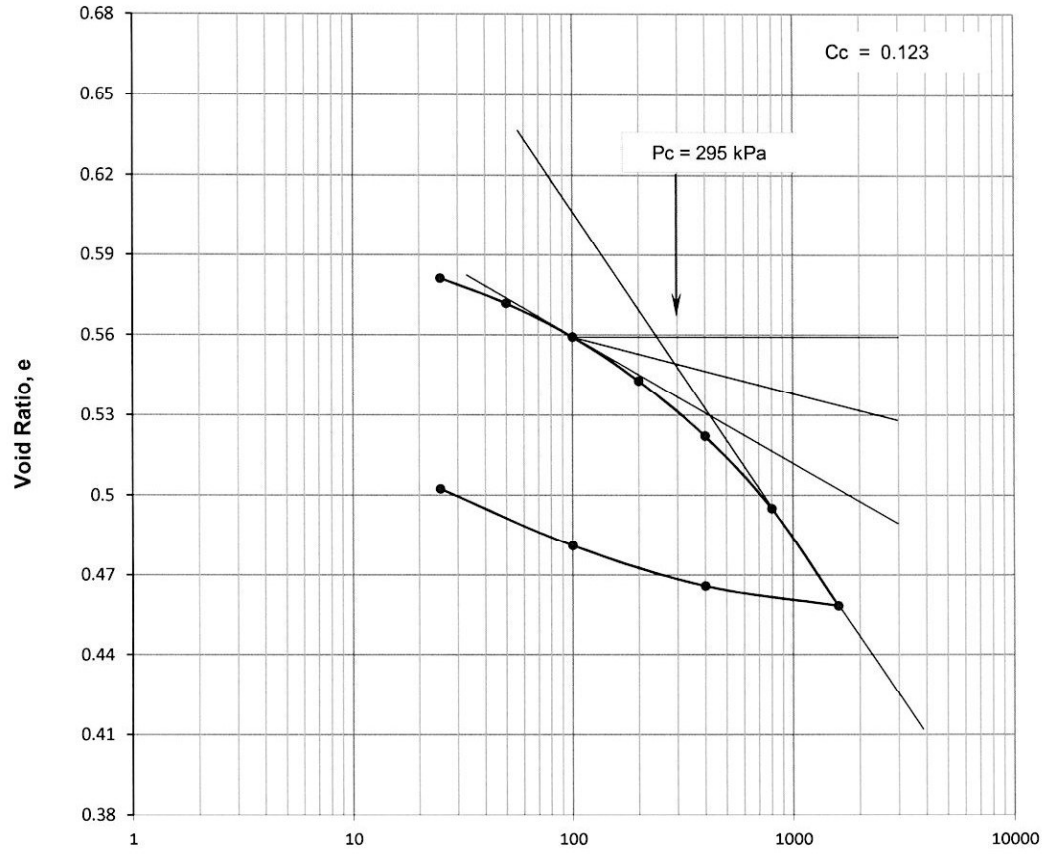
Compression Index, C_c = 0.123

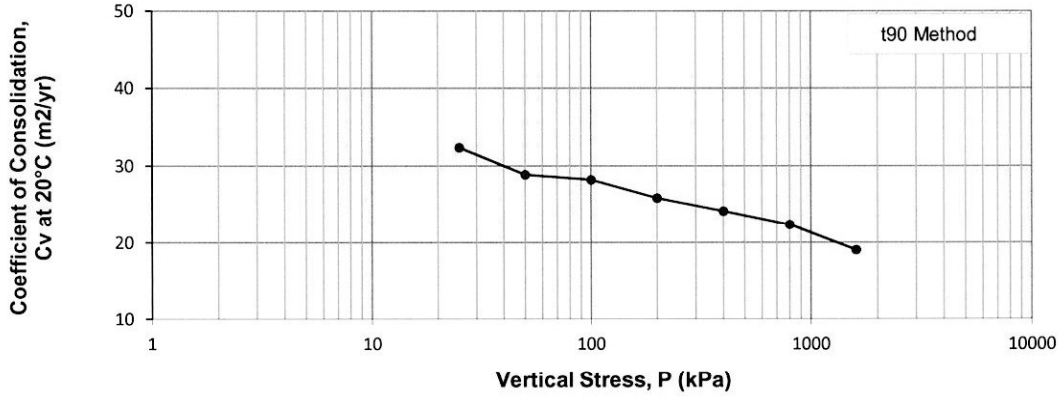
Project	AVA - Neo Tiew Crescent (5BHs)		
Borehole No.	BH-5	Job No.	K5728
Sample No.	TW02	Client	AVA
Depth (m)	16.00-16.90m	Database :	.\SQLEXPRESS \ Ryobi
Sample Condition	Undisturbed Sample	Test Name	Oedo6-NeoTiew-B5T02
Soil Description	Light greenish grey very clayey SAND	Test Date	31.05.2018

Tested By :	Checked By :	Approved By :
	(Min Win Htut)	(Athorised Signatory - Sio Keong Kong)

One-Dimensional Consolidation Test

Test Method - BS1377 Part 5 : 1990 (Method 3)





Project	AVA - Neo Tiew Crescent (5BHs)		
Borehole No.	BH-5	Job No.	K5728
Sample No.	TW02	Client	AVA
Depth (m)	16.00-16.90m	Database :	.\SQLEXPRESS \ Ryobi
Sample Condition	Undisturbed Sample	Test Name	Oedo6-NeoTiew-B5T02
Soil Description	Light greenish grey very clayey SAND	Test Date	31.05.2018

Tested By :	Checked By :	Approved By :
	(Min Win Htut)	(Athorised Signatory - Sio Keong Kong)

ACCREDITED LABORATORY
SAC-SINGLAS
Cert No: LA-1993-0064-A
Cert No: LA-2000-0178-F

CERTIFICATE OF ANALYSIS

Work Order	: **SG1808925**	Page	: 1 of 2
Client	: **RYOBI GEOTECH PTE LTD**	Project	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
Contact	: Mr Min Win Htut	Order number	: GTPO2161
Address	: 58A Sungei Kadut Loop Ryobi Industrial Bldg, Singapore 729505	Quote number	: SG2016RYOGEO0001 (Soil - Organic Content, Total Sulphate, pH Value, Chloride Content & Soluble Sulphate)
E-mail	: min.win.htut@ryobi-g.com	Date Received	: 31-May-2018
Telephone	: +65 6369 7100	Date Analysed	: 01-Jun-2018
Facsimile	: +65 6362 5848	Date Issued	: 08-Jun-2018
No. of samples received	: 5	No. of samples analysed	: 5

General Comments

This report supersedes any previous report(s) with this reference. All pages of this report have been checked and approved for release. Results apply to the sample(s) as submitted. The laboratory declares that the test results relate only to the items tested and do not substitute any other documents. This report may not be reproduced except with prior written approval from the testing laboratory. This report may not be used for advertising purposes.

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, BS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference. LOR = Limit of reporting

* Preceeding indicates non-accredited test. In the case when a procedure belonging to an accredited method was used for non-accredited matrix, would apply that the reported results are non-accredited.

- **BS method is referenced to British Standard 1377: Part 3/1990**
- **Organic Content Test is referenced to Clause 3 of Part 3:BS1377**
- **Chloride Content Test is referenced to Clause 7.3 or Part 3:BS1377**
- **Sulphate Content Test is referenced to Clause 5.2 of Part 3:BS1377**
- **pH Test is referenced to Clause 9 of Part 3: BS1377**

Signatories

This laboratory is accredited under SAC - SINGLAS. The tests reported herein have been performed in accordance with the laboratory's Terms of Accreditation. This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Accreditation Category*	*Position*
Pansy Teo	SG - Inorganics SG - Organics	Senior Environmental Manager

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-1993-0064-A Cert No: LA-2008-0178-F ALS

Analytical Results

Sub-Matrix: **SOIL**

				Client sample ID	BH-3 S1	BH-4 S1	BH-5 S1
				Sampling date/time	31-May-2018 00:00	31-May-2018 00:00	31-May-2018 00:00
Compound	*Method*	*LOR*	*Unit*		**SG1808925-001**	**SG1808925-002**	**SG1808925-003**
INORGANIC- Physical Properties							
pH Value	BS1377 pH	0.1	pH Unit		7.2	5.6	7.4
INORGANICS - Nonmetalllic Constituents							
Chloride	BS1377 Cl	0.01	% DW		<0.01	<0.01	<0.01
Organic Matter	BS1377	0.1	% DW		0.5	0.2	0.3
Sulphate as SO3	BS1377 SO3	0.01	% DW		<0.01	<0.01	<0.01

Sub-Matrix: **SOIL**

				Client sample ID	BH-6 S1	BH-7 S1	—
				Sampling date/time	31-May-2018 00:00	31-May-2018 00:00	----
Compound	*Method*	*LOR*	*Unit*		**SG1808925-004**	**SG1808925-005**	--------
INORGANIC- Physical Properties							
pH Value	BS1377 pH	0.1	pH Unit		6.5	6.5	----
INORGANICS - Nonmetalllic Constituents							
Chloride	BS1377 Cl	0.01	% DW		<0.01	<0.01	----
Organic Matter	BS1377	0.1	% DW		0.3	0.5	----
Sulphate as SO3	BS1377 SO3	0.01	% DW		<0.01	<0.01	----

ACCREDITED LABORATORY
SAC-SINGLAS
Cert No: LA-1993-0064-A
Cert No: LA-2000-0178-F

CERTIFICATE OF ANALYSIS

Work Order	: **SG1808926**	Page	: 1 of 2
Client	: **RYOBI GEOTECH PTE LTD**	Project	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
Contact	: Mr Min Win Htut	Order number	: GTPO2161
Address	: 58A Sungei Kadut Loop Ryobi Industrial Bldg, Singapore 729505	Quote number	: SG2016RYOGEO0002 (Water - Organic Content, Sulphate Content, Chloride, pH, Salinity & Soluble Sulphate)
E-mail	: min.win.htut@ryobi-g.com	Date Received	: 31-May-2018
Telephone	: +65 6369 7100	Date Analysed	: 31-May-2018
Facsimile	: +65 6362 5848	Date Issued	: 08-Jun-2018
No. of samples received	: 5	No. of samples analysed	: 5

General Comments

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* Preceeding indicates non-accredited test. In the case when a procedure belonging to an accredited method was used for non-accredited matrix, would apply that the reported results are non-accredited.

- **Sulphate Content Test is referenced to Clause 5.2 of Part 3:BS1377**
- **BS method is referenced to British Standard 1377: Part 3/1990**
- **Chloride ContentTest is referenced to Clause 7.3 of Part 3: BS1377**
- **pH Test is referenced to Clause 9 of Part 3: BS1377**

Signatories

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Signatories	*Accreditation Category*	*Position*
Pansy Teo	SG - Inorganics SG - Organics	Senior Environmental Manager

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-1993-0084-A Cert No: LA-2008-0178-P ALS

Analytical Results

Sub-Matrix: **WATER**

			Client sample ID	BH-3	BH-4	BH-5
			Sampling date/time	31-May-2018 00:00	31-May-2018 00:00	31-May-2018 00:00
Compound	*Method*	*LOR*	*Unit*	**SG1808926-001**	**SG1808926-002**	**SG1808926-003**
INORGANIC- Physical Properties						
pH Value	BS1377 pH	0.1	pH Unit	12.2	7.2	12.3
INORGANICS - Nonmetalllic Constituents						
Chloride	BS1377 Cl	0.01	g/L	<0.01	<0.01	<0.01
INORGANICS-Anions						
Sulphate as SO3	BS1377 SO3	0.01	g/L	<0.01	<0.01	<0.01
ORGANICS-General						
•Organic Content	Ashing/Gravimetric	0.10	% (w/v)	<0.10	<0.10	<0.10

Sub-Matrix: **WATER**

			Client sample ID	BH-6	BH-7	—
			Sampling date/time	31-May-2018 00:00	31-May-2018 00:00	----
Compound	*Method*	*LOR*	*Unit*	**SG1808926-004**	**SG1808926-005**	--------
INORGANIC- Physical Properties						
pH Value	BS1377 pH	0.1	pH Unit	7.6	12.2	----
INORGANICS - Nonmetalllic Constituents						
Chloride	BS1377 Cl	0.01	g/L	<0.01	<0.01	----
INORGANICS-Anions						
Sulphate as SO3	BS1377 SO3	0.01	g/L	0.01	<0.01	----
ORGANICS-General						
•Organic Content	Ashing/Gravimetric	0.10	% (w/v)	<0.10	<0.10	----

Ryobi Geotechnique International Pte Ltd

58A Sungei Kadut Loop, Ryobi Industrial Bldg., Singapore 729505 Tel: 65- 6369 7100 Fax: 65- 6362 5848

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

SUMMARY OF LABORATORY TEST RESULTS

CLIENT : AVA

PROJECT : 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)

JOB NO. : K5728

BOREHOLE NO :			BH-6						
SAMPLE NO :			D 1	SPT03	TW01	SPT05	SPT06	TW02	SPT08
SAMPLE DEPTH :		m	1.00	6.00-6.45	8.00-8.90	12.00-12.45	14.00-14.45	16.00-16.90	20.00-20.45
MOISTURE CONTENT (BS 1377 Part 2 : 1990 : Method 3)		%	-	-	22.6	19.4	-	23.4	22.3
BULK DENSITY (BS 1377 Part 2 : 1990 : Method 7)		Mg/m^3	-	-	2.03	2.01	-	1.97	2.03
DRY DENSITY (BS 1377 Part 2 : 1990 : Method 7)		Mg/m^3	-	-	-	-	-	-	-
PARTICLE DENSITY (BS 1377 Part 2 : 1990 : Method 8 / Small Pyknometer)		Mg/m^3	-	-	2.59	2.60	-	2.60	2.59
GRAIN SIZE ANALYSIS (BS 1377 Part 2 : 1990 : Method 9.3 & 9.5)	GRAVEL	%	-	-	1	1	-	0	5
	SAND	%	-	-	65	66	-	70	68
	SILT	%	-	-	21	20	-	16	15
	CLAY	%	-	-	13	13	-	14	12
ATTERBERG LIMITS (BS 1377 Part 2 : 1990 : Method 4.3 & 5)	LIQUID LIMIT	%	-	33.7	48.4	-	(A)	63.7	-
	PLASTIC LIMIT	%	-	16.4	26.4	-		31.0	-
	PLASTICITY INDEX		-	17	22	-		33	-
TRIAXIAL COMPRESSION TEST (BS 1377 Part 7 & 8 : 1990)	TEST TYPE		-	-	**UU**	-	-	-	-
	TOTAL COHESION	kPa	-	-	70.5	-	-	-	-
	TEST TYPE		-	-	-	-	-	**CU**	-
	EFFECTIVE COHESION	kPa	-	-	-	-	-	4.4	-
	EFFECTIVE PHI ANGLE	degree	-	-	-	-	-	36.2	-
CONSOLIDATION TEST (BS 1377 Part 5 : 1990 : Method 3)	PRECONSOLIDATION PRESSURE	kPa	-	-	-	-	-	-	-
	COMPRESSION INDEX	C_c	-	-	-	-	-	-	-
ROCK TEST	POINT LOAD STRENGTH INDEX $I_{s(50)}$	MPa	-	-	-	-	-	-	-
	BULK DENSITY	Mg/m^3	-	-	-	-	-	-	-
	UNCONFINED COMPRESSIVE STRENGTH	MPa	-	-	-	-	-	-	-
CHEMICAL CONTENTS ANALYSIS	pH Value		6.5	-	-	-	-	-	-
	Chloride Content	%	<0.01	-	-	-	-	-	-
	Organic Content	%	0.3	-	-	-	-	-	-
	Sulphate Content	%	<0.01	-	-	-	-	-	-

LEGENDS :

UU - Unconsolidated Undrained Test (Part 7/Method 8)

CU - Consolidated Undrained Test (Part 8/Method 7)

CD - Consolidated Drained Test (Part 8/Method 8)

REMARKS :

(A) - Test cancelled due to high content of sand.

PREPARED BY : (Min Win Htut)

CHECKED BY : (Sio Keong Kong)

DATE : 11/06/2018

This laboratory is accredited under the Singapore Accreditation Council-Singapore Laboratory Accreditation Scheme (SAC-SINGLAS) and has met the requirements of ISO /IEC 17025 : 2005. The results reported herein have been performed in accordance with the laboratory's terms of accreditation under the SAC-SINGLAS.

Ryobi Geotechnique International Pte Ltd

58A Sungei Kadut Loop, Ryobi Industrial Bldg., Singapore 729505 Tel: 65- 6369 7100 Fax: 65- 6362 5848

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

SUMMARY OF LABORATORY TEST RESULTS

CLIENT : AVA

PROJECT : 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)

JOB NO. : K5728

BOREHOLE NO :			BH-6						
SAMPLE NO :			TW03	SPT11	SPT12	W1			
SAMPLE DEPTH :		m	24.00-24.90	28.00-28.45	30.00-30.45	Water Sample			
MOISTURE CONTENT (BS 1377 Part 2 : 1990 : Method 3)		%	21.7	16.4	-				
BULK DENSITY (BS 1377 Part 2 : 1990 : Method 7)		Mg/m^3	2.09	1.94	-	-			
DRY DENSITY (BS 1377 Part 2 : 1990 : Method 7)		Mg/m^3	-	-	-	-			
PARTICLE DENSITY (BS 1377 Part 2 : 1990 : Method 8 / Small Pyknometer)		Mg/m^3	2.65	2.62	-	-			
GRAIN SIZE ANALYSIS (BS 1377 Part 2 : 1990 : Method 9.3 & 9.5)	GRAVEL	%	0	10	-	-			
	SAND	%	3	69	-	-			
	SILT	%	51	17	-	-			
	CLAY	%	46	4	-	-			
ATTERBERG LIMITS (BS 1377 Part 2 : 1990 : Method 4.3 & 5)	LIQUID LIMIT	%	51.9	-	(A)	-			
	PLASTIC LIMIT	%	23.7	-		-			
	PLASTICITY INDEX		28	-		-			
TRIAXIAL COMPRESSION TEST (BS 1377 Part 7 & 8 : 1990)	TEST TYPE		**UU**	-	-	-			
	TOTAL COHESION	kPa	149.4	-	-	-			
	TEST TYPE		-	-	-	-			
	EFFECTIVE COHESION	kPa	-	-	-	-			
	EFFECTIVE PHI ANGLE	degree	-	-	-	-			
CONSOLIDATION TEST (BS 1377 Part 5 : 1990 : Method 3)	PRECONSOLIDATION PRESSURE	kPa	-	-	-	-			
	COMPRESSION INDEX	C_c	-	-	-	-			
ROCK TEST	POINT LOAD STRENGTH INDEX $I_{s(50)}$	MPa	-	-	-	-			
	BULK DENSITY	Mg/m^3	-	-	-	-			
	UNCONFINED COMPRESSIVE STRENGTH	MPa	-	-	-	-			
CHEMICAL CONTENTS ANALYSIS	pH Value		-	-	-	7.6			
	Chloride Content	g/L	-	-	-	<0.01			
	Organic Content	% (w/v)	-	-	-	<0.10			
	Sulphate Content	g/L	-	-	-	0.01			

LEGENDS :
UU - Unconsolidated Undrained Test (Part 7/Method 8)
CU - Consolidated Undrained Test (Part 8/Method 7)
CD - Consolidated Drained Test (Part 8/Method 8)

REMARKS :
(A) - Test cancelled due to high content of sand.

PREPARED BY : (Min Win Htut)

CHECKED BY : (Sio Keong Kong)

DATE : 11/06/2018

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MOISTURE CONTENT, DENSITY AND PARTICLE DENSITY

(TEST METHOD- BS 1377 Part 2 : 1990)

PROJECT 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)

JOB NO. K5728

BOREHOLE NO.	SAMPLE NO.	DEPTH (m)	MOISTURE CONTENT (%)	BULK DENSITY (Mg/m^3)	DRY DENSITY (Mg/m^3)	PARTICLE DENSITY (Mg/m^3)
BH-6	TW01	8.00-8.90	22.6	2.03	-	2.59
BH-6	SPT05	12.00-12.45	19.4	2.01	-	2.60
BH-6	TW02	16.00-16.90	23.4	1.97	-	2.60
BH-6	SPT08	20.00-20.45	22.3	2.03	-	2.59
BH-6	TW03	24.00-24.90	21.7	2.09	-	2.65
BH-6	SPT11	28.00-28.45	16.4	1.94	-	2.62

Method Used : MOISTURE CONTENT (BS 1377 Part 2 : 1990 : 3.2)
BULK & DRY DENSITY (BS 1377 Part 2 : 1990 : 7.2)
PARTICLE DENSITY (BS 1377 Part 2 : 1990 : 8.3)

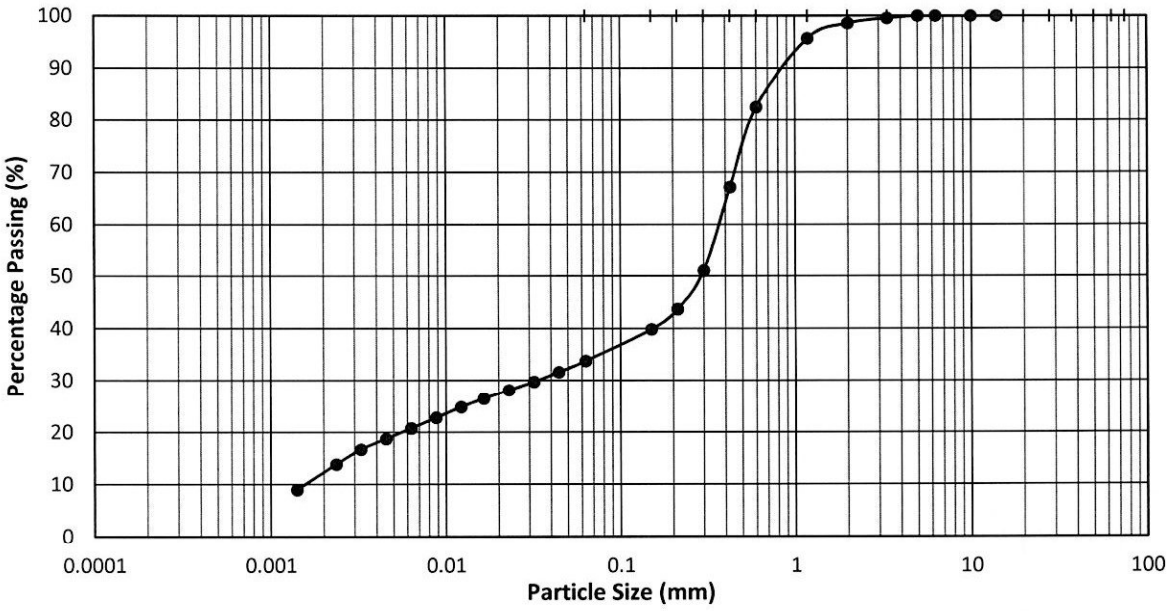
TESTED BY: MONJU Date :	APPROVED BY: (Authorised Signatory - Min Win Htut)	DATE : 11.8.2016

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

GRAIN SIZE ANALYSIS BY SIEVE AND HYDROMETER METHOD

(TEST METHOD- BS 1377 : Part 2 : 1990 - Clauses 9.3 & 9.5)

PROJECT	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
JOB NO.	: K5728
BOREHOLE NO.	: BH-6
SAMPLE NO.	: TW01
DEPTH (m)	: 8.00-8.90m
TEST DATE	: 05.06.2018



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLE
	SILT			SAND			GRAVEL			

SOIL DESCRIPTION : **Light grey very clayey SAND with traces of gravel**

HYDROMETER + SIEVING

GRAVEL	=	**1**	%
SAND	=	**65**	%
SILT	=	**21**	%
CLAY	=	**13**	%

% of Passing 0.425 mm Sieve : 67.2

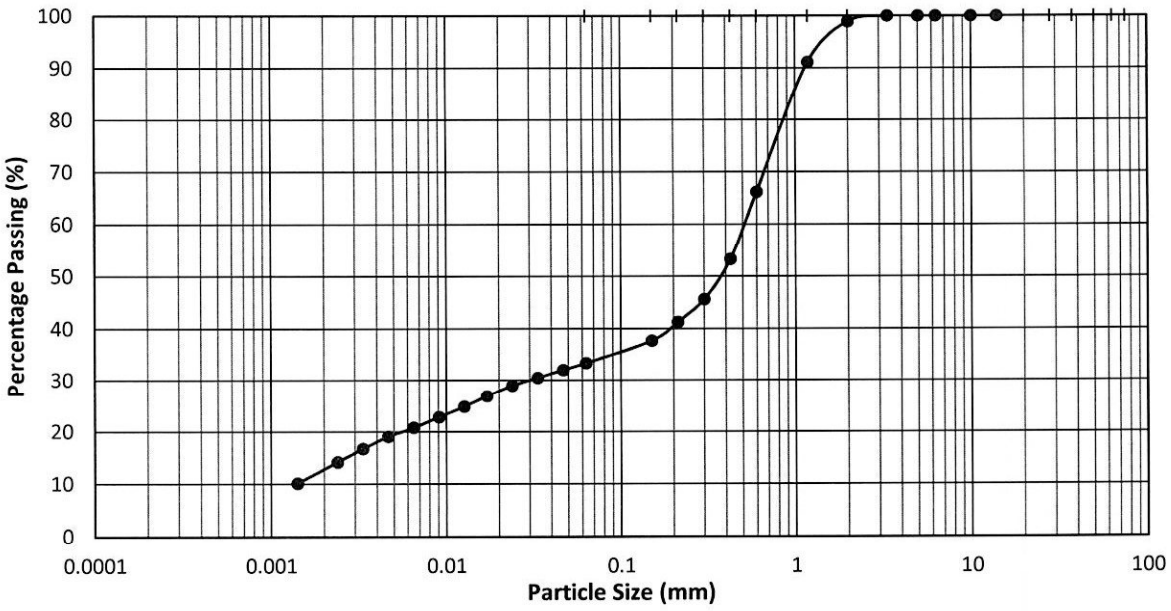
TESTED BY :	APPROVED BY :	DATE :
	(Authorised Signatory - Min Win Htut)	11.6.2018

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

GRAIN SIZE ANALYSIS BY SIEVE AND HYDROMETER METHOD

(TEST METHOD- BS 1377 : Part 2 : 1990 - Clauses 9.3 & 9.5)

PROJECT	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
JOB NO.	: K5728
BOREHOLE NO.	: BH-6
SAMPLE NO.	: SPT05
DEPTH (m)	: 12.00-12.45m
TEST DATE	: 04.05.2018



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLE
	SILT			SAND			GRAVEL			

SOIL DESCRIPTION : **Light grey and light yellow very clayey SAND with traces of gravel**

HYDROMETER + SIEVING

GRAVEL	=	**1**	%
SAND	=	**66**	%
SILT	=	**20**	%
CLAY	=	**13**	%

% of Passing 0.425 mm Sieve : 53.3

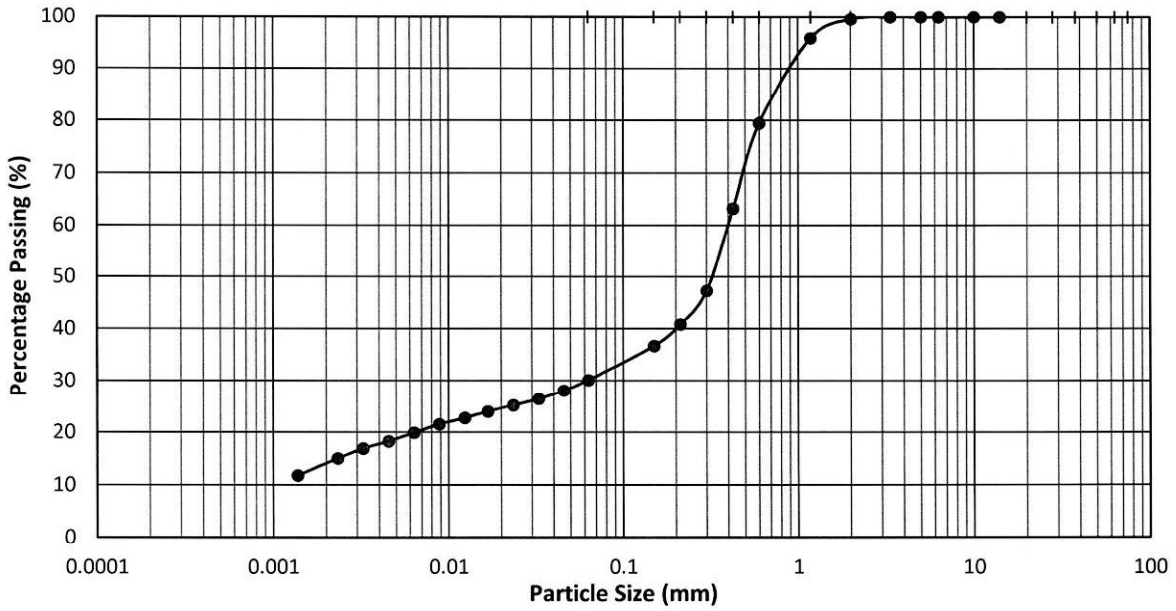
TESTED BY :	APPROVED BY :	DATE :
	(Authorised Signatory - Min Win Htut)	11.6.2018

GRAIN SIZE ANALYSIS BY SIEVE AND HYDROMETER METHOD

(TEST METHOD- BS 1377 : Part 2 : 1990 - Clauses 9.3 & 9.5)

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

PROJECT	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
JOB NO.	: K5728
BOREHOLE NO.	: BH-6
SAMPLE NO.	: TW02
DEPTH (m)	: 16.00-16.90m
TEST DATE	: 05.06.2018



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLE
	SILT			SAND			GRAVEL			

SOIL DESCRIPTION : **Light grey and light yellow very clayey SAND**

HYDROMETER + SIEVING

GRAVEL	=	**0**	%
SAND	=	**70**	%
SILT	=	**16**	%
CLAY	=	**14**	%

% of Passing 0.425 mm Sieve : 63.2

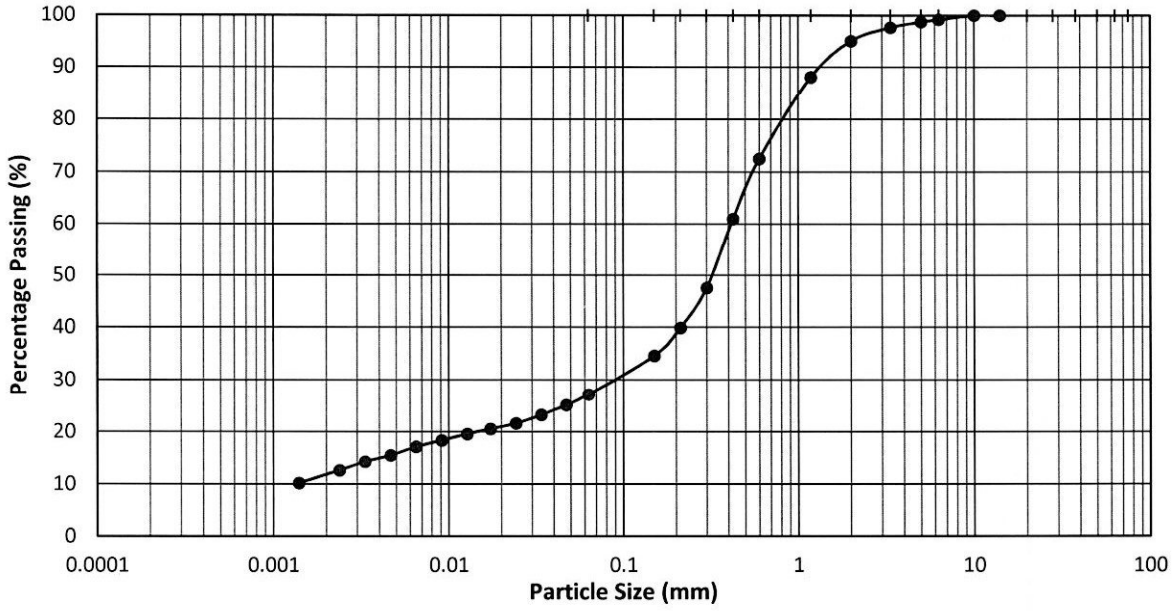
TESTED BY :	APPROVED BY :	DATE :
	(Authorised Signatory - Min Win Htut)	11.6.2018

GRAIN SIZE ANALYSIS BY SIEVE AND HYDROMETER METHOD

(TEST METHOD- BS 1377 : Part 2 : 1990 - Clauses 9.3 & 9.5)

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

PROJECT	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
JOB NO.	: K5728
BOREHOLE NO.	: BH-6
SAMPLE NO.	: SPT08
DEPTH (m)	: 20.00-20.45m
TEST DATE	: 04.05.2018



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLE
	SILT			SAND			GRAVEL			

SOIL DESCRIPTION : **Light grey and light yellow gravelly very clayey SAND**

HYDROMETER + SIEVING

GRAVEL	=	**5**	%
SAND	=	**68**	%
SILT	=	**15**	%
CLAY	=	**12**	%

% of Passing 0.425 mm Sieve : 61.0

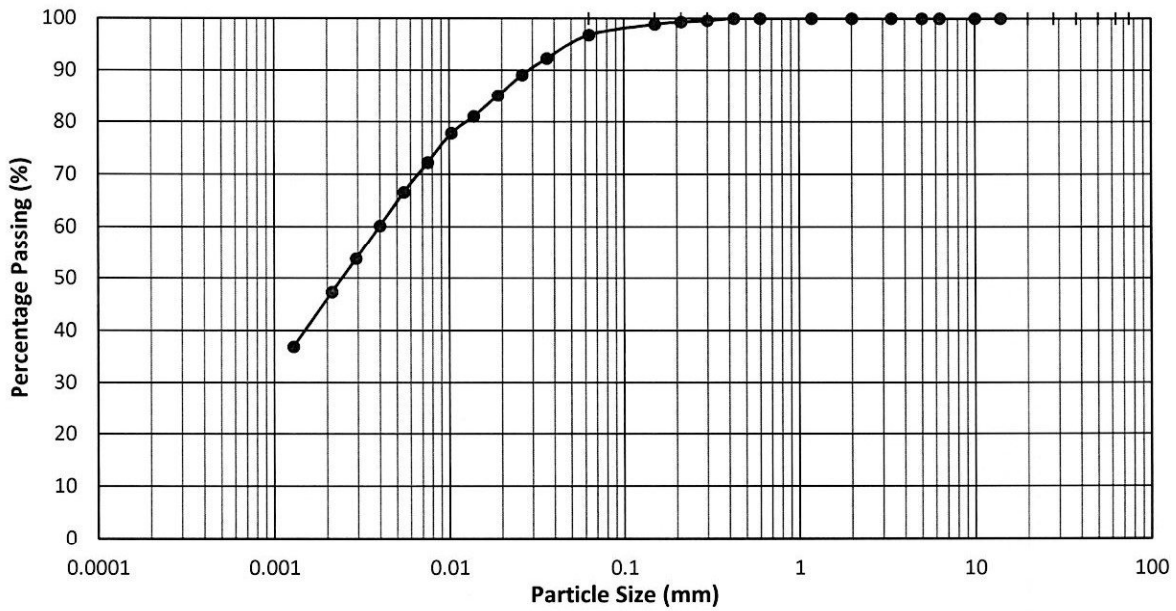
TESTED BY :	APPROVED BY :	DATE :
	(Authorised Signatory - Min Win Htut)	11.6.2018

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

GRAIN SIZE ANALYSIS BY SIEVE AND HYDROMETER METHOD

(TEST METHOD- BS 1377 : Part 2 : 1990 - Clauses 9.3 & 9.5)

PROJECT	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
JOB NO.	: K5728
BOREHOLE NO.	: BH-6
SAMPLE NO.	: TW03
DEPTH (m)	: 24.00-24.90m
TEST DATE	: 05.06.2018



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLE
	SILT			SAND			GRAVEL			

SOIL DESCRIPTION : **Yellowish grey and reddish brown slightly sandy CLAY**

HYDROMETER + SIEVING

GRAVEL	=	**0**	%
SAND	=	**3**	%
SILT	=	**51**	%
CLAY	=	**46**	%

% of Passing 0.425 mm Sieve : 100.0

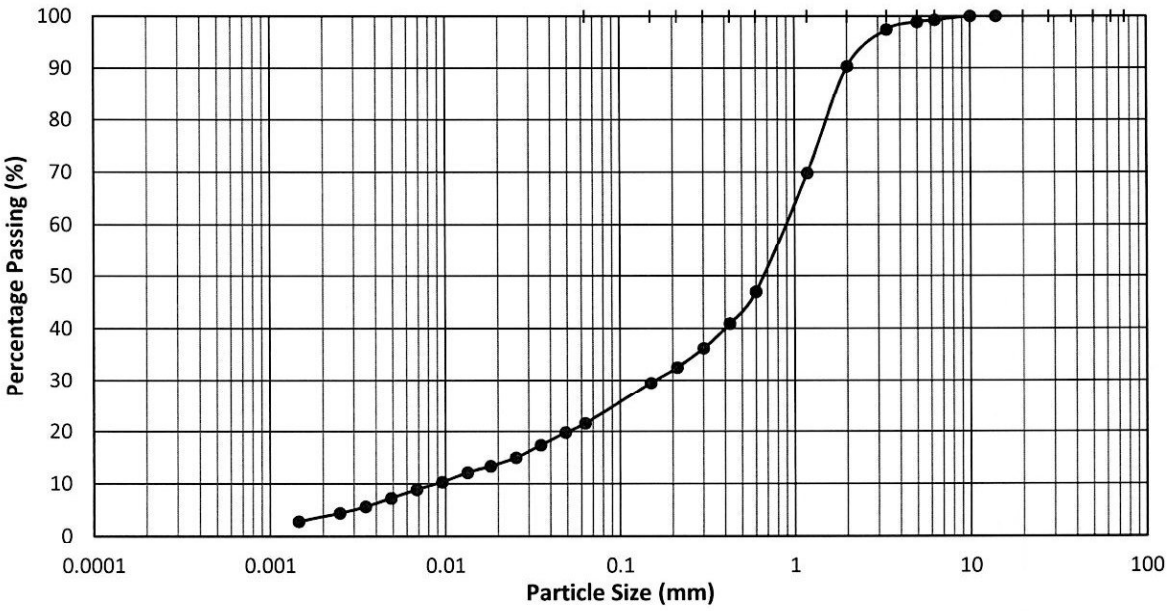
TESTED BY :	APPROVED BY :	DATE :
	(Authorised Signatory - Min Win Htut)	11.6.2018

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

GRAIN SIZE ANALYSIS BY SIEVE AND HYDROMETER METHOD

(TEST METHOD- BS 1377 : Part 2 : 1990 - Clauses 9.3 & 9.5)

PROJECT	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
JOB NO.	: K5728
BOREHOLE NO.	: BH-6
SAMPLE NO.	: SPT11
DEPTH (m)	: 28.00-28.45m
TEST DATE	: 04.05.2018



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLE
	SILT			SAND			GRAVEL			

SOIL DESCRIPTION : **Light grey and light yellow gravelly very clayey SAND**

HYDROMETER + SIEVING

GRAVEL	=	**10**	%
SAND	=	**69**	%
SILT	=	**17**	%
CLAY	=	**4**	%

% of Passing 0.425 mm Sieve : 40.9

TESTED BY :	APPROVED BY :	DATE :
	(Authorised Signatory - Min Win Htut)	11.6.2018

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

ATTERBERG LIMITS TEST BY CONE PENETROMETER METHOD

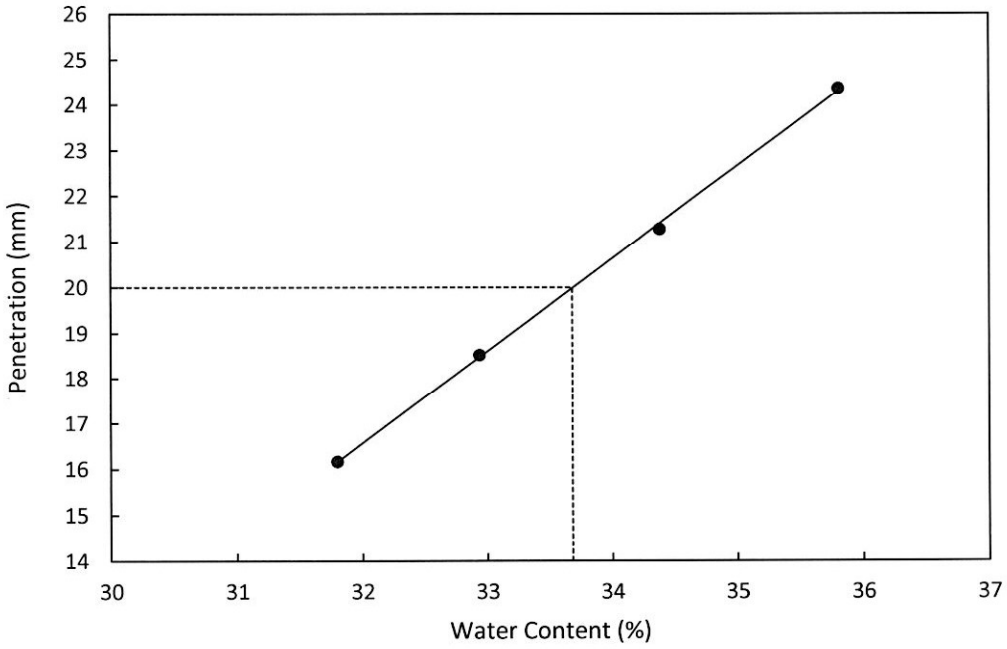
(TEST METHOD- BS 1377 : Part 2 : 1990 - Method 4.3 & 5)

PROJECT	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
JOB NO.	: K5728
BOREHOLE NO.	: BH6
SAMPLE NO.	: SPT03
DEPTH(M)	: 6.00-6.45m
SOIL DESCRIPTION	: Light grey very clayey SAND
SAMPLE CONDITION	: Natural
% OF PASSING 0.425mm SIEVE	: -
TEST DATE	: 03.06.2018

		LIQUID LIMIT				PLASTIC LIMIT	
WET WEIGHT + CUP	(g)	20.85	20.35	20.37	20.37	20.41	20.55
DRY WEIGHT + CUP	(g)	18.02	17.58	17.52	17.23	18.68	18.86
CUP WEIGHT	(g)	9.12	9.17	9.23	8.46	8.21	8.48
WATER CONTENT	(%)	31.8	32.9	34.4	35.8	16.5	16.3
PENETRATION	(mm)	16.2	18.5	21.3	24.4	-	-

LIQUID LIMIT	(%)	**33.7**
PLASTIC LIMIT	(%)	**16.4**
PLASTICITY INDEX		**17**

NOTE:
M : SILT
C : CLAY
L : LOW PLASTICITY
I : INTERMEDIATE PLASTICITY
H : HIGH PLASTICITY
V : VERY HIGH PLASTICITY
E : EXTREMELY HIGH PLASTICITY



TESTED BY :	APPROVED BY :	DATE :
	(Authorised Signatory - Min Win Htut)	11.6.2018

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

ATTERBERG LIMITS TEST BY CONE PENETROMETER METHOD

(TEST METHOD- BS 1377 : Part 2 : 1990 - Method 4.3 & 5)

PROJECT	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
JOB NO.	: K5728
BOREHOLE NO.	: BH6
SAMPLE NO.	: TW01
DEPTH(M)	: 8.00-8.90m
SOIL DESCRIPTION	: Light grey very clayey SAND with traces of gravel
SAMPLE CONDITION	: Sieved
% OF PASSING 0.425mm SIEVE	: 39
TEST DATE	: 01.06.2018

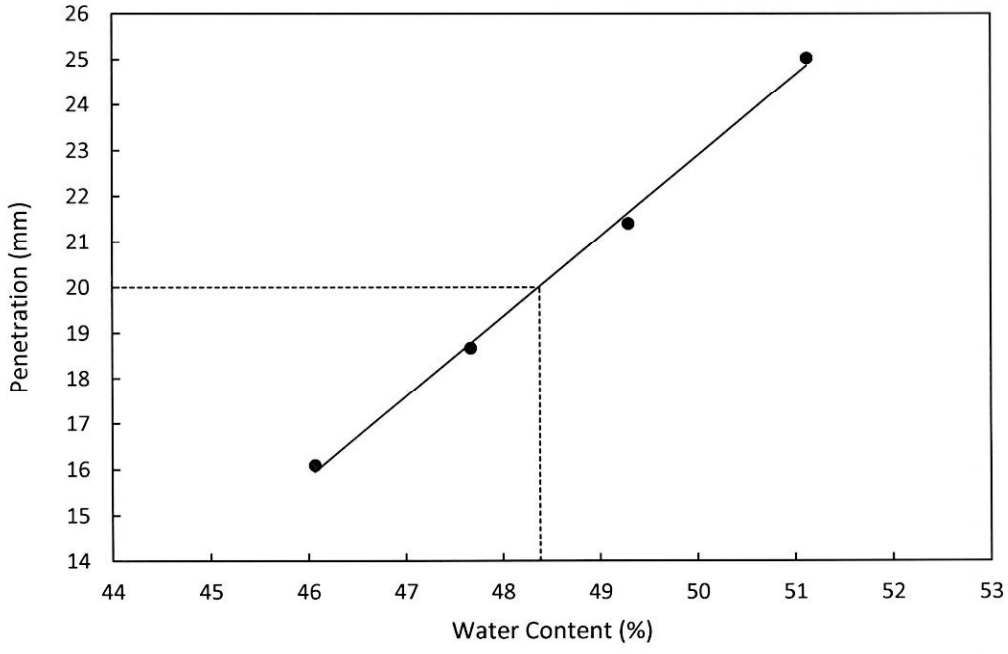
		LIQUID LIMIT				PLASTIC LIMIT	
WET WEIGHT + CUP	(g)	20.86	20.43	20.82	20.62	20.43	20.45
DRY WEIGHT + CUP	(g)	17.23	16.65	16.65	16.52	17.89	18.10
CUP WEIGHT	(g)	9.35	8.72	8.19	8.50	8.26	9.21
WATER CONTENT	(%)	46.1	47.7	49.3	51.1	26.4	26.4
PENETRATION	(mm)	16.1	18.7	21.4	25.0	-	-

LIQUID LIMIT	(%)	**48.4**
PLASTIC LIMIT	(%)	**26.4**
PLASTICITY INDEX		**22**

NOTE:

M : SILT C : CLAY L : LOW PLASTICITY

I : INTERMEDIATE PLASTICITY H : HIGH PLASTICITY V : VERY HIGH PLASTICITY E : EXTREMELY HIGH PLASTICITY



TESTED BY :	APPROVED BY :	DATE :
S. Htut.	(Authorised Signatory - Min Win Htut)	11.6.2018

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

ATTERBERG LIMITS TEST BY CONE PENETROMETER METHOD

(TEST METHOD- BS 1377 : Part 2 : 1990 - Method 4.3 & 5)

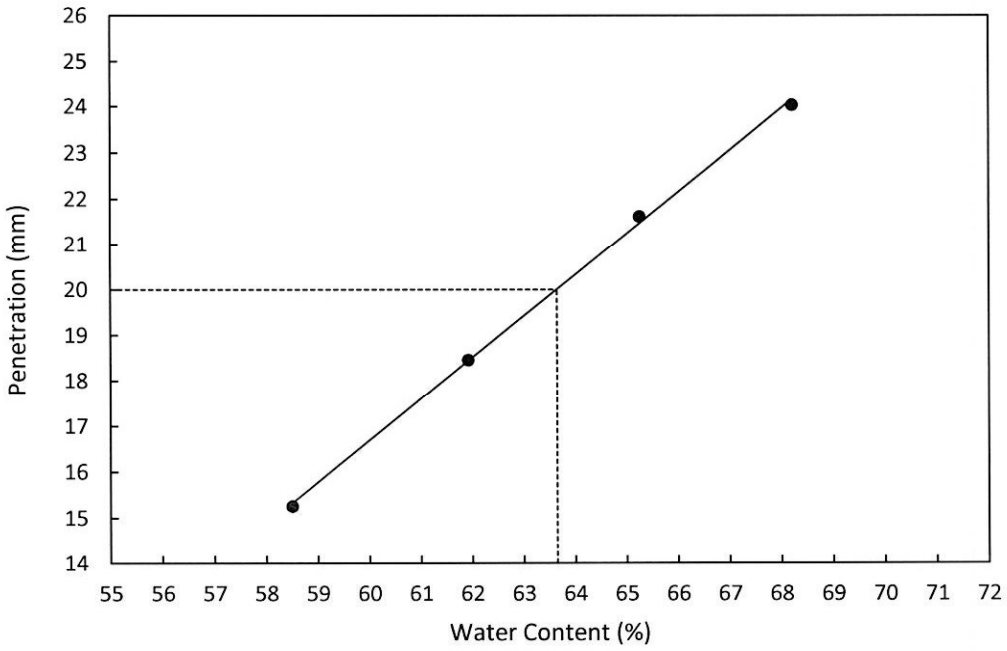
PROJECT	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
JOB NO.	: K5728
BOREHOLE NO.	: BH6
SAMPLE NO.	: TW02
DEPTH(M)	: 16.00-16.90m
SOIL DESCRIPTION	: Light grey and light yellow very clayey SAND
SAMPLE CONDITION	: Sieved
% OF PASSING 0.425mm SIEVE	: 36
TEST DATE	: 01.06.2018

		LIQUID LIMIT				PLASTIC LIMIT	
WET WEIGHT + CUP	(g)	20.42	20.28	20.32	20.13	20.88	20.42
DRY WEIGHT + CUP	(g)	16.29	16.02	15.72	15.11	17.72	17.55
CUP WEIGHT	(g)	9.23	9.14	8.67	7.75	7.59	8.21
WATER CONTENT	(%)	58.5	61.9	65.2	68.2	31.2	30.7
PENETRATION	(mm)	15.3	18.5	21.6	24.0	-	-

LIQUID LIMIT	(%)	**63.7**
PLASTIC LIMIT	(%)	**31.0**
PLASTICITY INDEX		**33**

NOTE:

M : SILT C : CLAY L : LOW PLASTICITY I : INTERMEDIATE PLASTICITY H : HIGH PLASTICITY V : VERY HIGH PLASTICITY E : EXTREMELY HIGH PLASTICITY



TESTED BY :	APPROVED BY :	DATE :
	(Authorised Signatory - Min Win Htut)	11.6.2018

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

ATTERBERG LIMITS TEST BY CONE PENETROMETER METHOD

(TEST METHOD- BS 1377 : Part 2 : 1990 - Method 4.3 & 5)

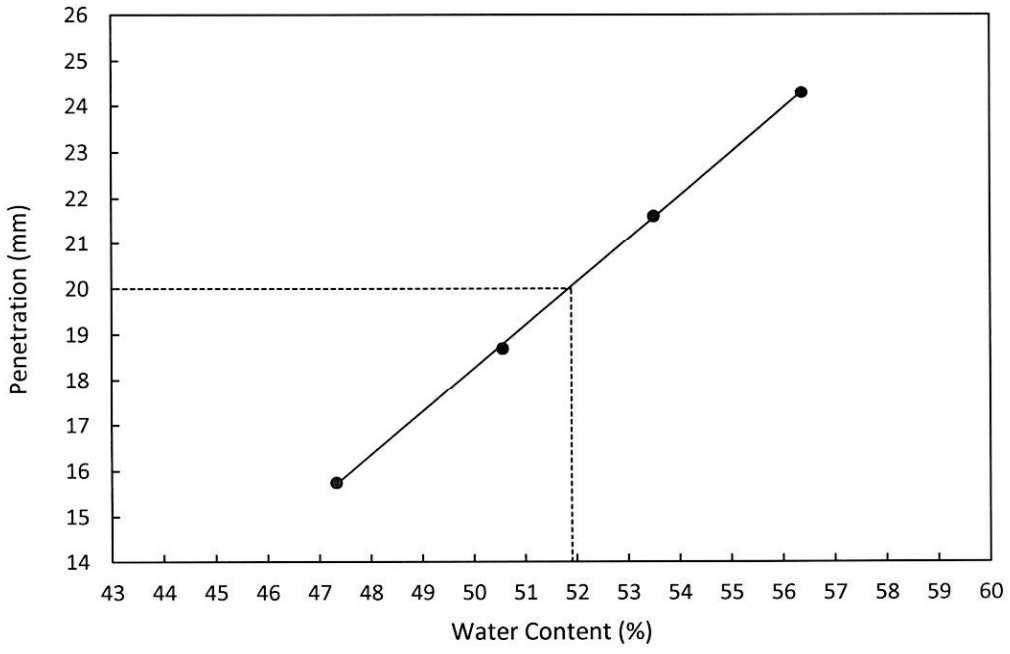
PROJECT	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
JOB NO.	: K5728
BOREHOLE NO.	: BH6
SAMPLE NO.	: TW03
DEPTH(M)	: 24.00-24.90m
SOIL DESCRIPTION	: Yellowish grey and reddish brown slightly sandy CLAY
SAMPLE CONDITION	: Natural
% OF PASSING 0.425mm SIEVE	: 100
TEST DATE	: 01.06.2018

		LIQUID LIMIT				PLASTIC LIMIT	
WET WEIGHT + CUP	(g)	20.50	20.41	20.14	20.69	20.91	20.25
DRY WEIGHT + CUP	(g)	16.78	16.82	15.86	16.40	18.56	18.11
CUP WEIGHT	(g)	8.92	9.72	7.86	8.79	8.55	9.13
WATER CONTENT	(%)	47.3	50.6	53.5	56.4	23.5	23.8
PENETRATION	(mm)	15.8	18.7	21.6	24.3	-	-

LIQUID LIMIT	(%)	**51.9**
PLASTIC LIMIT	(%)	**23.7**
PLASTICITY INDEX		**28**

NOTE:

M : SILT
C : CLAY
L : LOW PLASTICITY
I : INTERMEDIATE PLASTICITY
H : HIGH PLASTICITY
V : VERY HIGH PLASTICITY
E : EXTREMELY HIGH PLASTICITY

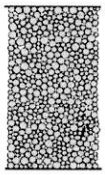


TESTED BY :	APPROVED BY :	DATE :
	(Authorised Signatory - Min Win Htut)	11.6.2018

Total Stress Triaxial Compression

Unconsolidated Undrained (Multiple Specimen)

Summary Report

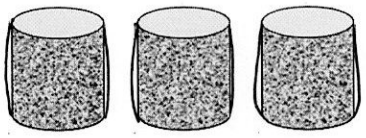
Sample Details					
 *sketch showing specimen location in original sample*	Depth		8.00-8.90m		
	Description		Light grey very clayey SAND with traces of gravel		
	Type		Undisturbed Sample		
			Spm. 1	2	3
	Initial Sample Length	L_0 (mm)	76.0	76.0	76.0
	Initial Sample Diameter	D_0 (mm)	38.0	38.0	38.0
	Initial Sample Weight	W_0 (gr)	173.0	174.9	176.9
	Bulk Density	ρ_0 (Mg/m3)	2.01	2.03	2.05
	Particle Density	ρ_s (Mg/m3)	2.59	2.59	2.59

Initial Conditions					
Specimen			Spm. 1	2	3
Initial Cell Pressure	σ_3	(kPa)	75	150	300
Strain Rate	m_s	(mm/min)	0.76000	0.76000	0.76000
MembraneThickness	m_b	(mm)	0.20	0.20	0.20
Initial Moisture	$\omega_i\%$	(%)	25	22	23
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.61	1.67	1.67
Initial Voids Ratio	e_0	.	0.61	0.55	0.55
Initial Degree of Saturation	S_o	(%)	100	100	100

Final Conditions					
			Spm. 1	2	3
Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	129.91	138.43	154.63
MembraneCorrection	m_c	(kPa)	1.440	1.780	1.450
Strain At Max Stress	$\varepsilon_f\%$	(%)	12.88	17.22	12.97
Shear Strength	c_u	(kPa)	64.96	69.22	77.31
Final Moisture	$\omega_f\%$	(%)	25	22	23
Final Dry Density	ρ_{df}	(Mg/m3)	1.61	1.67	1.67
Final Voids Ratio	e_f	.	0.61	0.55	0.55
Final Degree of Saturation	S_f	(%)	100.0	100.0	100.0

Notes

Soil parameters in final condition are assumed the same with the initial condition.



Failure Sketch

(surface inclination)

Test Method	BS1377: Part 7 1990 : Clause 8	Test Name	UU8-AVA-B6T1
Database: .\SQLEXPRESS \ RyobiG-L3-2017		Test Date	1/6/2018
Site Reference	AVA-Neo Tiew Crescent (5BHs)	Borehole	BH-6
Jobfile	AVA - Neo Tiew Crescent	Sample	TW01
Client	AVA	Depth	8.00-8.90m
Operator	Checked Min Win Htut	Approved	Sio Keong Kong

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

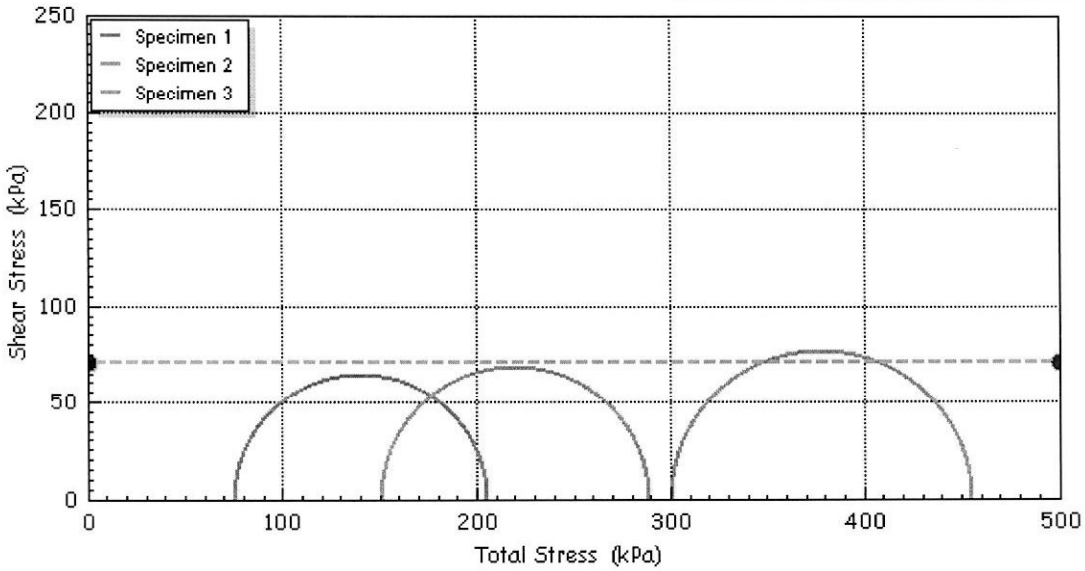
Ryobi Geotechnique International Pte Ltd

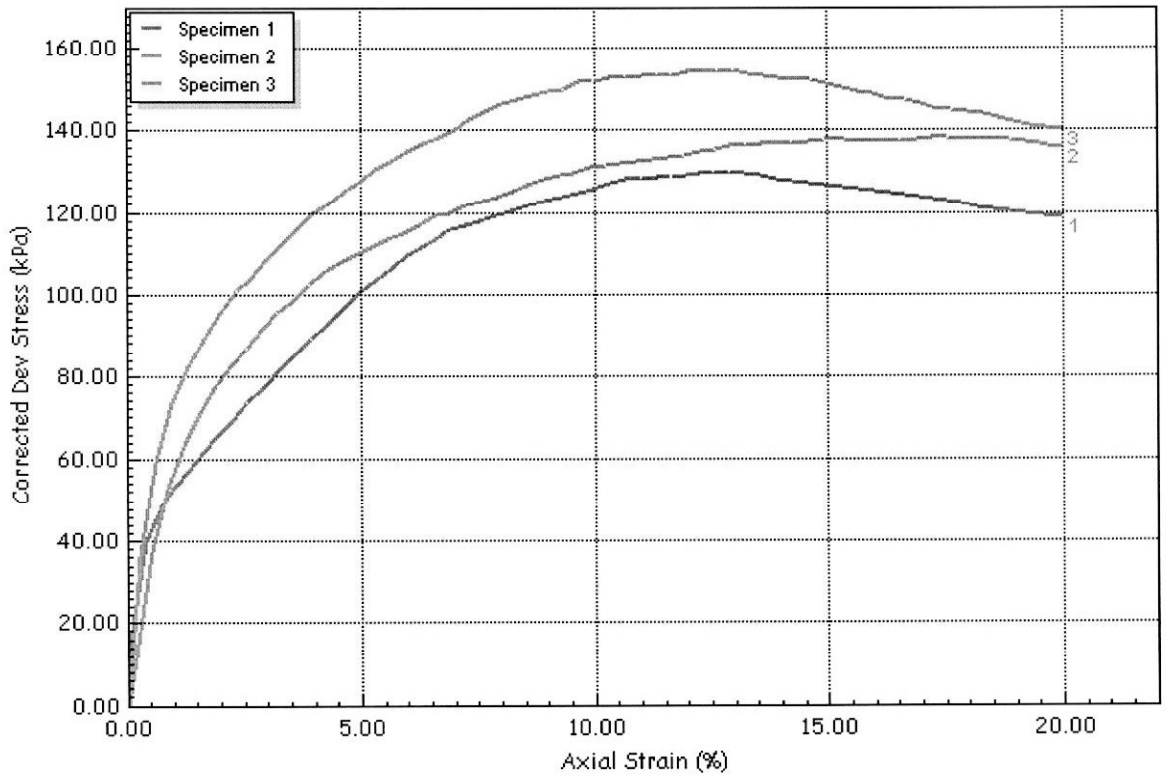
Total Stress Triaxial Compression

Unconsolidated Undrained (Multiple Specimen)

Test Results Plots

Cohesion Level	c	(kPa)	70.5
Friction Angle	ϕ	(deg)	0.0





Test Method	BS1377: Part 7 1990 : Clause 8	Test Name	UU8-AVA-B6T1
Database: .\SQLEXPRESS \ RyobiG-L3-2017		Test Date	1/6/2018
Site Reference	AVA-Neo Tiew Crescent (5BHs)	Borehole	BH-6
Jobfile	AVA - Neo Tiew Crescent	Sample	TW01
Client	AVA	Depth	8.00-8.90m
Operator		Checked	Min Win Htut
		Approved	Sio Keong Kong

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

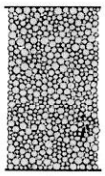
Ryobi Geotechnique International Pte Ltd

Total Stress Triaxial Compression

Unconsolidated Undrained (Multiple Specimen)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	24.00-24.90m			
Description	Stiff yellowish grey and reddish brown slightly sandy CLAY			
Type	Undisturbed Sample			
			Spm. 1	2
Initial Sample Length	L_0	(mm)	76.0	76.0
Initial Sample Diameter	D_0	(mm)	38.0	38.0
Initial Sample Weight	W_0	(gr)	179.4	180.3
Bulk Density	ρ_0	(Mg/m3)	2.08	2.09
Particle Density	ρ_s	(Mg/m3)	2.65	2.65

Initial Conditions

Specimen			Spm. 1	2
Initial Cell Pressure	σ_3	(kPa)	225	450
Strain Rate	m_S	(mm/min)	0.76000	0.76000
MembraneThickness	m_b	(mm)	0.20	0.20
Initial Moisture	$\omega_i\%$	(%)	24	23
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.68	1.69
Initial Voids Ratio	e_0	.	0.57	0.56
Initial Degree of Saturation	S_o	(%)	100	100

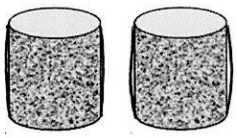
Final Conditions

			Spm. 1	2
Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	304.74	292.67
MembraneCorrection	m_C	(kPa)	1.870	1.920
Strain At Max Stress	$\varepsilon_f\%$	(%)	18.49	19.11
Shear Strength	c_U	(kPa)	152.37	146.33
Final Moisture	$\omega_f\%$	(%)	24	23
Final Dry Density	ρ_{df}	(Mg/m3)	1.68	1.69
Final Voids Ratio	e_f	.	0.57	0.56
Final Degree of Saturation	S_f	(%)	100.0	100.0

Notes

Soil parameters in final condition are assumed the same with the initial condition.

Only two specimens tested due to insufficient sample.



Failure Sketch

(surface inclination)

Test Method	BS1377: Part 7 1990 : Clause 8	Test Name	UU9-AVA-B6T3
Database: .\SQLEXPRESS \ RyobiG-L3-2017		Test Date	1/6/2018
Site Reference	AVA-Neo Tiew Crescent (5BHs)	Borehole	BH-6
Jobfile	AVA - Neo Tiew Crescent	Sample	TW03
Client	AVA	Depth	24.00-24.90m
Operator		Checked	Min Win Htut
		Approved	Sio Keong Kong

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

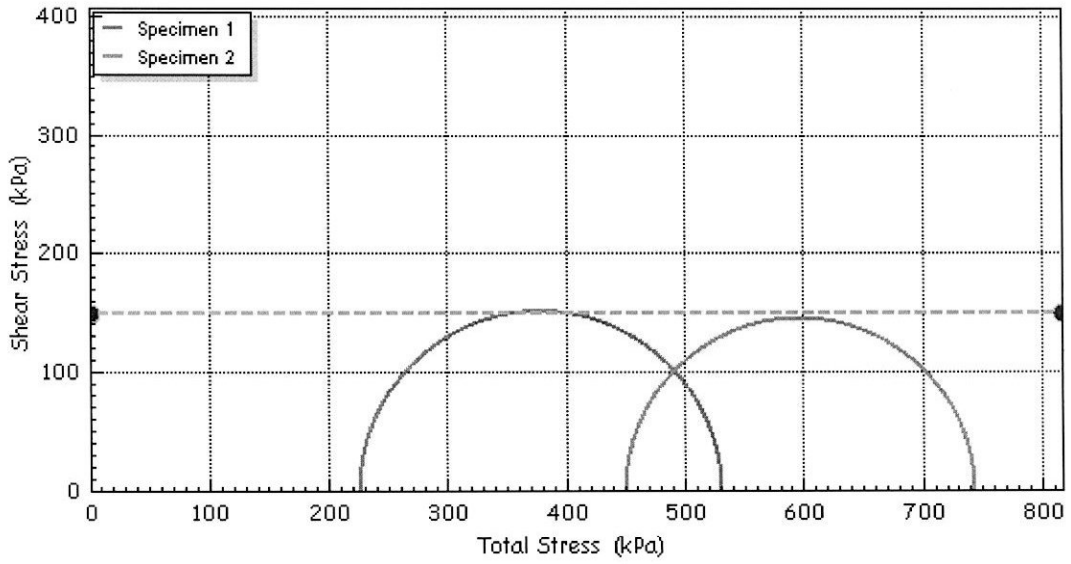
Ryobi Geotechnique International Pte Ltd

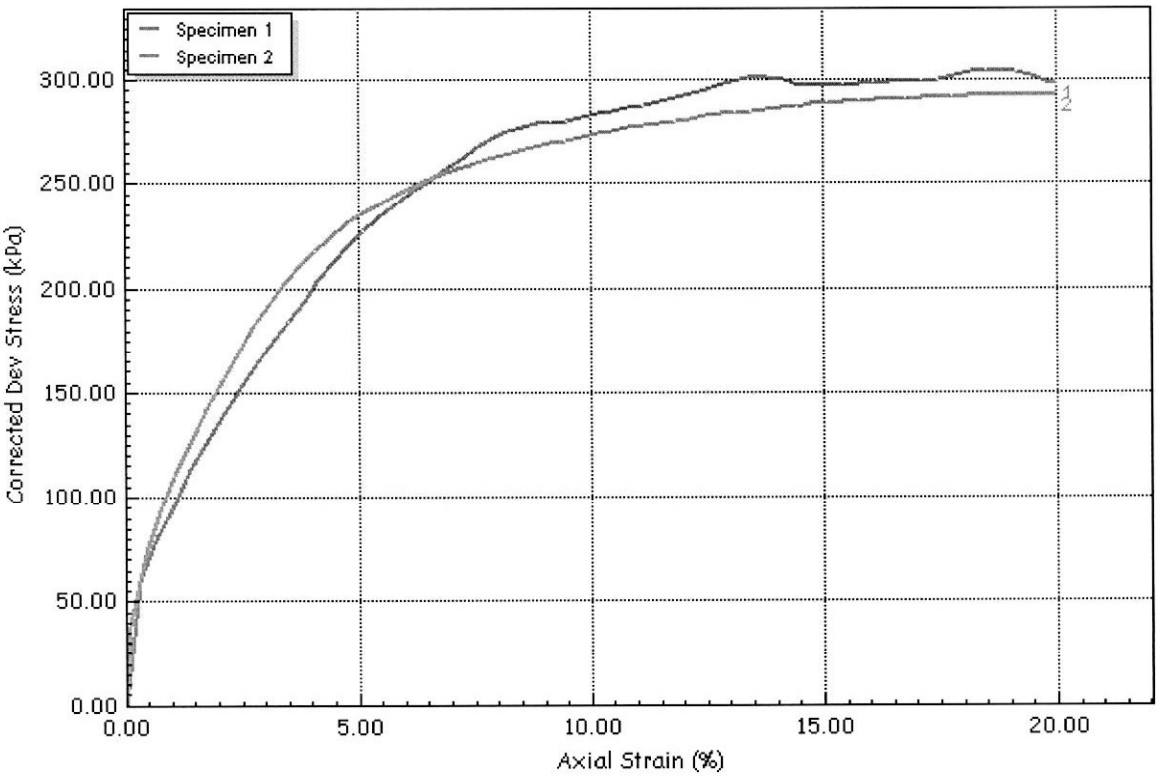
Total Stress Triaxial Compression

Unconsolidated Undrained (Multiple Specimen)

Test Results Plots

Cohesion Level	c	(kPa)	149.4
Friction Angle	ϕ	(deg)	0.0





Test Method	BS1377: Part 7 1990 : Clause 8	Test Name	UU9-AVA-B6T3
Database: .\SQLEXPRESS \ RyobiG-L3-2017		Test Date	1/6/2018
Site Reference	AVA-Neo Tiew Crescent (5BHs)	Borehole	BH-6
Jobfile	AVA - Neo Tiew Crescent	Sample	TW03
Client	AVA	Depth	24.00-24.90m
Operator		Checked	Min Win Htut
		Approved	Sio Keong Kong

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

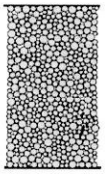
Ryobi Geotechnique International Pte Ltd

Effective Stress Triaxial Compression

Consolidated Undrained

Summary Report

Sample Details



sketch showing specimen location in original sample

			Spm. 1	2	3
Depth			16.00-16.90m		
Description			Light grey and light yellow very clayey SAND		
Type			Undisturbed Sample		
Initial Sample Length	L_0	(mm)	76.0	76.0	76.0
Initial Sample Diameter	D_0	(mm)	38.0	38.0	38.0
Initial Sample Weight	W_0	(gr)	170.8	168.5	169.1
Initial Bulk Density	ρ_0	(Mg/m3)	1.98	1.95	1.96
Particle Density	ρ_s	(Mg/m3)	2.60	2.60	2.60

Initial Conditions			Spm. 1	2	3
Initial Cell Pressure	σ_{3i}	(kPa)	280	360	430
Initial Back Pressure	U_{bi}	(kPa)	200	200	200
Strain Rate	m_s	(mm/min)	0.06000	0.06000	0.06000
Membrane Thickness	m_b	(mm)	0.200	0.200	0.200
Initial Moisture	$\omega_i\%$	(%)	24	25	25
Initial Dry Density	ρ_{di}	(Mg/m3)	1.60	1.56	1.56
Initial Voids Ratio	e_i	.	0.630	0.669	0.662
Initial Degree of Saturation	S_i	(%)	100	99	100
B Value	B	.	0.98	0.97	0.98

Final Conditions			Spm. 1	2	3
Final Moisture	$\omega_f\%$	(%)	23	23	22
Final Dry Density	ρ_{df}	(Mg/m3)	1.66	1.64	1.67
Final Voids Ratio	e_f	.	0.570	0.581	0.561
Final Degree of Saturation	S_f	(%)	100.0	100.0	100.0
Failure Criteria		.	Max. Stress Ratio	Max. Stress Ratio	Max. Stress Ratio
Strain At Failure	$\varepsilon\%$	(%)	5.16	8.32	7.25
Stress At Failure	$(\sigma_1-\sigma_3)$	(kPa)	123.2	237.7	336.7
Minor Stress At Failure	σ_3'	(kPa)	38.0	74.1	110.0
Major Stress At Failure	σ_1'	(kPa)	161.2	311.8	446.7
Principal Stress Ratio At Failure	σ_1'/σ_3'	(kPa)	4.242	4.208	4.060

Notes

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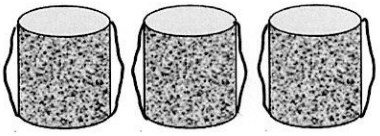


Test Method	BS1377-8 : 1990 : Clause 7	Test Name	CU3-NeoTiew-B6T02
Database: .\SQLEXPRESS \ Ryobi		Test Date	1/6/2018
Site Reference	AVA - Neo Tiew Crescent (5BHs)	Borehole	BH-6
Jobfile	K5728 Neo Tiew Crescent	Sample	TW02
Client	AVA	Depth	16.00-16.90m
Operator		Checked	Min Win Htut
		Approved	Sio Keong Kong

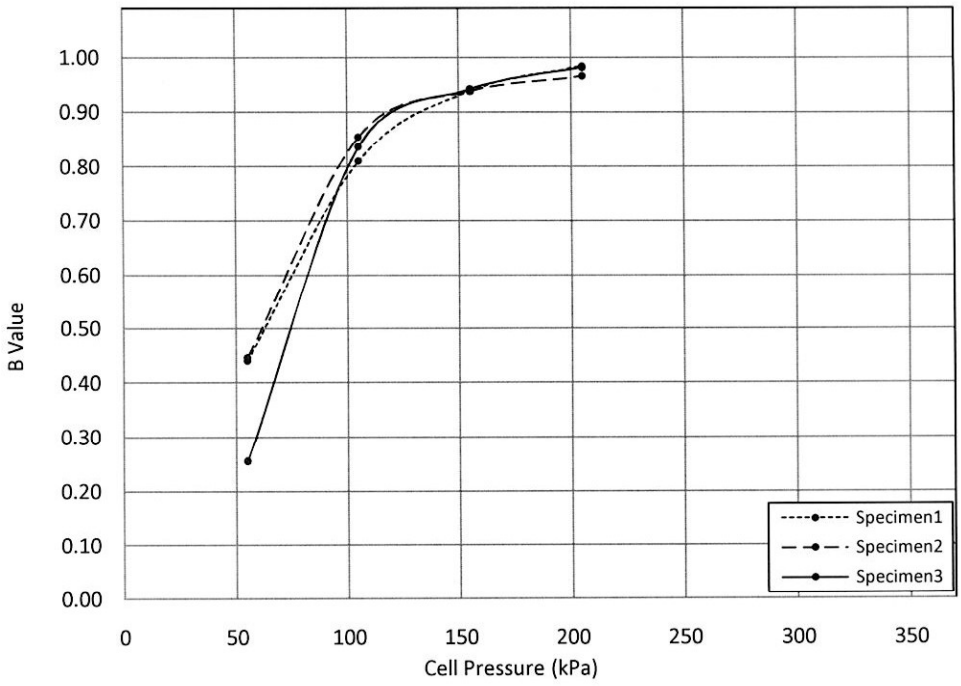
ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

Ryobi Geotechnique International Pte Ltd

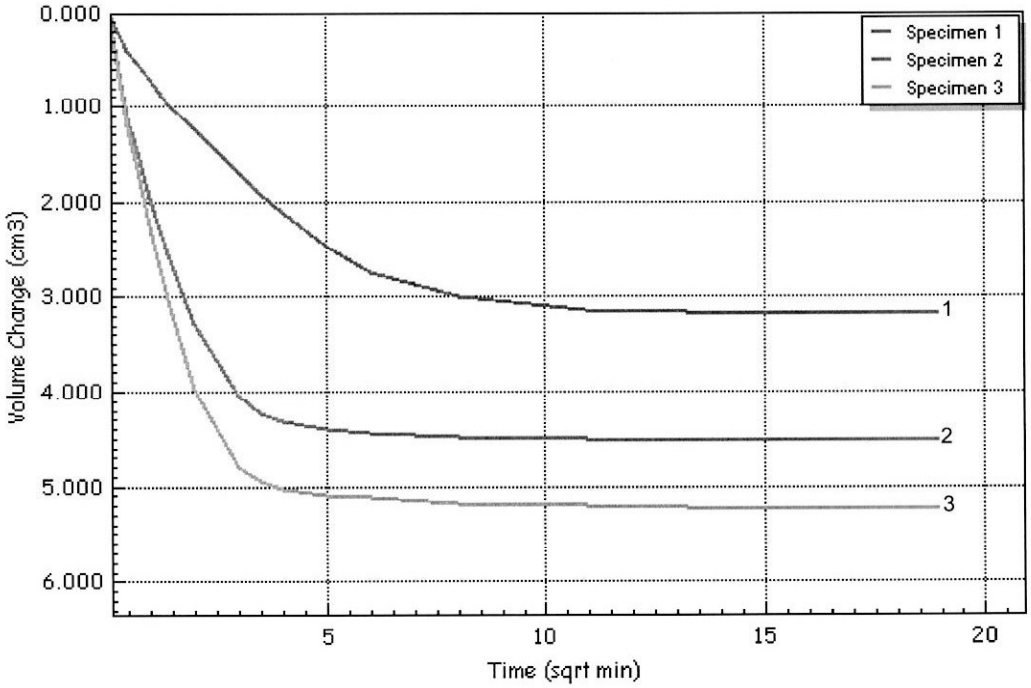
Effective Stress Triaxial Compression

Consolidated Undrained

Saturation and Consolidation Plots



Drainage Method : Both End and Side Drain



Test Method	BS1377-8 : 1990 : Clause 7	Test Name	CU3-NeoTiew-B6T02
Database: .\SQLEXPRESS \ Ryobi		Test Date	1/6/2018
Site Reference	AVA - Neo Tiew Crescent (5BHs)	Borehole	BH-6
Jobfile	K5728 Neo Tiew Crescent	Sample	TW02
Client	AVA	Depth	16.00-16.90m
Operator		Checked	Min Win Htut
		Approved	Sio Keong Kong

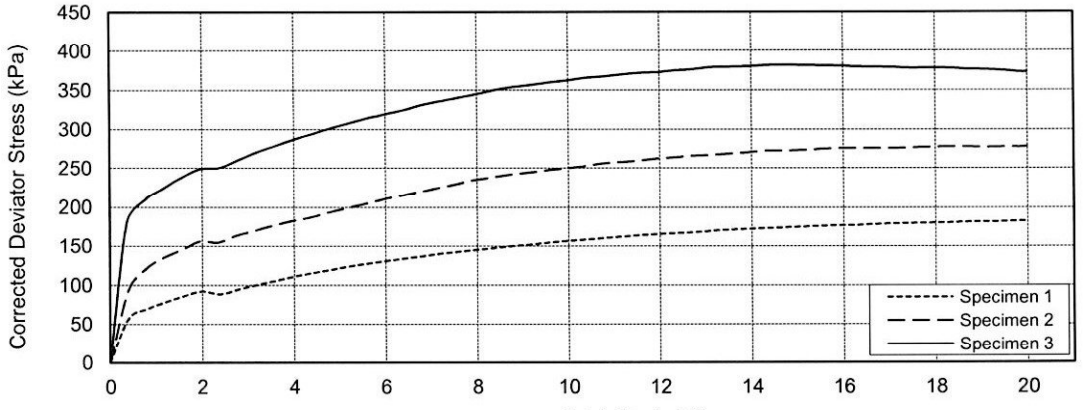
ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0622-B

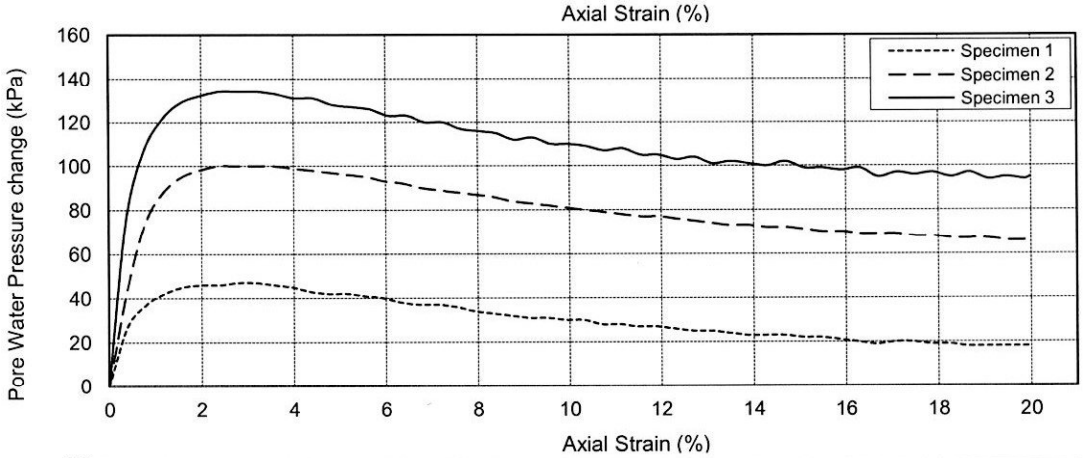
Ryobi Geotechnique International Pte Ltd

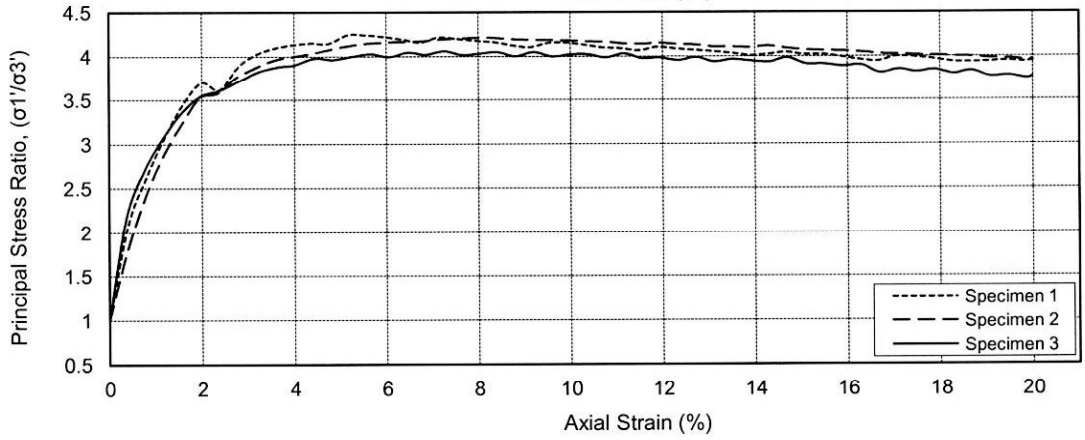
Effective Stress Triaxial Compression

Consolidation Undrained

Shear Stage Plots







Initial and Final Values	Spm.1	Spm.2	Spm.3
Pore Water Pressure at start of shear stage (kPa)	200	200	200
Pore Water Pressure at Max. Stress Ratio (kPa)	242	286	320
A Value at Max. Stress Ratio	0.341	0.361	0.356

Note : Side drain correction has been applied to strain exceeding 2% according to BS 1377.

Test Method	BS1337-8 : 1990 : Clause 7	Test Name	CU3-NeoTiew-B6T02
Database :.\SQLEXPRESS\Ryobi-2017		Test Date	1/6/2018
Site Reference	AVA - Neo Tiew Crescent (5BHs)	Borehole	BH-6
Jobfile	K5728 Neo Tiew Crescent	Sample	TW02
Client	AVA	Depth	16.00-16.90m
Operator		Checked	Min Win Htut
		Approved	Sio Keong Kong

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0022-B

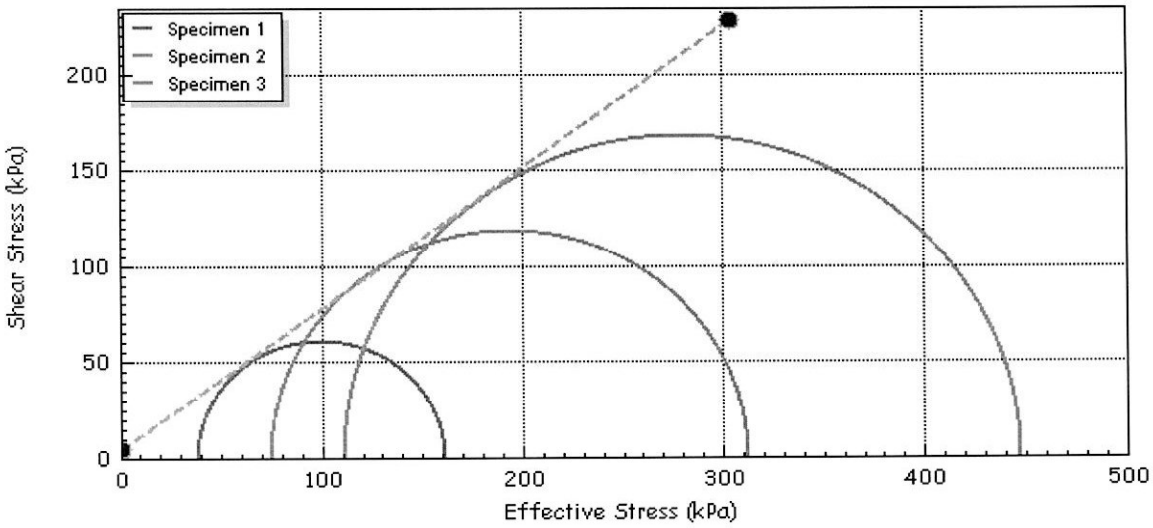
Ryobi Geotechnique International Pte Ltd

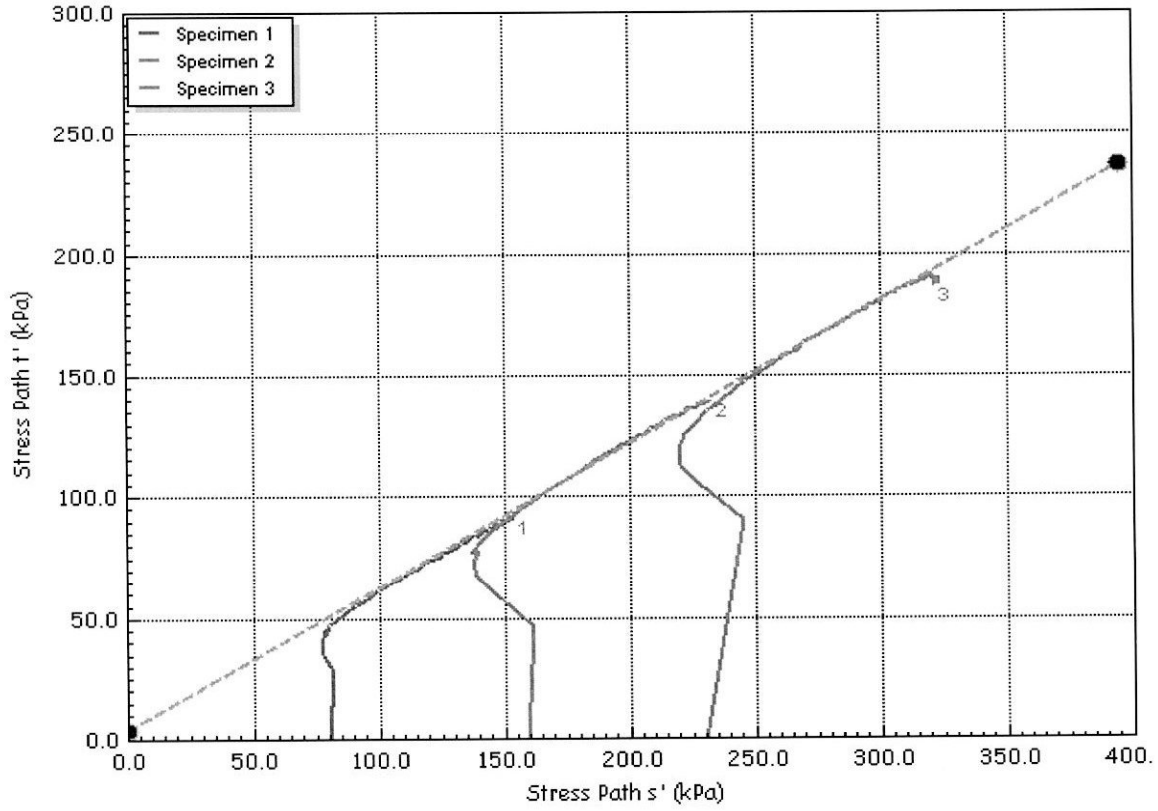
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots

Effective Cohesion	c'	(kPa)	4.4	Stress Path Intercept	t_0'	(kPa)	3.6
Effective Friction Angle	ϕ'	(deg)	36.2	Stress Path Inclination	θ	(deg)	30.6





Test Method	BS1377-8 : 1990 : Clause 7	Test Name	CU3-NeoTiew-B6T02
Database: .\SQLEXPRESS \ Ryobi		Test Date	1/6/2018
Site Reference	AVA - Neo Tiew Crescent (5BHs)	Borehole	BH-6
Jobfile	K5728 Neo Tiew Crescent	Sample	TW02
Client	AVA	Depth	16.00-16.90m
Operator	Kai	Checked	Min Win Htut
		Approved	Sio Keong Kong

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

Ryobi Geotechnique International Pte Ltd

ACCREDITED LABORATORY SAC-SINGLAS
Cert No: LA-1993-0064-A
Cert No: LA-2000-0178-F

CERTIFICATE OF ANALYSIS

Work Order	: **SG1808925**	Page	: 1 of 2
Client	: **RYOBI GEOTECH PTE LTD**	Project	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
Contact	: Mr Min Win Htut	Order number	: GTPO2161
Address	: 58A Sungei Kadut Loop Ryobi Industrial Bldg, Singapore 729505	Quote number	: SG2016RYOGEO0001 (Soil - Organic Content, Total Sulphate, pH Value, Chloride Content & Soluble Sulphate)
E-mail	: min.win.htut@ryobi-g.com	Date Received	: 31-May-2018
Telephone	: +65 6369 7100	Date Analysed	: 01-Jun-2018
Facsimile	: +65 6362 5848	Date Issued	: 08-Jun-2018
No. of samples received	: 5	No. of samples analysed	: 5

General Comments

This report supersedes any previous report(s) with this reference. All pages of this report have been checked and approved for release. Results apply to the sample(s) as submitted. The laboratory declares that the test results relate only to the items tested and do not substitute any other documents. This report may not be reproduced except with prior written approval from the testing laboratory. This report may not be used for advertising purposes.

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, BS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference. LOR = Limit of reporting

* Preceeding indicates non-accredited test. In the case when a procedure belonging to an accredited method was used for non-accredited matrix, would apply that the reported results are non-accredited.

- **BS method is referenced to British Standard 1377: Part 3/1990**
- **Organic Content Test is referenced to Clause 3 of Part 3:BS1377**
- **Chloride Content Test is referenced to Clause 7.3 or Part 3:BS1377**
- **Sulphate Content Test is referenced to Clause 5.2 of Part 3:BS1377**
- **pH Test is referenced to Clause 9 of Part 3: BS1377**

Signatories

This laboratory is accredited under SAC - SINGLAS. The tests reported herein have been performed in accordance with the laboratory's Terms of Accreditation. This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Accreditation Category*	*Position*
Pansy Teo	SG - Inorganics SG - Organics	Senior Environmental Manager

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-1993-0064-A Cert No: LA-2006-0178-P ALS

Analytical Results

Sub-Matrix: **SOIL**

				Client sample ID	BH-3 S1	BH-4 S1	BH-5 S1
				Sampling date/time	31-May-2018 00:00	31-May-2018 00:00	31-May-2018 00:00
Compound	*Method*	*LOR*	*Unit*		**SG1808925-001**	**SG1808925-002**	**SG1808925-003**
INORGANIC- Physical Properties							
pH Value	BS1377 pH	0.1	pH Unit		7.2	5.6	7.4
INORGANICS - Nonmetalllic Constituents							
Chloride	BS1377 Cl	0.01	% DW		<0.01	<0.01	<0.01
Organic Matter	BS1377	0.1	% DW		0.5	0.2	0.3
Sulphate as SO3	BS1377 SO3	0.01	% DW		<0.01	<0.01	<0.01

Sub-Matrix: **SOIL**

				Client sample ID	BH-6 S1	BH-7 S1	—
				Sampling date/time	31-May-2018 00:00	31-May-2018 00:00	----
Compound	*Method*	*LOR*	*Unit*		**SG1808925-004**	**SG1808925-005**	**--------**
INORGANIC- Physical Properties							
pH Value	BS1377 pH	0.1	pH Unit		6.5	6.5	----
INORGANICS - Nonmetalllic Constituents							
Chloride	BS1377 Cl	0.01	% DW		<0.01	<0.01	----
Organic Matter	BS1377	0.1	% DW		0.3	0.5	----
Sulphate as SO3	BS1377 SO3	0.01	% DW		<0.01	<0.01	----

ACCREDITED LABORATORY SAC-SINGLAS
Cert No: LA-1993-0064-A
Cert No: LA-2000-0178-F

CERTIFICATE OF ANALYSIS

Work Order	: **SG1808926**	Page	: 1 of 2
Client	: **RYOBI GEOTECH PTE LTD**	Project	: 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)
Contact	: Mr Min Win Htut	Order number	: GTPO2161
Address	: 58A Sungei Kadut Loop Ryobi Industrial Bldg, Singapore 729505	Quote number	: SG2016RYOGEO0002 (Water - Organic Content, Sulphate Content, Chloride, pH, Salinity & Soluble Sulphate)
E-mail	: min.win.htut@ryobi-g.com	Date Received	: 31-May-2018
Telephone	: +65 6369 7100	Date Analysed	: 31-May-2018
Facsimile	: +65 6362 5848	Date Issued	: 08-Jun-2018
No. of samples received	: 5	No. of samples analysed	: 5

General Comments

This report supersedes any previous report(s) with this reference. All pages of this report have been checked and approved for release. Results apply to the sample(s) as submitted. The laboratory declares that the test results relate only to the items tested and do not substitute any other documents. This report may not be reproduced except with prior written approval from the testing laboratory. This report may not be used for advertising purposes.

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, BS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference. LOR = Limit of reporting

* Preceeding indicates non-accredited test. In the case when a procedure belonging to an accredited method was used for non-accredited matrix, would apply that the reported results are non-accredited.

- **Sulphate Content Test is referenced to Clause 5.2 of Part 3:BS1377**
- **BS method is referenced to British Standard 1377: Part 3/1990**
- **Chloride ContentTest is referenced to Clause 7.3 of Part 3: BS1377**
- **pH Test is referenced to Clause 9 of Part 3: BS1377**

Signatories

This laboratory is accredited under SAC - SINGLAS. The tests reported herein have been performed in accordance with the laboratory's Terms of Accreditation. This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Accreditation Category*	*Position*
Pansy Teo	SG - Inorganics SG - Organics	Senior Environmental Manager

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-1993-0044-A Cert No: LA-2008-0178-P ALS

Analytical Results

Sub-Matrix: **WATER**

			Client sample ID	**BH-3**	**BH-4**	**BH-5**
			Sampling date/time	31-May-2018 00:00	31-May-2018 00:00	31-May-2018 00:00
Compound	*Method*	*LOR*	*Unit*	**SG1808926-001**	**SG1808926-002**	**SG1808926-003**
INORGANIC- Physical Properties						
pH Value	BS1377 pH	0.1	pH Unit	12.2	7.2	12.3
INORGANICS - Nonmetalllic Constituents						
Chloride	BS1377 Cl	0.01	g/L	<0.01	<0.01	<0.01
INORGANICS-Anions						
Sulphate as SO3	BS1377 SO3	0.01	g/L	<0.01	<0.01	<0.01
ORGANICS-General						
•Organic Content	Ashing/Gravimetric	0.10	% (w/v)	<0.10	<0.10	<0.10

Sub-Matrix: **WATER**

			Client sample ID	**BH-6**	**BH-7**	**—**
			Sampling date/time	31-May-2018 00:00	31-May-2018 00:00	----
Compound	*Method*	*LOR*	*Unit*	**SG1808926-004**	**SG1808926-005**	**--------**
INORGANIC- Physical Properties						
pH Value	BS1377 pH	0.1	pH Unit	7.6	12.2	----
INORGANICS - Nonmetalllic Constituents						
Chloride	BS1377 Cl	0.01	g/L	<0.01	<0.01	----
INORGANICS-Anions						
Sulphate as SO3	BS1377 SO3	0.01	g/L	0.01	<0.01	----
ORGANICS-General						
•Organic Content	Ashing/Gravimetric	0.10	% (w/v)	<0.10	<0.10	----

Ryobi Geotechnique International Pte Ltd

58A Sungei Kadut Loop, Ryobi Industrial Bldg., Singapore 729505 Tel: 65- 6369 7100 Fax: 65- 6362 5848

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2016-0623-B

SUMMARY OF LABORATORY TEST RESULTS

CLIENT : AVA

PROJECT : 36 months SI Term Contract for AVA at Neo Tiew Crescent (5BHs)

JOB NO. : K5728

BOREHOLE NO :			BH-7						
SAMPLE NO :			D 1	SPT03	TW01	SPT05	SPT06	TW02	SPT08
SAMPLE DEPTH :		m	1.00	6.00-6.45	8.00-8.90	12.00-12.45	14.00-14.45	16.00-16.90	20.00-20.45
MOISTURE CONTENT (BS 1377 Part 2 : 1990 : Method 3)		%	-	-	18.8	16.3	-	20.9	18.3
BULK DENSITY (BS 1377 Part 2 : 1990 : Method 7)		Mg/m^3	-	-	2.05	2.06	-	2.09	1.99
DRY DENSITY (BS 1377 Part 2 : 1990 : Method 7)		Mg/m^3	-	-	-	-	-	-	-
PARTICLE DENSITY (BS 1377 Part 2 : 1990 : Method 8 / Small Pyknometer)		Mg/m^3	-	-	2.58	2.62	-	2.63	2.61
GRAIN SIZE ANALYSIS (BS 1377 Part 2 : 1990 : Method 9.3 & 9.5)	GRAVEL	%	-	-	5	0	-	0	0
	SAND	%	-	-	69	64	-	43	78
	SILT	%	-	-	17	30	-	47	18
	CLAY	%	-	-	9	6	-	10	4
ATTERBERG LIMITS (BS 1377 Part 2 : 1990 : Method 4.3 & 5)	LIQUID LIMIT	%	-	40.0	45.2	-	56.0	45.9	-
	PLASTIC LIMIT	%	-	24.0	26.3	-	26.5	22.5	-
	PLASTICITY INDEX		-	16	19	-	29	23	-
TRIAXIAL COMPRESSION TEST (BS 1377 Part 7 & 8 : 1990)	TEST TYPE		-	-	-	-	-	**UU**	-
	TOTAL COHESION	kPa	-	-	-	-	-	193.1	-
	TEST TYPE		-	-	**CU**	-	-	-	-
	EFFECTIVE COHESION	kPa	-	-	5.0	-	-	-	-
	EFFECTIVE PHI ANGLE	degree	-	-	34.3	-	-	-	-
CONSOLIDATION TEST (BS 1377 Part 5 : 1990 : Method 3)	PRECONSOLIDATION PRESSURE	kPa	-	-	-	-	-	-	-
	COMPRESSION INDEX	C_c	-	-	-	-	-	-	-
ROCK TEST	POINT LOAD STRENGTH INDEX $I_{s(50)}$	MPa	-	-	-	-	-	-	-
	BULK DENSITY	Mg/m^3	-	-	-	-	-	-	-
	UNCONFINED COMPRESSIVE STRENGTH	MPa	-	-	-	-	-	-	-
CHEMICAL CONTENTS ANALYSIS	pH Value		6.5	-	-	-	-	-	-
	Chloride Content	%	<0.01	-	-	-	-	-	-
	Organic Content	%	0.5	-	-	-	-	-	-
	Sulphate Content	%	<0.01	-	-	-	-	-	-

LEGENDS :

UU - Unconsolidated Undrained Test (Part 7/Method 8)

CU - Consolidated Undrained Test (Part 8/Method 7)

CD - Consolidated Drained Test (Part 8/Method 8)

REMARKS :

-

PREPARED BY : (Min Win Htut)

CHECKED BY : (Sio Keong Kong)

DATE : 11/06/2018

This laboratory is accredited under the Singapore Accreditation Council-Singapore Laboratory Accreditation Scheme (SAC-SINGLAS) and has met the requirements of ISO /IEC 17025 : 2005. The results reported herein have been performed in accordance with the laboratory's terms of accreditation under the SAC-SINGLAS.