Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	Carnival Phase II
Contract ID:	C6411
Client:	Wokingham Borough Council
Hole ID:	TP2

Trial Pit Photograph



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Contract Name:	Carnival Phase II
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Hole ID:	TP2

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	Carnival Phase II
Contract ID:	C6411
Client:	Wokingham Borough Council
Hole ID:	TP3

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	Carnival Phase II
Contract ID:	C6411
Client:	Wokingham Borough Council
Hole ID:	TP3

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	Carnival Phase II
Contract ID:	C6411
Client:	Wokingham Borough Council
Hole ID:	TP3

APPENDIX D

Geotechnical Laboratory Test Results

LABORATORY REPORT

4043

Contract Number: PSL19/4270

Report Date: 05 August 2019

Client's Reference: C6411

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
Innsworth Lane
Gloucester
GL3 1DL

For the attention of: Richard Tucker

Contract Title: Carnival Phase 2

Date Received: 12/7/2019
Date Commenced: 12/7/2019
Date Completed: 2/8/2019

Notes: **Opinions and Interpretations are outside the UKAS Accreditation**

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

[redacted]

R Gunson (Director)
A Watkins (Director)
R Berriman (Quality Manager)

S Royle (Laboratory Manager)
S Eyre (Senior Technician)
L Knight (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH02		UT100	1.70	2.15	Soft brown mottled grey sandy CLAY.
BH02		D	2.15	2.20	Brown mottled grey sandy CLAY.
BH02		D	3.00		Brown sandy CLAY.
BH02		D	5.40		Brown sandy CLAY.
BH02		D	6.50		Brown sandy CLAY.
BH02		D	8.60		Brown sandy CLAY.
BH02		CS	10.00	10.30	Stiff brown sandy CLAY.
BH02		D	11.30		Brown sandy CLAY.
BH03		B	0.90	1.20	Brown mottled grey slightly gravelly very sandy CLAY.
BH03		UT100	1.70	2.15	Brown mottled grey sandy CLAY.
BH03		D	2.15	2.20	Brown mottled grey sandy CLAY.
BH03		UT100	2.70	3.15	Soft brown mottled grey sandy CLAY.
BH03		D	4.50		Brown slightly sandy CLAY.
BH03		D	6.50		Brown sandy CLAY.
BH03		CS	11.00	11.30	Stiff brown sandy CLAY.
BH03		D	11.40		Brown sandy CLAY.
BH03		CS	17.00	17.30	Very stiff brown sandy CLAY.
BH03		D	18.40		Brown sandy CLAY.
BH03		CS	21.30	21.60	Stiff brown sandy CLAY.

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH02		D	2.15	2.20	26			52	24	28	100	High plasticity CH.
BH02		D	5.40		23			53	24	29	100	High plasticity CH.
BH02		D	8.60		21			48	22	26	100	Intermediate plasticity CI.
BH02		D	11.30		23			54	24	30	100	High plasticity CH.
BH03		D	2.15	2.20	28			46	22	24	100	Intermediate plasticity CI.
BH03		D	6.50		23			52	25	27	100	High plasticity CH.
BH03		D	11.40		22			54	25	29	100	High plasticity CH.
BH03		D	18.40		22			52	24	28	100	High plasticity CH.

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

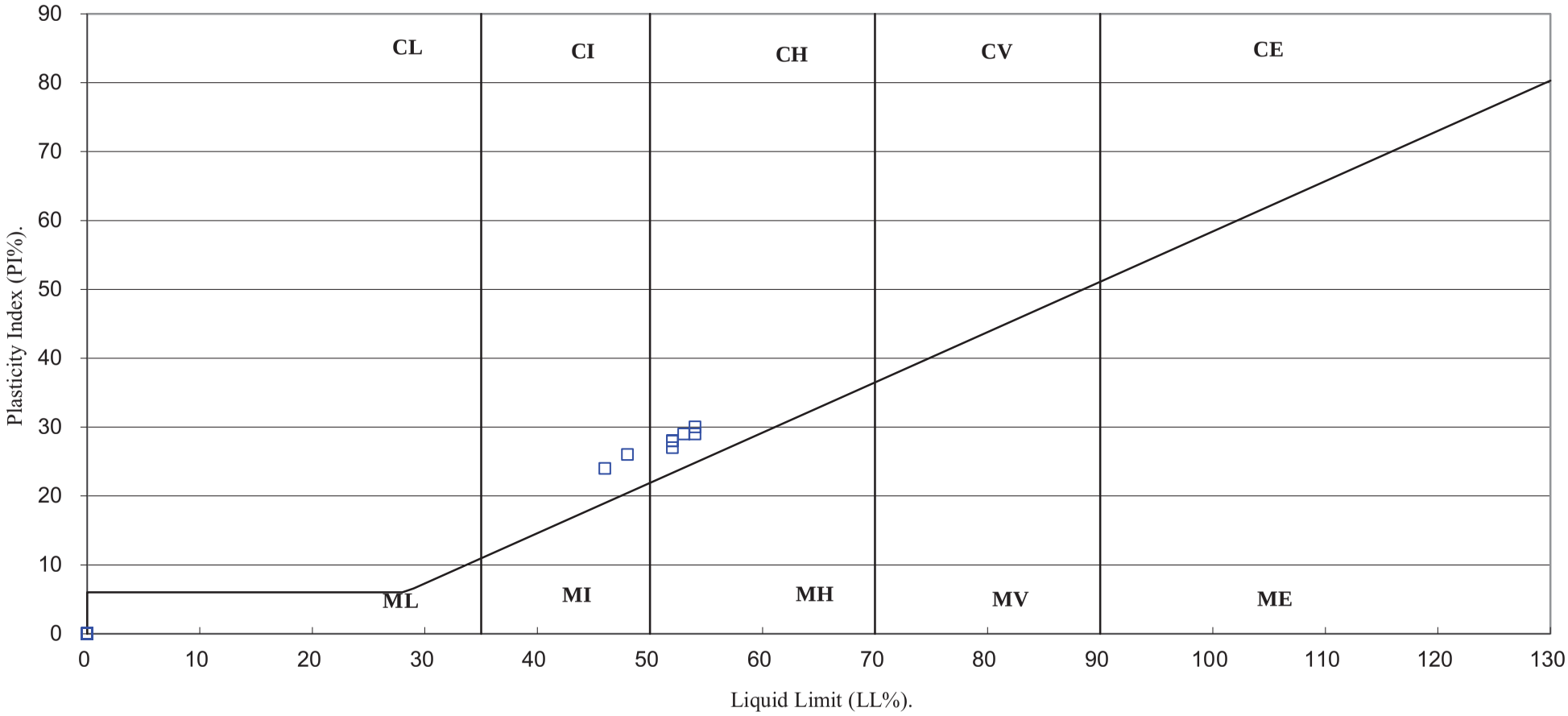
PSL Professional Soils Laboratory

Carnival Phase 2

Contract No: PSL19/4270

Client Ref: C6411

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



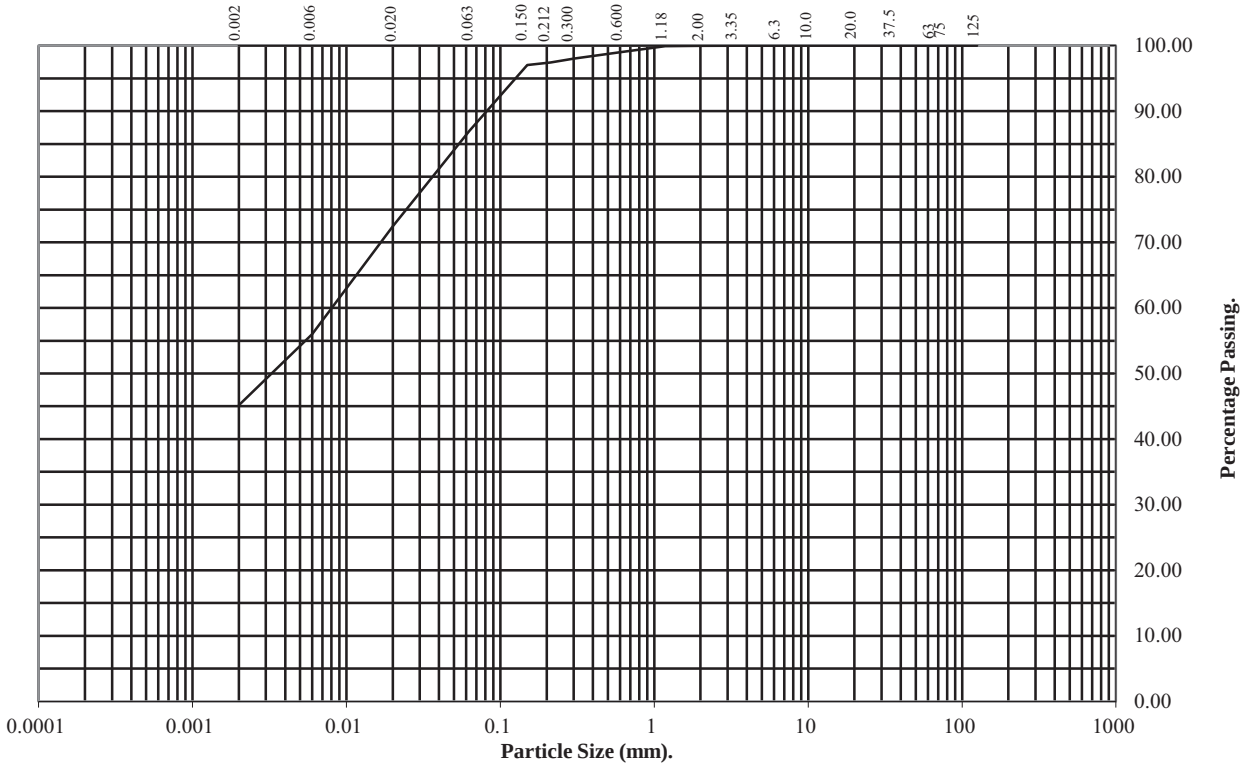
UKAS TESTING 4043	PSL Professional Soils Laboratory	Carnival Phase 2	**Contract No:** PSL19/4270 **Client Ref:** C6411

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**BH02**	**Top Depth (m):**	**2.15**
Sample Number:		**Base Depth(m):**	**2.20**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	99
0.3	98
0.212	97
0.15	97
0.063	87

Particle Diameter	Percentage Passing
0.02	72
0.006	56
0.002	45

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	13
Silt	42
Clay	45

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

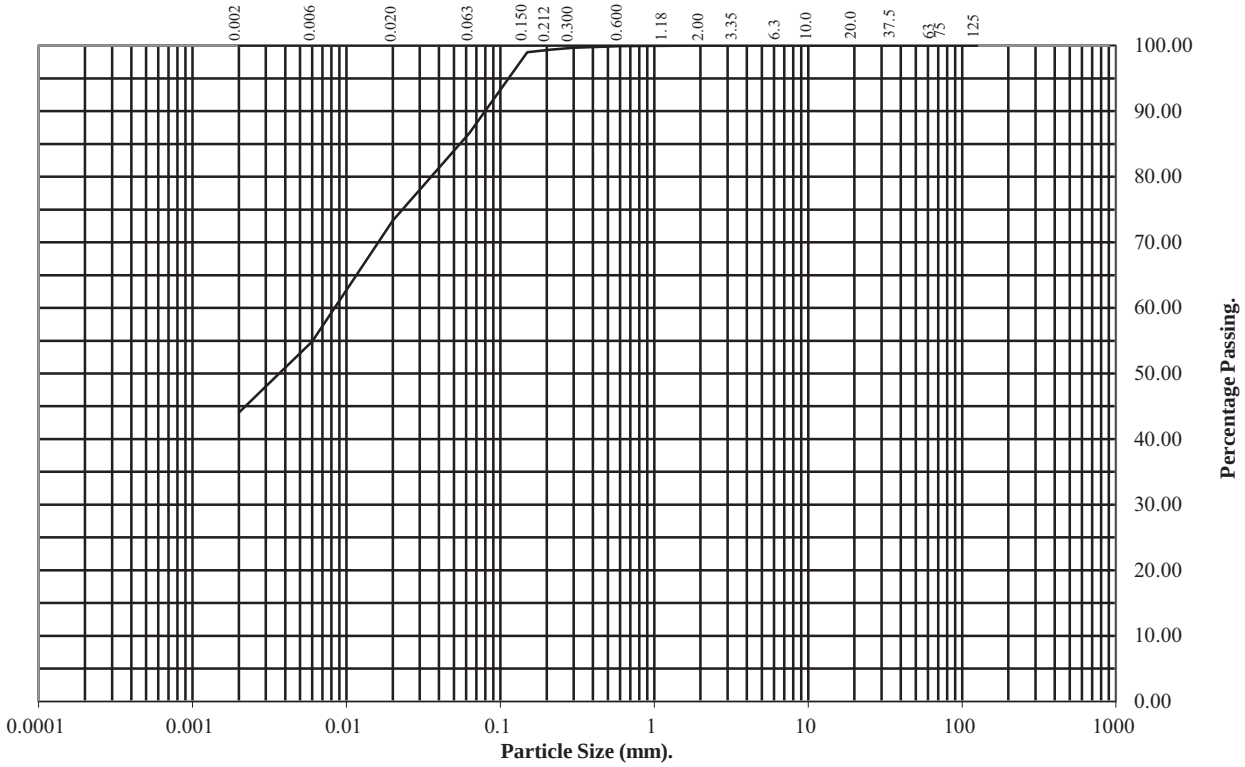
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **BH02** **Top Depth (m):** **3.00**

Sample Number: **Base Depth(m):**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	100
0.3	100
0.212	99
0.15	99
0.063	87

Particle Diameter	Percentage Passing
0.02	73
0.006	55
0.002	44

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	13
Silt	43
Clay	44

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

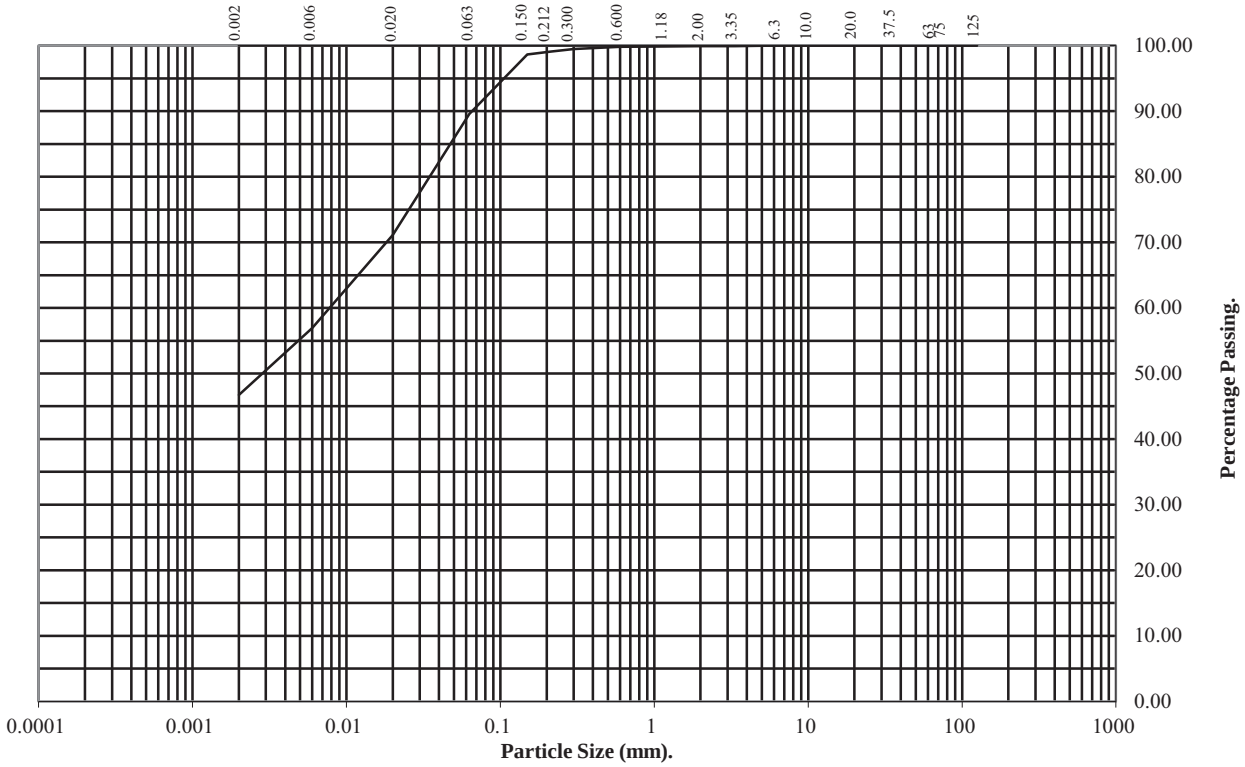
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **BH02** **Top Depth (m):** **6.50**

Sample Number: **Base Depth(m):**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	100
0.3	99
0.212	99
0.15	99
0.063	90

Particle Diameter	Percentage Passing
0.02	71
0.006	57
0.002	47

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	10
Silt	43
Clay	47

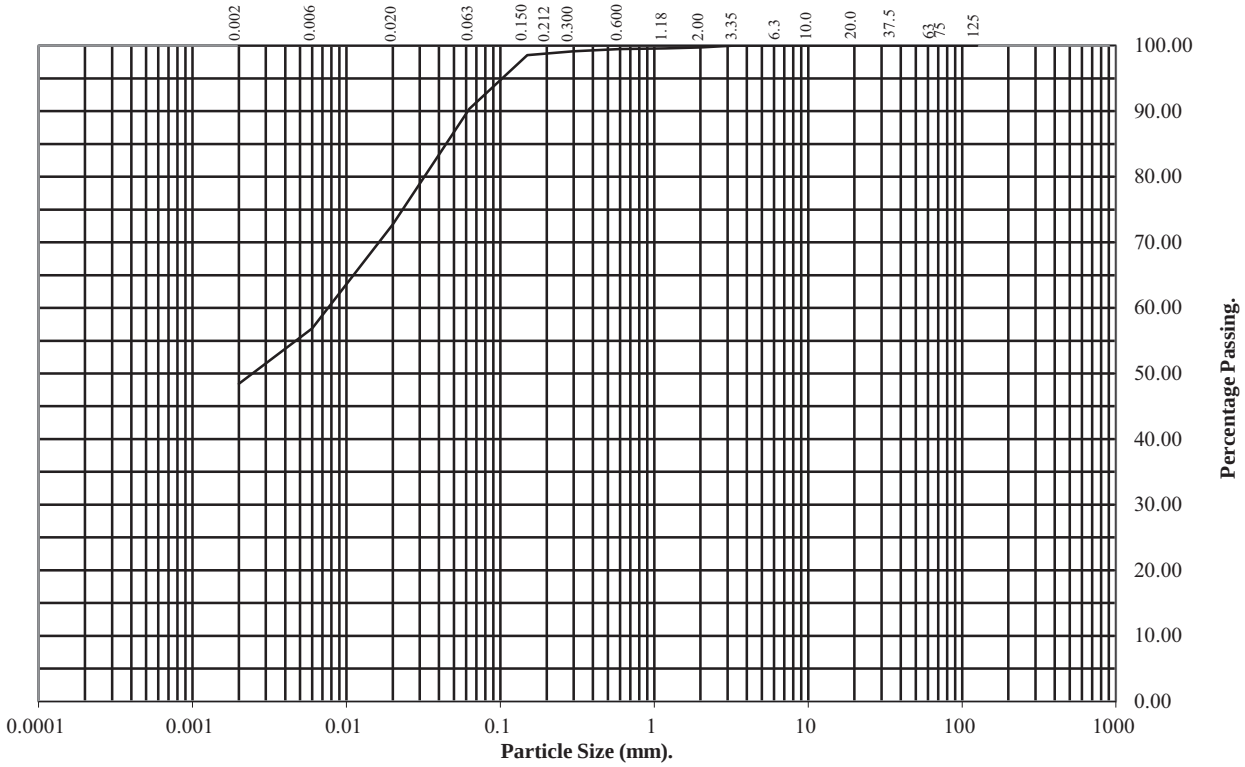
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**BH03**	**Top Depth (m):**	**2.15**
Sample Number:		**Base Depth(m):**	**2.20**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	99
0.3	99
0.212	99
0.15	99
0.063	90

Particle Diameter	Percentage Passing
0.02	73
0.006	57
0.002	48

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	10
Silt	42
Clay	48

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

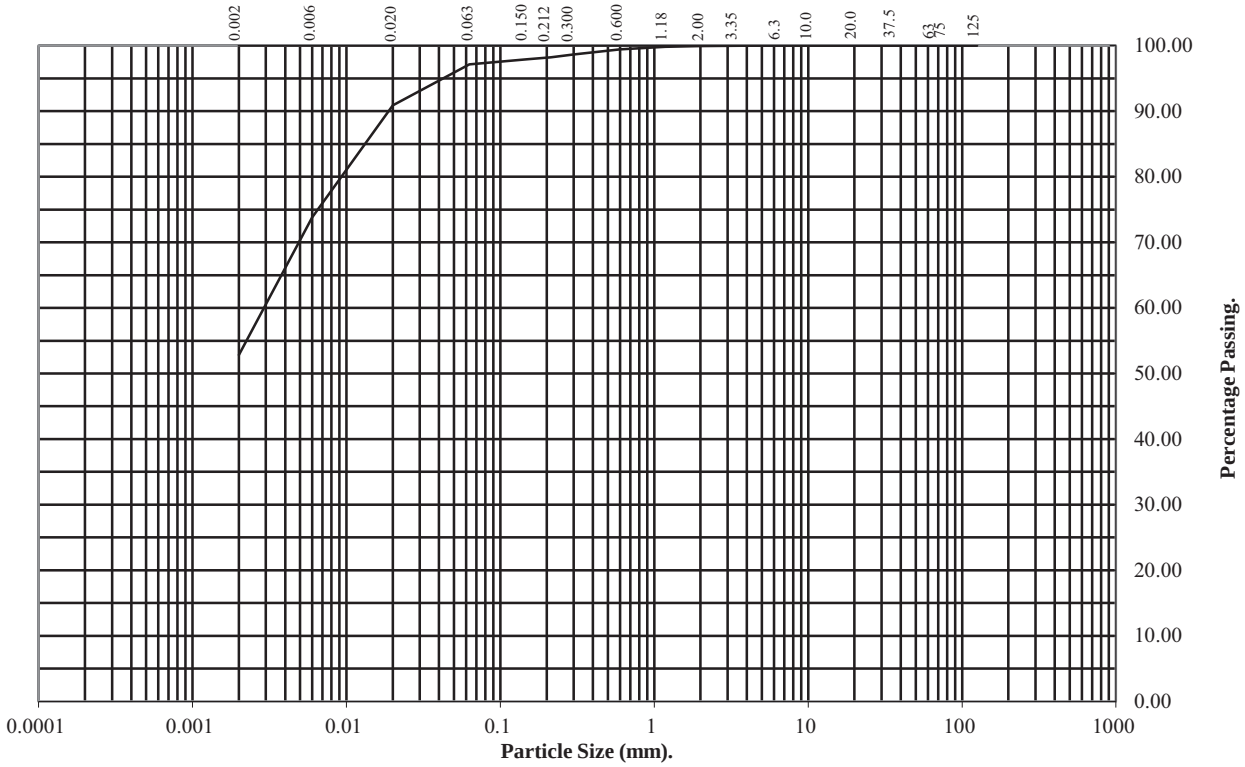
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **BH03** **Top Depth (m):** **4.50**

Sample Number: **Base Depth(m):**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	99
0.3	99
0.212	98
0.15	98
0.063	97

Particle Diameter	Percentage Passing
0.02	91
0.006	74
0.002	53

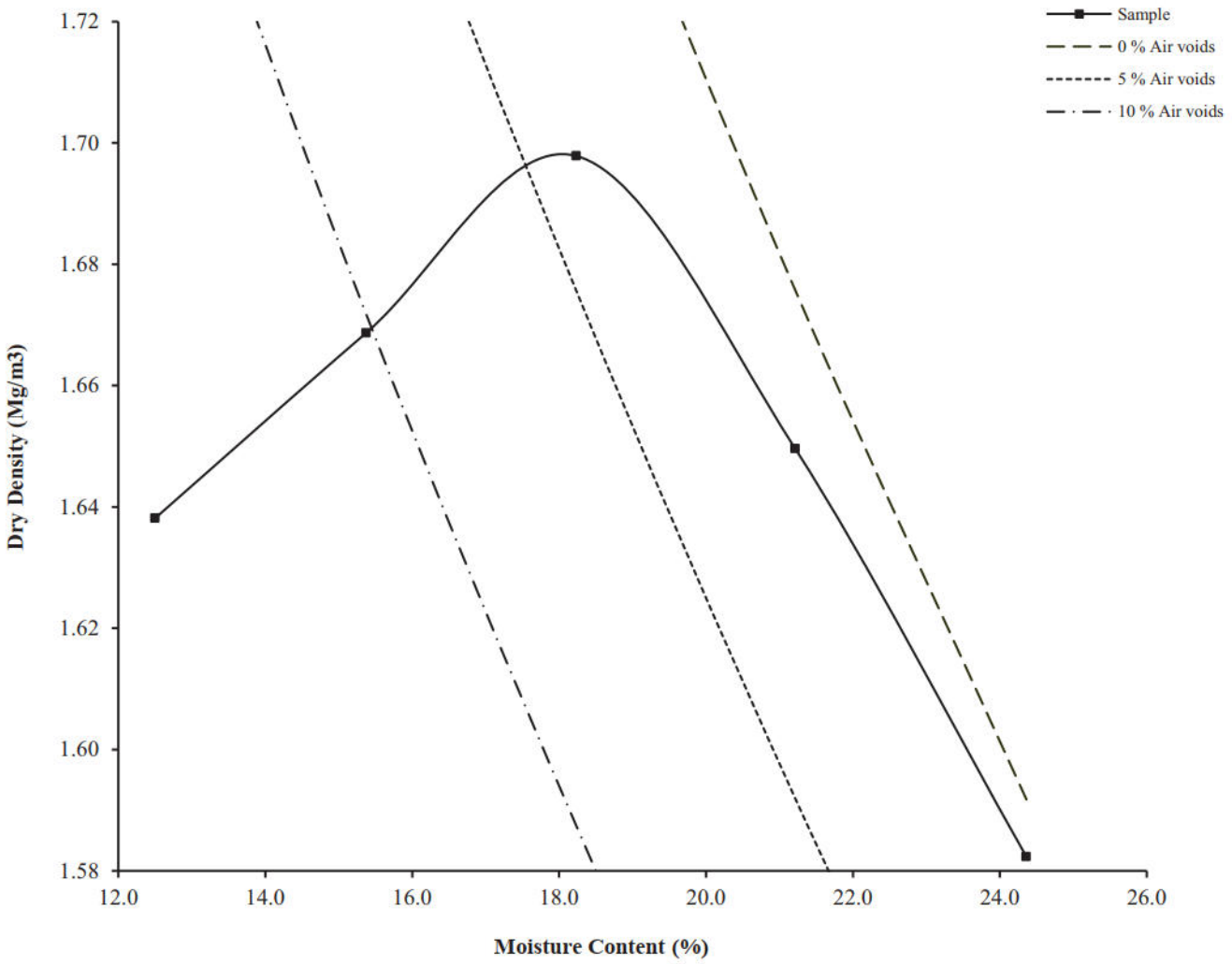
Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	3
Silt	44
Clay	53

Remarks:
See Summary of Soil Descriptions

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number:	**BH03**	**Top Depth (m) :**	**0.90**
Sample Number:		**Base Depth (m) :**	**1.20**
Sample Type:	**B**		



Initial Moisture Content:		21	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.60	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.70	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		18			
Remarks See summary of soil descriptions.					

ONE DIMENSIONAL CONSOLIDATION TEST

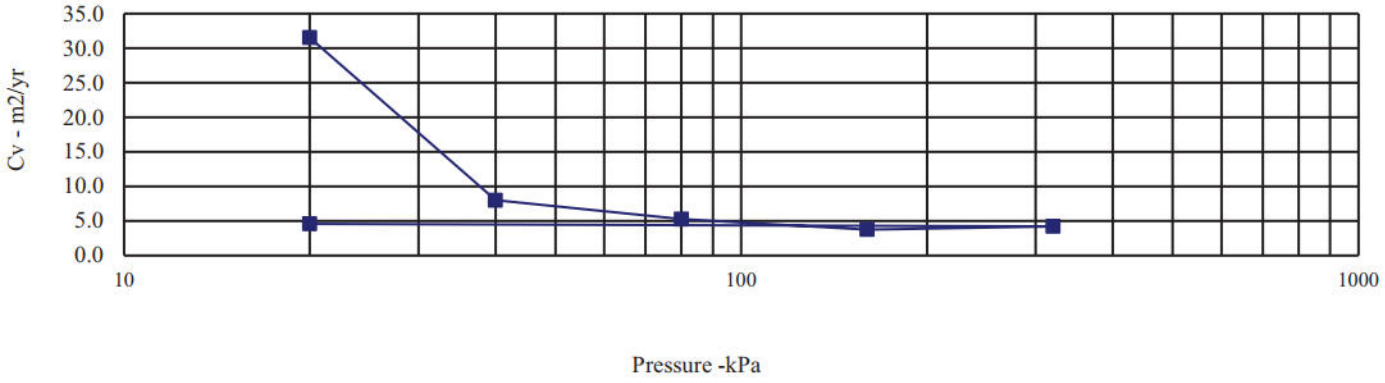
BS 1377: Part 5: 1990: Clause 3

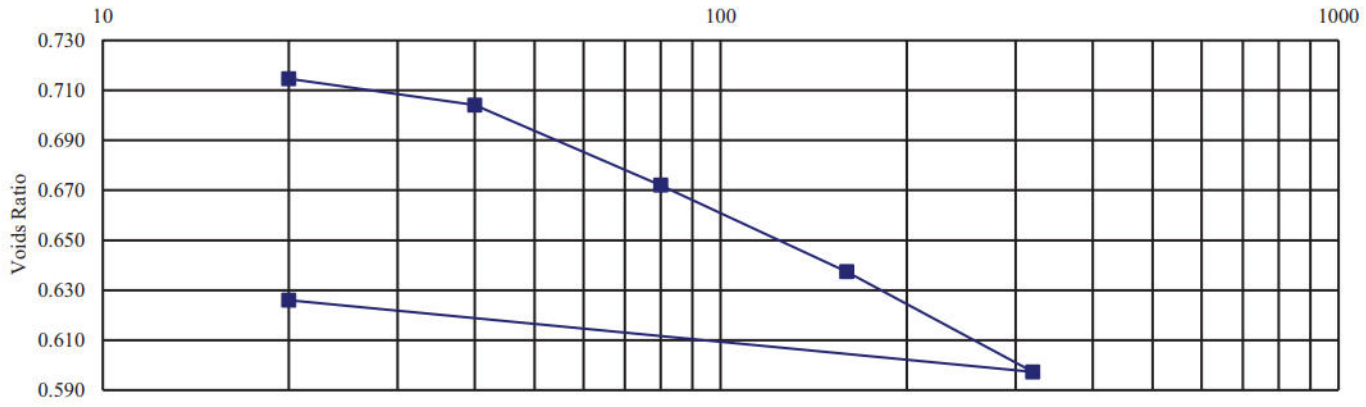
Hole Number: BH02 **Top Depth (m):** 1.70

Sample Number: **Base Depth (m) :** 2.15

Sample Type: UT100

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	28						
Bulk Density (Mg/m3):	1.95	0	20	0.824	31.525	Method used to	
Dry Density (Mg/m3):	1.52	20	40	0.308	7.987	determine CV:	T90
Voids Ratio:	0.743	40	80	0.471	5.245	Nominal temperature	
Degree of saturation:	101.0	80	160	0.259	3.747	during test ' C:	20
Height (mm):	19.78	160	320	0.153	4.178	Remarks:	
Diameter (mm)	75.035	320	20	0.060	4.582	See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	Carnival Phase 2	Contract No: PSL19/4270 Client Ref: C6411

ONE DIMENSIONAL CONSOLIDATION TEST

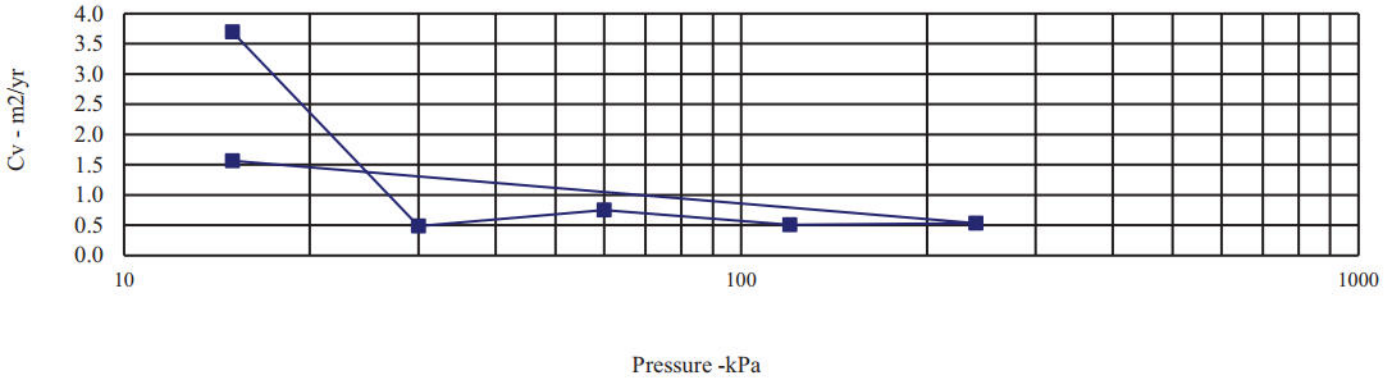
BS 1377: Part 5: 1990: Clause 3

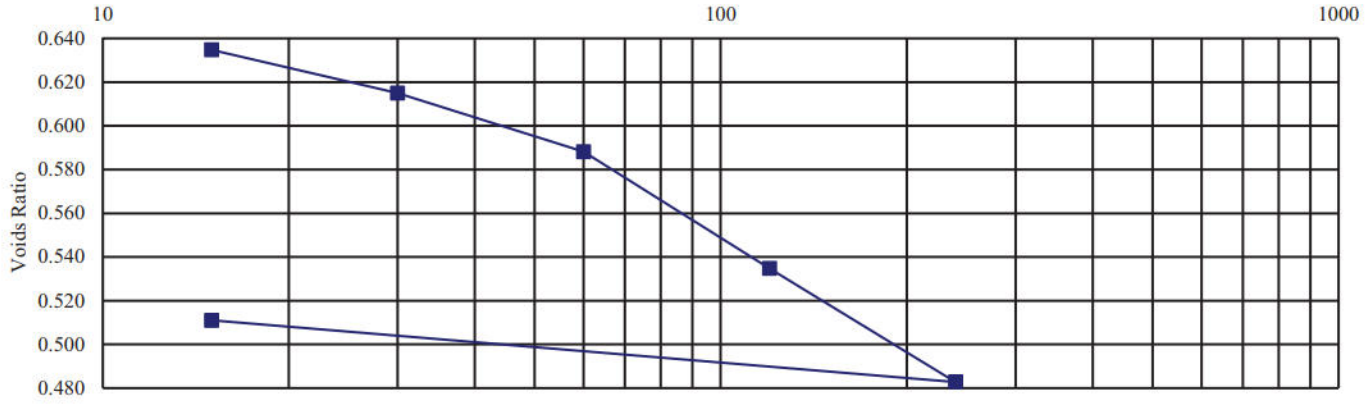
Hole Number: BH03 **Top Depth (m):** 1.70

Sample Number: **Base Depth (m) :** 2.15

Sample Type: UT100

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	26						
Bulk Density (Mg/m3):	1.99	0	15	1.752	3.695	Method used to	
Dry Density (Mg/m3):	1.58	15	30	0.809	0.484	determine CV:	T90
Voids Ratio:	0.679	30	60	0.552	0.751	Nominal temperature	
Degree of saturation:	102.5	60	120	0.561	0.504	during test ' C:	20
Height (mm):	19.634	120	240	0.282	0.530	Remarks:	
Diameter (mm)	75.033	240	15	0.085	1.563	See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





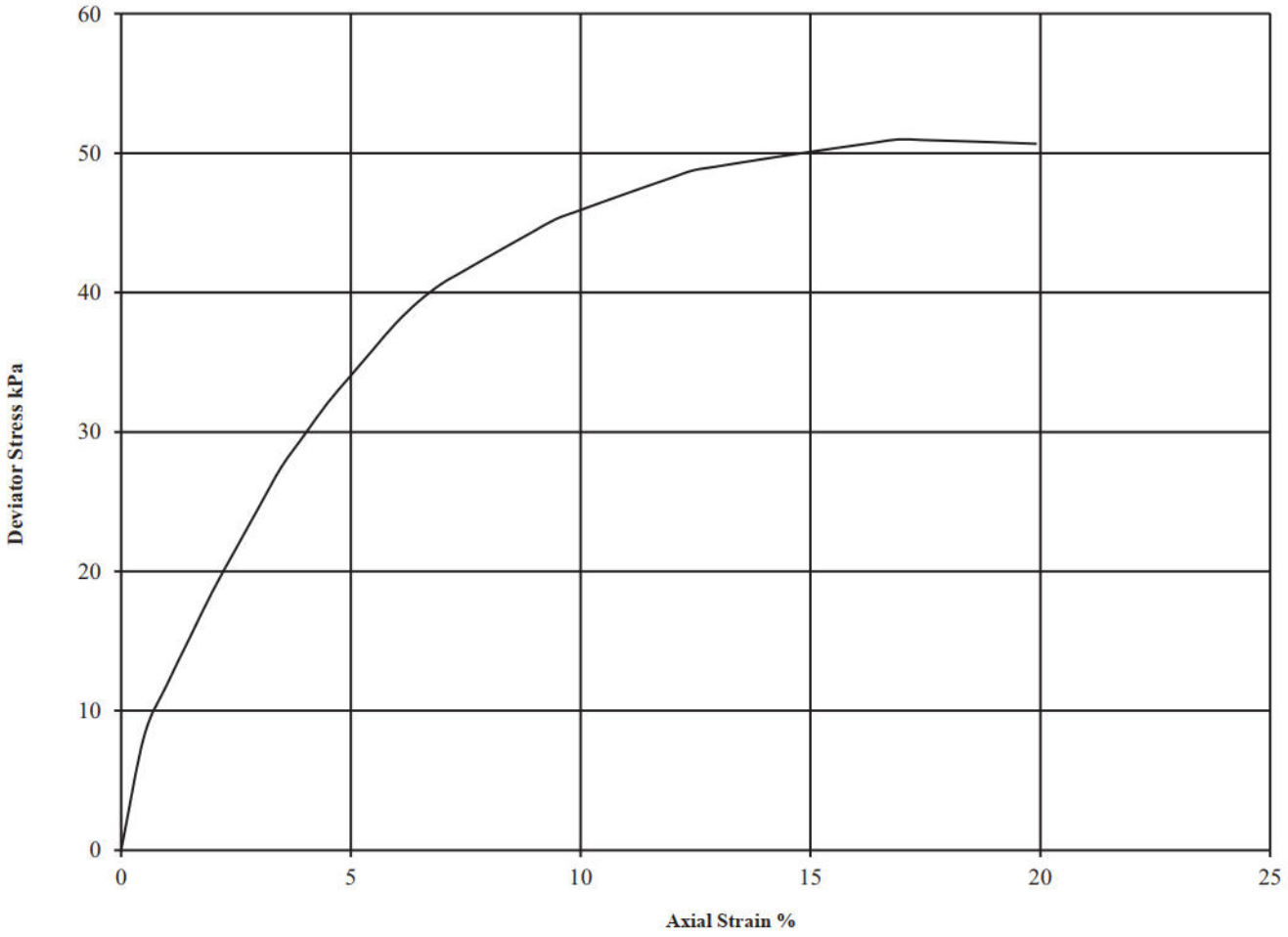
UKAS TESTING 4043	PSL Professional Soils Laboratory	Carnival Phase 2	Contract No: PSL19/4270 Client Ref: C6411

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH02**	**Top Depth (m):**	**1.70**
Sample Number:		**Base Depth (m):**	**2.15**
Sample Type	**UT100**		



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.34
1	28	1.95	1.52	35	51	25	16.9	Plastic	See summary of soil descriptions

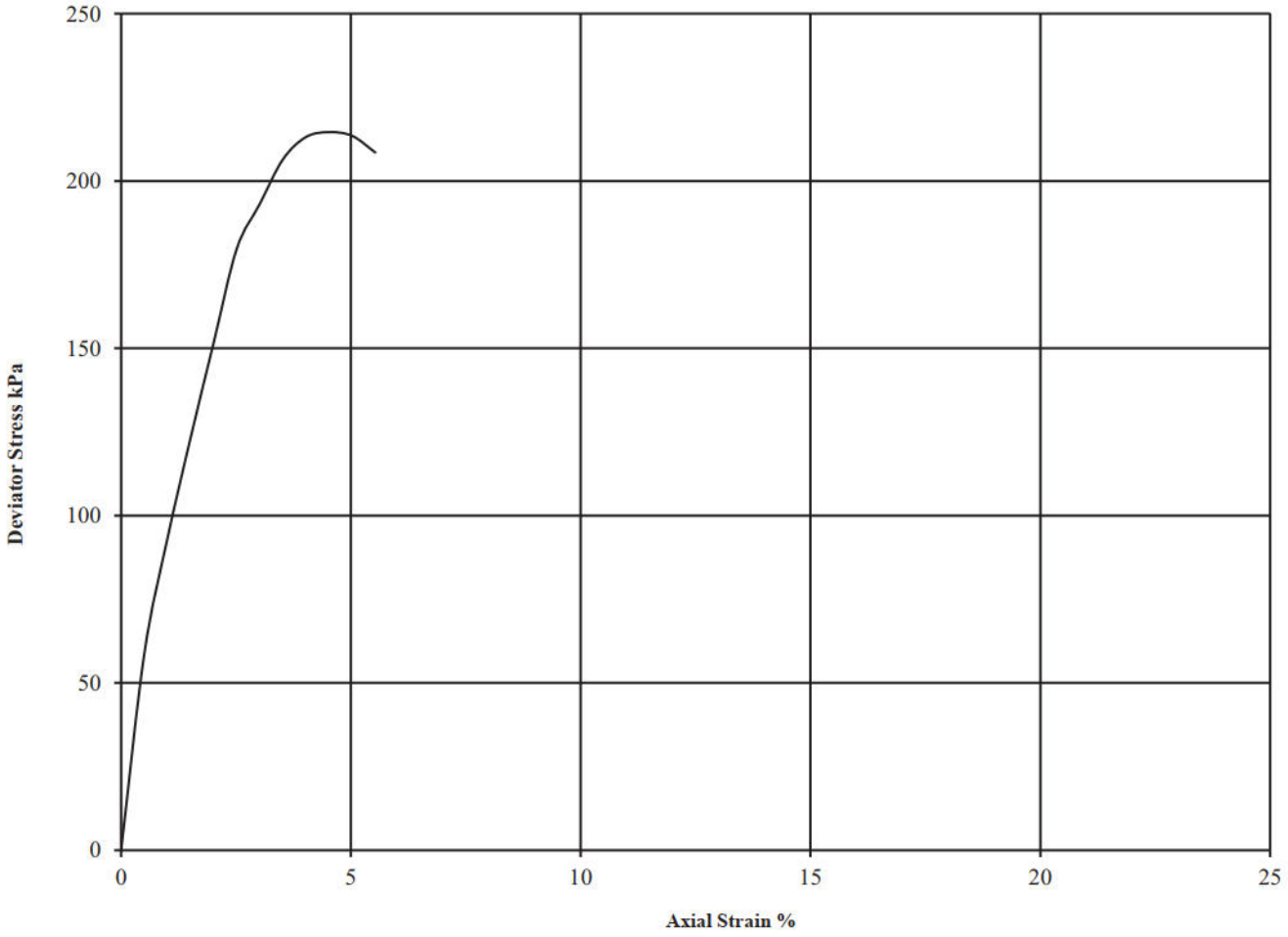
UKAS TESTING 4043	PSL Professional Soils Laboratory	**Carnival Phase 2**	**Contract No:** PSL19/4270 **Client Ref:** C6411

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH02**	**Top Depth (m):**	**10.00**
Sample Number:		**Base Depth (m):**	**10.30**
Sample Type	**CS**		



Diameter (mm):		88	Height (mm):		175	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.42
1	21	2.10	1.74	200	215	107	4.5	Brittle	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Carnival Phase 2

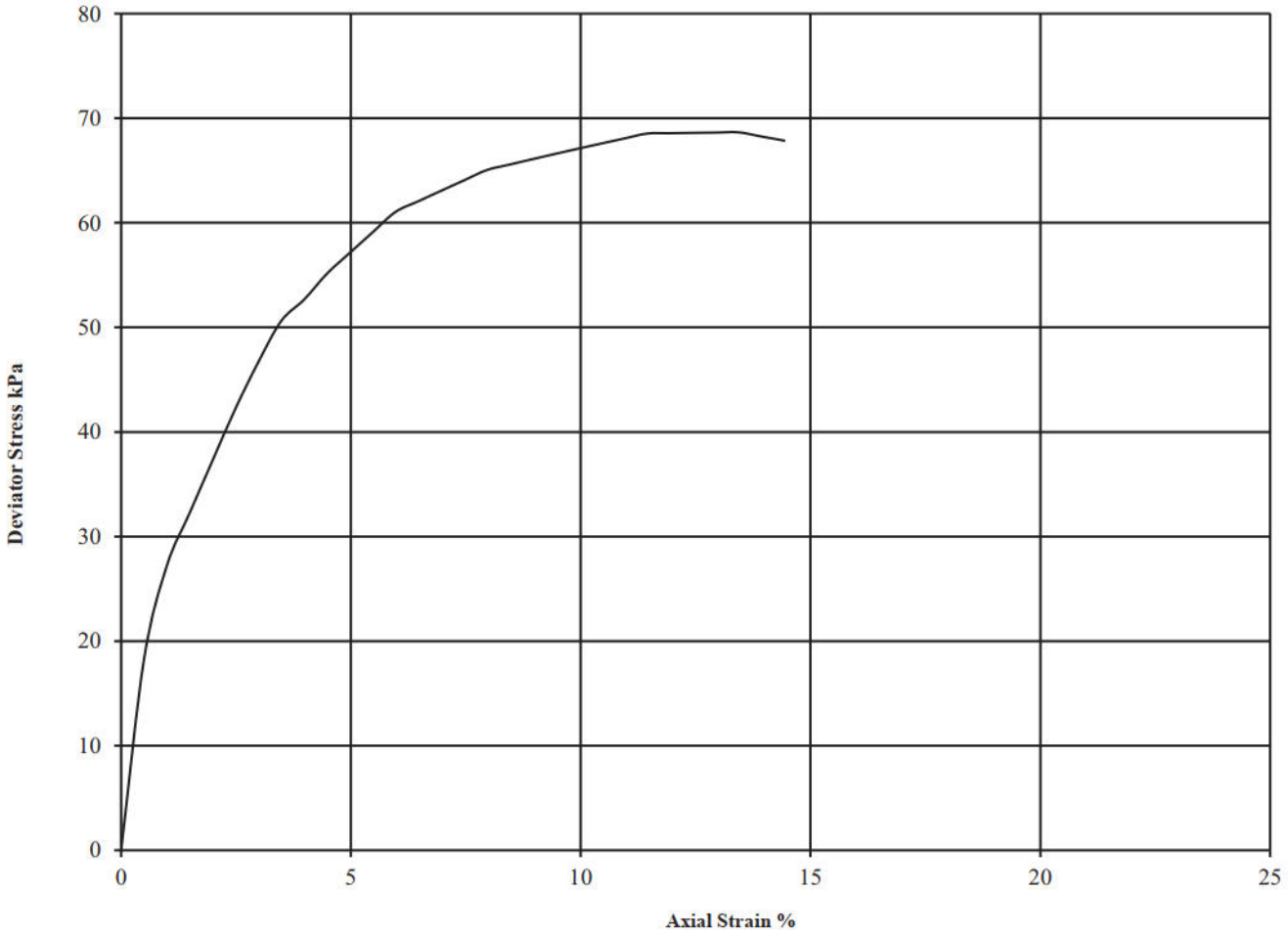
Contract No:
PSL19/4270
Client Ref:
C6411

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH03**	**Top Depth (m):**	**2.70**
Sample Number:		**Base Depth (m):**	**3.15**
Sample Type	**UT100**		



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.34
1	30	1.84	1.41	50	69	34	13.4	Plastic	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Carnival Phase 2

Contract No: PSL19/4270

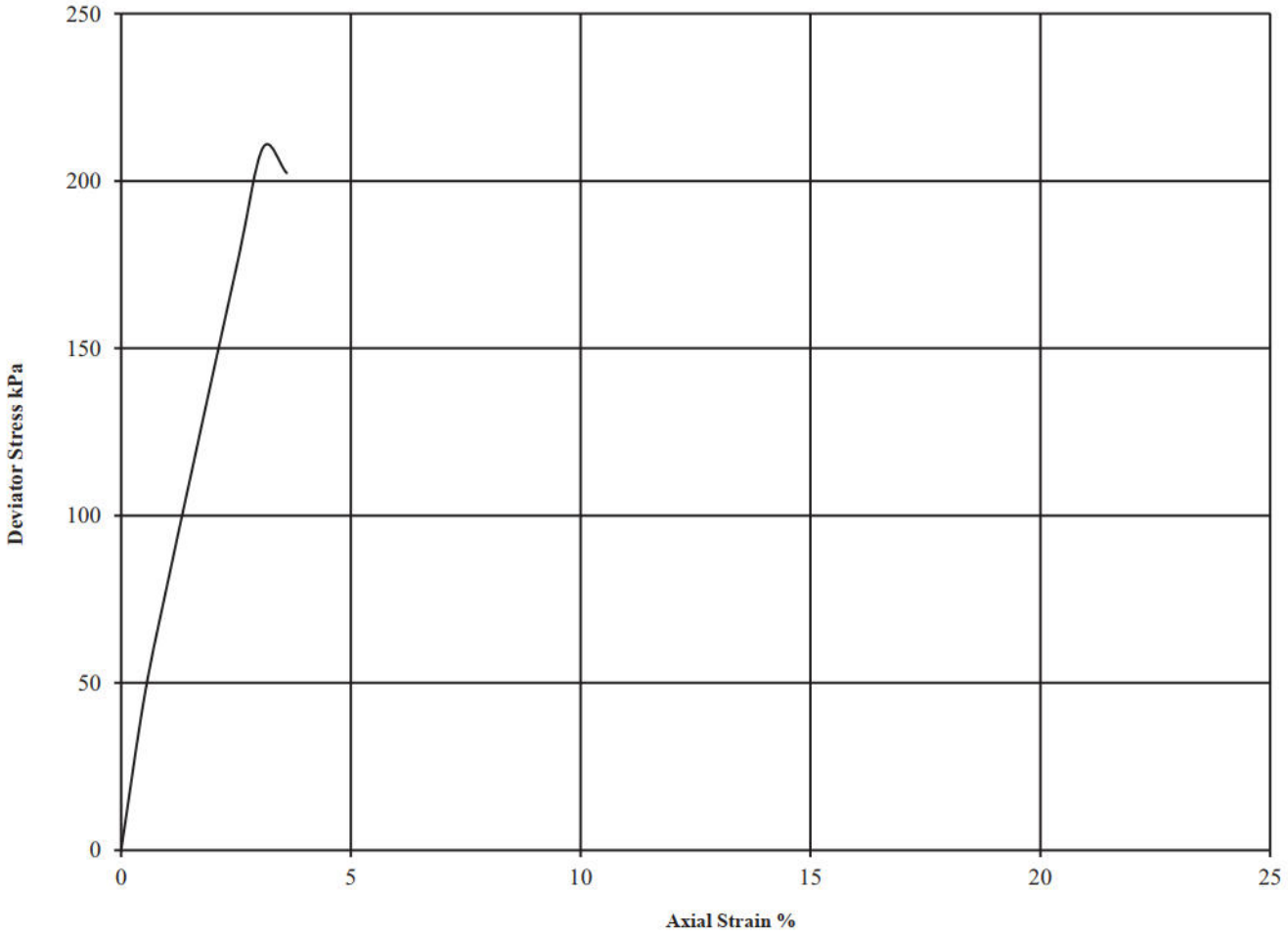
Client Ref: C6411

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH03**	**Top Depth (m):**	**11.00**
Sample Number:		**Base Depth (m):**	**11.30**
Sample Type	**CS**		



Diameter (mm):		88	Height (mm):		171	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.42
1	22	2.11	1.73	220	210	105	3.1	Brittle	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Carnival Phase 2

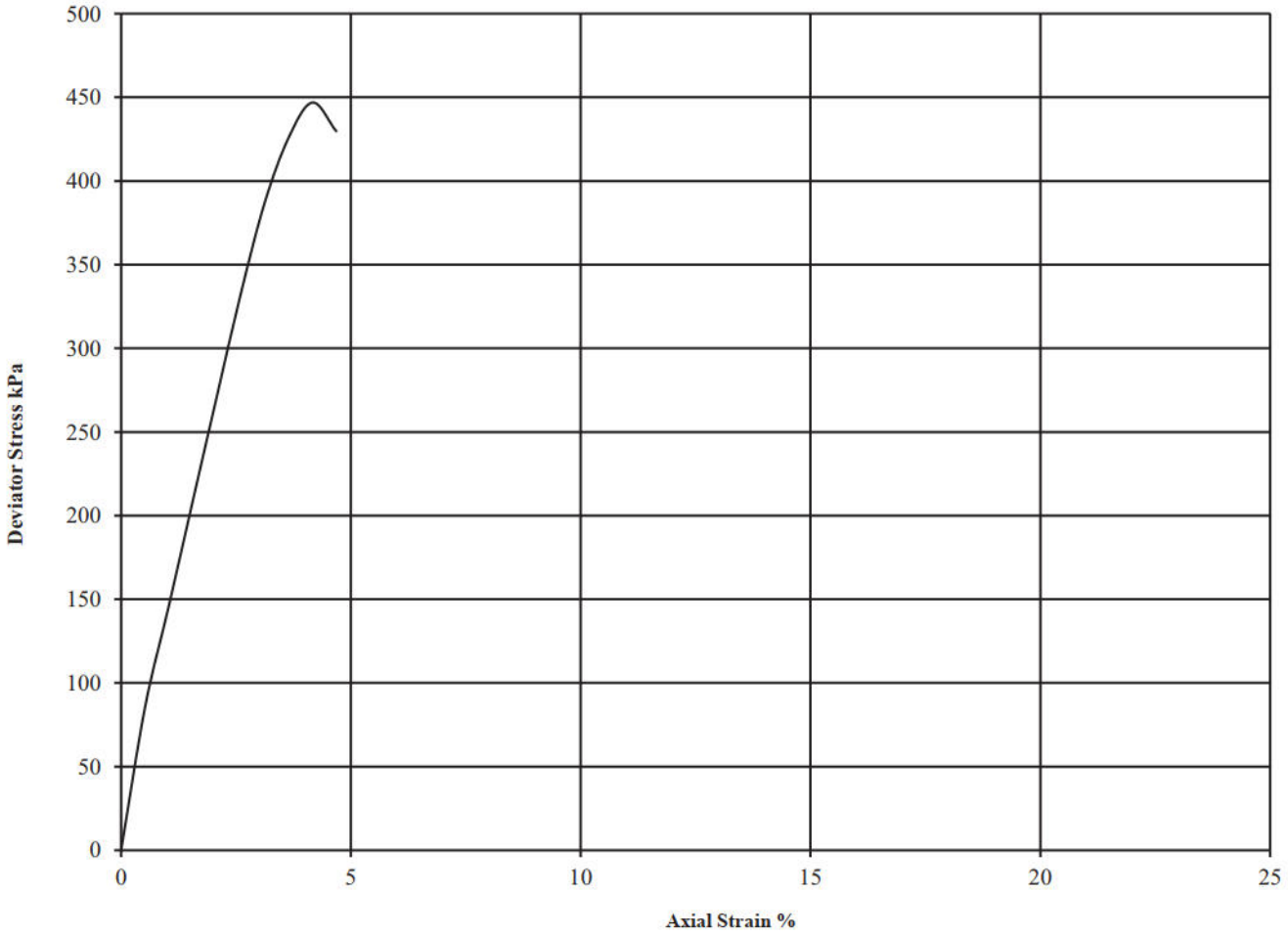
Contract No:
PSL19/4270
Client Ref:
C6411

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH03**	**Top Depth (m):**	**17.00**
Sample Number:		**Base Depth (m):**	**17.30**
Sample Type	**CS**		



Diameter (mm):		90	Height (mm):		173	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.41
1	19	2.09	1.75	340	447	223	4.2	Brittle	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Carnival Phase 2

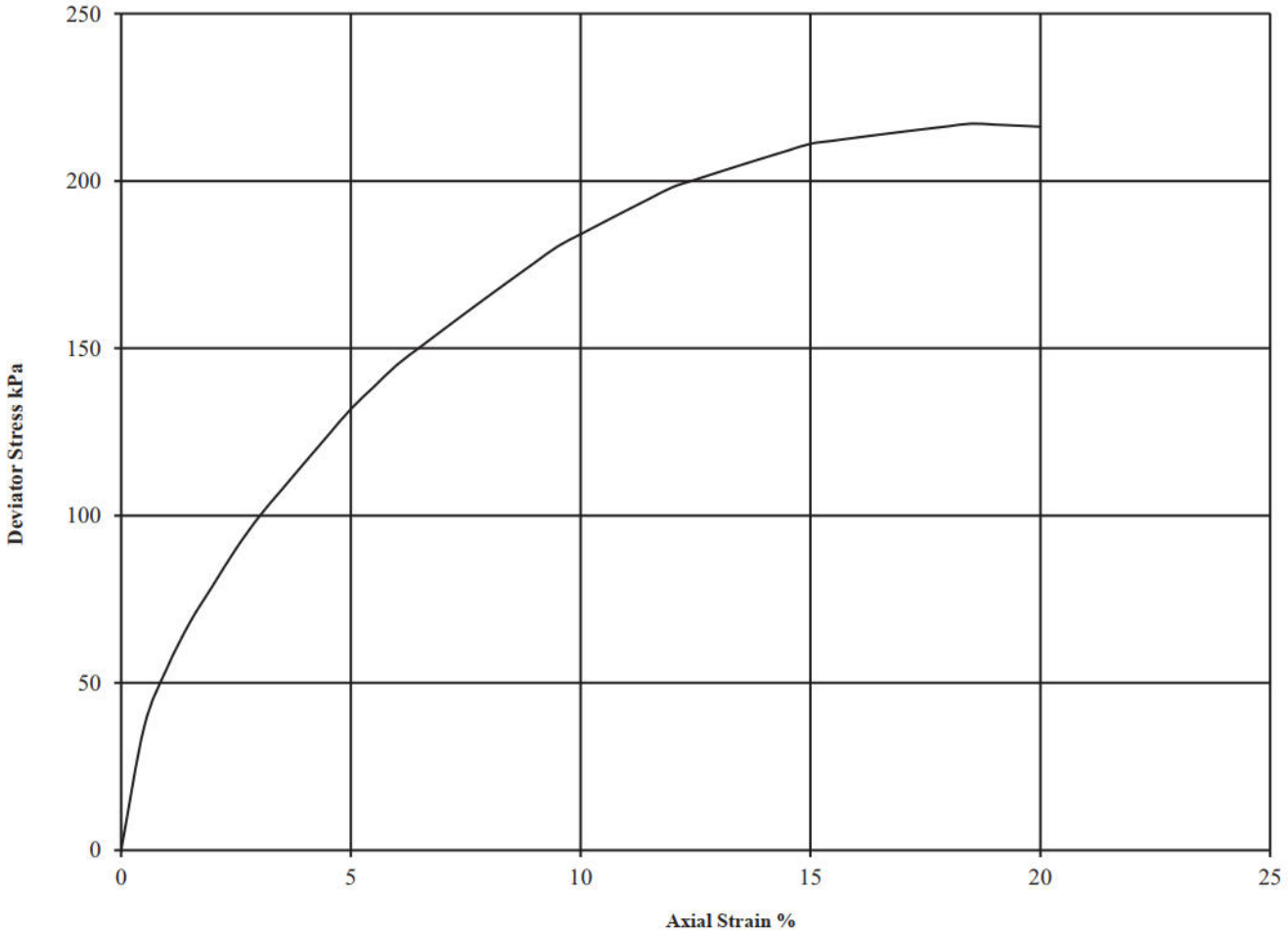
Contract No:
PSL19/4270
Client Ref:
C6411

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH03**	**Top Depth (m):**	**21.30**
Sample Number:		**Base Depth (m):**	**21.60**
Sample Type	**CS**		



Diameter (mm):		90	Height (mm):		180	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.38
1	24	1.97	1.60	420	217	109	18.5	Plastic	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Carnival Phase 2

Contract No:
PSL19/4270
Client Ref:
C6411

Effective Stress Triaxial Compression

Consolidated Undrained

Summary Report

Sample Details				
	Depth	1.70-2.15m UT100		
	Description	Brown mottled grey sandy CLAY.		
	Type	Undisturbed, Vertical orientation.		
	Initial Sample Length	L_0	(mm)	173.5
	Initial Sample Diameter	D_0	(mm)	97.5
	Initial Sample Weight	W_0	(gr)	2619.8
sketch showing specimen location in original sample	Initial Bulk Density	ρ_0	(Mg/m3)	2.02
	Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions			Stage 1
Initial Cell Pressure	σ_{3i}	(kPa)	485
Initial Back Pressure	U_{bi}	(kPa)	450
Membrane Thickness	m_b	(mm)	0.600
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Pore Water Pressure Input	u_{pwp}	(kPa)	CH 3
Sample Volume	V	(cc)	CH 2
Initial Moisture	ω_i	(%)	28
Initial Dry Density	ρ_{di}	(Mg/m3)	1.58
Initial Voids Ratio	e_i	.	0.675
Initial Degree of Saturation	S_i	(%)	100
B Value	B	.	0.98

Final Conditions			
Final Moisture	ω_f	(%)	27
Final Dry Density	ρ_{df}	(Mg/m3)	1.60
Final Voids Ratio	e_f	.	0.653
Final Degree of Saturation	S_f	(%)	100.0
			Stage 1
Failure Criteria		.	Max. Dev. Stress
Strain At Failure	ε_f	(%)	19.93
Stress At Failure	$(\sigma_1-\sigma_3)$	(kPa)	64.7
Minor Stress At Failure	σ_3'	(kPa)	38.0
Major Stress At Failure	σ_1'	(kPa)	102.7
Principal Stress At Failure	σ_1'/σ_3'		2.702

Notes



Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH03 1.70-2.15m UT100
		Test Date	19/07/2019
		Borehole	BH03
Jobfile	Carnival Phase II	Sample	1.70-2.15m UT100
Client	CC Ground Investigations Ltd	Depth	1.70-2.15m UT100

UKAS TESTING 4043

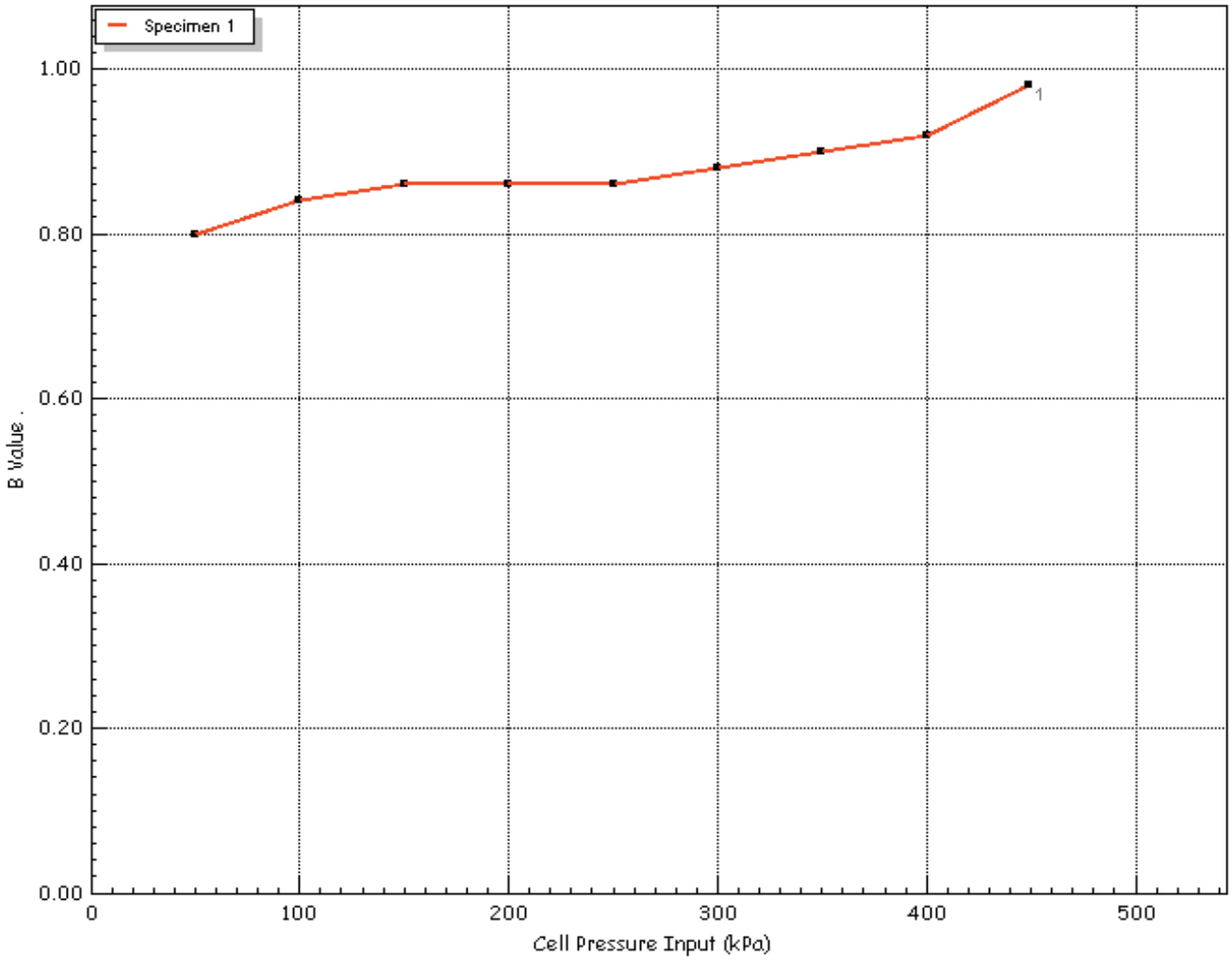
PSL Professional Soils Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Saturation Plots

Saturation Method			Stepped
Cell Pressure Input	σ	(kPa)	450
Pore Water Pressure Input	u pwp	(kPa)	428
B Value	B	.	0.98



Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH03 1.70-2.15m UT100
		Test Date	19/07/2019
		Borehole	BH03
Jobfile	Carnival Phase II	Sample	1.70-2.15m UT100
Client	CC Ground Investigations Ltd	Depth	1.70-2.15m UT100

UKAS TESTING 4043

PSL Professional Soils Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Consolidation Plots

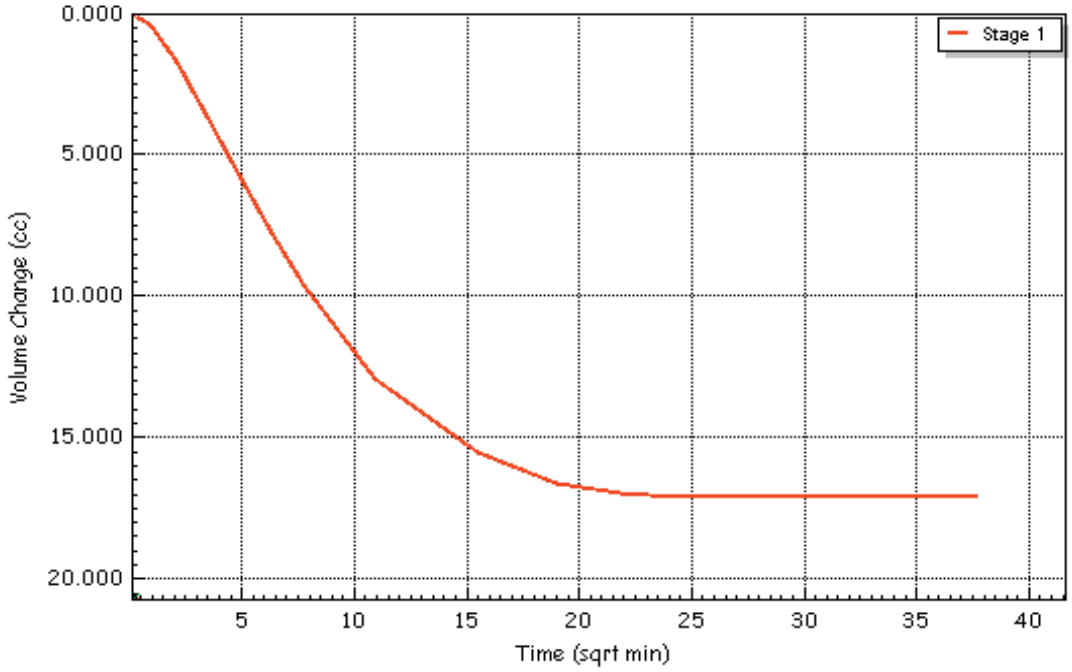
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	484
Initial Back Pressure	u_{bi}	(kPa)	450
Pore Water Pressure Input	u_{pwp}	(kPa)	459
Drainage Method			Radial+One End

Final Conditions

PWP Dissipation %	U%	(%)	100.00
Volumetric Strain	ε_v%	(%)	1.32
Corrected Length	L_C	(mm)	172.7
Corrected Area	A_C	(cm2)	74.00
Corrected Volume	V_C	(cc)	1278.280
T100 Time to Failure	t_{100}	(min)	163.06
Consolidation	c_v	(m2/year)	1.448
Compressibility	m_v	(m2/MN)	1.467
Test Time	t_F	(h:m:s)	04:53:30
Estimated Strain to Failure	ε %	(%)	5.0
Shear Machine Speed	d_r	(mm/min)	0.02943

Notes



Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH03 1.70-2.15m UT100
		Test Date	19/07/2019
		Borehole	BH03
Jobfile	Carnival Phase II	Sample	1.70-2.15m UT100
Client	CC Ground Investigations Ltd	Depth	1.70-2.15m UT100

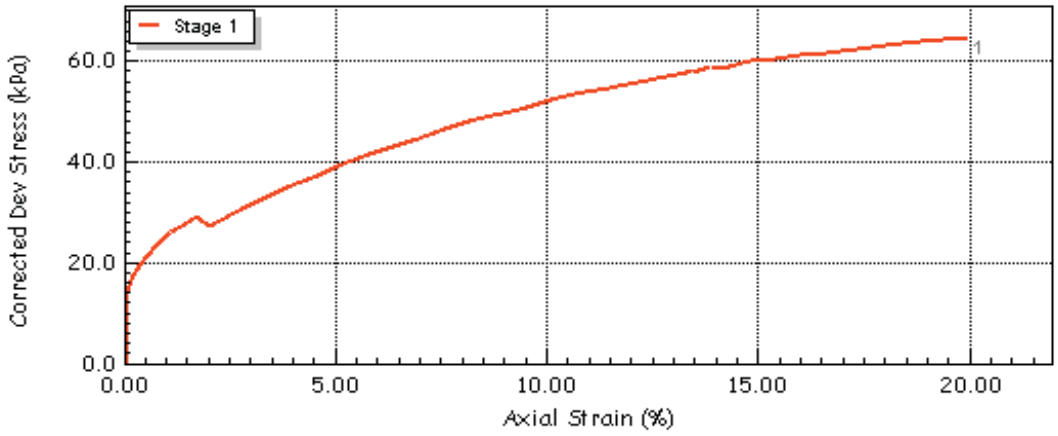
UKAS TESTING 4043

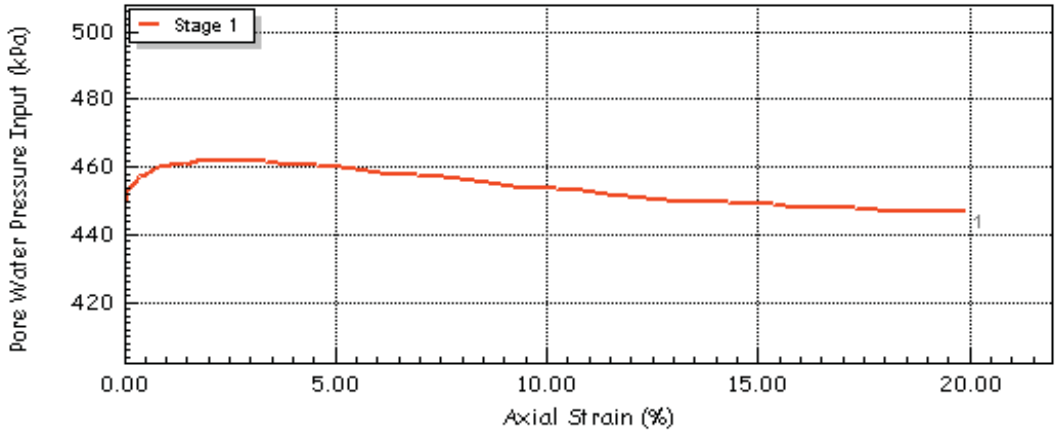
PSL Professional Soils Laboratory

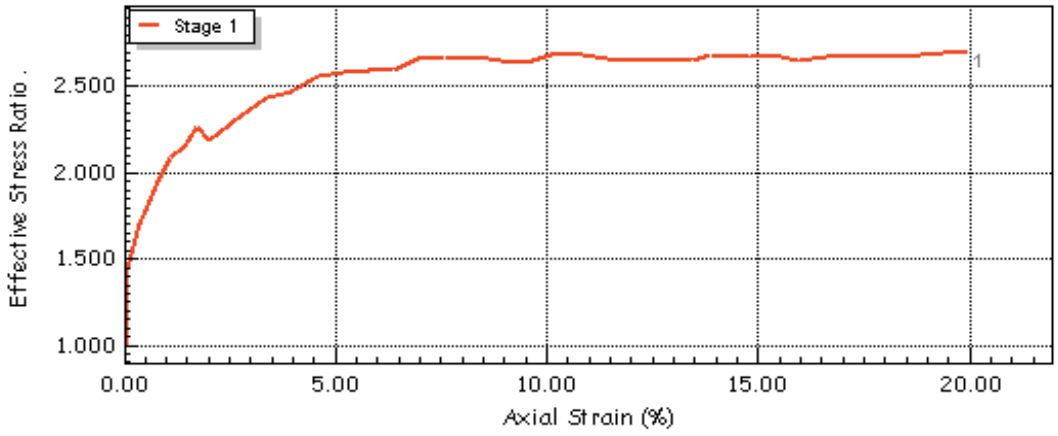
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots







UKAS TESTING 4043	Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH03 1.70-2.15m UT100
			Test Date	19/07/2019
	Jobfile	Carnival Phase II	Borehole	BH03
	Client	CC Ground Investigations Ltd	Sample	1.70-2.15m UT100
			Depth	1.70-2.15m UT100

PSL Professional Soils Laboratory

Certificate of Analysis

Certificate Number	19-13754
	25-Jul-19
Client	Professional Soils Laboratory Ltd 5/7 Hexthorpe Road Hexthorpe DN4 0AR
Our Reference	19-13754
Client Reference	PSL19/4270
Order No	(not supplied)
Contract Title	Carnival Phase II
Description	4 Soil samples.
Date Received	19-Jul-19
Date Started	19-Jul-19
Date Completed	25-Jul-19
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By [redacted]

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 19-13754
Client Ref PSL19/4270
Contract Title Carnival Phase II

			Lab No	1534247	1534248	1534249	1534250
			Sample ID	BH02	BH02	BH03	BH03
			Depth	3.00	8.60	3.15-3.20	8.20
			Other ID				
			Sample Type	D	D	D	D
			Sampling Date	n/s	n/s	n/s	n/s
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Metals							
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10	26	< 10	11
Inorganics							
pH	DETSC 2008#		pH	7.9	7.9	5.7	7.6
Chloride Aqueous Extract	DETSC 2055	1	mg/l	7.8	3.1	10	5.7
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0	< 1.0	1.2	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	31	340	28	130
Sulphur as S, Total	DETSC 2320	0.01	%	< 0.01	0.57	< 0.01	0.56
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.02	0.14	0.01	0.09

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 19-13754
Client Ref PSL19/4270
Contract Carnival Phase II

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1534247	BH02 3.00 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), pH + Conductivity (7 days)	
1534248	BH02 8.60 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), pH + Conductivity (7 days)	
1534249	BH03 3.15-3.20 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), pH + Conductivity (7 days)	
1534250	BH03 8.20 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

LABORATORY REPORT

4043

Contract Number: PSL19/4271

Report Date: 01 August 2019

Client's Reference: C6411

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
Innsworth Lane
Gloucester
GL3 1DL

For the attention of: Richard Tucker

Contract Title: Carnival Phase 2

Date Received: 12/7/2019
Date Commenced: 12/7/2019
Date Completed: 1/8/2019

Notes: **Opinions and Interpretations are outside the UKAS Accreditation**

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson (Director)	A Watkins (Director)	R Berriman (Quality Manager)
L Knight (Senior Technician)	S Eyre (Senior Technician)	S Royle (Laboratory Manager)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH01		UT100	2.70	3.15	Brown sandy silty CLAY.
BH01		D	3.12	3.20	Brown mottled grey slightly sandy very silty CLAY.
BH01		UT100	3.70	4.15	Brown slightly sandy silty CLAY.
BH01		D	4.15	4.20	Brown slightly sandy silty CLAY.
BH01		D	5.70		Brown slightly sandy silty CLAY.
BH01		D	9.20		Dark grey slightly sandy CLAY.
BH01		D	13.70		Dark grey sandy CLAY.
BH01		D	16.65		Dark grey sandy CLAY.
BH01		CS	20.00	20.30	Very stiff brown slightly sandy CLAY.
BH04		B	1.00	1.20	Brown mottled grey very gravelly very sandy CLAY.
BH04		UT100	1.70	2.15	Firm brown mottled grey slightly sandy CLAY.
BH04		D	2.15		Brown mottled grey slightly sandy silty CLAY.
BH04		D	3.00		Brown sandy CLAY.
BH04		D	4.20		Brown sandy CLAY.
BH04		D	6.85		Dark grey sandy CLAY.
BH04		D	9.00		Dark grey sandy CLAY.
BH04		D	12.00		Brown sandy CLAY.
BH04		D	13.60		Dark grey mottled brown sandy CLAY.
TP2		B	1.00		Brown mottled grey slightly gravelly sandy CLAY.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP2		B	2.00		Brown mottled grey slightly gravelly sandy CLAY.
TP3		B	1.00		Brown gravelly sandy CLAY.
TP3		B	2.00		Brown slightly gravelly sandy CLAY.
TP3		B	3.00		Greyish brown slightly gravelly sandy CLAY.
WS02		B	1.00		Brown mottled grey slightly gravelly sandy CLAY.
WS02		D	1.70		Brown sandy CLAY.
WS02		D	2.70		Brown sandy CLAY.
WS02		D	3.70		Brown mottled grey sandy CLAY.
WS03		B	1.00		Brown mottled grey slightly gravelly sandy CLAY.
WS03		D	1.70		Brown mottled grey sandy CLAY.
WS03		D	2.70		Brown slightly sandy silty CLAY.
WS03		D	4.80		Brown slightly sandy silty CLAY.
WS04		D	2.70		Brown slightly sandy silty CLAY.
WS04		D	3.70		Brown mottled grey sandy silty CLAY.
WS04		D	4.70		Brown slightly sandy very silty CLAY.

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH01		D	4.15	4.20	29			53	23	30	100	High plasticity CH.
BH01		D	9.20		25			56	24	32	100	High plasticity CH.
BH01		D	13.70		21			43	21	22	100	Intermediate plasticity CI.
BH01		D	16.65		22			41	20	21	100	Intermediate plasticity CI.
BH04		D	3.00		26			47	23	24	100	Intermediate plasticity CI.
BH04		D	4.20		26			42	20	22	100	Intermediate plasticity CI.
BH04		D	6.85		26			49	23	26	100	Intermediate plasticity CI.
BH04		D	9.00		21			46	22	24	100	Intermediate plasticity CI.
BH04		D	13.60		20			45	21	24	100	Intermediate plasticity CI.
TP3		B	1.00		23			48	23	25	80	Intermediate plasticity CI.
WS02		D	1.70		21			41	19	22	100	Intermediate plasticity CI.
WS02		D	3.70		26			47	22	25	100	Intermediate plasticity CI.
WS03		D	1.70		23			40	19	21	100	Intermediate plasticity CI.
WS03		D	4.80		24			55	23	32	100	High plasticity CH.
WS04		D	2.70		27			59	24	35	100	High plasticity CH.
WS04		D	3.70		20			42	21	21	100	Intermediate plasticity CI.
WS04		D	4.70		21			39	19	20	100	Intermediate plasticity CI.

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Carnival Phase 2

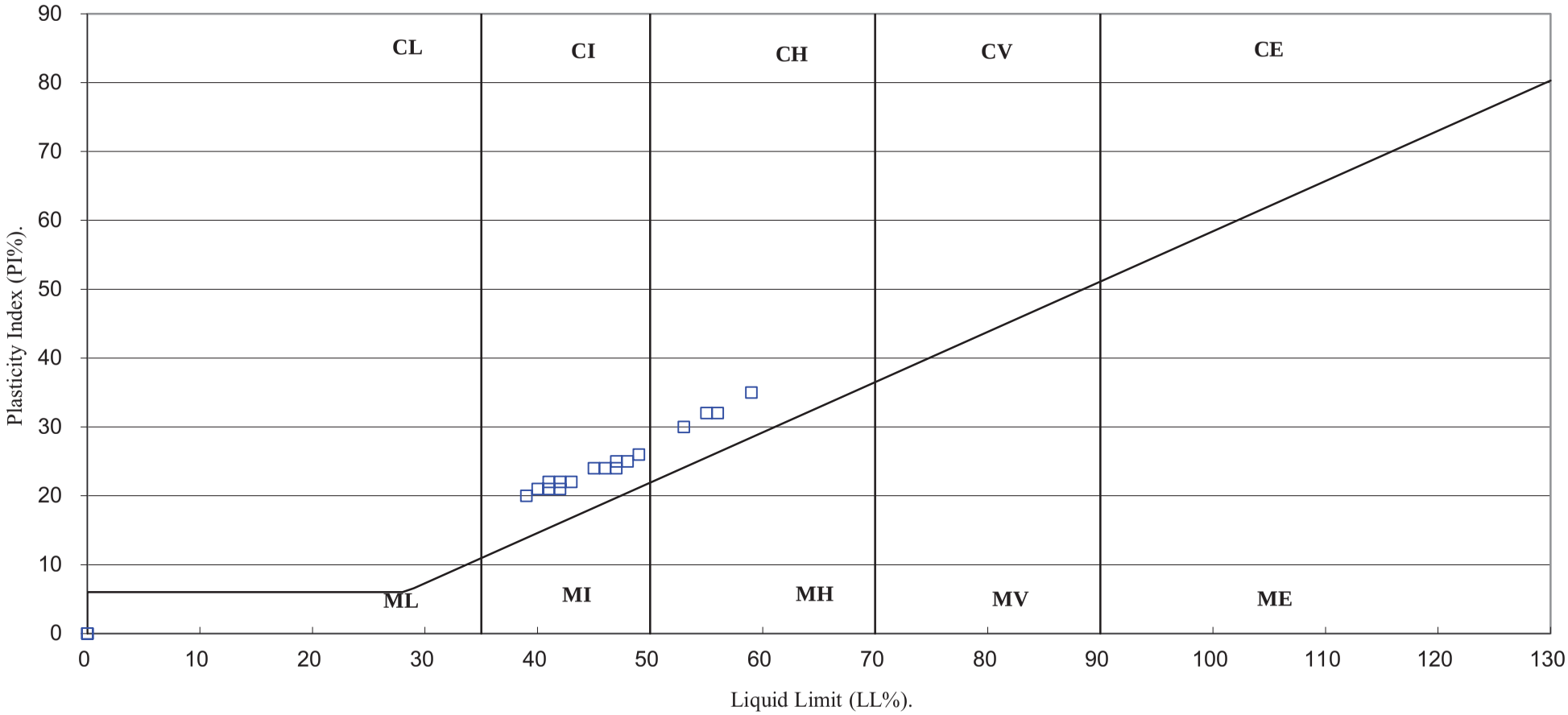
Contract No:

PSL19/4271

Client Ref:

C6411

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



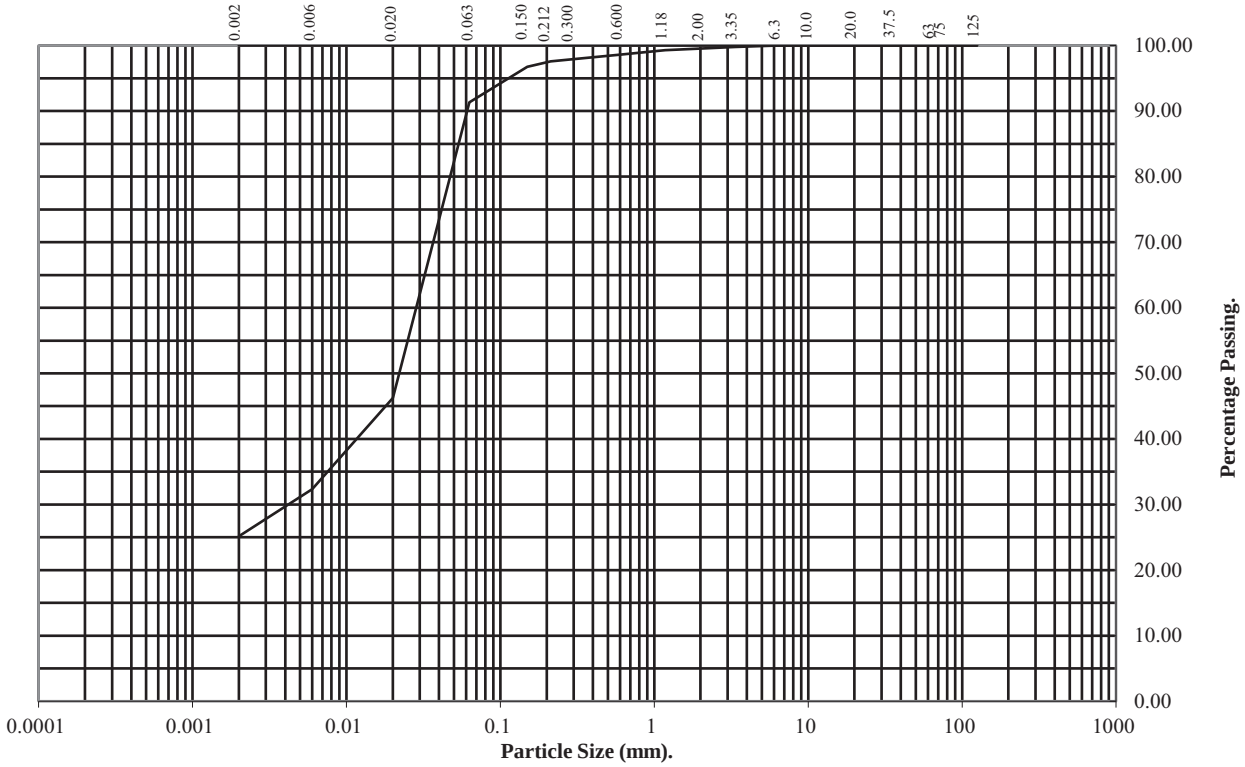
UKAS TESTING 4043	PSL Professional Soils Laboratory	Carnival Phase 2	**Contract No:** PSL19/4271 **Client Ref:** C6411

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**BH01**	**Top Depth (m):**	**3.12**
Sample Number:		**Base Depth(m):**	**3.20**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	99
0.3	98
0.212	98
0.15	97
0.063	91

Particle Diameter	Percentage Passing
0.02	46
0.006	32
0.002	25

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	9
Silt	66
Clay	25

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

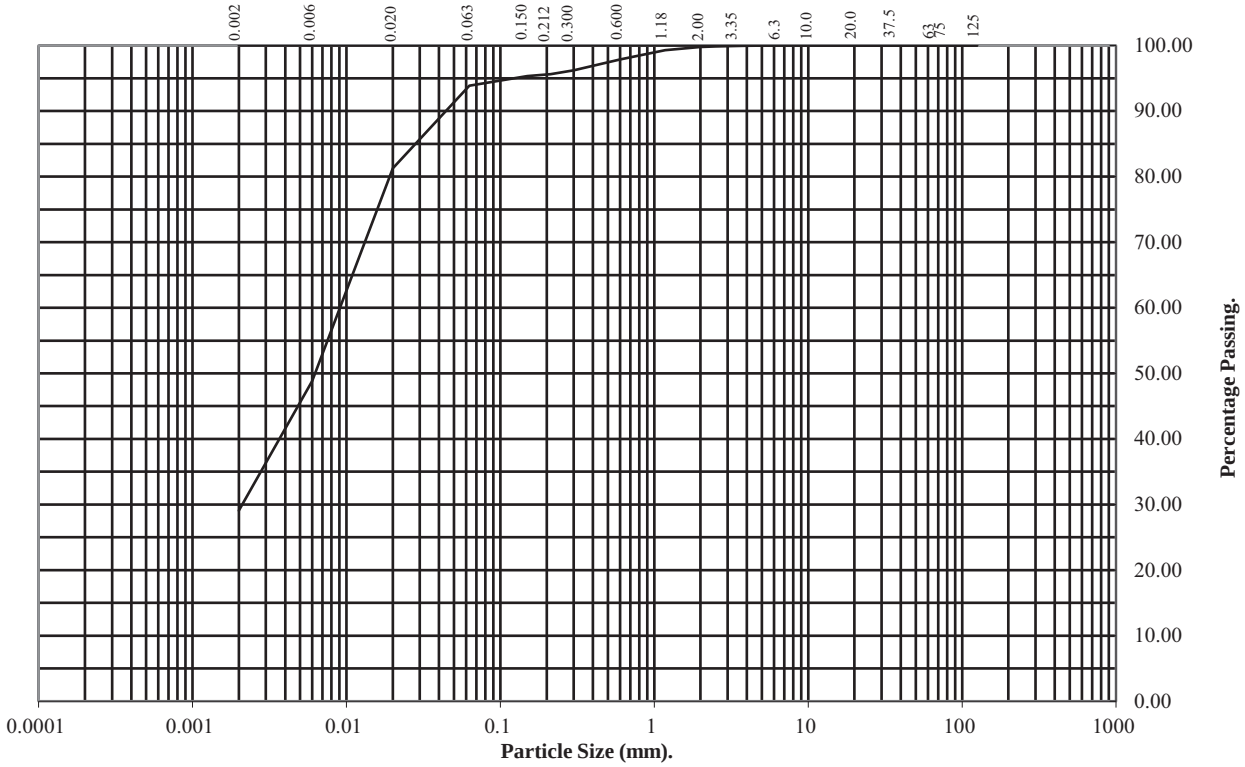
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **BH01** **Top Depth (m):** **5.70**

Sample Number: **Base Depth(m):**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	98
0.3	96
0.212	96
0.15	95
0.063	94

Particle Diameter	Percentage Passing
0.02	81
0.006	49
0.002	29

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	6
Silt	65
Clay	29

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

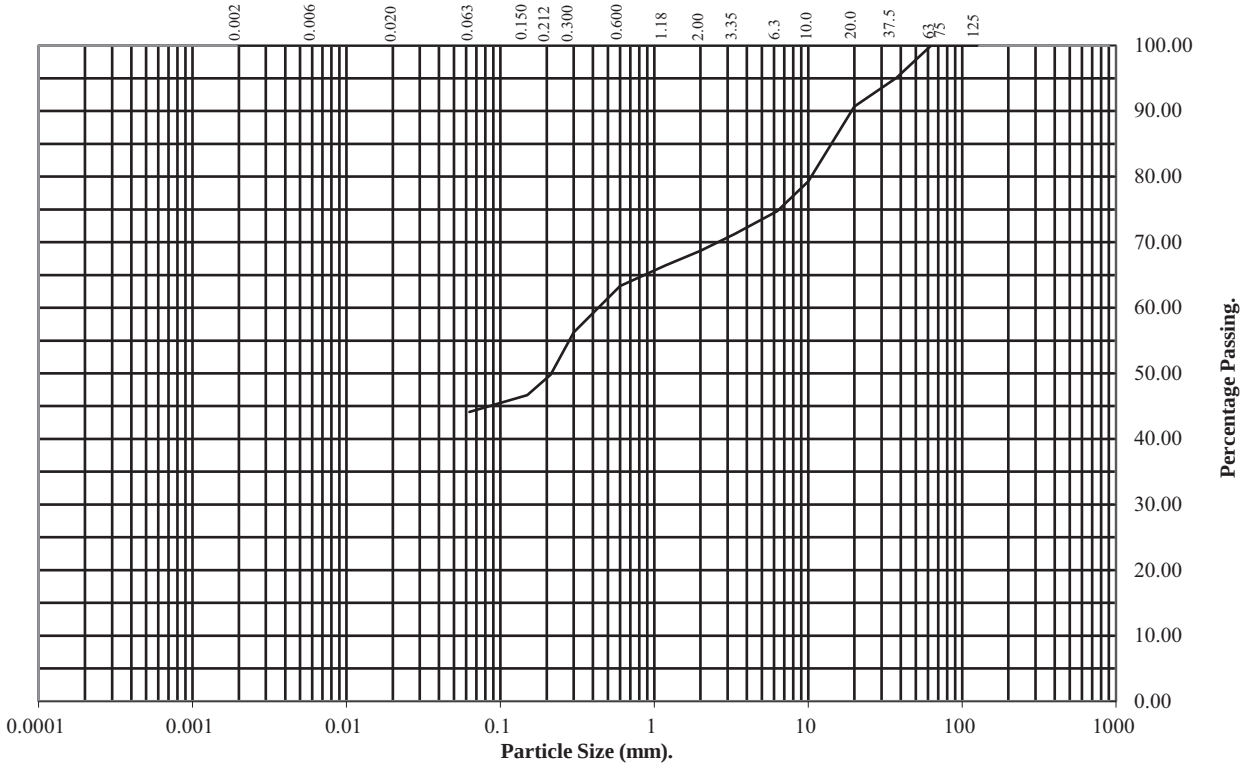
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **BH04** **Top Depth (m):** **1.00**

Sample Number: **Base Depth(m):** **1.20**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	95
20	91
10	79
6.3	75
3.35	71
2	69
1.18	66
0.6	63
0.3	56
0.212	50
0.15	47
0.063	44

Soil Fraction	Total Percentage
Cobbles	0
Gravel	31
Sand	25
Silt/Clay	44

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

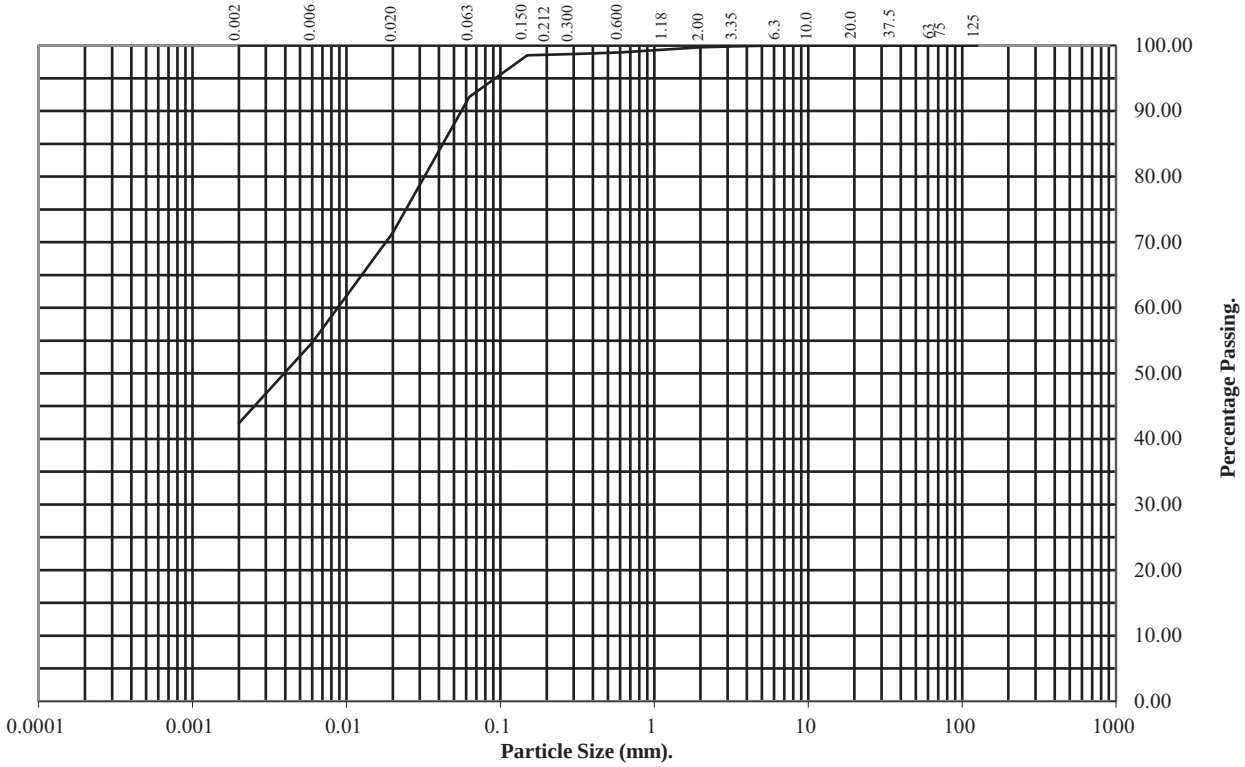
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **BH04** **Top Depth (m):** **2.15**

Sample Number: **Base Depth(m):**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	99
0.3	99
0.212	99
0.15	98
0.063	92

Particle Diameter	Percentage Passing
0.02	71
0.006	55
0.002	42

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	8
Silt	50
Clay	42

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

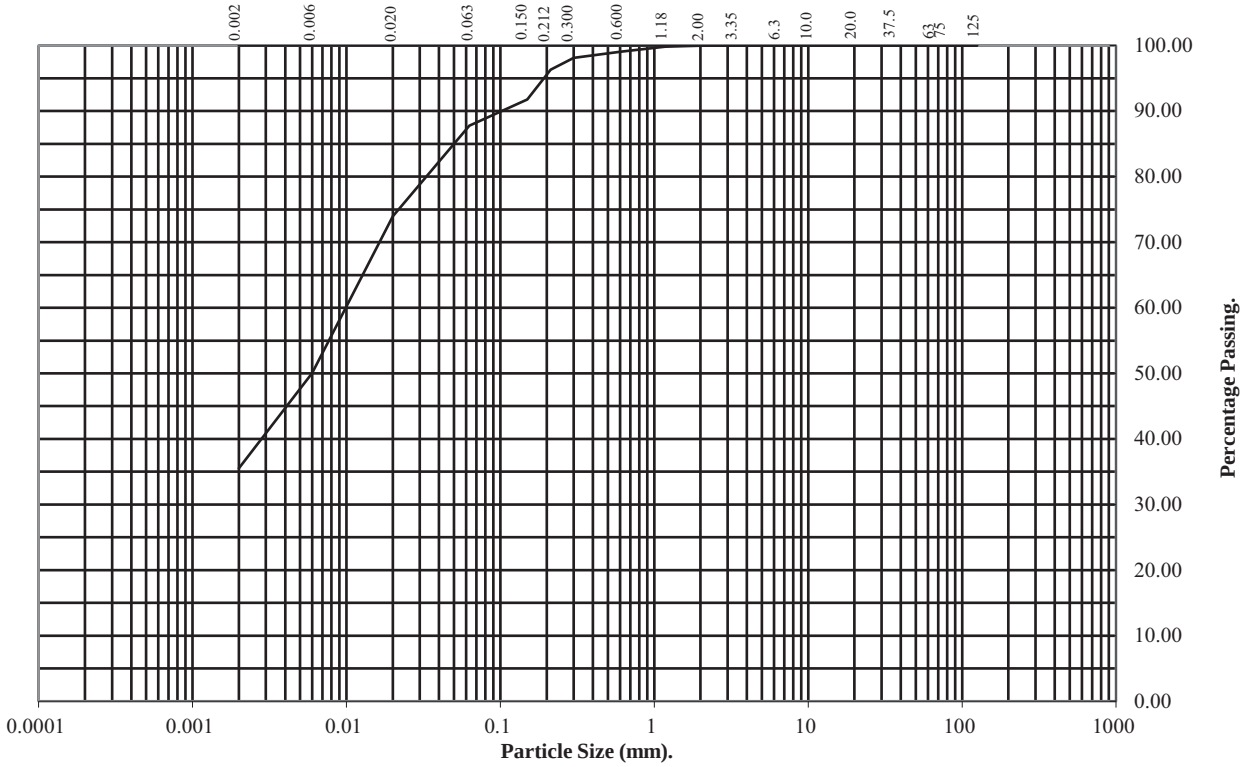
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **BH04** **Top Depth (m):** **12.00**

Sample Number: **Base Depth(m):**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	99
0.3	98
0.212	96
0.15	92
0.063	88

Particle Diameter	Percentage Passing
0.02	74
0.006	50
0.002	36

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	12
Silt	52
Clay	36

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

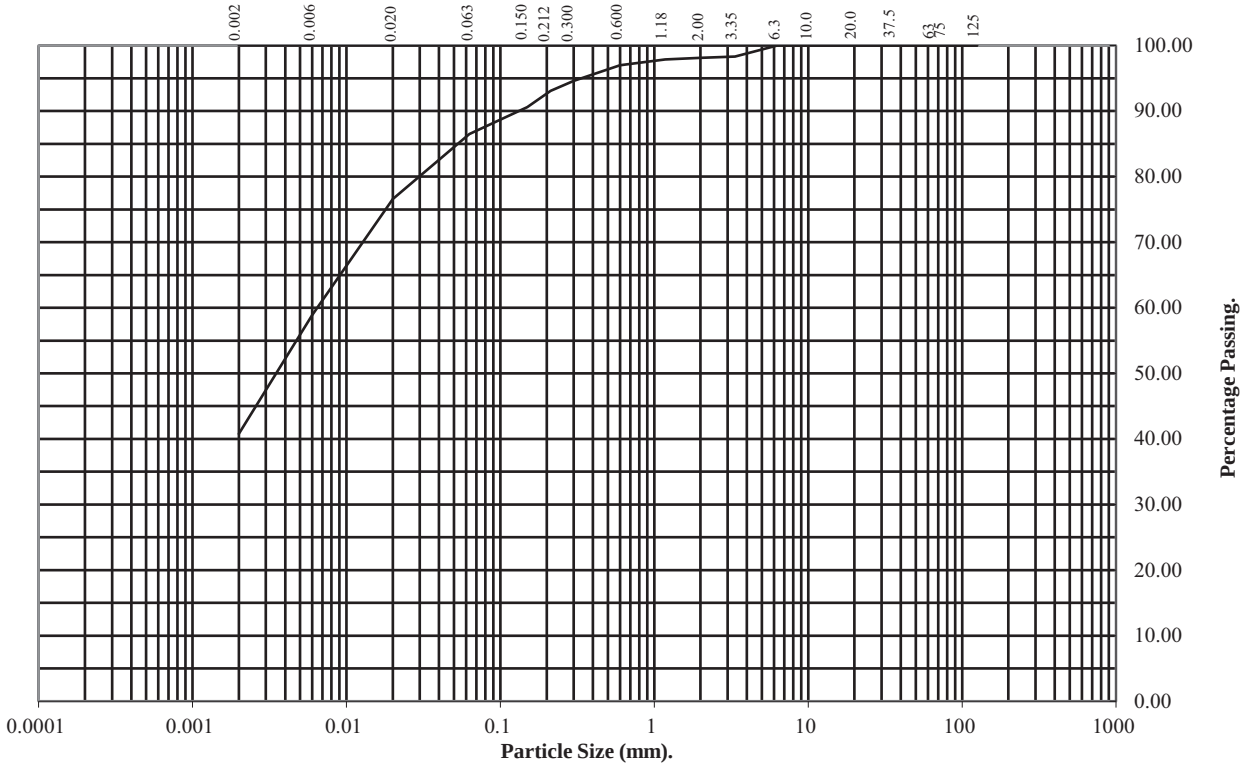
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: TP2 **Top Depth (m):** 2.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	98
2	98
1.18	98
0.6	97
0.3	95
0.212	93
0.15	91
0.063	87

Particle Diameter	Percentage Passing
0.02	77
0.006	59
0.002	41

Soil Fraction	Total Percentage
Cobbles	0
Gravel	2
Sand	11
Silt	46
Clay	41

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

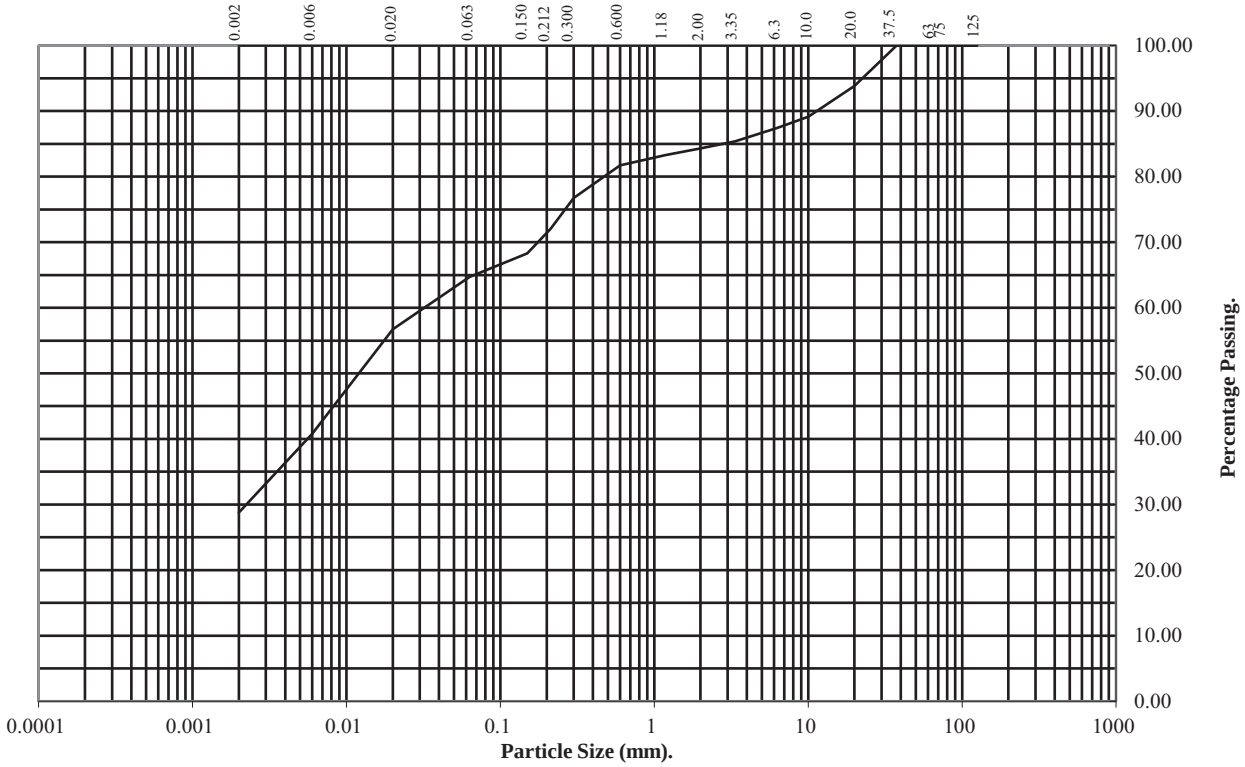
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: TP3 **Top Depth (m):** 1.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	94
10	89
6.3	87
3.35	85
2	84
1.18	83
0.6	82
0.3	77
0.212	72
0.15	68
0.063	65

Particle Diameter	Percentage Passing
0.02	57
0.006	41
0.002	29

Soil Fraction	Total Percentage
Cobbles	0
Gravel	16
Sand	19
Silt	36
Clay	29

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

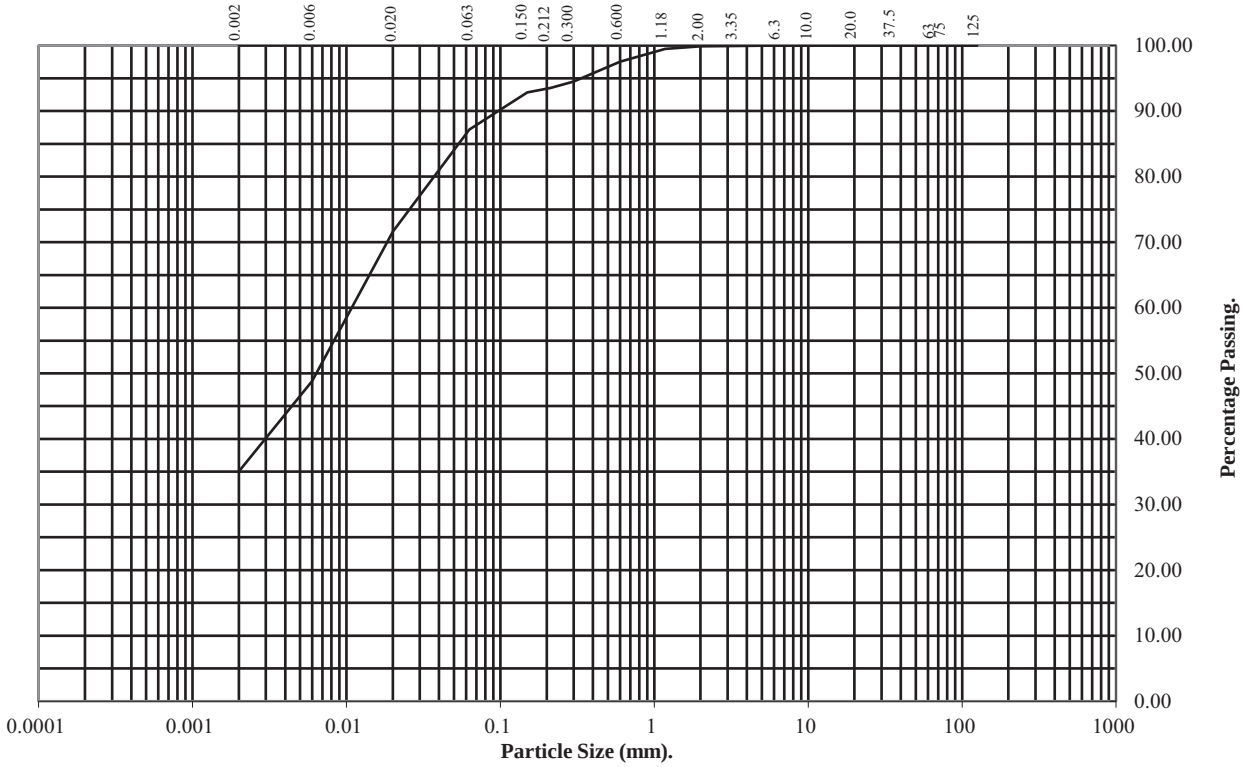
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **WS02** **Top Depth (m):** **2.70**

Sample Number: **Base Depth(m):**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	98
0.3	95
0.212	94
0.15	93
0.063	87

Particle Diameter	Percentage Passing
0.02	72
0.006	49
0.002	35

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	13
Silt	52
Clay	35

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

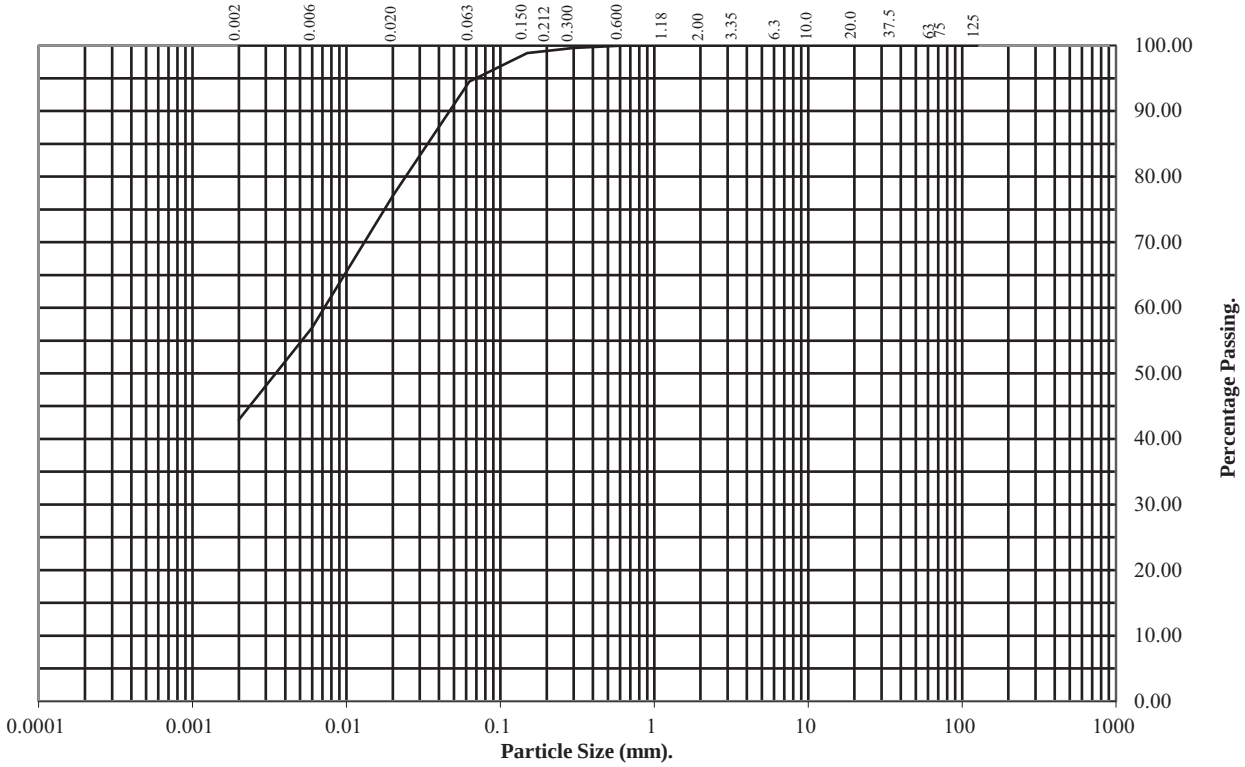
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **WS03** **Top Depth (m):** **2.70**

Sample Number: **Base Depth(m):**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	100
0.3	100
0.212	99
0.15	99
0.063	95

Particle Diameter	Percentage Passing
0.02	77
0.006	57
0.002	43

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	5
Silt	52
Clay	43

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

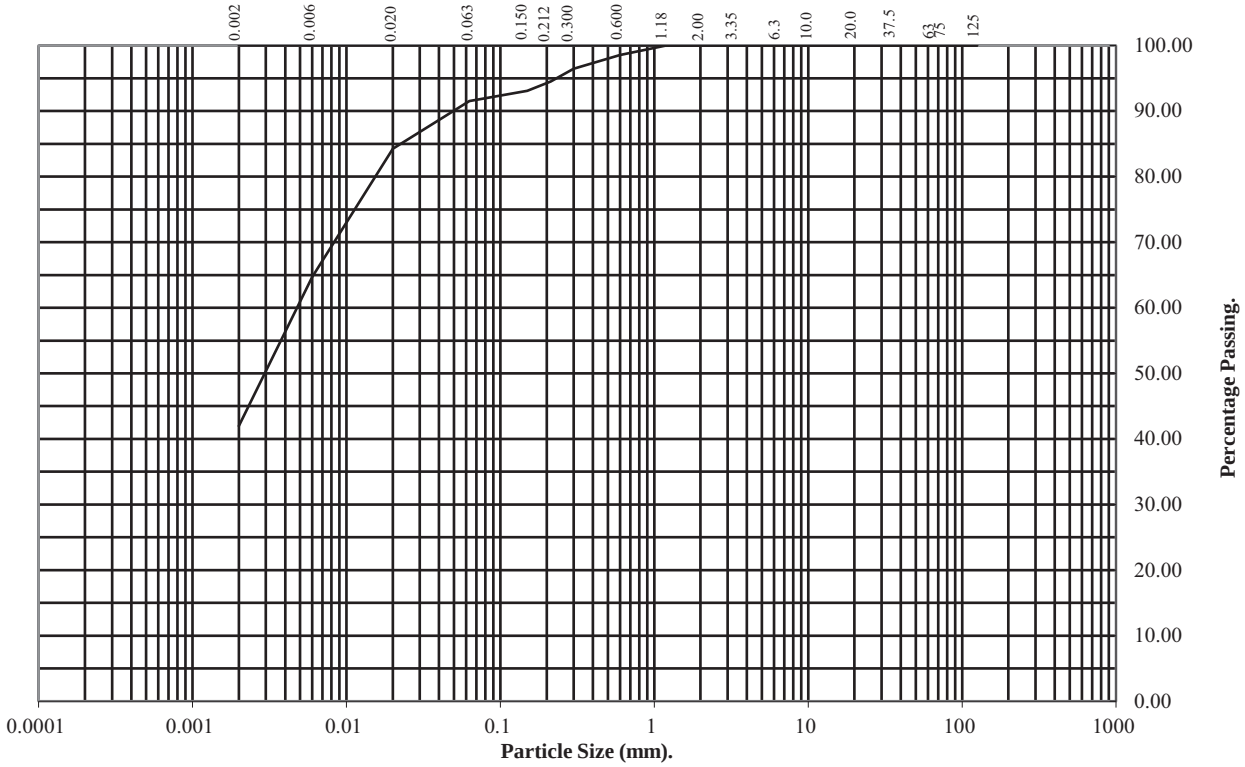
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **WS03** **Top Depth (m):** **4.80**

Sample Number: **Base Depth(m):**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	99
0.3	96
0.212	95
0.15	93
0.063	92

Particle Diameter	Percentage Passing
0.02	84
0.006	65
0.002	42

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	8
Silt	50
Clay	42

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

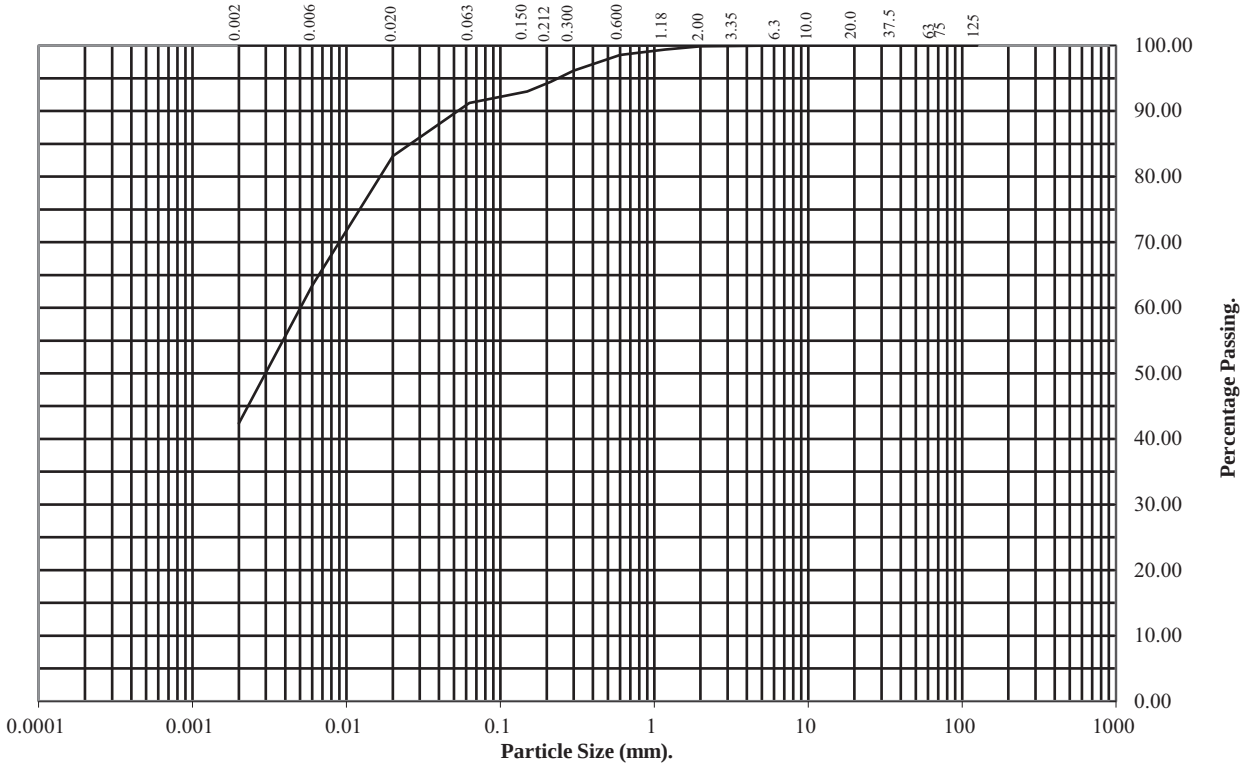
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **WS04** **Top Depth (m):** **2.70**

Sample Number: **Base Depth(m):**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	99
0.3	96
0.212	94
0.15	93
0.063	91

Particle Diameter	Percentage Passing
0.02	83
0.006	63
0.002	42

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	9
Silt	49
Clay	42

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

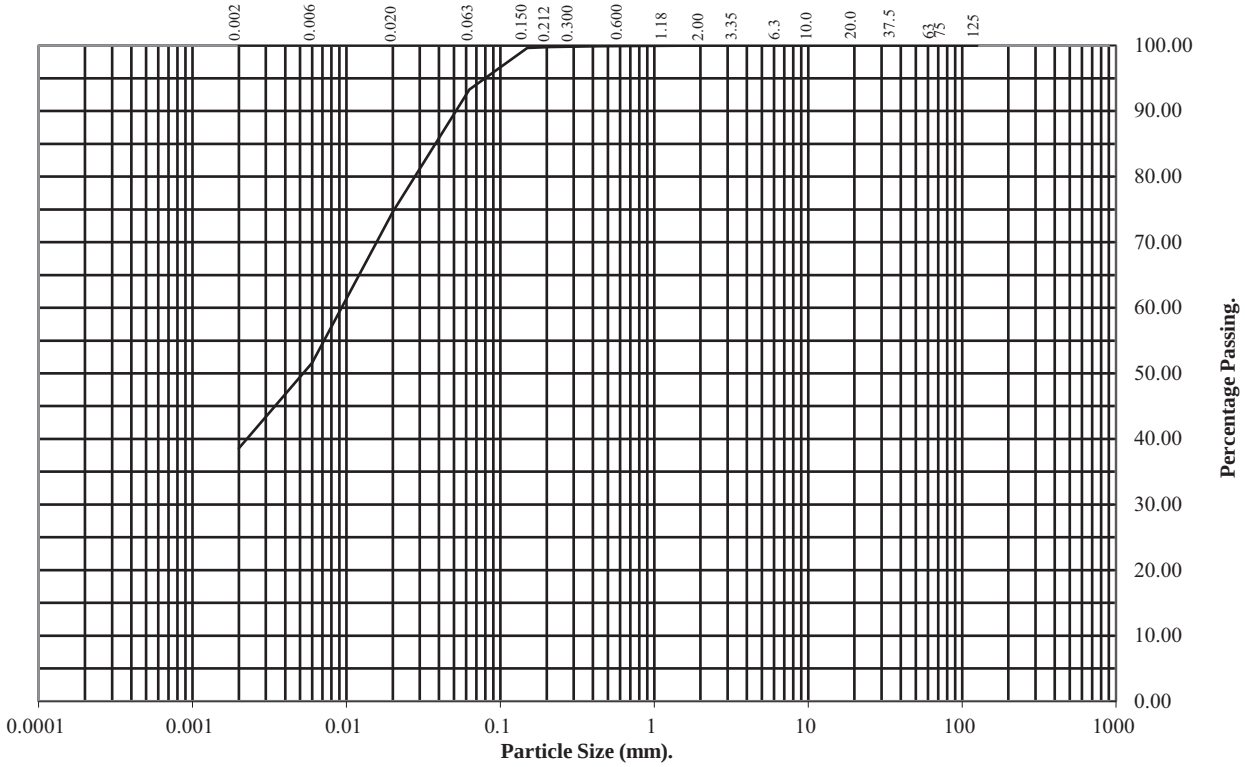
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **WS04** **Top Depth (m):** **4.70**

Sample Number: **Base Depth(m):**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	100
0.3	100
0.212	100
0.15	100
0.063	93

Particle Diameter	Percentage Passing
0.02	75
0.006	52
0.002	39

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	7
Silt	54
Clay	39

Remarks:
See Summary of Soil Descriptions

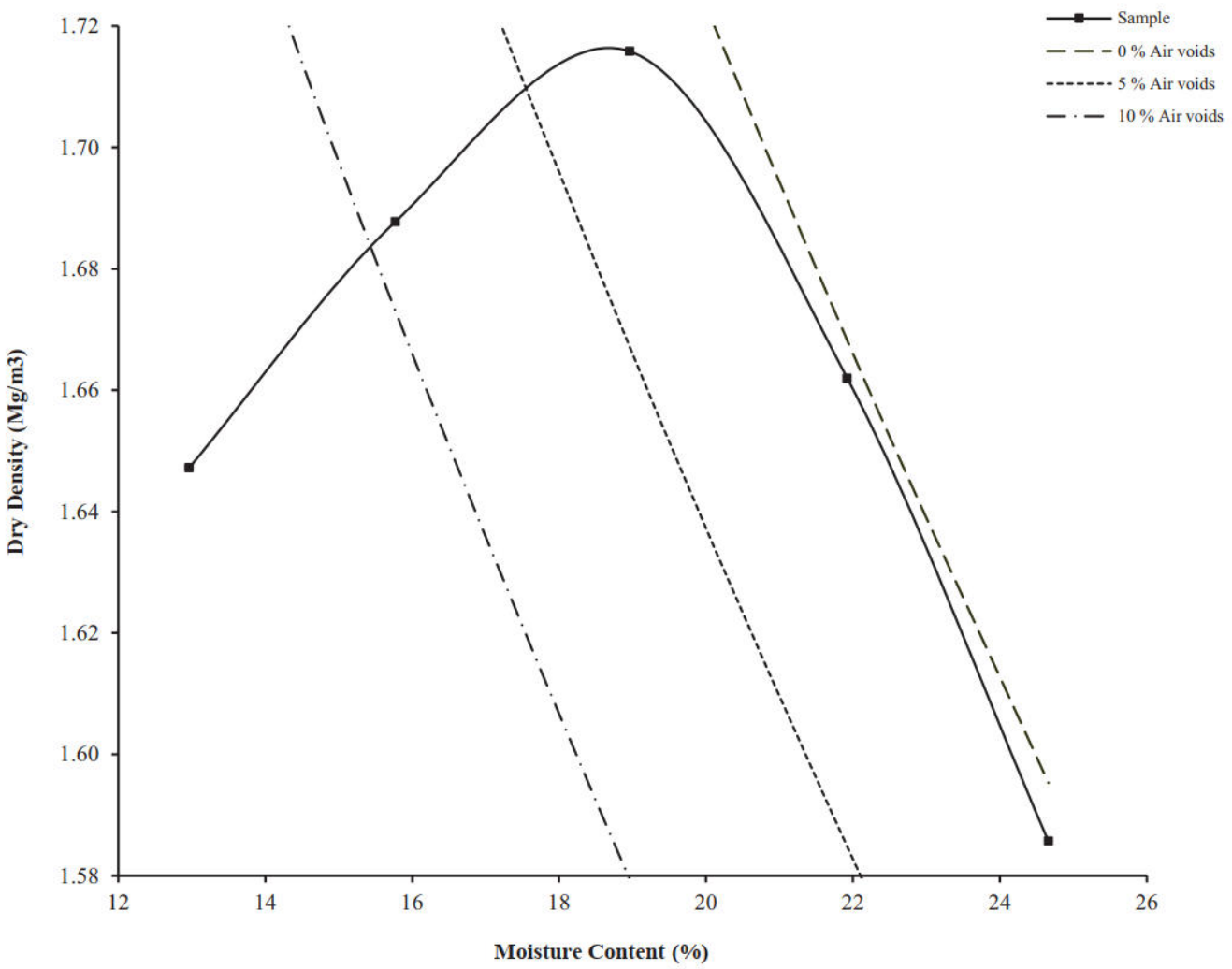
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP2 **Top Depth (m) :** 1.00

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		25	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.63	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.72	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		19			
Remarks See summary of soil descriptions.					

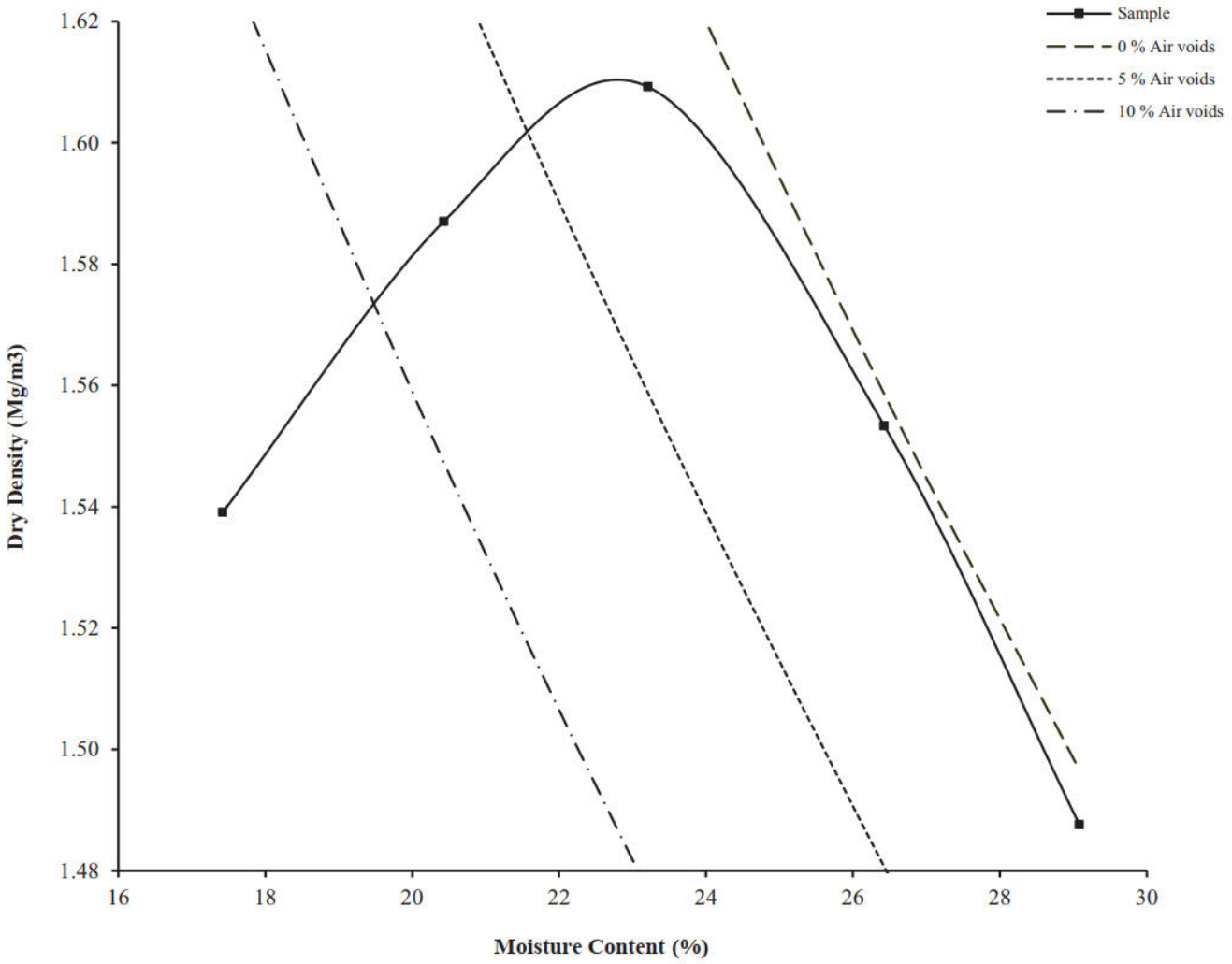
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP3 **Top Depth (m) :** 1.00

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		26	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.61	Material Retained on 20.0 mm Test Sieve (%):		6
Optimum Moisture Content (%):		23			
Remarks See summary of soil descriptions.					

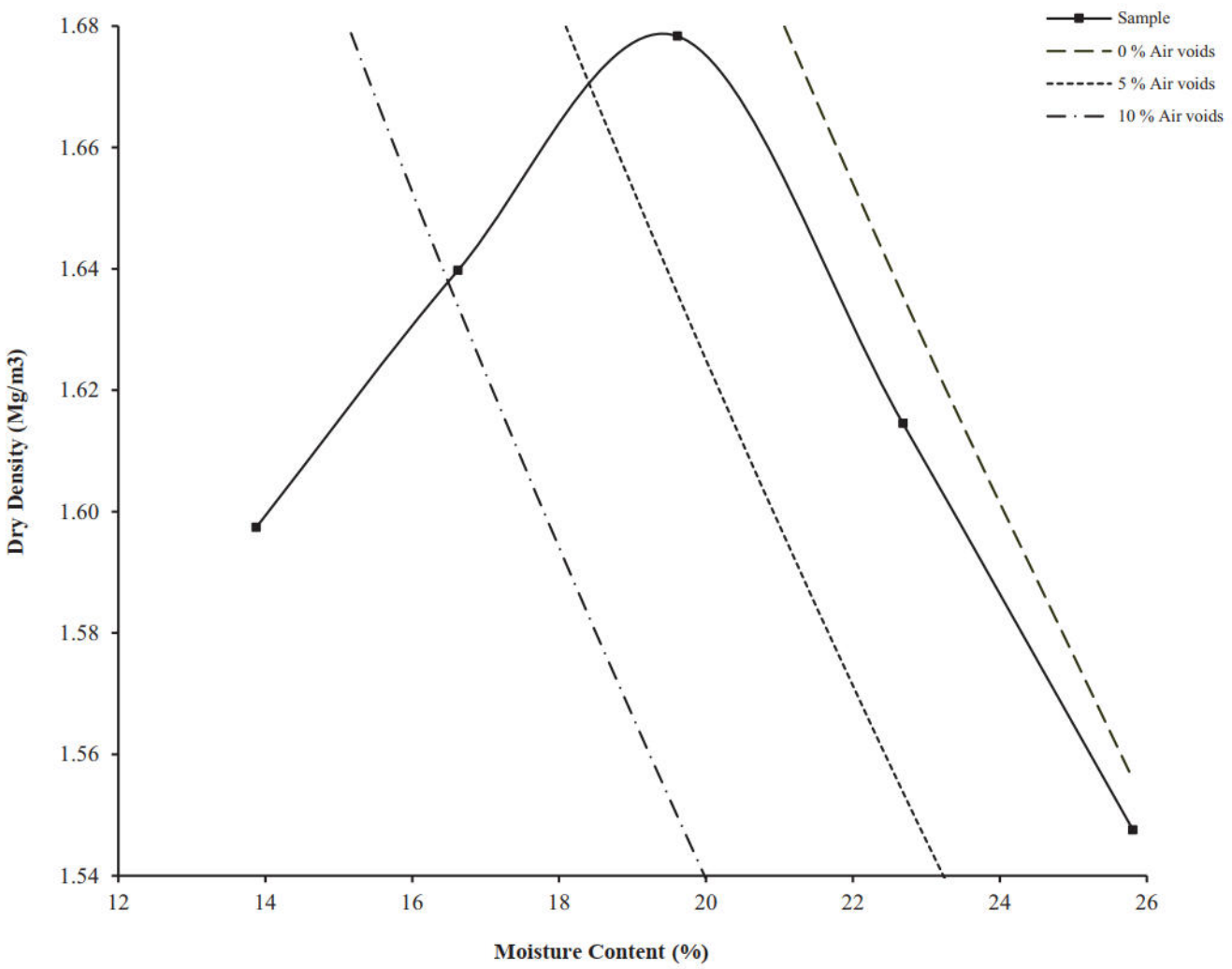
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP3 **Top Depth (m) :** 2.00

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		26	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.60	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.68	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		20			
Remarks See summary of soil descriptions.					

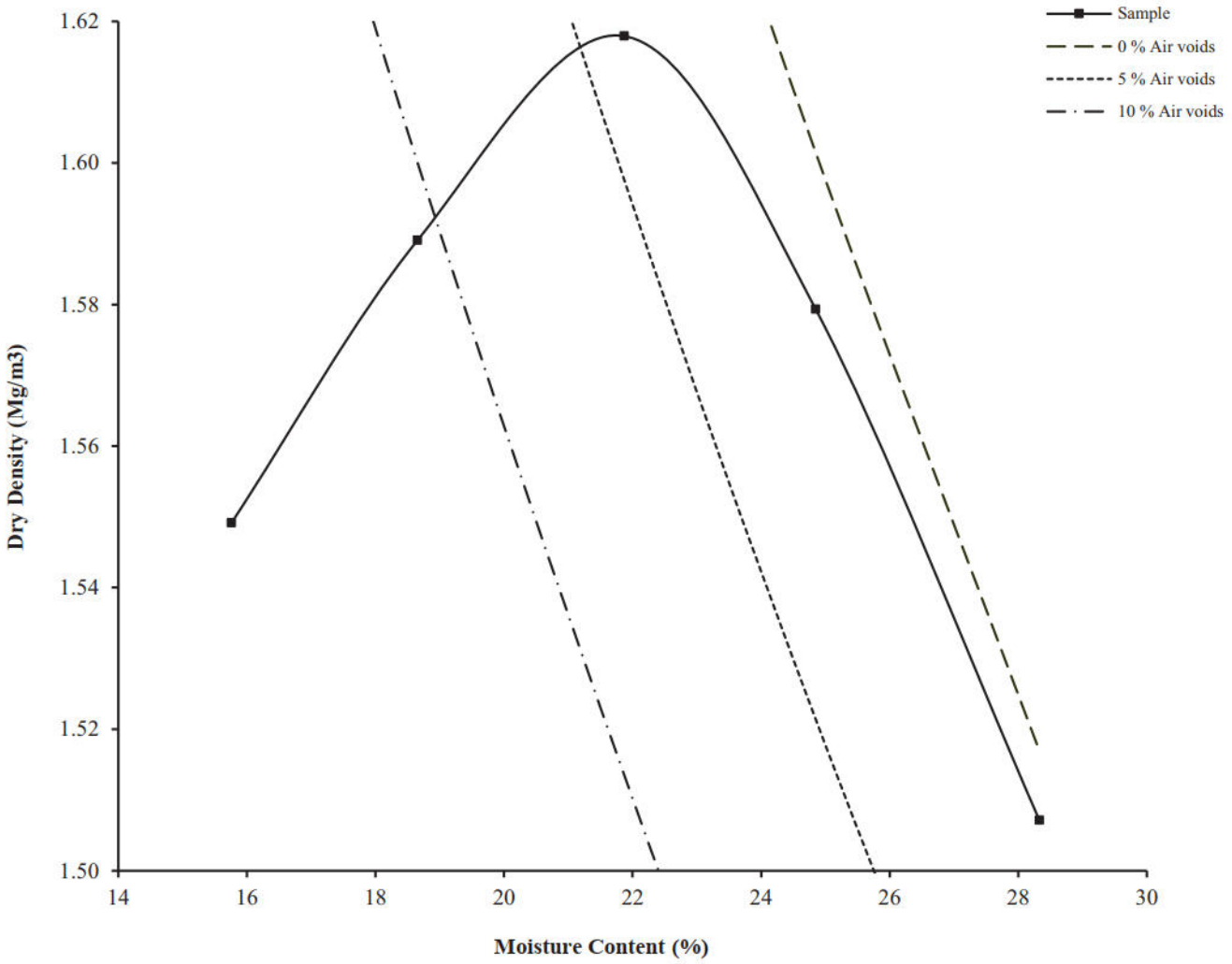
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP3 **Top Depth (m) :** 3.00

Sample Number: **Base Depth (m) :**

Sample Type: B

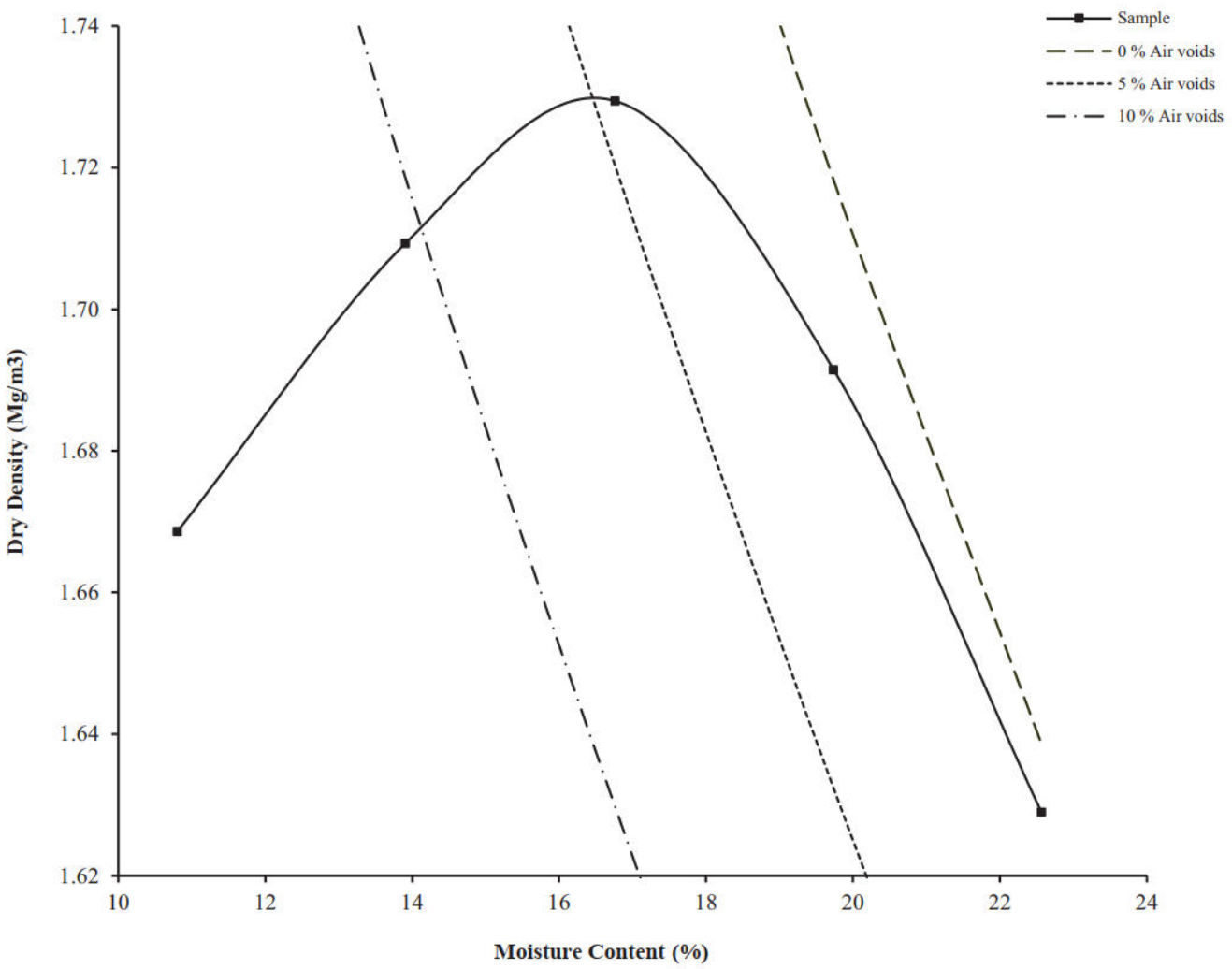


Initial Moisture Content:		25	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.66	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.62	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		22			
Remarks See summary of soil descriptions.					

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number:	**WS02**	**Top Depth (m) :**	**1.00**
Sample Number:		**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		17	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.60	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.73	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		17			
Remarks See summary of soil descriptions.					

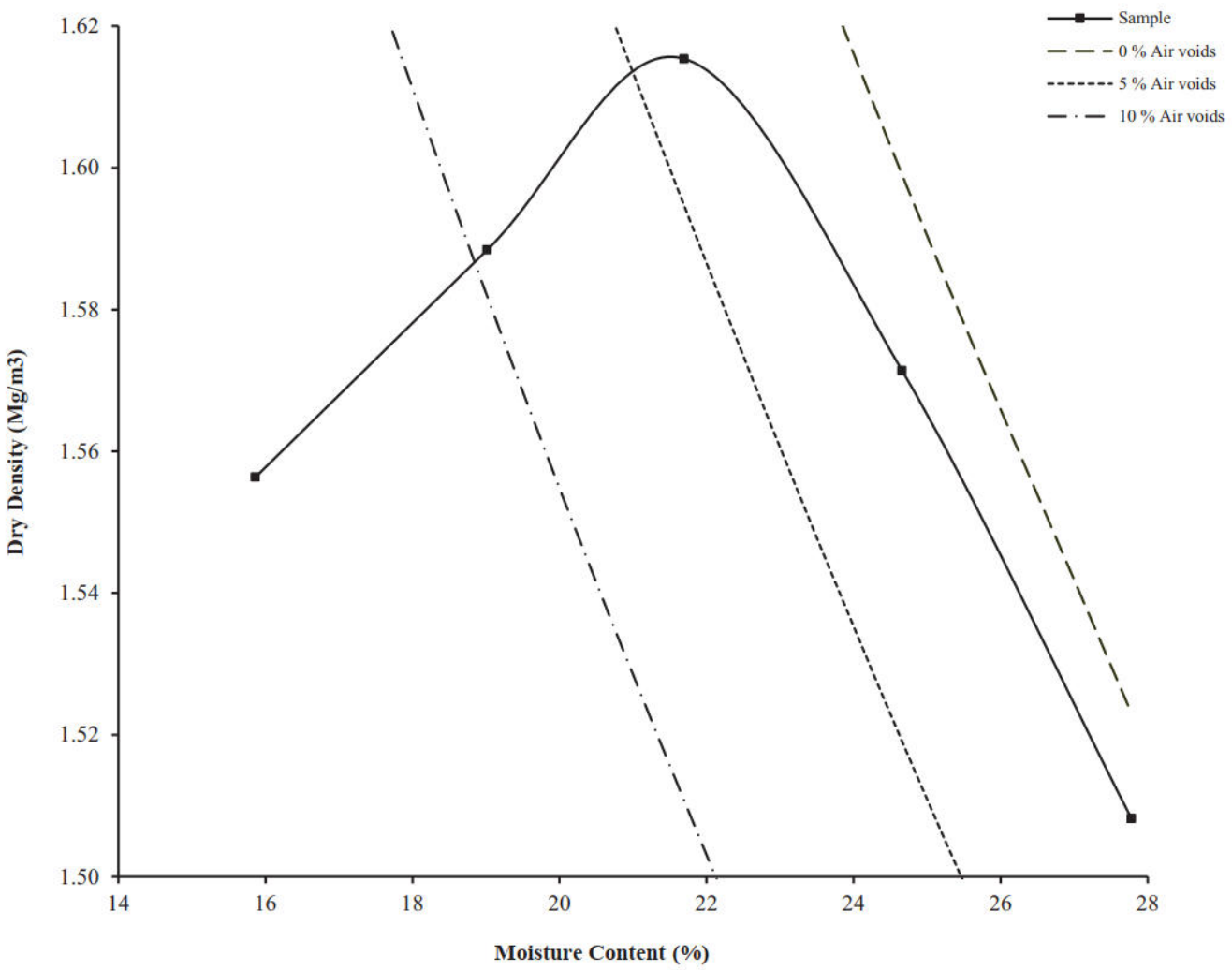
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: WS03 **Top Depth (m) :** 1.00

Sample Number: **Base Depth (m) :**

Sample Type: B



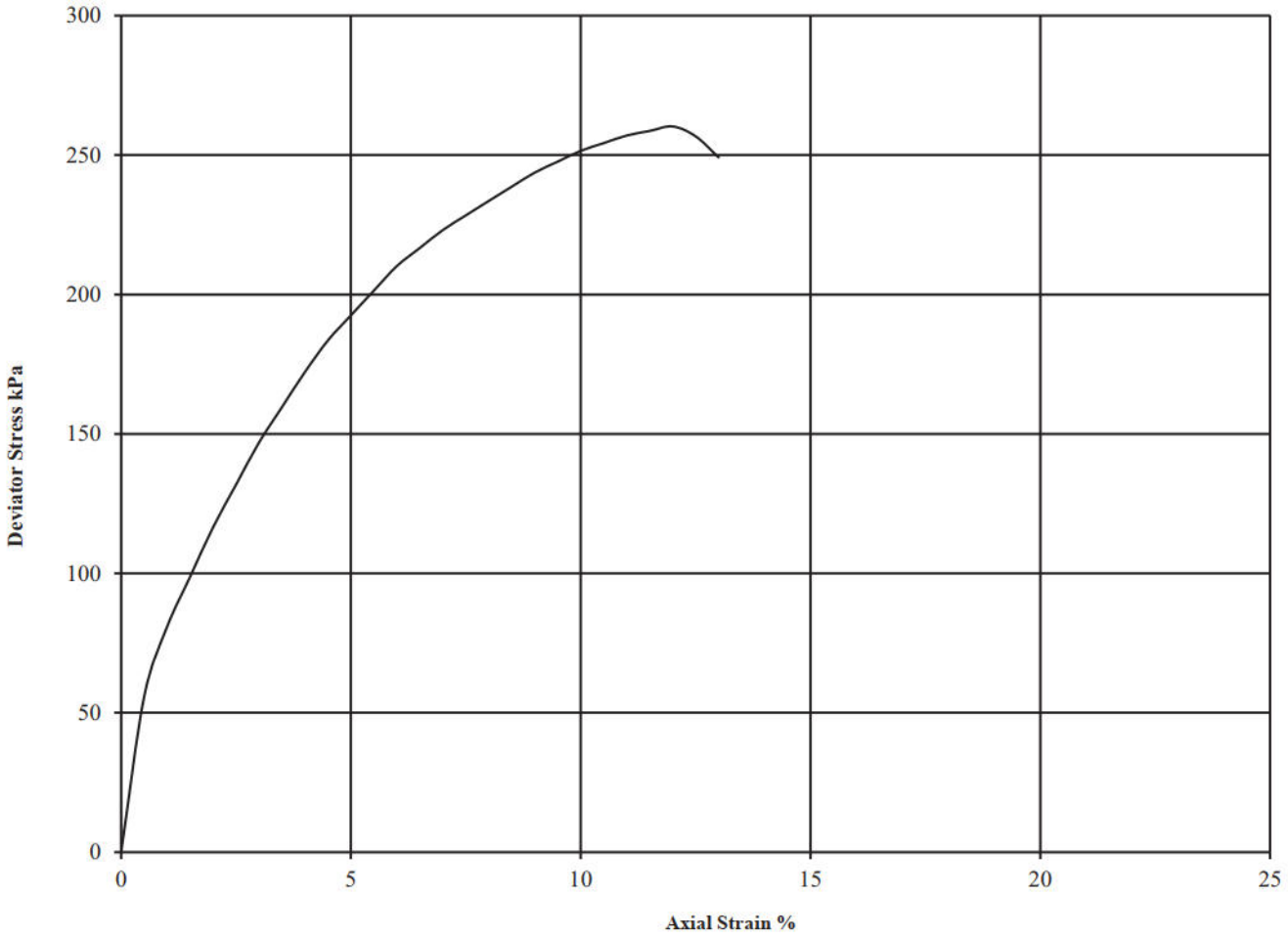
Initial Moisture Content:		25	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.64	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.62	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		22			
Remarks See summary of soil descriptions.					

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH01**	**Top Depth (m):**	**20.00**
Sample Number:		**Base Depth (m):**	**20.30**
Sample Type	**CS**		



Diameter (mm):		38	Height (mm):		76	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.83
1	28	1.89	1.48	400	260	130	12.0	Brittle	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Carnival Phase 2

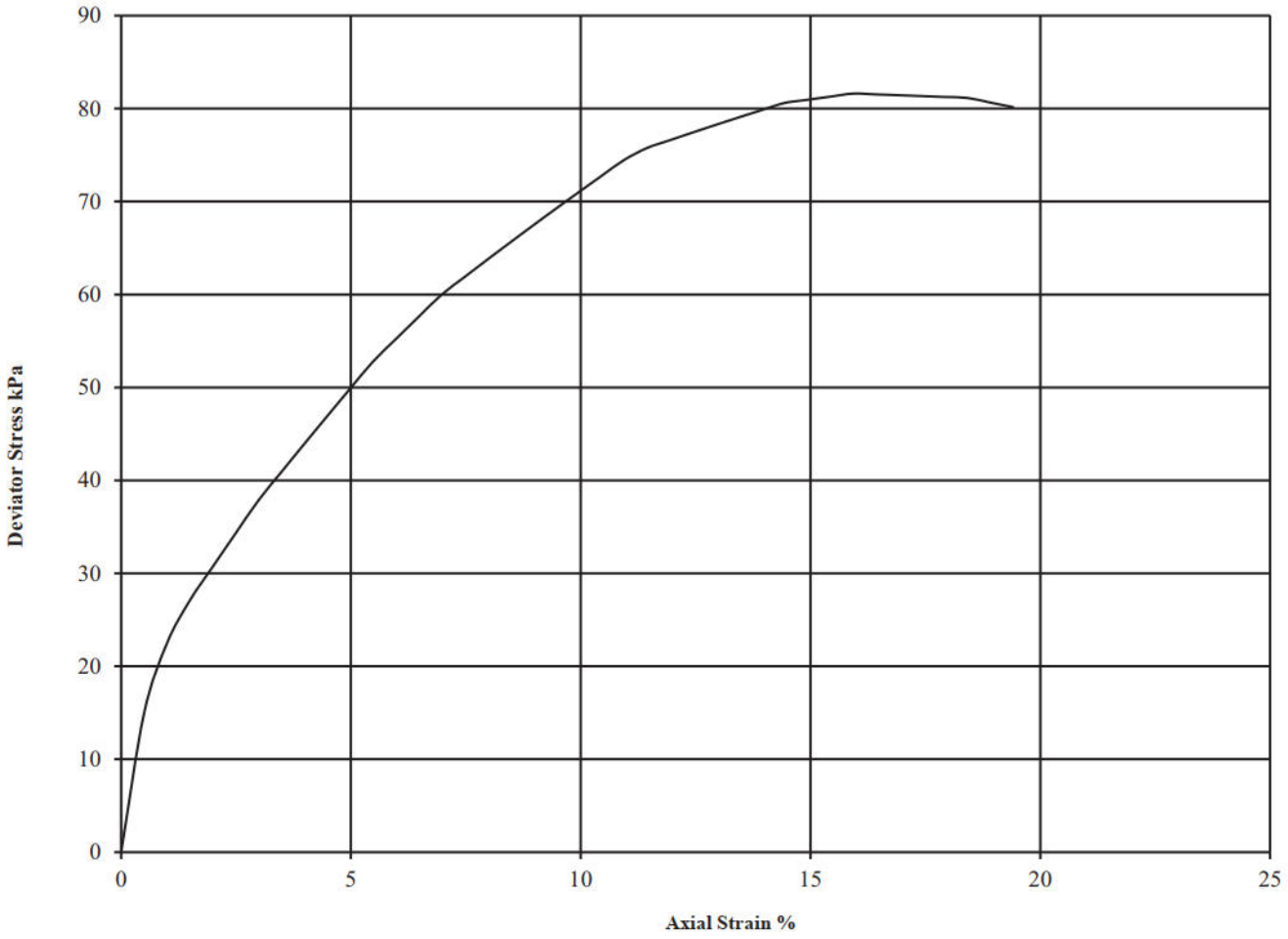
Contract No:
PSL19/4271
Client Ref:
C6411

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH04**	**Top Depth (m):**	**1.70**
Sample Number:		**Base Depth (m):**	**2.15**
Sample Type	**UT100**		



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.34
1	24	1.98	1.59	35	82	41	15.9	Plastic	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Carnival Phase 2

Contract No:
PSL19/4271
Client Ref:
C6411

ONE DIMENSIONAL CONSOLIDATION TEST

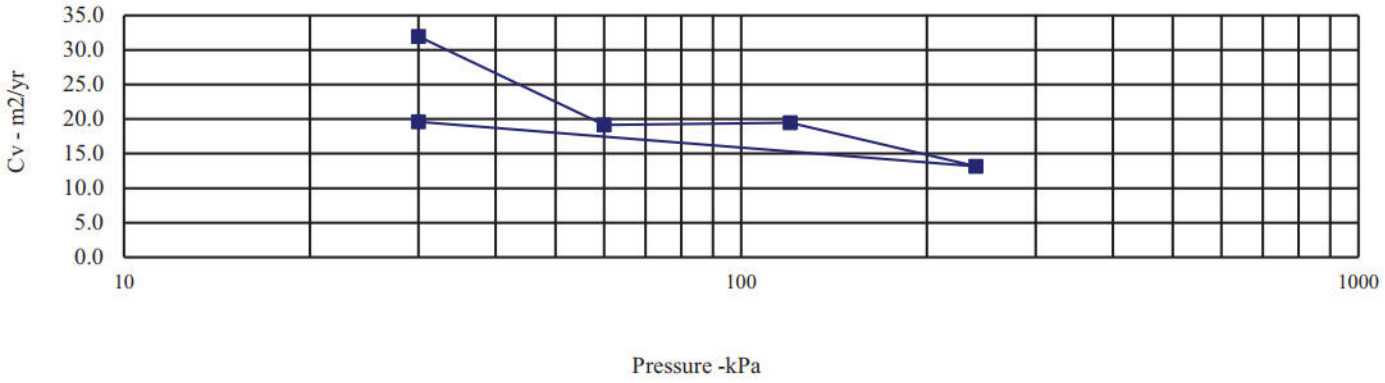
BS 1377: Part 5: 1990: Clause 3

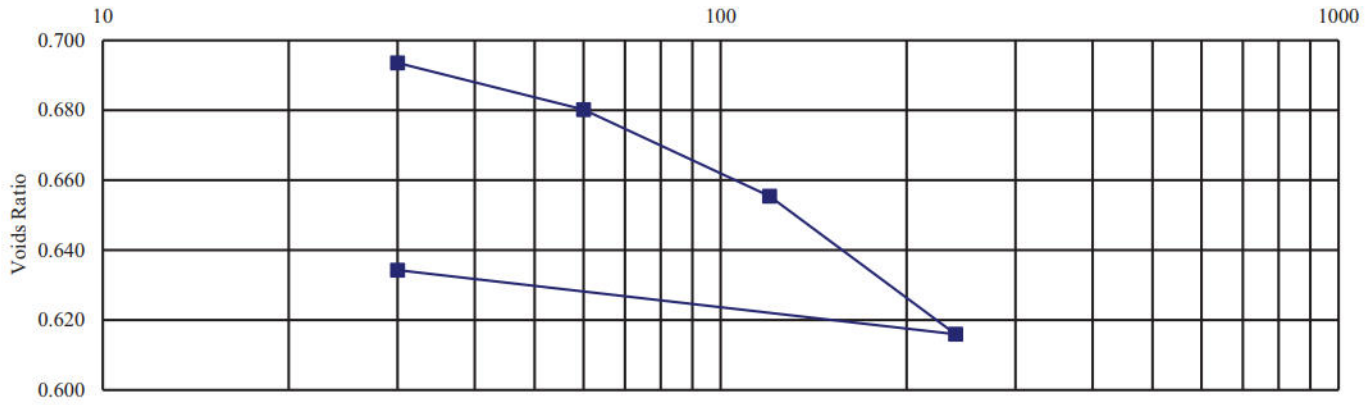
Hole Number: BH01 **Top Depth (m):** 2.70

Sample Number: **Base Depth (m) :** 3.15

Sample Type: UT100

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	22						
Bulk Density (Mg/m3):	1.89	0	30	0.304	31.959	Method used to	
Dry Density (Mg/m3):	1.55	30	60	0.263	19.166	determine CV:	T90
Voids Ratio:	0.709	60	120	0.245	19.482	Nominal temperature	
Degree of saturation:	81.5	120	240	0.199	13.161	during test ' C:	20
Height (mm):	20.068	240	30	0.054	19.619	Remarks:	
Diameter (mm)	75.04					See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	Carnival Phase 2	Contract No: PSL19/4271 Client Ref: C6411

ONE DIMENSIONAL CONSOLIDATION TEST

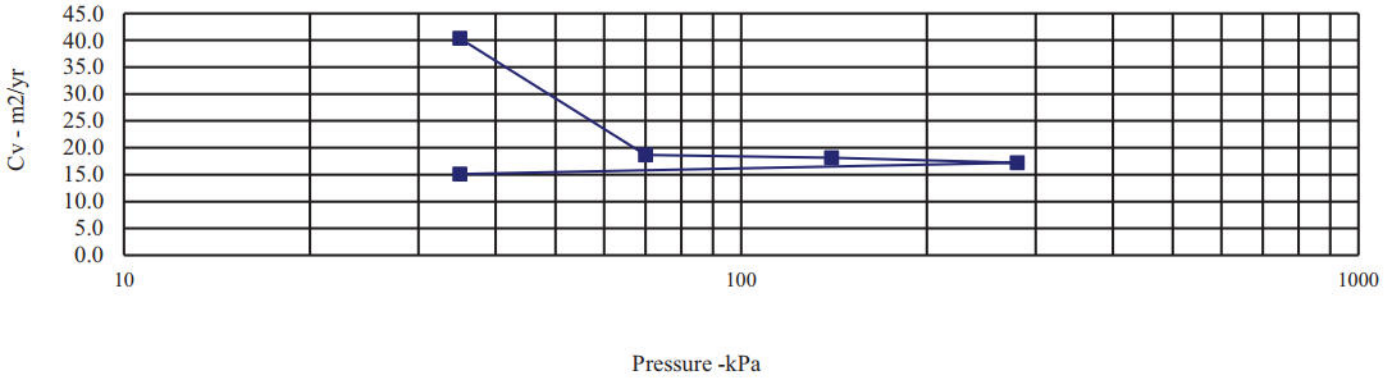
BS 1377: Part 5: 1990: Clause 3

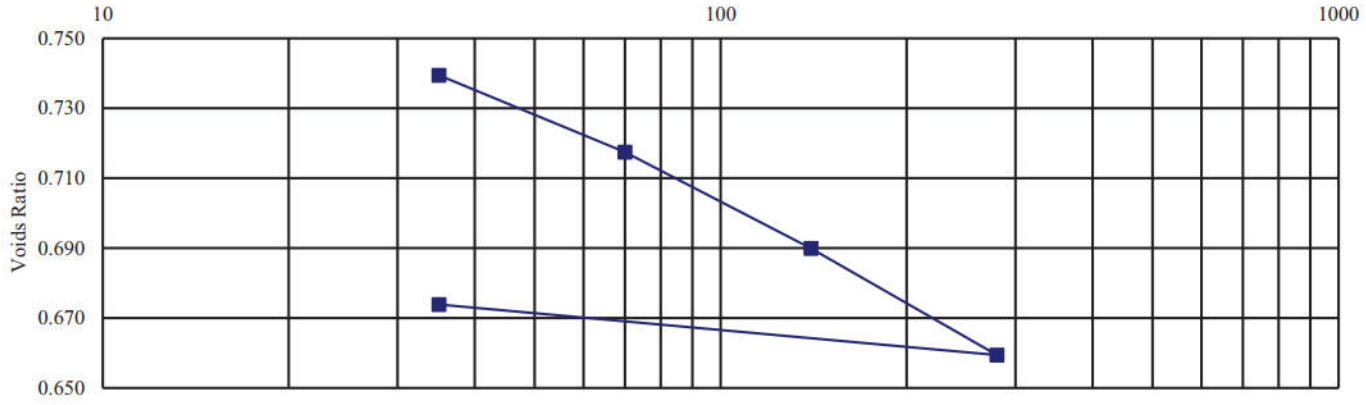
Hole Number: BH01 **Top Depth (m):** 3.70

Sample Number: **Base Depth (m) :** 4.15

Sample Type: UT100

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	27						
Bulk Density (Mg/m3):	1.90	0	35	0.397	40.362	Method used to	
Dry Density (Mg/m3):	1.50	35	70	0.361	18.695	determine CV:	T90
Voids Ratio:	0.764	70	140	0.229	18.147	Nominal temperature	
Degree of saturation:	92.6	140	280	0.129	17.208	during test ' C:	20
Height (mm):	19.928	280	35	0.035	15.106	Remarks:	
Diameter (mm)	74.918					See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	Carnival Phase 2	Contract No: PSL19/4271 Client Ref: C6411

ONE DIMENSIONAL CONSOLIDATION TEST

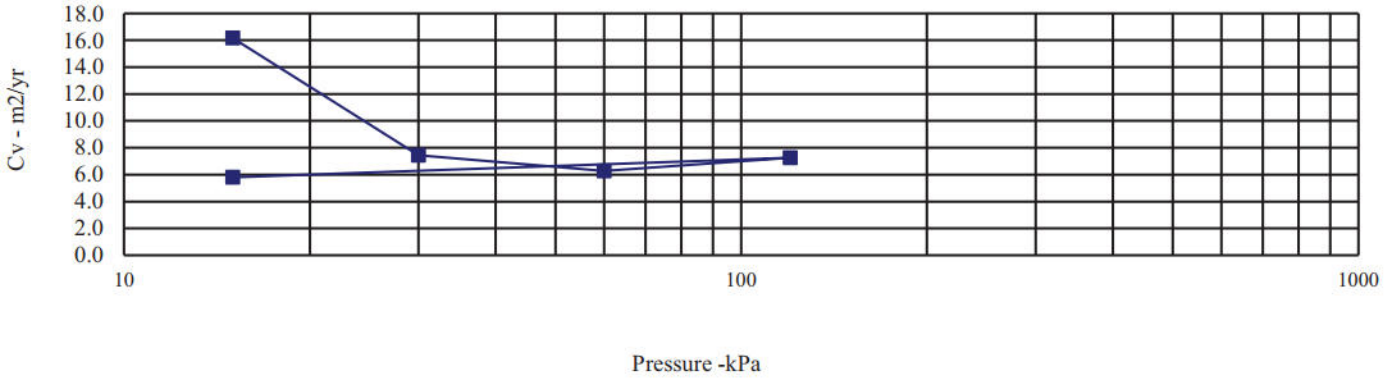
BS 1377: Part 5: 1990: Clause 3

Hole Number: BH04 **Top Depth (m):** 1.70

Sample Number: **Base Depth (m) :** 2.15

Sample Type: UT100

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	24						
Bulk Density (Mg/m3):	1.94	0	15	0.321	16.170	Method used to	
Dry Density (Mg/m3):	1.56	15	30	0.706	7.433	determine CV:	T90
Voids Ratio:	0.700	30	60	0.493	6.275	Nominal temperature	
Degree of saturation:	92.0	60	120	0.275	7.261	during test ' C:	20
Height (mm):	19.932	120	15	0.056	5.801	Remarks:	
Diameter (mm)	74.933					See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	Carnival Phase 2	Contract No: PSL19/4271 Client Ref: C6411

Effective Stress Triaxial Compression

Consolidated Undrained

Summary Report

Sample Details				
	Depth	2.70-3.15m UT100		
	Description	Brown sandy silty CLAY.		
	Type	Undisturbed, Vertical orientation.		
	Initial Sample Length	L_0	(mm)	211.0
	Initial Sample Diameter	D_0	(mm)	105.1
	Initial Sample Weight	W_0	(gr)	3404.3
sketch showing specimen location in original sample	Initial Bulk Density	ρ_0	(Mg/m3)	1.86
	Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions			Stage 1
Initial Cell Pressure	σ_{3i}	(kPa)	610
Initial Back Pressure	U_{bi}	(kPa)	550
Membrane Thickness	m_b	(mm)	0.600
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Pore Water Pressure Input	u_{pwp}	(kPa)	CH 3
Sample Volume	V	(cc)	CH 2
Initial Moisture	ω_i	(%)	26
Initial Dry Density	ρ_{di}	(Mg/m3)	1.48
Initial Voids Ratio	e_i	.	0.795
Initial Degree of Saturation	S_i	(%)	87
B Value	B	.	0.98

Final Conditions			
Final Moisture	ω_f	(%)	27
Final Dry Density	ρ_{df}	(Mg/m3)	1.49
Final Voids Ratio	e_f	.	0.775
Final Degree of Saturation	S_f	(%)	93.4
			Stage 1
Failure Criteria		.	Max. Dev. Stress
Strain At Failure	ε_f	(%)	10.19
Stress At Failure	$(\sigma_1-\sigma_3)$	(kPa)	137.2
Minor Stress At Failure	σ_3'	(kPa)	71.0
Major Stress At Failure	σ_1'	(kPa)	208.2
Principal Stress At Failure	σ_1'/σ_3'		2.933

Notes



Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH01 2.70-3.15m UT100
		Test Date	19/07/2019
		Borehole	BH01
Jobfile	Carnival Phase II	Sample	2.70-3.15m UT100
Client	CC Ground Investigations Ltd	Depth	2.70-3.15m UT100

UKAS TESTING 4043

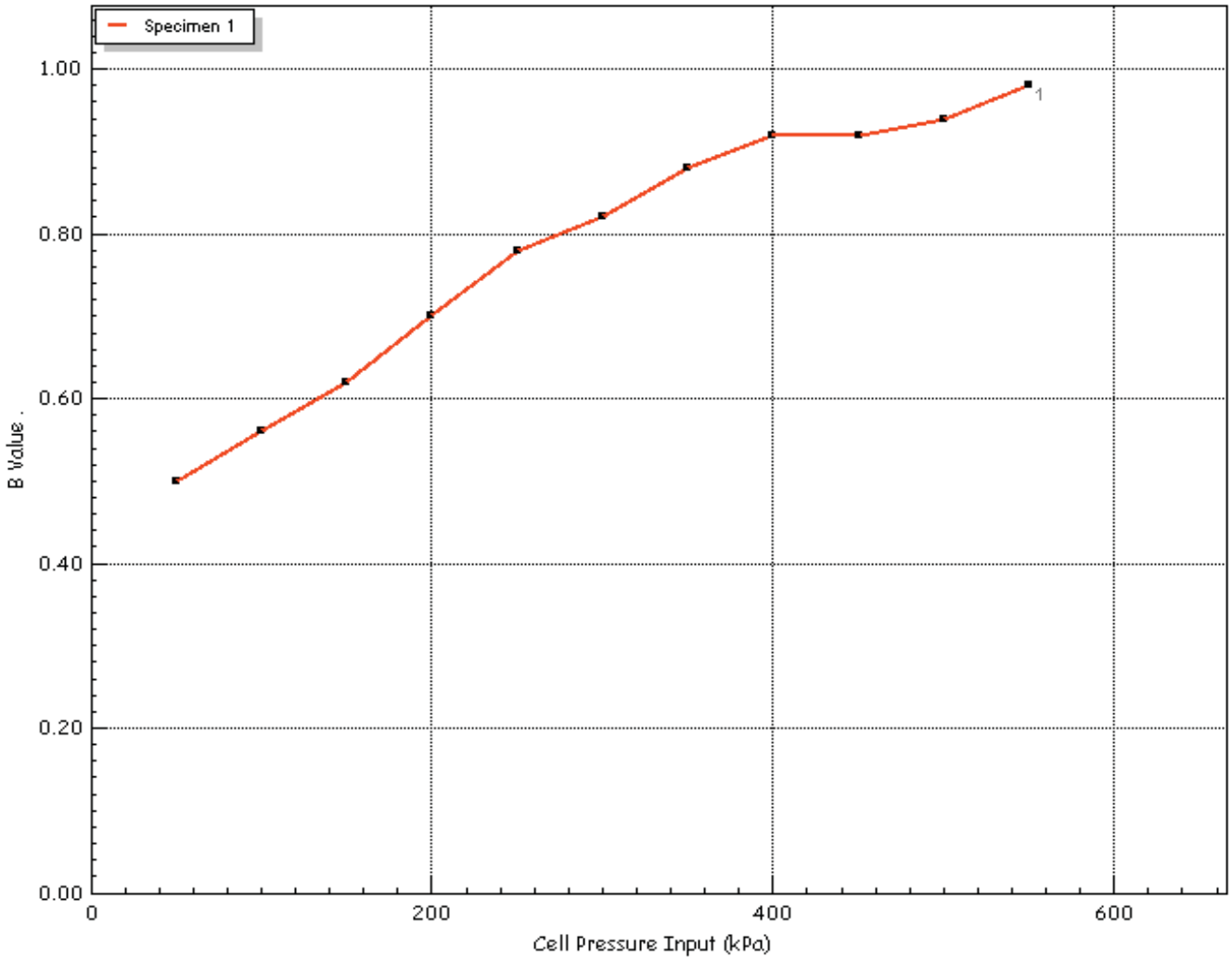
PSL Professional Soils Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Saturation Plots

Saturation Method			Stepped
Cell Pressure Input	σ	(kPa)	550
Pore Water Pressure Input	u pwp	(kPa)	530
B Value	B	.	0.98



Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH01 2.70-3.15m UT100
		Test Date	19/07/2019
		Borehole	BH01
Jobfile	Carnival Phase II	Sample	2.70-3.15m UT100
Client	CC Ground Investigations Ltd	Depth	2.70-3.15m UT100

UKAS TESTING 4043

PSL Professional Soils Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Consolidation Plots

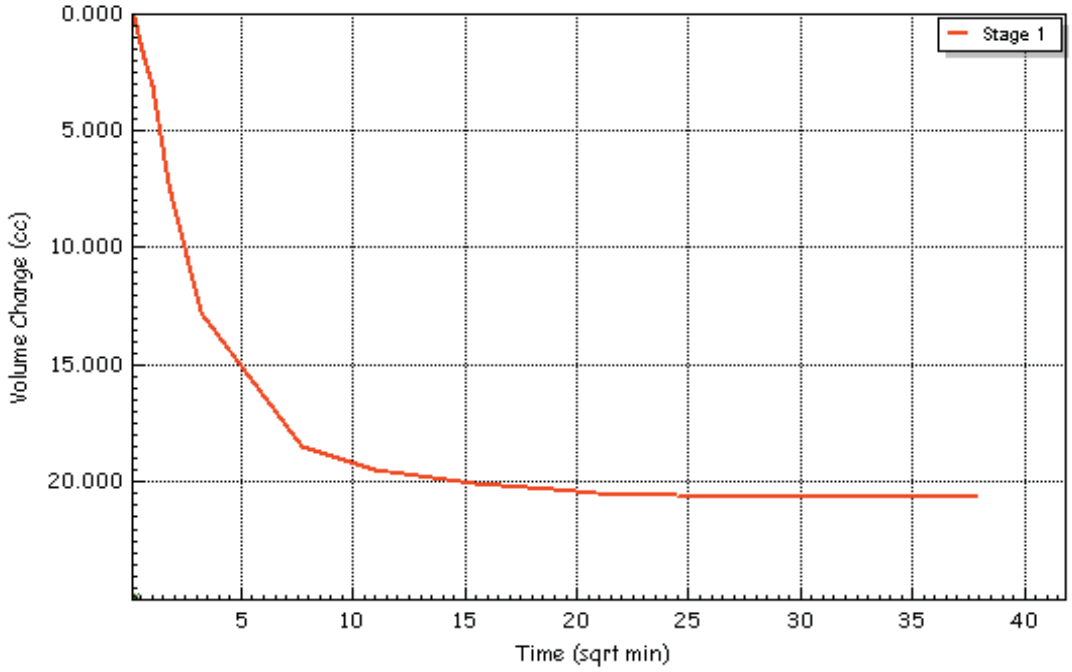
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	610
Initial Back Pressure	u_{bi}	(kPa)	550
Pore Water Pressure Input	u_{pwp}	(kPa)	588
Drainage Method			Radial+One End

Final Conditions

PWP Dissipation %	U%	(%)	100.00
Volumetric Strain	ε_v%	(%)	1.13
Corrected Length	L_C	(mm)	210.2
Corrected Area	A_C	(cm2)	86.10
Corrected Volume	V_C	(cc)	1809.893
T100 Time to Failure	t_{100}	(min)	16.51
Consolidation	c_v	(m2/year)	13.816
Compressibility	m_v	(m2/MN)	0.297
Test Time	t_F	(h:m:s)	02:00:00
Estimated Strain to Failure	ε %	(%)	5.0
Shear Machine Speed	d_r	(mm/min)	0.08759

Notes



Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH01 2.70-3.15m UT100
		Test Date	19/07/2019
		Borehole	BH01
Jobfile	Carnival Phase II	Sample	2.70-3.15m UT100
Client	CC Ground Investigations Ltd	Depth	2.70-3.15m UT100

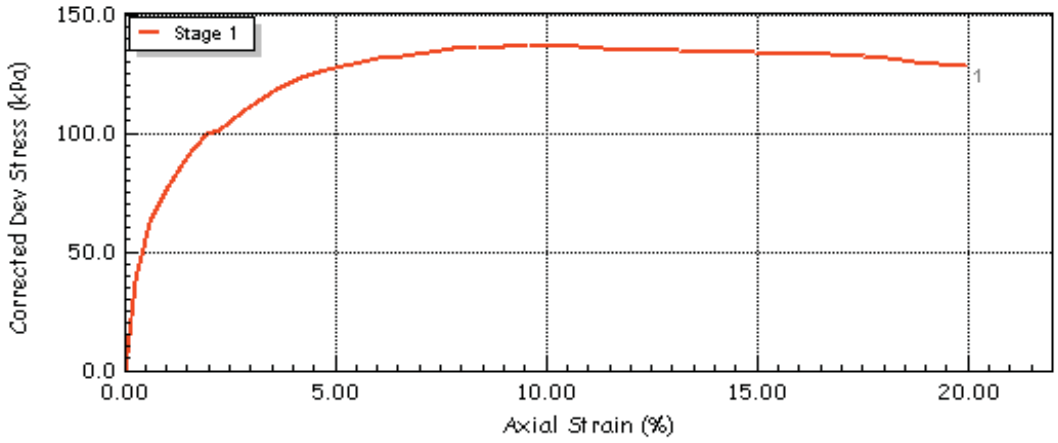
UKAS TESTING 4043

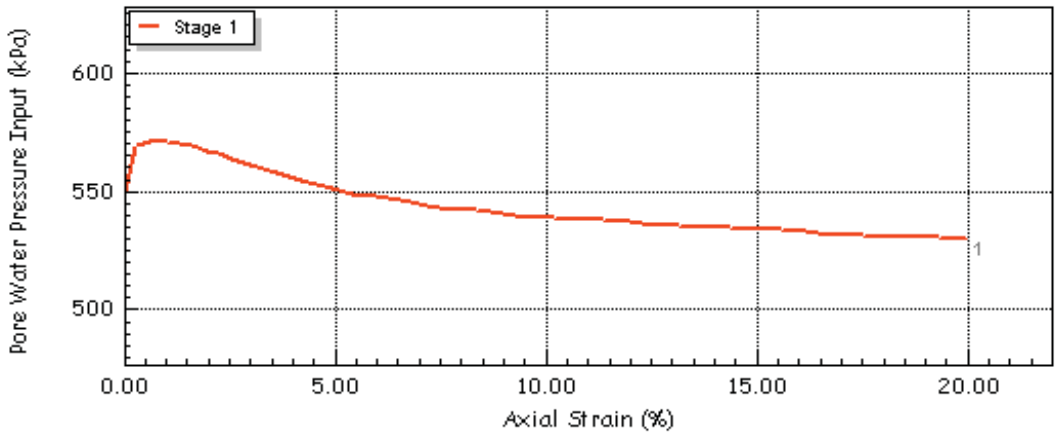
PSL Professional Soils Laboratory

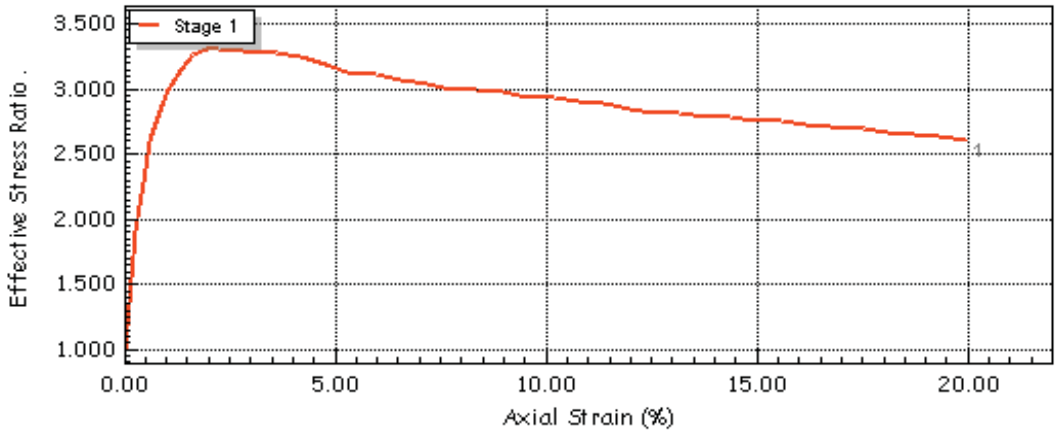
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots







UKAS TESTING 4043	Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH01 2.70-3.15m UT100
			Test Date	19/07/2019
			Borehole	BH01
	Jobfile	Carnival Phase II	Sample	2.70-3.15m UT100
	Client	CC Ground Investigations Ltd	Depth	2.70-3.15m UT100

PSL Professional Soils Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Summary Report

Sample Details				
	Depth	11.10-11.40m CS		
	Description	Brown CLAY.		
	Type	Undisturbed, Vertical orientation.		
	Initial Sample Length	L_0	(mm)	140.8
	Initial Sample Diameter	D_0	(mm)	69.8
	Initial Sample Weight	W_0	(gr)	1102.2
sketch showing specimen location in original sample	Initial Bulk Density	ρ_0	(Mg/m3)	2.05
	Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions			Stage 1
Initial Cell Pressure	σ_{3i}	(kPa)	720
Initial Back Pressure	U_{bi}	(kPa)	500
Membrane Thickness	m_b	(mm)	0.600
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Pore Water Pressure Input	u_{pwp}	(kPa)	CH 3
Sample Volume	V	(cc)	CH 2
Initial Moisture	ω_i	(%)	22
Initial Dry Density	ρ_{di}	(Mg/m3)	1.67
Initial Voids Ratio	e_i	.	0.584
Initial Degree of Saturation	S_i	(%)	100
B Value	B	.	0.98

Final Conditions			
Final Moisture	ω_f	(%)	21
Final Dry Density	ρ_{df}	(Mg/m3)	1.74
Final Voids Ratio	e_f	.	0.523
Final Degree of Saturation	S_f	(%)	100.0
			Stage 1
Failure Criteria		.	Max. Dev. Stress
Strain At Failure	ε_f	(%)	3.13
Stress At Failure	$(\sigma_1 - \sigma_3)$	(kPa)	319.5
Minor Stress At Failure	σ_3'	(kPa)	123.0
Major Stress At Failure	σ_1'	(kPa)	442.5
Principal Stress At Failure	σ_1'/σ_3'		3.598

Notes



Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH01 11.10-11.40m CS
		Test Date	22/07/2019
		Borehole	BH01
Jobfile	Carnival Phase II	Sample	11.10-11.40m CS
Client	CC Ground Investigations Ltd	Depth	11.10-11.40m CS

UKAS TESTING 4043

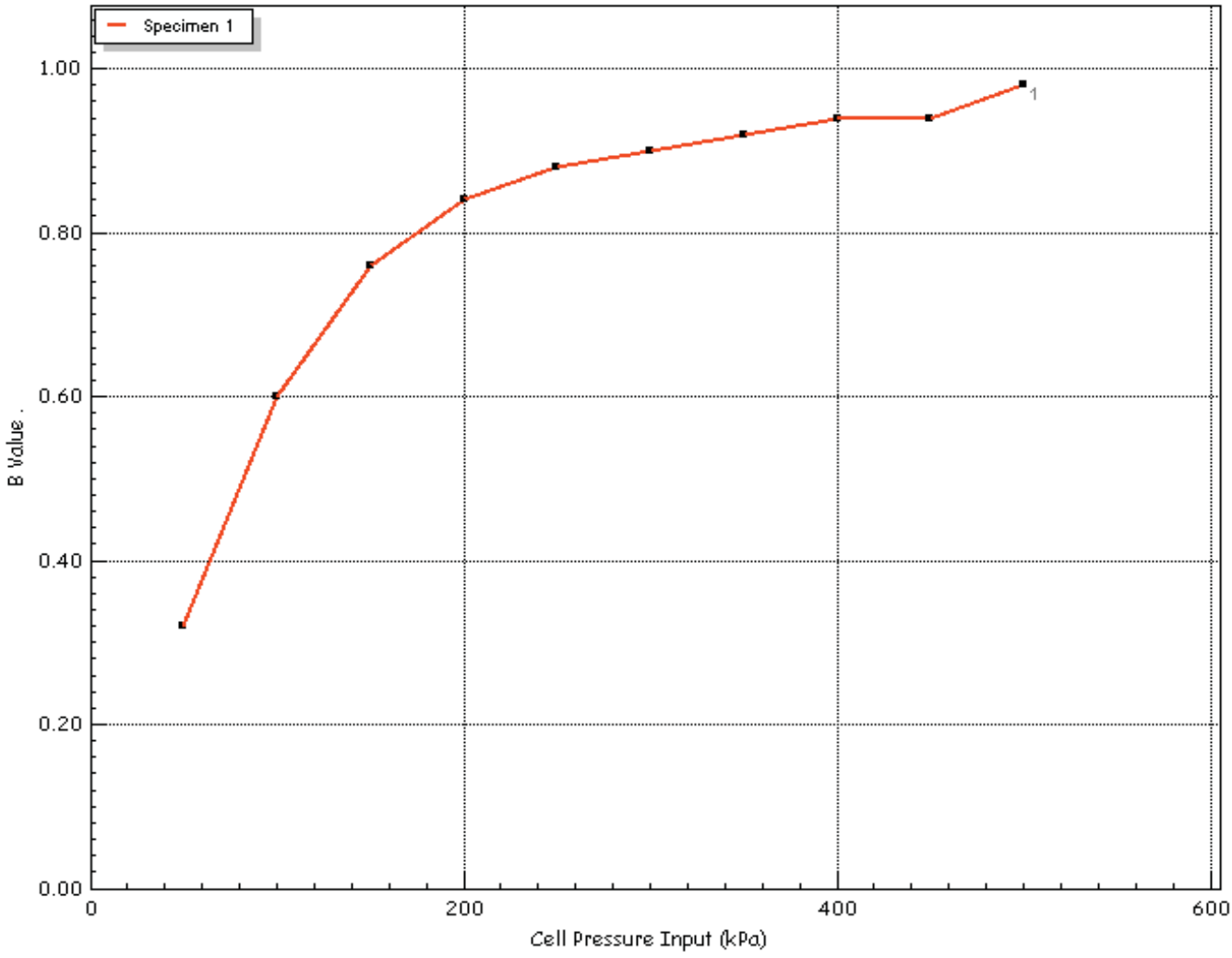
PSL Professional Soils Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Saturation Plots

Saturation Method			Stepped
Cell Pressure Input	σ	(kPa)	500
Pore Water Pressure Input	u pwp	(kPa)	478
B Value	B	.	0.98



Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH01 11.10-11.40m CS
		Test Date	22/07/2019
		Borehole	BH01
Jobfile	Carnival Phase II	Sample	11.10-11.40m CS
Client	CC Ground Investigations Ltd	Depth	11.10-11.40m CS

UKAS TESTING 4043

PSL Professional Soils Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Consolidation Plots

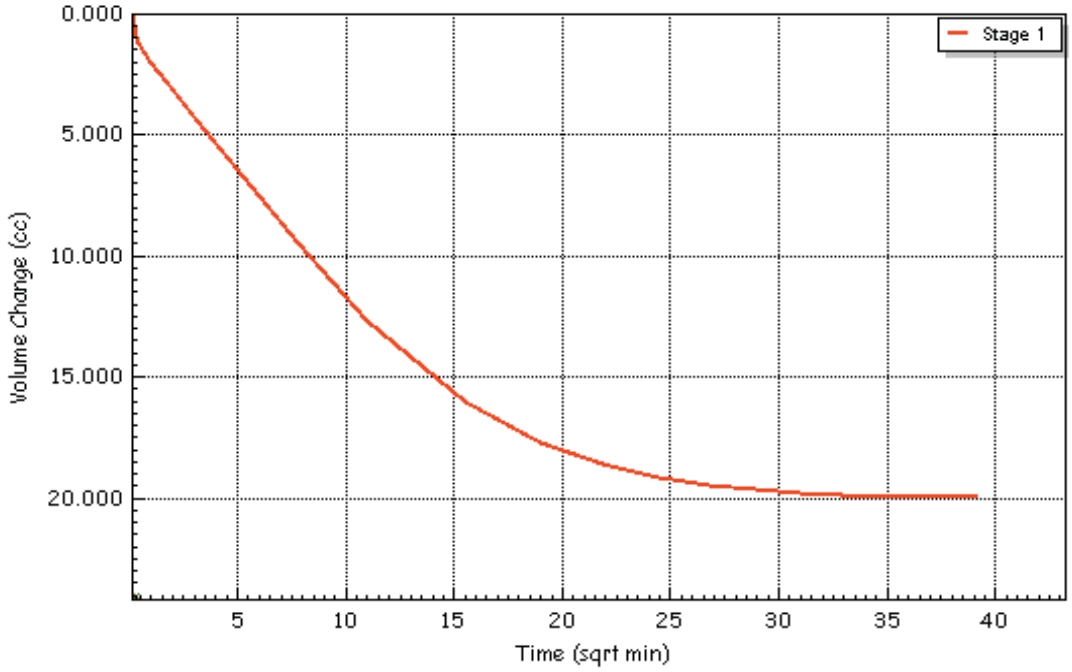
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	720
Initial Back Pressure	u_{bi}	(kPa)	500
Pore Water Pressure Input	u_{pwp}	(kPa)	695
Drainage Method			Radial+One End

Final Conditions

PWP Dissipation %	U%	(%)	100.00
Volumetric Strain	ε_v%	(%)	3.70
Corrected Length	L_C	(mm)	139.1
Corrected Area	A_C	(cm2)	37.32
Corrected Volume	V_C	(cc)	518.824
T100 Time to Failure	t_{100}	(min)	295.12
Consolidation	c_V	(m2/year)	0.341
Compressibility	m_V	(m2/MN)	0.190
Test Time	t_F	(h:m:s)	08:51:12
Estimated Strain to Failure	ε%	(%)	5.0
Shear Machine Speed	d_r	(mm/min)	0.01309

Notes



Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH01 11.10-11.40m CS
		Test Date	22/07/2019
		Borehole	BH01
Jobfile	Carnival Phase II	Sample	11.10-11.40m CS
Client	CC Ground Investigations Ltd	Depth	11.10-11.40m CS

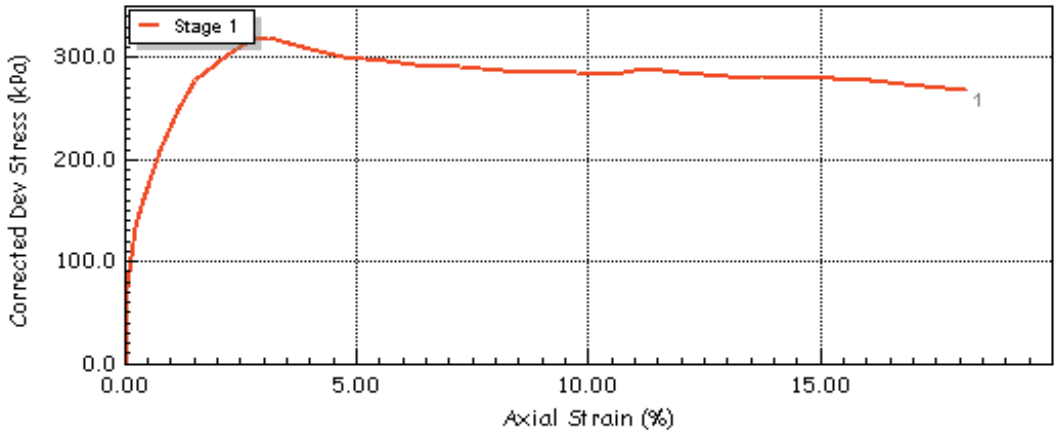
UKAS TESTING 4043

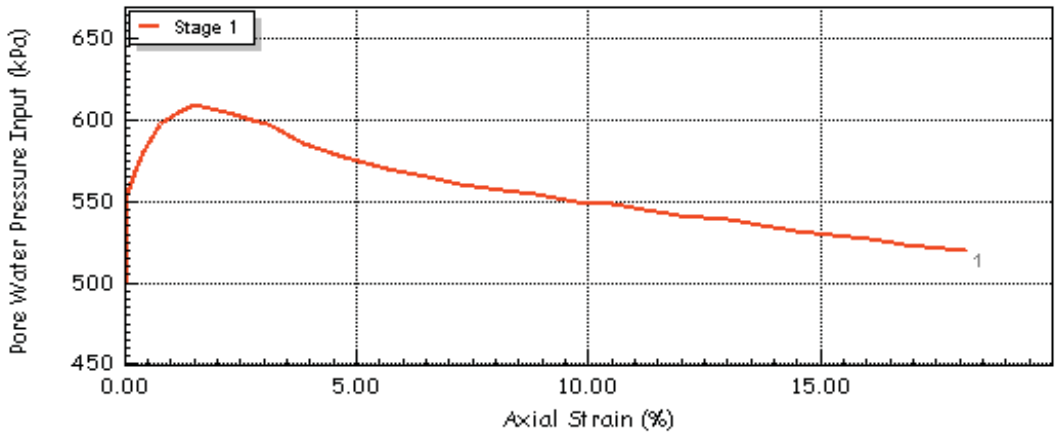
PSL Professional Soils Laboratory

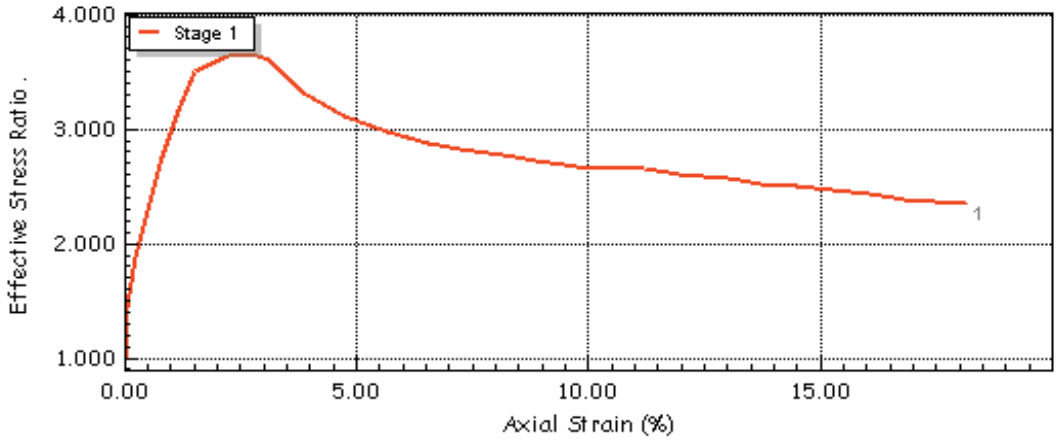
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots







UKAS TESTING 4043	Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH01 11.10-11.40m CS
			Test Date	22/07/2019
	Jobfile	Carnival Phase II	Borehole	BH01
			Sample	11.10-11.40m CS
	Client	CC Ground Investigations Ltd	Depth	11.10-11.40m CS

PSL Professional Soils Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Summary Report

Sample Details				
	Depth	2.70-3.15m UT100		
	Description	Brown slightly sandy silty CLAY.		
	Type	Undisturbed, Vertical orientation.		
	Initial Sample Length	L_0	(mm)	211.0
	Initial Sample Diameter	D_0	(mm)	105.1
	Initial Sample Weight	W_0	(gr)	3523.4
sketch showing specimen location in original sample	Initial Bulk Density	ρ_0	(Mg/m3)	1.92
	Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions			Stage 1
Initial Cell Pressure	σ_{3i}	(kPa)	450
Initial Back Pressure	U_{bi}	(kPa)	400
Membrane Thickness	m_b	(mm)	0.600
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 1
Pore Water Pressure Input	u_{pwp}	(kPa)	CH 3
Sample Volume	V	(cc)	CH 2
Initial Moisture	ω_i	(%)	26
Initial Dry Density	ρ_{di}	(Mg/m3)	1.53
Initial Voids Ratio	e_i	.	0.730
Initial Degree of Saturation	S_i	(%)	93
B Value	B	.	0.98

Final Conditions			
Final Moisture	ω_f	(%)	26
Final Dry Density	ρ_{df}	(Mg/m3)	1.55
Final Voids Ratio	e_f	.	0.710
Final Degree of Saturation	S_f	(%)	97.8
			Stage 1
Failure Criteria		.	Max. Dev. Stress
Strain At Failure	ε_f	(%)	5.63
Stress At Failure	$(\sigma_1-\sigma_3)$	(kPa)	87.4
Minor Stress At Failure	σ_3'	(kPa)	46.0
Major Stress At Failure	σ_1'	(kPa)	133.4
Principal Stress At Failure	σ_1'/σ_3'		2.899

Notes



Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH04 2.70-3.15m UT100
		Test Date	19/07/2019
		Borehole	BH04
Jobfile	Carnival Phase II	Sample	2.70-3.15m UT100
Client	CC Ground Investigations Ltd	Depth	2.70-3.15m UT100

UKAS TESTING 4043

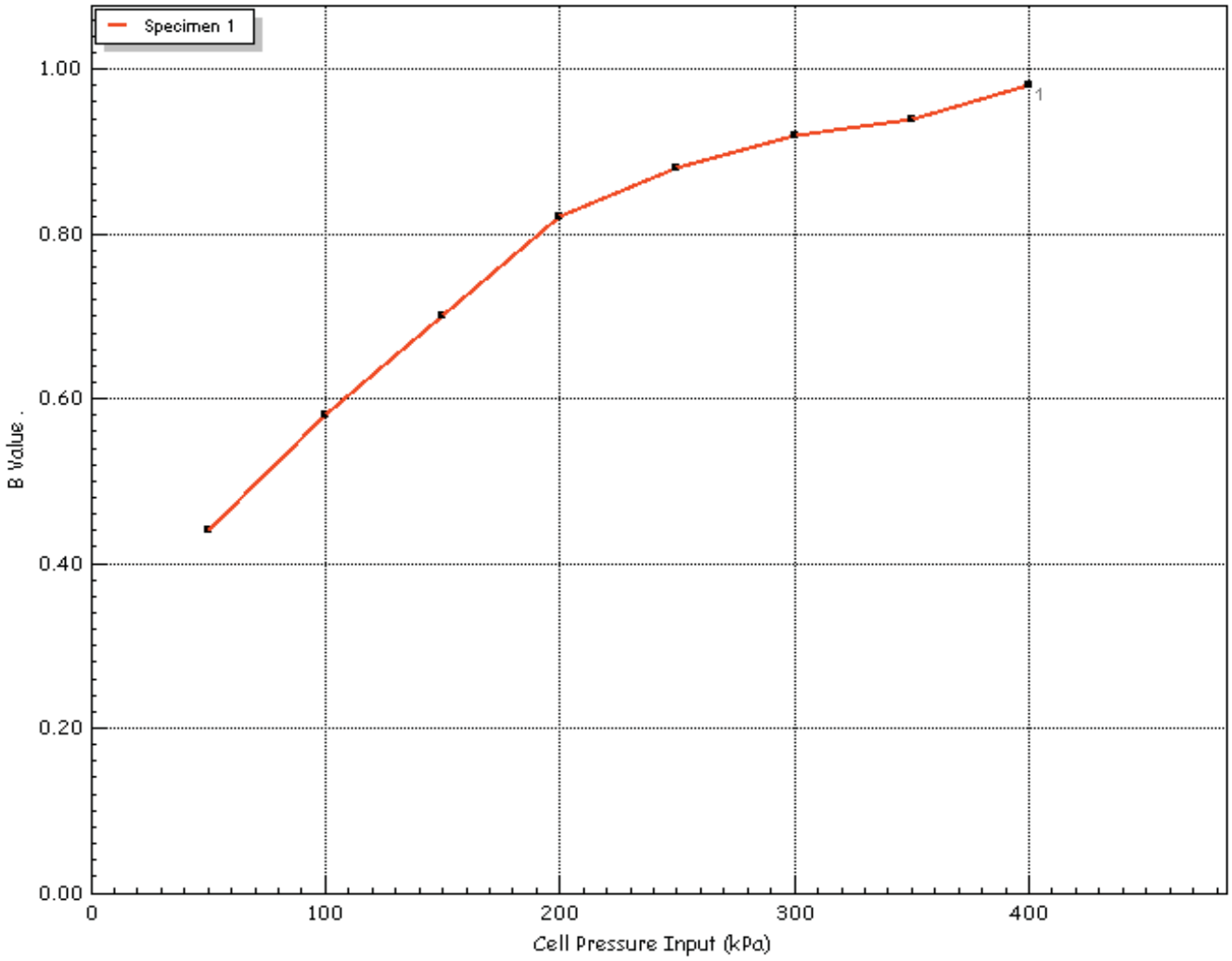
PSL Professional Soils Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Saturation Plots

Saturation Method			Stepped
Cell Pressure Input	σ	(kPa)	400
Pore Water Pressure Input	u pwp	(kPa)	379
B Value	B	.	0.98



Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH04 2.70-3.15m UT100
		Test Date	19/07/2019
		Borehole	BH04
Jobfile	Carnival Phase II	Sample	2.70-3.15m UT100
Client	CC Ground Investigations Ltd	Depth	2.70-3.15m UT100

UKAS TESTING 4043

PSL Professional Soils Laboratory

Effective Stress Triaxial Compression

Consolidated Undrained

Consolidation Plots

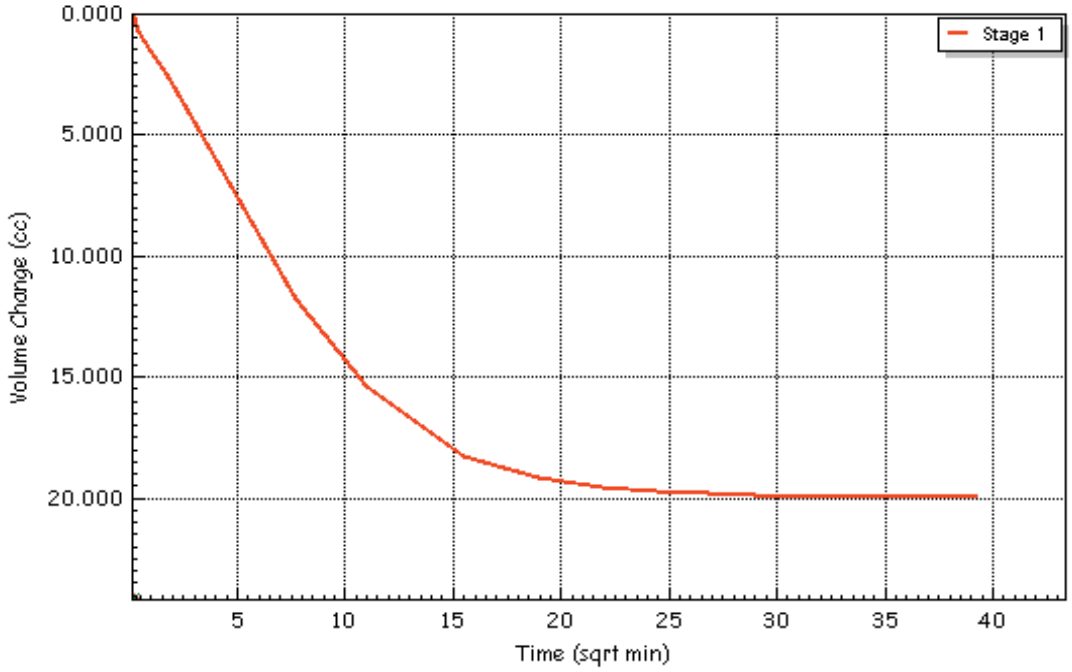
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	450
Initial Back Pressure	u_{bi}	(kPa)	400
Pore Water Pressure Input	u_{pwp}	(kPa)	426
Drainage Method			Radial+One End

Final Conditions

PWP Dissipation %	U%	(%)	100.00
Volumetric Strain	ε_v%	(%)	1.09
Corrected Length	L_C	(mm)	210.2
Corrected Area	A_C	(cm2)	86.12
Corrected Volume	V_C	(cc)	1810.571
T100 Time to Failure	t_{100}	(min)	168.23
Consolidation	c_V	(m2/year)	1.356
Compressibility	m_V	(m2/MN)	0.419
Test Time	t_F	(h:m:s)	05:02:48
Estimated Strain to Failure	ε%	(%)	5.0
Shear Machine Speed	d_r	(mm/min)	0.03471

Notes



Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH04 2.70-3.15m UT100
		Test Date	19/07/2019
		Borehole	BH04
Jobfile	Carnival Phase II	Sample	2.70-3.15m UT100
Client	CC Ground Investigations Ltd	Depth	2.70-3.15m UT100

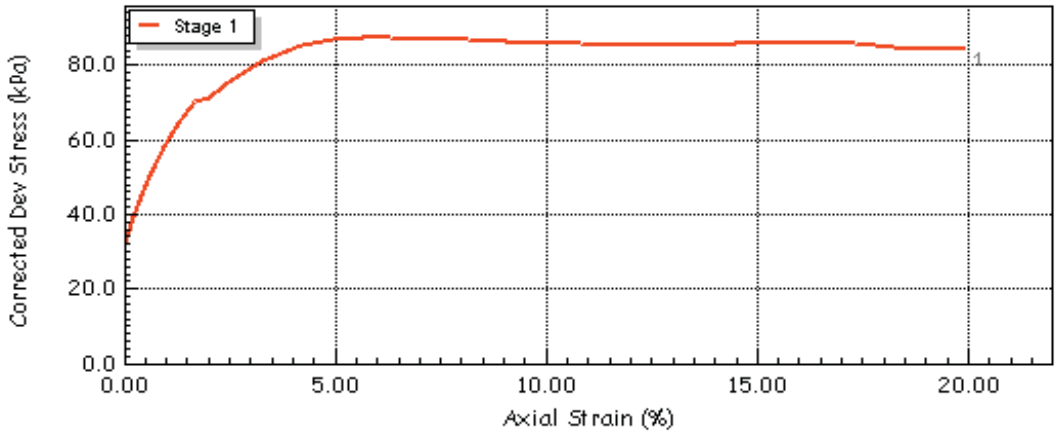
UKAS TESTING 4043

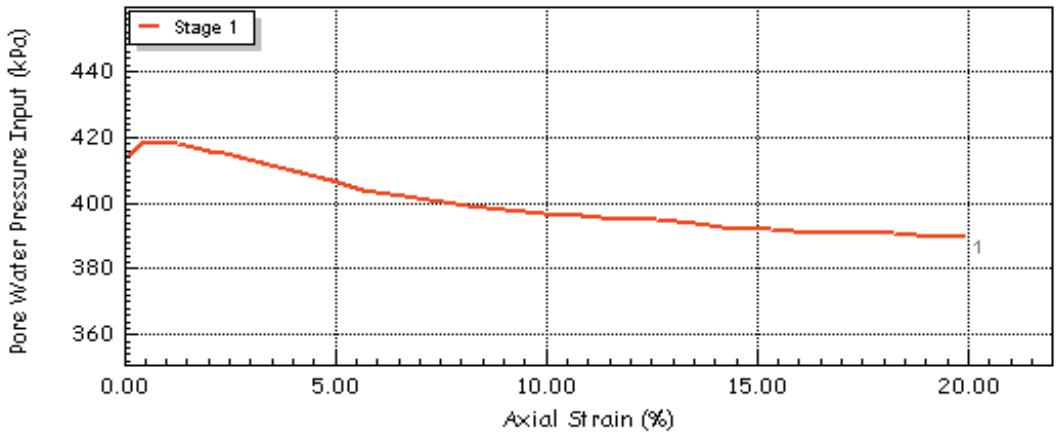
PSL Professional Soils Laboratory

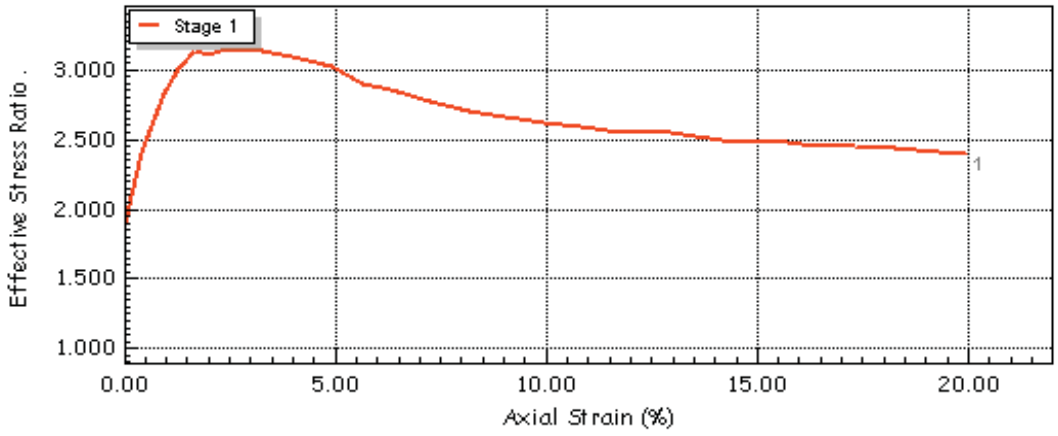
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots







Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH04 2.70-3.15m UT100
		Test Date	19/07/2019
		Borehole	BH04
Jobfile	Carnival Phase II	Sample	2.70-3.15m UT100
Client	CC Ground Investigations Ltd	Depth	2.70-3.15m UT100

UKAS TESTING 4043

PSL Professional Soils Laboratory

Certificate of Analysis

Certificate Number 19-13752

25-Jul-19

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 19-13752

Client Reference PSL19/4271

Order No (not supplied)

Contract Title Carnival Phase II

Description 7 Soil samples.

Date Received 19-Jul-19

Date Started 19-Jul-19

Date Completed 25-Jul-19

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By [redacted]

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 19-13752
Client Ref PSL19/4271
Contract Title Carnival Phase II

			Lab No	1534236	1534237	1534238	1534239	1534240	1534241	1534242
			Sample ID	BH01	BH01	BH01	BH04	BH04	WS03	WS04
			Depth	3.20	4.15-4.20	17.40	1.00-1.20	3.15-3.20	3.80	2.70
			Other ID							
			Sample Type	D	D	D	B	D	D	D
			Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s	n/s
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Metals										
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	16	36	12	< 10	22	40	14
Inorganics										
pH	DETSC 2008#		pH	7.4	7.2	7.9	7.9	6.9	7.5	7.6
Chloride Aqueous Extract	DETSC 2055	1	mg/l	10	13	5.0	8.1	6.0	8.8	24
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0	< 1.0	< 1.0	11	< 1.0	1.0	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	230	360	130	48	89	390	140
Sulphur as S, Total	DETSC 2320	0.01	%	0.03	0.28	0.74	0.03	0.09	0.39	0.02
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.07	0.15	0.11	0.05	0.10	0.16	0.04

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 19-13752
Client Ref PSL19/4271
Contract Carnival Phase II

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1534236	BH01 3.20 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), pH + Conductivity (7 days)	
1534237	BH01 4.15-4.20 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), pH + Conductivity (7 days)	
1534238	BH01 17.40 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), pH + Conductivity (7 days)	
1534239	BH04 1.00-1.20 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), pH + Conductivity (7 days)	
1534240	BH04 3.15-3.20 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), pH + Conductivity (7 days)	
1534241	WS03 3.80 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), pH + Conductivity (7 days)	
1534242	WS04 2.70 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

APPENDIX E

Chemical Laboratory Test Results

Richard Tucker
CC Ground Investigation Ltd
Unit A2
Innsworth Tech Park
Innsworth Lane
Gloucester
GL3 1DL

t: 01452 739 165
f: 01452 739 220
e: Richard@ccground.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-47850

Project / Site name:	Carnival Phase II	**Samples received on:**	25/06/2019
Your job number:	C6411	**Samples instructed on:**	28/06/2019
Your order number:	C6411	**Analysis completed by:**	09/07/2019
Report Issue Number:	1	**Report issued on:**	09/07/2019
Samples Analysed:	2 leachate samples - 7 soil samples		

Signed: [redacted]

Rexona Rahman
Head of Customer Services
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-47850

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1256724	1256725	1256726	1256727	1256728
Sample Reference				BH01	BH01	BH01	BH01	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	1.00	2.00	3.00	0.50
Date Sampled				24/06/2019	24/06/2019	24/06/2019	24/06/2019	27/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	9.8	12	18	21	15
Total mass of sample received	kg	0.001	NONE	1.6	1.5	1.6	1.8	1.8
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-	-	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	7.3	-	7.5	8.9
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	-	< 1	< 1
Total Organic Carbon (TOC)	%	0.1	MCERTS	< 0.1	0.5	-	< 0.1	< 0.1
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	0.69	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	0.67	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.53	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	0.38	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.74	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.21	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.53	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.39	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.41	-	-	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	4.55	-	-	-	-

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Analytical Report Number: 19-47850

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1256724	1256725	1256726	1256727	1256728
Sample Reference				BH01	BH01	BH01	BH01	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	1.00	2.00	3.00	0.50
Date Sampled				24/06/2019	24/06/2019	24/06/2019	24/06/2019	27/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	1.5	< 1.0	-	< 1.0	1.5
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.0	7.5	-	7.1	12
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.48	0.54	-	0.71	0.48
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	0.8	-	1.5	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	< 0.2	0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	-	-	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	23	-	29	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	34	29	-	30	33
Lead (aqua regia extractable)	mg/kg	1	MCERTS	54	27	-	5.8	39
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.5	-	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	9.4	14	-	13	10
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	29	33	-	37	38
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	43	34	-	32	110
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	-	-	-
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	< 10	< 10	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	-	-	-
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	< 10	< 10	-	-	-

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Analytical Report Number: 19-47850

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1256724	1256725	1256726	1256727	1256728
Sample Reference				BH01	BH01	BH01	BH01	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	1.00	2.00	3.00	0.50
Date Sampled				24/06/2019	24/06/2019	24/06/2019	24/06/2019	27/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Chloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Benzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Styrene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Tribromomethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0

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Analytical Report Number: 19-47850

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1256724	1256725	1256726	1256727	1256728
Sample Reference				BH01	BH01	BH01	BH01	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	1.00	2.00	3.00	0.50
Date Sampled				24/06/2019	24/06/2019	24/06/2019	24/06/2019	27/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.87
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.19
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	-	0.44	-	-	1.4
Pyrene	mg/kg	0.05	MCERTS	-	0.45	-	-	1.3
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	0.34	-	-	0.82
Chrysene	mg/kg	0.05	MCERTS	-	0.27	-	-	0.71
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	0.38	-	-	0.84
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	0.24	-	-	0.50
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	0.37	-	-	0.77
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	0.22	-	-	0.51
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	0.26	-	-	0.49

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Analytical Report Number: 19-47850

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1256724	1256725	1256726	1256727	1256728
Sample Reference				BH01	BH01	BH01	BH01	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	1.00	2.00	3.00	0.50
Date Sampled				24/06/2019	24/06/2019	24/06/2019	24/06/2019	27/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs								
PCB Congener 077	mg/kg	0.001	NONE	< 0.001	-	< 0.001	< 0.001	< 0.001
PCB Congener 081	mg/kg	0.001	NONE	< 0.001	-	< 0.001	< 0.001	< 0.001
PCB Congener 105	mg/kg	0.001	NONE	< 0.001	-	< 0.001	< 0.001	< 0.001
PCB Congener 114	mg/kg	0.001	NONE	< 0.001	-	< 0.001	< 0.001	< 0.001
PCB Congener 118	mg/kg	0.001	NONE	< 0.001	-	< 0.001	< 0.001	< 0.001
PCB Congener 123	mg/kg	0.001	NONE	< 0.001	-	< 0.001	< 0.001	< 0.001
PCB Congener 126	mg/kg	0.001	NONE	< 0.001	-	< 0.001	< 0.001	< 0.001
PCB Congener 156	mg/kg	0.001	NONE	< 0.001	-	< 0.001	< 0.001	< 0.001
PCB Congener 157	mg/kg	0.001	NONE	< 0.001	-	< 0.001	< 0.001	< 0.001
PCB Congener 167	mg/kg	0.001	NONE	< 0.001	-	< 0.001	< 0.001	< 0.001
PCB Congener 169	mg/kg	0.001	NONE	< 0.001	-	< 0.001	< 0.001	< 0.001
PCB Congener 189	mg/kg	0.001	NONE	< 0.001	-	< 0.001	< 0.001	< 0.001
Total PCBs	mg/kg	0.012	NONE	< 0.012	-	< 0.012	< 0.012	< 0.012

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Analytical Report Number: 19-47850

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1256729	1257069			
Sample Reference				BH04	BH04			
Sample Number				None Supplied	None Supplied			
Depth (m)				1.00	2.00			
Date Sampled				27/06/2019	27/06/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	17	18			
Total mass of sample received	kg	0.001	NONE	1.9	2.0			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	7.2			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.2	0.2			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	-			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	-			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	-			

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Analytical Report Number: 19-47850

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1256729	1257069			
Sample Reference				BH04	BH04			
Sample Number				None Supplied	None Supplied			
Depth (m)				1.00	2.00			
Date Sampled				27/06/2019	27/06/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	< 1.0			
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.1	11			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.38	0.83			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.6			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	-			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	34			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	15			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	21	9.5			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	8.3	23			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	34	47			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	42	51			
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	-			
Toluene	µg/kg	1	MCERTS	< 1.0	-			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-			
o-xylene	µg/kg	1	MCERTS	< 1.0	-			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-			
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	-			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-			
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	< 10	-			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	-			
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	-			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-			
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	< 10	-			

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Analytical Report Number: 19-47850

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1256729	1257069			
Sample Reference				BH04	BH04			
Sample Number				None Supplied	None Supplied			
Depth (m)				1.00	2.00			
Date Sampled				27/06/2019	27/06/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-			
Chloroethane	µg/kg	1	NONE	-	-			
Bromomethane	µg/kg	1	ISO 17025	-	-			
Vinyl Chloride	µg/kg	1	NONE	-	-			
Trichlorofluoromethane	µg/kg	1	NONE	-	-			
1,1-Dichloroethene	µg/kg	1	NONE	-	-			
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-			
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-			
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-			
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-			
Trichloromethane	µg/kg	1	MCERTS	-	-			
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-			
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-			
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-			
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-			
Benzene	µg/kg	1	MCERTS	-	-			
Tetrachloromethane	µg/kg	1	MCERTS	-	-			
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-			
Trichloroethene	µg/kg	1	MCERTS	-	-			
Dibromomethane	µg/kg	1	MCERTS	-	-			
Bromodichloromethane	µg/kg	1	MCERTS	-	-			
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-			
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-			
Toluene	µg/kg	1	MCERTS	-	-			
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-			
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-			
Dibromochloromethane	µg/kg	1	ISO 17025	-	-			
Tetrachloroethene	µg/kg	1	NONE	-	-			
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-			
Chlorobenzene	µg/kg	1	MCERTS	-	-			
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-			
Ethylbenzene	µg/kg	1	MCERTS	-	-			
p & m-Xylene	µg/kg	1	MCERTS	-	-			
Styrene	µg/kg	1	MCERTS	-	-			
Tribromomethane	µg/kg	1	NONE	-	-			
o-Xylene	µg/kg	1	MCERTS	-	-			
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-			
Isopropylbenzene	µg/kg	1	MCERTS	-	-			
Bromobenzene	µg/kg	1	MCERTS	-	-			
n-Propylbenzene	µg/kg	1	ISO 17025	-	-			
2-Chlorotoluene	µg/kg	1	MCERTS	-	-			
4-Chlorotoluene	µg/kg	1	MCERTS	-	-			
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-			
tert-Butylbenzene	µg/kg	1	MCERTS	-	-			
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-			
sec-Butylbenzene	µg/kg	1	MCERTS	-	-			
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-			
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-			
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-			
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-			
Butylbenzene	µg/kg	1	MCERTS	-	-			
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-			
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-			
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-			
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-			

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Analytical Report Number: 19-47850

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1256729	1257069			
Sample Reference				BH04	BH04			
Sample Number				None Supplied	None Supplied			
Depth (m)				1.00	2.00			
Date Sampled				27/06/2019	27/06/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-			
Phenol	mg/kg	0.2	ISO 17025	-	-			
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-			
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-			
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-			
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-			
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-			
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-			
2-Methylphenol	mg/kg	0.3	MCERTS	-	-			
Hexachloroethane	mg/kg	0.05	MCERTS	-	-			
Nitrobenzene	mg/kg	0.3	MCERTS	-	-			
4-Methylphenol	mg/kg	0.2	NONE	-	-			
Isophorone	mg/kg	0.2	MCERTS	-	-			
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-			
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-			
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-			
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-			
Naphthalene	mg/kg	0.05	MCERTS	-	-			
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-			
4-Chloroaniline	mg/kg	0.1	NONE	-	-			
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-			
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-			
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-			
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-			
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-			
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-			
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-			
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-			
Acenaphthylene	mg/kg	0.05	MCERTS	-	-			
Acenaphthene	mg/kg	0.05	MCERTS	-	-			
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-			
Dibenzofuran	mg/kg	0.2	MCERTS	-	-			
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-			
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-			
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-			
Fluorene	mg/kg	0.05	MCERTS	-	-			
Azobenzene	mg/kg	0.3	MCERTS	-	-			
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-			
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-			
Phenanthrene	mg/kg	0.05	MCERTS	-	-			
Anthracene	mg/kg	0.05	MCERTS	-	-			
Carbazole	mg/kg	0.3	MCERTS	-	-			
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-			
Anthraquinone	mg/kg	0.3	MCERTS	-	-			
Fluoranthene	mg/kg	0.05	MCERTS	-	-			
Pyrene	mg/kg	0.05	MCERTS	-	-			
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-			
Chrysene	mg/kg	0.05	MCERTS	-	-			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-			

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Analytical Report Number: 19-47850

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1256729	1257069			
Sample Reference				BH04	BH04			
Sample Number				None Supplied	None Supplied			
Depth (m)				1.00	2.00			
Date Sampled				27/06/2019	27/06/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs								
PCB Congener 077	mg/kg	0.001	NONE	-	-			
PCB Congener 081	mg/kg	0.001	NONE	-	-			
PCB Congener 105	mg/kg	0.001	NONE	-	-			
PCB Congener 114	mg/kg	0.001	NONE	-	-			
PCB Congener 118	mg/kg	0.001	NONE	-	-			
PCB Congener 123	mg/kg	0.001	NONE	-	-			
PCB Congener 126	mg/kg	0.001	NONE	-	-			
PCB Congener 156	mg/kg	0.001	NONE	-	-			
PCB Congener 157	mg/kg	0.001	NONE	-	-			
PCB Congener 167	mg/kg	0.001	NONE	-	-			
PCB Congener 169	mg/kg	0.001	NONE	-	-			
PCB Congener 189	mg/kg	0.001	NONE	-	-			
Total PCBs	mg/kg	0.012	NONE	-	-			

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Analytical Report Number: 19-47850

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1256730	1256731			
Sample Reference				BH01	BH04			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.30	0.50			
Date Sampled				24/06/2019	27/06/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	8.0	9.7			
Total Cyanide	µg/l	10	ISO 17025	< 10	15			
Chloride	mg/l	0.15	ISO 17025	3.0	7.0			
Ammoniacal Nitrogen as N	µg/l	15	NONE	50	61			
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	10			
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01			
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2			
Heavy Metals / Metalloids								
Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7			
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1	13			
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2			
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08			
Chromium (dissolved)	µg/l	0.4	ISO 17025	4.1	6.8			
Copper (dissolved)	µg/l	0.7	ISO 17025	8.0	5.3			
Lead (dissolved)	µg/l	1	ISO 17025	9.2	4.1			
Manganese (dissolved)	mg/l	0.00006	NONE	0.018	0.0022			
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5			
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.0	< 0.3			
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0			
Vanadium (dissolved)	µg/l	1.7	ISO 17025	9.2	37			
Zinc (dissolved)	µg/l	0.4	ISO 17025	14	1.4			
Calcium (dissolved)	mg/l	0.012	ISO 17025	35	23			

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Analytical Report Number: 19-47850

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1256730	1256731			
Sample Reference				BH01	BH04			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.30	0.50			
Date Sampled				24/06/2019	27/06/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10			

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Analytical Report Number : 19-47850

Project / Site name: Carnival Phase II

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1256724	BH01	None Supplied	0.30	Brown sandy clay with gravel and brick.
1256725	BH01	None Supplied	1.00	Brown sandy clay with gravel.
1256726	BH01	None Supplied	2.00	Light brown clay.
1256727	BH01	None Supplied	3.00	Light brown clay with gravel.
1256728	BH04	None Supplied	0.50	Light brown clay and sand with gravel.
1256729	BH04	None Supplied	1.00	Light brown clay and sand with gravel.
1257069	BH04	None Supplied	2.00	Brown clay.

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Analytical Report Number : 19-47850

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
PCBs WHO 12 in soil	Determination of PCBs (WHO-12 Congeners) by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	NONE
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-47850

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Richard Tucker
CC Ground Investigation Ltd
Unit A2
Innsworth Tech Park
Innsworth Lane
Gloucester
GL3 1DL

t: 01452 739 165
f: 01452 739 220
e: Richard@ccground.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-48029

Project / Site name:	Carnival Phase II	**Samples received on:**	28/06/2019
Your job number:	C6411	**Samples instructed on:**	02/07/2019
Your order number:	C6411	**Analysis completed by:**	10/07/2019
Report Issue Number:	1	**Report issued on:**	10/07/2019
Samples Analysed:	1 leachate sample - 3 soil samples		

Signed: [redacted]

Zina Abdul Razzak
Senior Quality Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 19-48029

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1257514	1257515	1257516		
Sample Reference				WS02	WS02	WS02		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.50	1.00	2.80		
Date Sampled				28/06/2019	28/06/2019	28/06/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	11	11	17		
Total mass of sample received	kg	0.001	NONE	1.8	1.7	1.5		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.8	7.5	5.3		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.4	0.7	0.2		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-		
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-		
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-		
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-		
Phenanthrene	mg/kg	0.05	MCERTS	-	0.44	-		
Anthracene	mg/kg	0.05	MCERTS	-	0.13	-		
Fluoranthene	mg/kg	0.05	MCERTS	-	1.3	-		
Pyrene	mg/kg	0.05	MCERTS	-	1.4	-		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	0.68	-		
Chrysene	mg/kg	0.05	MCERTS	-	0.74	-		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	1.2	-		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	0.38	-		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	0.90	-		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	0.57	-		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	0.72	-		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	8.46	-		
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	10	8.8		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.65	0.51	0.46		
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	0.7	0.7		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	-		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	21	25		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	17	14		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	32	39	15		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	10	11		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	35	33	37		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	35	37	33		

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Analytical Report Number: 19-48029

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1257514	1257515	1257516		
Sample Reference				WS02	WS02	WS02		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.50	1.00	2.80		
Date Sampled				28/06/2019	28/06/2019	28/06/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	-	-		
Toluene	µg/kg	1	MCERTS	< 1.0	-	-		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-		
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-		
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-	-		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	-		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	-		
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	-	-		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	-		
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	< 10	-	-		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	-		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	-		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	21	-	-		
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	-	-		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	27	-	-		
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	27	-	-		

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Analytical Report Number: 19-48029

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1257514	1257515	1257516		
Sample Reference				WS02	WS02	WS02		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.50	1.00	2.80		
Date Sampled				28/06/2019	28/06/2019	28/06/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	-	-		
Chloroethane	µg/kg	1	NONE	< 1.0	-	-		
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-	-		
Vinyl Chloride	µg/kg	1	NONE	< 1.0	-	-		
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	-	-		
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	-	-		
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	-	-		
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	-	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-		
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	-		
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	-		
Trichloromethane	µg/kg	1	MCERTS	< 1.0	-	-		
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-		
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	-		
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	-	-		
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-	-		
Benzene	µg/kg	1	MCERTS	< 1.0	-	-		
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	-	-		
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	-		
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-	-		
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-	-		
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	-	-		
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-		
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-		
Toluene	µg/kg	1	MCERTS	< 1.0	-	-		
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-		
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-	-		
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-	-		
Tetrachloroethene	µg/kg	1	NONE	< 1.0	-	-		
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-	-		
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-		
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-		
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-	-		
Styrene	µg/kg	1	MCERTS	< 1.0	-	-		
Tribromomethane	µg/kg	1	NONE	< 1.0	-	-		
o-Xylene	µg/kg	1	MCERTS	< 1.0	-	-		
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-		
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	-	-		
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-	-		
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-		
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	-		
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	-		
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-		
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-		
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-		
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-		
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-		
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-	-		
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-		
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-		
Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-		
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-	-		
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-		
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	-	-		
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-		

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Analytical Report Number: 19-48029

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1257514	1257515	1257516		
Sample Reference				WS02	WS02	WS02		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.50	1.00	2.80		
Date Sampled				28/06/2019	28/06/2019	28/06/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	-	-		
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	-		
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-		
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	-		
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-		
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	-		
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-		
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	-		
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-		
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	-		
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-		
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	-		
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	-		
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	-		
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-		
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	-		
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-		
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-		
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	-		
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	-		
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	-		
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	-		
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-		
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	-		
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	-		
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	-		
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	-		
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	-		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	-		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	-		
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	-		
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	-		
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	-		
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-		
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	-		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	-		
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-		
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	-		
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-		
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-	-		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-		
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	-		
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-		
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	-		
Fluoranthene	mg/kg	0.05	MCERTS	0.52	-	-		
Pyrene	mg/kg	0.05	MCERTS	0.61	-	-		
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	-		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.35	-	-		
Chrysene	mg/kg	0.05	MCERTS	0.40	-	-		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.70	-	-		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.26	-	-		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.59	-	-		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.37	-	-		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.48	-	-		

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Analytical Report Number: 19-48029

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1257517				
Sample Reference				WS02				
Sample Number				None Supplied				
Depth (m)				0.50				
Date Sampled				28/06/2019				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	8.1				
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0				
Chloride	mg/l	0.15	ISO 17025	3.6				
Ammoniacal Nitrogen as N	µg/l	15	NONE	38				
Total Phenols								
Total Phenols (monohydric)	µg/l	1	ISO 17025	9.1				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2				

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Analytical Report Number: 19-48029

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1257517				
Sample Reference				WS02				
Sample Number				None Supplied				
Depth (m)				0.50				
Date Sampled				28/06/2019				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7				
Arsenic (dissolved)	µg/l	1.1	ISO 17025	5.4				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.1				
Copper (dissolved)	µg/l	0.7	ISO 17025	4.6				
Lead (dissolved)	µg/l	1	ISO 17025	1.6				
Manganese (dissolved)	mg/l	0.00006	NONE	0.0023				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.5				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	4.6				
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.2				
Calcium (dissolved)	mg/l	0.012	ISO 17025	22				
Monoaromatics & Oxygenates								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				

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Analytical Report Number : 19-48029

Project / Site name: Carnival Phase II

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1257514	WS02	None Supplied	0.50	Brown loam and sand with gravel.
1257515	WS02	None Supplied	1.00	Brown loam and sand with vegetation and gravel.
1257516	WS02	None Supplied	2.80	Brown clay and sand with gravel.

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Analytical Report Number : 19-48029

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX in leachates (Monoaromatics)	Determination of BTEX in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS

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Analytical Report Number : 19-48029

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Richard Tucker
CC Ground Investigation Ltd
Unit A2
Innsworth Tech Park
Innsworth Lane
Gloucester
GL3 1DL

t: 01452 739 165
f: 01452 739 220
e: Richard@ccground.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-48031

Project / Site name:	Carnival Phase II	**Samples received on:**	28/06/2019
Your job number:	C6411	**Samples instructed on:**	02/07/2019
Your order number:	C6411	**Analysis completed by:**	10/07/2019
Report Issue Number:	1	**Report issued on:**	10/07/2019
Samples Analysed:	1 10:1 WAC sample		

Signed: [redacted]

Rexona Rahman
Head of Customer Services
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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i2 Analytical
7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	**19-48031**						
					Client:	**CCGROUND**	
Location	**Carnival Phase II**						
Lab Reference (Sample Number)	1257519 / 1257520				**Landfill Waste Acceptance Criteria**		
					Limits		
Sampling Date	28/06/2019						
Sample ID	WS02				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Depth (m)	1.00						
Solid Waste Analysis							
TOC (%)**	0.7				3%	5%	6%
Loss on Ignition (%) **	-				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	3.5				100	--	--
pH (units)**	-				--	>6	--
Acid Neutralisation Capacity (mol / kg)	-				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0011			< 0.0110	0.5	2	25
Barium *	0.0083			0.0739	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0032			0.028	0.5	10	70
Copper *	0.0053			0.047	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0007			0.0059	0.5	10	30
Nickel *	0.0023			0.020	0.4	10	40
Lead *	0.0064			0.057	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0078			0.069	4	50	200
Chloride *	1.9			17	800	4000	25000
Fluoride	1.3			12	10	150	500
Sulphate *	3.4			30	1000	20000	50000
TDS*	51			450	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	6.08			53.9	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.7						
Dry Matter (%)	89						
Moisture (%)	11						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation
** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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Analytical Report Number : 19-48031

Project / Site name: Carnival Phase II

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Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1257519	WS02	None Supplied	1.00	Brown loam and sand with vegetation and gravel.

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Analytical Report Number : 19-48031

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Richard Tucker
CC Ground Investigation Ltd
Unit A2
Innsworth Tech Park
Innsworth Lane
Gloucester
GL3 1DL

t: 01452 739 165
f: 01452 739 220
e: Richard@ccground.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-47852

Project / Site name:	carnival Phase II	**Samples received on:**	25/06/2019
Your job number:	C6411	**Samples instructed on:**	28/06/2019
Your order number:	C6411	**Analysis completed by:**	09/07/2019
Report Issue Number:	1	**Report issued on:**	09/07/2019
Samples Analysed:	4 WAC 10:1 Samples		

Signed: [redacted]

Rexona Rahman
Head of Customer Services
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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i2 Analytical
7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	**19-47852**						
					Client:	**CCGROUND**	
Location	**carnival Phase II**						
Lab Reference (Sample Number)	1256736 / 1256737				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	24/06/2019				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	BH01						
Depth (m)	1.00						
Solid Waste Analysis							
TOC (%)**	0.6				3%	5%	6%
Loss on Ignition (%) **	-				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	3.0				100	--	--
pH (units)**	-				--	>6	--
Acid Neutralisation Capacity (mol / kg)	-				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 2 preparation utilising end over end leaching procedure)	10:1 mg/l			10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0011			< 0.0110	0.5	2	25
Barium *	0.0318			0.279	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0036			0.031	0.5	10	70
Copper *	0.0040			0.035	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0012			0.0103	0.5	10	30
Nickel *	0.0030			0.026	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0042			0.037	4	50	200
Chloride *	1.7			15	800	4000	25000
Fluoride	0.29			2.5	10	150	500
Sulphate *	180			1500	1000	20000	50000
TDS*	220			1900	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	6.86			60.1	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.5						
Dry Matter (%)	88						
Moisture (%)	12						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation
** = MCERTS accredited

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i2 Analytical
7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	**19-47852**						
					Client:	**CCGROUND**	
Location	**carnival Phase II**						
Lab Reference (Sample Number)	1256738 / 1256739				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	24/06/2019				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	BH01						
Depth (m)	2.00						
Solid Waste Analysis							
TOC (%)**	0.3				3%	5%	6%
Loss on Ignition (%) **	-				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 0.9				100	--	--
pH (units)**	-				--	>6	--
Acid Neutralisation Capacity (mol / kg)	-				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 2 preparation utilising end over end leaching procedure)	10:1 mg/l			10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0064			0.0541	0.5	2	25
Barium *	0.0210			0.179	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0013			0.011	0.5	10	70
Copper *	0.0031			0.026	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	< 0.0004			< 0.0040	0.5	10	30
Nickel *	0.0098			0.083	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.021			0.18	4	50	200
Chloride *	2.1			18	800	4000	25000
Fluoride	1.5			13	10	150	500
Sulphate *	62			520	1000	20000	50000
TDS*	97			820	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	5.42			46.0	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.6						
Dry Matter (%)	82						
Moisture (%)	18						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
Stated limits are for guidance only and i2 cannot be held responsible for any discrepencies with current legislation
** = MCERTS accrediited

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i2 Analytical
7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	**19-47852**						
					Client:	**CCGROUND**	
Location	**carnival Phase II**						
Lab Reference (Sample Number)	1256740 / 1256741				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	24/06/2019				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	BH01						
Depth (m)	3.00						
Solid Waste Analysis							
TOC (%)**	< 0.1				3%	5%	6%
Loss on Ignition (%) **	-				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 0.9				100	--	--
pH (units)**	-				--	>6	--
Acid Neutralisation Capacity (mol / kg)	-				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 2 preparation utilising end over end leaching procedure)	10:1 mg/l			10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0042			0.0354	0.5	2	25
Barium *	0.0100			0.0833	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0011			0.0095	0.5	10	70
Copper *	0.0041			0.034	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	< 0.0004			< 0.0040	0.5	10	30
Nickel *	0.0027			0.022	0.4	10	40
Lead *	0.0022			0.019	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0071			0.059	4	50	200
Chloride *	3.7			31	800	4000	25000
Fluoride	1.1			9.2	10	150	500
Sulphate *	31			260	1000	20000	50000
TDS*	110			900	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	9.66			80.9	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.8						
Dry Matter (%)	79						
Moisture (%)	21						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
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i2 Analytical
7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	**19-47852**						
					Client:	**CCGROUND**	
Location	**carnival Phase II**						
Lab Reference (Sample Number)	1256742 / 1256743				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	24/06/2019				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	BH04						
Depth (m)	0.50						
Solid Waste Analysis							
TOC (%)**	0.2				3%	5%	6%
Loss on Ignition (%) **	-				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	8.4				100	--	--
pH (units)**	-				--	>6	--
Acid Neutralisation Capacity (mol / kg)	-				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0064			0.0570	0.5	2	25
Barium *	0.0157			0.140	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0050			0.045	0.5	10	70
Copper *	0.0060			0.053	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0048			0.0424	0.5	10	30
Nickel *	0.0016			0.014	0.4	10	40
Lead *	0.0037			0.033	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0042			0.038	4	50	200
Chloride *	2.5			23	800	4000	25000
Fluoride	0.85			7.5	10	150	500
Sulphate *	16			140	1000	20000	50000
TDS*	71			630	4000	60000	100000
Phenol Index (Monhydric Phenols) *	0.010			< 0.10	1	-	-
DOC	7.70			68.5	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.8						
Dry Matter (%)	85						
Moisture (%)	15						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
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Analytical Report Number : 19-47852

Project / Site name: carnival Phase II

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1256736	BH01	None Supplied	1.00	Brown sandy clay with gravel.
1256738	BH01	None Supplied	2.00	Light brown clay.
1256740	BH01	None Supplied	3.00	Light brown clay with gravel.
1256742	BH04	None Supplied	0.50	Light brown clay and sand with gravel.

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Analytical Report Number : 19-47852

Project / Site name: carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Richard Tucker
CC Ground Investigation Ltd
Unit A2
Innsworth Tech Park
Innsworth Lane
Gloucester
GL3 1DL

t: 01452 739 165
f: 01452 739 220
e: Richard@ccground.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-48166

Project / Site name:	Carnival Phase II	**Samples received on:**	02/07/2019
Your job number:	C6411	**Samples instructed on:**	02/07/2019
Your order number:	C6411	**Analysis completed by:**	11/07/2019
Report Issue Number:	1	**Report issued on:**	11/07/2019
Samples Analysed:	2 10:1 WAC samples		

Signed: [redacted]

Katarzyna Lewicka
Head of Reporting Section
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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i2 Analytical
7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	**19-48166**						
					Client:	**CCGROUND**	
Location	**Carnival Phase II**						
Lab Reference (Sample Number)	1258203 / 1258204				**Landfill Waste Acceptance Criteria**		
					Limits		
Sampling Date	28/06/2019						
Sample ID	WS03				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Depth (m)	1.80						
Solid Waste Analysis							
TOC (%)**	0.2				3%	5%	6%
Loss on Ignition (%) **	-				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 0.9				100	--	--
pH (units)**	-				--	>6	--
Acid Neutralisation Capacity (mol / kg)	-				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0011			< 0.0110	0.5	2	25
Barium *	0.0078			0.0635	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0048			0.040	0.5	10	70
Copper *	0.0023			0.019	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	< 0.0004			< 0.0040	0.5	10	30
Nickel *	0.0038			0.031	0.4	10	40
Lead *	0.0033			0.027	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.012			0.096	4	50	200
Chloride *	8.2			67	800	4000	25000
Fluoride	0.89			7.3	10	150	500
Sulphate *	6.5			54	1000	20000	50000
TDS*	41			340	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	1.96			16.1	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.5						
Dry Matter (%)	84						
Moisture (%)	16						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.

*= UKAS accredited (liquid eluate analysis only)

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** = MCERTS accredited

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i2 Analytical
7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	**19-48166**						
					Client:	**CCGROUND**	
Location	**Carnival Phase II**						
Lab Reference (Sample Number)	1258205 / 1258206				**Landfill Waste Acceptance Criteria**		
					Limits		
Sampling Date	28/06/2019				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS04						
Depth (m)	0.50						
Solid Waste Analysis							
TOC (%)**	0.9				3%	5%	6%
Loss on Ignition (%) **	-				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	28				500	--	--
Total PAH (WAC-17) (mg/kg)	54				100	--	--
pH (units)**	-				--	>6	--
Acid Neutralisation Capacity (mol / kg)	-				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0011			< 0.0110	0.5	2	25
Barium *	0.0200			0.186	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0039			0.036	0.5	10	70
Copper *	0.026			0.24	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0017			0.0160	0.5	10	30
Nickel *	0.017			0.16	0.4	10	40
Lead *	0.0039			0.036	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0049			0.045	4	50	200
Chloride *	4.5			42	800	4000	25000
Fluoride	0.12			1.1	10	150	500
Sulphate *	33			310	1000	20000	50000
TDS*	360			3300	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	12.2			113	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.4						
Dry Matter (%)	95						
Moisture (%)	5.0						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
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Analytical Report Number : 19-48166

Project / Site name: Carnival Phase II

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Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1258203	WS03	None Supplied	1.80	Brown clay.
1258205	WS04	None Supplied	0.50	Brown loam and sand with gravel.

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Analytical Report Number : 19-48166

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Richard Tucker
CC Ground Investigation Ltd
Unit A2
Innsworth Tech Park
Innsworth Lane
Gloucester
GL3 1DL

t: 01452 739 165
f: 01452 739 220
e: Richard@ccground.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-48164

Project / Site name:	Carnival Phase II	**Samples received on:**	02/07/2019
Your job number:	C6411	**Samples instructed on:**	02/07/2019
Your order number:	C6411	**Analysis completed by:**	11/07/2019
Report Issue Number:	1	**Report issued on:**	11/07/2019
Samples Analysed:	2 leachate samples - 6 soil samples		

Signed: [redacted]

Zina Abdul Razzak
Senior Quality Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 19-48164

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1258194	1258195	1258196	1258197	1258198
Sample Reference				WS01A	WS03	WS03	WS04	WS04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	1.80	0.50	1.00
Date Sampled				27/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	7.5	6.8	16	5.0	9.5
Total mass of sample received	kg	0.001	NONE	1.7	1.1	1.5	1.4	1.8
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.3	8.4	8.1	9.7	9.3
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Organic Carbon (TOC)	%	0.1	MCERTS	2.4	0.4	0.2	0.9	0.4
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	16	1.1	< 0.05	-	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	13	< 0.05	< 0.05	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	3.8	< 0.05	< 0.05	-	< 0.05
Fluorene	mg/kg	0.05	MCERTS	15	0.28	< 0.05	-	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	89	0.70	< 0.05	-	1.5
Anthracene	mg/kg	0.05	MCERTS	27	< 0.05	< 0.05	-	0.59
Fluoranthene	mg/kg	0.05	MCERTS	110	< 0.05	< 0.05	-	3.0
Pyrene	mg/kg	0.05	MCERTS	97	< 0.05	< 0.05	-	2.8
Benzo(a)anthracene	mg/kg	0.05	MCERTS	58	< 0.05	< 0.05	-	1.7
Chrysene	mg/kg	0.05	MCERTS	42	< 0.05	< 0.05	-	1.6
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	65	< 0.05	< 0.05	-	2.0
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	25	< 0.05	< 0.05	-	1.1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	53	< 0.05	< 0.05	-	1.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	28	< 0.05	< 0.05	-	0.99
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	7.5	< 0.05	< 0.05	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	32	< 0.05	< 0.05	-	1.2
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	681	2.08	< 0.80	-	18.2

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Analytical Report Number: 19-48164

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1258194	1258195	1258196	1258197	1258198
Sample Reference				WS01A	WS03	WS03	WS04	WS04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	1.80	0.50	1.00
Date Sampled				27/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	3.5	< 1.0	< 1.0	< 1.0	1.1
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	3.9	12	8.4	9.3
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	0.29	0.96	0.44	0.45
Boron (water soluble)	mg/kg	0.2	MCERTS	2.0	0.6	0.4	2.0	1.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.5	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	-	-	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	13	36	25	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	34	11	15	21	9.1
Lead (aqua regia extractable)	mg/kg	1	MCERTS	69	13	11	27	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	10	30	10	9.8
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	38	16	51	31	39
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	73	53	51	85	43
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	< 8.0	< 8.0	26	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	< 10	29	< 10
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	-	< 10	< 10	29	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	2.5
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	< 2.0	6.3	9.6
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	< 10	< 10	47	56
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	< 10	< 10	120	97
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	< 8.4	< 8.4	14	< 8.4
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	< 10	180	170
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	-	< 10	< 10	190	170

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Analytical Report Number: 19-48164

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1258194	1258195	1258196	1258197	1258198
Sample Reference				WS01A	WS03	WS03	WS04	WS04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	1.80	0.50	1.00
Date Sampled				27/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Chloroethane	µg/kg	1	NONE	-	-	-	< 1.0	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	< 1.0	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	< 1.0	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	< 1.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	< 1.0	-
Benzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	< 1.0	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Styrene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Tribromomethane	µg/kg	1	NONE	-	-	-	< 1.0	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-

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Analytical Report Number: 19-48164

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1258194	1258195	1258196	1258197	1258198
Sample Reference				WS01A	WS03	WS03	WS04	WS04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	1.80	0.50	1.00
Date Sampled				27/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	0.43	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	0.25	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	< 0.3	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	0.39	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	3.5	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	1.6	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	8.5	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	8.1	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	< 0.3	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	5.2	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	4.2	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	6.6	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	2.5	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	5.5	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	2.9	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	0.75	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	3.2	-

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Analytical Report Number: 19-48164

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1258199				
Sample Reference				WS04				
Sample Number				None Supplied				
Depth (m)				1.80				
Date Sampled				28/06/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	16				
Total mass of sample received	kg	0.001	NONE	1.5				
Asbestos in Soil	Type	N/A	ISO 17025	-				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.3				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Pyrene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80				

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Analytical Report Number: 19-48164

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1258199				
Sample Reference				WS04				
Sample Number				None Supplied				
Depth (m)				1.80				
Date Sampled				28/06/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	25				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1				
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	-				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	46				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	29				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	17				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	40				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	71				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	62				
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	< 10				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	< 10				

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Analytical Report Number: 19-48164

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1258199				
Sample Reference				WS04				
Sample Number				None Supplied				
Depth (m)				1.80				
Date Sampled				28/06/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-				
Chloroethane	µg/kg	1	NONE	-				
Bromomethane	µg/kg	1	ISO 17025	-				
Vinyl Chloride	µg/kg	1	NONE	-				
Trichlorofluoromethane	µg/kg	1	NONE	-				
1,1-Dichloroethene	µg/kg	1	NONE	-				
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-				
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-				
1,1-Dichloroethane	µg/kg	1	MCERTS	-				
2,2-Dichloropropane	µg/kg	1	MCERTS	-				
Trichloromethane	µg/kg	1	MCERTS	-				
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-				
1,2-Dichloroethane	µg/kg	1	MCERTS	-				
1,1-Dichloropropene	µg/kg	1	MCERTS	-				
Trans-1,2-dichloroethene	µg/kg	1	NONE	-				
Benzene	µg/kg	1	MCERTS	-				
Tetrachloromethane	µg/kg	1	MCERTS	-				
1,2-Dichloropropane	µg/kg	1	MCERTS	-				
Trichloroethene	µg/kg	1	MCERTS	-				
Dibromomethane	µg/kg	1	MCERTS	-				
Bromodichloromethane	µg/kg	1	MCERTS	-				
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-				
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-				
Toluene	µg/kg	1	MCERTS	-				
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-				
1,3-Dichloropropane	µg/kg	1	ISO 17025	-				
Dibromochloromethane	µg/kg	1	ISO 17025	-				
Tetrachloroethene	µg/kg	1	NONE	-				
1,2-Dibromoethane	µg/kg	1	ISO 17025	-				
Chlorobenzene	µg/kg	1	MCERTS	-				
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-				
Ethylbenzene	µg/kg	1	MCERTS	-				
p & m-Xylene	µg/kg	1	MCERTS	-				
Styrene	µg/kg	1	MCERTS	-				
Tribromomethane	µg/kg	1	NONE	-				
o-Xylene	µg/kg	1	MCERTS	-				
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-				
Isopropylbenzene	µg/kg	1	MCERTS	-				
Bromobenzene	µg/kg	1	MCERTS	-				
n-Propylbenzene	µg/kg	1	ISO 17025	-				
2-Chlorotoluene	µg/kg	1	MCERTS	-				
4-Chlorotoluene	µg/kg	1	MCERTS	-				
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-				
tert-Butylbenzene	µg/kg	1	MCERTS	-				
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-				
sec-Butylbenzene	µg/kg	1	MCERTS	-				
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-				
p-Isopropyltoluene	µg/kg	1	ISO 17025	-				
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-				
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-				
Butylbenzene	µg/kg	1	MCERTS	-				
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-				
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-				
Hexachlorobutadiene	µg/kg	1	MCERTS	-				
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-				

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Analytical Report Number: 19-48164

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1258199				
Sample Reference				WS04				
Sample Number				None Supplied				
Depth (m)				1.80				
Date Sampled				28/06/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-				
Phenol	mg/kg	0.2	ISO 17025	-				
2-Chlorophenol	mg/kg	0.1	MCERTS	-				
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-				
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-				
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-				
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-				
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-				
2-Methylphenol	mg/kg	0.3	MCERTS	-				
Hexachloroethane	mg/kg	0.05	MCERTS	-				
Nitrobenzene	mg/kg	0.3	MCERTS	-				
4-Methylphenol	mg/kg	0.2	NONE	-				
Isophorone	mg/kg	0.2	MCERTS	-				
2-Nitrophenol	mg/kg	0.3	MCERTS	-				
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-				
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-				
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-				
Naphthalene	mg/kg	0.05	MCERTS	-				
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-				
4-Chloroaniline	mg/kg	0.1	NONE	-				
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-				
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-				
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-				
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-				
2-Methylnaphthalene	mg/kg	0.1	NONE	-				
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-				
Dimethylphthalate	mg/kg	0.1	MCERTS	-				
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-				
Acenaphthylene	mg/kg	0.05	MCERTS	-				
Acenaphthene	mg/kg	0.05	MCERTS	-				
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-				
Dibenzofuran	mg/kg	0.2	MCERTS	-				
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-				
Diethyl phthalate	mg/kg	0.2	MCERTS	-				
4-Nitroaniline	mg/kg	0.2	MCERTS	-				
Fluorene	mg/kg	0.05	MCERTS	-				
Azobenzene	mg/kg	0.3	MCERTS	-				
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-				
Hexachlorobenzene	mg/kg	0.3	MCERTS	-				
Phenanthrene	mg/kg	0.05	MCERTS	-				
Anthracene	mg/kg	0.05	MCERTS	-				
Carbazole	mg/kg	0.3	MCERTS	-				
Dibutyl phthalate	mg/kg	0.2	MCERTS	-				
Anthraquinone	mg/kg	0.3	MCERTS	-				
Fluoranthene	mg/kg	0.05	MCERTS	-				
Pyrene	mg/kg	0.05	MCERTS	-				
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-				
Chrysene	mg/kg	0.05	MCERTS	-				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-				

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Analytical Report Number: 19-48164

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1258200	1258201			
Sample Reference				WS01A	WS04			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.20	1.00			
Date Sampled				27/06/2019	28/06/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	8.0	7.8			
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10			
Chloride	mg/l	0.15	ISO 17025	8.5	7.1			
Ammoniacal Nitrogen as N	µg/l	15	NONE	< 15	17			
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10			
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01			
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2			
Heavy Metals / Metalloids								
Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7			
Arsenic (dissolved)	µg/l	1.1	ISO 17025	2.9	7.6			
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.2			
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08			
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.8	3.0			
Copper (dissolved)	µg/l	0.7	ISO 17025	17	5.2			
Lead (dissolved)	µg/l	1	ISO 17025	4.4	2.5			
Manganese (dissolved)	µg/l	0.06	ISO 17025	13	4.7			
Mercury (dissolved)	µg/l	0.5	ISO 17025	0.7	< 0.5			
Nickel (dissolved)	µg/l	0.3	ISO 17025	2.6	1.6			
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0			
Vanadium (dissolved)	µg/l	1.7	ISO 17025	7.0	4.7			
Zinc (dissolved)	µg/l	0.4	ISO 17025	11	7.8			
Calcium (dissolved)	mg/l	0.012	ISO 17025	31	20			
Monoaromatics & Oxygenates								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			

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Analytical Report Number : 19-48164

Project / Site name: Carnival Phase II

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1258194	WS01A	None Supplied	0.20	Brown loam and sand with gravel.
1258195	WS03	None Supplied	0.50	Brown clay and sand with gravel.
1258196	WS03	None Supplied	1.80	Brown clay.
1258197	WS04	None Supplied	0.50	Brown loam and sand with gravel.
1258198	WS04	None Supplied	1.00	Brown clay and sand with gravel.
1258199	WS04	None Supplied	1.80	Brown clay.

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Analytical Report Number : 19-48164

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX in leachates (Monoaromatics)	Determination of BTEX in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS

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Analytical Report Number : 19-48164

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Richard Tucker
CC Ground Investigation Ltd
Unit A2
Innsworth Tech Park
Innsworth Lane
Gloucester
GL3 1DL

t: 01452 739 165
f: 01452 739 220
e: Richard@ccground.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-48587

Project / Site name:	Carnival Phase II	**Samples received on:**	04/07/2019
Your job number:	C6411	**Samples instructed on:**	04/07/2019
Your order number:	C6411	**Analysis completed by:**	15/07/2019
Report Issue Number:	1	**Report issued on:**	15/07/2019
Samples Analysed:	1 leachate sample - 2 soil samples		

Signed: [redacted]

Vineetha Meethale-Vettil
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 19-48587

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1260114	1260115			
Sample Reference				BH03	BH03			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.50	1.00			
Date Sampled				02/07/2019	02/07/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	13	14			
Total mass of sample received	kg	0.001	NONE	1.8	1.5			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.8	7.6			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.7	2.3			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	-	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	< 0.80			

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Analytical Report Number: 19-48587

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1260114	1260115			
Sample Reference				BH03	BH03			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.50	1.00			
Date Sampled				02/07/2019	02/07/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	< 1.0			
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	8.9			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.51	0.71			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.5			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	-			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	38			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	16			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	11			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	6.5	12			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	37	50			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	34	46			
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	< 10	< 10			

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Analytical Report Number: 19-48587

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1260114	1260115			
Sample Reference				BH03	BH03			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.50	1.00			
Date Sampled				02/07/2019	02/07/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	-			
Chloroethane	µg/kg	1	NONE	< 1.0	-			
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-			
Vinyl Chloride	µg/kg	1	NONE	< 1.0	-			
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	-			
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	-			
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	-			
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	-			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-			
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-			
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-			
Trichloromethane	µg/kg	1	MCERTS	< 1.0	-			
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-			
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-			
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	-			
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-			
Benzene	µg/kg	1	MCERTS	< 1.0	-			
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	-			
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-			
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-			
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-			
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	-			
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-			
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-			
Toluene	µg/kg	1	MCERTS	< 1.0	-			
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-			
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-			
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-			
Tetrachloroethene	µg/kg	1	NONE	< 1.0	-			
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-			
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-			
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-			
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-			
Styrene	µg/kg	1	MCERTS	< 1.0	-			
Tribromomethane	µg/kg	1	NONE	< 1.0	-			
o-Xylene	µg/kg	1	MCERTS	< 1.0	-			
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-			
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	-			
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-			
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-			
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-			
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-			
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-			
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-			
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-			
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-			
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-			
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-			
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-			
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-			
Butylbenzene	µg/kg	1	MCERTS	< 1.0	-			
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-			
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-			
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	-			
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-			

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Analytical Report Number: 19-48587

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1260114	1260115			
Sample Reference				BH03	BH03			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.50	1.00			
Date Sampled				02/07/2019	02/07/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	-			
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-			
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-			
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-			
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-			
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-			
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-			
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-			
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-			
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-			
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-			
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-			
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-			
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-			
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-			
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-			
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-			
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-			
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-			
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-			
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-			
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-			
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-			
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-			
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-			
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-			
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-			
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-			
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-			
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-			
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-			
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-			
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-			
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-			
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-			
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-			
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-			
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-			
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	-			
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	-			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-			

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Analytical Report Number: 19-48587

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1260116				
Sample Reference				BH03				
Sample Number				None Supplied				
Depth (m)				0.50				
Date Sampled				02/07/2019				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.2				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Chloride	mg/l	0.15	ISO 17025	22				
Ammoniacal Nitrogen as N	µg/l	15	NONE	< 15				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2				
Heavy Metals / Metalloids								
Antimony (dissolved)	µg/l	1.7	ISO 17025	2.4				
Arsenic (dissolved)	µg/l	1.1	ISO 17025	2.7				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (dissolved)	µg/l	0.4	ISO 17025	6.3				
Copper (dissolved)	µg/l	0.7	ISO 17025	9.5				
Lead (dissolved)	µg/l	1	ISO 17025	2.4				
Manganese (dissolved)	µg/l	0.06	ISO 17025	47				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	2.7				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7				
Zinc (dissolved)	µg/l	0.4	ISO 17025	8.2				
Calcium (dissolved)	mg/l	0.012	ISO 17025	4.5				
Monoaromatics & Oxygenates								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-48587

Project / Site name: Carnival Phase II

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1260114	BH03	None Supplied	0.50	Light brown sandy clay with gravel.
1260115	BH03	None Supplied	1.00	Light brown clay and sand with gravel.

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Analytical Report Number : 19-48587

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX in leachates (Monoaromatics)	Determination of BTEX in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS

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Analytical Report Number : 19-48587

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Richard Tucker
CC Ground Investigation Ltd
Unit A2
Innsworth Tech Park
Innsworth Lane
Gloucester
GL3 1DL

t: 01452 739 165
f: 01452 739 220
e: Richard@ccground.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-49635

Project / Site name:	Carnival Phase II	**Samples received on:**	04/07/2019
Your job number:	C6411	**Samples instructed on:**	12/07/2019
Your order number:	C6411	**Analysis completed by:**	23/07/2019
Report Issue Number:	1	**Report issued on:**	23/07/2019
Samples Analysed:	10:1 WAC sample		

Signed: [redacted]

Karolina Marek
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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i2 Analytical
7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	**19-49635**						
					Client:	**CCGROUND**	
Location	**Carnival Phase II**						
Lab Reference (Sample Number)	1265899 / 1265900				**Landfill Waste Acceptance Criteria**		
					Limits		
Sampling Date	03/07/2019				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	TP3						
Depth (m)	1.00						
Solid Waste Analysis							
TOC (%)**	0.3				3%	5%	6%
Loss on Ignition (%) **	-				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	7.9				100	--	--
pH (units)**	-				--	>6	--
Acid Neutralisation Capacity (mol / kg)	-				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0027			0.0217	0.5	2	25
Barium *	0.0139			0.111	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0014			0.011	0.5	10	70
Copper *	0.0009			0.0076	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0033			0.0263	0.5	10	30
Nickel *	< 0.0003			< 0.0030	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0026			0.021	4	50	200
Chloride *	3.3			27	800	4000	25000
Fluoride	1.4			11	10	150	500
Sulphate *	100			830	1000	20000	50000
TDS*	140			1100	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	5.80			46.3	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.3						
Dry Matter (%)	81						
Moisture (%)	19						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation
** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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Analytical Report Number : 19-49635

Project / Site name: Carnival Phase II

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Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1265899	TP3	None Supplied	1.00	Brown clay and sand.

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Analytical Report Number : 19-49635

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Richard Tucker
CC Ground Investigation Ltd
Unit A2
Innsworth Tech Park
Innsworth Lane
Gloucester
GL3 1DL

t: 01452 739 165
f: 01452 739 220
e: Richard@ccground.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-48582

Project / Site name:	Carnival Phase II	**Samples received on:**	04/07/2019
Your job number:	C6411	**Samples instructed on:**	04/07/2019
Your order number:	C6411	**Analysis completed by:**	15/07/2019
Report Issue Number:	1	**Report issued on:**	15/07/2019
Samples Analysed:	1 leachate sample - 2 soil samples		

Signed: [redacted]

Karolina Marek
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 19-48582

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1260103	1260104			
Sample Reference				BH02	BH02			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.50	1.00			
Date Sampled				02/07/2019	02/07/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	12	11			
Total mass of sample received	kg	0.001	NONE	1.8	1.6			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.5			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Organic Carbon (TOC)	%	0.1	MCERTS	2.6	2.2			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	0.21	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	0.94	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	0.69	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	6.4	0.19			
Anthracene	mg/kg	0.05	MCERTS	1.8	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	14	0.45			
Pyrene	mg/kg	0.05	MCERTS	12	0.38			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	8.0	0.27			
Chrysene	mg/kg	0.05	MCERTS	7.5	0.25			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	9.8	0.33			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	4.5	0.13			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	8.4	0.31			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	4.6	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.8	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	4.9	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	85.3	2.31			

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Analytical Report Number: 19-48582

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1260103	1260104			
Sample Reference				BH02	BH02			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.50	1.00			
Date Sampled				02/07/2019	02/07/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	1.9	< 1.0			
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.5	8.0			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.60	0.66			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	1.1			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	29			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	33	20			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	37	20			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	9.9	9.9			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	35	40			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	49	43			
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	27	< 8.0			
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	47	< 8.4			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	30	< 10			
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	77	< 10			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.1	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	10	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	50	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	160	< 10			
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	230	< 8.4			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	220	< 10			
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	450	< 10			

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-48582

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1260105				
Sample Reference				BH02				
Sample Number				None Supplied				
Depth (m)				1.00				
Date Sampled				02/07/2019				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.2				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Chloride	mg/l	0.15	ISO 17025	4.8				
Ammoniacal Nitrogen as N	µg/l	15	NONE	1300				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2				

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Analytical Report Number: 19-48582

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1260105				
Sample Reference				BH02				
Sample Number				None Supplied				
Depth (m)				1.00				
Date Sampled				02/07/2019				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7				
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.9				
Copper (dissolved)	µg/l	0.7	ISO 17025	10				
Lead (dissolved)	µg/l	1	ISO 17025	1.1				
Manganese (dissolved)	µg/l	0.06	ISO 17025	370				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	4.5				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	3.2				
Zinc (dissolved)	µg/l	0.4	ISO 17025	9.5				
Calcium (dissolved)	mg/l	0.012	ISO 17025	8.1				
Monoaromatics & Oxygenates								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				

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Analytical Report Number : 19-48582

Project / Site name: Carnival Phase II

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1260103	BH02	None Supplied	0.50	Brown clay and sand with gravel.
1260104	BH02	None Supplied	1.00	Brown sandy clay with gravel.

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Analytical Report Number : 19-48582

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX in leachates (Monoaromatics)	Determination of BTEX in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE

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Analytical Report Number : 19-48582

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Richard Tucker
CC Ground Investigation Ltd
Unit A2
Innsworth Tech Park
Innsworth Lane
Gloucester
GL3 1DL

t: 01452 739 165
f: 01452 739 220
e: Richard@ccground.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-49656

Project / Site name:	Carnival Phase II	**Samples received on:**	11/07/2019
Your job number:	C6411	**Samples instructed on:**	12/07/2019
Your order number:	C6411	**Analysis completed by:**	22/07/2019
Report Issue Number:	1	**Report issued on:**	22/07/2019
Samples Analysed:	5 water samples		

Signed: [redacted]

Karolina Marek
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 19-49656

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1265977	1265978	1265979	1265980	1265981
Sample Reference				BH02	WS02	WS04	WS03	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.13	3.30	1.42	1.89	2.10
Date Sampled				10/07/2019	10/07/2019	10/07/2019	10/07/2019	10/07/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.5	7.2	8.0	7.2	7.5
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	10	< 10
Chloride	mg/l	0.15	ISO 17025	39	130	120	130	33
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	140	25	50	19	62
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	5.29	4.24	3.21	2.54	6.53
Hardness - Total	mgCaCO3/l	1	ISO 17025	340	292	220	510	385
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Heavy Metals / Metalloids								
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.7	0.7	< 0.4	< 0.4	0.8
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.72	1.29	1.70	0.36	0.62
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	0.02	< 0.02	< 0.02	0.03
Calcium (dissolved)	mg/l	0.012	ISO 17025	95	98	47	100	98
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.6	0.5	2.0	0.9	0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	2.5	3.9	7.3	7.2	2.2
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	2.7	0.6	< 0.2
Magnesium (dissolved)	mg/l	0.005	ISO 17025	25	12	25	62	34
Manganese (dissolved)	µg/l	0.05	ISO 17025	250	110	42	470	210
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	5.0	16	3.5	5.8	6.7
Selenium (dissolved)	µg/l	0.6	ISO 17025	14	4.1	17	1.6	25
Vanadium (dissolved)	µg/l	0.2	ISO 17025	1.6	2.1	2.8	0.9	0.5
Zinc (dissolved)	µg/l	0.5	ISO 17025	1.7	1.7	6.9	2.7	0.8

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Analytical Report Number: 19-49656

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1265977	1265978	1265979	1265980	1265981
Sample Reference				BH02	WS02	WS04	WS03	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.13	3.30	1.42	1.89	2.10
Date Sampled				10/07/2019	10/07/2019	10/07/2019	10/07/2019	10/07/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C35 - C44	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C44)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C35 - C44	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C44)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 19-49656

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
TPH in (Water)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L070-PL	W	NONE
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Richard Tucker
CC Ground Investigation Ltd
Unit A2
Innsworth Tech Park
Innsworth Lane
Gloucester
GL3 1DL

t: 01452 739 165
f: 01452 739 220
e: Richard@ccground.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-49633

Project / Site name:	Carnival Phase II	**Samples received on:**	04/07/2019
Your job number:	C6411	**Samples instructed on:**	12/07/2019
Your order number:	C6411	**Analysis completed by:**	22/07/2019
Report Issue Number:	1	**Report issued on:**	22/07/2019
Samples Analysed:	1 leachate sample - 4 soil samples		

Signed: [redacted]

Karolina Marek
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 19-49633

Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number				1265893	1265894	1265895	1265896	
Sample Reference				TP2	TP2	TP3	TP3	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.30	1.00	0.30	1.00	
Date Sampled				03/07/2019	03/07/2019	03/07/2019	03/07/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	4.2	17	11	19	
Total mass of sample received	kg	0.001	NONE	1.7	1.7	1.7	1.3	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.2	8.1	10.3	8.5	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.0	0.2	0.5	0.4	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	1.8	1.2	3.6	2.5	
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	70	20	10	32	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.46	0.86	0.59	1.1	
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.8	2.8	0.2	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.8	< 0.2	0.4	< 0.2	
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	-	< 1.2	< 1.2	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	34	28	31	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	19	62	24	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	47	16	56	24	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	38	16	31	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	26	59	35	49	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	50	140	68	

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Analytical Report Number: 19-49633

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1265897				
Sample Reference				TP3				
Sample Number				None Supplied				
Depth (m)				1.00				
Date Sampled				03/07/2019				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.6				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Chloride	mg/l	0.15	ISO 17025	14				
Ammoniacal Nitrogen as N	µg/l	15	NONE	42				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Heavy Metals / Metalloids								
Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7				
Arsenic (dissolved)	µg/l	1.1	ISO 17025	8.2				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.5				
Copper (dissolved)	µg/l	0.7	ISO 17025	21				
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0				
Manganese (dissolved)	mg/l	0.00006	NONE	0.0071				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.0				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	2.0				
Zinc (dissolved)	µg/l	0.4	ISO 17025	8.3				
Calcium (dissolved)	mg/l	0.012	ISO 17025	58				

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Analytical Report Number : 19-49633

Project / Site name: Carnival Phase II

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1265893	TP2	None Supplied	0.30	Brown clay and sand with gravel and tar.
1265894	TP2	None Supplied	1.00	Brown clay and sand.
1265895	TP3	None Supplied	0.30	Brown loam and sand with gravel and vegetation.
1265896	TP3	None Supplied	1.00	Brown clay and sand.

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Analytical Report Number : 19-49633

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS

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Analytical Report Number : 19-49633

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Richard Tucker
CC Ground Investigation Ltd
Unit A2
Innsworth Tech Park
Innsworth Lane
Gloucester
GL3 1DL

t: 01452 739 165
f: 01452 739 220
e: Richard@ccground.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-50493

Project / Site name:	Carnival Phase II	**Samples received on:**	18/07/2019
Your job number:	C6411	**Samples instructed on:**	19/07/2019
Your order number:	C6411	**Analysis completed by:**	29/07/2019
Report Issue Number:	1	**Report issued on:**	29/07/2019
Samples Analysed:	1 water sample		

Signed: [redacted]

Karolina Marek
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 19-50493

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1270810				
Sample Reference				BH01				
Sample Number				None Supplied				
Depth (m)				7.35				
Date Sampled				18/07/2019				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.7				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Chloride	mg/l	0.15	ISO 17025	67				
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	380				
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	2.58				
Hardness - Total	mgCaCO3/l	1	ISO 17025	204				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16				
Heavy Metals / Metalloids								
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.6				
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.65				
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1				
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02				
Calcium (dissolved)	mg/l	0.012	ISO 17025	54				
Chromium (dissolved)	µg/l	0.2	ISO 17025	1.4				
Copper (dissolved)	µg/l	0.5	ISO 17025	8.3				
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Magnesium (dissolved)	mg/l	0.005	ISO 17025	17				
Manganese (dissolved)	µg/l	0.05	ISO 17025	170				
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05				
Nickel (dissolved)	µg/l	0.5	ISO 17025	3.1				
Selenium (dissolved)	µg/l	0.6	ISO 17025	1.2				
Vanadium (dissolved)	µg/l	0.2	ISO 17025	1.2				
Zinc (dissolved)	µg/l	0.5	ISO 17025	5.1				

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Analytical Report Number: 19-50493

Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number				1270810				
Sample Reference				BH01				
Sample Number				None Supplied				
Depth (m)				7.35				
Date Sampled				18/07/2019				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C35 - C44	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C44)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C35 - C44	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C44)	µg/l	10	NONE	< 10				

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 19-50493

Project / Site name: Carnival Phase II

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
TPH in (Water)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L070-PL	W	NONE
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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The results included within the report are representative of the samples submitted for analysis.

APPENDIX F

Gas and Groundwater Monitoring Data

Groundwater Monitoring

Borehole	Date	Time	Installation Depth	Water Level (m)	Purged to (m)	Recharged to (m)	Remarks
WS02	05/07/19	09:05:00	4.39	3.30	DRY		5 Litres purged.
	05/07/19	10:35:00		3.71			
	05/07/19	11:35:00		3.46			
	05/07/19	12:35:00		3.31			
	05/07/19	13:35:00		3.30			
	05/07/19	14:35:00		3.30			
	05/07/19	15:35:00		3.30			
WS04	05/07/19	09:35:00	4.43	1.37	DRY		6 Litres purged.
	05/07/19	10:40:00		4.15			
	05/07/19	11:40:00		4.03			
	05/07/19	12:40:00		3.91			
	05/07/19	13:40:00		3.76			
	05/07/19	14:40:00		3.65			
	05/07/19	15:40:00		3.59			
BH02	05/07/19	09:55:00	3.12	0.40	DRY		12 Litres purged.
	05/07/19	10:45:00		1.83			
	05/07/19	11:45:00		1.35			
	05/07/19	12:45:00		1.31			
	05/07/19	13:45:00		1.17			
	05/07/19	14:45:00		1.17			
	05/07/19	15:45:00		1.17			
WS03	05/07/19	10:20:00	4.38	1.85	DRY		8 Litres purged.
	05/07/19	10:50:00		4.01			
	05/07/19	11:50:00		3.76			
	05/07/19	12:50:00		3.52			
	05/07/19	13:50:00		3.24			
	05/07/19	14:50:00		3.05			
	05/07/19	15:50:00		2.92			
BH04	05/07/19	08:35:00	4.60	0.32	3.78		26 Litres purged.
	05/07/19	10:30:00		3.09			
	05/07/19	11:30:00		2.97			
	05/07/19	12:30:00		2.87			
	05/07/19	13:30:00		2.69			
	05/07/19	14:30:00		2.60			
	05/07/19	15:30:00		2.51			
BH01	05/07/19						Could not be monitored.

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument: used:	Geotechnical Instruments dip meter

Low Flow Monitoring and Sampling

Borehole	Date	Time (Mins)	Temp (ºC)	DO (mg/L)	DO SAT (%)	ORP (mV)	pH	Act Cond (µS/cm)	Baro (mbar)	Salinity (psu)	TDS (ppm)
BH01											
								Remarks: Could not access location.			

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	In-Situ Smar TROLL MP Handheld Instrument + Low Flow Sampling System. Geotech Geopump Peristaltic Pump.

Low Flow Monitoring and Sampling

Borehole	Date	Time (Mins)	Temp (°C)	DO (mg/L)	DO SAT (%)	ORP (mV)	pH	Act Cond (µS/cm)	Baro (mbar)	Salinity (psu)	TDS (ppm)
BH02	10/07/19	0	19.05	0.44	4.75	51.5	7.78	1347.4	1012.4	0.75	0.97
		1	18.26	0.36	3.72	39.8	7.78	1290.0	1012.4	0.76	0.97
		2	17.42	0.34	3.58	36.4	7.78	1230.4	1012.4	0.73	0.93
		3	16.98	0.36	3.75	27.6	7.77	1106.2	1012.4	0.65	0.84
		4	16.83	0.36	3.78	26.6	7.77	1051.1	1012.4	0.62	0.80
		5	16.74	0.42	4.31	29.0	7.77	1005.2	1012.4	0.60	0.77
		6	16.83	0.43	4.47	43.4	7.76	967.38	1012.4	0.67	0.74
		7	17.02	0.47	4.94	55.9	7.70	943.83	1012.4	0.56	0.72
		8	17.09	0.57	5.96	69.7	7.52	939.90	1012.4	0.55	0.72
		9	17.15	0.61	6.39	80.3	7.54	922.86	1012.4	0.54	0.71
		10	17.06	0.66	6.87	88.9	7.49	917.30	1012.4	0.54	0.71
		11	17.01	0.63	6.58	95.3	7.45	925.11	1012.4	0.55	0.71
		12	16.83	0.62	6.39	100.9	7.42	907.37	1012.4	0.55	0.72
		13	16.69	0.58	5.98	102.4	7.40	904.55	1012.4	0.54	0.70
		14	16.64	0.57	5.96	103.5	7.39	905.24	1012.5	0.57	0.71
								Remarks:			

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	In-Situ Smar TROLL MP Handheld Instrument + Low Flow Sampling System. Geotech Geopump Peristaltic Pump.

Low Flow Monitoring and Sampling

Borehole	Date	Time (Mins)	Temp (ºC)	DO (mg/L)	DO SAT (%)	ORP (mV)	pH	Act Cond (µS/cm)	Baro (mbar)	Salinity (psu)	TDS (ppm)
BH04	10/07/19	0	18.62	0.52	5.48	179.0	7.42	923.52	1012.6	0.53	0.69
		1	18.25	0.47	5.03	153.7	7.34	922.35	1012.6	0.53	0.69
		2	18.03	0.45	4.91	137.0	7.29	927.25	1012.6	0.54	0.70
		3	17.90	0.68	7.83	127.2	7.26	943.59	1012.6	0.55	0.71
		4	17.85	1.03	10.98	121.4	7.23	943.58	1012.6	0.55	0.71
		5	17.86	1.16	12.19	117.1	7.21	943.55	1012.6	0.55	0.71
		6	17.86	1.17	12.52	113.1	7.20	944.95	1012.6	0.55	0.71
		7	17.85	1.09	11.42	109.0	7.18	949.18	1012.6	0.55	0.71
		8	17.85	1.04	10.75	107.5	7.18	948.02	1012.6	0.55	0.71
		9	17.85	0.92	9.70	106.1	7.18	946.36	1012.6	0.55	0.71
		10	17.81	0.89	9.35	104.8	7.17	948.02	1012.6	0.55	0.71
		11	17.75	0.86	9.21	103.9	7.17	949.32	1012.6	0.55	0.71
		12	17.72	0.84	9.01	102.8	7.17	952.54	1012.6	0.55	0.72
								Remarks:			

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	In-Situ Smar TROLL MP Handheld Instrument + Low Flow Sampling System. Geotech Geopump Peristaltic Pump.

Low Flow Monitoring and Sampling

Borehole	Date	Time (Mins)	Temp (°C)	DO (mg/L)	DO SAT (%)	ORP (mV)	pH	Act Cond (µS/cm)	Baro (mbar)	Salinity (psu)	TDS (ppm)
WS02	10/07/19	0	19.60	2.04	20.81	192.6	7.41	909.52	1012.4	0.52	0.68
		1	18.74	1.77	18.97	155.8	7.19	908.63	1012.4	0.52	0.68
		2	17.82	1.81	19.10	146.1	7.03	904.36	1012.4	0.53	0.69
		3	17.45	1.85	19.41	136.7	6.93	901.40	1012.4	0.53	0.69
		4	17.19	1.84	19.19	130.8	6.87	906.04	1012.4	0.53	0.70
		5	17.01	1.76	18.25	126.5	6.82	910.48	1012.4	0.54	0.70
		6	16.92	1.67	17.32	123.8	6.79	905.97	1012.4	0.53	0.69
		7	16.91	1.64	16.89	121.9	6.79	900.92	1012.4	0.53	0.69
		8	16.88	1.57	16.22	120.5	6.75	904.73	1012.4	0.54	0.70
		9	16.87	1.48	15.32	119.1	6.74	911.01	1012.4	0.54	0.70
		10	16.86	1.47	15.05	118.2	6.73	904.07	1012.4	0.53	0.70
		11	16.87	1.34	14.81	117.5	6.73	906.62	1012.4	0.54	0.70
								Remarks:			

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	In-Situ Smar TROLL MP Handheld Instrument + Low Flow Sampling System. Geotech Geopump Peristaltic Pump.

Low Flow Monitoring and Sampling

Borehole	Date	Time (Mins)	Temp (°C)	DO (mg/L)	DO SAT (%)	ORP (mV)	pH	Act Cond (µS/cm)	Baro (mbar)	Salinity (psu)	TDS (ppm)
WS03	10/07/19	0	19.85	4.85	38.77	56.0	7.90	1011.0	1012.5	0.56	0.72
		1	19.10	0.78	5.81	-4.0	7.53	962.57	1012.5	0.55	0.71
		2	18.53	0.36	3.83	-9.2	7.42	952.95	1012.5	0.55	0.71
		3	18.16	0.30	3.24	-9.1	7.33	947.84	1012.5	0.55	0.71
		4	17.97	0.28	2.99	-7.5	7.26	945.78	1012.5	0.55	0.71
		5	17.73	0.28	2.90	-4.7	7.20	948.35	1012.5	0.55	0.72
		6	17.59	0.30	3.15	4.4	7.12	949.24	1012.5	0.56	0.72
		7	17.41	0.37	3.84	11.6	7.08	955.32	1012.6	0.56	0.73
		8	17.36	0.40	4.13	18.0	7.05	960.63	1012.6	0.56	0.73
		9	17.31	0.42	4.17	21.0	7.02	973.16	1012.6	0.57	0.74
		10	17.27	0.45	4.26	22.3	7.01	968.98	1012.6	0.57	0.74
		11	17.23	0.46	4.30	22.7	7.00	967.61	1012.6	0.57	0.74
								Remarks:			

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	In-Situ Smar TROLL MP Handheld Instrument + Low Flow Sampling System. Geotech Geopump Peristaltic Pump.

Low Flow Monitoring and Sampling

Borehole	Date	Time (Mins)	Temp (°C)	DO (mg/L)	DO SAT (%)	ORP (mV)	pH	Act Cond (µS/cm)	Baro (mbar)	Salinity (psu)	TDS (ppm)
WS04	10/07/19	0	19.85	1.45	15.83	155.5	7.93	838.78	1012.4	0.47	0.62
		1	18.58	1.54	16.51	146.2	7.90	831.82	1012.4	0.48	0.63
		2	17.83	1.61	17.13	142.1	7.87	831.40	1012.4	0.48	0.64
		3	17.23	1.69	17.80	140.2	7.86	832.52	1012.4	0.49	0.64
		4	16.93	1.76	18.28	140.3	7.84	834.84	1012.4	0.49	0.65
		5	16.82	1.83	19.23	142.9	7.82	844.06	1012.4	0.50	0.64
		6	16.92	1.89	19.51	145.5	7.81	840.54	1012.4	0.49	0.64
		7	16.98	1.88	19.50	147.9	7.81	837.53	1012.4	0.49	0.64
		8	16.96	1.92	20.13	151.8	7.81	837.86	1012.4	0.49	0.65
		9	16.95	2.05	21.57	166.3	7.80	840.20	1012.4	0.50	0.65
		10	17.00	2.15	23.75	166.6	7.79	843.13	1012.4	0.50	0.65
		11	17.09	2.46	25.93	165.3	7.79	841.80	1012.4	0.49	0.64
		12	17.01	2.51	26.14	167.4	7.79	842.12	1012.4	0.49	0.64
								Remarks:			

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	In-Situ Smar TROLL MP Handheld Instrument + Low Flow Sampling System. Geotech Geopump Peristaltic Pump.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
BH1 (50mm)	09/07/2019													Could not be monitored. Position covered.
	10/07/2019													Could not be monitored. Position covered.

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
BH02 (50mm)	09/07/2019	14:05:00	1014	-0.12									22.0	
		15s								5.5				PID
		30s								5.0				
		45s								3.8				
		1m								3.6				
		15s								2.8				
		30s								2.6				
		45s								2.2				
		2m								1.9				
		15s			0.0	0.3	19.7	6	1					GAS
		30s			0.0	0.3	19.6	6	1					
		45s			0.0	0.3	19.6	6	1					
		1m			0.0	0.3	19.7	6	1					
		15s			0.0	0.3	19.8	5	1					
		30s			0.0	0.2	19.9	5	1					
		45s			0.0	0.2	19.9	4	1					
		2m			0.0	0.2	20.0	4	1					
		3m			0.0	0.1	20.0	3	1					
		4m			0.0	0.1	20.1	3	1					
		5m			0.0	0.1	20.1	3	1					
		1m									-3.4			FLOW
		2m									-1.6			
		3m									-1.1			
		4m									-0.8			
		5m									-0.7			
		14:18:00	1014									1.09		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
BH04 (50mm)	09/07/2019	13:30:00	1016	-16.30									22.0	
		15s								14.1				PID
		30s								8.9				
		45s								1.6				
		1m								0.3				
		15s								0.0				
		30s								0.2				
		45s								0.2				
		2m								0.0				
		15s			0.0	3.0	18.3	1	0					GAS
		30s			0.0	3.1	13.9	1	0					
		45s			0.0	3.1	13.0	2	0					
		1m			0.0	3.1	12.8	2	0					
		15s			0.0	3.1	12.8	2	0					
		30s			0.0	3.1	12.7	2	0					
		45s			0.0	3.1	12.7	2	0					
		2m			0.0	3.1	12.7	2	0					
		3m			0.0	3.1	12.7	2	0					
		4m			0.0	3.0	12.7	2	0					
		5m			0.0	2.9	12.6	2	0					
		1m									-13.7			FLOW
		2m									-10.2			
		3m									-8.7			
		4m									-5.0			
		5m									-3.4			
		13:43:00	1016									2.13		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
WS02 (50mm)	09/07/2019	14:00:00	1016	-0.07									22.0	
		15s								0.6				PID
		30s								0.3				
		45s								0.2				
		1m								0.2				
		15s								0.2				
		30s								0.2				
		45s								0.3				
		2m								0.3				
		15s			0.0	3.1	20.0	3	1					GAS
		30s			0.0	3.2	18.5	2	1					
		45s			0.0	3.3	18.1	2	1					
		1m			0.0	3.4	18.0	2	1					
		15s			0.0	3.5	18.0	2	1					
		30s			0.0	3.5	18.0	2	1					
		45s			0.0	3.5	18.0	2	1					
		2m			0.0	3.5	18.0	2	1					
		3m			0.0	3.5	18.1	1	1					
		4m			0.0	3.5	18.3	1	1					
		5m			0.0	3.5	18.4	1	1					
		1m									0.1			FLOW
		2m									0.1			
		3m									0.1			
		4m									0.1			
		5m									0.1			
		14:13:00	1016									3.30		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
WS03 (50mm)	09/07/2019	14:30:00	1013	-0.12									22.0	
		15s								0.6				PID
		30s								0.6				
		45s								0.7				
		1m								0.7				
		15s								0.7				
		30s								0.8				
		45s								0.8				
		2m								0.8				
		15s			0.1	0.1	21.4	0	1					GAS
		30s			0.1	0.7	21.0	0	1					
		45s			0.1	0.7	20.8	0	1					
		1m			0.0	0.7	20.7	0	1					
		15s			0.0	0.7	20.7	0	1					
		30s			0.0	0.7	20.6	0	1					
		45s			0.0	0.6	20.6	0	1					
		2m			0.0	0.6	20.5	0	1					
		3m			0.0	0.6	20.4	0	1					
		4m			0.0	0.7	20.3	0	1					
		5m			0.0	0.7	20.2	0	1					
		1m									0.1			FLOW
		2m									0.1			
		3m									0.1			
		4m									0.1			
		5m									0.1			
		14:43:00	1013									1.89		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
WS04 (50mm)	09/07/2019	13:40:00	1015	0.02									22.0	
		15s								5.2				PID
		30s								6.0				
		45s								7.1				
		1m								7.2				
		15s								7.4				
		30s								7.6				
		45s								7.7				
		2m								7.8				
		15s			0.1	0.4	19.1	2	0					GAS
		30s			0.1	0.4	18.8	2	0					
		45s			0.1	0.4	18.7	2	0					
		1m			0.0	0.4	18.6	2	0					
		15s			0.0	0.4	18.5	2	0					
		30s			0.0	0.4	18.4	2	0					
		45s			0.0	0.3	18.4	2	0					
		2m			0.0	0.3	18.3	2	0					
		3m			0.0	0.3	18.1	1	0					
		4m			0.0	0.3	17.9	0	0					
		5m			0.0	0.3	17.8	0	0					
		1m									0.0			FLOW
		2m									0.0			
		3m									0.0			
		4m									0.0			
		5m									0.0			
		13:53:00	1015									1.42		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
BH01 (50mm)	18/07/2019	10:30:00	1003	-5.32									20.0	
		15s								3.6				PID
		30s								3.4				
		45s								3.2				
		1m								3.1				
		15s								2.9				
		30s								2.8				
		45s								2.1				
		2m								2.0				
		15s			0.0	1.2	18.1	2	0					GAS
		30s			0.0	1.3	17.4	2	0					
		45s			0.0	1.4	17.0	2	0					
		1m			0.0	1.4	16.9	2	0					
		15s			0.0	1.4	17.0	2	0					
		30s			0.0	1.3	17.1	2	0					
		45s			0.0	1.3	17.2	2	0					
		2m			0.0	1.1	17.4	2	0					
		3m			0.0	1.1	17.3	2	0					
		4m			0.0	1.0	17.7	2	0					
		5m			0.0	1.0	17.6	2	0					
		1m									-2.6			FLOW
		2m									-1.8			
		3m									-1.4			Base of install: 15.06
		4m									-1.0			Purged: 68 litres
		5m									-0.9			Post purge water/sample level: 7.35
		10:43:00	1003									3.70		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
BH02 (50mm)	18/07/2019	09:45:00	1004	-8.92									20.0	
		15s								1.8				PID
		30s								1.8				
		45s								1.9				
		1m								1.8				
		15s								1.7				
		30s								1.7				
		45s								1.7				
		2m								1.7				
		15s			0.1	0.8	19.5	2	0					GAS
		30s			0.1	0.8	19.2	3	0					
		45s			0.1	0.8	19.1	3	0					
		1m			0.1	0.7	19.3	2	0					
		15s			0.1	0.7	19.4	2	0					
		30s			0.1	0.6	19.5	2	0					
		45s			0.1	0.6	19.6	2	0					
		2m			0.1	0.5	19.7	2	0					
		3m			0.1	0.5	19.6	2	0					
		4m			0.1	0.5	19.5	1	0					
		5m			0.1	0.6	19.2	2	0					
		1m									-2.7			FLOW
		2m									-0.9			Initial Flow: -14.7
		3m									-0.5			
		4m									-0.4			
		5m									-0.2			
		09:58:00	1004									1.12		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
BH04 (50mm)	18/07/2019	11:10:00	1004	-36.34									21.0	
		15s								5.4				PID
		30s								6.3				
		45s								6.7				
		1m								6.9				
		15s								7.0				
		30s								7.1				
		45s								7.2				
		2m								7.2				
		15s			0.0	4.6	10.5	3	0					GAS
		30s			0.0	4.6	8.9	4	0					
		45s			0.0	4.6	8.7	4	0					
		1m			0.0	4.6	8.7	5	0					
		15s			0.0	4.7	8.7	5	0					
		30s			0.0	4.7	8.6	5	0					
		45s			0.0	4.7	8.6	5	0					
		2m			0.0	4.7	8.6	5	0					
		3m			0.0	4.7	8.5	5	0					
		4m			0.0	4.7	8.5	5	0					
		5m			0.0	4.7	8.5	5	0					
		1m									-21.8			FLOW
		2m									-16.5			Initial Flow: -26.0
		3m									-10.2			
		4m									-7.9			
		5m									-5.3			
		11:23:00	1004									2.12		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
WS02 (50mm)	18/07/2019	10:50:00	1003	0.02									21.0	
		15s								0.8				PID
		30s								0.8				
		45s								0.7				
		1m								0.7				
		15s								0.6				
		30s								0.6				
		45s								0.5				
		2m								0.5				
		15s			0.0	3.5	18.1	2	0					GAS
		30s			0.0	3.5	17.6	1	0					
		45s			0.0	3.5	17.5	1	0					
		1m			0.0	3.5	17.5	1	0					
		15s			0.0	3.6	17.5	1	0					
		30s			0.0	3.6	17.5	1	0					
		45s			0.0	3.6	17.5	1	0					
		2m			0.0	3.6	17.5	1	0					
		3m			0.0	3.6	17.5	1	0					
		4m			0.0	3.6	17.5	1	0					
		5m			0.0	3.5	17.5	1	0					
		1m									0.3			FLOW
		2m									0.3			
		3m									0.3			
		4m									0.2			
		5m									0.2			
		11:03:00	1003									3.11		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
WS03 (50mm)	18/07/2019	11:30:00	1004	-0.09									21.0	
		15s								4.3				PID
		30s								5.1				
		45s								5.3				
		1m								5.4				
		15s								5.5				
		30s								5.5				
		45s								5.5				
		2m								5.6				
		15s			0.0	0.5	20.3	3	0					GAS
		30s			0.0	0.5	20.3	3	0					
		45s			0.0	0.5	20.3	3	0					
		1m			0.0	0.5	20.3	3	0					
		15s			0.0	0.5	20.2	3	0					
		30s			0.0	0.5	20.2	3	0					
		45s			0.0	0.5	20.2	3	0					
		2m			0.0	0.5	20.2	3	0					
		3m			0.0	0.5	20.2	3	0					
		4m			0.0	0.5	20.2	3	0					
		5m			0.0	0.5	20.2	3	0					
		1m									0.1			FLOW
		2m									0.1			
		3m									0.1			
		4m									0.1			
		5m									0.1			
		11:43:00	1004									1.81		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
WS04 (50mm)	18/07/2019	10:10:00	1004	-3.63									20.0	
		15s								4.2				PID
		30s								5.1				
		45s								5.7				
		1m								6.0				
		15s								6.1				
		30s								6.2				
		45s								6.3				
		2m								6.4				
		15s			0.0	0.3	20.0	4	0					GAS
		30s			0.1	0.3	19.7	5	0					
		45s			0.1	0.3	19.7	5	0					
		1m			0.1	0.3	19.6	5	0					
		15s			0.0	0.4	19.5	4	0					
		30s			0.0	0.5	19.3	4	0					
		45s			0.0	0.6	19.0	3	0					
		2m			0.0	0.7	18.7	2	0					
		3m			0.0	0.8	18.6	2	0					
		4m			0.0	0.9	18.5	2	0					
		5m			0.0	0.9	18.5	2	0					
		1m									0.1			FLOW
		2m									0.2			
		3m									0.2			
		4m									0.2			
		5m									0.2			
		10:23:00	1004									1.49		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
BH01 (50mm)	25/07/2019	10:20:00	1005	-0.43									27.0	
		10:21:00								1.8				PID
		10:22:00								1.9				
		10:23:00								1.9				
		10:24:00								1.9				
		10:25:00								2.0				
		10:26:00			0.0	1.2	18.1	2	0					GAS
		10:27:00			0.0	1.3	17.4	2	0					
		10:28:00			0.0	1.4	17.0	2	0					
		10:29:00			0.0	1.4	16.9	2	0					
		10:30:00			0.0	1.4	17.0	2	0					
		10:31:00									0.1			FLOW
		10:32:00									0.1			
		10:33:00									0.1			
		10:34:00									0.1			
		10:35:00									0.1			
		10:36:00	1005									3.81		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
BH02 (50mm)	25/07/2019	11:40:00	1005	0.24									27.0	
		11:41:00								4.2				PID
		11:42:00								3.2				
		11:43:00								2.6				
		11:44:00								2.5				
		11:45:00								2.6				
		11:46:00			0.0	0.6	20.0	5	0					GAS
		11:47:00			0.0	0.4	20.5	4	0					
		11:48:00			0.0	0.3	20.6	4	0					
		11:49:00			0.0	0.4	20.2	4	0					
		11:50:00			0.0	0.5	19.7	4	0					
		11:51:00									0.1			FLOW
		11:52:00									0.1			
		11:53:00									0.1			
		11:54:00									0.1			
		11:55:00									0.1			
		11:56:00	1005									0.97		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
BH04 (50mm)	25/07/2019	11:00:00	1005	3.80									26.0	
		11:01:00								7.2				PID
		11:02:00								7.1				
		11:03:00								6.7				
		11:04:00								6.0				
		11:05:00								5.6				
		11:06:00			0.0	5.4	7.0	1	0					GAS
		11:07:00			0.0	5.2	7.0	2	0					
		11:08:00			0.0	5.0	7.2	2	0					
		11:09:00			0.0	4.9	7.4	2	0					
		11:10:00			0.0	4.8	7.4	2	0					
		11:11:00									4.8			FLOW
		11:12:00									3.5			
		11:13:00									2.5			
		11:14:00									1.8			
		11:15:00									1.5			
		11:16:00	1005									1.98		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
WS02 (50mm)	25/07/2019	10:40:00	1005	-0.10									25.0	
		10:41:00								1.6				PID
		10:42:00								1.3				
		10:43:00								1.1				
		10:44:00								1.0				
		10:45:00								1.0				
		10:46:00			0.1	2.9	19.1	1	0					GAS
		10:47:00			0.1	2.9	19.2	0	0					
		10:48:00			0.1	2.9	19.3	0	0					
		10:49:00			0.1	2.9	19.3	0	0					
		10:50:00			0.1	2.9	19.3	0	0					
		10:51:00									0.0			FLOW
		10:52:00									0.0			
		10:53:00									0.0			
		10:54:00									0.0			
		10:55:00									0.0			
		10:56:00	1005									2.37		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
WS03 (50mm)	25/07/2019	11:20:00	1004	0.05									27.0	
		11:21:00								7.1				PID
		11:22:00								7.0				
		11:23:00								6.8				
		11:24:00								6.7				
		11:25:00								6.6				
		11:26:00			0.1	0.9	19.9	0	1					GAS
		11:27:00			0.1	0.8	19.8	0	1					
		11:28:00			0.1	0.8	19.8	0	1					
		11:29:00			0.1	0.8	19.7	0	1					
		11:30:00			0.1	0.9	19.6	0	1					
		11:31:00									0.0			FLOW
		11:32:00									0.0			
		11:33:00									0.0			
		11:34:00									0.0			
		11:35:00									0.0			
		11:36:00	1004									1.91		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
WS04 (50mm)	25/07/2019	12:00:00	1005	0.48									30.0	
		12:01:00								4.0				PID
		12:02:00								4.1				
		12:03:00								4.3				
		12:04:00								3.2				
		12:05:00								2.4				
		12:06:00			0.1	0.7	20.2	4	0					GAS
		12:07:00			0.1	0.7	20.1	4	0					
		12:08:00			0.1	0.7	20.0	4	0					
		12:09:00			0.1	0.8	19.6	3	0					
		12:10:00			0.1	1.2	18.9	2	0					
		12:11:00									0.0			FLOW
		12:12:00									0.0			
		12:13:00									0.0			
		12:14:00									0.0			
		12:15:00									0.0			
		12:16:00	1005									1.52		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
BH01 (50mm)	02/08/2019	10:00:00	1014	-15.05									21.0	
		15s								0.7				PID
		30s								1.0				
		45s								1.2				
		1m								1.3				
		15s								1.4				
		30s								1.4				
		45s								1.5				
		2m								1.5				
		15s			0.0	3.2	16.5	5	0					GAS
		30s			0.0	3.2	15.6	5	0					
		45s			0.0	3.2	15.5	5	0					
		1m			0.0	3.2	15.5	5	0					
		15s			0.0	3.2	15.5	5	0					
		30s			0.0	3.2	15.5	5	0					
		45s			0.0	3.2	15.5	5	0					
		2m			0.0	3.2	15.5	5	0					
		3m			0.0	3.2	15.5	5	0					
		4m			0.0	3.2	15.5	5	0					
		5m			0.0	3.2	15.5	5	0					
		1m									-6.1			FLOW
		2m									-5.0			
		3m									-4.1			
		4m									-3.6			
		5m									-3.2			
		10:13:00	1014									3.91		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
BH02 (50mm)	02/08/2019	10:45:00												PID
		15s												
		30s												
		45s												
		1m												
		15s												
		30s												
		45s												
		2m												
		15s												GAS
		30s				Could not monitor. Car parked over cover in compound.								
		45s												
		1m												
		15s												
		30s												
		45s												
		2m												
		3m												
		4m												
		5m												
		1m												FLOW
		2m												
		3m												
		4m												
		5m												

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
BH04 (50mm)	02/08/2019	11:40:00	1014	-56.53									21.0	
		15s								2.7				PID
		30s								2.8				
		45s								2.9				
		1m								4.5				
		15s								4.6				
		30s								4.6				
		45s								4.7				
		2m								4.7				
		15s			0.0	5.8	8.0	4	0					GAS
		30s			0.0	5.9	6.0	5	0					
		45s			0.0	5.9	5.9	5	0					
		1m			0.0	5.9	5.8	5	0					
		15s			0.0	5.9	5.8	5	0					
		30s			0.0	5.9	5.8	5	0					
		45s			0.0	5.9	5.8	5	0					
		2m			0.0	5.9	5.7	5	0					
		3m			0.0	5.9	5.7	5	0					
		4m			0.0	5.9	5.7	5	0					
		5m			0.0	5.9	5.7	5	0					
		1m									-13.6			FLOW
		2m									-9.3			
		3m									-5.5			
		4m									-3.1			
		5m									-2.3			
		11:53:00	1014									1.86		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
WS02 (50mm)	02/08/2019	11:15:00	1014	0.02									21.0	
		15s								0.1				PID
		30s								0.2				
		45s								0.3				
		1m								0.3				
		15s								0.3				
		30s								0.3				
		45s								0.3				
		2m								0.4				
		15s			0.0	2.7	18.0	3	0					GAS
		30s			0.0	2.7	17.9	2	0					
		45s			0.0	2.7	17.9	2	0					
		1m			0.0	2.7	17.9	2	0					
		15s			0.0	2.7	18.0	2	0					
		30s			0.0	2.6	18.0	2	0					
		45s			0.0	2.6	18.0	2	0					
		2m			0.0	2.6	18.0	2	0					
		3m			0.0	2.6	18.0	2	0					
		4m			0.0	2.6	18.1	2	0					
		5m			0.0	2.6	18.1	2	0					
		1m									0.0			FLOW
		2m									0.0			
		3m									0.0			
		4m									0.0			
		5m									0.0			
		11:28:00	1014									3.39		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
WS03 (50mm)	02/08/2019	12:00:00	1014	0.02									21.0	
		15s								4.2				PID
		30s								4.1				
		45s								4.2				
		1m								4.2				
		15s								4.4				
		30s								4.4				
		45s								4.5				
		2m								4.5				
		15s			0.0	0.4	19.6	4	0					GAS
		30s			0.0	0.4	19.9	4	0					
		45s			0.0	0.4	19.9	3	0					
		1m			0.0	0.4	19.9	3	0					
		15s			0.0	0.4	20.0	4	0					
		30s			0.0	0.4	20.0	4	0					
		45s			0.0	0.3	20.0	3	0					
		2m			0.0	0.3	20.0	4	0					
		3m			0.0	0.3	20.0	3	0					
		4m			0.0	0.3	20.1	3	0					
		5m			0.0	0.4	20.1	4	0					
		1m									0.2			FLOW
		2m									0.1			
		3m									0.1			
		4m									0.1			
		5m									0.1			
		12:13:00	1014									1.93		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

Gas and Groundwater Monitoring

Borehole	Date	Time	Barometric Pressure (mb)	Differential Pressure (mb)	Methane (%)	Carbon Dioxide (%)	Oxygen (min) (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID VOCs (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (mbgl)	Temperature (ºC)	Comments
WS04 (50mm)	02/08/2019	10:30:00	1014	-4.13									20.0	
		15s								6.6				PID
		30s								6.9				
		45s								7.0				
		1m								7.0				
		15s								7.0				
		30s								6.9				
		45s								6.9				
		2m								6.9				
		15s			0.0	1.2	18.6	4	0					GAS
		30s			0.0	1.2	18.1	4	0					
		45s			0.0	1.2	18.1	4	0					
		1m			0.0	1.3	18.0	4	0					
		15s			0.0	1.4	17.9	4	0					
		30s			0.0	1.6	17.8	3	0					
		45s			0.0	1.6	17.8	3	0					
		2m			0.0	2.0	17.6	3	0					
		3m			0.0	2.0	17.5	2	0					
		4m			0.0	2.2	17.5	2	0					
		5m			0.0	2.3	17.5	2	0					
		1m									0.1			FLOW
		2m									0.3			
		3m									0.3			
		4m									0.3			
		5m									0.3			
		10:42:00	1014									1.52		

CC Ground Investigations Ltd

Contract Name:	Carnival Phase 2
Contract ID:	C6411
Client:	Wokingham Borough Council
Instrument used:	GA5000 Gas analyser. MiniRAE Lite PID. Geotechnical Instruments dip meter.

APPENDIX G

SPT Calibration Certificate

CC Ground Investigations Limited

STANDARD PENETRATION TEST

Telephone: 01452 739165, Fax: 01452 739220, Email: info@ccground.co.uk

CC Ground Investigations Ltd

Client:	Wokingham Borough Council	Contract:	C6411
Site:	Carnival Phase II	Checked:	RT

Notes:

1 Test carried out in general accordance with BS EN ISO 22476: Part 3 (2005)+A1: 2011

2 N values have not been subjected to any correction.

3 Test carried out using split spoon S, solid cone C.

4 Where full test drive not completed, linearly extrapolated N value reported.

5 <1 Denotes hammer self weight penetration (sank under own weight).

6 ** Denotes no effective penetration.

BH	Top Depth (m)	Type	Seating Blows	Blows Main Test	Total Penetration (mm)	Casing Depth (m)	Water Depth (m)	Self-Weight Penetration (mm)	Blows 1	Blows 2	Blows 3	Blows 4	Blows 5	Blows 6	Pen 1 (mm)	Pen 2 (mm)	Pen 3 (mm)	Pen 4 (mm)	Pen 5 (mm)	Pen 6 (mm)	Spt 'N' Value	SPT Reported Result	Hammer Serial Number	Hammer Energy Ratio (%)
BH01	2.20	S	1	4	450			450	1	0	1	1	1	1	75	75	75	75	75	75	4	S 4	CC04	77
BH01	3.20	S	3	8	450			450	1	2	2	2	2	2	75	75	75	75	75	75	8	S 8	CC04	77
BH01	4.20	S	4	8	450			450	1	2	2	2	2	2	75	75	75	75	75	75	8	S 8	CC04	77
BH01	4.70	S	3	11	450			450	1	2	2	3	3	3	75	75	75	75	75	75	11	S 11	CC04	77
BH01	5.70	S	7	26	450			450	3	4	6	7	7	6	75	75	75	75	75	75	26	S 26	CC04	77
BH01	7.20	S	6	22	450	7.20		450	3	3	4	5	6	7	75	75	75	75	75	75	22	S 22	CC04	77
BH01	8.70	S	6	18	450	7.20	1.87	450	3	3	4	3	6	5	75	75	75	75	75	75	18	S 18	CC04	77
BH01	10.20	S	5	29	450	7.20	1.71	450	2	3	4	5	10	10	75	75	75	75	75	75	29	S 29	CC04	77
BH01	11.70	S	7	23	450	7.20	1.94	450	3	4	3	4	7	9	75	75	75	75	75	75	23	S 23	CC04	77
BH01	13.20	S	10	30	450	7.20	2.88	450	5	5	6	7	7	10	75	75	75	75	75	75	30	S 30	CC04	77
BH01	14.70	S	12	37	450	7.20	3.42	450	6	6	7	8	10	12	75	75	75	75	75	75	37	S 37	CC04	77
BH01	16.20	S	13	38	450	7.20	4.88	450	6	7	7	10	10	11	75	75	75	75	75	75	38	S 38	CC04	77
BH01	17.70	S	15	36	450	7.20	5.62	450	8	7	9	8	9	10	75	75	75	75	75	75	36	S 36	CC04	77
BH01	19.20	S	10	37	450	7.20	6.60	450	5	5	6	10	11	10	75	75	75	75	75	75	37	S 37	CC04	77
BH01	20.70	S	12	28	450	7.20	4.76	450	6	6	6	8	8	7	75	75	75	75	75	75	28	S 28	CC04	77
BH01	22.20	S	8	28	450	7.20	5.01	450	3	5	6	6	8	8	75	75	75	75	75	75	28	S 28	CC04	77
BH01	23.70	S	10	36	450	7.20	5.46	450	4	6	6	5	6	8	75	75	75	75	75	75	36	S 36	CC04	77
BH01	25.20	S	11	33	450	7.20	5.09	450	6	5	7	8	9	9	75	75	75	75	75	75	33	S 33	CC04	77
BH02	2.20	S	4	13	450			0	2	2	3	3	3	4	75	75	75	75	75	75	13	S 13	CC01	72
BH02	3.20	S	5	9	450	3.20		0	2	3	2	2	3	2	75	75	75	75	75	75	9	S 9	CC01	72
BH02	4.70	S	3	9	450	3.20	1.27	0	3	9	2	2	3	2	75	75	75	75	75	75	9	S 9	CC01	72
BH02	6.20	S	4	14	450	3.20	1.19	0	2	2	3	3	4	4	75	75	75	75	75	75	14	S 14	CC01	72
BH02	7.70	S	6	16	450	3.20	1.52	0	3	3	4	3	4	5	75	75	75	75	75	75	16	S 16	CC01	72
BH02	9.20	S	5	35	450	3.20	1.47	0	2	3	7	9	9	10	75	75	75	75	75	75	35	S 35	CC01	72
BH02	10.70	S	6	35	450	3.20	1.47	0	2	4	7	9	9	10	75	75	75	75	75	75	35	S 35	CC01	72

CC Ground Investigations Limited

STANDARD PENETRATION TEST

Telephone: 01452 739165, Fax: 01452 739220, Email: info@ccground.co.uk

CC Ground Investigations Ltd

Client:	Wokingham Borough Council	Contract:	C6411
Site:	Carnival Phase II	Checked:	RT

Notes:

1 Test carried out in general accordance with BS EN ISO 22476: Part 3 (2005)+A1: 2011

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4 Where full test drive not completed, linearly extrapolated N value reported.

5 <1 Denotes hammer self weight penetration (sank under own weight).

6 ** Denotes no effective penetration.

BH	Top Depth (m)	Type	Seating Blows	Blows Main Test	Total Penetration (mm)	Casing Depth (m)	Water Depth (m)	Self-Weight Penetration (mm)	Blows 1	Blows 2	Blows 3	Blows 4	Blows 5	Blows 6	Pen 1 (mm)	Pen 2 (mm)	Pen 3 (mm)	Pen 4 (mm)	Pen 5 (mm)	Pen 6 (mm)	Spt 'N' Value	SPT Reported Result	Hammer Serial Number	Hammer Energy Ratio (%)
BH02	12.20	S	7	27	450	3.20	1.52	0	3	4	6	7	6	8	75	75	75	75	75	75	27	S 27	CC01	72
BH02	13.70	S	7	30	450	3.20	1.81	0	3	4	5	7	9	9	75	75	75	75	75	75	30	S 30	CC01	72
BH02	15.20	S	7	26	450	3.20	1.79	0	3	4	5	6	8	7	75	75	75	75	75	75	26	S 26	CC01	72
BH03	2.20	S	3	8	450			0	1	2	1	2	2	3	75	75	75	75	75	75	8	S 8	CC01	72
BH03	3.20	S	5	13	450			0	2	3	3	3	3	4	75	75	75	75	75	75	13	S 13	CC01	72
BH03	3.70	S	6	15	450			0	3	3	3	4	3	3	75	75	75	75	75	75	15	S 15	CC01	72
BH03	4.70	S	4	8	450			0	2	2	2	2	2	2	75	75	75	75	75	75	8	S 8	CC01	72
BH03	5.70	S	5	11	450			0	2	3	3	2	3	3	75	75	75	75	75	75	11	S 11	CC01	72
BH03	7.20	S	3	12	450			0	1	2	3	3	3	3	75	75	75	75	75	75	12	S 12	CC01	72
BH03	8.70	S	5	17	450	5.70	1.59	0	2	3	4	4	5	4	75	75	75	75	75	75	17	S 17	CC01	72
BH03	10.20	S	6	23	450	5.70	2.21	0	3	3	4	5	7	7	75	75	75	75	75	75	23	S 23	CC01	72
BH03	11.70	S	5	21	450	5.70	1.96	0	2	3	4	5	6	6	75	75	75	75	75	75	21	S 21	CC01	72
BH03	13.20	S	7	24	450	5.70	1.84	0	3	4	4	5	7	8	75	75	75	75	75	75	24	S 24	CC01	72
BH03	14.70	S	8	27	450	5.70	2.92	0	4	4	5	7	8	7	75	75	75	75	75	75	27	S 27	CC01	72
BH03	16.20	S	8	25	450	5.70	3.07	0	4	4	5	6	6	8	75	75	75	75	75	75	25	S 25	CC01	72
BH03	17.70	S	8	24	450	5.70	3.12	0	4	4	6	5	6	7	75	75	75	75	75	75	24	S 24	CC01	72
BH03	19.20	S	9	25	450	5.70	3.68	0	4	5	5	6	7	7	75	75	75	75	75	75	25	S 25	CC01	72
BH03	20.70	S	10	31	450	5.70	3.72	0	4	6	7	7	8	9	75	75	75	75	75	75	31	S 31	CC01	72
BH03	22.20	S	11	29	450	5.70	3.88	0	5	6	6	7	8	8	75	75	75	75	75	75	29	S 29	CC01	72
BH03	23.70	S	10	32	450	5.70	5.29	0	5	5	6	8	8	10	75	75	75	75	75	75	32	S 32	CC01	72
BH04	2.20	S	1	7	450		2.20	0	1	0	1	2	2	2	75	75	75	75	75	75	7	S 7	CC01	72
BH04	3.20	S	4	15	450		3.20	0	2	2	3	3	4	5	75	75	75	75	75	75	15	S 15	CC01	72
BH04	3.70	S	4	10	450		3.70	0	2	2	2	3	3	2	75	75	75	75	75	75	10	S 10	CC01	72
BH04	4.70	S	5	17	450		4.70	0	2	3	3	4	5	5	75	75	75	75	75	75	17	S 17	CC01	72
BH04	5.70	S	5	18	450		5.70	0	2	3	4	4	5	5	75	75	75	75	75	75	18	S 18	CC01	72

CC Ground Investigations Limited

STANDARD PENETRATION TEST

Telephone: 01452 739165, Fax: 01452 739220, Email: info@ccground.co.uk

Client:	Wokingham Borough Council	Contract:	C6411
Site:	Carnival Phase II	Checked:	RT

Notes:

1 Test carried out in general accordance with BS EN ISO 22476: Part 3 (2005)+A1: 2011

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5 <1 Denotes hammer self weight penetration (sank under own weight).

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BH	Top Depth (m)	Type	Seating Blows	Blows Main Test	Total Penetration (mm)	Casing Depth (m)	Water Depth (m)	Self-Weight Penetration (mm)	Blows 1	Blows 2	Blows 3	Blows 4	Blows 5	Blows 6	Pen 1 (mm)	Pen 2 (mm)	Pen 3 (mm)	Pen 4 (mm)	Pen 5 (mm)	Pen 6 (mm)	Spt 'N' Value	SPT Reported Result	Hammer Serial Number	Hammer Energy Ratio (%)
BH04	7.20	S	7	16	450	5.70	1.53	0	4	3	3	3	5	5	75	75	75	75	75	75	16	S 16	CC01	72
BH04	8.70	S	4	17	450	5.70	2.00	0	2	2	3	4	5	5	75	75	75	75	75	75	17	S 17	CC01	72
BH04	10.20	S	5	20	450	5.70	1.39	0	2	3	4	5	5	6	75	75	75	75	75	75	20	S 20	CC01	72
BH04	11.70	S	9	29	450	5.70	1.52	0	4	5	5	5	9	10	75	75	75	75	75	75	29	S 29	CC01	72
BH04	13.20	S	7	24	450	5.70	2.14	0	3	4	5	5	6	8	75	75	75	75	75	75	24	S 24	CC01	72
BH04	14.70	S	7	21	450	5.70		0	3	4	4	5	6	6	75	75	75	75	75	75	21	S 21	CC01	72
WS02	1.20	S	4	10	450			0	2	2	2	4	2	2	75	75	75	75	75	75	10	S 10	T07	78
WS02	2.00	S	3	7	450			0	1	2	1	3	3	3	75	75	75	75	75	75	7	S 7	T07	78
WS02	3.00	S	0	0	450			450	0	0	0	0	0	0	75	75	75	75	75	75	0	S>1	T07	78
WS02	4.00	S	1	7	450			75	0	1	1	1	2	3	75	75	75	75	75	75	7	S 7	T07	78
WS02	5.00	S	5	15	450		3.80	0	2	3	3	4	4	4	75	75	75	75	75	75	15	S 15	T07	78
WS03	1.20	S	2	9	450			0	1	1	1	3	2	3	75	75	75	75	75	75	9	S 9	T07	78
WS03	2.00	S	3	12	450			0	1	2	2	3	3	4	75	75	75	75	75	75	12	S 12	T07	78
WS03	3.00	S	6	13	450			0	3	3	3	4	4	3	75	75	75	75	75	75	13	S 13	T07	78
WS03	4.00	S	4	15	450			0	2	2	3	3	4	5	75	75	75	75	75	75	15	S 15	T07	78
WS03	5.00	S	4	17	450			0	2	2	3	4	5	5	75	75	75	75	75	75	17	S 17	T07	78
WS04	1.00	S	2	7	450			0	1	1	1	1	2	3	75	75	75	75	75	75	7	S 7	T07	78
WS04	2.00	S	2	4	450			0	1	1	1	1	1	1	75	75	75	75	75	75	4	S 4	T07	78
WS04	3.00	S	3	11	450			0	1	2	2	2	3	4	75	75	75	75	75	75	11	S 11	T07	78
WS04	4.00	S	4	14	450			0	2	2	2	4	4	4	75	75	75	75	75	75	14	S 14	T07	78
WS04	5.00	S	3	15	450			0	1	2	3	3	4	5	75	75	75	75	75	75	15	S 15	T07	78

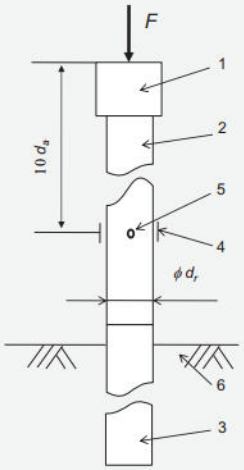
SPT Calibration Report

Hammer Energy Measurement Report

Type of Hammer		TERRIER
Test No		EQU2249
Client		CCGI
Test Depth (m)		9.00
Mass of hammer	m =	63.5kg
Falling height	h =	0.76m
E_{theor} =	$m \times g \times h$ =	473J

Characteristics of the instrumented rod

Diameter	d_r = 0.052 m
Length of instrumented rod	0.558 m
Area	A = 11.61 cm²
Modulus	E_a = 206843 MPa



Key

1 Anvil
2 Part of instrumented rod
3 Drive Rod
4 Strain Gauge
5 Accelerometer
6 Ground

F Force
d_r Diameter of rod

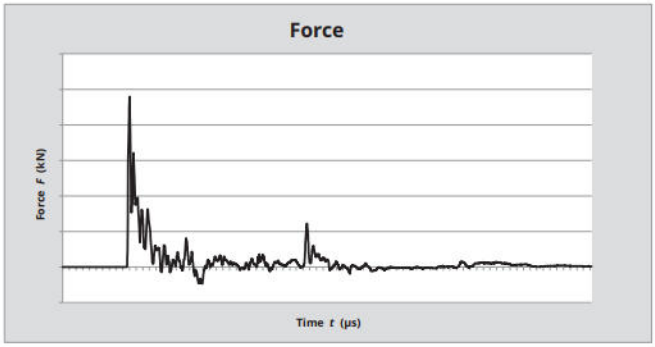
Fig. B.1 and B.2
BS EN ISO 22476-3 : 2005 + A1 : 2011

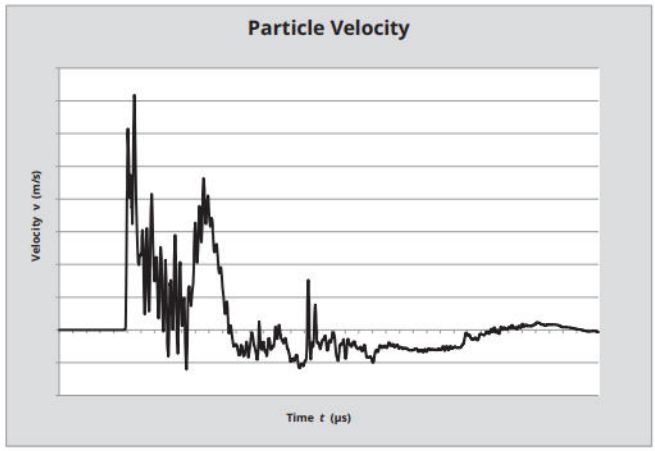
DATE OF TEST	VALID UNTIL	HAMMER ID
03/01/2019	03/01/2020	T07

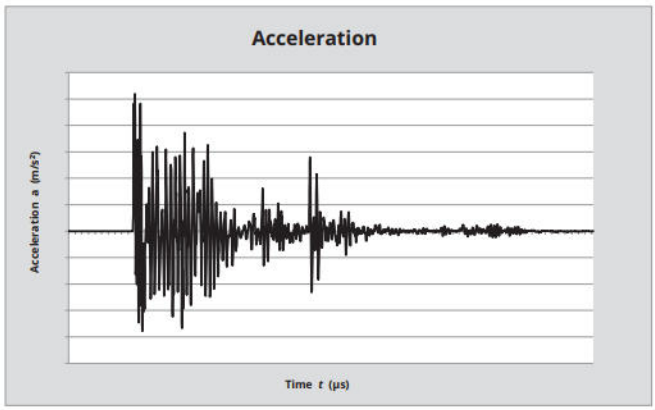
Observations:
1.

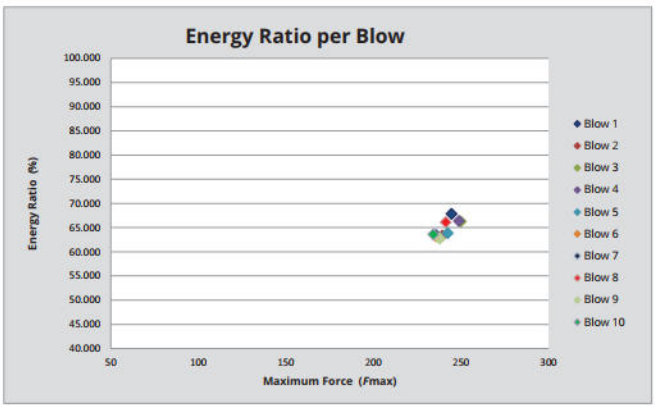
E_{meas} = **0.305** kN-m

E_{theor} = **0.473** kN-m









Energy Ratio (Er) = $\frac{E_{meas}}{E_{theor}}$ **64.47%**

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Equipe SPT Analyzer Operator	Certificate prepared by	Certificate checked by	Certificate date
AF	[redacted]	[redacted]	09/01/2019

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Tel: +44 (0)1295 670990 Fax: +44 (0)1295 678232 Email: info@equipegroup.com

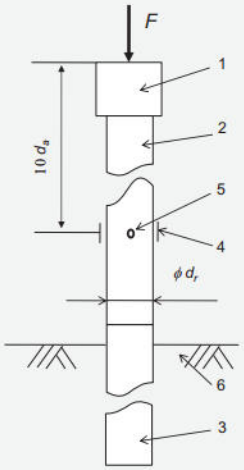
SPT Calibration Report

Hammer Energy Measurement Report

Type of Hammer	SPT HAMMER
Test No	EQU2240
Client	CCGI
Test Depth (m)	9.00
Mass of hammer	m = 63.5kg
Falling height	h = 0.76m
E_{theor} =	$m \times g \times h$ = 473J

Characteristics of the instrumented rod

Diameter	d_r = 0.052 m
Length of instrumented rod	0.558 m
Area	A = 11.61 cm²
Modulus	E_a = 206843 MPa



Key

1 Anvil
2 Part of instrumented rod
3 Drive Rod
4 Strain Gauge
5 Accelerometer
6 Ground

F Force
d_r Diameter of rod

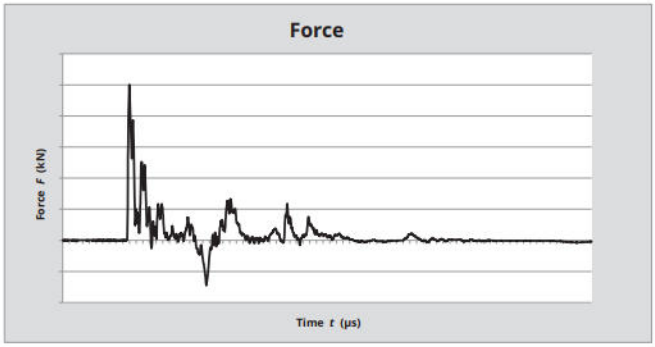
Fig. B.1 and B.2
BS EN ISO 22476-3 : 2005 + A1 : 2011

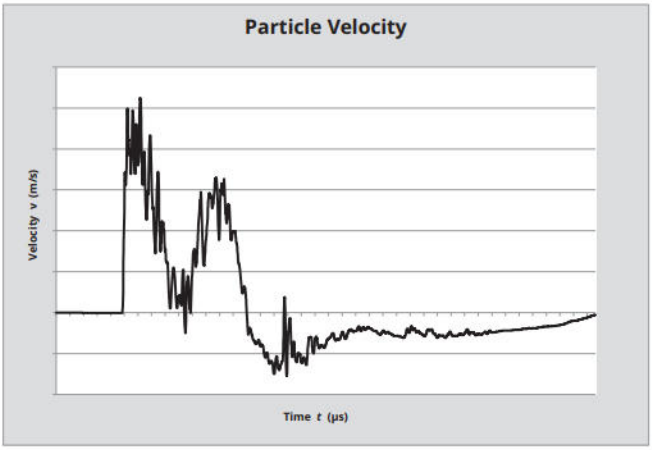
DATE OF TEST	VALID UNTIL	HAMMER ID
03/01/2019	03/01/2020	CC04

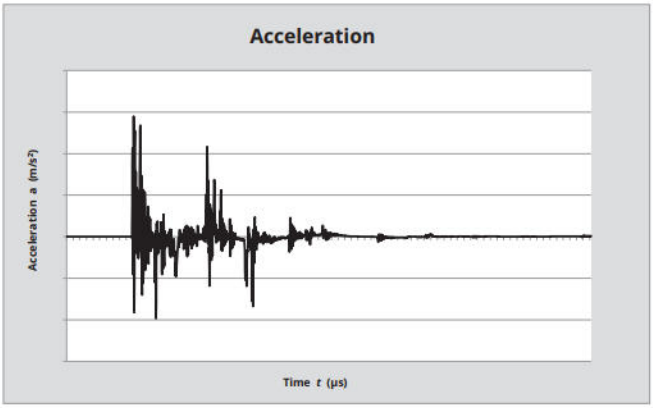
Observations:
1.

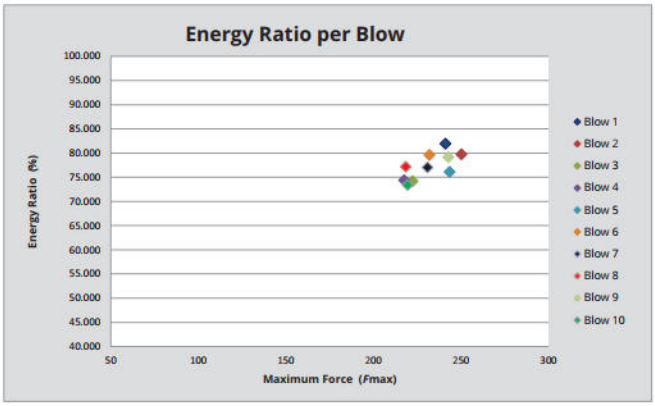
E_{meas} = **0.364** kN-m

E_{theor} = **0.473** kN-m









Energy Ratio (Er) = $\frac{E_{meas}}{E_{theor}}$ **77.00%**

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Equipe SPT Analyzer Operator	Certificate prepared by	Certificate checked by	Certificate date
AF	[redacted]	[redacted]	09/01/2019

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Tel: +44 (0)1295 670990 Fax: +44 (0)1295 678232 Email: info@equipegroup.com

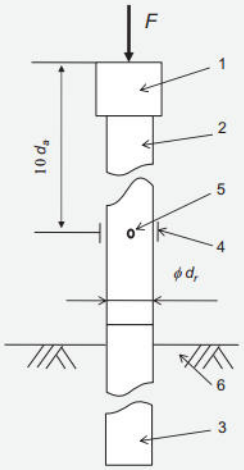
SPT Calibration Report

Hammer Energy Measurement Report

Type of Hammer		SPT HAMMER
Test No		EQU2239
Client		CCGI
Test Depth (m)		9.00
Mass of hammer	m =	63.5kg
Falling height	h =	0.76m
E_{theor} =	$m \times g \times h$ =	473J

Characteristics of the instrumented rod

Diameter	d_r =	0.052 m
Length of instrumented rod		0.558 m
Area	A =	11.61 cm²
Modulus	E_a =	206843 MPa



Key

1 Anvil
2 Part of instrumented rod
3 Drive Rod
4 Strain Gauge
5 Accelerometer
6 Ground

F Force
d_r Diameter of rod

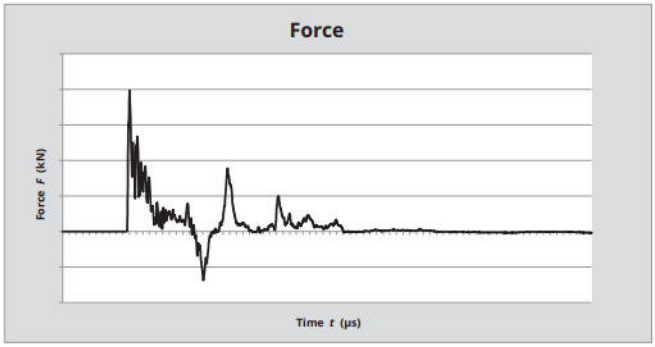
Fig. B.1 and B.2
BS EN ISO 22476-3 : 2005 + A1 : 2011

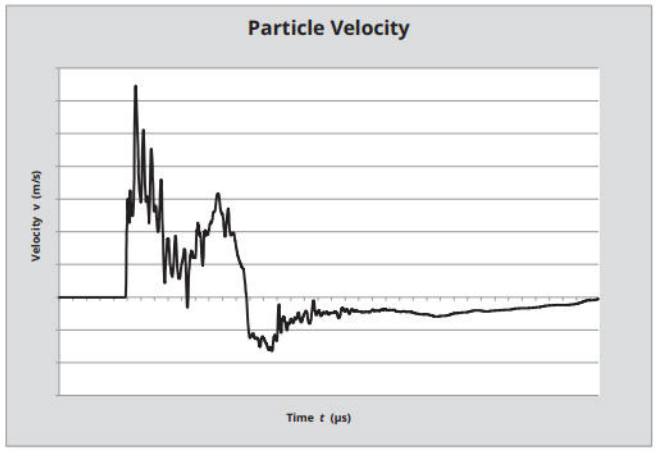
DATE OF TEST	VALID UNTIL	HAMMER ID
03/01/2019	03/01/2020	CC01

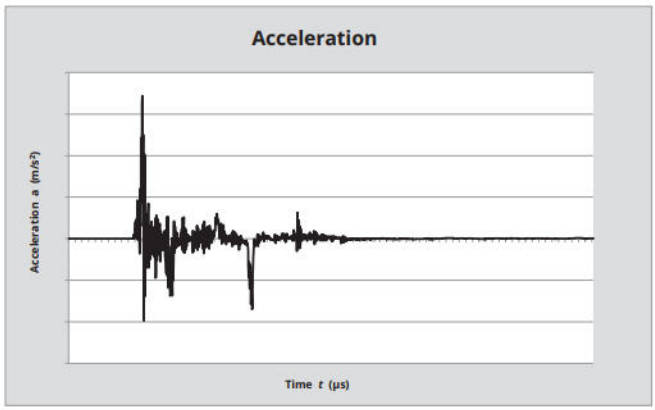
Observations:
1.

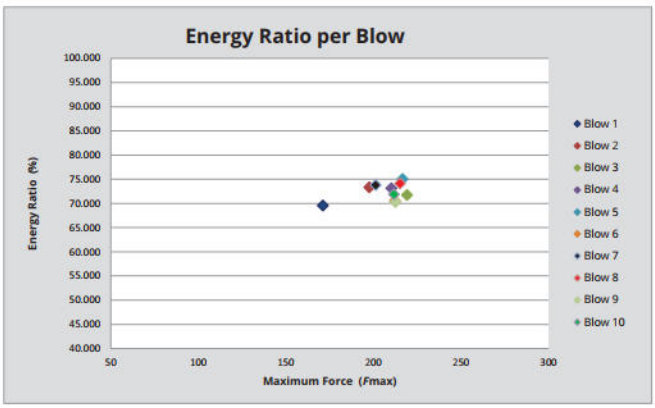
E_{meas} = **0.341** kN-m

E_{theor} = **0.473** kN-m









Energy Ratio (Er) = $\frac{E_{meas}}{E_{theor}}$ **72.09%**

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Equipe SPT Analyzer Operator	Certificate prepared by	Certificate checked by	Certificate date
AF	[redacted]	[redacted]	09/01/2019

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Tel: +44 (0)1295 670990 Fax: +44 (0)1295 678232 Email: info@equipegroup.com

Appendix B

Geotechnical parameter plots

B1 Geotechnical parameter plots

Figure B1 – SPT N60 Made Ground and Bagshot Formation

Figure B2 – PSD grading curves Made Ground

Figure B3 – Moisture content results

Figure B4 – Plasticity index results with elevation

Figure B5 – Plasticity index chart

Figure B6 – Dry density/moisture content relationship

Figure B7 – PSD grading curves Bagshot Formation

Figure B8 – PSD results for percent passing a 63µm sieve with depth

Figure B9 – PSD results for percent passing a 2µm sieve with depth

Figure B10 – Consolidated undrained triaxial results

Figure B11 – CPT cone resistance

Figure B12 – CPT friction ratio

Figure B13 – CPT cone resistance vs friction ratio

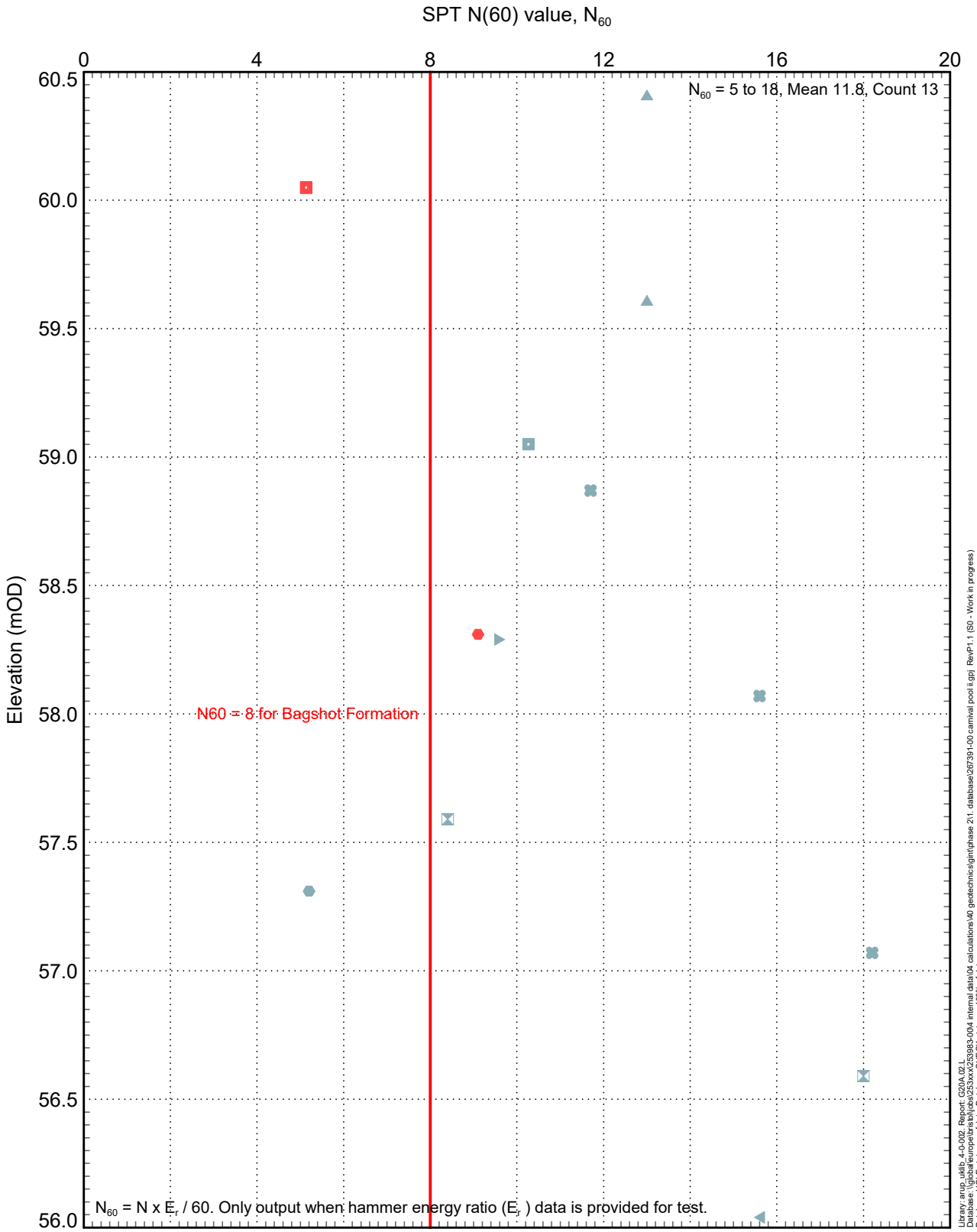
Figure B14 – Variation of friction angle estimated from plasticity index

Figure B15 – Undrained shear strength with elevation

Figure B16 – One dimensional consolidation test results

Figure B17 – SPT N60 London Clay

Figure B18 – PSD grading curves London Clay



Made Ground (MG)
Bagshot Formation (BAG)
WS02
WS03
WS04
BH01
BH02
BH03
BH04

ARUP

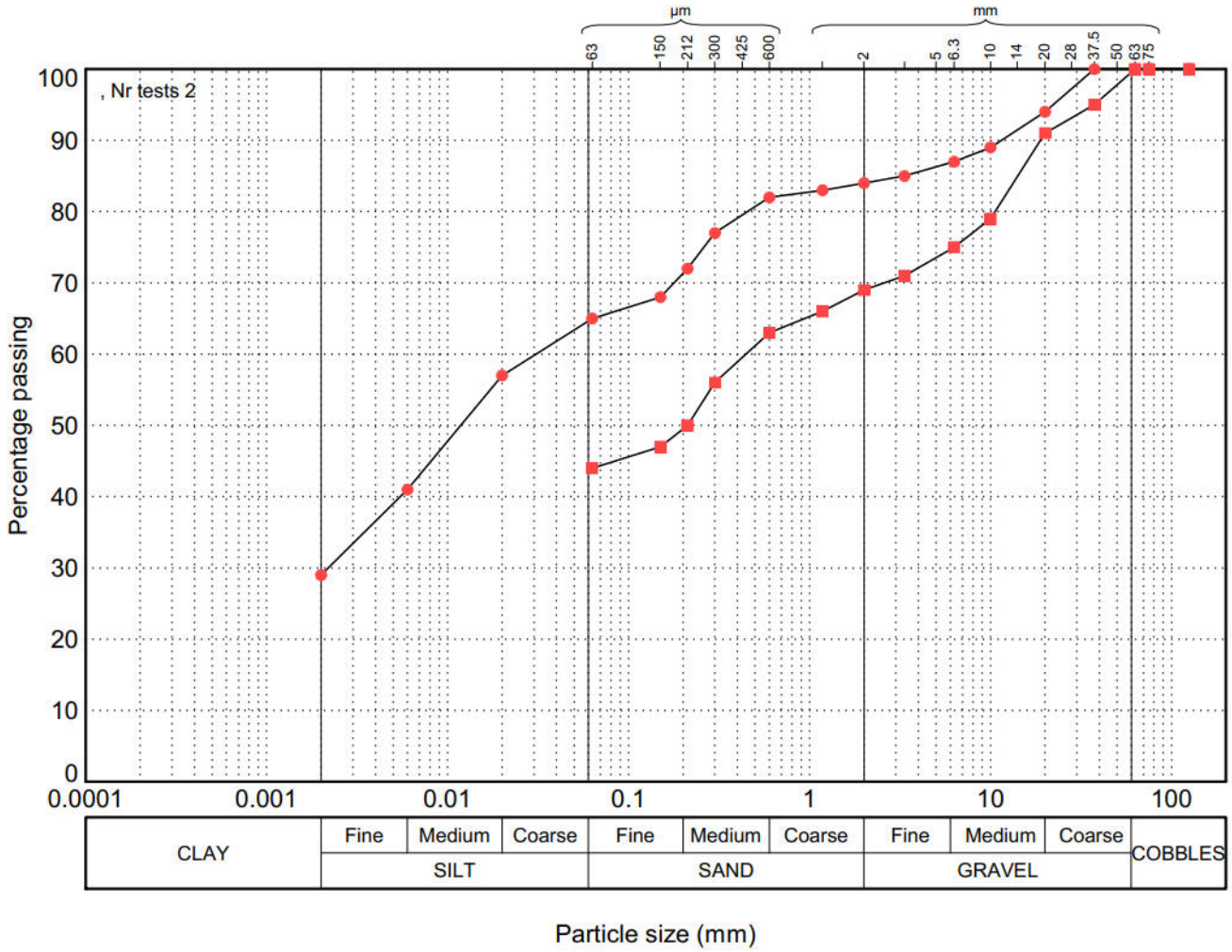
Job Title
Carnival Pool II Detailed Design

Figure Title
Standard penetration tests
MADE GROUND & BAGSHOT FORMATION

Job No
267391-00

Figure No
B.01

ARUP. gINT v8.30.004. Made by Nick Maddock on 11-Oct-19



Made Ground (MG)
TP3, 58.3mOD
BH04, 59.1mOD

ARUP

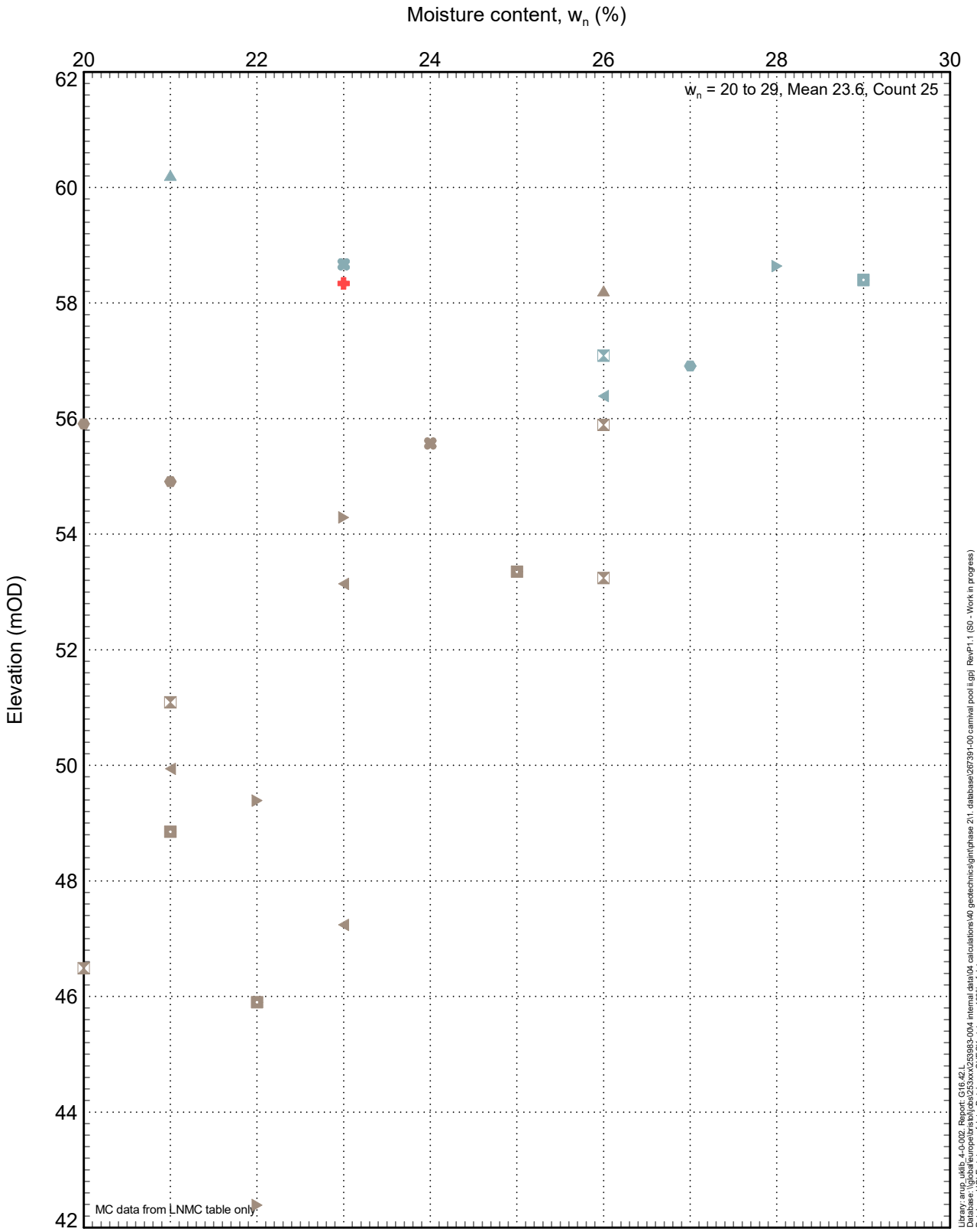
Job Title
Carnival Pool II Detailed Design

Figure Title
Particle size distribution
MADE GROUND

Job No
267391-00

Figure No
B.02

ARUP, gINT v8.30.004. Made by Nick Maddock on 11-Oct-19



- Made Ground (MG)
- Bagshot Formation (BAG)
- London Clay (LC)
- WS02
- WS03
- WS04
- TP3
- BH01
- BH02
- BH03
- BH04

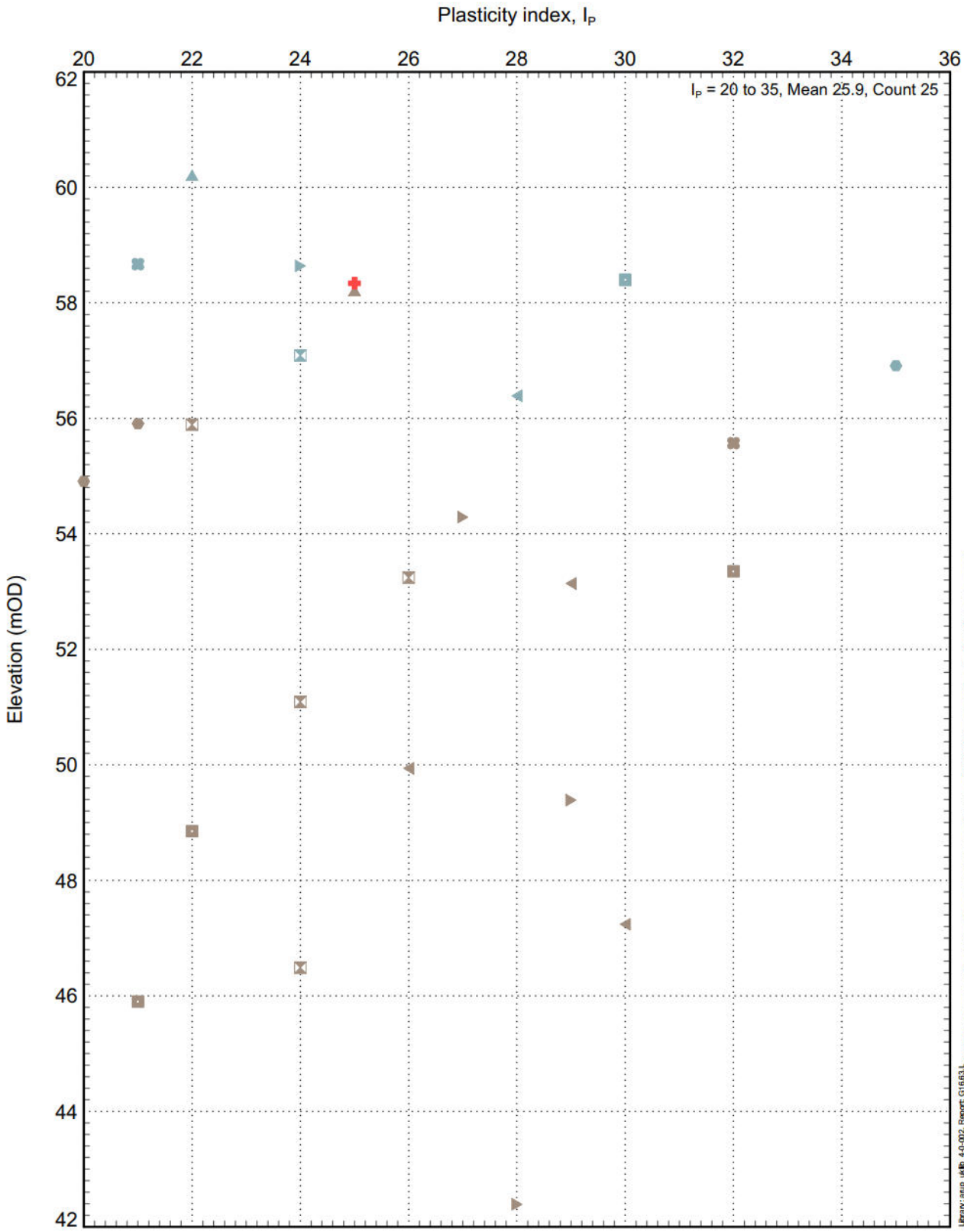
ARUP

Job Title
Carnival Pool II Detailed Design

Figure Title
Natural moisture content

Job No	Figure No
267391-00	**B.03**

ARUP. gINT v8.30.004. Made by Nick Maddock on 11-Oct-19



- Made Ground (MG)
- Bagshot Formation (BAG)
- London Clay (LC)
- WS02
- WS03
- WS04
- TP3
- BH01
- BH02
- BH03
- BH04

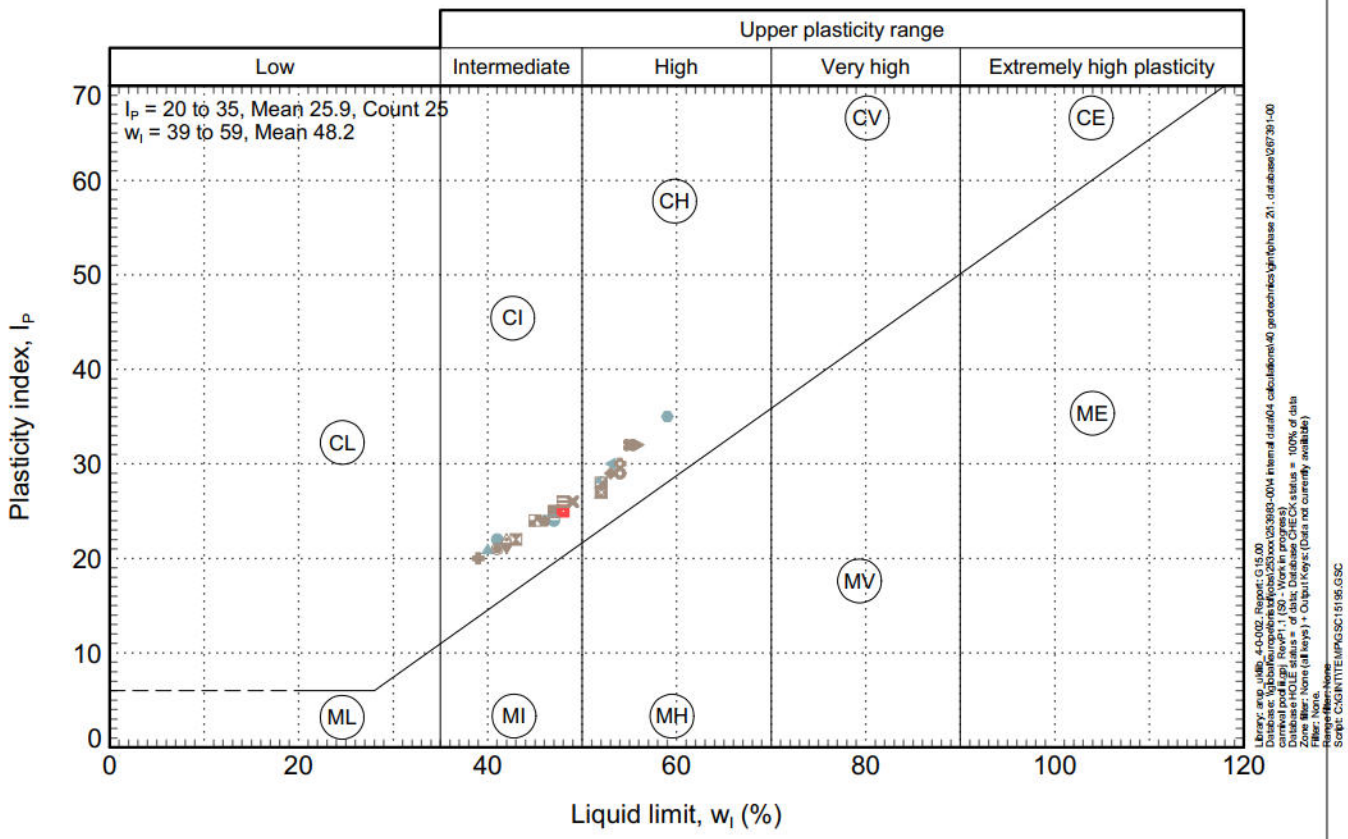
ARUP

Job Title
Carnival Pool II Detailed Design

Figure Title
Plasticity index

Job No	Figure No
267391-00	B.04

ARUP, gINT v8.30.004. Made by Nick Maddock on 11-Oct-19



- Made Ground (MG)
- Bagshot Formation (BAG)
- London Clay (LC)
- WS02, 60.2mOD
- WS02, 58.2mOD
- WS03, 58.7mOD
- WS03, 55.6mOD
- WS04, 56.9mOD
- WS04, 55.9mOD
- WS04, 54.9mOD
- TP3, 58.3mOD
- BH01, 58.4mOD
- BH01, 53.4mOD
- BH01, 48.9mOD
- BH01, 45.9mOD
- BH02, 56.4mOD
- BH02, 53.1mOD
- BH02, 49.9mOD
- BH02, 47.2mOD
- BH03, 58.6mOD
- BH03, 54.3mOD
- BH03, 49.4mOD
- BH03, 42.4mOD
- BH04, 57.1mOD
- BH04, 55.9mOD
- BH04, 53.2mOD
- BH04, 51.1mOD
- BH04, 46.5mOD

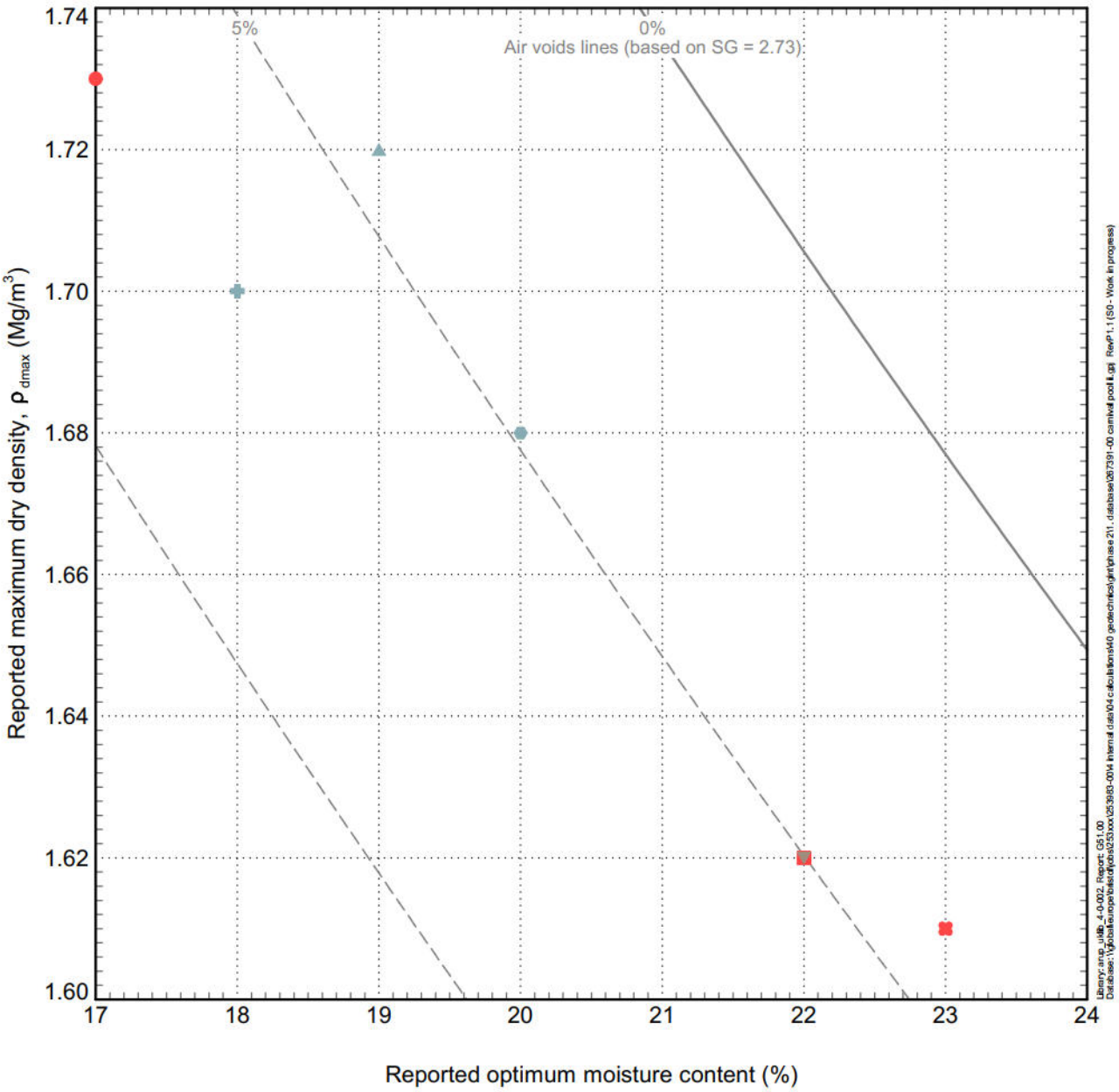
ARUP

Job Title
Carnival Pool II Detailed Design

Figure Title
Plasticity chart

Job No	Figure No
267391-00	B.05

ARUP, gINT v8.30.004. Made by Nick Maddock on 11-Oct-19



- Made Ground (MG)
- Bagshot Formation (BAG)
- London Clay (LC)
- WS02, 60.9mOD
- WS03, 59.4mOD
- TP2, 57.6mOD
- TP3, 58.3mOD
- TP3, 57.3mOD
- TP3, 56.3mOD
- BH03, 59.9mOD

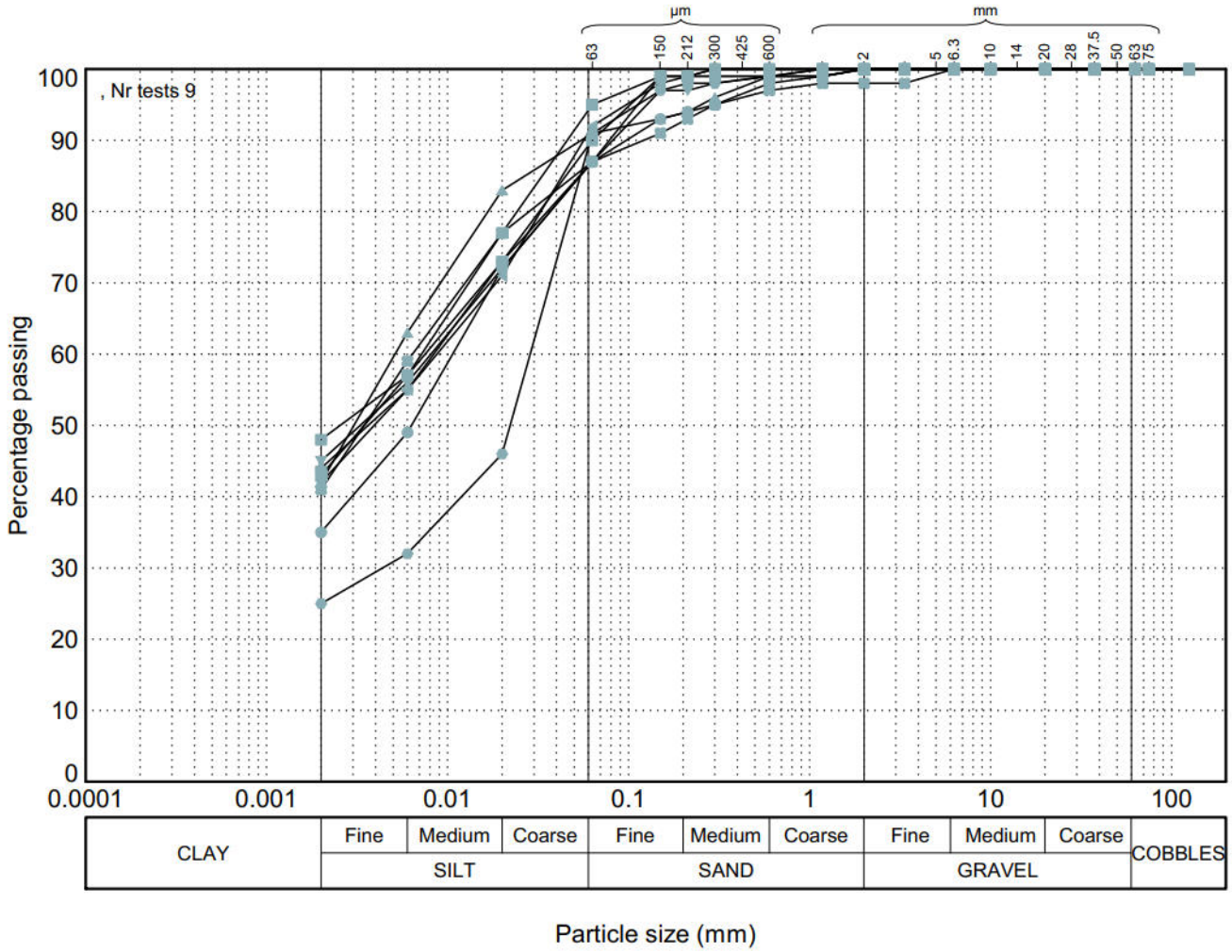
ARUP

Job Title
Carnival Pool II Detailed Design

Figure Title
OMC and maximum dry density

Job No	Figure No
267391-00	B.06

ARUP, gINT v8.30.004. Made by Nick Maddock on 11-Oct-19



Library: arup_uklib_4-0-002, Report: G19A00
Database: \\globaleurope\emea\ldn\obs\253xxx\253983-004 internal data\04 calculations\40 geotechnics\phase 2\1. database\267391-00 carnival pool ii.gpj
RevPT.1 (SG - Work in progress)
Database HOLE status = 'd' data; Database CHECK status = 100% of data
Output Keys: None (all keys) - Output Keys: (Data not currently available)
Filter: None.
Range filter: Include Top, [GEOL].[Depth], [GEOL].[GEOL_BASE], [GEOL].[GEOL_GEOL], [[GEOL].[GEOL_GEOL] = 'BAG']
Script: CXGINTTEMPGSC15195.GSC

- Bagshot Formation (BAG)
- WS02, 59.2mOD
- WS03, 57.7mOD
- WS04, 56.9mOD
- TP2, 56.6mOD
- BH01, 59.4mOD
- BH02, 56.4mOD
- BH02, 55.5mOD
- BH03, 58.6mOD
- BH04, 57.9mOD

ARUP

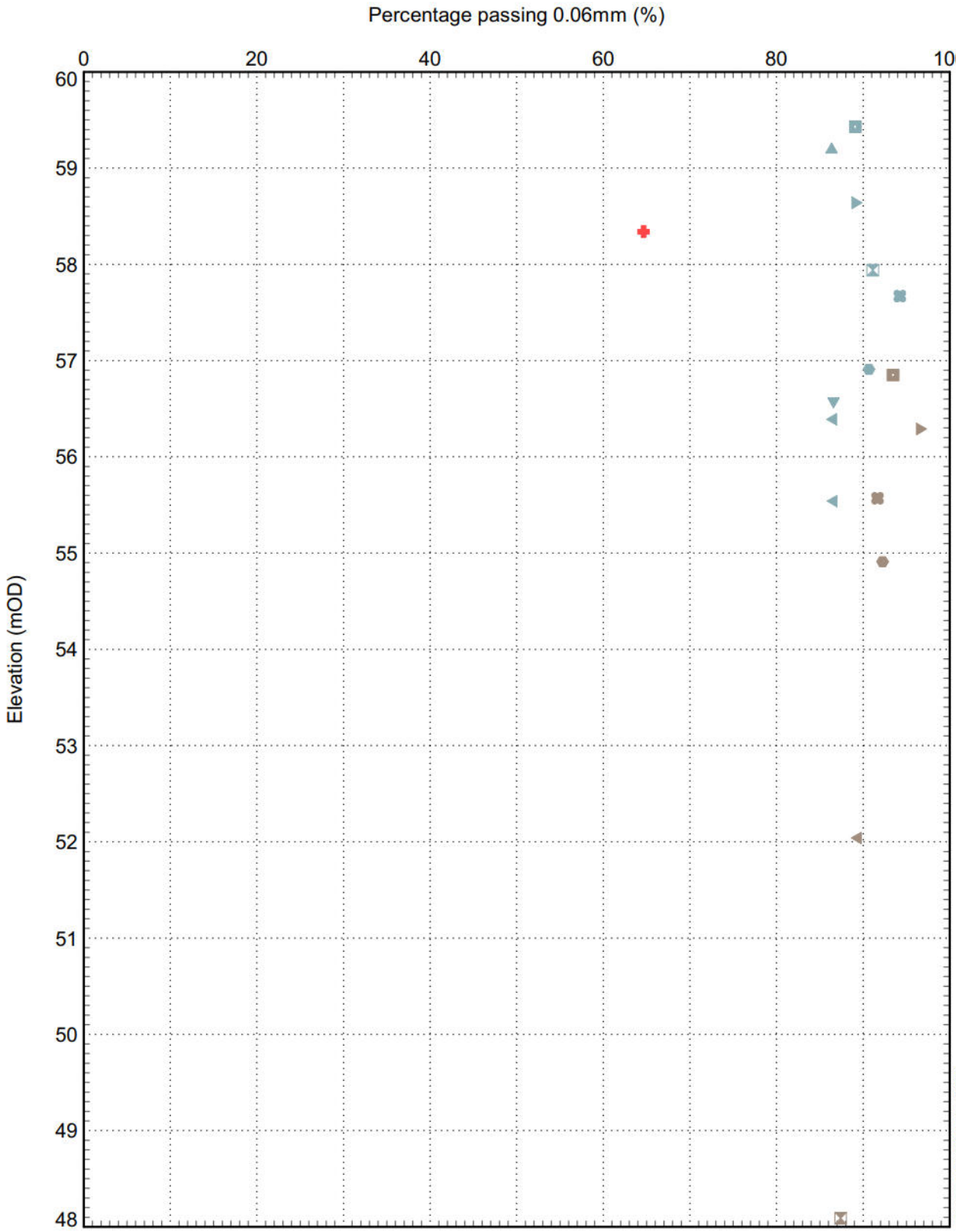
Job Title
Carnival Pool II Detailed Design

Figure Title
Particle size distribution
BAGSHOT FORMATION

Job No
267391-00

Figure No
B.07

ARUP, gINT v8.30.004. Made by Nick Maddock on 11-Oct-19



- Made Ground (MG)
- Bagshot Formation (BAG)
- London Clay (LC)
- WS02
- WS03
- WS04
- TP2
- TP3
- BH01
- BH02
- BH03
- BH04

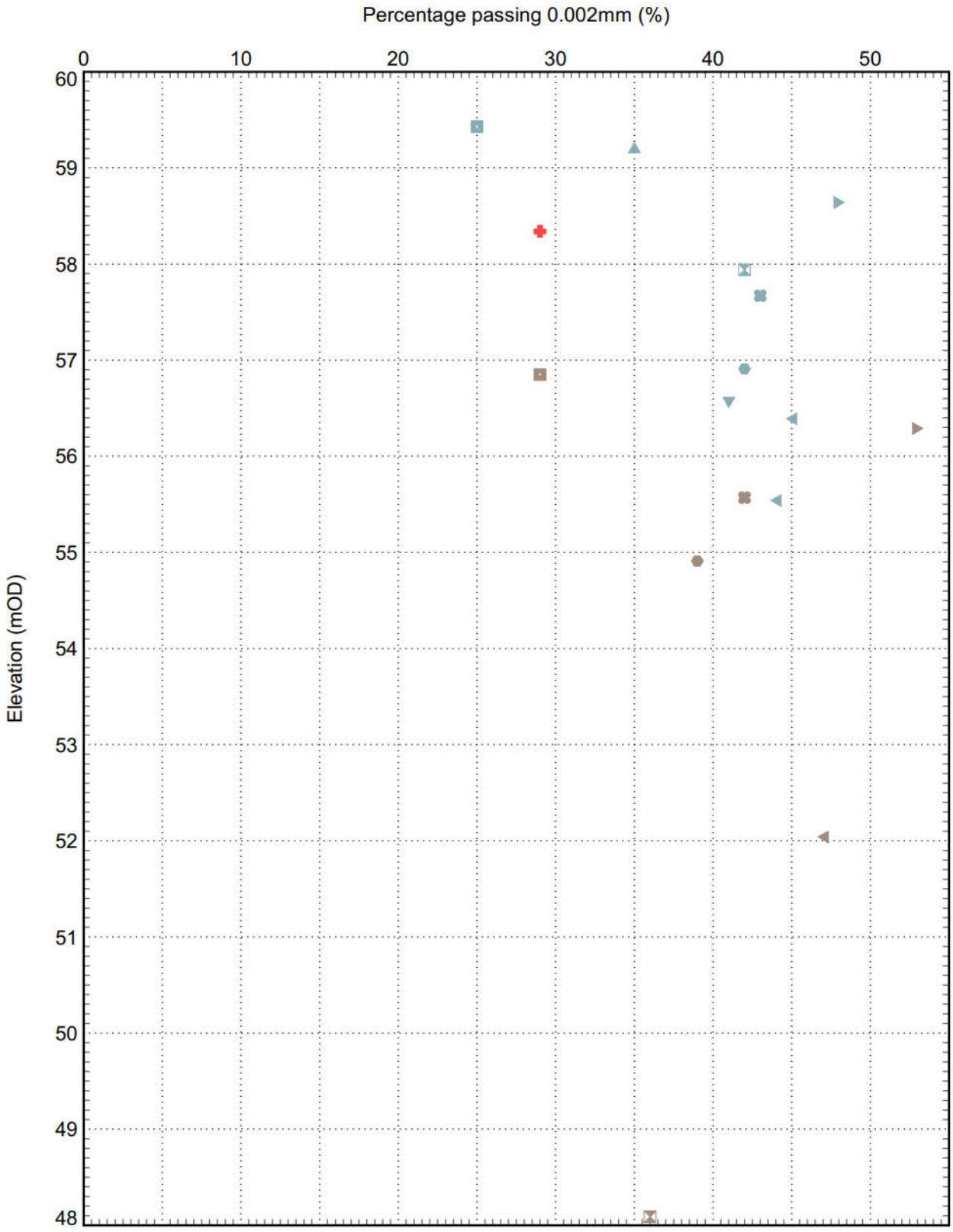
ARUP

Job Title
Carnival Pool II Detailed Design

Figure Title
Percentage passing 0.06mm

Job No	Figure No
267391-00	B.08

ARUP, gINT v8.30.004. Made by Nick Maddock on 11-Oct-19



- Made Ground (MG)
- Bagshot Formation (BAG)
- London Clay (LC)
- WS02
- WS03
- WS04
- TP2
- TP3
- BH01
- BH02
- BH03
- BH04

ARUP

Job Title
Carnival Pool II Detailed Design

Figure Title
Percentage passing 0.002mm

Job No	Figure No
267391-00	B.09

ARUP, gINT v8.30.004. Made by Nick Maddock on 11-Oct-19

Figure 17(a) - Bagshot Formation

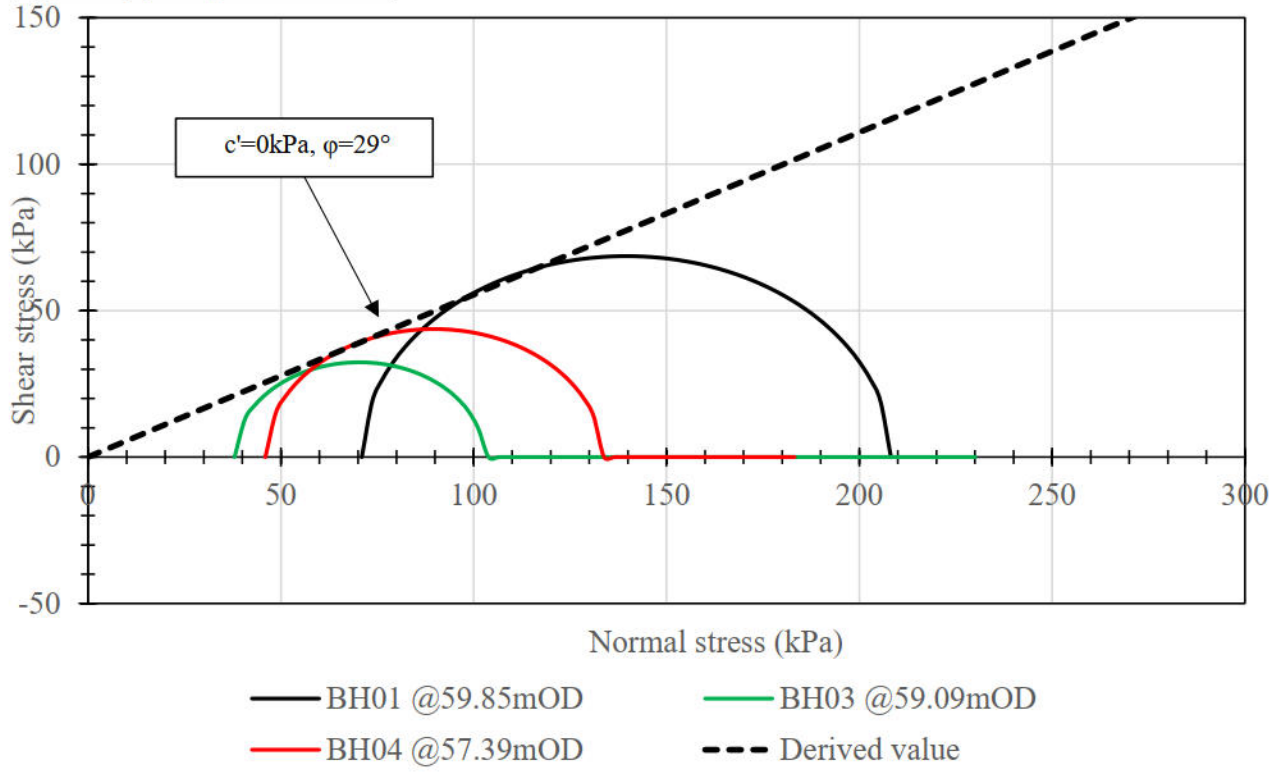
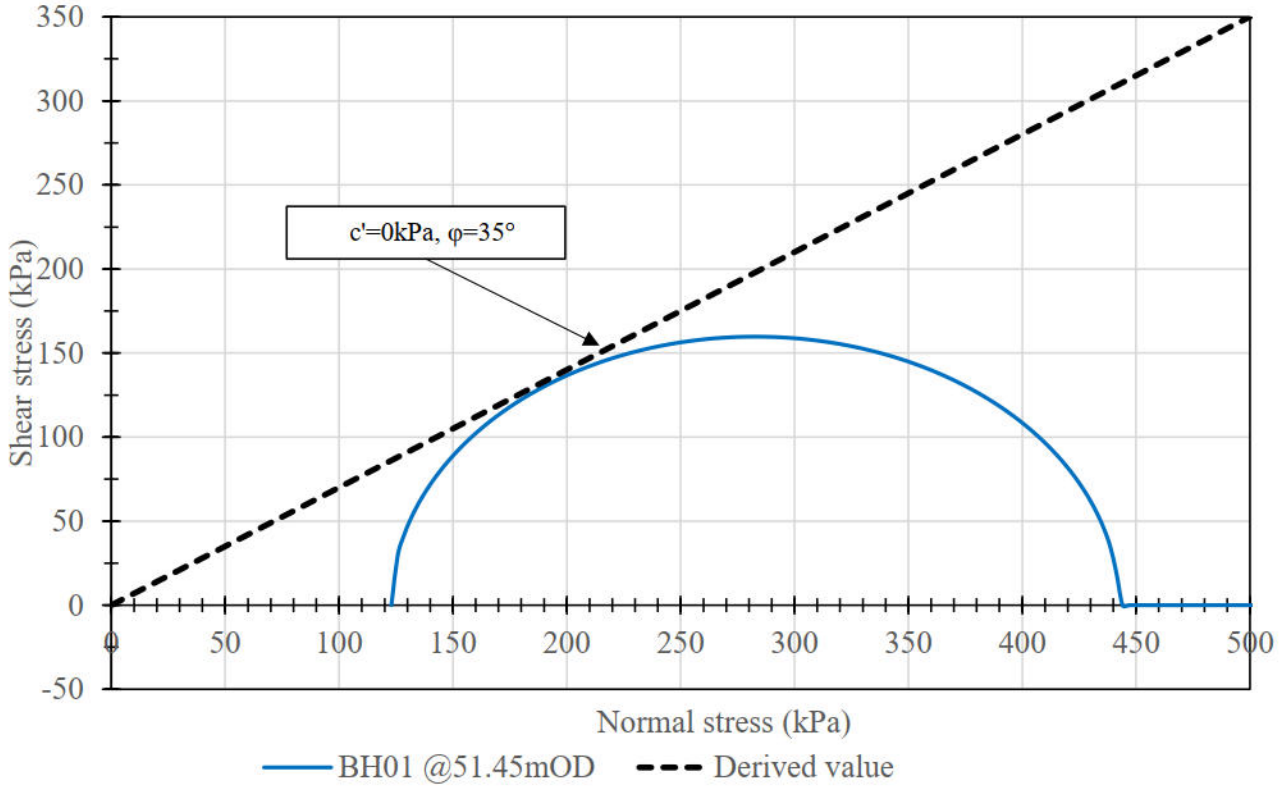


Figure 17(b) - London Clay



ARUP

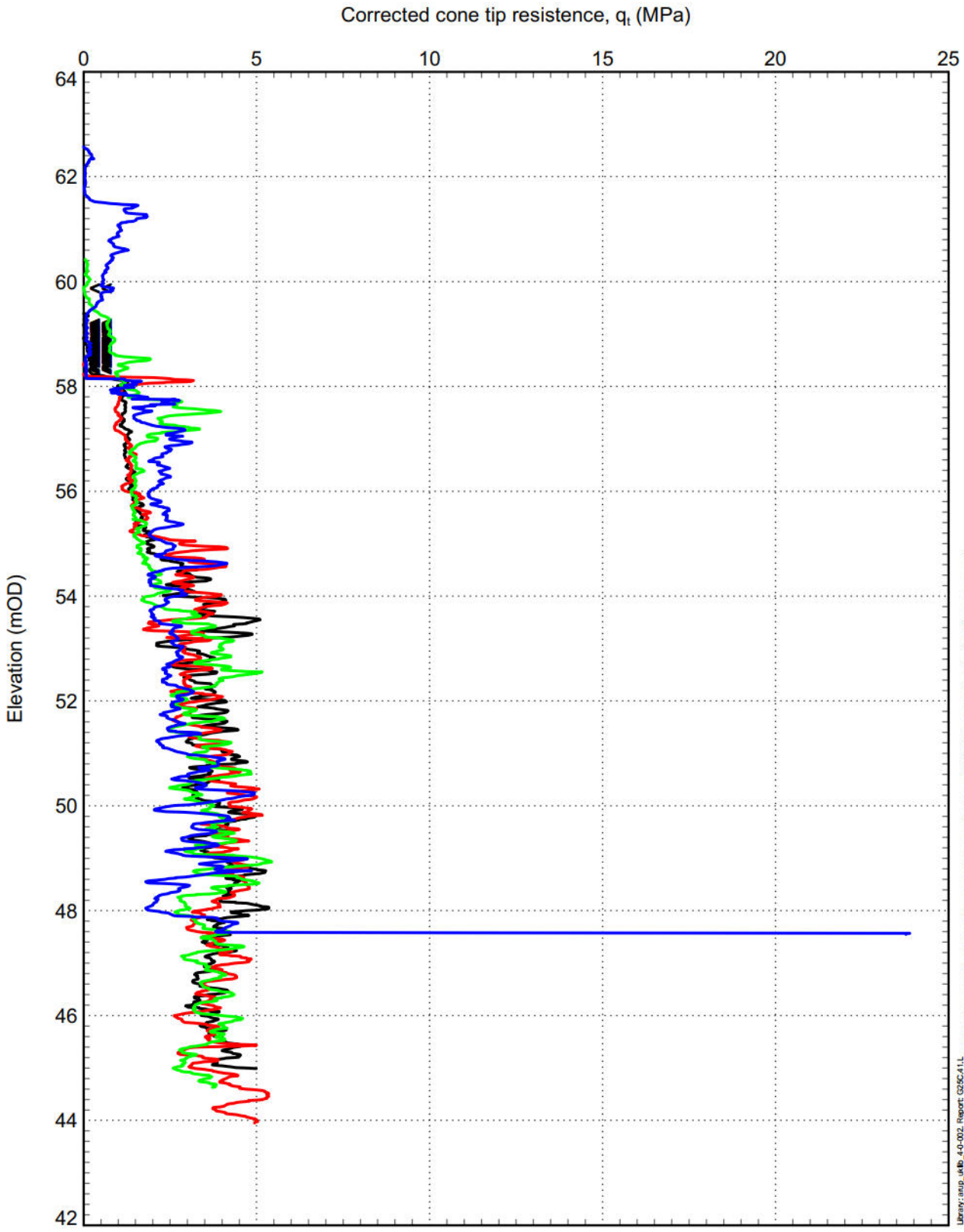
Job Title

Carnival Pool Phase II

Figure Title

Consolidated Undrained Triaxial results

Job No	Figure No
267391-00	B.10



ARUP

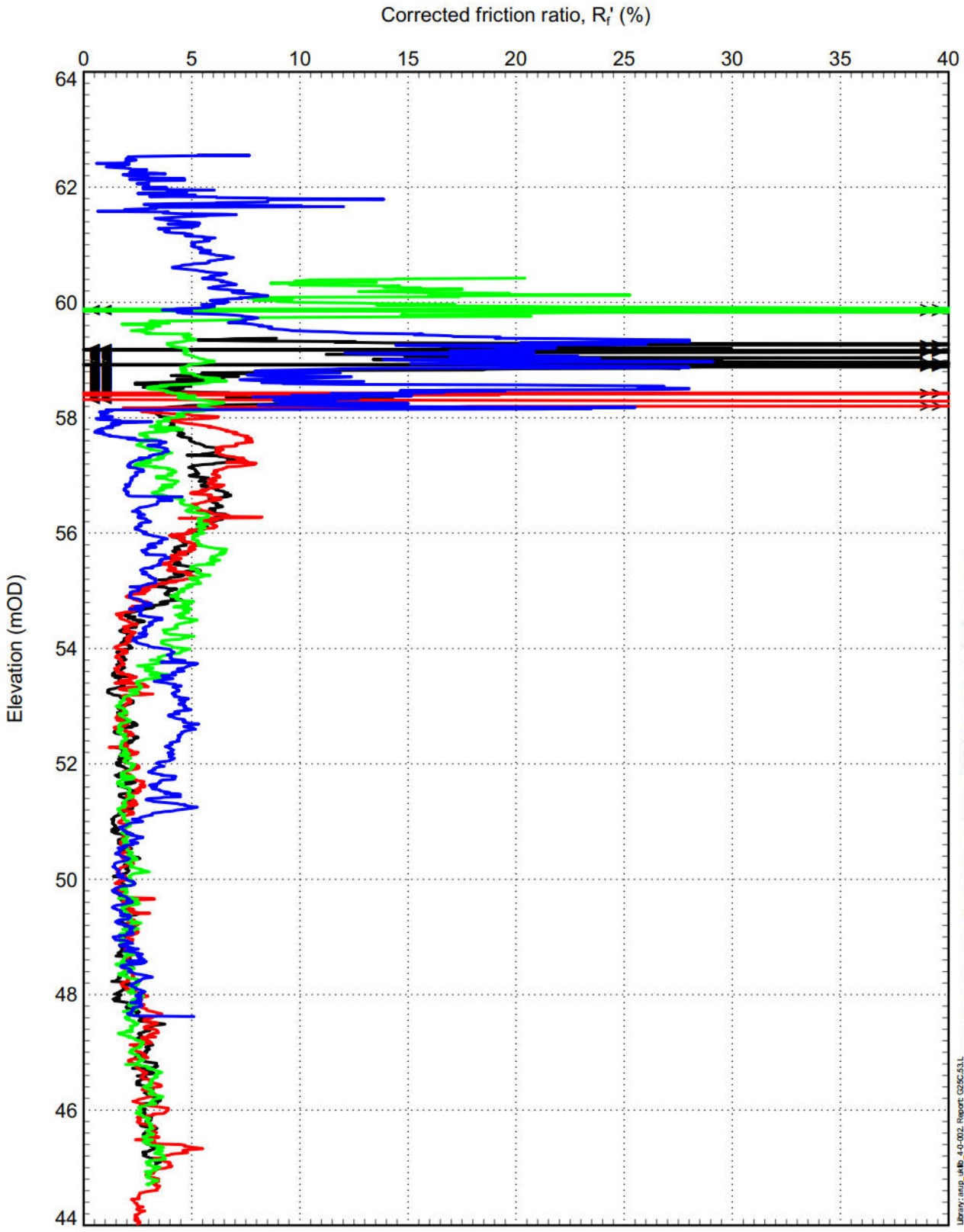
Job Title
Carnival Pool II Detailed Design

Figure Title
CPT corrected cone tip resistence

Job No
267391-00

Figure No
B.11

ARUP, gINT v8.30.004. Made by Nick Maddock on 11-Oct-19



ARUP

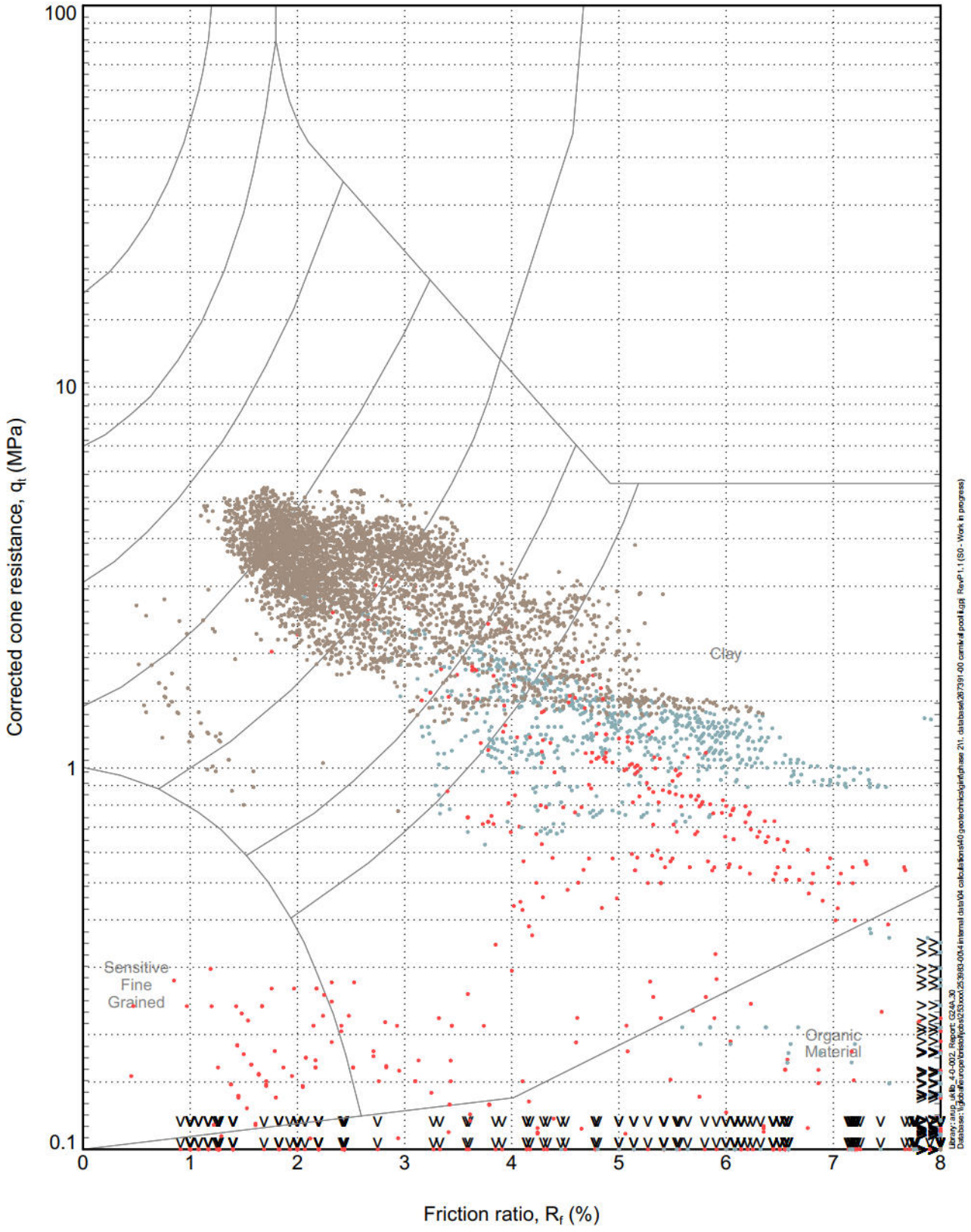
Job Title
Carnival Pool II Detailed Design

Figure Title
CPT corrected friction ratio

Job No
267391-00

Figure No
B.12

ARUP, gINT v8.30.004. Made by Nick Maddock on 11-Oct-19



- Made Ground (MG)
- Bagshot Formation (BAG)
- London Clay (LC)

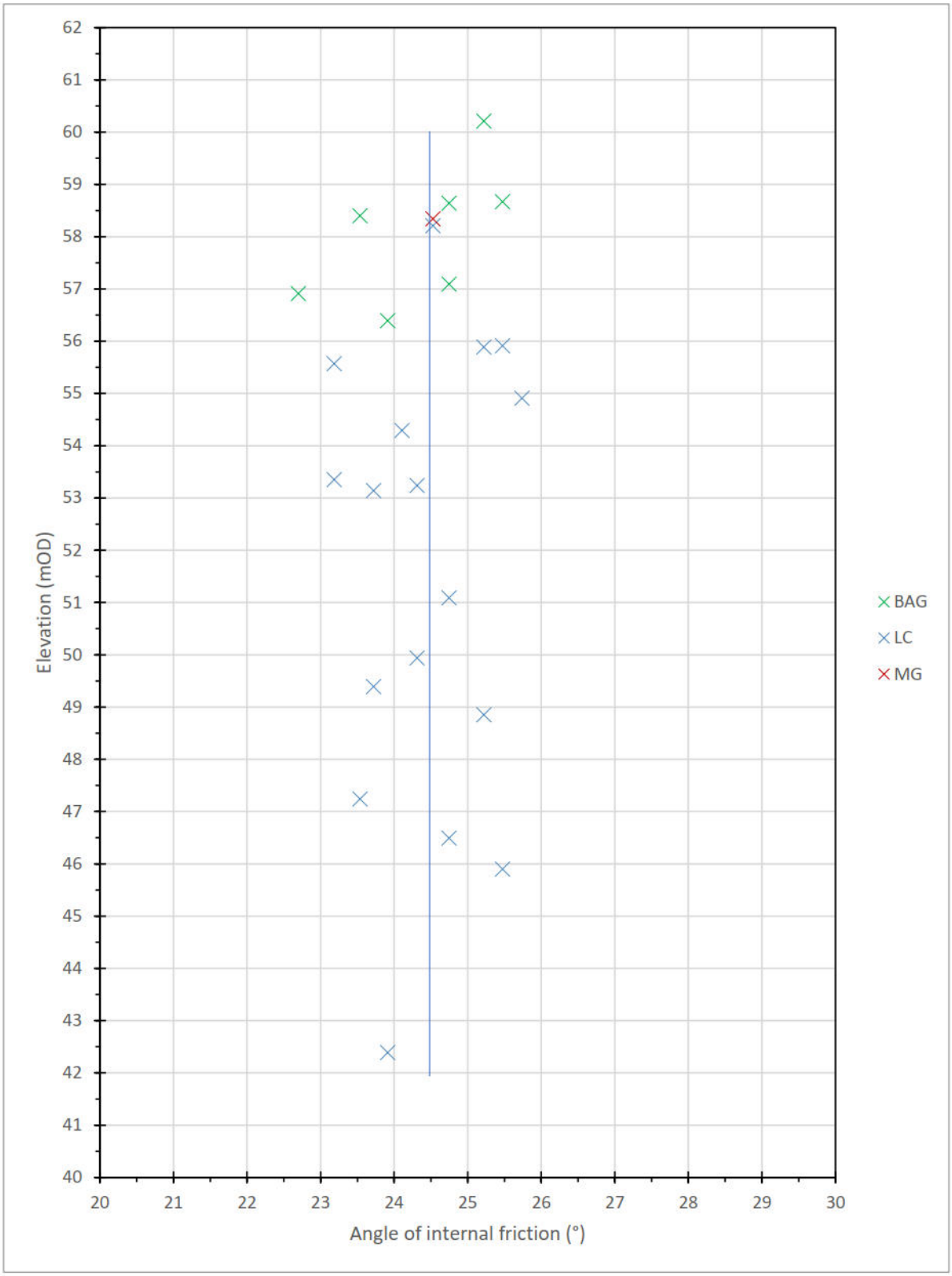
ARUP

Job Title
Carnival Pool II Detailed Design

Figure Title
CPT corrected cone resistance vs friction ratio

Job No	Figure No
267391-00	B.13

ARUP, gINT v8.30.004. Made by Nick Maddock on 11-Oct-19

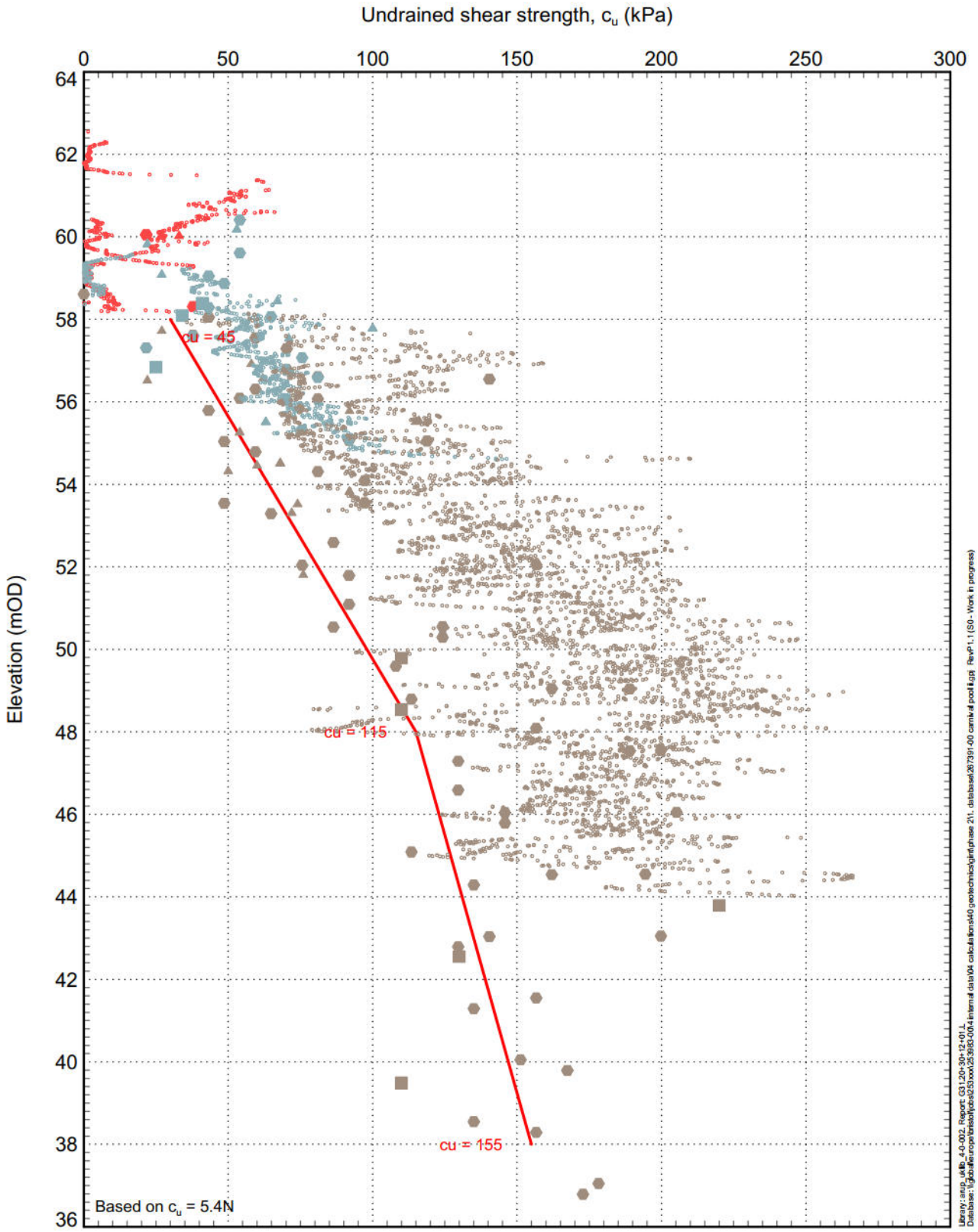


ARUP

Job Title
Carnival Pool Phase II

Figure Title
Angle of internal friction from plasticity index

Job No	Figure No
267391-00	B.14



- Made Ground (MG)
- Bagshot Formation (BAG)
- London Clay (LC)
- Unknown
- cu from SPT (x5.4)
- cu from CPT (N_{kt}=19)
- From hand vane (peak)
- From triaxial test

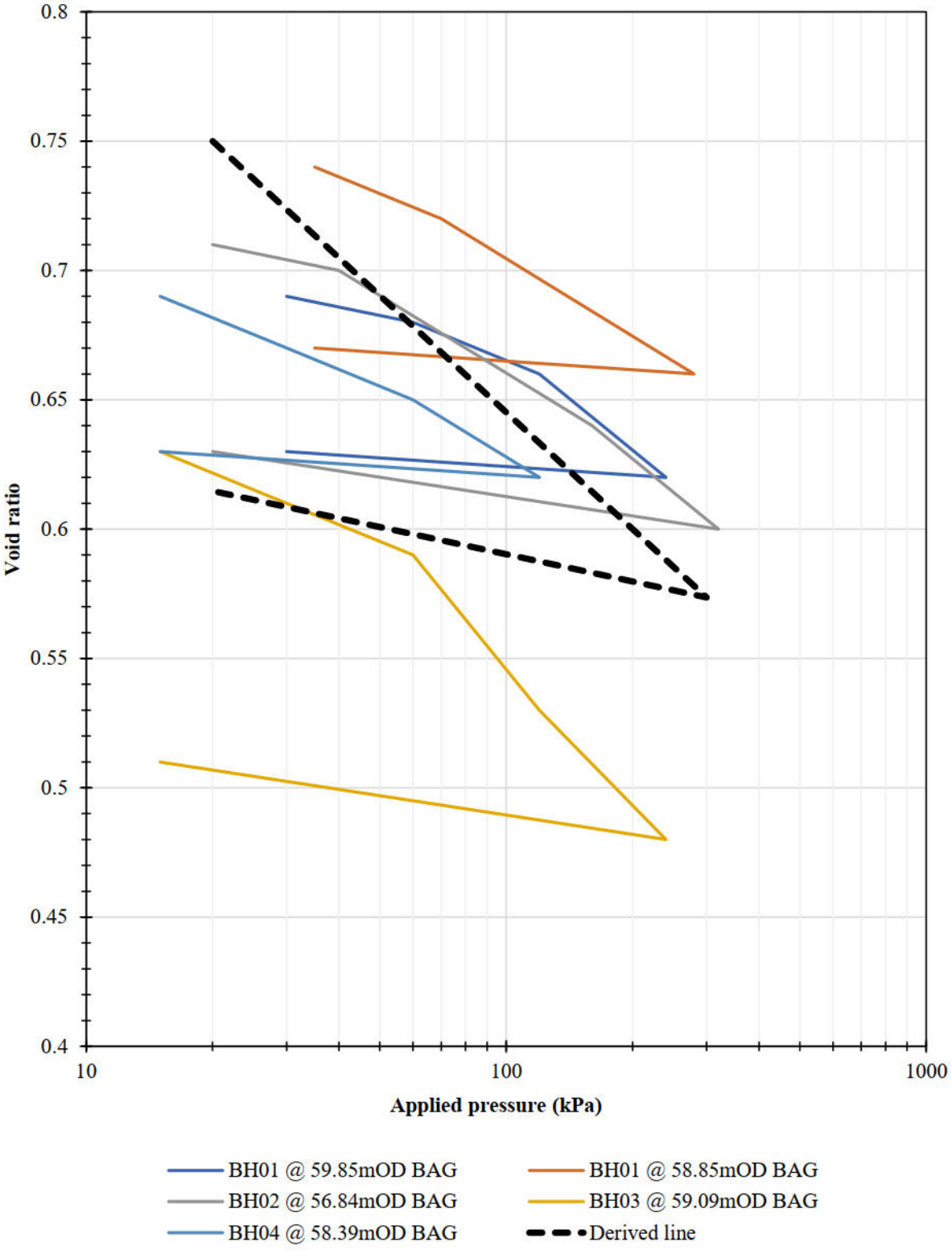
ARUP

Job Title
Carnival Pool II Detailed Design

Figure Title
Undrained shear strength

Job No	Figure No
267391-00	B.15

ARUP, gINT v8.30.004. Made by Nick Maddock on 11-Oct-19



ARUP

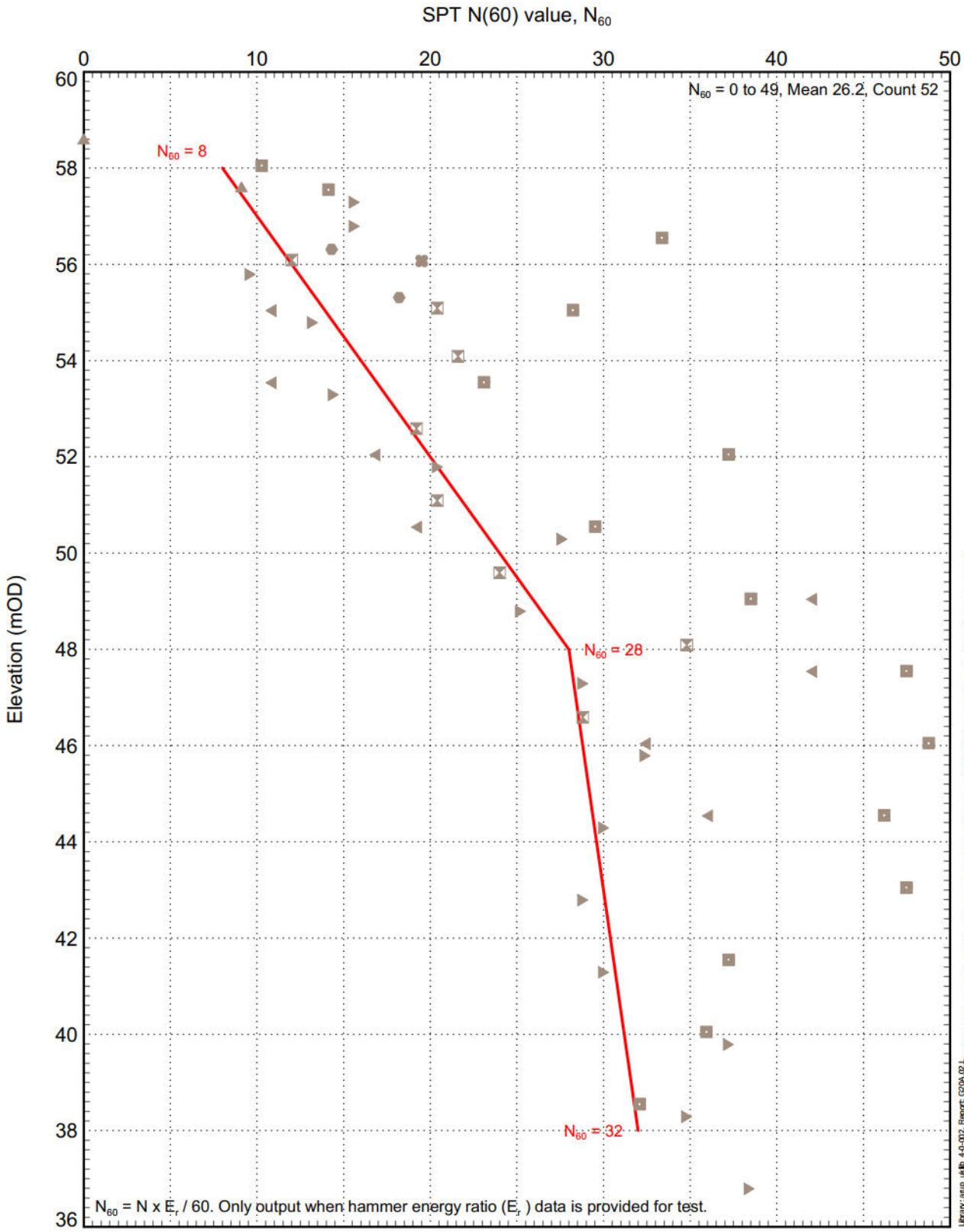
Job Title

Figure Title

One dimensional consolidation resutls - Bagshot Formation

Job No: 267391-00

Figure No: B.16



- London Clay (LC)
- WS02
- WS03
- WS04
- BH01
- BH02
- BH03
- BH04

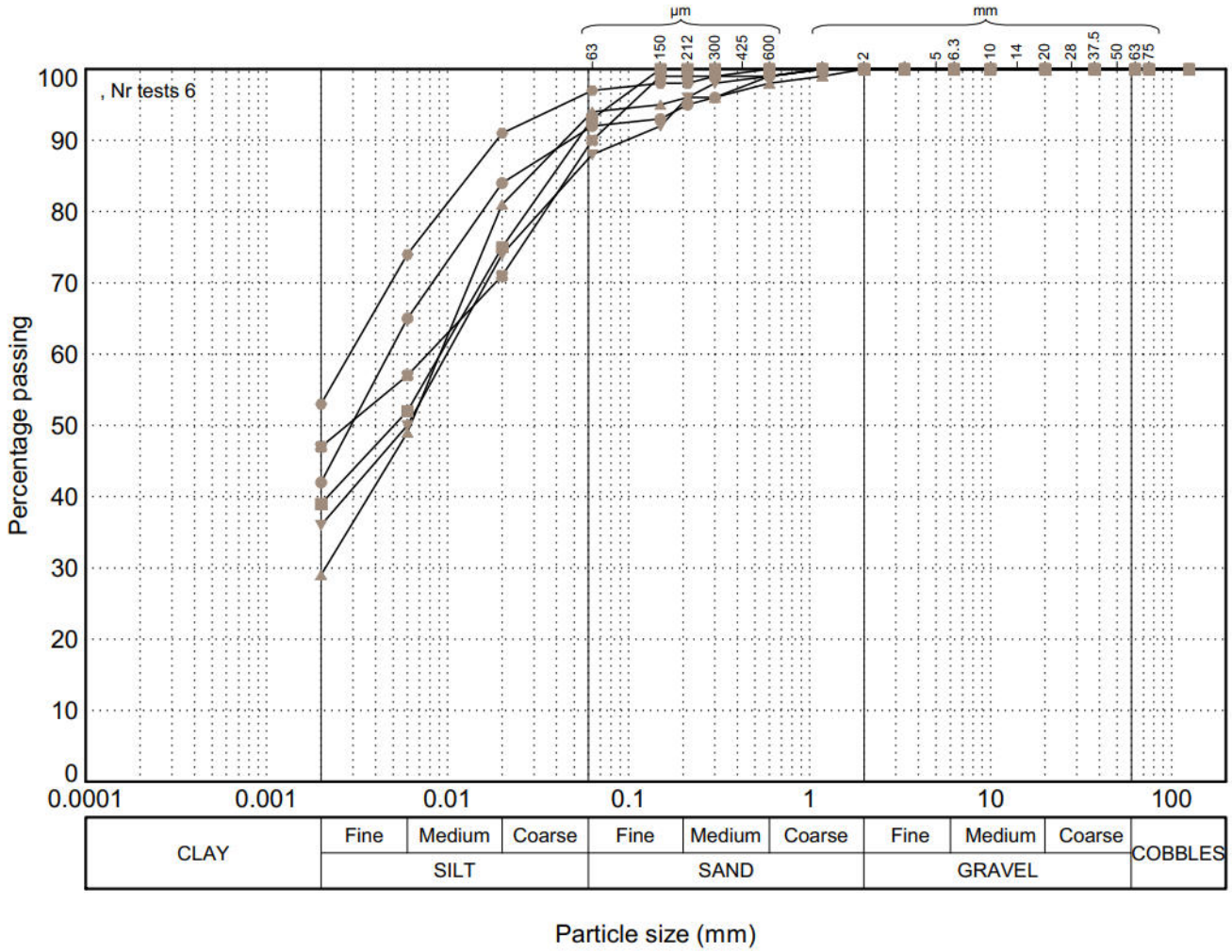
ARUP

Job Title
Carnival Pool II Detailed Design

Figure Title
Standard penetration tests
LONDON CLAY

Job No	Figure No
267391-00	B.17

ARUP, gINT v8.30.004. Made by Nick Maddock on 11-Oct-19



Library: arup_uklib_4-0-002, Report: G19A00
Database: \\globaleurope\data\jobs\253xxx\253983-004 internal data\04 calculations\40 geotechnics\ginphase 2\1. database\267391-00 carnival pool ii.gpj
RevPT.1 (SD - Work in progress)
Database HOLE status = 'd' data; Database CHECK status = 100% of data
Output Keys: None (all keys) ; Output Keys: (Data not currently available)
Filter: None.
Range filter: Include Top, [GEOL].[Depth], [GEOL].[GEOL_BASE], [GEOL].[GEOL_GEOL], [[GEOL].[GEOL_GEOL] = 'LC']
Script: C:\GINTEMP\GSC15196.GSC

- London Clay (LC)
- WS03, 55.6mOD
- WS04, 54.9mOD
- BH01, 56.9mOD
- BH02, 52.0mOD
- BH03, 56.3mOD
- BH04, 48.1mOD

ARUP

Job Title
Carnival Pool II Detailed Design

Figure Title
Particle size distribution
LONDON CLAY

Job No
267391-00

Figure No
B.18

ARUP, gINT v8.30.004. Made by Nick Maddock on 11-Oct-19

Appendix C

Chemical Screening Tables

C1 Soil Analysis

Analytical Report Number: 19-48587
Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number						1260114	1260115	1260103	1260104	1257514	1257515	1257516	1256724	1256725	1256726	1256727	1256728	1256729	1257069	1258194	1258195	1258196	1258197	1258198	1258199	1265893	1265894	1265895	1265896
Sample Reference						BH03	BH03	BH02	BH02	WS02	WS02	WS02	BH01	BH01	BH01	BH01	BH04	BH04	BH04	WS01A	WS03	WS03	WS04	WS04	WS04	TP2	TP2	TP3	TP3
Sample Number						None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)						0.50	1.00	0.50	1.00	0.50	1.00	2.80	0.30	1.00	2.00	3.00	0.50	1.00	2.00	0.20	0.50	1.80	0.50	1.00	1.80	0.30	1.00	0.30	1.00
Date Sampled						02/07/2019	02/07/2019	02/07/2019	02/07/2019	28/06/2019	28/06/2019	28/06/2019	24/06/2019	24/06/2019	24/06/2019	24/06/2019	27/06/2019	27/06/2019	27/06/2019	27/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019	03/07/2019	03/07/2019	03/07/2019	03/07/2019
Time Taken						None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	**Residential without plant**	**Max**	MG	NAT	MG	MG	MG	MG	NAT	MG	MG	MG	NAT	MG	MG	NAT	MG	MG	NAT	MG	MG	NAT	MG	NAT	MG	MG
Stone Content	%	0.1	NONE		0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE		21	13	14	12	11	11	11	17	9.8	12	18	21	15	17	18	7.5	6.8	16	5	9.5	16	4.2	17	11	19
Total mass of sample received	kg	0.001	NONE		2	1.8	1.5	1.8	1.6	1.8	1.7	1.5	1.6	1.5	1.6	1.8	1.8	1.9	2	1.7	1.1	1.5	1.4	1.8	1.5	1.7	1.7	1.7	1.3
Asbestos in Soil	Type	N/A	ISO 17025	detection	0	Not-detected	-	Not-detected	Not-detected	Not-detected	Not-detected	-	Not-detected	Not-detected	-	-	Not-detected	Not-detected	-	Not-detected	Not-detected	-	Not-detected	Not-detected	-	Not-detected	-	Not-detected	Not-detected
General Inorganics																													
pH - Automated	pH Units	N/A	MCERTS	6 to 9	9.7	7.8	7.6	7.7	7.5	7.8	7.5	5.3	7.9	7.3	-	7.5	8.9	7.9	7.2	7.3	8.4	8.1	9.7	9.3	7.9	8.2	8.1	10.3	8.5
Total Cyanide	mg/kg	1	MCERTS		0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Organic Carbon (TOC)	%	0.1	MCERTS		2.6	1.7	2.3	2.6	2.2	0.4	0.7	0.2	< 0.1	0.5	-	< 0.1	< 0.1	0.2	0.2	2.4	0.4	0.2	0.9	0.4	0.3	1.0	0.2	0.5	0.4
Total Phenols																													
Total Phenols (monohydric)	mg/kg	1	MCERTS		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs																													
Naphthalene	mg/kg	0.05	MCERTS	2.3	16	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	< 0.05	-	16	1.1	< 0.05	< 0.05	< 0.05	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	2893	13	-	< 0.05	0.21	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	< 0.05	-	13	< 0.05	< 0.05	0.43	< 0.05	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	2995	3.8	-	< 0.05	0.94	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	< 0.05	-	3.8	< 0.05	< 0.05	0.25	< 0.05	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	2795	15	-	< 0.05	0.69	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	< 0.05	-	15	0.28	< 0.05	0.39	< 0.05	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	1292	89	-	< 0.05	6.4	0.19	-	0.44	-	< 0.05	-	-	-	-	< 0.05	-	89	0.7	< 0.05	3.5	1.5	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	30604	27	-	< 0.05	1.8	< 0.05	-	0.13	-	< 0.05	-	-	-	-	< 0.05	-	27	< 0.05	< 0.05	1.6	0.59	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	1526	110	-	< 0.05	14	0.45	-	1.3	-	0.69	-	-	-	-	< 0.05	-	110	< 0.05	< 0.05	8.5	3	< 0.05				
Pyrene	mg/kg	0.05	MCERTS	3661	97	-	< 0.05	12	0.38	-	1.4	-	0.67	-	-	-	-	< 0.05	-	97	< 0.05	< 0.05	8.1	2.8	< 0.05				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	11	58	-	< 0.05	8	0.27	-	0.68	-	0.53	-	-	-	-	< 0.05	-	58	< 0.05	< 0.05	5.2	1.7	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	30	42	-	< 0.05	7.5	0.25	-	0.74	-	0.38	-	-	-	-	< 0.05	-	42	< 0.05	< 0.05	4.2	1.6	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	3.95	65	-	< 0.05	9.8	0.33	-	1.2	-	0.74	-	-	-	-	< 0.05	-	65	< 0.05	< 0.05	6.6	2	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	106	25	-	< 0.05	4.5	0.13	-	0.38	-	0.21	-	-	-	-	< 0.05	-	25	< 0.05	< 0.05	2.5	1.1	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.17	53	-	< 0.05	8.4	0.31	-	0.9	-	0.53	-	-	-	-	< 0.05	-	53	< 0.05	< 0.05	5.5	1.8	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	45	28	-	< 0.05	4.6	< 0.05	-	0.57	-	0.39	-	-	-	-	< 0.05	-	28	< 0.05	< 0.05	2.9	0.99	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.31	7.5	-	< 0.05	1.8	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	< 0.05	-	7.5	< 0.05	< 0.05	0.75	< 0.05	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	335	32	-	< 0.05	4.9	< 0.05	-	0.72	-	0.41	-	-	-	-	< 0.05	-	32	< 0.05	< 0.05	3.2	1.2	< 0.05				
					0																								
Total PAH					0																								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS		681	-	< 0.80	85.3	2.31	-	8.46	-	4.55	-	-	-	-	< 0.80	-	681	2.08	< 0.80	-	18.2	< 0.80				
					0																								
Heavy Metals / Metalloids					0																								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	618	3.5	< 1.0	< 1.0	1.9	< 1.0	< 1.0	< 1.0	< 1.0	1.5	< 1.0	-	< 1.0	1.5	< 1.0	< 1.0	3.5	< 1.0	< 1.0	< 1.0	1.1	< 1.0	1.8	1.2	3.6	2.5
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	40	25	14	8.9	8.5	8	12	10	8.8	8	7.5	-	7.1	12	7.1	11	12	3.9	12	8.4	9.3	25	70	20	10	32
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.7	1.2	0.51	0.71	0.6	0.66	0.65	0.51	0.46	0.48	0.54	-	0.71	0.48	0.38	0.83	1.2	0.29	0.96	0.44	0.45	1.1	0.46	0.86	0.59	1.1
Boron (water soluble)	mg/kg	0.2	MCERTS	10775	2	0.4	0.5	0.9	1.1	0.7	0.7	0.7	0.9	0.8	-	1.5	1.3	0.5	0.6	2	0.6	0.4	2	1	0.6	0.5	0.8	2.8	0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	85	0.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2	0.2	< 0.2	< 0.2	< 0.2	0.5	< 0.2	< 0.2	< 0.2	< 0.2	0.8	< 0.2	0.4	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	6	0	< 1.2	-	< 1.2	< 1.2	< 1.2	< 1.2	-	< 1.2	< 1.2	-	-	< 1.2	< 1.2	-	< 1.2	< 1.2	-	-	< 1.2	-	< 1.2	-	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	907	46	29	38	20	29	28	21	25	20	23	-	29	26	25	34	27	13	36	25	23	46	18	34	28	31
Copper (aqua regia extractable)	mg/kg	1	MCERTS	7130	34	13	16	33	20	17	17	14	34	29	-	30	33	21	15	34	11	15	21	9.1	29	17	19	62	24
Lead (aqua regia extractable)	mg/kg	1	MCERTS	310	69	13	11	37	20	32	39	15	54	27	-	5.8	39	21	9.5	69	13	11	27	17	17	47	16	56	24
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	56	0.5	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	0.5	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	181	40	6.5	12	9.9	9.9	12	10	11	9.4	14	-	13	10	8.3	23	17	10	30	10	9.8	40	12	38	16	31
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	430	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	651	71	37	50	35	40	35	33	37	29	33	-	37	38	34	47	38	16	51	31	39	71	26	59	35	49
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	40400	110	34	46	49	43	35	37	33	43	34	-	32	110	42	51	73	53	51	85	43	62	100	50	140	68
					0																								
					0																								
Monoaromatics & Oxygenates					0																								
Benzene	µg/kg	1	MCERTS		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0	-	-	-	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Toluene	µg/kg	1	MCERTS		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0	-	-	-	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0	-	-	-	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
p & m-xylene	µg/kg	1	MCERTS		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0	-	-	-	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
o-xylene	µg/kg	1	MCERTS		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0	-	-	-	< 1.0	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0	-	-	-	< 1.0	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
					0																								
					0																								
Petroleum Hydrocarbons					0																								
					0																								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	42	0	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-	-	< 0.001	< 0.001	-	-	-	< 0.001	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	104	0	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-	-	< 0.001	< 0.001	-	-	-	< 0.001	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	27	0	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-	-	< 0.001	< 0.001	-	-	-	< 0.001	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	132	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	< 1.0	< 1.0	-	-	-	< 1.0	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	1061	0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	-	-	< 2.0	< 2.0	-	-	-	< 2.0	-	-	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	11925	0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	-	-	< 8.0	< 8.0	-	-	-	< 8.0	-	-	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	11925	27	< 8.0	< 8.0	27	< 8.0	< 8.0	-	-	< 8.0	< 8.0	-	-	-	< 8.0	-	-	< 8.0	< 8.0	26	< 8.0	< 8.0				
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	11925	47	< 8.4	< 8.4	47	< 8.4	< 8.4	-	-	< 8.4	< 8.4	-	-	-	< 8.4	-	-	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS		30	< 10	< 10	30	< 10	< 10	-	-	< 10	< 10	-	-	-	< 10	-	-	< 10	< 10	29	< 10	< 10				
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE		77	< 10	< 10	77	< 10	< 10	-	-	< 10	< 10	-	-	-	< 10	-	-	< 10	< 10	29	< 10	< 10				
					0																								
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	0.38	0	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-	-	< 0.001	< 0.001	-	-	-	< 0.001	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	880	0	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-	-	< 0.001	< 0.001	-	-	-	< 0.001	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	47.2	0	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-	-	< 0.001	< 0.001	-	-	-	< 0.001	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	252	2.5	< 1.0	< 1.0	2.1	< 1.0	< 1.0	-	-	< 1.0	< 1.0	-	-	-	< 1.0	-	-	< 1.0	< 1.0	< 1.0	2.5	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	1800	10	< 2.0	< 2.0	10	< 2.0	< 2.0	-	-	< 2.0	< 2.0	-	-	-	< 2.0	-	-	< 2.0	< 2.0	6.3	9.6	< 2.0				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	1400	56	< 10	< 10	50	< 10	< 10	-	-	< 10	< 10	-	-	-	< 10	-	-	< 10	< 10	47	56	< 10				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	1930	160	< 10	< 10	160	< 10	21	-	-	< 10	< 10	-	-	-	< 10	-	-	< 10	< 10	120	97	< 10				
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	1930	230	< 8.4	< 8.4	230	< 8.4	< 8.4	-	-	< 8.4	< 8.4	-	-	-	< 8.4	-	-	< 8.4	< 8.4	14	< 8.4	< 8.4				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS		220	< 10	< 10	220	< 10	27	-	-	< 10	< 10	-	-	-	< 10	-	-	< 10	< 10	180	170	< 10				
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE		450	< 10	< 10	450	< 10	27	-	-	< 10	< 10	-	-	-	< 10	-	-	< 10	< 10	190	170	< 10				
					0																								
VOCs					0																								
Chloromethane	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Chloroethane	µg/kg	1	NONE		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Bromomethane	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Vinyl Chloride	µg/kg	1	NONE		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Trichlorofluoromethane	µg/kg	1	NONE		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,1-Dichloroethene	µg/kg	1	NONE		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Cis-1,2-dichloroethene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,1-Dichloroethane	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
2,2-Dichloropropane	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Trichloromethane	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,1,1-Trichloroethane	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,2-Dichloroethane	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,1-Dichloropropene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Trans-1,2-dichloroethene	µg/kg	1	NONE		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Benzene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Tetrachloromethane	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,2-Dichloropropane	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Trichloroethene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Dibromomethane	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Bromodichloromethane	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Toluene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,1,2-Trichloroethane	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,3-Dichloropropane	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Dibromochloromethane	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Tetrachloroethene	µg/kg	1	NONE		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,2-Dibromoethane	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Chlorobenzene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Ethylbenzene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
p & m-Xylene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Styrene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Tribromomethane	µg/kg	1	NONE		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
o-Xylene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Isopropylbenzene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Bromobenzene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
n-Propylbenzene	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
2-Chlorotoluene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
4-Chlorotoluene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
tert-Butylbenzene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
sec-Butylbenzene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,3-Dichlorobenzene	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
p-Isopropyltoluene	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,2-Dichlorobenzene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,4-Dichlorobenzene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Butylbenzene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
Hexachlorobutadiene	µg/kg	1	MCERTS		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025		0	< 1.0	-	-	-	< 1.0	-	-	-	< 1.0	-	-	< 1.0	-	-	-	-	-	< 1.0	-	-				
					0																								
SVOCs					0																								
Aniline	mg/kg	0.1	NONE		0	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1	-	-	< 0.1	-	-	-	-	-	< 0.1	-	-				
Phenol	mg/kg	0.2	ISO 17025		0	< 0.2	-	-	-	< 0.2	-	-	-	< 0.2	-	-	< 0.2	-	-	-	-	-	< 0.2	-	-				
2-Chlorophenol	mg/kg	0.1	MCERTS		0	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1	-	-	< 0.1	-	-	-	-	-	< 0.1	-	-				
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS		0	< 0.2	-	-	-	< 0.2	-	-	-	< 0.2	-	-	< 0.2	-	-	-	-	-	< 0.2	-	-				
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS		0	< 0.2	-	-	-	< 0.2	-	-	-	< 0.2	-	-	< 0.2	-	-	-	-	-	< 0.2	-	-				
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS		0	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1	-	-	< 0.1	-	-	-	-	-	< 0.1	-	-				
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS		0	< 0.2	-	-	-	< 0.2	-	-	-	< 0.2	-	-	< 0.2	-	-	-	-	-	< 0.2	-	-				
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS		0	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1	-	-	< 0.1	-	-	-	-	-	< 0.1	-	-				
2-Methylphenol	mg/kg	0.3	MCERTS		0	< 0.3	-	-	-	< 0.3	-	-	-	< 0.3	-	-	< 0.3	-	-	-	-	-	< 0.3	-	-				
Hexachloroethane	mg/kg	0.05	MCERTS		0	< 0.05	-	-	-	< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	-	-	-	-	< 0.05	-	-				
Nitrobenzene	mg/kg	0.3	MCERTS		0	< 0.3	-	-	-	< 0.3	-	-	-	< 0.3	-	-	< 0.3	-	-	-	-	-	< 0.3	-	-				
4-Methylphenol	mg/kg	0.2	NONE		0	< 0.2	-	-	-	< 0.2	-	-	-	< 0.2	-	-	< 0.2	-	-	-	-	-	< 0.2	-	-				
Isophorone	mg/kg	0.2	MCERTS		0	< 0.2	-	-	-	< 0.2	-	-	-	< 0.2	-	-	< 0.2	-	-	-	-	-	< 0.2	-	-				
2-Nitrophenol	mg/kg	0.3	MCERTS		0	< 0.3	-	-	-	< 0.3	-	-	-	< 0.3	-	-	< 0.3	-	-	-	-	-	< 0.3	-	-				
2,4-Dimethylphenol	mg/kg	0.3	MCERTS		0	< 0.3	-	-	-	< 0.3	-	-	-	< 0.3	-	-	< 0.3	-	-	-	-	-	< 0.3	-	-				
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS		0	< 0.3	-	-	-	< 0.3	-	-	-	< 0.3	-	-	< 0.3	-	-	-	-	-	< 0.3	-	-				
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS		0	< 0.3	-	-	-	< 0.3	-	-	-	< 0.3	-	-	< 0.3	-	-	-	-	-	< 0.3	-	-				
Naphthalene	mg/kg	0.05	MCERTS		0	< 0.05	-	-	-	< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	-	-	-	-	< 0.05	-	-				
2,4-Dichlorophenol	mg/kg	0.3	MCERTS		0	< 0.3	-	-	-	< 0.3	-	-	-	< 0.3	-	-	< 0.3	-	-	-	-	-	< 0.3	-	-				
4-Chloroaniline	mg/kg	0.1	NONE		0	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1	-	-	< 0.1	-	-	-	-	-	< 0.1	-	-				
Hexachlorobutadiene	mg/kg	0.1	MCERTS		0	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1	-	-	< 0.1	-	-	-	-	-	< 0.1	-	-				
4-Chloro-3-methylphenol	mg/kg	0.1	NONE		0	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1	-	-	< 0.1	-	-	-	-	-	< 0.1	-	-				
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS		0	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1	-	-	< 0.1	-	-	-	-	-	< 0.1	-	-				
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS		0	< 0.2	-	-	-	< 0.2	-	-	-	< 0.2	-	-	< 0.2	-	-	-	-	-	< 0.2	-	-				
2-Methylnaphthalene	mg/kg	0.1	NONE		0	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1	-	-	< 0.1	-	-	-	-	-	< 0.1	-	-				
2-Chloronaphthalene	mg/kg	0.1	MCERTS		0	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1	-	-	< 0.1	-	-	-	-	-	< 0.1	-	-				
Dimethylphthalate	mg/kg	0.1	MCERTS		0	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1	-	-	< 0.1	-	-	-	-	-	< 0.1	-	-				
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS		0	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1	-	-	< 0.1	-	-	-	-	-	< 0.1	-	-				
Acenaphthylene	mg/kg	0.05	MCERTS		0.43	< 0.05	-	-	-	< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	-	-	-	-	0.43	-	-				
Acenaphthene	mg/kg	0.05	MCERTS		0.25	< 0.05	-	-	-	< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	-	-	-	-	0.25	-	-				
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS		0	< 0.2	-	-	-	< 0.2	-	-	-	< 0.2	-	-	< 0.2	-	-	-	-	-	< 0.2	-	-				
Dibenzofuran	mg/kg	0.2	MCERTS		0	< 0.2	-	-	-	< 0.2	-	-	-	< 0.2	-	-	< 0.2	-	-	-	-	-	< 0.2	-	-				
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025		0	< 0.3	-	-	-	< 0.3	-	-	-	< 0.3	-	-	< 0.3	-	-	-	-	-	< 0.3	-	-				
Diethyl phthalate	mg/kg	0.2	MCERTS		0	< 0.2	-	-	-	< 0.2	-	-	-	< 0.2	-	-	< 0.2	-	-	-	-	-	< 0.2	-	-				
4-Nitroaniline	mg/kg	0.2	MCERTS		0	< 0.2	-	-	-	< 0.2	-	-	-	< 0.2	-	-	< 0.2	-	-	-	-	-	< 0.2	-	-				
Fluorene	mg/kg	0.05	MCERTS		0.39	< 0.05	-	-	-	< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	-	-	-	-	0.39	-	-				
Azobenzene	mg/kg	0.3	MCERTS		0	< 0.3	-	-	-	< 0.3	-	-	-	< 0.3	-	-	< 0.3	-	-	-	-	-	< 0.3	-	-				
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS		0	< 0.2	-	-	-	< 0.2	-	-	-	< 0.2	-	-	< 0.2	-	-	-	-	-	< 0.2	-	-				
Hexachlorobenzene	mg/kg	0.3	MCERTS		0	< 0.3	-	-	-	< 0.3	-	-	-	< 0.3	-	-	< 0.3	-	-	-	-	-	< 0.3	-	-				
Phenanthrene	mg/kg	0.05	MCERTS		3.5	< 0.05	-	-	-	< 0.05	-	-	-	< 0.05	-	-	0.87	-	-	-	-	-	3.5	-	-				
Anthracene	mg/kg	0.05	MCERTS		1.6	< 0.05	-	-	-	< 0.05	-	-	-	< 0.05	-	-	0.19	-	-	-	-	-	1.6	-	-				
Carbazole	mg/kg	0.3	MCERTS		0	< 0.3	-	-	-	< 0.3	-	-	-	< 0.3	-	-	< 0.3	-	-	-	-	-	< 0.3	-	-				
Dibutyl phthalate	mg/kg	0.2	MCERTS		0	< 0.2	-	-	-	< 0.2	-	-	-	< 0.2	-	-	< 0.2	-	-	-	-	-	< 0.2	-	-				
Anthraquinone	mg/kg	0.3	MCERTS		0	< 0.3	-	-	-	< 0.3	-	-	-	< 0.3	-	-	< 0.3	-	-	-	-	-	< 0.3	-	-				
Fluoranthene	mg/kg	0.05	MCERTS		8.5	< 0.05	-	-	-	0.52	-	-	-	0.44	-	-	1.4	-	-	-	-	-	8.5	-	-				
Pyrene	mg/kg	0.05	MCERTS		8.1	< 0.05	-	-	-	0.61	-	-	-	0.45	-	-	1.3	-	-	-	-	-	8.1	-	-				
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025		0	< 0.3	-	-	-	< 0.3	-	-	-	< 0.3	-	-	< 0.3	-	-	-	-	-	< 0.3	-	-				
Benzo(a)anthracene	mg/kg	0.05	MCERTS		5.2	< 0.05	-	-	-	0.35	-	-	-	0.34	-	-	0.82	-	-	-	-	-	5.2	-	-				
Chrysene	mg/kg	0.05	MCERTS		4.2	< 0.05	-	-	-	0.4	-	-	-	0.27	-	-	0.71	-	-	-	-	-	4.2	-	-				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS		6.6	< 0.05	-	-	-	0.7	-	-	-	0.38	-	-	0.84	-	-	-	-	-	6.6	-	-				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS		2.5	< 0.05	-	-	-	0.26	-	-	-	0.24	-	-	0.5	-	-	-	-	-	2.5	-	-				
Benzo(a)pyrene	mg/kg	0.05	MCERTS		5.5	< 0.05	-	-	-	0.59	-	-	-	0.37	-	-	0.77	-	-	-	-	-	5.5	-	-				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS		2.9	< 0.05	-	-	-	0.37	-	-	-	0.22	-	-	0.51	-	-	-	-	-	2.9	-	-				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS		0.75	< 0.05	-	-	-	< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	-	-	-	-	0.75	-	-				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS		3.2	< 0.05	-	-	-	0.48	-	-	-	0.26	-	-	0.49	-	-	-	-	-	3.2	-	-				
					0																								
PCBs					0																								
PCB Congener 077	mg/kg	0.001	NONE		0								< 0.001	-	< 0.001	< 0.001	< 0.001	-	-	-	-	-	-	-	-				
PCB Congener 081	mg/kg	0.001	NONE		0								< 0.001	-	< 0.001	< 0.001	< 0.001	-	-	-	-	-	-	-	-				
PCB Congener 105	mg/kg	0.001	NONE		0								< 0.001	-	< 0.001	< 0.001	< 0.001	-	-	-	-	-	-	-	-				
PCB Congener 114	mg/kg	0.001	NONE		0								< 0.001	-	< 0.001	< 0.001	< 0.001	-	-	-	-	-	-	-	-				
PCB Congener 118	mg/kg	0.001	NONE		0								< 0.001	-	< 0.001	< 0.001	< 0.001	-	-	-	-	-	-	-	-				
PCB Congener 123	mg/kg	0.001	NONE		0								< 0.001	-	< 0.001	< 0.001	< 0.001	-	-	-	-	-	-	-	-				
PCB Congener 126	mg/kg	0.001	NONE		0								< 0.001	-	< 0.001	< 0.001	< 0.001	-	-	-	-	-	-	-	-				
PCB Congener 156	mg/kg	0.001	NONE		0								< 0.001	-	< 0.001	< 0.001	< 0.001	-	-	-	-	-	-	-	-				
PCB Congener 157	mg/kg	0.001	NONE		0								< 0.001	-	< 0.001	< 0.001	< 0.001	-	-	-	-	-	-	-	-				
PCB Congener 167	mg/kg	0.001	NONE		0								< 0.001	-	< 0.001	< 0.001	< 0.001	-	-	-	-	-	-	-	-				
PCB Congener 169	mg/kg	0.001	NONE		0								< 0.001	-	< 0.001	< 0.001	< 0.001	-	-	-	-	-	-	-	-				
PCB Congener 189	mg/kg	0.001	NONE		0								< 0.001	-	< 0.001	< 0.001	< 0.001	-	-	-	-	-	-	-	-				
Total PCBs	mg/kg	0.012	NONE		0								< 0.012	-	< 0.012	< 0.012	< 0.012	-	-	-	-	-	-	-	-				

C2 Leachate Analysis

Leachate Analysis

Carnival Pool P2

Analytical Report Number: 19-48587
Project / Site name: Carnival Phase II

Your Order No: C6411

Lab Sample Number						1260116	1260105	1257517	1256730	1256731
Sample Reference						BH03	BH02	WS02	BH01	BH04
Sample Number						None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)						0.50	1.00	0.50	0.30	0.50
Date Sampled						02/07/2019	02/07/2019	28/06/2019	24/06/2019	27/06/2019
Time Taken						None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	**Screening criteria (FEQS)**	**Max**	MG	MG	MG	MG	MG
General Inorganics										
pH	pH Units	N/A	ISO 17025			7.2	7.2	8.1	8.0	9.7
Total Cyanide	µg/l	10	ISO 17025			< 10	< 10	< 1.0	< 10	15
Chloride	mg/l	0.15	ISO 17025			22	4.8	3.6	3.0	7.0
Ammoniacal Nitrogen as N	µg/l	15	NONE			< 15	1300	38	50	61
Total Phenols										
Total Phenols (monohydric)	µg/l	10	ISO 17025			< 10	< 10	9.1	< 10	10
Speciated PAHs										
Naphthalene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH										
Total EPA-16 PAHs	µg/l	0.2	NONE			< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Heavy Metals / Metalloids										
Antimony (dissolved)	µg/l	1.7	ISO 17025	5	2.4	2.4	< 1.7	< 1.7	< 1.7	< 1.7
Arsenic (dissolved)	µg/l	1.1	ISO 17025	50	13	2.7	< 1.1	5.4	< 1.1	13
Beryllium (dissolved)	µg/l	0.2	ISO 17025		0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Cadmium (dissolved)	µg/l	0.08	ISO 17025	0.25	0	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (dissolved)	µg/l	0.4	ISO 17025	4.7	6.8	6.3	1.9	1.1	4.1	6.8
Copper (dissolved)	µg/l	0.7	ISO 17025	Bio 1	10	9.5	10	4.6	8	5.3
Lead (dissolved)	µg/l	1	ISO 17025	1.2	9.2	2.4	1.1	1.6	9.2	4.1
Manganese (dissolved)	µg/l	0.06	ISO 17025	Bio 123	370	47	370	0.0023	0.018	0.0022
Mercury (dissolved)	µg/l	0.5	ISO 17025	1	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	Bio 4	4.5	2.7	4.5	1.5	1	< 0.3
Selenium (dissolved)	µg/l	4	ISO 17025	10	0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	20	37	< 1.7	3.2	4.6	9.2	37
Zinc (dissolved)	µg/l	0.4	ISO 17025	Bio 10.9	14	8.2	9.5	5.2	14	1.4
Calcium (dissolved)	mg/l	0.012	ISO 17025			4.5	8.1	22	35	23
Monoaromatics & Oxygenates										
Benzene	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025		0	-	-	-	< 10	< 10

C3 Groundwater Analysis

Analytical Report Number: 19-49656
Project / Site name: Carnival Phase II
Your Order No: C6411

Lab Sample Number						1265977	1265978	1265979	1265980	1265981	1270810
Sample Reference						BH02	WS02	WS04	WS03	BH04	BH01
Sample Number						None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)						1.13	3.30	1.42	1.89	2.10	7.35
Date Sampled						10/07/2019	10/07/2019	10/07/2019	10/07/2019	10/07/2019	18/07/2019
Time Taken						None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	**Screening criteria (FEQS)**	**Max**						
General Inorganics											
pH	pH Units	N/A	ISO 17025		8	7.5	7.2	8	7.2	7.5	7.7
Total Cyanide	µg/l	10	ISO 17025		10	< 10	< 10	< 10	10	< 10	< 10
Chloride	mg/l	0.15	ISO 17025		130	39	130	120	130	33	67
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025		380	140	25	50	19	62	380
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE		6.53	5.29	4.24	3.21	2.54	6.53	2.58
Hardness - Total	mgCaCO3/l	1	ISO 17025		510	340	292	220	510	385	204
Total Phenols											
Total Phenols (monohydric)	µg/l	10	ISO 17025		0	< 10	< 10	< 10	< 10	< 10	< 10
Speciated PAHs											
Naphthalene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025		0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH											
Total EPA-16 PAHs	µg/l	0.16	ISO 17025		0	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Heavy Metals / Metalloids											
Antimony (dissolved)	µg/l	0.4	ISO 17025	UKDWS 5	0.8	0.7	0.7	< 0.4	< 0.4	0.8	0.6
Arsenic (dissolved)	µg/l	0.15	ISO 17025	50	1.7	0.72	1.29	1.7	0.36	0.62	0.65
Beryllium (dissolved)	µg/l	0.1	ISO 17025		0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.25	0.03	< 0.02	0.02	< 0.02	< 0.02	0.03	< 0.02
Calcium (dissolved)	mg/l	0.012	ISO 17025		100	95	98	47	100	98	54
Chromium (dissolved)	µg/l	0.2	ISO 17025	4.7	2	0.6	0.5	2	0.9	0.2	1.4
Copper (dissolved)	µg/l	0.5	ISO 17025	Bio 1	8.3	2.5	3.9	7.3	7.2	2.2	8.3
Lead (dissolved)	µg/l	0.2	ISO 17025	1.2	2.7	< 0.2	< 0.2	2.7	0.6	< 0.2	< 0.2
Magnesium (dissolved)	mg/l	0.005	ISO 17025		62	25	12	25	62	34	17
Manganese (dissolved)	µg/l	0.05	ISO 17025	Bio 123	470	250	110	42	470	210	170
Mercury (dissolved)	µg/l	0.05	ISO 17025	1	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	Bio 4	16	5	16	3.5	5.8	6.7	3.1
Selenium (dissolved)	µg/l	0.6	ISO 17025	UKDWS 10	25	14	4.1	17	1.6	25	1.2
Vanadium (dissolved)	µg/l	0.2	ISO 17025	20	2.8	1.6	2.1	2.8	0.9	0.5	1.2
Zinc (dissolved)	µg/l	0.5	ISO 17025	10.9	6.9	1.7	1.7	6.9	2.7	0.8	5.1
Monoaromatics & Oxygenates											
Benzene	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons											
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE		0	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE		0	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE		0	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE		0	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C35 - C44	µg/l	10	NONE		0	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE		0	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C44)	µg/l	10	NONE		0	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025		0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE		0	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE		0	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE		0	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE		0	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C35 - C44	µg/l	10	NONE		0	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE		0	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C44)	µg/l	10	NONE		0	< 10	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample