JACKSON GEO SERVICES	EXPLORATORY HOLE PHOTOGRAPHS			Remarks Machine excavated trial pit from GL to 2.00m.		Exploratory Hole **Trial Emb Cut**
Project	Global Centre of Rail Excellence	**Easting**	282924.46	**Equipment**	13 Tonne Tracked Excavator	Sheet 2 of 3
Client	Walters UK Limited	**Northing**	211397.43	**Method**	TP	
Project No	G22069	**Level**	304.87 mAOD	**Termination Reason**	Scheduled depth.	



Trial Embankment Cut - Face C



Trial Embankment Cut - Face D

JACKSON GEO SERVICES	EXPLORATORY HOLE PHOTOGRAPHS			Remarks Machine excavated trial pit from GL to 2.00m.		Exploratory Hole Trial Emb Cut
Project	Global Centre of Rail Excellence	**Easting**	282924.46	**Equipment**	13 Tonne Tracked Excavator	Sheet 3 of 3
Client	Walters UK Limited	**Northing**	211397.43	**Method**	TP	
Project No	G22069	**Level**	304.87 mAOD	**Termination Reason**	Scheduled depth.	



Trial Embankment Cut - Spoil

SOIL SOAKAWAY INFILTRATION TEST

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
Emb 2 Soakaway	1				2.00	3.20	1.20

Test Data	
Time Elapsed (mins)	Water Depth (m bgl)
0.50	0.90
1.00	0.96
1.50	1.00
2.00	1.05
2.50	1.11
3.00	1.21
3.50	1.26
4.00	1.32
4.50	1.34
5.00	1.39
6.00	1.47
7.00	1.51
8.00	1.53
9.00	1.57
10.00	1.60
15.00	1.79
20.00	1.83
25.00	1.91

Soakaway Construction	Vertical sides trimmed square. No fill material.		
Date of Test	25/11/2022	Weather	Dry
Fill Porosity		Test Duration (mins)	25
Operative	SC	Checked by	

Water Depth Test Start (m)	0.84	Base base area (m^2)	3.84
Water Depth Test End (m)	1.91	Pit sides area (m^2)	6.4
75% effective depth (m)	1.13	Vp75-25 (m^3)	2.2272
50% effective depth (m)	1.42	ap50 (m^2)	8.548
25% effective depth (m)	1.71		

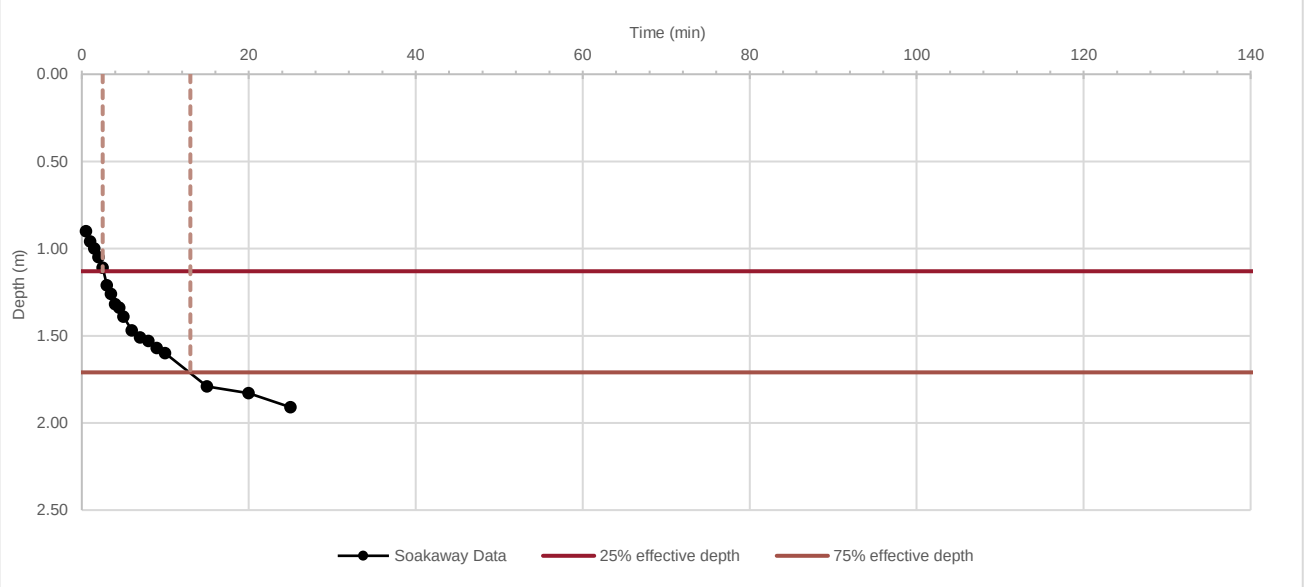
Time water level reaches 75% effective depth (Tp75) (mins)	2.5
Time water level reaches 25% effective depth (Tp25) (mins)	13

Soil Infiltration Rate (f) (m/s)	4.14E-04

Remarks

Undertaken in accordance with BRE digest 365 (2016)

Water bowser emptied completely (9000L)



SOIL SOAKAWAY INFILTRATION TEST

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
Emb 2 Soakaway	2				2.00	3.20	1.20

Test Data	
Time Elapsed (mins)	Water Depth (m bgl)
0.50	0.95
1.00	1.01
1.50	1.06
2.00	1.10
2.50	1.14
3.00	1.19
3.50	1.23
4.00	1.27
4.50	1.32
5.00	1.35
6.00	1.42
7.00	1.48
8.00	1.53
9.00	1.58
10.00	1.60
15.00	1.75
20.00	1.87

Soakaway Construction	Vertical sides trimmed square. No fill material.		
Date of Test	25/11/2022	Weather	Showers
Fill Porosity		Test Duration (mins)	20
Operative	SC	Checked by	

Water Depth Test Start (m)	0.85	Base base area (m^2)	3.84
Water Depth Test End (m)	1.87	Pit sides area (m^2)	6.4
75% effective depth (m)	1.14	Vp75-25 (m^3)	2.208
50% effective depth (m)	1.43	ap50 (m^2)	8.328
25% effective depth (m)	1.71		

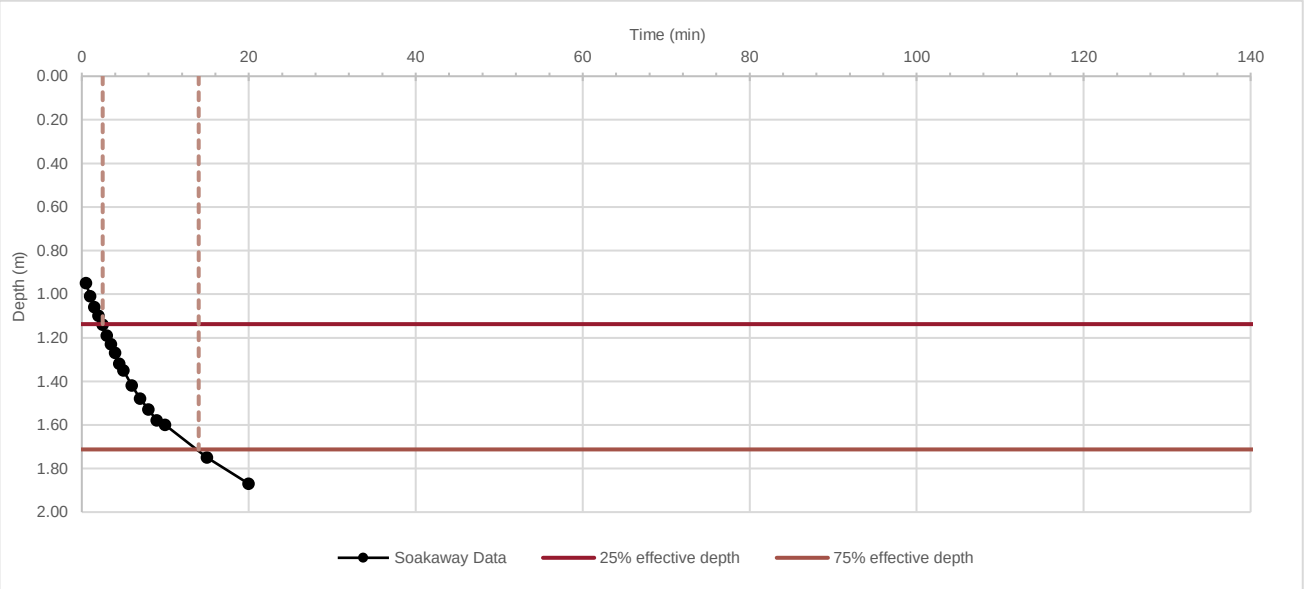
Time water level reaches 75% effective depth (Tp75) (mins)	2.5
Time water level reaches 25% effective depth (Tp25) (mins)	14

Soil Infiltration Rate (f) (m/s)	3.84E-04

Remarks

Undertaken in accordance with BRE digest 365 (2016)

Water bowser emptied (9000L)



SOIL SOAKAWAY INFILTRATION TEST

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
Emb 2 Soakaway	3				2.00	3.20	1.20

Test Data	
Time Elapsed (mins)	Water Depth (m bgl)
0.50	0.88
1.00	0.93
1.50	0.97
2.00	1.03
2.50	1.08
3.00	1.14
3.50	1.17
4.00	1.22
4.50	1.25
5.00	1.29
6.00	1.37
7.00	1.46
8.00	1.50
9.00	1.53
10.00	1.56
15.00	1.70
20.00	1.85

Soakaway Construction	Vertical sides trimmed square. No fill material.		
Date of Test	25/11/2022	Weather	Showers
Fill Porosity		Test Duration (mins)	360
Operative	SC	Checked by	

Water Depth Test Start (m)	0.79	Base base area (m^2)	3.84
Water Depth Test End (m)	1.9	Pit sides area (m^2)	6.4
75% effective depth (m)	1.09	Vp75-25 (m^3)	2.3232
50% effective depth (m)	1.40	ap50 (m^2)	8.724
25% effective depth (m)	1.70		

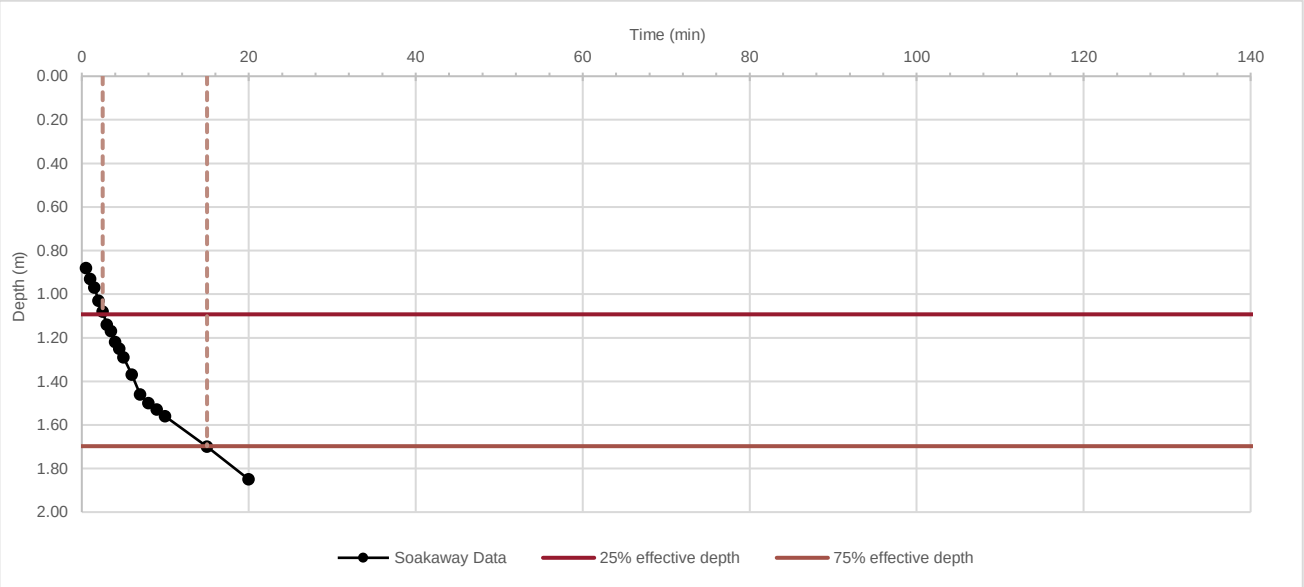
Time water level reaches 75% effective depth (Tp75) (mins)	2.5
Time water level reaches 25% effective depth (Tp25) (mins)	15

Soil Infiltration Rate (f) (m/s)	3.55E-04

Remarks

Undertaken in accordance with BRE digest 365 (2016)

Water bowser emptied (9000L)



SOIL SOAKAWAY INFILTRATION TEST

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
S1-TP111	1	284443.58	210631.42		3.50	4.20	0.70

Test Data	
Time Elapsed (mins)	Water Depth (m bgl)
0.50	1.45
1.00	1.46
1.50	1.46
2.00	1.46
2.50	1.46
3.00	1.47
3.50	1.47
4.00	1.47
4.50	1.47
5.00	1.475
6.00	1.475
7.00	1.475
8.00	1.475
9.00	1.48
10.00	1.48
15.00	1.48
20.00	1.48
30.00	1.48
60.00	1.48
120.00	1.48
168.00	1.48

Soakaway Construction	Vertical sides trimmed square. No fill material.		
Date of Test	15/11/2022	Weather	Dry overcast
Fill Porosity		Test Duration (mins)	168
Operative	JJ	Checked by	

Water Depth Test Start (m)	1.45	Base base area (m^2)	2.94
Water Depth Test End (m)	1.48	Pit sides area (m^2)	14.7
75% effective depth (m)	1.96	Vp75-25 (m^3)	3.0135
50% effective depth (m)	2.48	ap50 (m^2)	3.087
25% effective depth (m)	2.99		

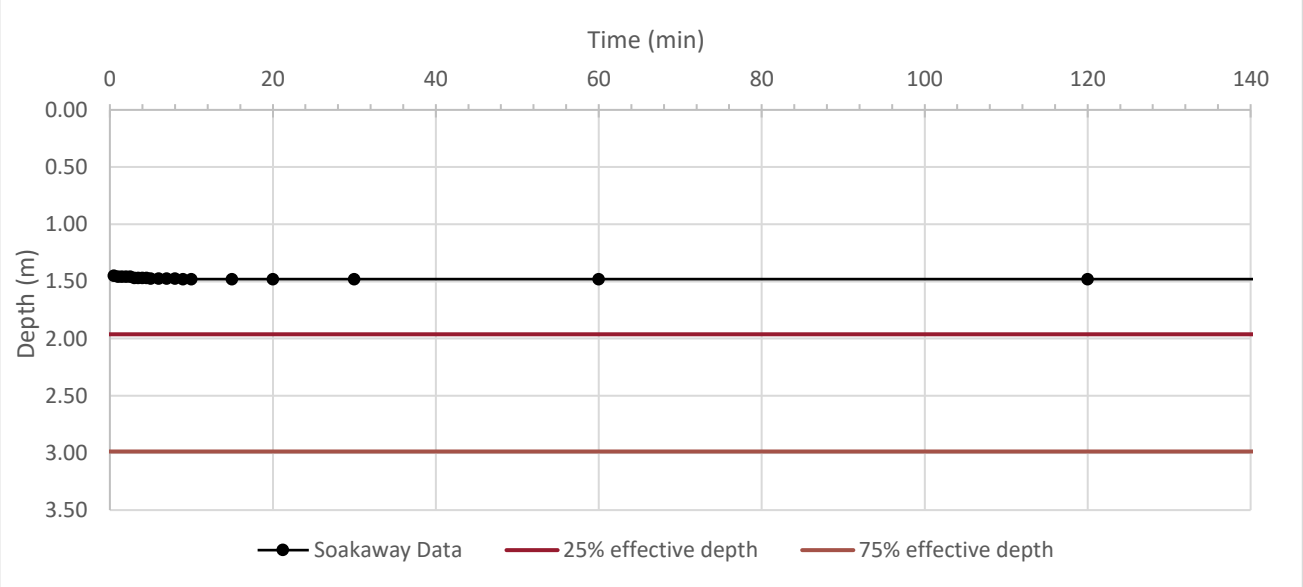
Time water level reaches 75% effective depth (Tp75) (mins)	
Time water level reaches 25% effective depth (Tp25) (mins)	

Soil Infiltration Rate (f) (m/s)	Unable to determine

Remarks

Undertaken in accordance with BRE digest 365 (2016)

Soakaway terminated due to lack of infiltration.



SOIL SOAKAWAY INFILTRATION TEST

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
Trial Emb Cut	1				2.00	3.00	1.00

Test Data	
Time Elapsed (mins)	Water Depth (m bgl)

Soakaway Construction	Vertical sides trimmed square. No fill material.		
Date of Test	25/11/2022	Weather	Sunny
Fill Porosity		Test Duration (mins)	1
Operative	SC	Checked by	

Water Depth Test Start (m)	1.75	Base base area (m^2)	3
Water Depth Test End (m)	2	Pit sides area (m^2)	6
75% effective depth (m)	1.81	Vp75-25 (m^3)	0.375
50% effective depth (m)	1.88	ap50 (m^2)	4
25% effective depth (m)	1.94		

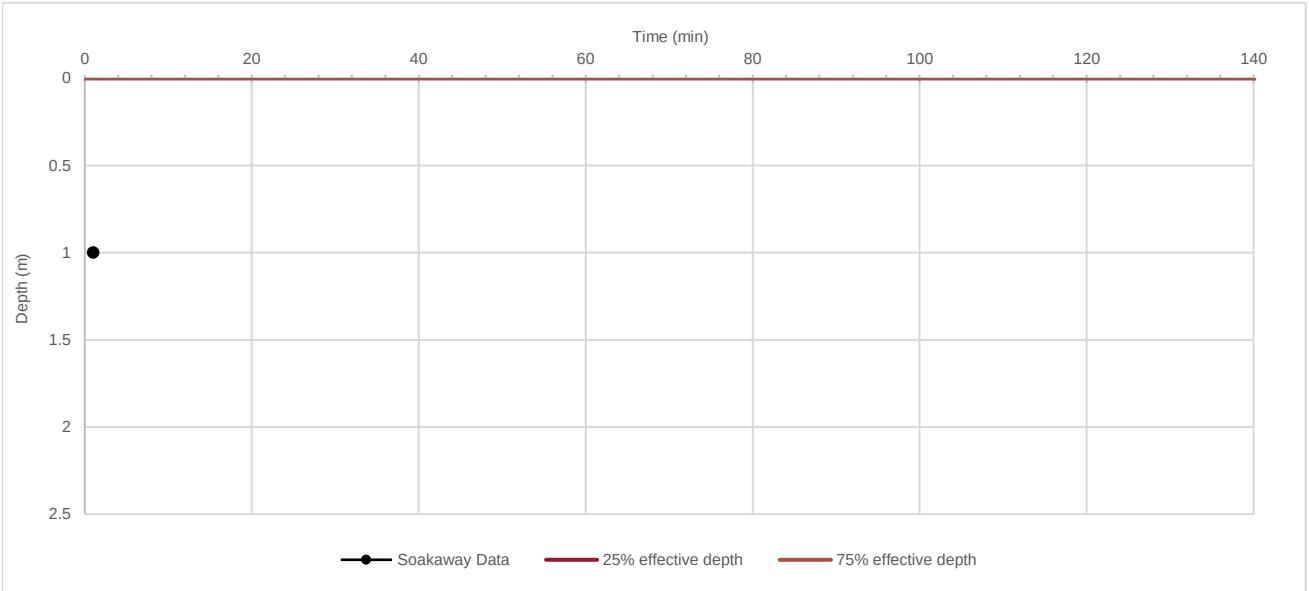
Time water level reaches 75% effective depth (Tp75) (mins)	
Time water level reaches 25% effective depth (Tp25) (mins)	

Soil Infiltration Rate (f) (m/s)	Unable to determine

Remarks

Undertaken in accordance with BRE digest 365 (2016)

Water bowser emptied, 9000L in to pit with fast infiltration. Infiltration too quick to accurately measure rate.



SOIL SOAKAWAY INFILTRATION TEST

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
Trial Emb Cut	2				2.00	3.00	1.00

Test Data	
Time Elapsed (mins)	Water Depth (m bgl)

Soakaway Construction	Vertical sides trimmed square. No fill material.		
Date of Test	25/11/2022	Weather	Sunny
Fill Porosity		Test Duration (mins)	1
Operative	SC	Checked by	

Water Depth Test Start (m)	1.56	Base base area (m^2)	3
Water Depth Test End (m)	2	Pit sides area (m^2)	6
75% effective depth (m)	1.67	Vp75-25 (m^3)	0.66
50% effective depth (m)	1.78	ap50 (m^2)	4.76
25% effective depth (m)	1.89		

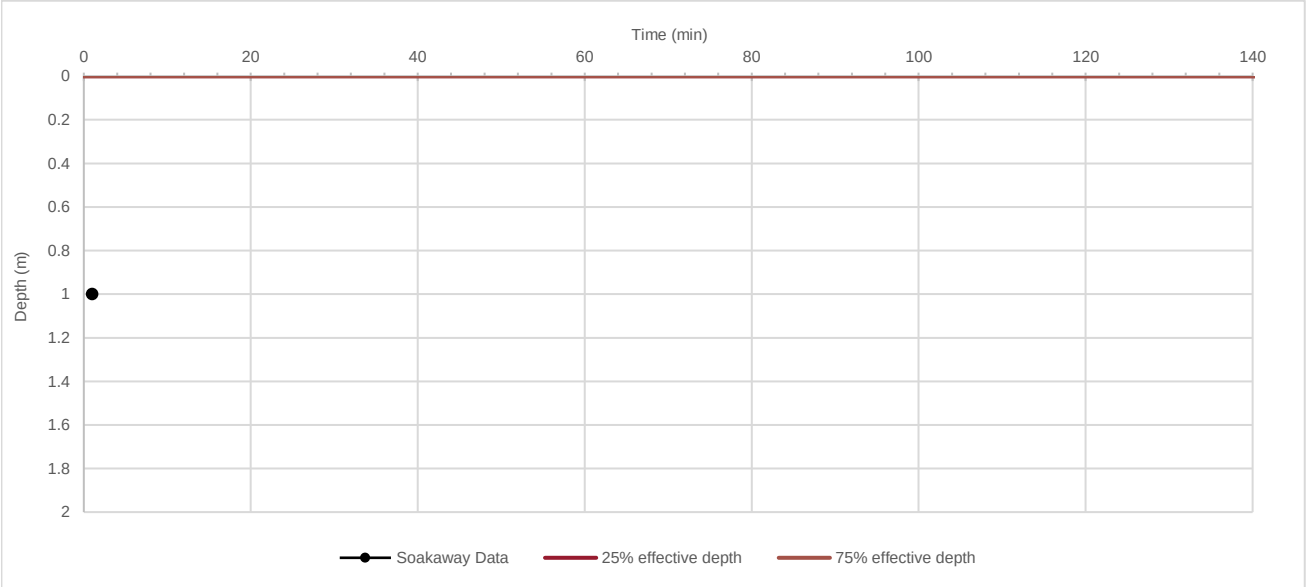
Time water level reaches 75% effective depth (Tp75) (mins)	
Time water level reaches 25% effective depth (Tp25) (mins)	

Soil Infiltration Rate (f) (m/s)	Unable to determine

Remarks

Undertaken in accordance with BRE digest 365 (2016)

Water bowser emptied, 9000L in to pit with fast infiltration. Infiltration too quick to accurately measure rate.



SOIL SOAKAWAY INFILTRATION TEST

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole ID	Test No	Easting	Northing	Ground Level	Depth (m)	Length (m)	Width (m)
Trial Emb Cut	3				2.00	3.00	1.00

Test Data	
Time Elapsed (mins)	Water Depth (m bgl)

Soakaway Construction	Vertical sides trimmed square. No fill material.		
Date of Test	25/11/2022	Weather	Sunny
Fill Porosity		Test Duration (mins)	1
Operative	SC	Checked by	

Water Depth Test Start (m)	1.41	Base base area (m^2)	3
Water Depth Test End (m)	2	Pit sides area (m^2)	6
75% effective depth (m)	1.56	Vp75-25 (m^3)	0.885
50% effective depth (m)	1.71	ap50 (m^2)	5.36
25% effective depth (m)	1.85		

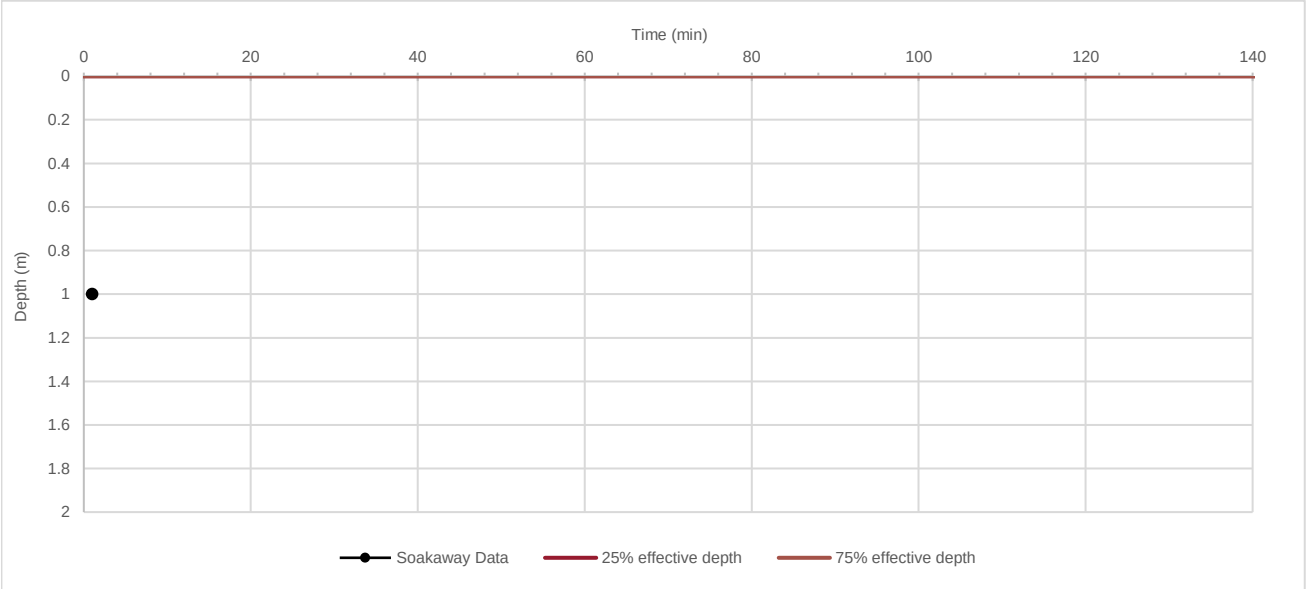
Time water level reaches 75% effective depth (Tp75) (mins)	
Time water level reaches 25% effective depth (Tp25) (mins)	

Soil Infiltration Rate (f) (m/s)	Unable to determine

Remarks

Undertaken in accordance with BRE digest 365 (2016)

Water bowser emptied, 9000L in to pit with fast infiltration. Infiltration too quick to accurately measure rate.



Appendix III

Monitoring

Gas Monitor Calibration Certificate	Certificate Number:
	G504748_1/31650
	G508511_2/32102
Barometric Pressure Data	
Gas and Groundwater Monitoring	
Well Development Records	S1-BH101 to S10BH103,
	S1-BH105, S1-BH108,
	S1-BH112 Instrument 1 and 2,
	S1-BH113, S1-BH121,
	S1-BH122 and SOP003.16
Purging and Sampling Records	Visit 1
	Visit 2
	Visit 3

JACKSON GEO SERVICES

CERTIFICATION OF CALIBRATION

4533

Date Of Calibration: 21-Nov-2022

Certificate Number: G504748_1/31650

Issued by: QED Environmental Systems Ltd.

Customer: **Jackson Drilling Ltd**

Jackson Drilling Northwood Farm Coxbridge Road Baltonsborough
GLASTONBURY Somerset BA6 8RA UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G504748

UKAS Accredited results:

Results after adjustment :

Methane (CH_4)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	5.1	0.072
15.0	15.2	0.13
60.0	59.9	0.42

Carbon Dioxide (CO_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.8	0.074
15.0	14.8	0.13
40.0	40.3	0.29

Oxygen (O_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
21.2	21.3	0.25

The inwards assessment was carried out 15-Nov-2022.
The maximum adjustment is larger than the specification limit.
Inwards assessment data is available if requested.

All concentrations are molar.

CH_4, CO_2 readings recorded at : 30.7 °C ± 2.5 °C

O2 readings recorded at : 22.0 °C ± 2.5 °C

Barometric Pressure : 0984 mbar ± 4 mbar

Method of Test : The analyser is calibrated in a temperature controlled chamber using a series of reference gases, in compliance with procedure LP004.

Instrument has passed calibration as the measurement result is within the specification limit. The specification limit takes into account the measurement uncertainty.
The results relate only to the item calibrated

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance:114 IGC Instance:114

www.qedenv.com +44 (0) 333 800 0088 sales@qedenv.co.uk

QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

CERTIFICATION OF CALIBRATION

4533

Date Of Calibration: 21-Nov-2022

Certificate Number: G504748_1/31650

Issued by: QED Environmental Systems Ltd.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Calibrations marked 'Non-UKAS Accredited results' on this certificate have been included for completeness.

Non-UKAS accredited results after adjustment:

Barometer (mbar)	
Reference	**Instrument Reading**
984	985

Additional Gas Cells		
Gas	**Certified Gas (ppm)**	**Instrument Reading (ppm)**
CO	505	505
H_2S	260	260

Internal Flow	
Applied (l/hr)	**Instrument Reading (l/hr)**
5.0	5.0
10.0	10.0

Date of Issue : 23-Nov-2022 **Approved by Signatory**

Laura McBride

Laboratory Inspection

End of Certificate

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

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QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

CERTIFICATION OF CALIBRATION

4533

Date Of Calibration: 01-Feb-2023

Certificate Number: G508511_2/32102

Issued by: QED Environmental Systems Ltd.

Customer: **Jackson Drilling Ltd**

Jackson Drilling Northwood Farm Coxbridge Road Baltonsborough
GLASTONBURY Somerset BA6 8RA UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G508511

UKAS Accredited results:

Results after adjustment :

Methane (CH_4)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.9	0.072
15.0	14.9	0.13
60.0	59.6	0.42

Carbon Dioxide (CO_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.9	0.074
15.0	15.0	0.13
40.0	40.1	0.29

Oxygen (O_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
21.5	21.5	0.25

The inwards assessment was carried out 23-Jan-2023.

The maximum adjustment is larger than the specification limit.

Inwards assessment data is available if requested.

All concentrations are molar.

CH_4, CO_2 readings recorded at : 31.3 °C ± 2.5 °C

O2 readings recorded at : 21.3 °C ± 2.5 °C

Barometric Pressure : 1013 mbar ± 4 mbar

Method of Test : The analyser is calibrated in a temperature controlled chamber using a series of reference gases, in compliance with procedure LP004.

Instrument has passed calibration as the measurement result is within the specification limit. The specification limit takes into account the measurement uncertainty.

The results relate only to the item calibrated

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance:114 IGC Instance:114

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QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

CERTIFICATION OF CALIBRATION

4533

Date Of Calibration: 01-Feb-2023

Certificate Number: G508511_2/32102

Issued by: QED Environmental Systems Ltd.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Calibrations marked 'Non-UKAS Accredited results' on this certificate have been included for completeness.

Non-UKAS accredited results after adjustment:

Barometer (mbar)	
Reference	**Instrument Reading**
1013	1013

Additional Gas Cells		
Gas	**Certified Gas (ppm)**	**Instrument Reading (ppm)**
CO	505	505
H_2S	258.8	259

Internal Flow	
Applied (l/hr)	**Instrument Reading (l/hr)**
5.0	5.1
10.0	10.1

Date of Issue : 02-Feb-2023 **Approved by Signatory**

Laura McBride

Laboratory Inspection

End of Certificate

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

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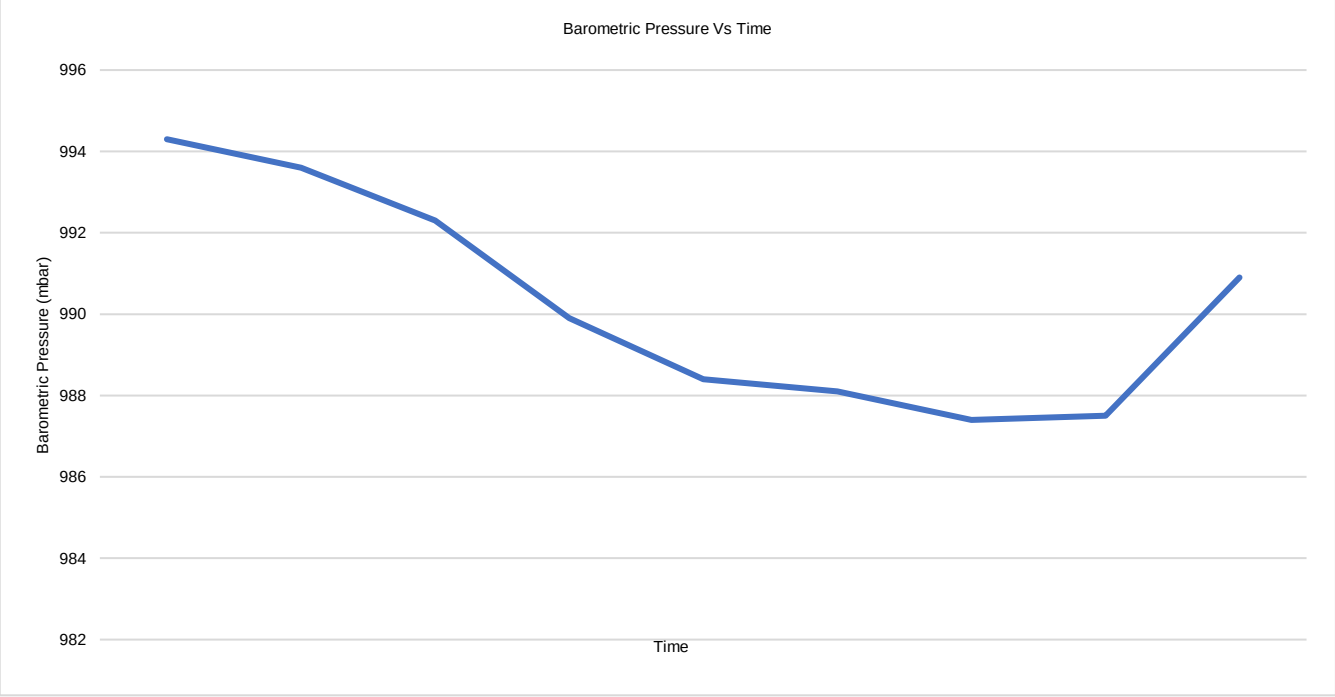
QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

BAROMETRIC PRESSURE DATA

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

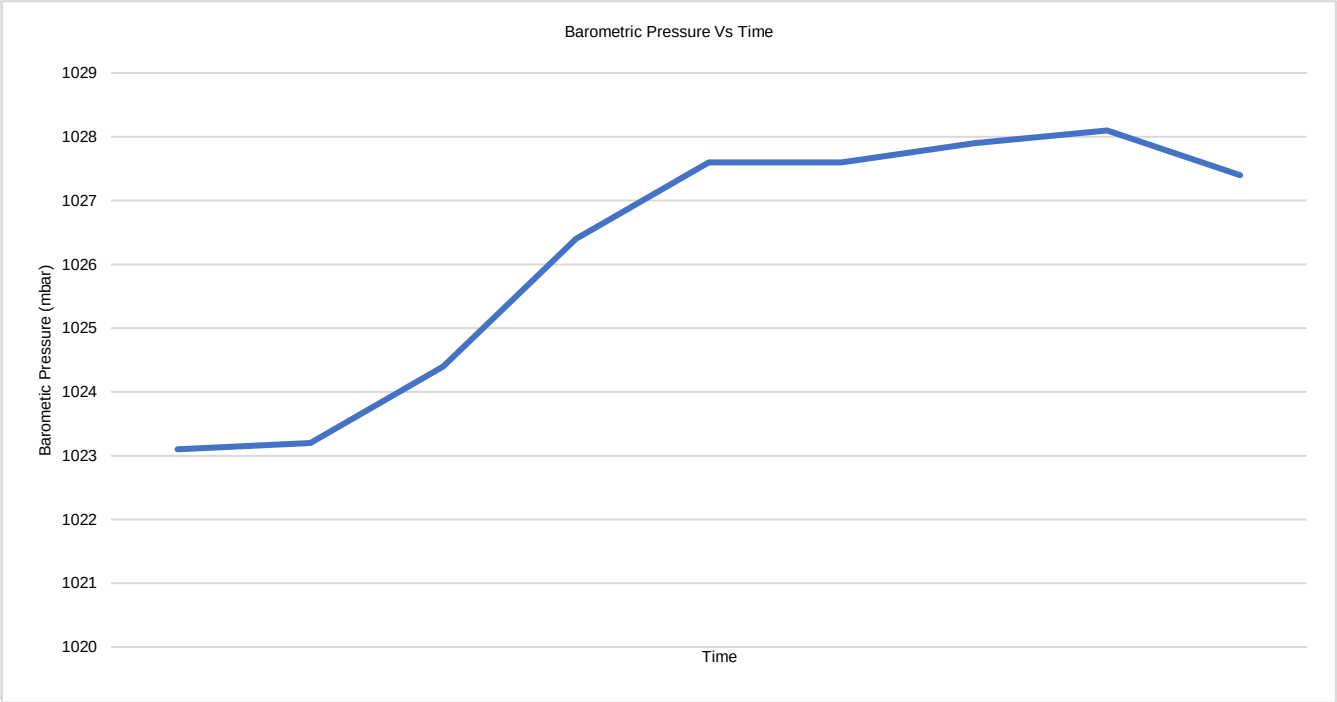
Date	Time (24hr)	Barometric Pressure (mbar)
08/01/2023	00:00	994.3
	03:00	993.6
	06:00	992.3
	09:00	989.9
	12:00	988.4
	15:00	988.1
	18:00	987.4
	21:00	987.5
	00:00	990.9



BAROMETRIC PRESSURE DATA

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

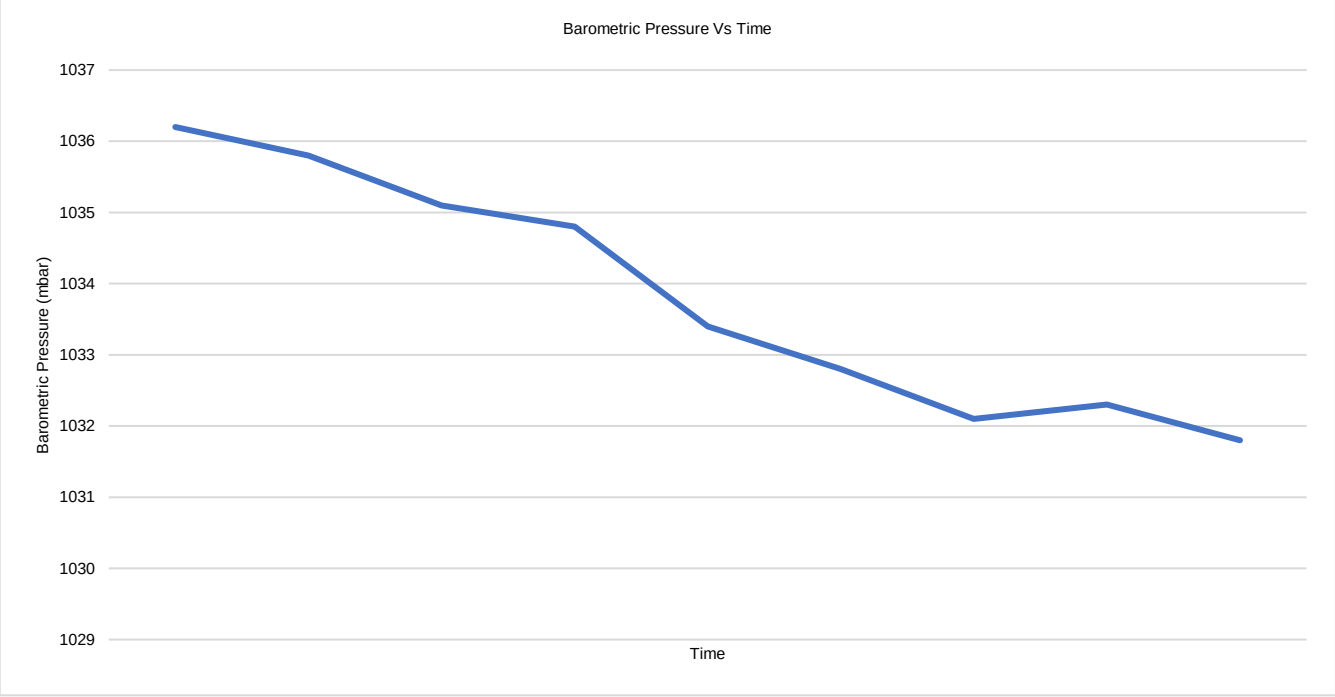
Date	Time (24hr)	Barometric Pressure (mbar)
30/01/2023	00:00	1023.1
	03:00	1023.2
	06:00	1024.4
	09:00	1026.4
	12:00	1027.6
	15:00	1027.6
	18:00	1027.9
	21:00	1028.1
	00:00	1027.4



BAROMETRIC PRESSURE DATA

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Date	Time (24hr)	Barometric Pressure (mbar)
12/02/2023	00:00	1036.2
	03:00	1035.8
	06:00	1035.1
	09:00	1034.8
	12:00	1033.4
	15:00	1032.8
	18:00	1032.1
	21:00	1032.3
	00:00	1031.8



GAS AND GROUNDWATER MONITORING DATA

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH101	1	20/12/2022 15:54	Water Level	10.56	m	0.01	Dip Meter	Base dipped at 13.49m
S1-BH101	1	21/12/2022 13:59	Water Level	10.54	m	0.01	Dip Meter	Base dipped at 13.48m
S1-BH101	1	22/12/2022 12:31	Water Level	10.52	m	0.01	Dip Meter	Base dipped at 13.48m
S1-BH101	1	09/01/2023 13:49	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Differential Pressure	-0.09	mbar	4	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Steady Carbon Dioxide	1.4	%	0.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Barometric Pressure	979	mbar	5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Peak Oxygen	19.1	%	1	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Steady Oxygen	19.1	%	1	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Carbon Monoxide	23	ppm	2	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Steady Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Peak Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Gas Flow Rate	-7.3	l/hr	0.3	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Peak Carbon Dioxide	1.4	%	0.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:51	Water Level	10.44	m	0.01	Dip Meter	Base dipped at 13.74m. No LNAPL detected.
S1-BH101	1	25/01/2023 14:42	Water Level		m	0.01	Dip Meter	Base dipped at 13.74m. Borehole dry
S1-BH101	1	31/01/2023 12:34	Gas Flow Rate	6.5	l/hr	0.3	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Peak Carbon Dioxide	1.5	%	0.5	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Steady Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Differential Pressure	-0.34	mbar	4	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Peak Oxygen	18.9	%	1	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Barometric Pressure	998	mbar	5	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Peak Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Steady Oxygen	18.9	%	1	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Carbon Monoxide	2	ppm	2	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Steady Carbon Dioxide	1.5	%	0.5	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:36	Water Level	10.66	m	0.01	Dip Meter	Base dipped at 13.61m
S1-BH101	1	14/02/2023 14:43	Water Level	10.66	m	0.01	Dip Meter	Base dipped at 13.47m
S1-BH101	1	17/02/2023 14:45	Steady Methane	0.1	%	0.5	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Peak Methane	0.1	%	0.5	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Barometric Pressure	1000	mbar	5	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Differential Pressure	-2.94	mbar	4	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Carbon Monoxide	3	ppm	2	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Peak Carbon Dioxide	1	%	0.5	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Gas Flow Rate	3	l/hr	0.3	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Steady Oxygen	18.9	%	1	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Peak Oxygen	18.8	%	1	GA5000 SN:G508511	

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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH101	1	17/02/2023 14:45	Steady Carbon Dioxide	1	%	0.5	GA5000 SN:G508511	
S1-BH102	1	21/11/2022 12:31	Water Level	0.64	m	0.01	Dip Meter	Base dipped at 8.94m
S1-BH102	1	22/11/2022 11:05	Water Level	0.68	m	0.01	Dip Meter	Base dipped at 8.94m
S1-BH102	1	23/11/2022 13:50	Water Level	0.48	m	0.01	Dip Meter	Base dipped at 8.93m
S1-BH102	1	24/11/2022 09:01	Water Level	0.53	m	0.01	Dip Meter	Base dipped at 8.94m
S1-BH102	1	25/11/2022 10:41	Water Level	0.61	m	0.01	Dip Meter	Base dipped at 8.85m
S1-BH102	1	28/11/2022 11:48	Water Level	0.65	m	0.01	Dip Meter	Base dipped at 8.94m
S1-BH102	1	29/11/2022 13:42	LNAPL	0.74	m	0.01	Interface Probe	Base dipped at 8.86m. No LNAPL detected.
S1-BH102	1	30/11/2022 15:51	LNAPL	0.7	m	0.01	Interface Probe	Base dipped at 8.86m.
S1-BH102	1	01/12/2022 11:53	LNAPL	0.72	m	0.01	Interface Probe	Base dipped at 8.85m.
S1-BH102	1	02/12/2022 15:04	Water Level	0.69	m	0.01	Dip Meter	Base dipped at 8.85m.
S1-BH102	1	05/12/2022 12:05	Water Level	0.65	m	0.01	Dip Meter	Base dipped at 8.85m.
S1-BH102	1	06/12/2022 08:48	LNAPL	0.66	m	0.01	Interface Probe	Base dipped at 8.85m.
S1-BH102	1	07/12/2022 12:29	LNAPL	0.65	m	0.01	Interface Probe	Base dipped at 8.85m.
S1-BH102	1	08/12/2022 09:16	LNAPL	0.62	m	0.01	Interface Probe	Depth to base 2.98m
S1-BH102	1	09/12/2022 09:34	LNAPL	0.68	m	0.01	Interface Probe	Depth to base 2.98m
S1-BH102	1	12/12/2022 12:39	Water Level	0.65	m	0.01	Dip Meter	Base dipped at 8.82m
S1-BH102	1	13/12/2022 12:30	Water Level	0.69	m	0.01	Dip Meter	Base dipped at 8.84m
S1-BH102	1	14/12/2022 14:32	Water Level	0.69	m	0.01	Dip Meter	Base dipped at 8.84m
S1-BH102	1	15/12/2022 11:03	Water Level	0.64	m	0.01	Dip Meter	Base dipped at 8.84m
S1-BH102	1	16/12/2022 11:03	Water Level	0.64	m	0.01	Dip Meter	Base dipped at 8.84m
S1-BH102	1	20/12/2022 14:59	Water Level	0.66	m	0.01	Dip Meter	Base dipped at 8.77m
S1-BH102	1	22/12/2022 10:06	Water Level	0.63	m	0.01	Dip Meter	Base dipped at 8.85m
S1-BH102	1	09/01/2023 11:01	Steady Carbon Dioxide	4.5	%	0.5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Steady Methane	8.5	%	0.5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Peak Methane	8.2	%	0.5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Carbon Monoxide	2	ppm	2	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Steady Oxygen	14.4	%	1	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Peak Oxygen	14.4	%	1	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Differential Pressure	0.02	mbar	4	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Gas Flow Rate	-8.8	l/hr	0.3	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Peak Carbon Dioxide	4.5	%	0.5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:03	Water Level	0.5	m	0.01	Dip Meter	Base dipped at 8.77m. No LNAPL detected.
S1-BH102	1	24/01/2023 11:15	Water Level	0.68	m	0.01	Dip Meter	Base dipped at 8.72m
S1-BH102	1	31/01/2023 10:39	Peak Carbon Dioxide	3.6	%	0.5	GA5000 SN:G504748	
S1-BH102	1	31/01/2023 10:39	Steady Methane	2.7	%	0.5	GA5000 SN:G504748	
S1-BH102	1	31/01/2023 10:39	Steady Carbon Dioxide	3.6	%	0.5	GA5000 SN:G504748	

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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH102	1	31/01/2023 10:39	Steady Oxygen	18.9	%	1	GA5000 SN:G504748	
S1-BH102	1	31/01/2023 10:39	Peak Methane	2.7	%	0.5	GA5000 SN:G504748	
S1-BH102	1	31/01/2023 10:39	Gas Flow Rate	5.5	l/hr	0.3	GA5000 SN:G504748	
S1-BH102	1	31/01/2023 10:39	Differential Pressure	14.38	mbar	4	GA5000 SN:G504748	
S1-BH102	1	31/01/2023 10:39	Carbon Monoxide	1	ppm	2	GA5000 SN:G504748	
S1-BH102	1	31/01/2023 10:39	Barometric Pressure	1000	mbar	5	GA5000 SN:G504748	
S1-BH102	1	31/01/2023 10:39	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH102	1	31/01/2023 10:39	Peak Oxygen	18.9	%	1	GA5000 SN:G504748	
S1-BH102	1	31/01/2023 10:40	Water Level	0.64	m	0.01	Dip Meter	Base dipped at 8.85m
S1-BH102	1	01/02/2023 11:18	Water Level	0.64	m	0.01	Dip Meter	Base dipped at 8.85m
S1-BH102	1	13/02/2023 11:43	Water Level	0.68	m	0.01	Dip Meter	Base dipped at 8.75m
S1-BH102	1	13/02/2023 11:45	Carbon Monoxide	1	ppm	2	GA5000 SN:G508511	
S1-BH102	1	13/02/2023 11:45	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH102	1	13/02/2023 11:45	Barometric Pressure	1006	mbar	5	GA5000 SN:G508511	
S1-BH102	1	13/02/2023 11:45	Peak Carbon Dioxide	2	%	0.5	GA5000 SN:G508511	
S1-BH102	1	13/02/2023 11:45	Peak Oxygen	16.6	%	1	GA5000 SN:G508511	
S1-BH102	1	13/02/2023 11:45	Differential Pressure	12.91	mbar	4	GA5000 SN:G508511	
S1-BH102	1	13/02/2023 11:45	Steady Methane	8.9	%	0.5	GA5000 SN:G508511	
S1-BH102	1	13/02/2023 11:45	Steady Oxygen	16.6	%	1	GA5000 SN:G508511	
S1-BH102	1	13/02/2023 11:45	Gas Flow Rate	6.2	l/hr	0.3	GA5000 SN:G508511	
S1-BH102	1	13/02/2023 11:45	Peak Methane	8.9	%	0.5	GA5000 SN:G508511	
S1-BH102	1	13/02/2023 11:45	Steady Carbon Dioxide	2	%	0.5	GA5000 SN:G508511	
S1-BH103	1	02/12/2022 14:11	LNAPL	3.32	m	0.01	Interface Probe	Base dipped at 5.22m.
S1-BH103	1	05/12/2022 12:13	LNAPL	3.35	m	0.01	Interface Probe	Base dipped at 5.20m.
S1-BH103	1	06/12/2022 08:58	LNAPL	3.42	m	0.01	Interface Probe	Base dipped at 5.20m.
S1-BH103	1	07/12/2022 12:32	LNAPL	3.42	m	0.01	Interface Probe	Base dipped at 5.20m.
S1-BH103	1	08/12/2022 10:05	LNAPL	3.42	m	0.01	Interface Probe	Depth to base 5.67m
S1-BH103	1	09/12/2022 11:22	LNAPL	3.42	m	0.01	Interface Probe	Depth to base 5.67m
S1-BH103	1	12/12/2022 12:10	Water Level	3.42	m	0.01	Dip Meter	Base dipped at 12.10m
S1-BH103	1	13/12/2022 12:40	Water Level	3.42	m	0.01	Dip Meter	Base dipped at 5.67m
S1-BH103	1	14/12/2022 13:56	Water Level	3.42	m	0.01	Dip Meter	Base dipped at 5.67m
S1-BH103	1	16/12/2022 12:38	Water Level	3.4	m	0.01	Dip Meter	Base dipped at 5.67m
S1-BH103	1	20/12/2022 15:13	Water Level	3.14	m	0.01	Dip Meter	Base dipped at 5.51m
S1-BH103	1	22/12/2022 10:13	Water Level	3.12	m	0.01	Dip Meter	Base dipped at 5.52m
S1-BH103	1	09/01/2023 11:34	Water Level	2.85	m	0.01	Dip Meter	Base dipped at 5.75m. No LNAPL detected.
S1-BH103	1	09/01/2023 11:35	Peak Carbon Dioxide	4.7	%	0.5	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Peak Oxygen	15.9	%	1	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Steady Oxygen	15.9	%	1	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	

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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH103	1	09/01/2023 11:35	Steady Carbon Dioxide	4.7	%	0.5	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Gas Flow Rate	0.2	l/hr	0.3	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Steady Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Differential Pressure	-0.02	mbar	4	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Peak Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH103	1	25/01/2023 10:38	Water Level	3.25	m	0.01	Dip Meter	Base dipped at 5.54m
S1-BH103	1	31/01/2023 11:23	Peak Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Steady Carbon Dioxide	4	%	0.5	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Steady Oxygen	18.9	%	1	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Barometric Pressure	999	mbar	5	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Differential Pressure	-0.12	mbar	4	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Peak Carbon Dioxide	4	%	0.5	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Gas Flow Rate	0	l/hr	0.3	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Steady Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Peak Oxygen	18.9	%	1	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:25	Water Level	3.3	m	0.01	Dip Meter	Base dipped at 5.52m
S1-BH103	1	02/02/2023 09:34	Water Level	3.3	m	0.01	Dip Meter	Base dipped at 5.52m
S1-BH103	1	14/02/2023 09:10	Water Level	3.4	m	0.01	Dip Meter	Base dipped at 5.52m
S1-BH103	1	14/02/2023 09:12	Peak Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Carbon Monoxide	0	ppm	2	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Gas Flow Rate	0.1	l/hr	0.3	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Differential Pressure	0.1	mbar	4	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Peak Oxygen	17.9	%	1	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Peak Carbon Dioxide	4.4	%	0.5	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Steady Oxygen	17.9	%	1	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Steady Carbon Dioxide	4.4	%	0.5	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Barometric Pressure	1003	mbar	5	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Steady Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH105	1	06/12/2022 08:59	LNAPL	6.47	m	0.01	Interface Probe	Base dipped at 15.50m.
S1-BH105	1	07/12/2022 12:34	LNAPL	6.46	m	0.01	Interface Probe	Base dipped at 15.48m.
S1-BH105	1	08/12/2022 10:25	LNAPL	6.45	m	0.01	Interface Probe	Depth to base 15.63m
S1-BH105	1	09/12/2022 11:29	LNAPL	6.43	m	0.01	Interface Probe	Depth to base 15.63m
S1-BH105	1	12/12/2022 12:00	Water Level	6.45	m	0.01	Dip Meter	Base dipped at 15.64m
S1-BH105	1	13/12/2022 13:15	Water Level	8.84	m	0.01	Dip Meter	Base dipped at 15.61m

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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH105	1	14/12/2022 13:46	Water Level	8.83	m	0.01	Dip Meter	Base dipped at 15.60m
S1-BH105	1	15/12/2022 10:14	Water Level	6.51	m	0.01	Dip Meter	Base dipped at 15.61m
S1-BH105	1	16/12/2022 11:53	Water Level	6.5	m	0.01	Dip Meter	Base dipped at 15.62m
S1-BH105	1	20/12/2022 15:19	Water Level	6.4	m	0.01	Dip Meter	Base dipped at 15.39m
S1-BH105	1	22/12/2022 10:21	Water Level	6.38	m	0.01	Dip Meter	Base dipped at 15.61m
S1-BH105	1	09/01/2023 12:11	Steady Oxygen	5	%	1	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Peak Oxygen	5	%	1	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Peak Carbon Dioxide	3.9	%	0.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Barometric Pressure	977	mbar	5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Peak Methane	25.9	%	0.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Steady Methane	25.8	%	0.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Carbon Monoxide	1	ppm	2	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Gas Flow Rate	-8.3	l/hr	0.3	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Differential Pressure	0.02	mbar	4	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Steady Carbon Dioxide	3.9	%	0.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:14	Water Level	6.3	m	0.01	Dip Meter	Base dipped at 15.50m. No LNAPL detected.
S1-BH105	1	16/01/2023 11:11	Water Level	6.275	m	0.01	Dip Meter	Base dipped at 15.44m
S1-BH105	1	31/01/2023 11:37	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Peak Methane	21	%	0.5	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Differential Pressure	1.26	mbar	4	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Peak Carbon Dioxide	3.6	%	0.5	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Steady Methane	21	%	0.5	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Gas Flow Rate	5.5	l/hr	0.3	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Carbon Monoxide	88	ppm	2	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Peak Oxygen	9.3	%	1	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Steady Carbon Dioxide	3.6	%	0.5	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Steady Oxygen	9.3	%	1	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Barometric Pressure	999	mbar	5	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:39	Water Level	6.42	m	0.01	Dip Meter	Base dipped at 15.36m
S1-BH105	1	01/02/2023 14:26	Water Level	6.42	m	0.01	Dip Meter	Base dipped at 15.36m
S1-BH105	1	14/02/2023 10:19	Water Level	6.46	m	0.01	Dip Meter	Base dipped at 15.36m
S1-BH105	1	14/02/2023 10:21	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Differential Pressure	2.59	mbar	4	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Steady Methane	34.1	%	0.5	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Peak Carbon Dioxide	3.8	%	0.5	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Peak Methane	35.1	%	0.5	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Carbon Monoxide	10	ppm	2	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Barometric Pressure	1003	mbar	5	GA5000 SN:G508511	

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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH105	1	14/02/2023 10:21	Steady Carbon Dioxide	3.8	%	0.5	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Gas Flow Rate	3.9	l/hr	0.3	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Steady Oxygen	6.5	%	1	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Peak Oxygen	6.5	%	1	GA5000 SN:G508511	
S1-BH108	1	25/11/2022 10:28	Water Level	1.78	m	0.01	Dip Meter	Base dipped at 15.50m
S1-BH108	1	28/11/2022 10:20	Water Level	1.4	m	0.01	Dip Meter	Base dipped at 15.50m
S1-BH108	1	29/11/2022 13:41	LNAPL	1.35	m	0.01	Interface Probe	Base dipped at 15.43m. No LNAPL detected.
S1-BH108	1	30/11/2022 15:47	LNAPL	1.49	m	0.01	Interface Probe	Base dipped at 15.50m.
S1-BH108	1	01/12/2022 11:51	LNAPL	1.5	m	0.01	Interface Probe	Base dipped at 15.50m.
S1-BH108	1	02/12/2022 14:59	LNAPL	1.69	m	0.01	Interface Probe	Base dipped at 15.50m.
S1-BH108	1	05/12/2022 12:00	Water Level	1.84	m	0.01	Dip Meter	Base dipped at 15.48m.
S1-BH108	1	06/12/2022 08:44	LNAPL	0	m	0.01	Interface Probe	Heavy damage from machine strike, unable to dip due to bent post.
S1-BH108	1	07/12/2022 08:46	Water Level	1.79	m	0.01	Dip Meter	Base dipped at 15.47m.
S1-BH108	1	08/12/2022 09:30	LNAPL	1.8	m	0.01	Interface Probe	Depth to base 15.77m
S1-BH108	1	09/12/2022 09:17	LNAPL	1.97	m	0.01	Interface Probe	Depth to base 15.77m
S1-BH108	1	12/12/2022 12:19	Water Level	2.23	m	0.01	Dip Meter	Base dipped at 12.19m
S1-BH108	1	13/12/2022 10:05	Water Level	2.43	m	0.01	Dip Meter	Base dipped at 15.75m
S1-BH108	1	14/12/2022 14:10	Water Level	2.44	m	0.01	Dip Meter	Base dipped at 15.75m
S1-BH108	1	15/12/2022 09:14	Water Level	2.47	m	0.01	Dip Meter	Base dipped at 2.47m
S1-BH108	1	16/12/2022 12:42	Water Level	2.49	m	0.01	Dip Meter	Base dipped at 15.71m
S1-BH108	1	20/12/2022 14:48	Water Level	2.23	m	0.01	Dip Meter	Base dipped at 15.45m
S1-BH108	1	22/12/2022 09:57	Water Level	2.25	m	0.01	Dip Meter	Base dipped at 15.51m
S1-BH108	1	09/01/2023 10:16	Peak Carbon Dioxide	0.9	%	0.5	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Steady Oxygen	20.7	%	1	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Peak Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Barometric Pressure	976	mbar	5	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Gas Flow Rate	-3.4	l/hr	0.3	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Steady Carbon Dioxide	0.6	%	0.5	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Differential Pressure	-0.02	mbar	4	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Peak Oxygen	20.6	%	1	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Steady Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:21	Water Level	1.19	m	0.01	Dip Meter	Base dipped at 15.60m. No LNAPL detected.
S1-BH108	1	16/01/2023 13:04	Water Level	1.18	m	0.01	Dip Meter	Base dipped at 15.55m
S1-BH108	1	31/01/2023 10:04	Steady Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Peak Carbon Dioxide	2.8	%	0.5	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Barometric Pressure	999	mbar	5	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	

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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH108	1	31/01/2023 10:04	Steady Carbon Dioxide	2.8	%	0.5	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Peak Oxygen	20.3	%	1	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Gas Flow Rate	6.3	l/hr	0.3	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Differential Pressure	0.03	mbar	4	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Carbon Monoxide	10	ppm	2	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Peak Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Steady Oxygen	20.3	%	1	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:07	Water Level	2.13	m	0.01	Dip Meter	Base dipped at 15.46m
S1-BH112	1	20/12/2022 15:32	Water Level	2.09	m	0.01	Dip Meter	Base dipped at 3.34m
S1-BH112	2	20/12/2022 15:47	Water Level	9.74	m	0.01	Dip Meter	Base dipped at 15.23m
S1-BH112	1	21/12/2022 12:22	Water Level	2.25	m	0.01	Dip Meter	Base dipped at 3.31m
S1-BH112	2	21/12/2022 12:24	Water Level	9.62	m	0.01	Dip Meter	Base dipped at 15.00m
S1-BH112	1	22/12/2022 10:33	Water Level	2.08	m	0.01	Dip Meter	Base dipped at 3.3m
S1-BH112	2	23/12/2022 10:35	Water Level	9.62	m	0.01	Dip Meter	Base dipped at 14.99m
S1-BH112	1	09/01/2023 12:46	Steady Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Steady Oxygen	9	%	1	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Differential Pressure	0.1	mbar	4	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Steady Carbon Dioxide	1.4	%	0.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Peak Oxygen	9	%	1	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Steady Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Peak Carbon Dioxide	1.4	%	0.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Gas Flow Rate	0.2	l/hr	0.3	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:53	Water Level	2.41	m	0.01	Dip Meter	Base dipped at 3.37m. No LNAPL detected.
S1-BH112	2	09/01/2023 13:06	Steady Oxygen	8.5	%	1	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Peak Methane	0.2	%	0.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Peak Carbon Dioxide	2.3	%	0.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Differential Pressure	0.03	mbar	4	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Gas Flow Rate	-3	l/hr	0.3	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Carbon Monoxide	1	ppm	2	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Peak Oxygen	8.5	%	1	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Steady Carbon Dioxide	2.3	%	0.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Steady Methane	0.2	%	0.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:09	Water Level	8.87	m	0.01	Dip Meter	Base dipped at 15.12m. No LNAPL detected.
S1-BH112	1	02/02/2023 10:49	Water Level		m	0.01	Dip Meter	Water dipped at 3.15m. Base dipped at 3.36m

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S1-BH112	2	02/02/2023 10:58	Water Level	9.98	m	0.01	Dip Meter	Base dipped at 15.00m
S1-BH112	1	14/02/2023 13:58	Steady Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Peak Oxygen	14.8	%	1	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Steady Oxygen	14.8	%	1	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Differential Pressure	0.14	mbar	4	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Carbon Monoxide	1	ppm	2	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Steady Carbon Dioxide	2	%	0.5	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Peak Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Gas Flow Rate	0.2	l/hr	0.3	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Water Level		m	0.01	Dip Meter	Water dipped at 3.20m. Base dipped at 3.41m
S1-BH112	1	14/02/2023 13:58	Barometric Pressure	1001	mbar	5	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Peak Carbon Dioxide	2	%	0.5	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Differential Pressure	0.66	mbar	4	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Gas Flow Rate	0.3	l/hr	0.3	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Peak Carbon Dioxide	0.9	%	0.5	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Steady Carbon Dioxide	0.9	%	0.5	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Peak Oxygen	17.1	%	1	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Steady Methane	0.1	%	0.5	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Water Level	10.13	m	0.01	Dip Meter	Base dipped at 15.17m
S1-BH112	2	14/02/2023 14:05	Steady Oxygen	17.2	%	1	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Peak Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Carbon Monoxide	2	ppm	2	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Barometric Pressure	1001	mbar	5	GA5000 SN:G508511	
S1-BH113	1	25/11/2022 11:00	Water Level	4.17	m	0.01	Dip Meter	Base dipped at 5.50m
S1-BH113	1	28/11/2022 12:42	Water Level	4.1	m	0.01	Dip Meter	Base dipped at 5.50m
S1-BH113	1	29/11/2022 13:44	LNAPL	4.09	m	0.01	Interface Probe	Base dipped at 5.50m. No LNAPL detected.
S1-BH113	1	30/11/2022 15:52	LNAPL	4.29	m	0.01	Interface Probe	Base dipped at 5.50m.
S1-BH113	1	01/12/2022 11:55	LNAPL	4.33	m	0.01	Interface Probe	Base dipped at 5.50m.
S1-BH113	1	02/12/2022 12:08	Water Level	4.37	m	0.01	Dip Meter	Base dipped at 5.50m.
S1-BH113	1	05/12/2022 14:08	Water Level	4.55	m	0.01	Dip Meter	Base dipped at 5.50m.
S1-BH113	1	06/12/2022 08:51	LNAPL	4.5	m	0.01	Interface Probe	Base dipped at 5.50m.
S1-BH113	1	07/12/2022 12:35	LNAPL	4.52	m	0.01	Interface Probe	Base dipped at 5.49m.
S1-BH113	1	08/12/2022 10:40	LNAPL	4.52	m	0.01	Interface Probe	Depth to base 5.85m
S1-BH113	1	09/12/2022 11:34	LNAPL	4.55	m	0.01	Interface Probe	Depth to base 5.85m
S1-BH113	1	12/12/2022 11:51	Water Level	4.52	m	0.01	Dip Meter	Base dipped at 5.58m
S1-BH113	1	13/12/2022 13:18	Water Level	4.7	m	0.01	Dip Meter	Base dipped at 5.58m
S1-BH113	1	14/12/2022 13:31	Water Level	4.7	m	0.01	Dip Meter	Base dipped at5.58m

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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH113	1	15/12/2022 10:03	Water Level	4.71	m	0.01	Dip Meter	Base dipped at 5.58m
S1-BH113	1	16/12/2022 11:48	Water Level	4.8	m	0.01	Dip Meter	Base dipped at 5.58m
S1-BH113	1	20/12/2022 15:25	Water Level	4.13	m	0.01	Dip Meter	Base dipped at 5.50m
S1-BH113	1	22/12/2022 10:26	Water Level	4.11	m	0.01	Dip Meter	Base dipped at 5.52m
S1-BH113	1	09/01/2023 12:30	Gas Flow Rate	0.3	l/hr	0.3	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Steady Carbon Dioxide	4.5	%	0.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Carbon Monoxide	6	ppm	2	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Peak Carbon Dioxide	4.5	%	0.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Water Level	3.69	m	0.01	Dip Meter	Base dipped at 5.53m. No LNAPL detected.
S1-BH113	1	09/01/2023 12:30	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:32	Steady Methane	4.5	%	0.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:32	Peak Methane	0.2	%	0.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:33	Peak Oxygen	4.5	%	1	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:33	Steady Oxygen	1.8	%	1	GA5000 SN:G504748	
S1-BH113	1	16/01/2023 08:40	Water Level	3.86	m	0.01	Dip Meter	Base dipped at 5.53m
S1-BH113	1	31/01/2023 11:49	Peak Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Steady Carbon Dioxide	4	%	0.5	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Gas Flow Rate	0.2	l/hr	0.3	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Peak Carbon Dioxide	4	%	0.5	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Carbon Monoxide	2	ppm	2	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Steady Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Barometric Pressure	999	mbar	5	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Steady Oxygen	7	%	1	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Peak Oxygen	7	%	1	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Differential Pressure	0.14	mbar	4	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:51	Water Level	4.66	m	0.01	Dip Meter	Base dipped at 5.54m
S1-BH113	1	01/02/2023 15:15	Water Level	4.66	m	0.01	Dip Meter	Base dipped at 5.54m
S1-BH113	1	14/02/2023 11:03	Water Level		m	0.01	Dip Meter	Borehole dry. Base dipped at 5.49m
S1-BH113	1	14/02/2023 11:05	Peak Oxygen	9.5	%	1	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Steady Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Gas Flow Rate	0.2	l/hr	0.3	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Peak Methane	0.4	%	0.5	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Carbon Monoxide	1	ppm	2	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Peak Carbon Dioxide	5.4	%	0.5	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Barometric Pressure	1003	mbar	5	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Differential Pressure	0.14	mbar	4	GA5000 SN:G508511	

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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH113	1	14/02/2023 11:05	Steady Oxygen	9.6	%	1	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Steady Carbon Dioxide	5.4	%	0.5	GA5000 SN:G508511	
S1-BH121	1	15/11/2022 15:00	Water Level	0.52	m	0.01	Dip Meter	Base dipped at 3.37m
S1-BH121	1	16/11/2022 10:00	Water Level	0.43	m	0.01	Dip Meter	Base dipped at 3.37m
S1-BH121	1	17/11/2022 09:50	Water Level	0.53	m	0.01	Dip Meter	Base dipped at 3.37m
S1-BH121	1	21/11/2022 12:30	Water Level	0.44	m	0.01	Dip Meter	Base dipped at 3.36m
S1-BH121	1	22/11/2022 11:00	Water Level	0.46	m	0.01	Dip Meter	Base dipped at 3.37m
S1-BH121	1	23/11/2022 13:49	Water Level	0.44	m	0.01	Dip Meter	Base dipped at 3.36m
S1-BH121	1	24/11/2022 08:56	Water Level	0.47	m	0.01	Dip Meter	Base dipped at 3.36m
S1-BH121	1	25/11/2022 10:36	Water Level	0.48	m	0.01	Dip Meter	Base dipped at 3.35m
S1-BH121	1	28/11/2022 11:08	Water Level	0.43	m	0.01	Dip Meter	Base dipped at 3.38m
S1-BH121	1	29/11/2022 13:41	LNAPL	0.6	m	0.01	Interface Probe	Base dipped at 3.40m. No LNAPL detected.
S1-BH121	1	30/11/2022 15:49	LNAPL	0.62	m	0.01	Interface Probe	Base dipped at 3.39m.
S1-BH121	1	01/12/2022 11:52	LNAPL	0.64	m	0.01	Interface Probe	Base dipped at 3.40m.
S1-BH121	1	02/12/2022 14:02	Water Level	0.65	m	0.01	Dip Meter	Base dipped at 3.40m.
S1-BH121	1	05/12/2022 12:02	Water Level	0.71	m	0.01	Dip Meter	Base dipped at 3.40m.
S1-BH121	1	06/12/2022 08:47	LNAPL	0.71	m	0.01	Interface Probe	Base dipped at 3.41m.
S1-BH121	1	07/12/2022 12:27	LNAPL	0.7	m	0.01	Interface Probe	Base dipped at 3.40m.
S1-BH121	1	08/12/2022 09:45	LNAPL	0.77	m	0.01	Interface Probe	Depth to base 3.41m
S1-BH121	1	09/12/2022 09:34	LNAPL	0.7	m	0.01	Interface Probe	Depth to base 3.41m
S1-BH121	1	12/12/2022 12:48	Water Level	0.7	m	0.01	Dip Meter	Base dipped at 12.48m
S1-BH121	1	13/12/2022 12:16	Water Level	0.75	m	0.01	Dip Meter	Base dipped at 3.33m
S1-BH121	1	14/12/2022 14:19	Water Level	0.75	m	0.01	Dip Meter	Base dipped at 3.33m
S1-BH121	1	15/12/2022 10:34	Water Level	0.72	m	0.01	Dip Meter	Base dipped at 3.33m
S1-BH121	1	16/12/2022 12:06	Water Level	0.76	m	0.01	Dip Meter	Base dipped at 3.32m
S1-BH121	1	20/12/2022 14:55	Water Level	0.46	m	0.01	Dip Meter	Base dipped at 3.28m
S1-BH121	1	23/12/2022 10:03	Water Level	0.46	m	0.01	Dip Meter	Base dipped at 3.40m
S1-BH121	1	09/01/2023 10:36	Water Level	0.45	m	0.01	Dip Meter	Base dipped at 3.31m. No LNAPL detected
S1-BH121	1	09/01/2023 10:37	Peak Carbon Dioxide	2	%	0.5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Barometric Pressure	977	mbar	5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Gas Flow Rate	-12	l/hr	0.3	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Steady Methane	0.3	%	0.5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Peak Methane	0.3	%	0.5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Steady Carbon Dioxide	2	%	0.5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Peak Oxygen	20.1	%	1	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Steady Oxygen	20.1	%	1	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Differential Pressure	-0.02	mbar	4	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	

GAS AND GROUNDWATER MONITORING DATA

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH121	1	17/01/2023 08:27	Water Level	0.645	m	0.01	Dip Meter	Base dipped at 3.33m
S1-BH121	1	24/01/2023 14:15	Water Level	0.63	m	0.01	Dip Meter	Base dipped at 3.30m
S1-BH121	1	31/01/2023 10:25	Steady Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Steady Oxygen	21.2	%	1	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Differential Pressure	-0.14	mbar	4	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Peak Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Gas Flow Rate	3.9	l/hr	0.3	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Steady Carbon Dioxide	0.5	%	0.5	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Peak Carbon Dioxide	1.2	%	0.5	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Peak Oxygen	21.2	%	1	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Barometric Pressure	1000	mbar	5	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:27	Water Level	0.61	m	0.01	Dip Meter	Base dipped at 3.22m
S1-BH121	1	01/02/2023 10:37	Water Level	0.61	m	0.01	Dip Meter	Base dipped at 3.32m
S1-BH121	1	13/02/2023 10:44	Water Level	0.67	m	0.01	Dip Meter	Base dipped at 3.28m
S1-BH121	1	13/02/2023 10:46	Barometric Pressure	1006	mbar	5	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Carbon Monoxide	0	ppm	2	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Steady Carbon Dioxide	1.9	%	0.5	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Gas Flow Rate	5.6	l/hr	0.3	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Peak Carbon Dioxide	1.9	%	0.5	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Peak Oxygen	19.5	%	1	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Steady Oxygen	19.5	%	1	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Peak Methane	0.4	%	0.5	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Differential Pressure	12.27	mbar	4	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Steady Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH122	1	15/11/2022 15:05	Water Level	0.205	m	0.01	Dip Meter	Base dipped at 1.84m
S1-BH122	1	16/11/2022 10:05	Water Level	0.17	m	0.01	Dip Meter	Base dipped at 1.84m
S1-BH122	1	17/11/2022 09:53	Water Level	0.19	m	0.01	Dip Meter	Base dipped at 1.84m
S1-BH122	1	21/11/2022 12:31	Water Level	0.19	m	0.01	Dip Meter	Base dipped at 1.83m
S1-BH122	1	22/11/2022 11:10	Water Level	0.21	m	0.01	Dip Meter	Base dipped at 1.83m
S1-BH122	1	23/11/2022 13:51	Water Level	0.19	m	0.01	Dip Meter	Base dipped at 1.82m
S1-BH122	1	24/11/2022 09:04	Water Level	0.18	m	0.01	Dip Meter	Base dipped at 1.83m.
S1-BH122	1	25/11/2022 10:45	Water Level	0.2	m	0.01	Dip Meter	Base dipped at 1.82m
S1-BH122	1	28/11/2022 07:32	Water Level	0.19	m	0.01	Dip Meter	Base dipped at 1.84m
S1-BH122	1	29/11/2022 13:43	LNAPL	0.43	m	0.01	Interface Probe	Base dipped at 1.85m. No LNAPL detected.
S1-BH122	1	30/11/2022 15:51	LNAPL	0.29	m	0.01	Interface Probe	Base dipped at 1.85m.
S1-BH122	1	01/12/2022 11:54	LNAPL	0.28	m	0.01	Interface Probe	Base dipped at 1.85m.

GAS AND GROUNDWATER MONITORING DATA

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH122	1	02/12/2022 14:06	Water Level	0.28	m	0.01	Dip Meter	Base dipped at 1.85m.
S1-BH122	1	05/12/2022 12:06	Water Level	0.26	m	0.01	Dip Meter	Base dipped at 1.85m.
S1-BH122	1	06/12/2022 08:49	LNAPL	0.24	m	0.01	Interface Probe	Base dipped at 1.85m.
S1-BH122	1	07/12/2022 12:30	LNAPL	0.25	m	0.01	Interface Probe	Base dipped at 1.85m.
S1-BH122	1	08/12/2022 09:50	LNAPL	0.4	m	0.01	Interface Probe	Depth to base 2.00m
S1-BH122	1	09/12/2022 09:43	LNAPL	0.33	m	0.01	Interface Probe	Depth to base 2.00m
S1-BH122	1	12/12/2022 12:30	Water Level	0.36	m	0.01	Dip Meter	Base dipped at 1.80m
S1-BH122	1	13/12/2022 12:42	Water Level	0.42	m	0.01	Dip Meter	Base dipped at 2.45m
S1-BH122	1	14/12/2022 14:46	Water Level	0.36	m	0.01	Dip Meter	Base dipped at 2.46m
S1-BH122	1	15/12/2022 10:52	Water Level	0.32	m	0.01	Dip Meter	Base dipped at 1.79m
S1-BH122	1	16/12/2022 12:25	Water Level	0.36	m	0.01	Dip Meter	Base dipped at 1.79m
S1-BH122	1	20/12/2022 15:03	Water Level	0.17	m	0.01	Dip Meter	Base dipped at 1.80m
S1-BH122	1	23/12/2022 10:09	Water Level	0.21	m	0.01	Dip Meter	Base dipped at 1.79m
S1-BH122	1	09/01/2023 11:16	Steady Carbon Dioxide	2.2	%	0.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Steady Oxygen	19.4	%	1	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Peak Methane	0.3	%	0.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Steady Methane	0.3	%	0.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Differential Pressure	0.02	mbar	4	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Peak Carbon Dioxide	2.2	%	0.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Peak Oxygen	19.4	%	1	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Gas Flow Rate	-2.1	l/hr	0.3	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:19	Water Level	0.15	m	0.01	Dip Meter	Base dipped at 1.77m. No LNAPL detected.
S1-BH122	1	24/01/2023 12:04	Water Level	0.28	m	0.01	Dip Meter	Base dipped at 1.76m
S1-BH122	1	31/01/2023 10:51	Peak Carbon Dioxide	1.7	%	0.5	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Steady Carbon Dioxide	1.7	%	0.5	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Peak Oxygen	19.9	%	1	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Gas Flow Rate	11	l/hr	0.3	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Steady Oxygen	19.9	%	1	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Steady Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Barometric Pressure	1000	mbar	5	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Differential Pressure	-0.05	mbar	4	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Peak Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:53	Water Level	0.25	m	0.01	Dip Meter	Base dipped at 1.76m
S1-BH122	1	01/02/2023 12:07	Water Level	0.25	m	0.01	Dip Meter	Base dipped at 1.76m

GAS AND GROUNDWATER MONITORING DATA

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH122	1	13/02/2023 14:16	Water Level	0.34	m	0.01	Dip Meter	Base dipped at 1.76m
S1-BH122	1	13/02/2023 14:18	Hydrogen Sulphide	1	ppm	1.5	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Steady Carbon Dioxide	1.8	%	0.5	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Peak Oxygen	18.9	%	1	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Carbon Monoxide	2	ppm	2	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Peak Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Gas Flow Rate	7.5	l/hr	0.3	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Steady Oxygen	18.9	%	1	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Differential Pressure	-2.78	mbar	4	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Peak Carbon Dioxide	1.8	%	0.5	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Steady Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Barometric Pressure	1005	mbar	5	GA5000 SN:G508511	
SOP003.16	1	09/12/2022 13:33	Water Level		m	0.01	Dip Meter	Dry. Base dipped at 13.88m
SOP003.16	1	12/12/2022 11:30	Water Level	11.3	m	0.01	Dip Meter	Base dipped at 13.86m
SOP003.16	1	13/12/2022 13:53	Water Level	11.34	m	0.01	Dip Meter	Base dipped at 13.37m
SOP003.16	1	14/12/2022 13:05	Water Level	11.36	m	0.01	Dip Meter	Base dipped at 13.34m
SOP003.16	1	15/12/2022 09:54	Water Level	11.35	m	0.01	Dip Meter	Base dipped at 13.86m
SOP003.16	1	16/12/2022 11:40	Water Level	11.35	m	0.01	Dip Meter	Base dipped at 13.90m
SOP003.16	1	20/12/2022 13:45	Water Level	11.35	m	0.01	Dip Meter	Base dipped at 13.88m
SOP003.16	1	21/12/2022 08:35	Water Level	11.34	m	0.01	Dip Meter	Base dipped at 13.88m
SOP003.16	1	22/12/2022 10:15	Water Level	12.35	m	0.01	Dip Meter	Base dipped at 13.88m
SOP003.16	1	09/01/2023 13:21	Peak Oxygen	15.8	%	1	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Steady Methane	0.2	%	0.5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Gas Flow Rate	-6.8	l/hr	0.3	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Steady Oxygen	15.8	%	1	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Barometric Pressure	979	mbar	5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Peak Carbon Dioxide	3.7	%	0.5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Carbon Monoxide	2	ppm	2	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Peak Methane	0.3	%	0.5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Steady Carbon Dioxide	3.6	%	0.5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Differential Pressure	0.02	mbar	4	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:24	Water Level	10.2	m	0.01	Dip Meter	Base dipped at 13.75m. No LNAPL detected.
SOP003.16	1	25/01/2023 14:02	Water Level	11.04	m	0.01	Dip Meter	Base dipped at 13.60m
SOP003.16	1	31/01/2023 12:17	Gas Flow Rate	7	l/hr	0.3	GA5000 SN:G504748	
SOP003.16	1	31/01/2023 12:17	Differential Pressure	-6.67	mbar	4	GA5000 SN:G504748	
SOP003.16	1	31/01/2023 12:17	Steady Carbon Dioxide	2.2	%	0.5	GA5000 SN:G504748	
SOP003.16	1	31/01/2023 12:17	Steady Oxygen	17.8	%	1	GA5000 SN:G504748	
SOP003.16	1	31/01/2023 12:17	Peak Carbon Dioxide	2.2	%	0.5	GA5000 SN:G504748	

GAS AND GROUNDWATER MONITORING DATA

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
SOP003.16	1	31/01/2023 12:17	Peak Methane	0.2	%	0.5	GA5000 SN:G504748	
SOP003.16	1	31/01/2023 12:17	Steady Methane	0.2	%	0.5	GA5000 SN:G504748	
SOP003.16	1	31/01/2023 12:17	Barometric Pressure	998	mbar	5	GA5000 SN:G504748	
SOP003.16	1	31/01/2023 12:17	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
SOP003.16	1	31/01/2023 12:17	Peak Oxygen	17.8	%	1	GA5000 SN:G504748	
SOP003.16	1	31/01/2023 12:17	Carbon Monoxide	2	ppm	2	GA5000 SN:G504748	
SOP003.16	1	31/01/2023 12:18	Water Level	11.28	m	0.01	Dip Meter	Base dipped at 13.65m
SOP003.16	1	02/02/2023 10:21	Water Level	11.3	m	0.01	Dip Meter	Base dipped at 13.56m
SOP003.16	1	14/02/2023 12:22	Peak Methane	0.3	%	0.5	GA5000 SN:G508511	
SOP003.16	1	14/02/2023 12:22	Differential Pressure	-3.3	mbar	4	GA5000 SN:G508511	
SOP003.16	1	14/02/2023 12:22	Water Level	11.38	m	0.01	Dip Meter	Base dipped at 13.66m
SOP003.16	1	14/02/2023 12:22	Steady Carbon Dioxide	1.7	%	0.5	GA5000 SN:G508511	
SOP003.16	1	14/02/2023 12:22	Carbon Monoxide	2	ppm	2	GA5000 SN:G508511	
SOP003.16	1	14/02/2023 12:22	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
SOP003.16	1	14/02/2023 12:22	Steady Methane	0.2	%	0.5	GA5000 SN:G508511	
SOP003.16	1	14/02/2023 12:22	Barometric Pressure	1002	mbar	5	GA5000 SN:G508511	
SOP003.16	1	14/02/2023 12:22	Gas Flow Rate	3.4	l/hr	0.3	GA5000 SN:G508511	
SOP003.16	1	14/02/2023 12:22	Steady Oxygen	17.4	%	1	GA5000 SN:G508511	
SOP003.16	1	14/02/2023 12:22	Peak Carbon Dioxide	1.7	%	0.5	GA5000 SN:G508511	
SOP003.16	1	14/02/2023 12:22	Peak Oxygen	17.4	%	1	GA5000 SN:G508511	

INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH101	1	50	14.00	21/12/2214:00
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	11.00	14.00	Clear

Installation Inspection

Surface Conditions	Wet	Damage to Headworks?	No
Check Dip of Base (m bgl)	13.48	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Well Development

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Well Development

Groundwater Level (m bgl)	10.54	LNAPL/ DNAPL (m bgl)	0.00

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	6.5
Time to Purge (mins)	10	Number of Well Volumes Purged	3.2
Total Volume Purged (litres)	65.0	Operative	JP

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In-situ Parameter Device Model	N/A	Groundwater Odour	No
In-situ Parameter Device SN	N/A	Visual Turbidity	Yes
Confirm Field Calibration Completed	N/A	Groundwater Colour	Dark grey/black

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	3.00
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	140
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	13.3

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	3.46
Volume of the Standpipe (litres) (πdp2/4)*10-3	6.8

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**20.1**

Additional Notes and Observations

In-situ parameters not required during development.

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection			
Weather Conditions	Overcast	Surface Conditions	Wet
Installation Base Depth (m bgl)	9.00	Damage to headworks?	No

Remedial Actions undertaken to well:

Purging and Well Development

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Well Development

Groundwater Level (m bgl)	0.65	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00
Time to Purge (mins)	21	Number of Well Volumes Purged	3.00
Total Volume Purged (litres)	96	Operative	JJ

Well Volume Calculation

Volume of the Filter Pack	
Saturated length of Filter Pack (dip dpeth to base of intallation) (L) (m)	3.00
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	150
Volume of the Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	15.5
Volume of the Standpipe	
Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	8.35
Volume of the Standpipe (litres) (πdp2/4)*10-3	16.4
Total Well Volume	
Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**31.9**

Observations During Well Development (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model		Groundwater Odour	No
In-situ Parameter Device SN		Visual Turbidity	Yes
Confirm Field Calibration Completed		Groundwater Colour	Grey/Black running clear

Additional Notes and Observations

In-situ parameters not required during well development.

Exploratory Hole Number	S1-BH102	Installation No	1	Date and Time	28.11.22 11:48
Project Number	G22069	Client	Walters UK		
Project Name	GCRE				

INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH103	1	50	5.50	08.12.2022
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	2.00	5.50	Dry and cold

Installation Inspection

Surface Conditions	Dry	Damage to Headworks?	No
Check Dip of Base (m bgl)	5.2	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Well Development

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Well Development

Groundwater Level (m bgl)	3.45	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	WASP PUMP	Average Flow Rate (litres/min)	1.9
Time to Purge (mins)	15	Number of Well Volumes Purged	3.0
Total Volume Purged (litres)	29.0	Operative	JJ

Observations During Well Development (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	N/A	Groundwater Odour	None
In-situ Parameter Device SN	N/A	Visual Turbidity	No
Confirm Field Calibration Completed	N/A	Groundwater Colour	Clear

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	2.05
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	9.4

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	1.75
Volume of the Standpipe (litres) (πdp2/4)*10-3	8.0

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**9.6**

Additional Notes and Observations

In-situ parameters not required during development.

INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH105	1	50	15.00	08.12.22
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	11.00	15.00	Cold/Dry

Installation Inspection

Surface Conditions	Dry	Damage to Headworks?	No
Check Dip of Base (m bgl)	15.63	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Well Development

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Well Development

Groundwater Level (m bgl)	6.45	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp pump.	Average Flow Rate (litres/min)	6.9
Time to Purge (mins)	16	Number of Well Volumes Purged	3.0
Total Volume Purged (litres)	110.0	Operative	JJ

Observations During Well Development (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	N/A	Groundwater Odour	None
In-situ Parameter Device SN	N/A	Visual Turbidity	No
Confirm Field Calibration Completed	N/A	Groundwater Colour	Clear

Well Volume Calculation

Volume of the Filter Pack	
Saturated length of Filter Pack (L) (m)	4.00
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	20.1
Volume of the Standpipe	
Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	8.55
Volume of the Standpipe (litres) (πdp2/4)*10-3	16.8
Total Well Volume	
Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**36.9**

Additional Notes and Observations

In-situ parameters not required during development.

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection			
Weather Conditions	Rain	Surface Conditions	Wet
Installation Base Depth (m bgl)	15.50	Damage to headworks?	No
Remedial Actions undertaken to well:			

Purging and Well Development

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Well Development

Groundwater Level (m bgl)	1.40	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00
Time to Purge (mins)	14.5	Number of Well Volumes Purged	3.00
Total Volume Purged (litres)	121	Operative	JJ

Well Volume Calculation

Volume of the Filter Pack	
Saturated length of Filter Pack (dip dpeth to base of intallation) (L) (m)	2.50
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	150
Volume of the Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	12.6
Volume of the Standpipe	
Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	14.10
Volume of the Standpipe (litres) (πdp2/4)*10-3	27.7
Total Well Volume	
Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**40.3**

Observations During Well Development (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model		Groundwater Odour	No
In-situ Parameter Device SN		Visual Turbidity	Yes
Confirm Field Calibration Completed		Groundwater Colour	Grey/Black running clear

Additional Notes and Observations

In-situ parameters not required during well development.

Exploratory Hole Number	S1-BH108	Installation No	1	Date and Time	28.11.22 10:20
Project Number	G22069	Client	Walters UK		
Project Name	GCRE				

INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH112	1	50	2.50	21/12/2022 12:26
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	1.00	2.50	Clear

Installation Inspection

Surface Conditions	Wet	Damage to Headworks?	No
Check Dip of Base (m bgl)	3.31	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Well Development

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Well Development

Groundwater Level (m bgl)	2.25	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	10.0
Time to Purge (mins)	2	Number of Well Volumes Purged	8.8
Total Volume Purged (litres)	15.0	Operative	JP

Observations During Well Development (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	N/A	Groundwater Odour	No
In-situ Parameter Device SN	N/A	Visual Turbidity	Yes
Confirm Field Calibration Completed	N/A	Groundwater Colour	Grey

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	0.25
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	1.2

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	0.25
Volume of the Standpipe (litres) (πdp2/4)*10-3	0.5

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**1.7**

Additional Notes and Observations

In-situ parametes not required during development.

INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH112	2	50	15.00	21/12/2022 13:03
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	8.00	15.00	Clear

Installation Inspection

Surface Conditions	Wet	Damage to Headworks?	No
Check Dip of Base (m bgl)	15	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Well Development

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Well Development

Groundwater Level (m bgl)	9.62	LNAPL/ DNAPL (m bgl)	0.00

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	6.1
Time to Purge (mins)	20	Number of Well Volumes Purged	3.3
Total Volume Purged (litres)	120.0	Operative	JP

Observations During Well Development (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	N/A	Groundwater Odour	No
In-situ Parameter Device SN	N/A	Visual Turbidity	Yes
Confirm Field Calibration Completed	N/A	Groundwater Colour	Greyish brown running clear.

Well Volume Calculation

Volume of the Filter Pack	
Saturated length of Filter Pack (L) (m)	5.38
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	26.2
Volume of the Standpipe	
Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	5.38
Volume of the Standpipe (litres) (πdp2/4)*10-3	10.6
Total Well Volume	
Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**36.8**

Additional Notes and Observations

In-situ parameters not required during development.

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection			
Weather Conditions	Clear skies	Surface Conditions	Wet
Installation Base Depth (m bgl)	5.50	Damage to headworks?	No
Remedial Actions undertaken to well:			

Purging and Well Development

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Well Development

Groundwater Level (m bgl)	0.93	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00
Time to Purge (mins)	12	Number of Well Volumes Purged	5.75
Total Volume Purged (litres)	124	Operative	JJ

Well Volume Calculation

Volume of the Filter Pack	
Saturated length of Filter Pack (dip dpeth to base of intallation) (L) (m)	2.50
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	150
Volume of the Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	12.6
Volume of the Standpipe	
Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	4.57
Volume of the Standpipe (litres) (πdp2/4)*10-3	9.0
Total Well Volume	
Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**21.6**

Observations During Well Development (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model		Groundwater Odour	No
In-situ Parameter Device SN		Visual Turbidity	Yes
Confirm Field Calibration Completed		Groundwater Colour	Grey/Black running clear

Additional Notes and Observations

In-situ parameters not required during well development.

Exploratory Hole Number	S1-BH113	Installation No	1	Date and Time	28.11.22 12:42
Project Number	G22069	Client	Walters UK		
Project Name	GCRE				

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection			
Weather Conditions	Rajn	Surface Conditions	Wet
Installation Base Depth (m bgl)	3.50	Damage to headworks?	No
Remedial Actions undertaken to well:			

Purging and Well Development

Guidance Notes
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume			
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Well Development			
Groundwater Level (m bgl)	0.43	LNAPL/ DNAPL (m bgl)	N/A

Purging Details			
Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00
Time to Purge (mins)	15	Number of Well Volumes Purged	3.05
Total Volume Purged (litres)	39	Operative	JJ

Well Volume Calculation	
Volume of the Filter Pack	
Saturated length of Filter Pack (dip dpeth to base of intallation) (L) (m)	1.50
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	150
Volume of the Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	6.8
Volume of the Standpipe	
Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	3.07
Volume of the Standpipe (litres) (πdp2/4)*10-3	6.0
Total Well Volume	
Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**12.8**

Observations During Well Development (see Vu-situ output for insitu parameter readings)			
In-situ Parameter Device Model		Groundwater Odour	No
In-situ Parameter Device SN		Visual Turbidity	Yes
Confirm Field Calibration Completed		Groundwater Colour	Dark brown and black with a slight sheen, not a typical oil sheen though.

Additional Notes and Observations

In-situ parameters not required during well development.

Exploratory Hole Number	S1-BH121	Installation No	1	Date and Time	28.11.22 11:08
Project Number	G22069	Client	Walters UK		
Project Name	GCRE				

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection			
Weather Conditions	Overcast	Surface Conditions	Wet
Installation Base Depth (m bgl)	1.90	Damage to headworks?	No

Remedial Actions undertaken to well:

Purging and Well Development

Guidance Notes
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume			
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Well Development			
Groundwater Level (m bgl)	0.19	LNAPL/ DNAPL (m bgl)	N/A

Purging Details			
Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00
Time to Purge (mins)	5	Number of Well Volumes Purged	2.71
Total Volume Purged (litres)	18	Operative	JJ

Well Volume Calculation	
Volume of the Filter Pack	
Saturated length of Filter Pack (dip dpeth to base of intallation) (L) (m)	0.90
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	150
Volume of the Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	3.3
Volume of the Standpipe	
Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	1.71
Volume of the Standpipe (litres) (πdp2/4)*10-3	3.4
Total Well Volume	
Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**6.6**

Observations During Well Development (see Vu-situ output for insitu parameter readings)			
In-situ Parameter Device Model		Groundwater Odour	No
In-situ Parameter Device SN		Visual Turbidity	Yes
Confirm Field Calibration Completed		Groundwater Colour	Grey/Black running clear

Additional Notes and Observations

In-situ parameters not required during well development.

Exploratory Hole Number	S1-BH122	Installation No	1	Date and Time	28.11.22 12:08
Project Number	G22069	Client	Walters UK		
Project Name	GCRE				

INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
SOP003.16	1	50	13.00	14/12/2022 13:07
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	10.00	13.00	Cold and clear

Installation Inspection

Surface Conditions	Frozen	Damage to Headworks?	Not concreted in
Check Dip of Base (m bgl)	13.61	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

Well head concreted in.

Purging and Well Development

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Well Development

Groundwater Level (m bgl)	11.34	LNAPL/ DNAPL (m bgl)	0.00

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	7.0
Time to Purge (mins)	1	Number of Well Volumes Purged	1.0
Total Volume Purged (litres)	7.0	Operative	JP

Observations During Well Development (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	N/A	Groundwater Odour	No
In-situ Parameter Device SN	N/A	Visual Turbidity	No
Confirm Field Calibration Completed	N/A	Groundwater Colour	Clear

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	1.66
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	115
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	3.7

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	1.66
Volume of the Standpipe (litres) (πdp2/4)*10-3	3.3

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**7.0**

Additional Notes and Observations

In-situ parameters not required during development.
Well purged dry with no recharge.

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH101	1	50	14.00	25/01/2023 14:42
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	11.00	14.00	Foggy

Installation Inspection

Surface Conditions	Frozen	Damage to Headworks?	No
Check Dip of Base (m bgl)	13.74	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	Dry	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	N/A	Average Flow Rate (litres/min)	
Time to Purge (mins)	N/A	Number of Well Volumes Purged	
Total Volume Purged (litres)	N/A	Operative	JP

Observations During Purging (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	N/A	Groundwater Odour	N/A
In-situ Parameter Device SN	N/A	Visual Turbidity	N/A
Confirm Field Calibration Completed	N/A	Groundwater Colour	N/A

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	121
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	
Volume of the Standpipe (litres) (πdp2/4)*10-3	0.0

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**0.0**

Sampling Information

Sample Depth (m bgl)	N/A
Sample Type	N/A
Sample Reference Number	N/A
Date and Time Obtained	N/A

Additional Notes and Observations

Borehole dry unable to purge and sample.

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH102	1	50	9.00	24/01/2023 10:59
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Cover	6.00	9.00	Cold and clear

Installation Inspection

Surface Conditions	Snow	Damage to Headworks?	No
Check Dip of Base (m bgl)	8.72	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	0.60	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	12	Number of Well Volumes Purged	1.0
Total Volume Purged (litres)	24.0	Operative	JP

Observations During Purging
(see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey becoming light grey then opaque.

Well Volume Calculation

Volume of the Filter Pack	
Saturated length of Filter Pack (L) (m)	3.00
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	104
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	6.5
Volume of the Standpipe	
Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	8.40
Volume of the Standpipe (litres) (πdp2/4)*10-3	16.5
Total Well Volume	
Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**22.9**

Sampling Information

Sample Depth (m bgl)	8.72
Sample Type	EW
Sample Reference Number	28
Date and Time Obtained	24/01/2023 11:39

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 1/24/2023 11:27:28 AM
Project: GCRE
Operator Name: JP

Location Name: S1-BH102 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 2.72 m** **Top of Screen: 6 m** **Total Depth: 8.72 m** **Initial Depth to Water: 0.6 m**	**Pump Type: Wasp pump** **Estimated Total Volume Pumped: 24000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Cold and clear

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
1/24/2023 11:27 AM	00:00	8.22 pH	8.76 °C	706.08 µS/cm	5.79 mg/L		723.4 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:27 AM	00:30	7.98 pH	8.57 °C	820.19 µS/cm	4.81 mg/L		1,021.9 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:28 AM	01:00	7.79 pH	9.23 °C	791.63 µS/cm	7.07 mg/L		1,039.5 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:28 AM	01:30	7.66 pH	9.66 °C	846.68 µS/cm	3.41 mg/L		1,035.7 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:29 AM	02:00	7.60 pH	10.47 °C	862.04 µS/cm	1.28 mg/L		1,031.6 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:29 AM	02:30	7.53 pH	10.69 °C	852.78 µS/cm	0.75 mg/L		1,036.8 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:30 AM	03:00	7.50 pH	10.71 °C	865.61 µS/cm	0.52 mg/L		1,041.0 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:30 AM	03:30	7.42 pH	10.75 °C	865.44 µS/cm	0.36 mg/L		1,029.6 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:31 AM	04:00	7.38 pH	10.78 °C	867.66 µS/cm	0.27 mg/L		1,025.5 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:31 AM	04:30	7.36 pH	10.82 °C	878.89 µS/cm	0.21 mg/L		1,021.7 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:32 AM	05:00	7.33 pH	10.83 °C	872.22 µS/cm	0.24 mg/L		1,015.8 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:32 AM	05:30	7.32 pH	10.85 °C	878.87 µS/cm	0.20 mg/L		1,012.1 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:33 AM	06:00	7.29 pH	10.86 °C	876.68 µS/cm	0.17 mg/L		1,004.7 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:33 AM	06:30	7.24 pH	10.87 °C	879.91 µS/cm	0.15 mg/L		995.0 mV	60.00 cm	2,000.00 ml/min

1/24/2023 11:34 AM	07:00	7.25 pH	10.88 °C	869.03 µS/cm	0.14 mg/L		985.4 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:34 AM	07:30	7.20 pH	10.91 °C	867.33 µS/cm	0.14 mg/L		967.5 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:35 AM	08:00	7.17 pH	10.92 °C	866.86 µS/cm	0.13 mg/L		965.5 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:35 AM	08:30	7.16 pH	10.92 °C	870.46 µS/cm	0.12 mg/L		956.7 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:36 AM	09:00	7.13 pH	10.94 °C	872.52 µS/cm	0.12 mg/L		954.0 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:36 AM	09:30	7.11 pH	10.96 °C	868.69 µS/cm	0.12 mg/L		947.1 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:37 AM	10:00	7.08 pH	10.97 °C	870.62 µS/cm	0.11 mg/L		936.2 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:37 AM	10:30	7.08 pH	11.00 °C	870.96 µS/cm	0.11 mg/L		935.6 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:38 AM	11:00	7.06 pH	11.00 °C	870.03 µS/cm	0.16 mg/L		937.7 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:38 AM	11:30	7.06 pH	11.01 °C	871.01 µS/cm	0.20 mg/L		944.0 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:39 AM	12:00	7.04 pH	11.01 °C	871.01 µS/cm	0.17 mg/L		942.5 mV	60.00 cm	2,000.00 ml/min

Samples

Sample ID:	Description:
EW1	Ground water

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH103	1	50	5.50	25/01/2023 10:37
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	2.00	5.50	Foggy

Installation Inspection

Surface Conditions	Wet/thawing	Damage to Headworks?	No
Check Dip of Base (m bgl)	5.54	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	3.25	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	8	Number of Well Volumes Purged	1.0
Total Volume Purged (litres)	16.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	No
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey running clear

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	2.25
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	11.0

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	2.25
Volume of the Standpipe (litres) (πdp2/4)*10-3	4.4

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**15.4**

Sampling Information

Sample Depth (m bgl)	5.54
Sample Type	EW
Sample Reference Number	36
Date and Time Obtained	25/01/2023 13:32

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 1/25/2023 1:27:57 PM
Project: GCRE
Operator Name: JP

Location Name: S1-BH103 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 3.54 m** **Top of Screen: 2 m** **Total Depth: 5.54 m** **Initial Depth to Water: 3.25 m**	**Pump Type: Wasp pump** **Estimated Total Volume Pumped: 16000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Foggy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
1/25/2023 1:27 PM	00:00	6.17 pH	8.16 °C	959.69 µS/cm	7.86 mg/L		1,064.4 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:28 PM	00:30	6.29 pH	9.33 °C	934.40 µS/cm	1.84 mg/L		1,168.9 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:28 PM	01:00	6.41 pH	9.80 °C	932.32 µS/cm	0.52 mg/L		1,170.2 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:29 PM	01:30	6.46 pH	10.14 °C	932.15 µS/cm	0.27 mg/L		1,168.6 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:29 PM	02:00	6.47 pH	10.38 °C	926.11 µS/cm	0.22 mg/L		1,167.0 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:30 PM	02:30	6.48 pH	10.59 °C	922.65 µS/cm	0.17 mg/L		1,166.8 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:30 PM	03:00	6.50 pH	10.69 °C	921.95 µS/cm	0.14 mg/L		1,167.7 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:31 PM	03:30	6.50 pH	10.76 °C	920.08 µS/cm	0.13 mg/L		1,167.6 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:31 PM	04:00	6.53 pH	10.83 °C	919.62 µS/cm	0.12 mg/L		1,167.5 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:32 PM	04:30	6.54 pH	10.87 °C	918.08 µS/cm	0.10 mg/L		1,166.5 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:32 PM	05:00	6.55 pH	10.92 °C	919.87 µS/cm	0.10 mg/L		1,166.3 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:33 PM	05:30	6.59 pH	10.95 °C	918.96 µS/cm	0.09 mg/L		1,166.5 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:33 PM	06:00	6.59 pH	10.98 °C	918.85 µS/cm	0.08 mg/L		1,166.1 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:34 PM	06:30	6.62 pH	11.01 °C	918.87 µS/cm	0.07 mg/L		1,165.8 mV	325.00 cm	2,000.0 ml/min

1/25/2023 1:34 PM	07:00	6.64 pH	11.01 °C	918.26 µS/cm	0.07 mg/L		1,166.3 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:35 PM	07:30	6.66 pH	11.06 °C	927.09 µS/cm	0.05 mg/L		1,164.8 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:35 PM	08:00	6.70 pH	11.13 °C	927.89 µS/cm	0.04 mg/L		1,165.4 mV	325.00 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW1	Groundwater

Created using VuSitu from In-Situ, Inc.

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH105	1	50	15.00	16/1/123 12:08
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	11.00	15.00	clear

Installation Inspection

Surface Conditions	made ground	Damage to Headworks?	none
Check Dip of Base (m bgl)	15.44	Pipe Cover/Bung Present?	yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	6.28	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	wasp pump	Average Flow Rate (litres/min)	1.2
Time to Purge (mins)	25	Number of Well Volumes Purged	0.8
Total Volume Purged (litres)	30.0	Operative	Sse

Observations During Purging
(see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	None
In-situ Parameter Device SN	877732	Visual Turbidity	Med-High
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey running opaque

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	4.00
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	19.5

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	8.72
Volume of the Standpipe (litres) (πdp2/4)*10-3	17.1

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**36.6**

Sampling Information

Sample Depth (m bgl)	6.28
Sample Type	EW
Sample Reference Number	GW1
Date and Time Obtained	16/01/2022 12:22

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 12/7/2020 9:03:49 AM
Project: Gcre
Operator Name:

Location Name: Device Location	Flow Cell Volume: 90 ml	Instrument Used: Aqua TROLL 400 Serial Number: 877732

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5
16/1/2023 9:03 AM	00:00	8.06 pH	8.57 °C	831.97 µS/cm	1.03 mg/L		385.1 mV	
16/1/2023 9:04 AM	00:38	7.93 pH	9.27 °C	813.88 µS/cm	2.44 mg/L		537.5 mV	
16/1/2023 9:05 AM	01:16	7.83 pH	9.45 °C	804.16 µS/cm	0.67 mg/L		636.4 mV	
16/1/2023 9:05 AM	01:47	7.74 pH	9.53 °C	796.81 µS/cm	0.40 mg/L		721.2 mV	
16/1/2023 9:06 AM	02:17	7.68 pH	9.53 °C	789.98 µS/cm	0.31 mg/L		767.2 mV	
16/1/2023 9:06 AM	02:47	7.72 pH	9.43 °C	784.98 µS/cm	0.29 mg/L		743.1 mV	
16/1/2023 9:07 AM	03:17	7.58 pH	9.27 °C	784.89 µS/cm	0.28 mg/L		715.2 mV	
16/1/2023 9:07 AM	03:47	7.52 pH	9.14 °C	779.83 µS/cm	0.26 mg/L		711.9 mV	
16/1/2023 9:08 AM	04:17	7.50 pH	8.95 °C	782.59 µS/cm	0.86 mg/L		705.5 mV	
16/1/2023 9:08 AM	04:47	7.98 pH	8.95 °C	3.54 µS/cm	8.46 mg/L		706.8 mV	
16/1/2023 9:09 AM	05:17	8.02 pH	8.95 °C	3.61 µS/cm	10.77 mg/L		709.6 mV	
16/1/2023 9:09 AM	05:47	7.56 pH	8.63 °C	775.32 µS/cm	5.06 mg/L		726.0 mV	
16/1/2023 9:10 AM	06:17	7.47 pH	8.71 °C	780.98 µS/cm	1.33 mg/L		719.9 mV	
16/1/2023 9:10 AM	06:47	7.42 pH	9.09 °C	787.99 µS/cm	0.54 mg/L		716.5 mV	
16/1/2023 9:11 AM	07:17	7.39 pH	9.56 °C	800.16 µS/cm	0.21 mg/L		716.2 mV	
16/1/2023 9:11 AM	07:47	7.35 pH	9.78 °C	796.09 µS/cm	0.12 mg/L		715.4 mV	
16/1/2023 9:12 AM	08:17	7.33 pH	9.89 °C	788.67 µS/cm	0.08 mg/L		715.0 mV	
16/1/2023 9:12 AM	08:47	7.31 pH	9.89 °C	784.36 µS/cm	0.06 mg/L		716.1 mV	
16/1/2023 9:13 AM	09:17	7.30 pH	9.89 °C	781.40 µS/cm	0.06 mg/L		718.8 mV	

12/7/2020 9:13 AM	09:47	7.28 pH	9.81 °C	780.66 µS/cm	0.05 mg/L		719.8 mV	
12/7/2020 9:14 AM	10:17	7.27 pH	9.61 °C	783.96 µS/cm	0.06 mg/L		722.0 mV	
12/7/2020 9:14 AM	10:47	7.24 pH	9.52 °C	782.53 µS/cm	0.03 mg/L		723.5 mV	
12/7/2020 9:15 AM	11:17	7.25 pH	9.43 °C	782.22 µS/cm	0.02 mg/L		713.5 mV	
12/7/2020 9:15 AM	11:47	7.23 pH	9.42 °C	783.08 µS/cm	0.02 mg/L		712.8 mV	
12/7/2020 9:16 AM	12:17	7.23 pH	9.42 °C	782.88 µS/cm	0.01 mg/L		712.3 mV	
12/7/2020 9:16 AM	12:47	7.22 pH	9.42 °C	780.57 µS/cm	0.01 mg/L		712.4 mV	
12/7/2020 9:17 AM	13:17	7.21 pH	9.40 °C	779.33 µS/cm	0.01 mg/L		714.0 mV	
12/7/2020 9:17 AM	13:47	7.20 pH	9.36 °C	778.37 µS/cm	0.01 mg/L		713.8 mV	
12/7/2020 9:18 AM	14:17	7.19 pH	9.33 °C	777.89 µS/cm	0.01 mg/L		715.4 mV	
12/7/2020 9:18 AM	14:47	7.16 pH	9.28 °C	777.51 µS/cm	0.01 mg/L		715.9 mV	
12/7/2020 9:19 AM	15:17	7.17 pH	9.24 °C	778.31 µS/cm	0.01 mg/L		716.5 mV	
12/7/2020 9:19 AM	15:56	7.19 pH	9.23 °C	778.40 µS/cm	0.00 mg/L		593.9 mV	
12/7/2020 9:20 AM	16:20	7.36 pH	9.25 °C	779.73 µS/cm	0.00 mg/L		675.8 mV	

Samples

Sample ID:	Description:
Gw1	

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH108	1	50	15.50	16/01/13:05
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Cover	13.00	15.50	Clear

Installation Inspection

Surface Conditions	Made Ground	Damage to Headworks?	Previous damage
Check Dip of Base (m bgl)	15.55	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

None at this time. There is evidence of the headworks previously being damaged as it is surrounded by concrete that formaly surrounded the cover's base.

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	1.18	LNAPL/ DNAPL (m bgl)	None

Purging Details

Purge Method/ Device	N/A	Average Flow Rate (litres/min)	#VALUE!
Time to Purge (mins)	N/A	Number of Well Volumes Purged	#VALUE!
Total Volume Purged (litres)	N/A	Operative	Sse

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	N/A	Groundwater Odour	N/A
In-situ Parameter Device SN	N/A	Visual Turbidity	N/A
Confirm Field Calibration Completed	N/A	Groundwater Colour	N/A

Well Volume Calculation

Volume of the Filter Pack	
Saturated length of Filter Pack (L) (m)	2.50
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	145
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	12.0
Volume of the Standpipe	
Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	14.32
Volume of the Standpipe (litres) (πdp2/4)*10-3	28.1
Total Well Volume	
Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**40.1**

Sampling Information

Sample Depth (m bgl)	N/A
Sample Type	N/A
Sample Reference Number	N/A
Date and Time Obtained	N/A

Additional Notes and Observations

Unable to sample as pipe damaged around 0.5m below top of standpipe. Pipe is bent so allows dip tape to pass but no sampling device.

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH112	1	50	2.50	25/01/2023 13@58
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	1.00	2.50	Foggy

Installation Inspection

Surface Conditions	Wet	Damage to Headworks?	No
Check Dip of Base (m bgl)	Unknown	Pipe Cover/Bung Present?	Unknown

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	N/A	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	N/A	Average Flow Rate (litres/min)	N/A
Time to Purge (mins)	N/A	Number of Well Volumes Purged	N/A
Total Volume Purged (litres)	N/A	Operative	JP

Observations During Purging
(see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	N/A	Groundwater Odour	N/A
In-situ Parameter Device SN	N/A	Visual Turbidity	N/A
Confirm Field Calibration Completed	N/A	Groundwater Colour	N/A

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	
Volume of the Standpipe (litres) (πdp2/4)*10-3	

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**0.0**

Sampling Information

Sample Depth (m bgl)	N/A
Sample Type	N/A
Sample Reference Number	N/A
Date and Time Obtained	N/A

Additional Notes and Observations

Unable to carry out monitoring and sampling due to proximity of unguarded deep excavation.

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH112	2	50	15.00	25/01/2023 13:58
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	8.00	15.00	Foggy

Installation Inspection

Surface Conditions	Wet	Damage to Headworks?	No
Check Dip of Base (m bgl)	Unknown	Pipe Cover/Bung Present?	Unknown

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	N/A	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	N/A	Average Flow Rate (litres/min)	N/A
Time to Purge (mins)	N/A	Number of Well Volumes Purged	N/A
Total Volume Purged (litres)	N/A	Operative	JP

Observations During Purging
(see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	N/A	Groundwater Odour	N/A
In-situ Parameter Device SN	N/A	Visual Turbidity	N/A
Confirm Field Calibration Completed	N/A	Groundwater Colour	N/A

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	
Volume of the Standpipe (litres) (πdp2/4)*10-3	

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**0.0**

Sampling Information

Sample Depth (m bgl)	N/A
Sample Type	N/A
Sample Reference Number	N/A
Date and Time Obtained	N/A

Additional Notes and Observations

Unable to carry out monitoring and sampling due to proximity of unguarded deep excavation.

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH113	1	63	5.50	16/01/2023 10.30:00
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
0	Pipe Plug	3.00	5.50	Overcast

Installation Inspection

Surface Conditions	Made Ground	Damage to Headworks?	none
Check Dip of Base (m bgl)	5.5	Pipe Cover/Bung Present?	yes

Remedial actions undertaken to well:

none

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	3.86	LNAPL/ DNAPL (m bgl)	0.00

Purging Details

Purge Method/ Device	wasp pump	Average Flow Rate (litres/min)	3.0
Time to Purge (mins)	10	Number of Well Volumes Purged	2.4
Total Volume Purged (litres)	30.0	Operative	SSe

Observations During Puring
(see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua troll 400	Groundwater Odour	none
In-situ Parameter Device SN	877732	Visual Turbidity	low
Confirm Field Calibration Completed	Yes	Groundwater Colour	clear

Well Volume Calculation

Volume of the Filter Pack	
Saturated length of Filter Pack (L) (m)	1.64
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	7.4
Volume of the Standpipe	
Diameter of Standpipe (mm) (dp)	63
Saturated depth (m) (sd) (installation base - groundwater level)	1.64
Volume of the Standpipe (litres) (πdp2/4)*10-3	5.1
Total Well Volume	
Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**12.5**

Sampling Information

Sample Depth (m bgl)	3.86
Sample Type	GW
Sample Reference Number	1
Date and Time Obtained	16/01/2022 10.48

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 12/7/2020 7:59:48 AM
Project:
Operator Name:

Location Name: Device Location **Initial Depth to Water: 3.86 m**	**Estimated Total Volume Pumped: 5400 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 600 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
16/1/2023 7:59 AM	00:00	8.96 pH	5.71 °C	4.01 µS/cm	12.27 mg/L		278.9 mV	386.00 cm	600.00 ml/min
16/1/2023 8:00 AM	00:30	8.81 pH	5.71 °C	6.41 µS/cm	12.27 mg/L		425.3 mV	386.00 cm	600.00 ml/min
16/1/2023 8:00 AM	01:00	8.72 pH	5.72 °C	765.29 µS/cm	8.12 mg/L		164.3 mV	386.00 cm	600.00 ml/min
16/1/2023 8:01 AM	01:30	8.48 pH	7.37 °C	769.49 µS/cm	1.67 mg/L		175.1 mV	386.00 cm	600.00 ml/min
16/1/2023 8:01 AM	02:00	8.33 pH	8.09 °C	760.51 µS/cm	0.42 mg/L		257.5 mV	386.00 cm	600.00 ml/min
16/1/2023 8:02 AM	02:30	8.22 pH	8.47 °C	753.64 µS/cm	0.19 mg/L		349.6 mV	386.00 cm	600.00 ml/min
16/1/2023 8:02 AM	03:00	8.15 pH	8.57 °C	747.77 µS/cm	0.14 mg/L		425.9 mV	386.00 cm	600.00 ml/min
16/1/2023 8:03 AM	03:30	8.10 pH	8.61 °C	744.60 µS/cm	0.13 mg/L		478.5 mV	386.00 cm	600.00 ml/min
16/1/2023 8:03 AM	04:00	8.05 pH	8.59 °C	742.21 µS/cm	0.12 mg/L		525.4 mV	386.00 cm	600.00 ml/min
16/1/2023 8:04 AM	04:30	8.01 pH	8.55 °C	741.07 µS/cm	0.11 mg/L		560.8 mV	386.00 cm	600.00 ml/min
16/1/2023 8:04 AM	05:00	7.97 pH	8.61 °C	741.04 µS/cm	0.11 mg/L		585.6 mV	386.00 cm	600.00 ml/min
16/1/2023 8:05 AM	05:30	7.91 pH	8.71 °C	740.28 µS/cm	0.10 mg/L		603.7 mV	386.00 cm	600.00 ml/min
16/1/2023 8:05 AM	06:00	7.85 pH	8.77 °C	741.43 µS/cm	0.09 mg/L		615.7 mV	386.00 cm	600.00 ml/min
16/1/2023 8:06 AM	06:30	7.80 pH	8.84 °C	740.34 µS/cm	0.09 mg/L		624.6 mV	386.00 cm	600.00 ml/min
16/1/2023 8:06 AM	07:00	7.74 pH	8.80 °C	740.79 µS/cm	0.08 mg/L		630.4 mV	386.00 cm	600.00 ml/min
16/1/2023 8:07 AM	07:30	7.69 pH	8.82 °C	739.42 µS/cm	0.08 mg/L		636.5 mV	386.00 cm	600.00 ml/min
16/1/2023 8:07 AM	08:00	7.63 pH	8.76 °C	739.48 µS/cm	0.07 mg/L		641.3 mV	386.00 cm	600.00 ml/min

16/1/2023 8:08 AM	08:30	7.59 pH	8.81 °C	739.06 µS/cm	0.07 mg/L		645.0 mV	386.00 cm	600.00 ml/min
16/1/2023 8:08 AM	09:00	7.55 pH	8.78 °C	740.03 µS/cm	0.07 mg/L		647.8 mV	386.00 cm	600.00 ml/min

Samples

Sample ID:	Description:
Gw1	

Created using VuSitu from In-Situ, Inc.

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH121	1	50	3.50	24/01/2023 14:17
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	2.00	3.50	Cold and clear

Installation Inspection

Surface Conditions	Snow	Damage to Headworks?	No
Check Dip of Base (m bgl)	3.30	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	0.63	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	12	Number of Well Volumes Purged	1.5
Total Volume Purged (litres)	24.0	Operative	JP

Observations During Purging
(see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	No
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey running clear.

Well Volume Calculation

Volume of the Filter Pack	
Saturated length of Filter Pack (L) (m)	1.50
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	168
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	10.0
Volume of the Standpipe	
Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	2.87
Volume of the Standpipe (litres) (πdp2/4)*10-3	5.6
Total Well Volume	
Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**15.6**

Sampling Information

Sample Depth (m bgl)	3.30
Sample Type	EW
Sample Reference Number	19
Date and Time Obtained	24/01/2023 15:05

Additional Notes and Observations

Well purged dry then sampled

Low-Flow Test Report:

Test Date / Time: 1/24/2023 2:51:01 PM
Project: GCRE
Operator Name: JP

Location Name: S1-BH121 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 1.3 m** **Top of Screen: 2 m** **Total Depth: 3.3 m** **Initial Depth to Water: 0.63 m**	**Pump Type: Wasp pump** **Estimated Total Volume Pumped: 24000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Cold and clear

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
1/24/2023 2:51 PM	00:00	8.51 pH	9.61 °C	936.50 µS/cm	4.55 mg/L		320.6 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:51 PM	00:30	8.19 pH	9.10 °C	945.32 µS/cm	1.80 mg/L		502.8 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:52 PM	01:00	8.07 pH	8.52 °C	951.56 µS/cm	1.41 mg/L		597.8 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:52 PM	01:30	8.06 pH	8.28 °C	493.44 µS/cm	4.60 mg/L		683.0 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:53 PM	02:00	7.89 pH	8.52 °C	485.68 µS/cm	1.26 mg/L		759.1 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:53 PM	02:30	7.61 pH	8.58 °C	478.04 µS/cm	0.47 mg/L		810.7 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:54 PM	03:00	7.36 pH	8.62 °C	464.99 µS/cm	0.26 mg/L		836.2 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:54 PM	03:30	7.20 pH	8.62 °C	454.75 µS/cm	0.20 mg/L		843.6 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:55 PM	04:00	7.06 pH	8.59 °C	453.55 µS/cm	0.15 mg/L		845.5 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:55 PM	04:30	6.95 pH	8.57 °C	457.86 µS/cm	0.14 mg/L		839.5 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:56 PM	05:00	6.87 pH	8.54 °C	464.22 µS/cm	0.13 mg/L		836.1 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:56 PM	05:30	6.81 pH	8.52 °C	470.23 µS/cm	0.12 mg/L		828.0 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:57 PM	06:00	6.72 pH	8.50 °C	476.12 µS/cm	0.12 mg/L		822.5 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:57 PM	06:30	6.68 pH	8.49 °C	479.67 µS/cm	0.12 mg/L		815.7 mV	63.00 cm	2,000.0 ml/min

1/24/2023 2:58 PM	07:00	6.66 pH	8.49 °C	482.08 µS/cm	0.11 mg/L		807.9 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:58 PM	07:30	6.63 pH	8.50 °C	484.69 µS/cm	0.11 mg/L		801.2 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:59 PM	08:00	6.59 pH	8.49 °C	485.61 µS/cm	0.11 mg/L		794.4 mV	63.00 cm	2,000.0 ml/min
1/24/2023 2:59 PM	08:30	6.56 pH	8.48 °C	486.33 µS/cm	0.11 mg/L		791.1 mV	63.00 cm	2,000.0 ml/min
1/24/2023 3:00 PM	09:00	6.50 pH	8.48 °C	486.58 µS/cm	0.11 mg/L		787.2 mV	63.00 cm	2,000.0 ml/min
1/24/2023 3:00 PM	09:30	6.50 pH	8.47 °C	486.72 µS/cm	0.10 mg/L		781.5 mV	63.00 cm	2,000.0 ml/min
1/24/2023 3:01 PM	10:00	6.49 pH	8.47 °C	486.93 µS/cm	0.10 mg/L		804.3 mV	63.00 cm	2,000.0 ml/min
1/24/2023 3:01 PM	10:30	6.45 pH	8.47 °C	487.37 µS/cm	0.09 mg/L		777.9 mV	63.00 cm	2,000.0 ml/min
1/24/2023 3:02 PM	11:00	6.42 pH	8.47 °C	487.18 µS/cm	0.09 mg/L		775.2 mV	63.00 cm	2,000.0 ml/min
1/24/2023 3:02 PM	11:30	7.14 pH	8.47 °C	3.74 µS/cm	0.57 mg/L		949.8 mV	63.00 cm	2,000.0 ml/min
1/24/2023 3:03 PM	12:00	7.23 pH	8.50 °C	2.30 µS/cm	3.45 mg/L		980.8 mV	63.00 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW1	Groundwater

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH122	1	50	1.90	24/01/2023 12:05
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
0	Pipe Plug	1.00	1.90	Cold and clear

Installation Inspection

Surface Conditions	Snow	Damage to Headworks?	No
Check Dip of Base (m bgl)	1.76	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	0.28	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	8.5	Number of Well Volumes Purged	2.8
Total Volume Purged (litres)	17.0	Operative	JP

Observations During Purging (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey becoming light grey then clear.

Well Volume Calculation

Volume of the Filter Pack	
Saturated length of Filter Pack (L) (m)	0.90
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	122
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	2.9
Volume of the Standpipe	
Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	1.62
Volume of the Standpipe (litres) (πdp2/4)*10-3	3.2
Total Well Volume	
Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**6.1**

Sampling Information

Sample Depth (m bgl)	1.76
Sample Type	EW
Sample Reference Number	22
Date and Time Obtained	24/01/2023 12:27

Additional Notes and Observations

N/A

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
SOP003.16	1	50	13.00	25/01/2023 14.11
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	10.00	13.00	Foggy

Installation Inspection

Surface Conditions	Saturated	Damage to Headworks?	No
Check Dip of Base (m bgl)	13.6	Pipe Cover/Bung Present?	Yes

Yes

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	11.04	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	8.50	Number of Well Volumes Purged	1.8
Total Volume Purged (litres)	17.0	Operative	JP

Observations During Purging
(see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Grey running light grey/opaque

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	1.96
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	115
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	5.4

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	1.96
Volume of the Standpipe (litres) (πdp2/4)*10-3	3.8

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**9.3**

Sampling Information

Sample Depth (m bgl)	13.60
Sample Type	EW
Sample Reference Number	2
Date and Time Obtained	25/01/2023 14:23

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 1/25/2023 2:15:57 PM
Project: GCRE
Operator Name: JP

Location Name: SOP003.16 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 3.6 m** **Top of Screen: 10 m** **Total Depth: 13.6 m** **Initial Depth to Water: 11.04 m**	**Pump Type: Wasp pump** **Estimated Total Volume Pumped: 17000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Foggy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
1/25/2023 2:15 PM	00:00	6.69 pH	7.32 °C	14.11 µS/cm	8.08 mg/L		1,560.9 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:16 PM	00:30	7.01 pH	7.18 °C	80.75 µS/cm	5.90 mg/L		1,545.5 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:16 PM	01:00	6.96 pH	8.72 °C	749.89 µS/cm	2.54 mg/L		1,280.2 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:17 PM	01:30	6.93 pH	9.56 °C	695.41 µS/cm	0.61 mg/L		1,268.5 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:17 PM	02:00	6.86 pH	9.98 °C	678.67 µS/cm	0.22 mg/L		1,256.0 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:18 PM	02:30	6.78 pH	10.23 °C	675.41 µS/cm	0.14 mg/L		1,252.9 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:18 PM	03:00	6.72 pH	10.39 °C	675.90 µS/cm	0.11 mg/L		1,247.9 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:19 PM	03:30	6.68 pH	10.48 °C	677.34 µS/cm	0.09 mg/L		1,245.4 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:19 PM	04:00	6.63 pH	10.55 °C	679.63 µS/cm	0.08 mg/L		1,247.2 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:20 PM	04:30	6.60 pH	10.59 °C	681.00 µS/cm	0.07 mg/L		1,245.2 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:20 PM	05:00	6.58 pH	10.64 °C	682.17 µS/cm	0.06 mg/L		1,243.9 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:21 PM	05:30	6.53 pH	10.64 °C	683.48 µS/cm	0.05 mg/L		1,241.3 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:21 PM	06:00	6.51 pH	10.68 °C	683.89 µS/cm	0.05 mg/L		1,239.9 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:22 PM	06:30	6.49 pH	10.68 °C	684.06 µS/cm	0.04 mg/L		1,235.9 mV	1,104.0 cm	2,000.0 ml/min

1/25/2023 2:22 PM	07:00	6.48 pH	10.69 °C	683.97 µS/cm	0.04 mg/L		1,235.6 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:23 PM	07:30	6.47 pH	10.69 °C	684.37 µS/cm	0.04 mg/L		1,236.7 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:23 PM	08:00	6.59 pH	10.69 °C	685.17 µS/cm	0.04 mg/L		1,148.5 mV	1,104.0 cm	2,000.0 ml/min
1/25/2023 2:24 PM	08:30	6.42 pH	10.69 °C	685.80 µS/cm	0.04 mg/L		1,180.6 mV	1,104.0 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW	Groundwater

Created using VuSitu from In-Situ, Inc.

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH101	1	50	14.00	02/02/2023 12:52
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	11.00	14.00	Showers

Installation Inspection

Surface Conditions	Wet	Damage to Headworks?	No
Check Dip of Base (m bgl)	13.61	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	10.66	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	5.00	Number of Well Volumes Purged	0.6
Total Volume Purged (litres)	10.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey becoming light grey

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	3.00
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	121
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	9.4

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	3.34
Volume of the Standpipe (litres) (πdp2/4)*10-3	6.6

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**16.0**

Sampling Information

Sample Depth (m bgl)	13.61
Sample Type	EW
Sample Reference Number	45
Date and Time Obtained	02/02/2023 13:10

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/2/2023 1:03:05 PM
Project: GCRE
Operator Name: JP

Location Name: S1-BH101 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 4.00 m** **Top of Screen: 11.00 m** **Total Depth: 13.51 m** **Initial Depth to Water: 10.66 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 10000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Showers

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/2/2023 1:03 PM	00:00	9.62 pH	10.59 °C	4.84 µS/cm	1.62 mg/L		1,560.9 mV	1,066.0 cm	2,000.0 ml/min
2/2/2023 1:03 PM	00:30	11.52 pH	10.50 °C	878.18 µS/cm	3.96 mg/L		963.1 mV	1,066.0 cm	2,000.0 ml/min
2/2/2023 1:04 PM	01:00	11.90 pH	10.58 °C	877.35 µS/cm	1.29 mg/L		926.6 mV	1,066.0 cm	2,000.0 ml/min
2/2/2023 1:04 PM	01:30	11.90 pH	10.63 °C	876.35 µS/cm	0.47 mg/L		918.8 mV	1,066.0 cm	2,000.0 ml/min
2/2/2023 1:05 PM	02:00	11.95 pH	10.64 °C	878.85 µS/cm	0.23 mg/L		909.0 mV	1,066.0 cm	2,000.0 ml/min
2/2/2023 1:05 PM	02:30	11.92 pH	10.69 °C	881.95 µS/cm	0.16 mg/L		905.4 mV	1,066.0 cm	2,000.0 ml/min
2/2/2023 1:06 PM	03:00	11.82 pH	10.73 °C	882.26 µS/cm	0.13 mg/L		907.0 mV	1,066.0 cm	2,000.0 ml/min
2/2/2023 1:06 PM	03:30	11.78 pH	10.74 °C	884.28 µS/cm	0.11 mg/L		907.3 mV	1,066.0 cm	2,000.0 ml/min
2/2/2023 1:07 PM	04:00	11.75 pH	10.76 °C	887.24 µS/cm	0.09 mg/L		906.2 mV	1,066.0 cm	2,000.0 ml/min
2/2/2023 1:07 PM	04:30	11.74 pH	10.78 °C	889.56 µS/cm	0.09 mg/L		908.1 mV	1,066.0 cm	2,000.0 ml/min
2/2/2023 1:08 PM	05:00	11.71 pH	10.78 °C	891.46 µS/cm	0.08 mg/L		907.7 mV	1,066.0 cm	2,000.0 ml/min

Samples

Sample ID:	Description:

EW45	

Created using VuSitu from In-Situ, Inc.

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH102	1	50	9.00	01/02/2023 11:19
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Cover	6.00	9.00	Cloudy

Installation Inspection

Surface Conditions	Damp	Damage to Headworks?	No
Check Dip of Base (m bgl)	8.85	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	0.64	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	3.8
Time to Purge (mins)	5.00	Number of Well Volumes Purged	0.8
Total Volume Purged (litres)	19.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey becoming light grey.

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	3.00
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	104
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	6.5

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	8.36
Volume of the Standpipe (litres) (πdp2/4)*10-3	16.4

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**22.9**

Sampling Information

Sample Depth (m bgl)	8.85
Sample Type	EW
Sample Reference Number	29
Date and Time Obtained	01/022023 11:27

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/1/2023 11:21:48 AM
Project: GCRE
Operator Name: JP

Location Name: S1-BH102 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 2.85 m** **Top of Screen: 6.00 m** **Total Depth: 8.85 m** **Initial Depth to Water: 0.64 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 10000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Cloudy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/1/2023 11:21 AM	00:00	10.86 pH	8.19 °C	1.94 µS/cm	8.00 mg/L		1,504.5 mV		2,000.0 ml/min
2/1/2023 11:22 AM	00:30	12.56 pH	8.87 °C	816.84 µS/cm	4.93 mg/L		880.1 mV		2,000.0 ml/min
2/1/2023 11:22 AM	01:00	12.60 pH	9.70 °C	830.14 µS/cm	1.08 mg/L		895.8 mV		2,000.0 ml/min
2/1/2023 11:23 AM	01:30	12.72 pH	10.08 °C	842.02 µS/cm	0.31 mg/L		885.8 mV		2,000.0 ml/min
2/1/2023 11:23 AM	02:00	12.79 pH	10.29 °C	850.22 µS/cm	0.16 mg/L		882.6 mV		2,000.0 ml/min
2/1/2023 11:24 AM	02:30	12.88 pH	10.45 °C	854.28 µS/cm	0.11 mg/L		880.1 mV		2,000.0 ml/min
2/1/2023 11:24 AM	03:00	12.87 pH	10.53 °C	857.18 µS/cm	0.09 mg/L		882.3 mV		2,000.0 ml/min
2/1/2023 11:25 AM	03:30	12.82 pH	10.59 °C	859.61 µS/cm	0.07 mg/L		886.9 mV		2,000.0 ml/min
2/1/2023 11:25 AM	04:00	12.86 pH	10.60 °C	860.98 µS/cm	0.06 mg/L		886.6 mV		2,000.0 ml/min
2/1/2023 11:26 AM	04:30	12.91 pH	10.64 °C	861.53 µS/cm	0.05 mg/L		886.4 mV		2,000.0 ml/min
2/1/2023 11:26 AM	05:00	12.96 pH	10.64 °C	857.30 µS/cm	0.04 mg/L		887.9 mV		2,000.0 ml/min

Samples

Sample ID:	Description:

EW29	

Created using VuSitu from In-Situ, Inc.

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH103	1	50	5.50	02/02/2023 09:36
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	2.00	5.50	Foggy

Installation Inspection

Surface Conditions	Wet/thawing	Damage to Headworks?	No
Check Dip of Base (m bgl)	5.52	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	3.30	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	4.00	Number of Well Volumes Purged	0.5
Total Volume Purged (litres)	8.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	No
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey running clear

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	2.20
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	10.7

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	2.20
Volume of the Standpipe (litres) (πdp2/4)*10-3	4.3

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**15.0**

Sampling Information

Sample Depth (m bgl)	5.52
Sample Type	EW
Sample Reference Number	37
Date and Time Obtained	0202/2023 09:44

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/2/2023 9:39:32 AM
Project: GCRE
Operator Name: JP

Location Name: S1-BH103 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 3.54 m** **Top of Screen: 2.00 m** **Total Depth: 5.54 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 8000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Showers

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/2/2023 9:39 AM	00:00	11.71 pH	8.66 °C	883.00 µS/cm	11.75 mg/L		843.2 mV		2,000.0 ml/min
2/2/2023 9:40 AM	00:30	12.01 pH	9.84 °C	900.21 µS/cm	2.88 mg/L		911.9 mV		2,000.0 ml/min
2/2/2023 9:40 AM	01:00	12.18 pH	10.17 °C	892.40 µS/cm	0.95 mg/L		907.1 mV		2,000.0 ml/min
2/2/2023 9:41 AM	01:30	12.27 pH	10.38 °C	891.66 µS/cm	0.41 mg/L		906.8 mV		2,000.0 ml/min
2/2/2023 9:41 AM	02:00	12.31 pH	10.56 °C	891.50 µS/cm	0.26 mg/L		910.8 mV		2,000.0 ml/min
2/2/2023 9:42 AM	02:30	12.32 pH	10.68 °C	889.95 µS/cm	0.20 mg/L		911.3 mV		2,000.0 ml/min
2/2/2023 9:42 AM	03:00	12.37 pH	10.75 °C	888.87 µS/cm	0.17 mg/L		909.2 mV		2,000.0 ml/min
2/2/2023 9:43 AM	03:30	12.42 pH	10.82 °C	887.84 µS/cm	0.15 mg/L		907.5 mV		2,000.0 ml/min
2/2/2023 9:43 AM	04:00	12.43 pH	10.84 °C	888.80 µS/cm	0.14 mg/L		904.5 mV		2,000.0 ml/min

Samples

Sample ID:	Description:
EW37	

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH105	1	50	15.00	01/022023 14:28
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	11.00	15.00	Cloudy

Installation Inspection

Surface Conditions	Wet	Damage to Headworks?	No
Check Dip of Base (m bgl)	15.36	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	6.28	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	4.00	Number of Well Volumes Purged	0.2
Total Volume Purged (litres)	8.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey.

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	4.00
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	19.5

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	8.72
Volume of the Standpipe (litres) (πdp2/4)*10-3	17.1

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**36.6**

Sampling Information

Sample Depth (m bgl)	6.28
Sample Type	EW
Sample Reference Number	37
Date and Time Obtained	01/02/2023 14:51

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/1/2023 2:45:48 PM
Project: GCRE
Operator Name: JP

Location Name: S1-BH105 **Well Diameter: 5 cm Casing** **Type: Plastic** **Screen Length: 5.00 m** **Top of Screen: 11.00 m** **Total Depth: 15.36 m** **Initial Depth to Water: 6.28 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 8000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Cloudy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/1/2023 2:45 PM	00:00	12.36 pH	9.62 °C	824.01 µS/cm	6.86 mg/L		662.3 mV	628.00 cm	2,000.0 ml/min
2/1/2023 2:46 PM	00:30	12.57 pH	10.36 °C	804.75 µS/cm	1.18 mg/L		876.7 mV	628.00 cm	2,000.0 ml/min
2/1/2023 2:46 PM	01:00	12.47 pH	10.55 °C	799.56 µS/cm	0.35 mg/L		895.7 mV	628.00 cm	2,000.0 ml/min
2/1/2023 2:47 PM	01:30	12.55 pH	10.69 °C	795.25 µS/cm	0.18 mg/L		899.8 mV	628.00 cm	2,000.0 ml/min
2/1/2023 2:47 PM	02:00	12.66 pH	10.78 °C	793.58 µS/cm	0.14 mg/L		901.5 mV	628.00 cm	2,000.0 ml/min
2/1/2023 2:48 PM	02:30	12.71 pH	10.84 °C	791.13 µS/cm	0.11 mg/L		901.8 mV	628.00 cm	2,000.0 ml/min
2/1/2023 2:48 PM	03:00	12.75 pH	10.89 °C	789.68 µS/cm	0.09 mg/L		901.7 mV	628.00 cm	2,000.0 ml/min
2/1/2023 2:49 PM	03:30	12.78 pH	10.93 °C	790.52 µS/cm	0.08 mg/L		902.3 mV	628.00 cm	2,000.0 ml/min
2/1/2023 2:49 PM	04:00	12.81 pH	10.97 °C	792.12 µS/cm	0.07 mg/L		903.8 mV	628.00 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW37	

Created using VuSitu from In-Situ, Inc.

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH108	1	50	15.50	03/02/2023 09:31
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Cover	13.00	15.50	Overcast

Installation Inspection

Surface Conditions	Wet	Damage to Headworks?	Yes
Check Dip of Base (m bgl)	15.46	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

Previous damage to headworks and pipe. Installtion damaged at approximately 0.30mbgl, unable to cut pipe below damaged area due to the level of ground water. Top section of pipe removed and replaced.

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	2.13	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	N/A	Average Flow Rate (litres/min)	
Time to Purge (mins)	N/A	Number of Well Volumes Purged	
Total Volume Purged (litres)	N/A	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	N/A	Groundwater Odour	N/A
In-situ Parameter Device SN	N/A	Visual Turbidity	N/A
Confirm Field Calibration Completed	N/A	Groundwater Colour	N/A

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	2.50
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	145
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	12.0

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	13.37
Volume of the Standpipe (litres) (πdp2/4)*10-3	26.2

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**38.2**

Sampling Information

Sample Depth (m bgl)	N/A
Sample Type	N/A
Sample Reference Number	N/A
Date and Time Obtained	N/A

Additional Notes and Observations

Remedial action taken above has still not resolved the issue with the pipe. Unable to obtain a sample this round.

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH112	1	50	2.50	02/02/2023 10:52
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	1.00	2.50	Showers

Installation Inspection

Surface Conditions	Wet	Damage to Headworks?	No
Check Dip of Base (m bgl)	3.36	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	3..15	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	N/A	Average Flow Rate (litres/min)	#VALUE!
Time to Purge (mins)	N/A	Number of Well Volumes Purged	#VALUE!
Total Volume Purged (litres)	N/A	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	N/A	Groundwater Odour	N/A
In-situ Parameter Device SN	N/A	Visual Turbidity	N/A
Confirm Field Calibration Completed	N/A	Groundwater Colour	N/A

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	#VALUE!
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	#VALUE!

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	#VALUE!
Volume of the Standpipe (litres) (πdp2/4)*10-3	#VALUE!

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**#VALUE!**

Sampling Information

Sample Depth (m bgl)	N/A
Sample Type	N/A
Sample Reference Number	N/A
Date and Time Obtained	N/A

Additional Notes and Observations

Insufficient water to sample.

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH112	2	50	15.00	02/02/2023 11:13
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	8.00	15.00	Showers

Installation Inspection

Surface Conditions	Wet	Damage to Headworks?	No
Check Dip of Base (m bgl)	15	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume.

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	9.98	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	4.00	Number of Well Volumes Purged	0.2
Total Volume Purged (litres)	8.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Orangish brown running clear

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	5.02
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	24.5

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	5.02
Volume of the Standpipe (litres) (πdp2/4)*10-3	9.9

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**34.3**

Sampling Information

Sample Depth (m bgl)	15.00
Sample Type	EW
Sample Reference Number	26
Date and Time Obtained	02/02/2023 12:10

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/2/2023 12:03:44 PM
Project: GCRE
Operator Name: JP

Location Name: S1-BH112 INSTALL 2 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 7.00 m** **Top of Screen: 8.00 m** **Total Depth: 15.00 m** **Initial Depth to Water: 9.98 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 8000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Showers

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/2/2023 12:03 PM	00:00	11.26 pH	10.21 °C	640.97 µS/cm	2.39 mg/L		763.7 mV	998.00 cm	2,000.0 ml/min
2/2/2023 12:04 PM	00:30	11.83 pH	10.27 °C	637.09 µS/cm	0.72 mg/L		975.4 mV	998.00 cm	2,000.0 ml/min
2/2/2023 12:04 PM	01:00	12.06 pH	10.31 °C	636.95 µS/cm	0.36 mg/L		955.9 mV	998.00 cm	2,000.0 ml/min
2/2/2023 12:05 PM	01:30	12.14 pH	10.36 °C	635.98 µS/cm	0.27 mg/L		944.9 mV	998.00 cm	2,000.0 ml/min
2/2/2023 12:05 PM	02:00	12.18 pH	10.41 °C	634.87 µS/cm	0.26 mg/L		936.7 mV	998.00 cm	2,000.0 ml/min
2/2/2023 12:06 PM	02:30	12.21 pH	10.45 °C	633.24 µS/cm	0.27 mg/L		931.0 mV	998.00 cm	2,000.0 ml/min
2/2/2023 12:06 PM	03:00	12.19 pH	10.50 °C	631.72 µS/cm	0.27 mg/L		927.6 mV	998.00 cm	2,000.0 ml/min
2/2/2023 12:07 PM	03:30	12.18 pH	10.52 °C	631.02 µS/cm	0.26 mg/L		925.4 mV	998.00 cm	2,000.0 ml/min
2/2/2023 12:07 PM	04:00	12.12 pH	10.55 °C	630.84 µS/cm	0.25 mg/L		922.6 mV	998.00 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW26	

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INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH113	1	50	5.50	01/02/2023 15:16
Cover Type	**Pipe Cover**	**Top of Response Zone (m bgl)**	**Base of Response Zone (m bgl)**	**Weather**
0	Pipe Plug	3.00	5.50	Overcast

Installation Inspection

Surface Conditions	Wet	Damage to Headworks?	No
Check Dip of Base (m bgl)	5.54	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	4.66	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	4.50	Number of Well Volumes Purged	1.6
Total Volume Purged (litres)	9.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Clear

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	0.84
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	4.1

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	0.84
Volume of the Standpipe (litres) (πdp2/4)*10-3	1.6

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**5.7**

Sampling Information

Sample Depth (m bgl)	5.54
Sample Type	EW
Sample Reference Number	31
Date and Time Obtained	01/02/2023 15:32

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/1/2023 3:23:50 PM
Project: GCRE
Operator Name: JP

Location Name: S1-BH113 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 2.5.0 m** **Top of Screen: 3.00 m** **Total Depth: 5.54 m** **Initial Depth to Water: 4.66 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 9000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Cloudy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/1/2023 3:23 PM	00:00	11.99 pH	8.90 °C	948.26 µS/cm	9.14 mg/L		698.1 mV	466.00 cm	2,000.0 ml/min
2/1/2023 3:24 PM	00:30	12.30 pH	10.17 °C	950.73 µS/cm	1.37 mg/L		888.1 mV	466.00 cm	2,000.0 ml/min
2/1/2023 3:24 PM	01:00	12.37 pH	10.50 °C	944.34 µS/cm	0.27 mg/L		893.9 mV	466.00 cm	2,000.0 ml/min
2/1/2023 3:25 PM	01:30	12.52 pH	10.69 °C	939.75 µS/cm	0.13 mg/L		895.7 mV	466.00 cm	2,000.0 ml/min
2/1/2023 3:25 PM	02:00	12.55 pH	10.83 °C	935.54 µS/cm	0.09 mg/L		900.7 mV	466.00 cm	2,000.0 ml/min
2/1/2023 3:26 PM	02:30	12.49 pH	10.87 °C	933.63 µS/cm	0.08 mg/L		908.1 mV	466.00 cm	2,000.0 ml/min
2/1/2023 3:26 PM	03:00	12.52 pH	10.88 °C	932.29 µS/cm	0.08 mg/L		911.2 mV	466.00 cm	2,000.0 ml/min
2/1/2023 3:27 PM	03:30	12.54 pH	10.86 °C	930.93 µS/cm	0.09 mg/L		914.6 mV	466.00 cm	2,000.0 ml/min
2/1/2023 3:27 PM	04:00	12.51 pH	10.80 °C	929.17 µS/cm	0.09 mg/L		918.0 mV	466.00 cm	2,000.0 ml/min
2/1/2023 3:28 PM	04:30	12.49 pH	10.76 °C	929.44 µS/cm	0.10 mg/L		921.2 mV	466.00 cm	2,000.0 ml/min

Samples

Sample ID:	Description:

EW31	

Created using VuSitu from In-Situ, Inc.

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH121	1	50	3.50	0102/2023 10:38
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	2.00	3.50	Cloudy

Installation Inspection

Surface Conditions	Damp	Damage to Headworks?	No
Check Dip of Base (m bgl)	3.32	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	0.61	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	8.50	Number of Well Volumes Purged	1.1
Total Volume Purged (litres)	17.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	No
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey running clear.

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	1.50
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	168
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	10.0

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	2.89
Volume of the Standpipe (litres) (πdp2/4)*10-3	5.7

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**15.7**

Sampling Information

Sample Depth (m bgl)	3.32
Sample Type	EW
Sample Reference Number	20
Date and Time Obtained	01/02/2023 10:55

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/1/2023 10:46:25 AM
Project: GCRE
Operator Name: JP

Location Name: S1-BH121 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 1.30 m** **Top of Screen: 2.00 m Total Depth: 3.32 m** **Initial Depth to Water: 0.61 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 17000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Cloudy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/1/2023 10:46 AM	00:00	12.01 pH	10.16 °C	473.13 µS/cm	6.15 mg/L		946.1 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:46 AM	00:30	12.23 pH	9.86 °C	473.62 µS/cm	1.57 mg/L		980.5 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:47 AM	01:00	12.36 pH	9.31 °C	475.41 µS/cm	0.55 mg/L		972.7 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:47 AM	01:30	12.46 pH	8.84 °C	475.43 µS/cm	0.31 mg/L		967.5 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:48 AM	02:00	12.59 pH	8.52 °C	477.82 µS/cm	0.24 mg/L		959.8 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:48 AM	02:30	12.60 pH	8.31 °C	478.63 µS/cm	0.20 mg/L		955.2 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:49 AM	03:00	12.77 pH	8.20 °C	479.19 µS/cm	0.15 mg/L		946.2 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:49 AM	03:30	12.93 pH	8.18 °C	479.00 µS/cm	0.11 mg/L		930.3 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:50 AM	04:00	13.07 pH	8.16 °C	484.62 µS/cm	0.09 mg/L		919.8 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:50 AM	04:30	13.23 pH	8.14 °C	491.62 µS/cm	0.08 mg/L		908.7 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:51 AM	05:00	13.23 pH	8.14 °C	496.06 µS/cm	0.07 mg/L		907.3 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:51 AM	05:30	13.22 pH	8.13 °C	502.14 µS/cm	0.06 mg/L		907.2 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:52 AM	06:00	13.04 pH	8.12 °C	506.03 µS/cm	0.06 mg/L		916.5 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:52 AM	06:30	8.05 pH	8.12 °C	509.53 µS/cm	0.05 mg/L		1,199.2 mV	61.00 cm	2,000.0 ml/min

2/1/2023 10:53 AM	07:00	7.97 pH	8.11 °C	513.01 µS/cm	0.05 mg/L		1,204.5 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:53 AM	07:30	8.02 pH	8.11 °C	514.58 µS/cm	0.05 mg/L		1,206.1 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:54 AM	08:00	8.04 pH	8.11 °C	516.67 µS/cm	0.04 mg/L		1,205.7 mV	61.00 cm	2,000.0 ml/min
2/1/2023 10:54 AM	08:30	8.10 pH	8.10 °C	519.38 µS/cm	0.04 mg/L		1,204.4 mV	61.00 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW20	

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH122	1	50	1.90	01/02/2023 12:08
Cover Type	**Pipe Cover**	**Top of Response Zone (m bgl)**	**Base of Response Zone (m bgl)**	**Weather**
0	Pipe Plug	1.00	1.90	Cloudy

Installation Inspection

Surface Conditions	Wet	Damage to Headworks?	No
Check Dip of Base (m bgl)	1.76	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	0.25	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	4.0	Number of Well Volumes Purged	1.3
Total Volume Purged (litres)	8.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey becoming light grey.

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	0.90
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	122
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	2.9

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	1.65
Volume of the Standpipe (litres) (πdp2/4)*10-3	3.2

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**6.1**

Sampling Information

Sample Depth (m bgl)	1.76
Sample Type	EW
Sample Reference Number	23
Date and Time Obtained	01/02/2023 12:19

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/1/2023 12:14:48 PM
Project: GCRE
Operator Name: JP

Location Name: S1-BH122 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 0.76 m** **Top of Screen: 1.00 m** **Total Depth: 1.76 m** **Initial Depth to Water: 0.25 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 8000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Cloudy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/1/2023 12:14 PM	00:00	12.56 pH	8.09 °C	780.35 µS/cm	9.06 mg/L		693.8 mV	25.00 cm	2,000.0 ml/min
2/1/2023 12:15 PM	00:30	12.66 pH	8.43 °C	955.37 µS/cm	2.13 mg/L		909.5 mV	25.00 cm	2,000.0 ml/min
2/1/2023 12:15 PM	01:00	12.61 pH	8.42 °C	962.59 µS/cm	0.59 mg/L		929.4 mV	25.00 cm	2,000.0 ml/min
2/1/2023 12:16 PM	01:30	12.72 pH	8.42 °C	964.12 µS/cm	0.24 mg/L		932.3 mV	25.00 cm	2,000.0 ml/min
2/1/2023 12:16 PM	02:00	12.81 pH	8.43 °C	965.00 µS/cm	0.17 mg/L		934.3 mV	25.00 cm	2,000.0 ml/min
2/1/2023 12:17 PM	02:30	12.85 pH	8.45 °C	965.15 µS/cm	0.14 mg/L		935.3 mV	25.00 cm	2,000.0 ml/min
2/1/2023 12:17 PM	03:00	12.90 pH	8.47 °C	965.13 µS/cm	0.13 mg/L		934.5 mV	25.00 cm	2,000.0 ml/min
2/1/2023 12:18 PM	03:30	12.93 pH	8.47 °C	965.52 µS/cm	0.13 mg/L		933.5 mV	25.00 cm	2,000.0 ml/min
2/1/2023 12:18 PM	04:00	12.94 pH	8.47 °C	965.99 µS/cm	0.12 mg/L		933.4 mV	25.00 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW23	

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INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
SOP003.16	1	50	13.00	02/02/2]23 10:09
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	10.00	13.00	Showers

Installation Inspection

Surface Conditions	Saturated	Damage to Headworks?	No
Check Dip of Base (m bgl)	13.56	Pipe Cover/Bung Present?	Yes

Yes

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	11.30	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	3.50	Number of Well Volumes Purged	0.9
Total Volume Purged (litres)	7.0	Operative	JP

Observations During Purging (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Grey running light grey/opaque

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	1.70
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	115
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	4.7

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	1.70
Volume of the Standpipe (litres) (πdp2/4)*10-3	3.3

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**8.1**

Sampling Information

Sample Depth (m bgl)	13.56
Sample Type	EW
Sample Reference Number	3
Date and Time Obtained	02/02/2023 10:32

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/2/2023 10:27:33 AM
Project: GCRE
Operator Name: JP

Location Name: SOP003.16 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 3.60 m** **Top of Screen: 10.00 m** **Total Depth: 13.6 m** **Initial Depth to Water: 11.3 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 7000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Showers

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/2/2023 10:27 AM	00:00	11.38 pH	9.37 °C	645.22 µS/cm	7.06 mg/L		858.2 mV	1,130.0 cm	2,000.0 ml/min
2/2/2023 10:28 AM	00:30	12.00 pH	9.63 °C	676.10 µS/cm	2.24 mg/L		943.8 mV	1,130.0 cm	2,000.0 ml/min
2/2/2023 10:28 AM	01:00	12.21 pH	9.75 °C	671.18 µS/cm	0.85 mg/L		930.4 mV	1,130.0 cm	2,000.0 ml/min
2/2/2023 10:29 AM	01:30	12.25 pH	9.83 °C	660.04 µS/cm	0.42 mg/L		925.2 mV	1,130.0 cm	2,000.0 ml/min
2/2/2023 10:29 AM	02:00	12.24 pH	9.90 °C	652.47 µS/cm	0.29 mg/L		925.2 mV	1,130.0 cm	2,000.0 ml/min
2/2/2023 10:30 AM	02:30	12.23 pH	9.94 °C	650.37 µS/cm	0.25 mg/L		928.2 mV	1,130.0 cm	2,000.0 ml/min
2/2/2023 10:30 AM	03:00	12.25 pH	9.99 °C	650.23 µS/cm	0.24 mg/L		925.2 mV	1,130.0 cm	2,000.0 ml/min
2/2/2023 10:31 AM	03:30	12.26 pH	10.04 °C	650.58 µS/cm	0.22 mg/L		924.2 mV	1,130.0 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW3	

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH101	1	50	14.00	14/02/2023 14:44
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	11.00	14.00	Sunny

Installation Inspection

Surface Conditions	Dry	Damage to Headworks?	No
Check Dip of Base (m bgl)	13.47	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	10.66	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	8.00	Number of Well Volumes Purged	1.0
Total Volume Purged (litres)	16.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey running opaque

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	3.00
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	121
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	9.4

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	3.34
Volume of the Standpipe (litres) (πdp2/4)*10-3	6.6

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**16.0**

Sampling Information

Sample Depth (m bgl)	13.47
Sample Type	EW
Sample Reference Number	46
Date and Time Obtained	14/02/2023 15:04

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/14/2023 2:54:55 PM
Project: GCRE
Operator Name: JP

Location Name: S1-BH101 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 4 m** **Top of Screen: 11 m** **Total Depth: 13.47 m** **Initial Depth to Water: 10.66 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 16000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/14/2023 2:54 PM	00:00	7.88 pH	13.22 °C	712.83 µS/cm	1.94 mg/L		405.9 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 2:55 PM	00:30	7.87 pH	12.47 °C	839.94 µS/cm	0.62 mg/L		816.7 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 2:55 PM	01:00	7.86 pH	11.93 °C	849.86 µS/cm	0.33 mg/L		1,012.0 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 2:56 PM	01:30	7.85 pH	11.66 °C	856.45 µS/cm	0.31 mg/L		1,036.6 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 2:56 PM	02:00	7.84 pH	11.50 °C	861.57 µS/cm	0.30 mg/L		1,039.4 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 2:57 PM	02:30	7.84 pH	11.39 °C	865.66 µS/cm	0.21 mg/L		1,035.4 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 2:57 PM	03:00	7.84 pH	11.34 °C	869.13 µS/cm	0.17 mg/L		1,020.6 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 2:58 PM	03:30	7.84 pH	11.30 °C	874.10 µS/cm	0.15 mg/L		1,002.4 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 2:58 PM	04:00	7.84 pH	11.29 °C	875.75 µS/cm	0.14 mg/L		985.4 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 2:59 PM	04:30	7.84 pH	11.27 °C	877.00 µS/cm	0.13 mg/L		972.5 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 2:59 PM	05:00	7.84 pH	11.26 °C	879.63 µS/cm	0.15 mg/L		966.9 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 3:00 PM	05:30	7.84 pH	11.25 °C	881.03 µS/cm	0.13 mg/L		955.8 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 3:00 PM	06:00	7.84 pH	11.24 °C	881.98 µS/cm	0.11 mg/L		947.3 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 3:01 PM	06:30	7.84 pH	11.24 °C	882.42 µS/cm	0.11 mg/L		943.7 mV	1,066.0 cm	2,000.0 ml/min

2/14/2023 3:01 PM	07:00	7.84 pH	11.24 °C	884.10 µS/cm	0.13 mg/L		942.8 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 3:02 PM	07:30	7.85 pH	11.22 °C	885.04 µS/cm	0.12 mg/L		938.6 mV	1,066.0 cm	2,000.0 ml/min
2/14/2023 3:02 PM	08:00	7.85 pH	11.20 °C	885.54 µS/cm	0.12 mg/L		933.3 mV	1,066.0 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW46	

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INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH102	1	50	9.00	13/02/2023 00:00
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Cover	6.00	9.00	Sunny

Installation Inspection

Surface Conditions	Wet	Damage to Headworks?	No
Check Dip of Base (m bgl)	8.75	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	0.68	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	7.50	Number of Well Volumes Purged	0.7
Total Volume Purged (litres)	15.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey running light grey

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	3.00
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	104
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	6.5

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	8.32
Volume of the Standpipe (litres) (πdp2/4)*10-3	16.3

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**22.8**

Sampling Information

Sample Depth (m bgl)	8.75
Sample Type	EW
Sample Reference Number	30
Date and Time Obtained	13/02/2023 12:08

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/13/2023 11:58:45 AM
Project: GCRE
Operator Name: JP

Location Name: S1-BH102 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 2.75 m** **Top of Screen: 6 m** **Total Depth: 8.75 m** **Initial Depth to Water: 0.68 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 15000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/13/2023 11:58 AM	00:00	8.14 pH	11.06 °C	682.12 µS/cm	1.75 mg/L		309.1 mV	68.00 cm	2,000.0 ml/min
2/13/2023 11:59 AM	00:30	8.14 pH	11.14 °C	773.38 µS/cm	0.62 mg/L		579.9 mV	68.00 cm	2,000.0 ml/min
2/13/2023 11:59 AM	01:00	8.12 pH	10.96 °C	777.39 µS/cm	0.18 mg/L		782.4 mV	68.00 cm	2,000.0 ml/min
2/13/2023 12:00 PM	01:30	8.09 pH	10.84 °C	783.53 µS/cm	0.10 mg/L		895.7 mV	68.00 cm	2,000.0 ml/min
2/13/2023 12:00 PM	02:00	8.07 pH	10.79 °C	788.99 µS/cm	0.07 mg/L		918.8 mV	68.00 cm	2,000.0 ml/min
2/13/2023 12:01 PM	02:30	8.04 pH	10.76 °C	790.89 µS/cm	0.05 mg/L		915.3 mV	68.00 cm	2,000.0 ml/min
2/13/2023 12:01 PM	03:00	8.03 pH	10.73 °C	796.65 µS/cm	0.04 mg/L		908.8 mV	68.00 cm	2,000.0 ml/min
2/13/2023 12:02 PM	03:30	8.02 pH	10.69 °C	795.98 µS/cm	0.04 mg/L		904.8 mV	68.00 cm	2,000.0 ml/min
2/13/2023 12:02 PM	04:00	8.01 pH	10.67 °C	797.62 µS/cm	0.03 mg/L		904.8 mV	68.00 cm	2,000.0 ml/min
2/13/2023 12:03 PM	04:30	7.99 pH	10.65 °C	802.34 µS/cm	0.03 mg/L		952.1 mV	68.00 cm	2,000.0 ml/min
2/13/2023 12:03 PM	05:00	7.98 pH	10.65 °C	806.57 µS/cm	0.03 mg/L		908.2 mV	68.00 cm	2,000.0 ml/min
2/13/2023 12:04 PM	05:30	7.96 pH	10.67 °C	810.33 µS/cm	0.02 mg/L		898.4 mV	68.00 cm	2,000.0 ml/min
2/13/2023 12:04 PM	06:00	7.95 pH	10.69 °C	812.75 µS/cm	0.02 mg/L		899.9 mV	68.00 cm	2,000.0 ml/min
2/13/2023 12:05 PM	06:30	7.94 pH	10.69 °C	815.42 µS/cm	0.02 mg/L		901.3 mV	68.00 cm	2,000.0 ml/min

2/13/2023 12:05 PM	07:00	7.93 pH	10.71 °C	816.19 µS/cm	0.02 mg/L		901.8 mV	68.00 cm	2,000.0 ml/min
2/13/2023 12:06 PM	07:30	7.92 pH	10.71 °C	814.92 µS/cm	0.01 mg/L		904.2 mV	68.00 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW30	

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INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH103	1	50	5.50	14/02/2023 00:00
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	2.00	5.50	Overcast

Installation Inspection

Surface Conditions	Dry	Damage to Headworks?	No
Check Dip of Base (m bgl)	5.52	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	3.40	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	35	Number of Well Volumes Purged	4.9
Total Volume Purged (litres)	70.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey running clear

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	2.10
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	10.2

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	2.10
Volume of the Standpipe (litres) (πdp2/4)*10-3	4.1

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**14.4**

Sampling Information

Sample Depth (m bgl)	5.52
Sample Type	EW
Sample Reference Number	38
Date and Time Obtained	14/02/2023 10:00

Additional Notes and Observations

ORP not stabilised after 35 minutes

Low-Flow Test Report:

Test Date / Time: 2/14/2023 9:23:12 AM
Project: GCRE
Operator Name: JP

Location Name: S1-BH103 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 3.5 m** **Top of Screen: 2 m** **Total Depth: 5.52 m** **Initial Depth to Water: 3.4 m**	**Estimated Total Volume Pumped: 70000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Overcast

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/14/2023 9:23 AM	00:00	8.03 pH	6.17 °C	990.16 µS/cm	10.01 mg/L		623.6 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:23 AM	00:30	7.92 pH	7.92 °C	890.19 µS/cm	3.96 mg/L		898.2 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:24 AM	01:00	7.88 pH	8.66 °C	874.80 µS/cm	1.05 mg/L		935.3 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:24 AM	01:30	7.86 pH	9.24 °C	867.57 µS/cm	0.34 mg/L		939.2 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:25 AM	02:00	7.84 pH	9.66 °C	864.87 µS/cm	0.20 mg/L		937.5 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:25 AM	02:30	7.84 pH	9.94 °C	861.78 µS/cm	0.16 mg/L		949.1 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:26 AM	03:00	7.83 pH	10.15 °C	859.31 µS/cm	0.13 mg/L		928.8 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:26 AM	03:30	7.83 pH	10.29 °C	859.72 µS/cm	0.12 mg/L		938.8 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:27 AM	04:00	7.83 pH	10.39 °C	865.65 µS/cm	0.11 mg/L		922.5 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:27 AM	04:30	7.83 pH	10.45 °C	855.31 µS/cm	0.10 mg/L		913.9 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:28 AM	05:00	7.83 pH	10.50 °C	854.39 µS/cm	0.09 mg/L		905.6 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:28 AM	05:30	7.83 pH	10.55 °C	853.73 µS/cm	0.09 mg/L		919.1 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:29 AM	06:00	7.83 pH	10.59 °C	853.11 µS/cm	0.08 mg/L		897.6 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:29 AM	06:30	7.83 pH	10.60 °C	853.10 µS/cm	0.08 mg/L		913.7 mV	340.00 cm	2,000.0 ml/min

2/14/2023 9:30 AM	07:00	7.83 pH	10.61 °C	852.35 µS/cm	0.07 mg/L		887.4 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:30 AM	07:30	7.83 pH	10.61 °C	849.17 µS/cm	0.07 mg/L		892.1 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:31 AM	08:00	7.83 pH	10.62 °C	852.65 µS/cm	0.06 mg/L		898.4 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:31 AM	08:30	7.84 pH	10.63 °C	850.28 µS/cm	0.06 mg/L		871.3 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:32 AM	09:00	7.84 pH	10.61 °C	851.99 µS/cm	0.06 mg/L		883.2 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:32 AM	09:30	7.84 pH	10.61 °C	852.05 µS/cm	0.05 mg/L		863.4 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:33 AM	10:00	7.84 pH	10.60 °C	808.82 µS/cm	0.05 mg/L		858.6 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:33 AM	10:30	7.84 pH	10.59 °C	852.41 µS/cm	0.05 mg/L		876.2 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:34 AM	11:00	7.84 pH	10.59 °C	852.59 µS/cm	0.05 mg/L		852.0 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:34 AM	11:30	7.84 pH	10.60 °C	852.98 µS/cm	0.04 mg/L		865.1 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:35 AM	12:00	7.84 pH	10.61 °C	821.44 µS/cm	0.04 mg/L		850.2 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:35 AM	12:30	7.84 pH	10.63 °C	852.43 µS/cm	0.04 mg/L		836.9 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:36 AM	13:00	7.84 pH	10.63 °C	841.14 µS/cm	0.04 mg/L		858.1 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:36 AM	13:30	7.84 pH	10.61 °C	849.33 µS/cm	0.04 mg/L		840.7 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:37 AM	14:00	7.84 pH	10.60 °C	851.37 µS/cm	0.04 mg/L		855.9 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:37 AM	14:30	7.84 pH	10.59 °C	852.87 µS/cm	0.04 mg/L		838.2 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:38 AM	15:00	7.85 pH	10.59 °C	852.18 µS/cm	0.04 mg/L		837.8 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:38 AM	15:30	7.85 pH	10.59 °C	852.54 µS/cm	0.04 mg/L		853.2 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:39 AM	16:00	7.85 pH	10.57 °C	852.56 µS/cm	0.04 mg/L		846.1 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:39 AM	16:30	7.85 pH	10.57 °C	851.94 µS/cm	0.04 mg/L		856.7 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:40 AM	17:00	7.85 pH	10.58 °C	852.67 µS/cm	0.03 mg/L		838.2 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:40 AM	17:30	7.85 pH	10.59 °C	853.27 µS/cm	0.03 mg/L		822.2 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:41 AM	18:00	7.85 pH	10.59 °C	852.84 µS/cm	0.03 mg/L		854.7 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:41 AM	18:30	7.85 pH	10.60 °C	858.97 µS/cm	0.03 mg/L		834.5 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:42 AM	19:00	7.85 pH	10.60 °C	851.50 µS/cm	0.03 mg/L		837.4 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:42 AM	19:30	7.85 pH	10.59 °C	853.44 µS/cm	0.03 mg/L		828.4 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:43 AM	20:00	7.85 pH	10.59 °C	852.81 µS/cm	0.03 mg/L		830.3 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:43 AM	20:30	7.85 pH	10.59 °C	852.74 µS/cm	0.03 mg/L		846.8 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:44 AM	21:00	7.85 pH	10.60 °C	852.40 µS/cm	0.03 mg/L		835.0 mV	340.00 cm	2,000.0 ml/min

2/14/2023 9:44 AM	21:30	7.85 pH	10.59 °C	857.58 µS/cm	0.03 mg/L		821.4 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:45 AM	22:00	7.85 pH	10.57 °C	852.66 µS/cm	0.03 mg/L		854.7 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:45 AM	22:30	7.85 pH	10.55 °C	851.97 µS/cm	0.03 mg/L		839.9 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:46 AM	23:00	7.85 pH	10.54 °C	852.07 µS/cm	0.03 mg/L		833.1 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:46 AM	23:30	7.85 pH	10.53 °C	850.15 µS/cm	0.03 mg/L		822.3 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:47 AM	24:00	7.85 pH	10.54 °C	854.56 µS/cm	0.03 mg/L		823.1 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:47 AM	24:30	7.85 pH	10.55 °C	853.09 µS/cm	0.03 mg/L		847.6 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:48 AM	25:00	7.85 pH	10.55 °C	853.55 µS/cm	0.03 mg/L		826.8 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:48 AM	25:30	7.85 pH	10.55 °C	851.22 µS/cm	0.03 mg/L		846.8 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:49 AM	26:00	7.85 pH	10.56 °C	842.97 µS/cm	0.03 mg/L		822.5 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:49 AM	26:30	7.85 pH	10.56 °C	854.41 µS/cm	0.03 mg/L		830.5 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:50 AM	27:00	7.85 pH	10.56 °C	854.57 µS/cm	0.03 mg/L		844.2 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:50 AM	27:30	7.85 pH	10.56 °C	853.78 µS/cm	0.03 mg/L		841.9 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:51 AM	28:00	7.85 pH	10.56 °C	854.00 µS/cm	0.03 mg/L		833.1 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:51 AM	28:30	7.85 pH	10.55 °C	853.66 µS/cm	0.02 mg/L		825.6 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:52 AM	29:00	7.85 pH	10.55 °C	853.20 µS/cm	0.03 mg/L		826.4 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:52 AM	29:30	7.86 pH	10.55 °C	854.92 µS/cm	0.03 mg/L		853.3 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:53 AM	30:00	7.85 pH	10.55 °C	854.18 µS/cm	0.03 mg/L		821.7 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:53 AM	30:30	7.86 pH	10.55 °C	850.73 µS/cm	0.02 mg/L		845.9 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:54 AM	31:00	7.86 pH	10.55 °C	826.51 µS/cm	0.03 mg/L		823.7 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:54 AM	31:30	7.86 pH	10.55 °C	853.92 µS/cm	0.02 mg/L		825.4 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:55 AM	32:00	7.86 pH	10.55 °C	855.64 µS/cm	0.01 mg/L		841.5 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:55 AM	32:30	7.86 pH	10.59 °C	855.80 µS/cm	0.00 mg/L		817.3 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:56 AM	33:00	7.86 pH	10.64 °C	855.91 µS/cm	0.00 mg/L		829.8 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:56 AM	33:30	7.85 pH	10.69 °C	855.54 µS/cm	0.00 mg/L		811.8 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:57 AM	34:00	7.85 pH	10.70 °C	855.59 µS/cm	-0.01 mg/L		809.6 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:57 AM	34:30	7.85 pH	10.72 °C	855.09 µS/cm	-0.01 mg/L		827.0 mV	340.00 cm	2,000.0 ml/min
2/14/2023 9:58 AM	35:00	7.85 pH	10.73 °C	855.59 µS/cm	-0.01 mg/L		798.4 mV	340.00 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW38	

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH105	1	50	15.00	14/02/2023 10:25
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	11.00	15.00	Cloudy

Installation Inspection

Surface Conditions	Dry	Damage to Headworks?	No
Check Dip of Base (m bgl)	15.36	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	6.46	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	10.00	Number of Well Volumes Purged	0.6
Total Volume Purged (litres)	20.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 409	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey running light grey then clear

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	4.00
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	19.5

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	8.54
Volume of the Standpipe (litres) (πdp2/4)*10-3	16.8

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**36.3**

Sampling Information

Sample Depth (m bgl)	15.36
Sample Type	EW
Sample Reference Number	38
Date and Time Obtained	14/02/2023 10:42

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/14/2023 10:29:35 AM
Project: GCRE
Operator Name: JP

Location Name: S1-BH105 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 5 m** **Top of Screen: 11 m** **Total Depth: 15.36 m** **Initial Depth to Water: 6.46 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 20000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Cloudy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/14/2023 10:29 AM	00:00	8.00 pH	10.55 °C	803.62 µS/cm	3.88 mg/L		341.9 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:30 AM	00:30	7.80 pH	10.73 °C	769.40 µS/cm	0.80 mg/L		658.2 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:30 AM	01:00	7.69 pH	10.90 °C	765.28 µS/cm	0.22 mg/L		889.6 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:31 AM	01:30	7.62 pH	11.01 °C	763.97 µS/cm	0.12 mg/L		977.3 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:31 AM	02:00	7.58 pH	11.11 °C	763.41 µS/cm	0.09 mg/L		992.0 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:32 AM	02:30	7.54 pH	11.15 °C	763.82 µS/cm	0.08 mg/L		989.6 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:32 AM	03:00	7.52 pH	11.20 °C	763.92 µS/cm	0.07 mg/L		982.4 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:33 AM	03:30	7.50 pH	11.25 °C	763.83 µS/cm	0.06 mg/L		969.8 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:33 AM	04:00	7.49 pH	11.29 °C	763.12 µS/cm	0.05 mg/L		950.4 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:34 AM	04:30	7.48 pH	11.29 °C	761.73 µS/cm	0.04 mg/L		935.1 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:34 AM	05:00	7.47 pH	11.29 °C	759.95 µS/cm	0.04 mg/L		920.4 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:35 AM	05:30	7.47 pH	11.31 °C	757.29 µS/cm	0.03 mg/L		906.2 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:35 AM	06:00	7.46 pH	11.33 °C	754.33 µS/cm	0.03 mg/L		895.4 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:36 AM	06:30	7.46 pH	11.34 °C	751.75 µS/cm	0.03 mg/L		889.1 mV	646.00 cm	2,000.0 ml/min

2/14/2023 10:36 AM	07:00	7.46 pH	11.34 °C	748.20 µS/cm	0.03 mg/L		876.3 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:37 AM	07:30	7.46 pH	11.34 °C	744.82 µS/cm	0.04 mg/L		870.8 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:37 AM	08:00	7.46 pH	11.34 °C	742.12 µS/cm	0.04 mg/L		865.0 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:38 AM	08:30	7.46 pH	11.34 °C	738.09 µS/cm	0.03 mg/L		859.7 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:38 AM	09:00	7.46 pH	11.34 °C	733.43 µS/cm	0.03 mg/L		857.1 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:39 AM	09:30	7.46 pH	11.36 °C	731.07 µS/cm	0.03 mg/L		854.4 mV	646.00 cm	2,000.0 ml/min
2/14/2023 10:39 AM	10:00	7.46 pH	11.37 °C	728.33 µS/cm	0.02 mg/L		851.3 mV	646.00 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW38	

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH108	1	50	15.50	13/02/2023 09:00
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Cover	13.00	15.50	Sunny

Installation Inspection

Surface Conditions	Dry	Damage to Headworks?	No
Check Dip of Base (m bgl)	Unknown	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

Previous repair to damaged section of pipe has led to the borehole becoming blocked at circa 2.11m. Unable to pass obstruction with drain rods.

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	N/A	Number of Well Volumes Purged	N/A

Purging Details

Purge Method/ Device	N/A	Average Flow Rate (litres/min)	
Time to Purge (mins)	N/A	Number of Well Volumes Purged	
Total Volume Purged (litres)	N/A	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	N/A	Groundwater Odour	N/A
In-situ Parameter Device SN	N/A	Visual Turbidity	N/A
Confirm Field Calibration Completed	N/A	Groundwater Colour	N/A

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	145
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	0.0

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	
Volume of the Standpipe (litres) (πdp2/4)*10-3	0.0

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**0.0**

Sampling Information

Sample Depth (m bgl)	N/A
Sample Type	N/A
Sample Reference Number	N/A
Date and Time Obtained	N/A

Additional Notes and Observations

N/A

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH112	1	50	3.50	14/02/2023 14:01
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	1.00	3.50	Sunny

Installation Inspection

Surface Conditions	Dry	Damage to Headworks?	No
Check Dip of Base (m bgl)	3.42	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	3.20	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	N/A	Average Flow Rate (litres/min)	
Time to Purge (mins)	N/A	Number of Well Volumes Purged	
Total Volume Purged (litres)	N/A	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	N/A	Groundwater Odour	N/A
In-situ Parameter Device SN	N/A	Visual Turbidity	N/A
Confirm Field Calibration Completed	N/A	Groundwater Colour	N/A

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	0.30
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	1.5

Volume of the Standpipe

N/A	50
Saturated depth (m) (sd) (installation base - groundwater level)	0.30
Volume of the Standpipe (litres) (πdp2/4)*10-3	0.6

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**2.1**

Sampling Information

Sample Depth (m bgl)	N/A
Sample Type	N/A
Sample Reference Number	N/A
Date and Time Obtained	N/A

Additional Notes and Observations

Insufficient water to sample

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH112	2	50	15.00	14/02/2023 14:08
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	8.00	15.00	Sunny

Installation Inspection

Surface Conditions	Dry	Damage to Headworks?	No
Check Dip of Base (m bgl)	15.17	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	10.13	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	8.00	Number of Well Volumes Purged	0.5
Total Volume Purged (litres)	16.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Brown running clear

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	4.87
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	23.7

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	4.87
Volume of the Standpipe (litres) (πdp2/4)*10-3	9.6

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**33.3**

Sampling Information

Sample Depth (m bgl)	15.17
Sample Type	EW
Sample Reference Number	27
Date and Time Obtained	14/02/2023 14:23

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/14/2023 2:12:28 PM
Project: GCRE
Operator Name: JP

Location Name: S1-BH112 INSTALL 2 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 7 m** **Top of Screen: 8 m** **Total Depth: 15.17 m** **Initial Depth to Water: 10.13 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 16000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/14/2023 2:12 PM	00:00	8.03 pH	17.00 °C	603.22 µS/cm	4.05 mg/L		445.7 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:12 PM	00:30	7.91 pH	14.81 °C	614.69 µS/cm	0.81 mg/L		850.0 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:13 PM	01:00	7.81 pH	13.54 °C	622.27 µS/cm	0.25 mg/L		1,014.7 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:13 PM	01:30	7.73 pH	12.72 °C	631.46 µS/cm	0.16 mg/L		1,024.1 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:14 PM	02:00	7.66 pH	12.22 °C	637.81 µS/cm	0.14 mg/L		1,017.1 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:14 PM	02:30	7.62 pH	11.94 °C	643.52 µS/cm	0.13 mg/L		997.0 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:15 PM	03:00	7.58 pH	11.76 °C	645.85 µS/cm	0.13 mg/L		978.8 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:15 PM	03:30	7.55 pH	11.66 °C	647.23 µS/cm	0.12 mg/L		960.9 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:16 PM	04:00	7.53 pH	11.58 °C	647.38 µS/cm	0.12 mg/L		950.0 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:16 PM	04:30	7.52 pH	11.54 °C	647.72 µS/cm	0.11 mg/L		941.0 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:17 PM	05:00	7.50 pH	11.52 °C	648.56 µS/cm	0.10 mg/L		934.8 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:17 PM	05:30	7.49 pH	11.49 °C	648.60 µS/cm	0.10 mg/L		929.0 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:18 PM	06:00	7.49 pH	11.47 °C	648.15 µS/cm	0.09 mg/L		923.9 mV	1,013.0 cm	2,000.0 ml/min

2/14/2023 2:18 PM	06:30	7.48 pH	11.44 °C	648.53 µS/cm	0.09 mg/L		918.8 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:19 PM	07:00	7.47 pH	11.44 °C	649.44 µS/cm	0.08 mg/L		916.8 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:19 PM	07:30	7.47 pH	11.45 °C	648.92 µS/cm	0.08 mg/L		913.7 mV	1,013.0 cm	2,000.0 ml/min
2/14/2023 2:20 PM	08:00	7.47 pH	11.44 °C	649.47 µS/cm	0.08 mg/L		914.2 mV	1,013.0 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW27	

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH113	1	63	5.50	14/02/2023 11:03
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	3.00	5.50	Sunny

Installation Inspection

Surface Conditions	Dry	Damage to Headworks?	No
Check Dip of Base (m bgl)	5.49	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	Dry	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	N/A	Average Flow Rate (litres/min)	
Time to Purge (mins)	N/A	Number of Well Volumes Purged	
Total Volume Purged (litres)	N/A	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	N/A	Groundwater Odour	N/A
In-situ Parameter Device SN	N/A	Visual Turbidity	N/A
Confirm Field Calibration Completed	N/A	Groundwater Colour	N/A

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	146
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	0.0

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	63
Saturated depth (m) (sd) (installation base - groundwater level)	
Volume of the Standpipe (litres) (πdp2/4)*10-3	0.0

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**0.0**

Sampling Information

Sample Depth (m bgl)	N/A
Sample Type	N/A
Sample Reference Number	N/A
Date and Time Obtained	N/A

Additional Notes and Observations

N/A

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
S1-BH121	1	50	3.50	1302/2023 10:46
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	2.00	3.50	Sunny

Installation Inspection

Surface Conditions	Dry	Damage to Headworks?	No
Check Dip of Base (m bgl)	3.28	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	0.67	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	13.50	Number of Well Volumes Purged	1.7
Total Volume Purged (litres)	27.0	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	Yes of sulphur
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey running clear

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	1.50
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	168
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	10.0

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	2.83
Volume of the Standpipe (litres) (πdp2/4)*10-3	5.6

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**15.5**

Sampling Information

Sample Depth (m bgl)	3.28
Sample Type	EW
Sample Reference Number	21
Date and Time Obtained	13/02/2023 11:17

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/13/2023 11:01:54 AM
Project: GCRE
Operator Name: JP

Location Name: S1-BH121 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 1.5 m** **Top of Screen: 2 m** **Total Depth: 3.28 m** **Initial Depth to Water: 0.67 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 27000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/13/2023 11:01 AM	00:00	8.01 pH	9.70 °C	545.28 µS/cm	2.05 mg/L		533.9 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:02 AM	00:30	7.97 pH	9.14 °C	536.17 µS/cm	0.60 mg/L		852.0 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:02 AM	01:00	7.94 pH	8.82 °C	541.03 µS/cm	0.26 mg/L		969.6 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:03 AM	01:30	7.90 pH	8.66 °C	545.85 µS/cm	0.15 mg/L		997.1 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:03 AM	02:00	7.87 pH	8.53 °C	557.85 µS/cm	0.10 mg/L		1,001.7 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:04 AM	02:30	7.83 pH	8.42 °C	571.05 µS/cm	0.07 mg/L		1,000.7 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:04 AM	03:00	7.81 pH	8.42 °C	581.04 µS/cm	0.05 mg/L		994.7 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:05 AM	03:30	7.79 pH	8.45 °C	587.07 µS/cm	0.04 mg/L		984.6 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:05 AM	04:00	7.79 pH	8.48 °C	591.63 µS/cm	0.05 mg/L		973.8 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:06 AM	04:30	7.78 pH	8.50 °C	594.76 µS/cm	0.04 mg/L		963.8 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:06 AM	05:00	7.78 pH	8.55 °C	597.44 µS/cm	0.04 mg/L		948.8 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:07 AM	05:30	7.78 pH	8.57 °C	598.91 µS/cm	0.04 mg/L		933.9 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:07 AM	06:00	7.77 pH	8.57 °C	599.64 µS/cm	0.04 mg/L		923.6 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:08 AM	06:30	7.77 pH	8.57 °C	601.30 µS/cm	0.03 mg/L		912.2 mV	67.00 cm	2,000.0 ml/min

2/13/2023 11:08 AM	07:00	7.77 pH	8.57 °C	590.32 µS/cm	0.28 mg/L		916.1 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:09 AM	07:30	7.77 pH	8.57 °C	587.82 µS/cm	0.99 mg/L		921.4 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:09 AM	08:00	7.77 pH	8.57 °C	605.72 µS/cm	0.79 mg/L		925.1 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:10 AM	08:30	7.77 pH	8.55 °C	603.02 µS/cm	1.02 mg/L		923.4 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:10 AM	09:00	7.77 pH	8.55 °C	605.89 µS/cm	0.55 mg/L		921.8 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:11 AM	09:30	7.78 pH	8.53 °C	604.33 µS/cm	0.56 mg/L		918.7 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:11 AM	10:00	7.78 pH	8.52 °C	606.57 µS/cm	0.38 mg/L		916.5 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:12 AM	10:30	7.78 pH	8.55 °C	606.04 µS/cm	0.09 mg/L		904.6 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:12 AM	11:00	7.78 pH	8.54 °C	606.12 µS/cm	0.03 mg/L		899.1 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:13 AM	11:30	7.78 pH	8.52 °C	606.56 µS/cm	0.02 mg/L		891.7 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:13 AM	12:00	7.78 pH	8.52 °C	606.61 µS/cm	0.01 mg/L		886.6 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:14 AM	12:30	7.78 pH	8.52 °C	606.70 µS/cm	0.01 mg/L		885.4 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:14 AM	13:00	7.78 pH	8.49 °C	605.74 µS/cm	0.01 mg/L		883.7 mV	67.00 cm	2,000.0 ml/min
2/13/2023 11:15 AM	13:30	7.78 pH	8.49 °C	607.00 µS/cm	0.01 mg/L		884.0 mV	67.00 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW21	

INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited

Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time
SOP003.16	1	50	13.00	14/02/2023 12:26
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather
Box Cover	Pipe Plug	10.00	13.00	Sunny

Installation Inspection

Surface Conditions	Wet	Damage to Headworks?	No
Check Dip of Base (m bgl)	13.66	Pipe Cover/Bung Present?	Yes

Remedial actions undertaken to well:

N/A

Purging and Sampling

Guidance Notes

Well development undertaken in accordance with BS10175:2011+A2:2017.

Purge volumes to include the annulus of the filter pack.

Purging must continue until insitu parameters have stabilised unless agreed with clients representative.

Approx. Guidance Volumes for Field Calculation of Wet Well Volume

Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre

Groundwater Prior to Purging and Sampling

Groundwater Level (m bgl)	11.38	LNAPL/ DNAPL (m bgl)	N/A

Purging Details

Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0
Time to Purge (mins)	11.00	Number of Well Volumes Purged	2.9
Total Volume Purged (litres)	22	Operative	JP

Observations During Puring (see Vu-situ output for insitu parameter readings)

In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No
In-situ Parameter Device SN	877732	Visual Turbidity	Yes
Confirm Field Calibration Completed	Yes	Groundwater Colour	Light grey running clear

Well Volume Calculation

Volume of the Filter Pack

Saturated length of Filter Pack (L) (m)	1.62
Porosity of Filter Pack (ø)	0.33
Diameter of Filter Pack (mm) (df)	115
Volume of Filter Pack (litres) (Lø)((πdf2/4)-((πdp2/4))	4.5

Volume of the Standpipe

Diameter of Standpipe (mm) (dp)	50
Saturated depth (m) (sd) (installation base - groundwater level)	1.62
Volume of the Standpipe (litres) (πdp2/4)*10-3	3.2

Total Well Volume

Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	**7.7**

Sampling Information

Sample Depth (m bgl)	11.66
Sample Type	EW
Sample Reference Number	4
Date and Time Obtained	14/02/2023 12:43

Additional Notes and Observations

N/A

Low-Flow Test Report:

Test Date / Time: 2/14/2023 12:29:45 PM
Project: GCRE
Operator Name: JP

Location Name: SOP003.16 **Well Diameter: 5 cm** **Casing Type: Plastic** **Screen Length: 3.5 m** **Top of Screen: 10 m** **Total Depth: 13.66 m** **Initial Depth to Water: 11.38 m**	**Pump Type: Wasp Pump** **Estimated Total Volume Pumped: 22000 ml** **Flow Cell Volume: 90 ml** **Final Flow Rate: 2000 ml/min** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 400** **Serial Number: 877732**

Test Notes:

Weather Conditions:
Sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/14/2023 12:29 PM	00:00	8.05 pH	13.83 °C	645.72 µS/cm	3.36 mg/L		401.8 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:30 PM	00:30	7.83 pH	13.01 °C	633.05 µS/cm	0.79 mg/L		746.4 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:30 PM	01:00	7.68 pH	12.40 °C	637.44 µS/cm	0.28 mg/L		967.9 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:31 PM	01:30	7.59 pH	12.02 °C	643.80 µS/cm	0.18 mg/L		1,017.3 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:31 PM	02:00	7.53 pH	11.78 °C	648.53 µS/cm	0.16 mg/L		1,025.1 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:32 PM	02:30	7.49 pH	11.66 °C	652.20 µS/cm	0.14 mg/L		1,024.3 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:32 PM	03:00	7.47 pH	11.57 °C	655.79 µS/cm	0.13 mg/L		1,016.3 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:33 PM	03:30	7.46 pH	11.52 °C	658.51 µS/cm	0.12 mg/L		995.8 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:33 PM	04:00	7.45 pH	11.48 °C	660.71 µS/cm	0.11 mg/L		977.8 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:34 PM	04:30	7.45 pH	11.48 °C	661.81 µS/cm	0.10 mg/L		955.3 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:34 PM	05:00	7.45 pH	11.46 °C	662.59 µS/cm	0.09 mg/L		940.5 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:35 PM	05:30	7.44 pH	11.46 °C	663.01 µS/cm	0.08 mg/L		925.2 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:35 PM	06:00	7.44 pH	11.46 °C	663.16 µS/cm	0.07 mg/L		918.2 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:36 PM	06:30	7.44 pH	11.46 °C	663.43 µS/cm	0.06 mg/L		905.3 mV	1,138.0 cm	2,000.0 ml/min

2/14/2023 12:36 PM	07:00	7.43 pH	11.46 °C	663.74 µS/cm	0.06 mg/L		895.0 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:37 PM	07:30	7.43 pH	11.47 °C	663.65 µS/cm	0.05 mg/L		892.4 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:37 PM	08:00	7.43 pH	11.47 °C	663.86 µS/cm	0.05 mg/L		903.8 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:38 PM	08:30	7.43 pH	11.48 °C	664.03 µS/cm	0.04 mg/L		896.5 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:38 PM	09:00	7.43 pH	11.48 °C	664.13 µS/cm	0.04 mg/L		883.8 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:39 PM	09:30	7.43 pH	11.48 °C	664.16 µS/cm	0.04 mg/L		881.9 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:39 PM	10:00	7.43 pH	11.48 °C	664.39 µS/cm	0.03 mg/L		877.7 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:40 PM	10:30	7.43 pH	11.48 °C	664.81 µS/cm	0.03 mg/L		877.9 mV	1,138.0 cm	2,000.0 ml/min
2/14/2023 12:40 PM	11:00	7.42 pH	11.48 °C	664.93 µS/cm	0.02 mg/L		874.5 mV	1,138.0 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW4	

Appendix IV

Geotechnical Testing

GSTL Lab Report	63106, 63478, 63627, 63638, 64570
Eurofins Chemtest Lab Report	22-46523, 22-49093, 23-00130 and 23-04918

JACKSON GEO SERVICES

Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

Contract Number: 63106

Client Ref: **G22069**
Client PO:

Date Received: **08-12-2022**
Date Completed: **20-01-2023**
Report Date: **20-01-2023**

Client: **Jackson Drilling Holdings Ltd**
Northwood Farm
Coxbridge Road
Baltonsborough
Somerset
BA6 8RA

This report has been checked and approved by:

B. Evans

Brendan Evans
Office Administrator

Contract Title: **Global Centre Of Rail Excellence**
For the attention of: **Adam Putt**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	24
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	11
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	25
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) BS 1377:1990 - Part 2 : 9.4 - * UKAS	5
Organic Matter Content Sub-contracted Test	6
Dry Den/MC (4.5kg Rammer Method 1 litre mould/CBR Mould) BS 1377:1990 - Part 4 : 3.6 - * UKAS	1
One-dimensional Consolidation 75mm or 50mm diameter specimens (up to 5 stages/days) BS 1377:1990 - Part 5 : 3 - * UKAS	3
As 5.01, 5.03 & 5.04 each extra additional stage/day BS 1377:1990 - Part 5 : 3	53

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
- denotes test carried out by approved contractor
@ - denotes non accredited tests

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 test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (Human Resources/ Health and Safety Manager)

GEO Site & Testing Services Ltd
Units 3-4, Heol Aur, Dafen, Llanelli, Carmarthenshire, Wales SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

Contract Number: 63106

Test Description	Qty
Determination of Point Load Value Axial or Diametrical including WC ***Please note GSTL is not accredited for the water content of rock*** ISRM Suggested Method for Point Load Strength - * UKAS	3
Disposal of samples for job	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
- denotes test carried out by approved contractor
@ - denotes non accredited tests

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 test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

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GEO Site & Testing Services Ltd
Units 3-4, Heol Aur, Dafen, Llanelli, Carmarthenshire, Wales SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

Natural Moisture Content
(BS 1377:1990 - Part 2 : 3.2)
DESCRIPTIONS

Contract Number	63106	
Site Name	Global Centre Of Rail Excellence	
Date Tested	19/12/2022	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
S1-TP115	4	B	0.50	-	0.70	Black fine to coarse sandy silty/clayey fine to coarse GRAVEL
S1-BH121	103	B	1.20	-	1.80	Black silty/clayey fine to coarse sandy fine to coarse GRAVEL
S1-TP113	2	D	0.50	-	0.60	Brown fine to medium gravelly silty CLAY
S1-TP113	12	D	3.50	-	3.50	Brown fine to medium gravelly silty CLAY
S1-BH122	3	D	1.70	-	1.90	Black silty/clayey fine to coarse sandy fine to coarse GRAVEL
S1-BH122	12	D	6.00	-	6.45	Brown grey fine to medium gravelly fine to coarse sandy SILT/CLAY
S1-TP111	3	B	0.10	-	0.30	Black brown silty/clayey fine to coarse sandy fine to coarse GRAVEL
S1-TP111	4	D	0.30	-	0.35	Black brown silty/clayey fine to coarse sandy fine to coarse GRAVEL
S1-TP112	5	D	0.30	-	0.40	Brown fine to medium gravelly silty CLAY
S1-TP114	5	B	0.30	-	0.40	Grey brown silty/clayey fine to coarse sandy fine to coarse GRAVEL(with cobbles)
S1-TP114	8	D	0.90	-	1.00	Brown fine to medium gravelly silty CLAY
S1-BH102	3	B	0.00	-	0.60	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL
S1-BH110	105	B	1.00	-	1.30	Grey silty/clayey fine to coarse sandy fine to coarse GRAVEL
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Operators			
Clayton Jenkins			

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES

Natural Moisture Content
(BS 1377:1990 - Part 2 : 3.2)

Contract Number	63106
Project Name	Global Centre Of Rail Excellence
Date Tested	19/12/2022

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Remarks
S1-TP115	4	B	0.50	-	0.70	5.8	
S1-BH121	103	B	1.20	-	1.80	17	
S1-TP113	2	D	0.50	-	0.60	11	
S1-TP113	12	D	3.50	-	3.50	10	
S1-BH122	3	D	1.70	-	1.90	31	
S1-BH122	12	D	6.00	-	6.45	16	
S1-TP111	3	B	0.10	-	0.30	13	
S1-TP111	4	D	0.30	-	0.35	13	
S1-TP112	5	D	0.30	-	0.40	12	
S1-TP114	5	B	0.30	-	0.40	11	
S1-TP114	8	D	0.90	-	1.00	9.4	
S1-BH102	3	B	0.00	-	0.60	14	
S1-BH110	105	B	1.00	-	1.30	6.2	
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Operator
Clayton Jenkins

UKAS TESTING 2788

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)

Contract Number	63106
Project Name	Global Centre Of Rail Excellence
Date Tested	19/12/2022

DESCRIPTIONS

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
S1-BH121	104	D	2.70	-	2.80	Black fine to medium gravelly PEAT
S1-BH121	107	D	3.60	-	3.70	Brown fine to medium gravelly silty CLAY
S1-TP113	5	D	0.90	-	1.00	Brown fine to medium gravelly silty CLAY
S1-BH122	7	D	3.50	-	3.70	Black PEAT
S1-BH122	8	D	4.00	-	4.45	Brown fine to medium gravelly silty CLAY
S1-BH122	10	D	5.00	-	5.45	Brown silty CLAY
S1-TP111	8	D	1.00	-	1.05	Brown fine to medium gravelly silty CLAY
S1-BH102	8	D	3.00	-	3.45	Black PEAT
S1-BH102	9	D	4.00	-	4.45	Brown fine to medium gravelly silty CLAY
S1-BH110	109	D	4.75	-	4.80	Black PEAT
S1-BH110	111	D	6.10	-	6.15	Black PEAT
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Operator
Ethan Harper

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

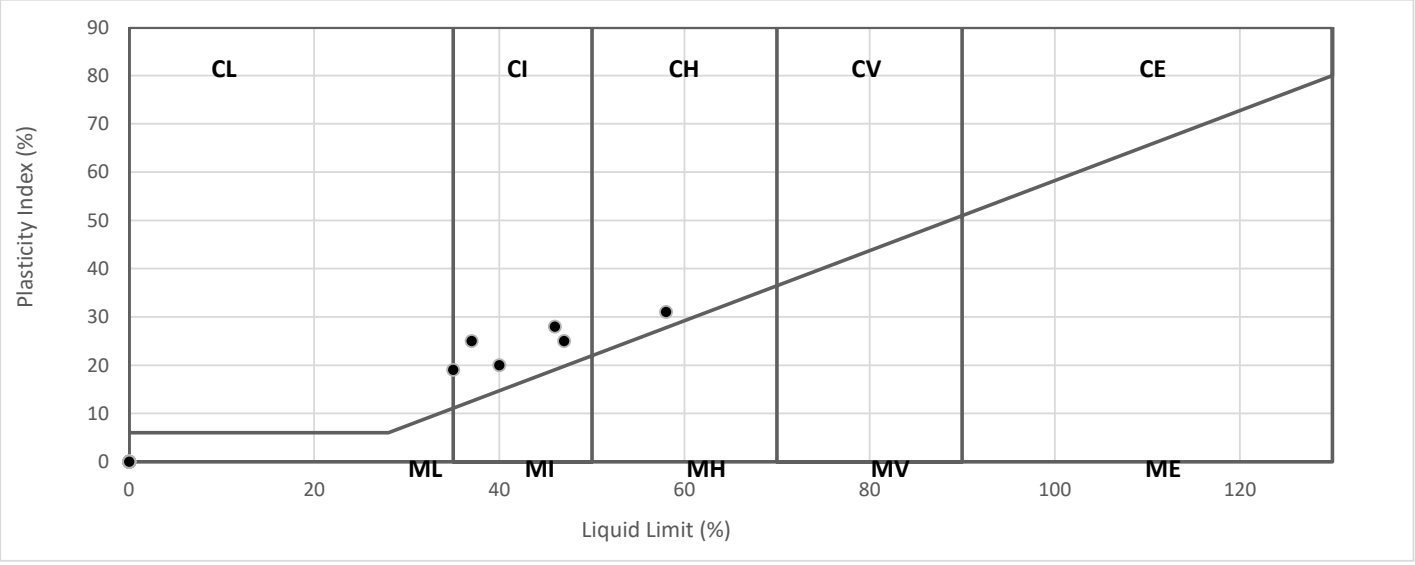
NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)

Contract Number	63106
Project Name	Global Centre Of Rail Excellence
Date Tested	19/12/2022

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
S1-BH121	104	D	2.70	-	2.80	504		NP		95	
S1-BH121	107	D	3.60	-	3.70	27	47	22	25	97	CI Intermediate Plasticity
S1-TP113	5	D	0.90	-	1.00	26	58	27	31	92	CH High Plasticity
S1-BH122	7	D	3.50	-	3.70	497		NP		100	
S1-BH122	8	D	4.00	-	4.45	18	35	16	19	97	CL/I Low/Inter. Plasticity
S1-BH122	10	D	5.00	-	5.45	21	46	18	28	100	CI Intermediate Plasticity
S1-TP111	8	D	1.00	-	1.05	13	37	12	25	90	CI Intermediate Plasticity
S1-BH102	8	D	3.00	-	3.45	504		NP		100	
S1-BH102	9	D	4.00	-	4.45	25	40	20	20	95	CI Intermediate Plasticity
S1-BH110	109	D	4.75	-	4.80	376		NP		100	
S1-BH110	111	D	6.10	-	6.15	399		NP		100	
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Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

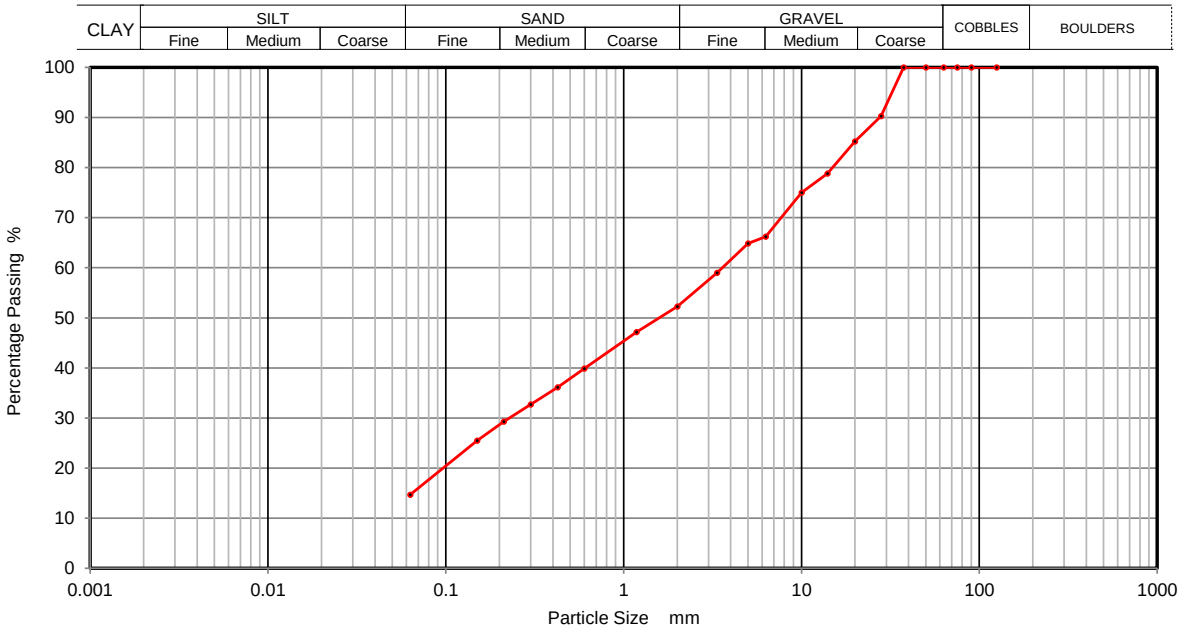
PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:2015+A1:2020



Operator
Ethan Harper

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-BH102
Project Name	Global Centre Of Rail Excellence	Sample No.	3
Soil Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.00
		Depth Base	0.60
Date Tested	03/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	90		
20	85		
14	79		
10	75		
6.3	66		
5	65		
3.35	59		
2	52		
1.18	47		
0.6	40		
0.425	36		
0.3	33		
0.212	29		
0.15	26		
0.063	15		

Sample Proportions	% dry mass
Cobbles	0
Gravel	48
Sand	37
Silt and Clay	15

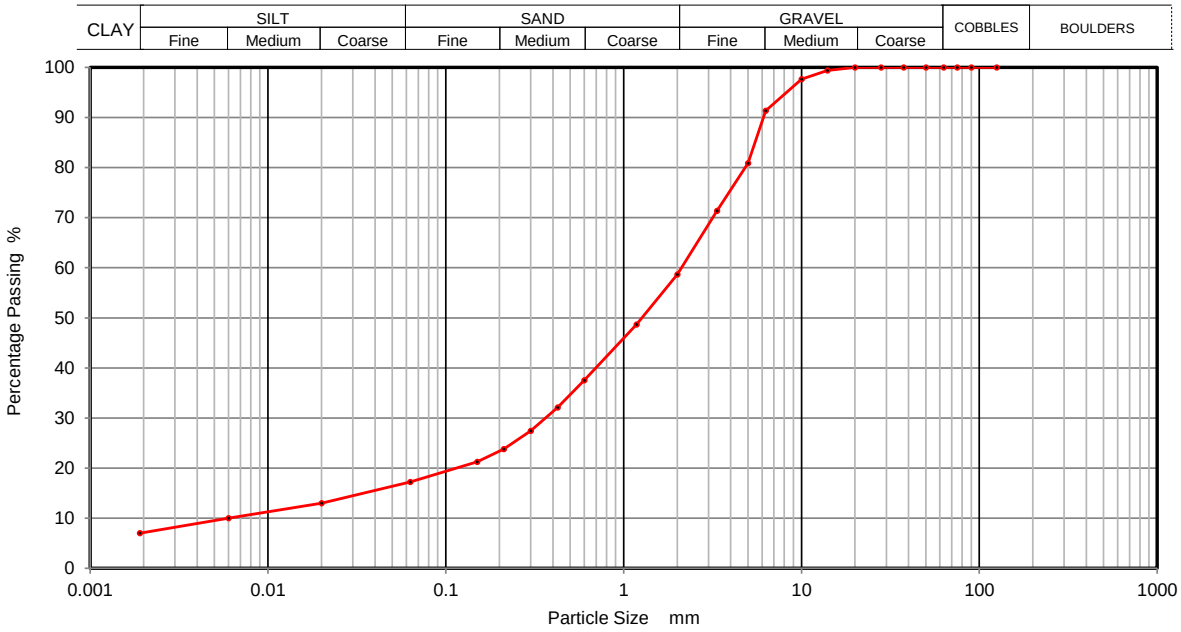
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	63106
		Borehole/Pit No.	S1-BH102
Project Name	Global Centre Of Rail Excellence	Sample No.	102
Soil Description	Black fine to medium gravelly PEAT	Depth Top	3.50
		Depth Base	3.60
Date Tested	03/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	13
90	100	0.0060	10
75	100	0.0020	7
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	91		
5	81		
3.35	71		
2	59		
1.18	49		
0.6	38		
0.425	32		
0.3	27		
0.212	24		
0.15	21		
0.063	17		

Sample Proportions	% dry mass
Cobbles	0
Gravel	41
Sand	42
Silt	10
Clay	7

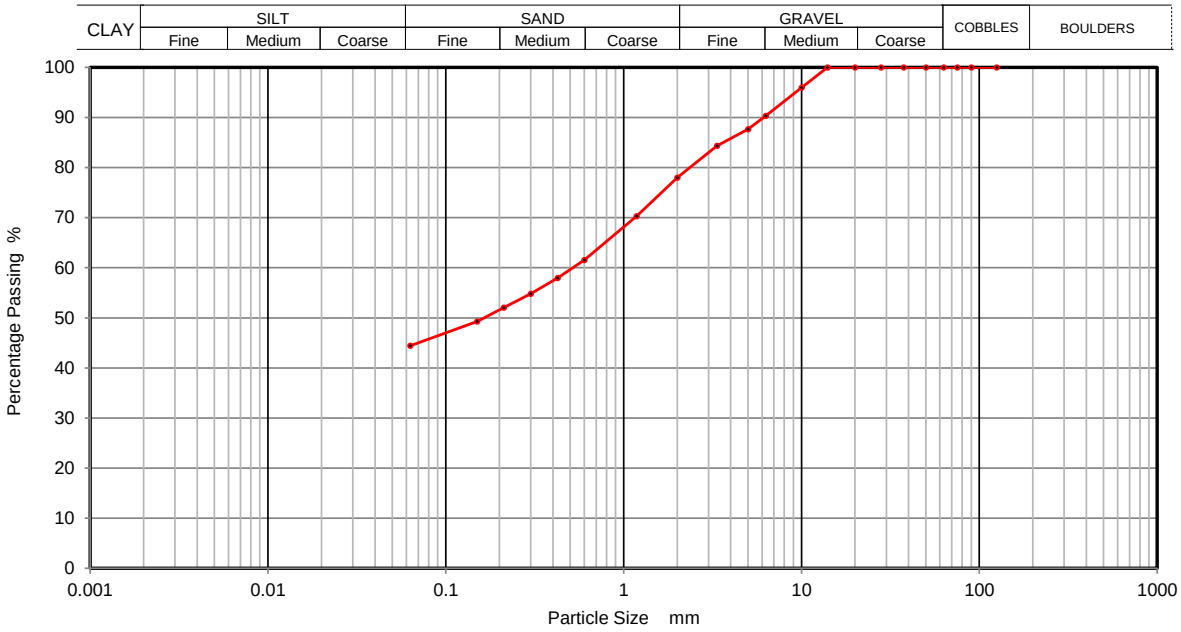
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-BH102
Project Name	Global Centre Of Rail Excellence	Sample No.	105
Soil Description	Grey fine to medium gravelly fine to coarse sandy SILT/CLAY	Depth Top	4.60
		Depth Base	4.70
Date Tested	03/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	96		
6.3	90		
5	88		
3.35	84		
2	78		
1.18	70		
0.6	62		
0.425	58		
0.3	55		
0.212	52		
0.15	49		
0.063	44		

Sample Proportions	% dry mass
Cobbles	0
Gravel	22
Sand	34
Silt and Clay	44

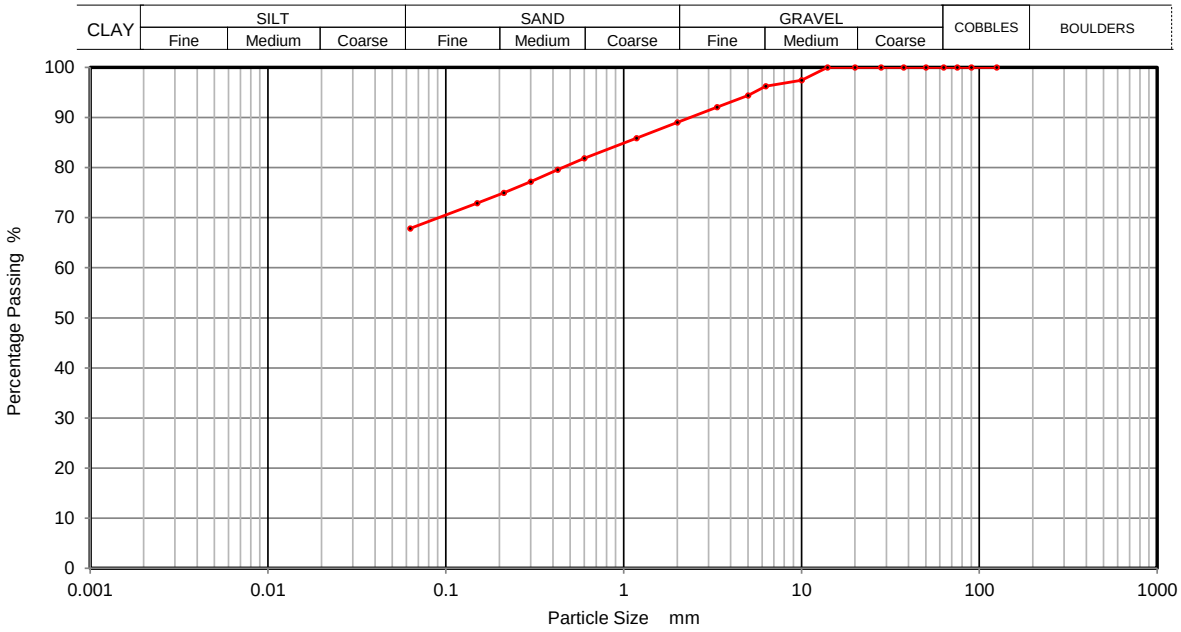
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-BH102
Project Name	Global Centre Of Rail Excellence	Sample No.	104
Soil Description	Grey fine to medium gravelly fine to coarse sandy SILT/CLAY	Depth Top	4.20
		Depth Base	4.30
Date Tested	03/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	97		
6.3	96		
5	94		
3.35	92		
2	89		
1.18	86		
0.6	82		
0.425	80		
0.3	77		
0.212	75		
0.15	73		
0.063	68		

Sample Proportions	% dry mass
Cobbles	0
Gravel	11
Sand	21
Silt and Clay	68

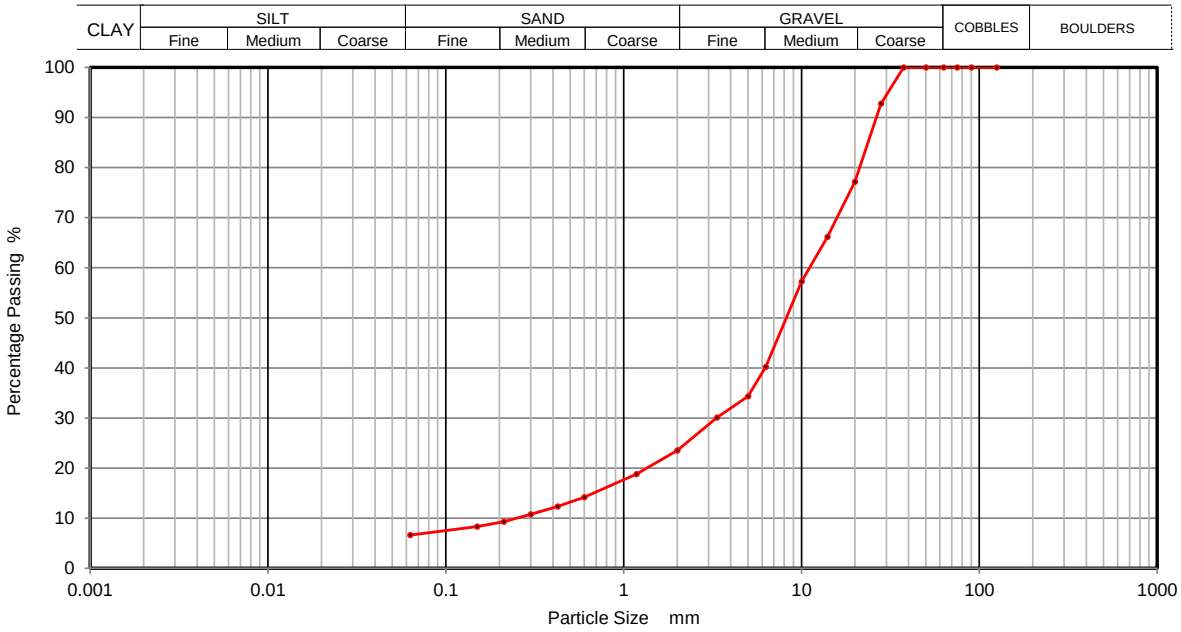
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-BH110
Project Name	Global Centre Of Rail Excellence	Sample No.	105
Soil Description	Grey silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.00
		Depth Base	1.30
Date Tested	03/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	93		
20	77		
14	66		
10	57		
6.3	40		
5	34		
3.35	30		
2	24		
1.18	19		
0.6	14		
0.425	12		
0.3	11		
0.212	9		
0.15	8		
0.063	7		

Sample Proportions	% dry mass
Cobbles	0
Gravel	76
Sand	17
Silt and Clay	7

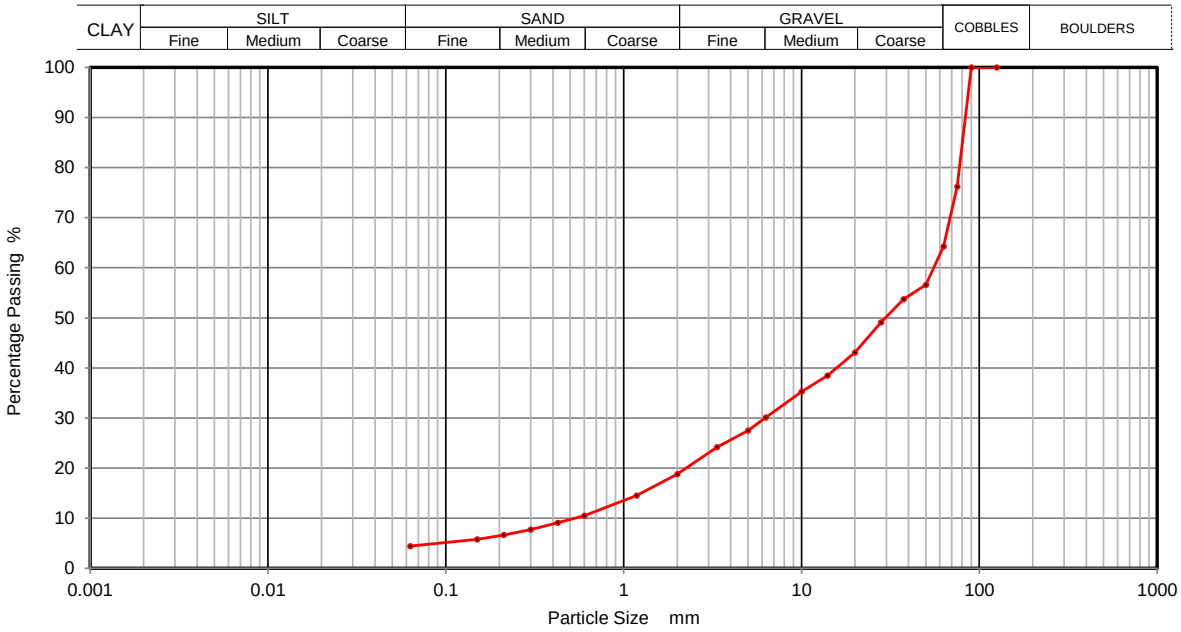
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-BH110
Project Name	Global Centre Of Rail Excellence	Sample No.	108
Soil Description	Black slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	4.00
		Depth Base	4.30
Date Tested	03/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	76		
63	64		
50	57		
37.5	54		
28	49		
20	43		
14	38		
10	35		
6.3	30		
5	27		
3.35	24		
2	19		
1.18	15		
0.6	10		
0.425	9		
0.3	8		
0.212	7		
0.15	6		
0.063	4		

Sample Proportions	% dry mass
Cobbles	36
Gravel	45
Sand	15
Silt and Clay	4

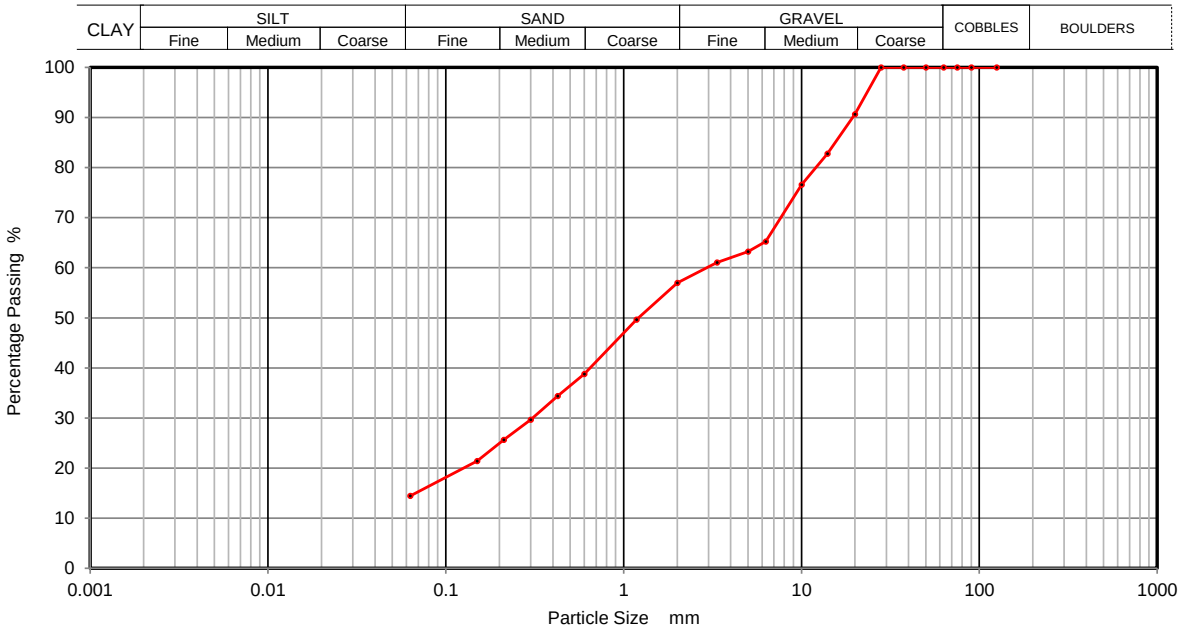
Remarks

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David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-BH121
Project Name	Global Centre Of Rail Excellence	Sample No.	103
Soil Description	Black silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.20
		Depth Base	1.80
Date Tested	03/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	91		
14	83		
10	77		
6.3	65		
5	63		
3.35	61		
2	57		
1.18	50		
0.6	39		
0.425	34		
0.3	30		
0.212	26		
0.15	21		
0.063	14		

Sample Proportions	% dry mass
Cobbles	0
Gravel	43
Sand	43
Silt and Clay	14

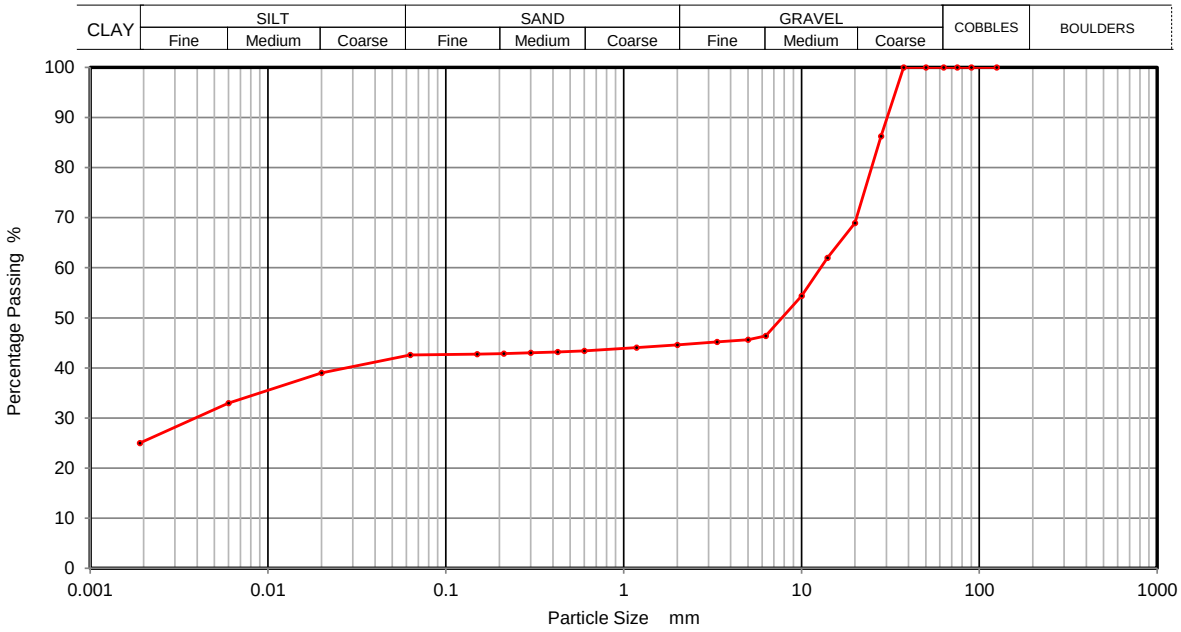
Remarks

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David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	63106
		Borehole/Pit No.	S1-BH121
Project Name	Global Centre Of Rail Excellence	Sample No.	106
Soil Description	Black slightly fine to coarse sandy organic silty clayey fine to coarse GRAVEL	Depth Top	3.50
		Depth Base	3.60
Date Tested	03/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	39
90	100	0.0060	33
75	100	0.0020	25
63	100		
50	100		
37.5	100		
28	86		
20	69		
14	62		
10	54		
6.3	46		
5	46		
3.35	45		
2	45		
1.18	44		
0.6	43		
0.425	43		
0.3	43		
0.212	43		
0.15	43		
0.063	43		

Sample Proportions	% dry mass
Cobbles	0
Gravel	55
Sand	2
Silt	18
Clay	25

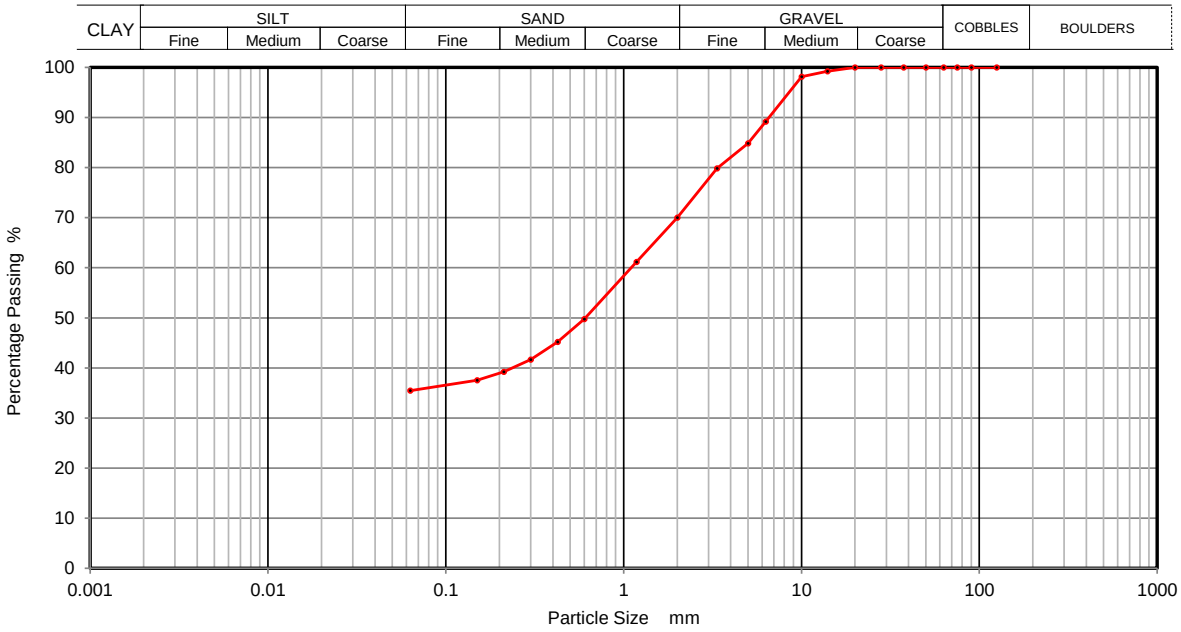
Remarks

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David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-BH121
Project Name	Global Centre Of Rail Excellence	Sample No.	108
Soil Description	Grey fine to medium gravelly fine to coarse sandy SILT/CLAY	Depth Top	3.90
		Depth Base	4.00
Date Tested	03/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	89		
5	85		
3.35	80		
2	70		
1.18	61		
0.6	50		
0.425	45		
0.3	42		
0.212	39		
0.15	38		
0.063	35		

Sample Proportions	% dry mass
Cobbles	0
Gravel	30
Sand	35
Silt and Clay	35

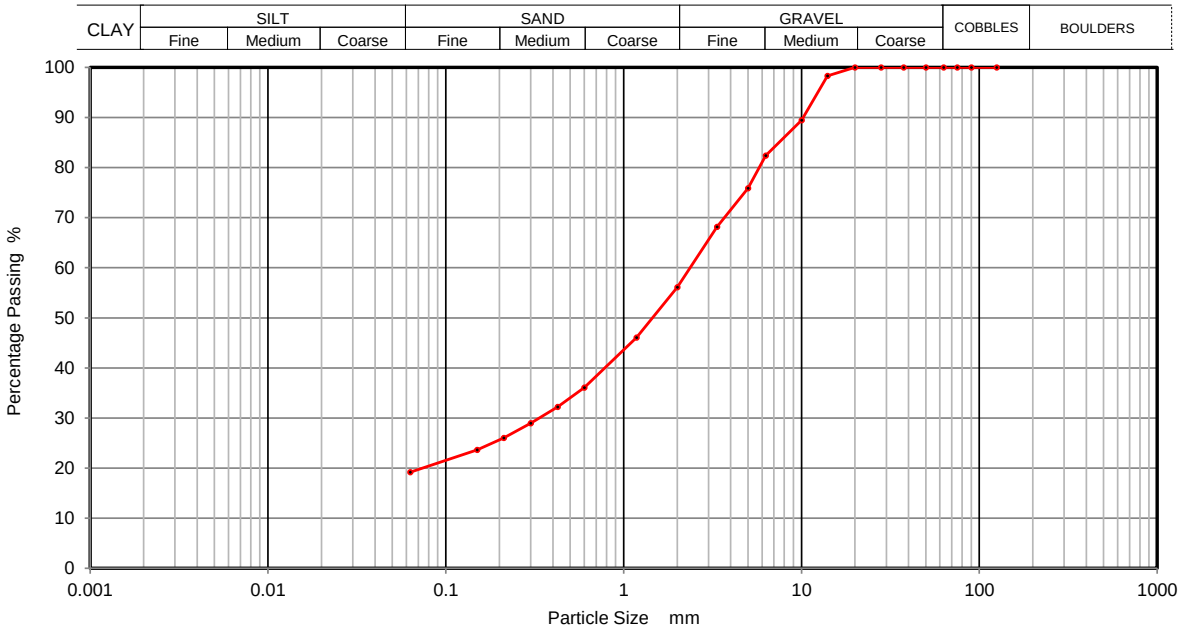
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-BH122
Project Name	Global Centre Of Rail Excellence	Sample No.	3
Soil Description	Black silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.70
		Depth Base	1.90
Date Tested	03/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	89		
6.3	82		
5	76		
3.35	68		
2	56		
1.18	46		
0.6	36		
0.425	32		
0.3	29		
0.212	26		
0.15	24		
0.063	19		

Sample Proportions	% dry mass
Cobbles	0
Gravel	44
Sand	37
Silt and Clay	19

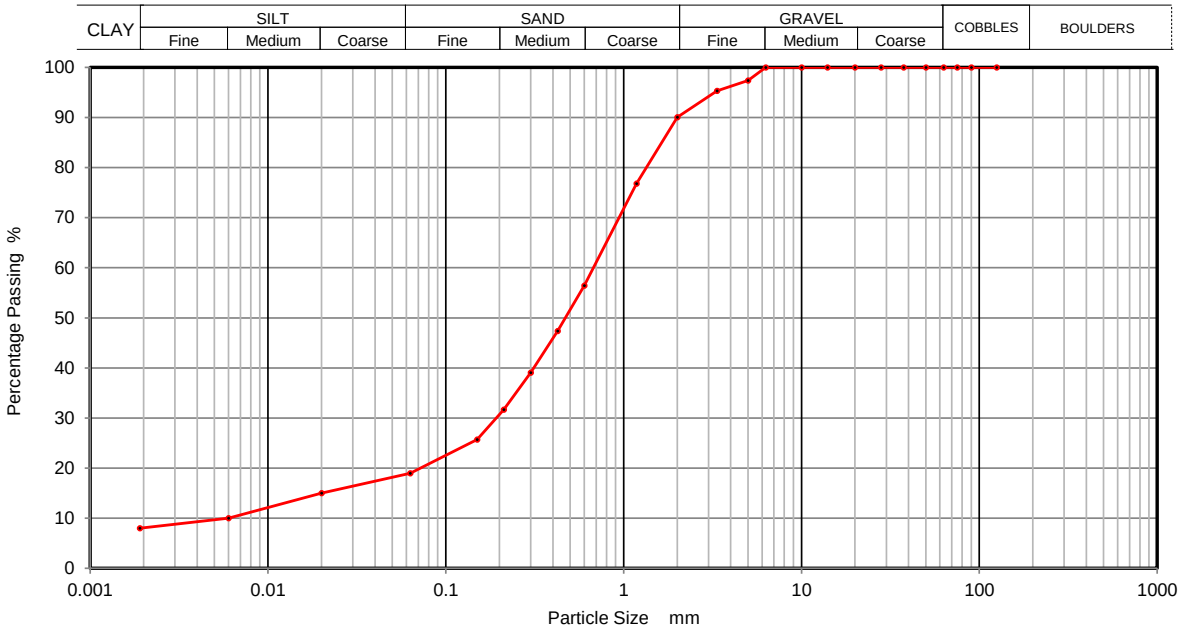
Remarks

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Operator
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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	63106
		Borehole/Pit No.	S1-BH122
Project Name	Global Centre Of Rail Excellence	Sample No.	4
Soil Description	BLACK PEAT	Depth Top	2.00
		Depth Base	2.45
Date Tested	03/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	15
90	100	0.0060	10
75	100	0.0020	8
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	97		
3.35	95		
2	90		
1.18	77		
0.6	56		
0.425	47		
0.3	39		
0.212	32		
0.15	26		
0.063	19		

Sample Proportions	% dry mass
Cobbles	0
Gravel	10
Sand	71
Silt	11
Clay	8

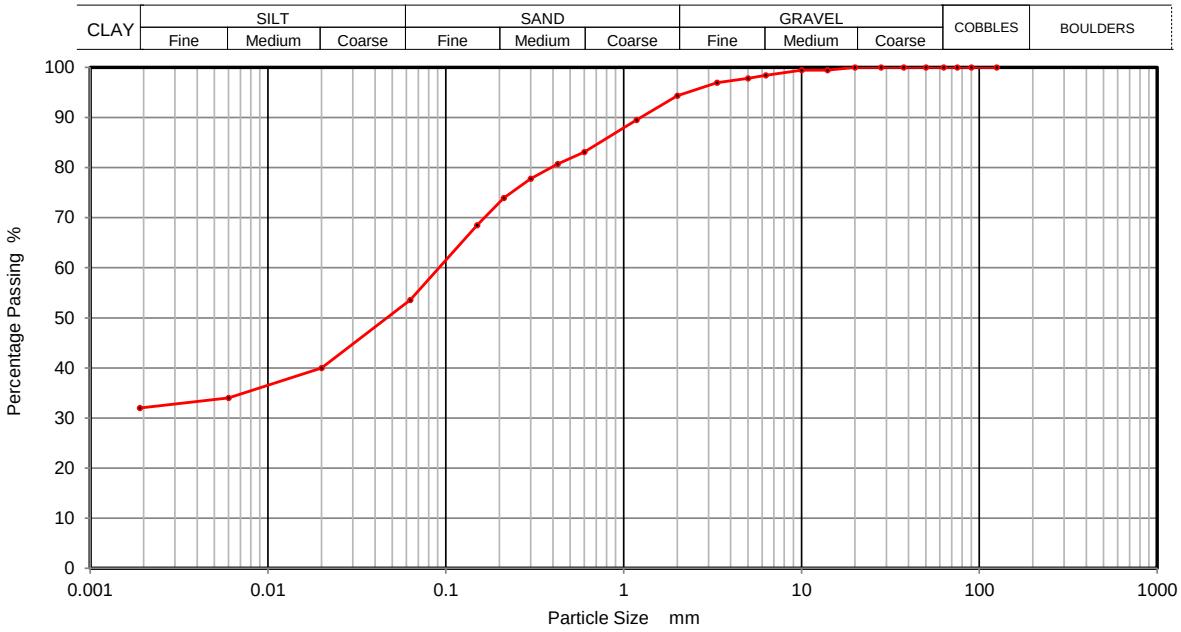
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	63106
		Borehole/Pit No.	S1-BH122
Project Name	Global Centre Of Rail Excellence	Sample No.	104
Soil Description	Brown fine to medium gravelly fine to coarse sandy silty CLAY	Depth Top	4.70
		Depth Base	4.80
Date Tested	03/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	40
90	100	0.0060	34
75	100	0.0020	32
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	99		
6.3	98		
5	98		
3.35	97		
2	94		
1.18	89		
0.6	83		
0.425	81		
0.3	78		
0.212	74		
0.15	68		
0.063	54		

Sample Proportions	% dry mass
Cobbles	0
Gravel	6
Sand	40
Silt	22
Clay	32

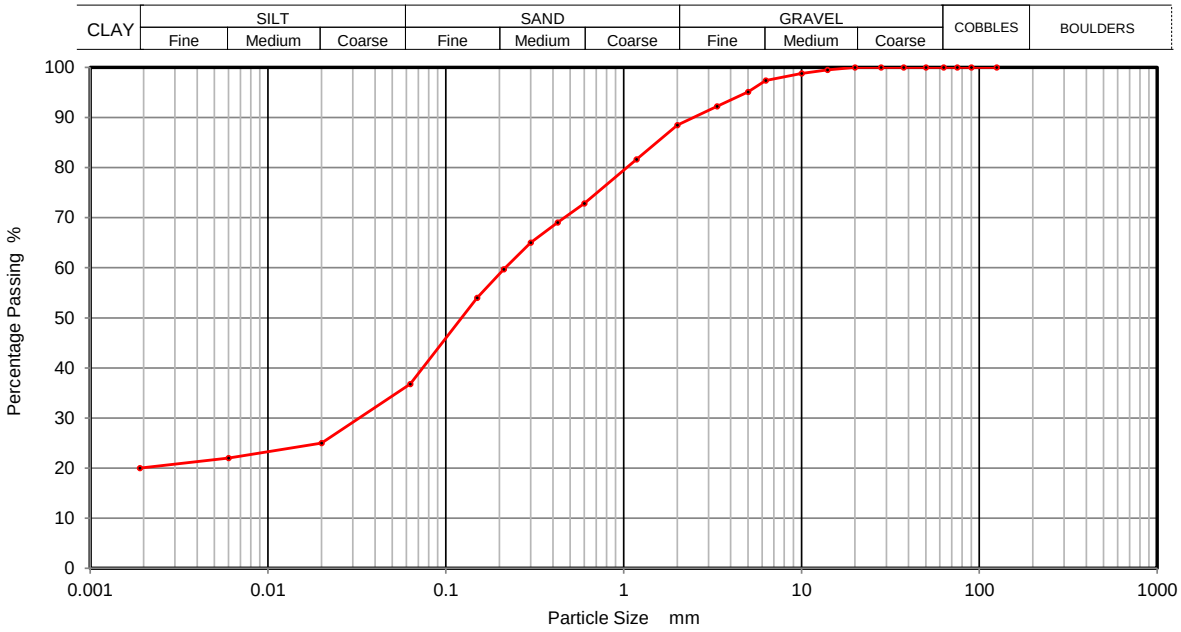
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	63106
		Borehole/Pit No.	S1-BH122
Project Name	Global Centre Of Rail Excellence	Sample No.	17
Soil Description	Brown fine to medium gravelly fine to coarse sandy silty CLAY	Depth Top	5.00
		Depth Base	5.45
Date Tested	03/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	25
90	100	0.0060	22
75	100	0.0020	20
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	99		
6.3	97		
5	95		
3.35	92		
2	88		
1.18	82		
0.6	73		
0.425	69		
0.3	65		
0.212	60		
0.15	54		
0.063	37		

Sample Proportions	% dry mass
Cobbles	0
Gravel	12
Sand	51
Silt	17
Clay	20

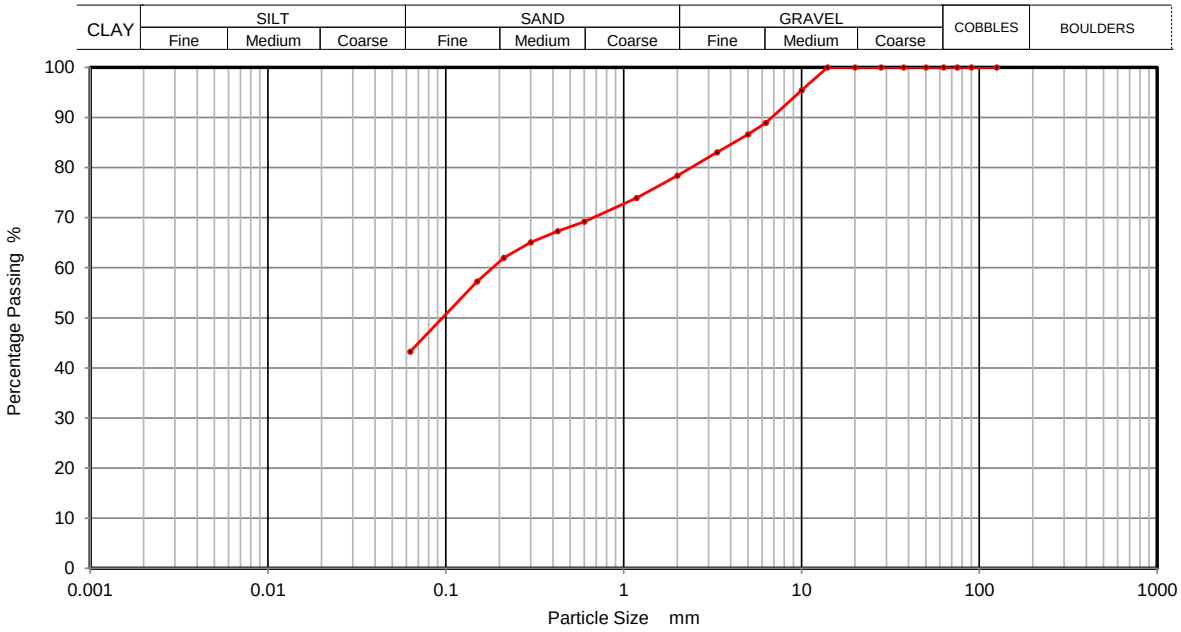
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-BH122
Project Name	Global Centre Of Rail Excellence	Sample No.	12
Soil Description	Brown grey fine to medium gravelly fine to coarse sandy SILT/CLAY	Depth Top	6.00
		Depth Base	6.45
Date Tested	03/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	95		
6.3	89		
5	87		
3.35	83		
2	78		
1.18	74		
0.6	69		
0.425	67		
0.3	65		
0.212	62		
0.15	57		
0.063	43		

Sample Proportions	% dry mass
Cobbles	0
Gravel	22
Sand	35
Silt and Clay	43

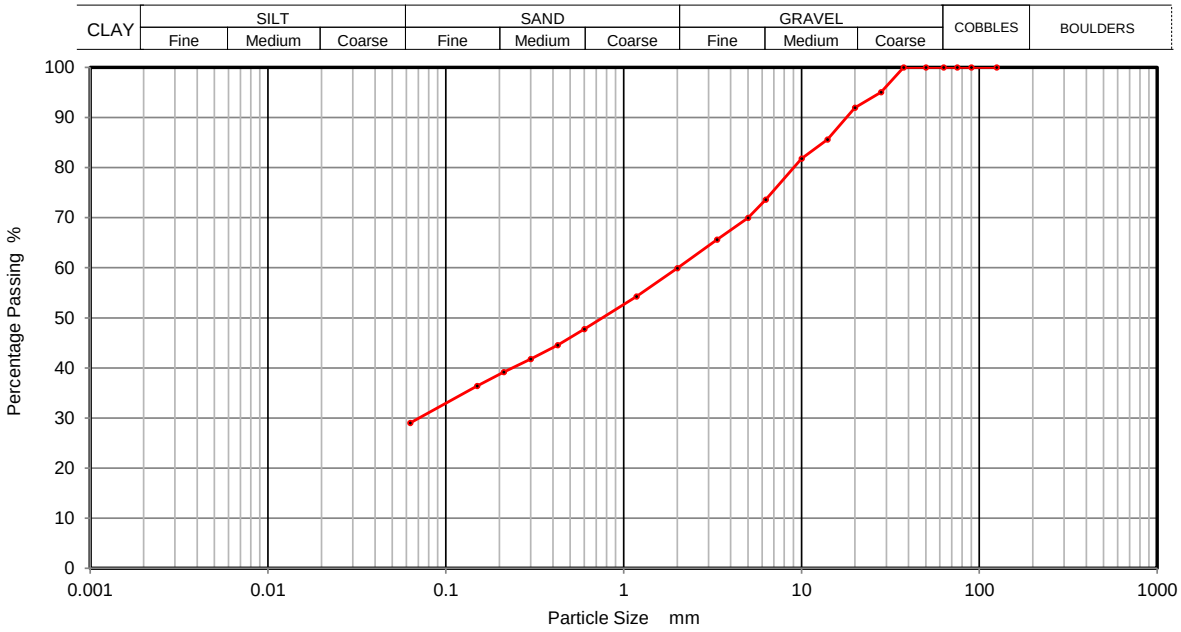
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-TP111
Project Name	Global Centre Of Rail Excellence	Sample No.	3
Soil Description	Black brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.10
		Depth Base	0.30
Date Tested	03/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	95		
20	92		
14	86		
10	82		
6.3	74		
5	70		
3.35	66		
2	60		
1.18	54		
0.6	48		
0.425	45		
0.3	42		
0.212	39		
0.15	36		
0.063	29		

Sample Proportions	% dry mass
Cobbles	0
Gravel	40
Sand	31
Silt and Clay	29

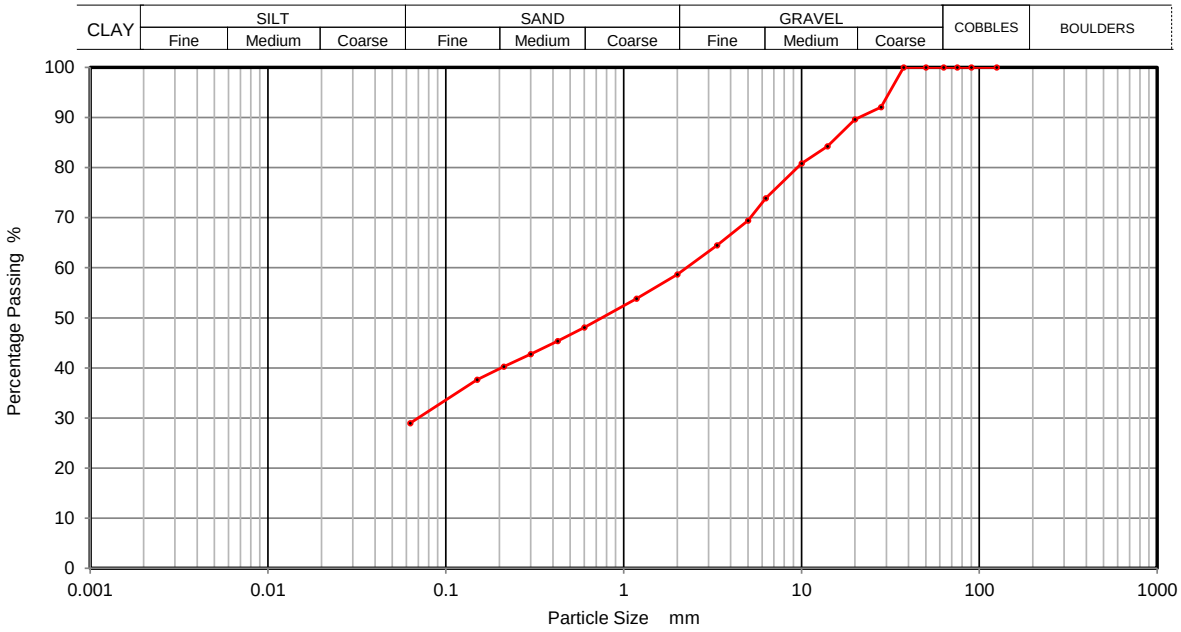
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-TP111
Project Name	Global Centre Of Rail Excellence	Sample No.	4
Soil Description	Black brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.30
		Depth Base	0.35
Date Tested	03/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	92		
20	90		
14	84		
10	81		
6.3	74		
5	69		
3.35	64		
2	59		
1.18	54		
0.6	48		
0.425	45		
0.3	43		
0.212	40		
0.15	38		
0.063	29		

Sample Proportions	% dry mass
Cobbles	0
Gravel	41
Sand	30
Silt and Clay	29

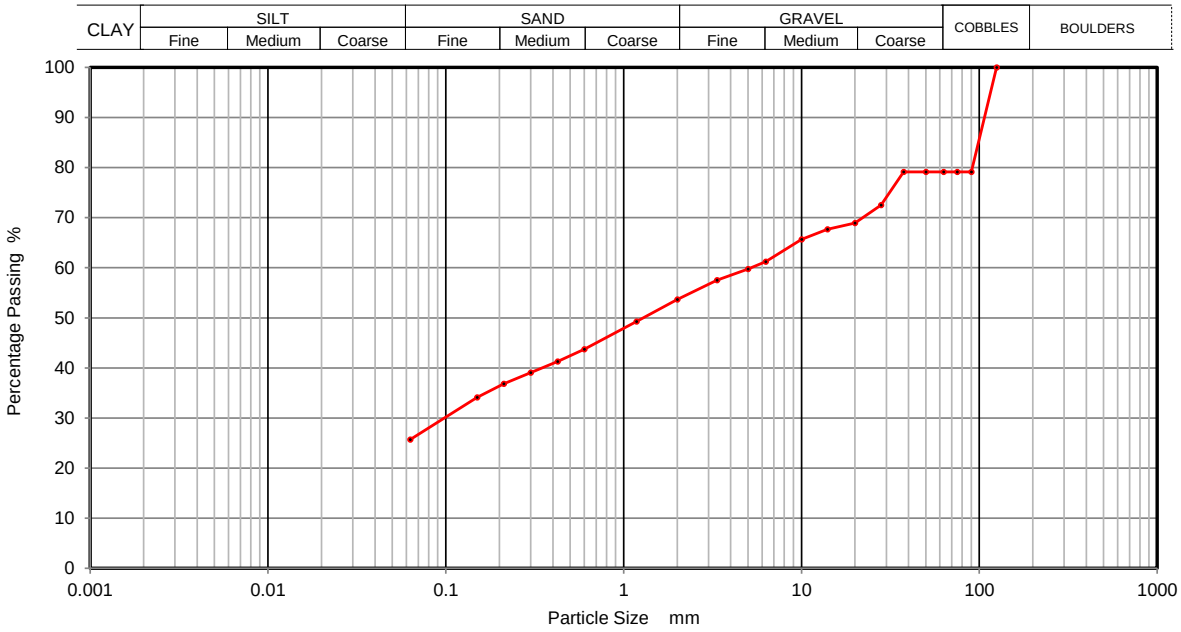
Remarks

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Operator
David Edwards

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2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-TP111
Project Name	Global Centre Of Rail Excellence	Sample No.	7
Soil Description	Grey brown silty/clayey fine to coarse gravelly fine to coarse SAND (with cobbles)	Depth Top	0.70
		Depth Base	1.00
Date Tested	03/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	79		
75	79		
63	79		
50	79		
37.5	79		
28	72		
20	69		
14	68		
10	66		
6.3	61		
5	60		
3.35	58		
2	54		
1.18	49		
0.6	44		
0.425	41		
0.3	39		
0.212	37		
0.15	34		
0.063	26		

Sample Proportions	% dry mass
Cobbles	21
Gravel	25
Sand	28
Silt and Clay	26

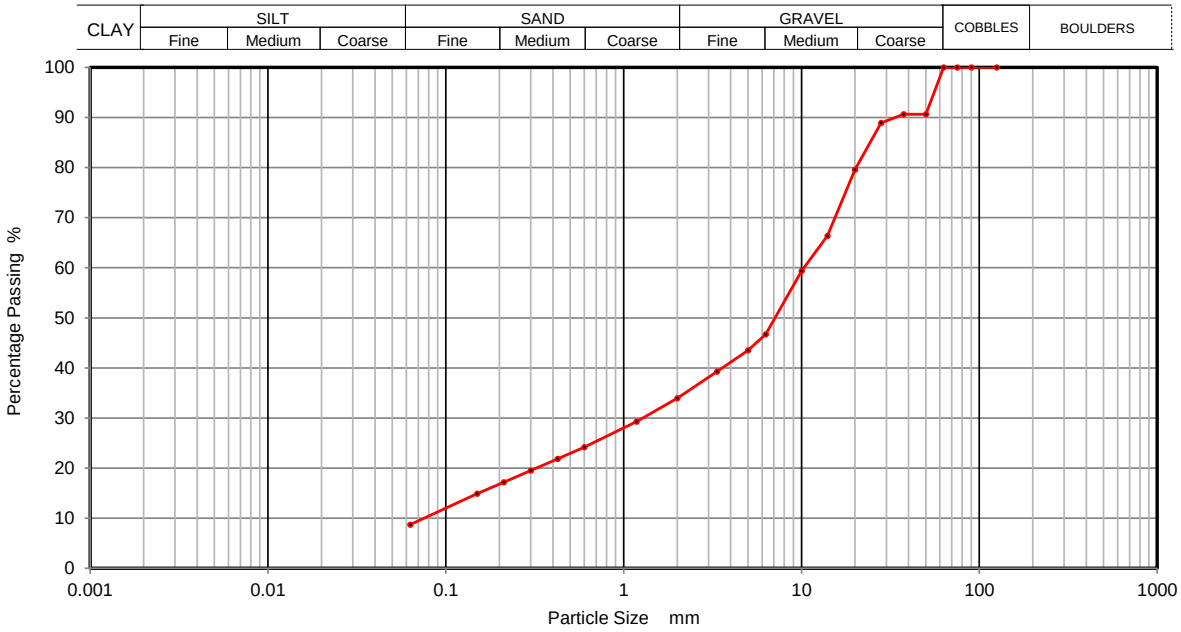
Remarks

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Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-TP111
Project Name	Global Centre Of Rail Excellence	Sample No.	10
Soil Description	Dark grey silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	2.00
		Depth Base	2.30
Date Tested	03/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	91		
37.5	91		
28	89		
20	80		
14	66		
10	59		
6.3	47		
5	43		
3.35	39		
2	34		
1.18	29		
0.6	24		
0.425	22		
0.3	19		
0.212	17		
0.15	15		
0.063	9		

Sample Proportions	% dry mass
Cobbles	0
Gravel	66
Sand	25
Silt and Clay	9

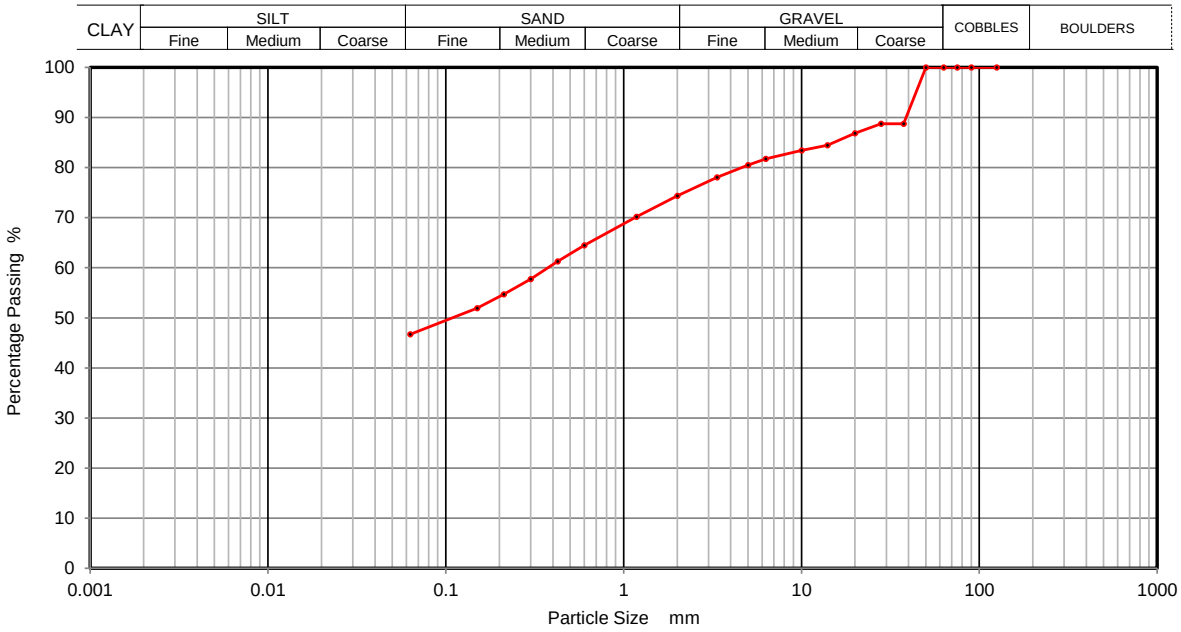
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-TP112
Project Name	Global Centre Of Rail Excellence	Sample No.	9
Soil Description	Black fine to coarse gravelly fine to coarse sandy SILT/CLAY	Depth Top	0.90
		Depth Base	1.00
Date Tested	03/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	89		
28	89		
20	87		
14	84		
10	83		
6.3	82		
5	80		
3.35	78		
2	74		
1.18	70		
0.6	64		
0.425	61		
0.3	58		
0.212	55		
0.15	52		
0.063	47		

Sample Proportions	% dry mass
Cobbles	0
Gravel	26
Sand	27
Silt and Clay	47

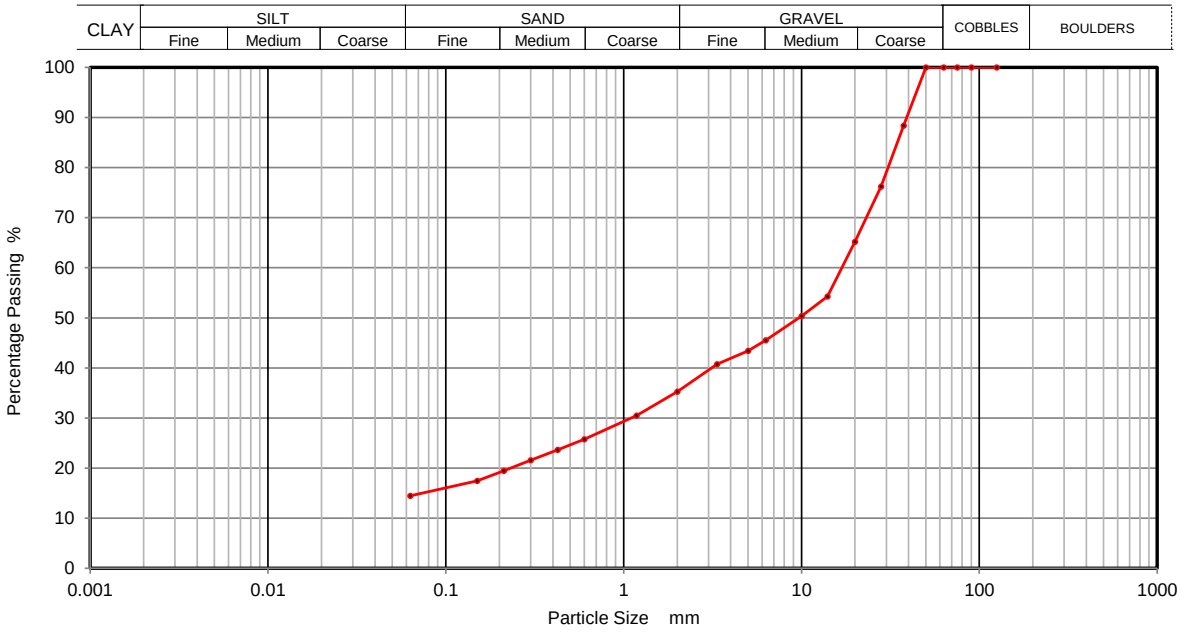
Remarks

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Operator
David Edwards

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2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-TP113
Project Name	Global Centre Of Rail Excellence	Sample No.	4
Soil Description	Black clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.50
		Depth Base	0.70
Date Tested	03/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	88		
28	76		
20	65		
14	54		
10	50		
6.3	46		
5	43		
3.35	41		
2	35		
1.18	30		
0.6	26		
0.425	24		
0.3	22		
0.212	19		
0.15	17		
0.063	14		

Sample Proportions	% dry mass
Cobbles	0
Gravel	65
Sand	21
Silt and Clay	14

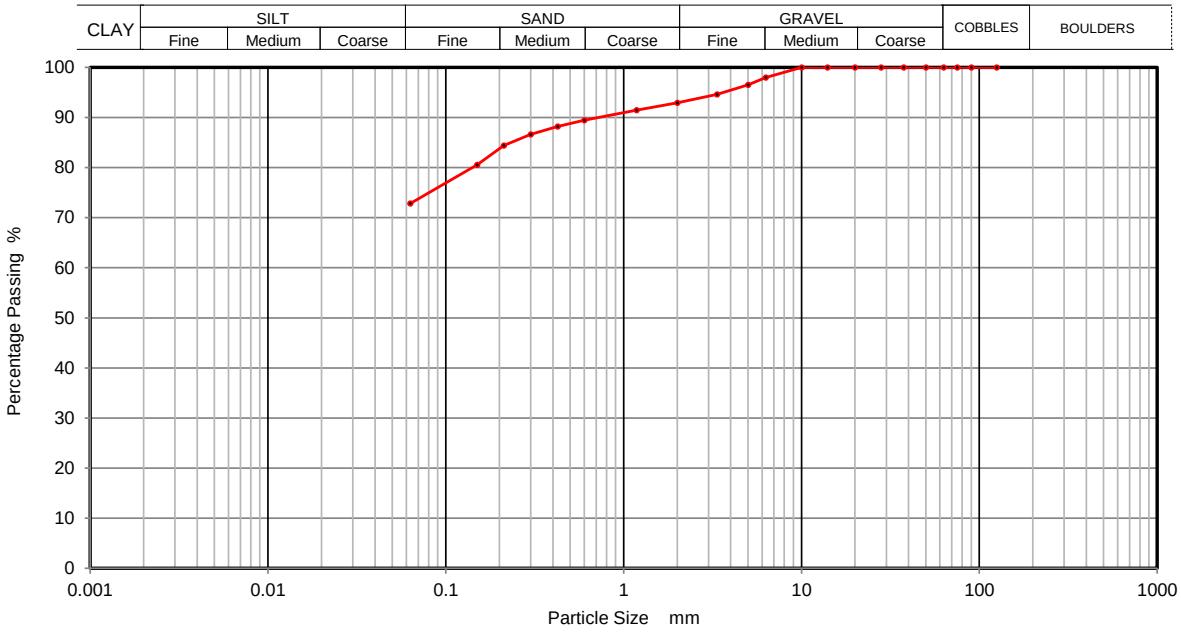
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-TP113
Project Name	Global Centre Of Rail Excellence	Sample No.	7
Soil Description	Brown fine to medium gravelly fine to coarse sandy SILT/CLAY	Depth Top	1.00
		Depth Base	1.10
Date Tested	03/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	98		
5	97		
3.35	95		
2	93		
1.18	91		
0.6	89		
0.425	88		
0.3	87		
0.212	84		
0.15	81		
0.063	73		

Sample Proportions	% dry mass
Cobbles	0
Gravel	7
Sand	20
Silt and Clay	73

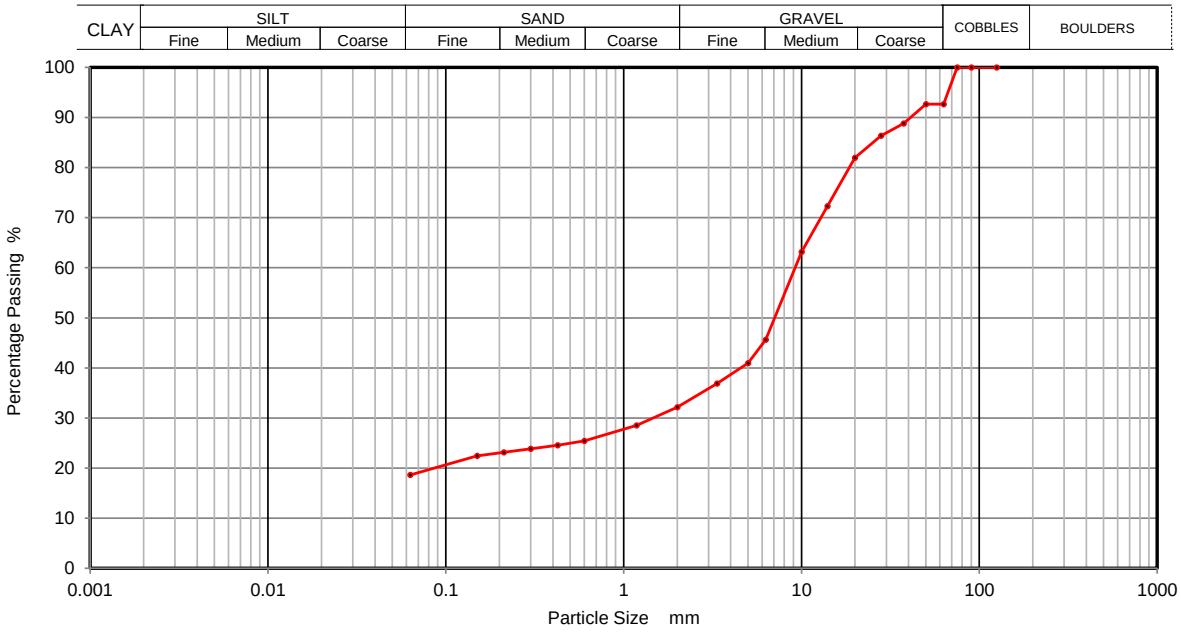
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-TP113
Project Name	Global Centre Of Rail Excellence	Sample No.	11
Soil Description	Brown fine to coarse sandy silty/clayey fine to coarse GRAVEL (with cobbles)	Depth Top	3.00
		Depth Base	3.10
Date Tested	03/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	93		
50	93		
37.5	89		
28	86		
20	82		
14	72		
10	63		
6.3	46		
5	41		
3.35	37		
2	32		
1.18	29		
0.6	25		
0.425	25		
0.3	24		
0.212	23		
0.15	22		
0.063	19		

Sample Proportions	% dry mass
Cobbles	7
Gravel	61
Sand	13
Silt and Clay	19

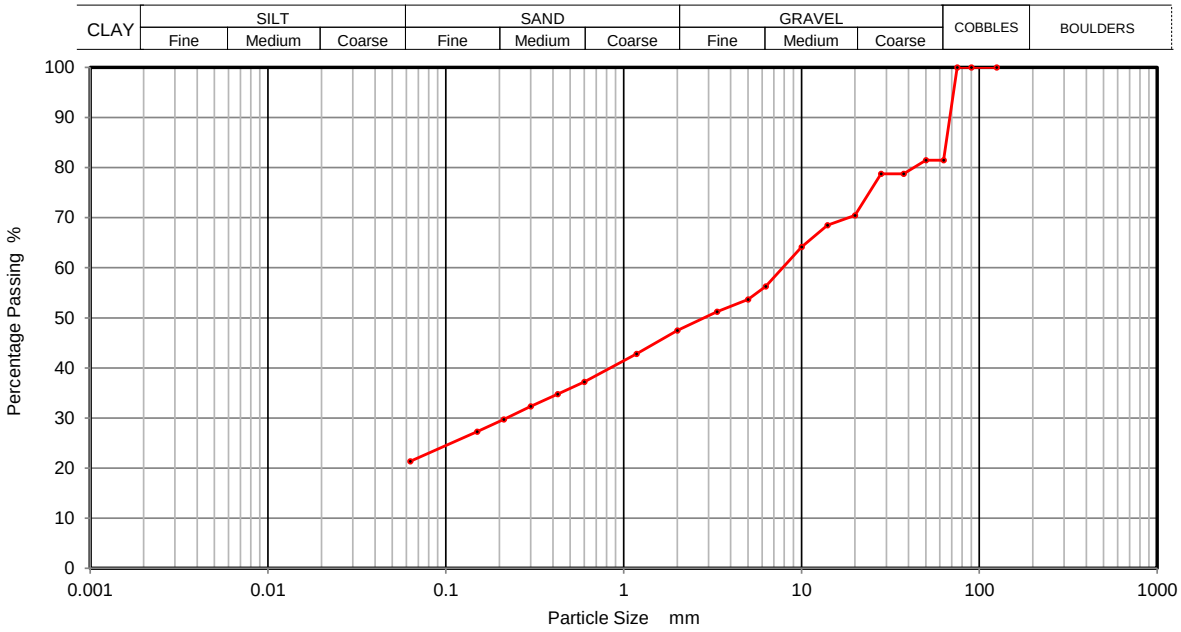
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-TP114
Project Name	Global Centre Of Rail Excellence	Sample No.	5
Soil Description	Grey brown silty/clayey fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	0.30
		Depth Base	0.40
Date Tested	03/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	81		
50	81		
37.5	79		
28	79		
20	70		
14	68		
10	64		
6.3	56		
5	54		
3.35	51		
2	47		
1.18	43		
0.6	37		
0.425	35		
0.3	32		
0.212	30		
0.15	27		
0.063	21		

Sample Proportions	% dry mass
Cobbles	19
Gravel	34
Sand	26
Silt and Clay	21

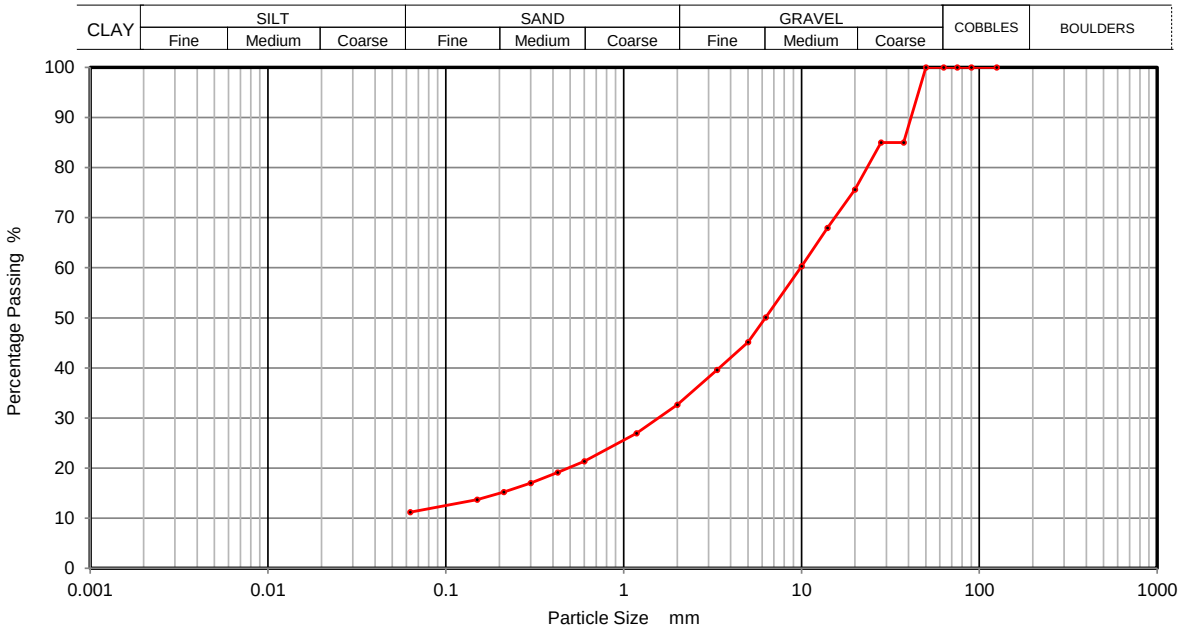
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-TP114
Project Name	Global Centre Of Rail Excellence	Sample No.	10
Soil Description	Black silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	2.10
		Depth Base	2.20
Date Tested	03/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	85		
28	85		
20	76		
14	68		
10	60		
6.3	50		
5	45		
3.35	40		
2	33		
1.18	27		
0.6	21		
0.425	19		
0.3	17		
0.212	15		
0.15	14		
0.063	11		

Sample Proportions	% dry mass
Cobbles	0
Gravel	67
Sand	22
Silt and Clay	11

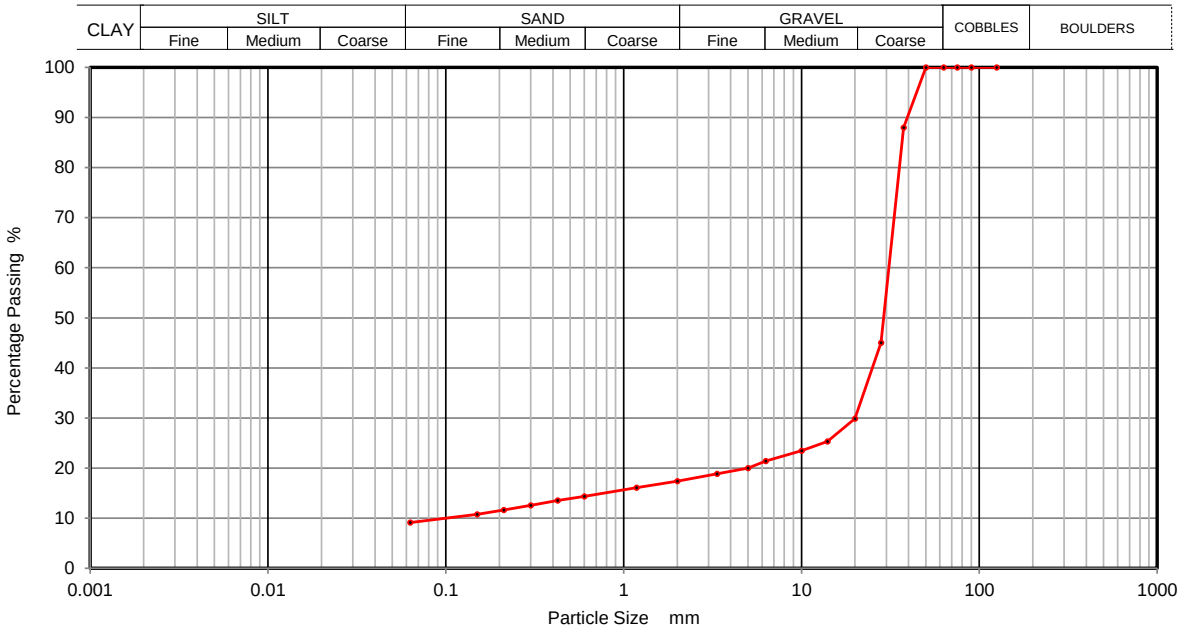
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63106
		Borehole/Pit No.	S1-TP115
Project Name	Global Centre Of Rail Excellence	Sample No.	4
Soil Description	Black fine to coarse sandy silty/clayey fine to coarse GRAVEL	Depth Top	0.50
		Depth Base	0.70
Date Tested	03/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	88		
28	45		
20	30		
14	25		
10	23		
6.3	21		
5	20		
3.35	19		
2	17		
1.18	16		
0.6	14		
0.425	14		
0.3	13		
0.212	12		
0.15	11		
0.063	9		

Sample Proportions	% dry mass
Cobbles	0
Gravel	83
Sand	8
Silt and Clay	9

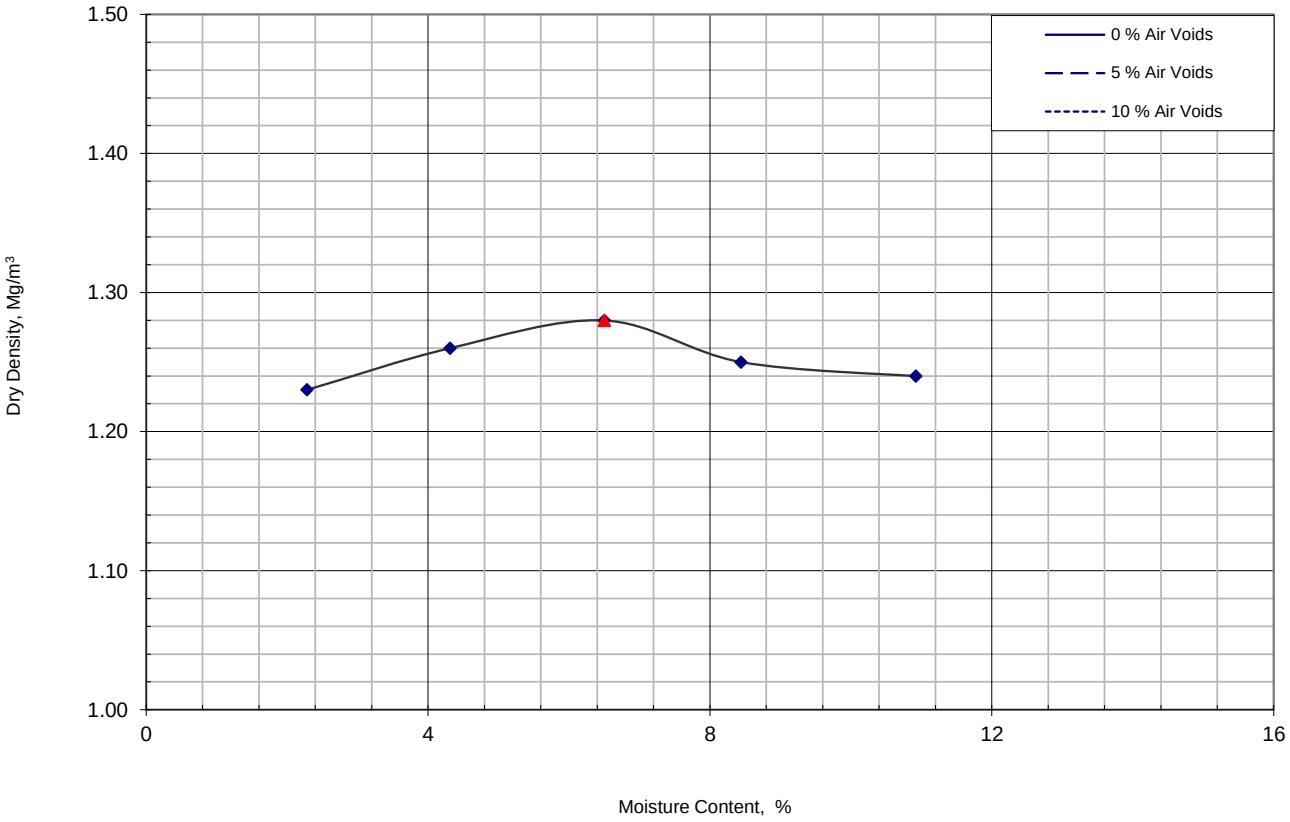
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Dry Density / Moisture Content Relationship BS 1377:Part 4:1990**	Contract Number	63106
		Borehole / Pit No	S1-TP114
Project Name	Global Centre Of Rail Excellence	Sample No	1
Date Tested	05/01/2023	Depth Top	0.10
Compaction Method	4.5 Kg Rammer	Depth Base	0.20
Compaction Clause	BS1377:Part 4:1990, Clause 3.5	Sample Type	B
Sample Description	Black silty/clayey fine to coarse GRAVEL	Single or Separate Sample Used	Single



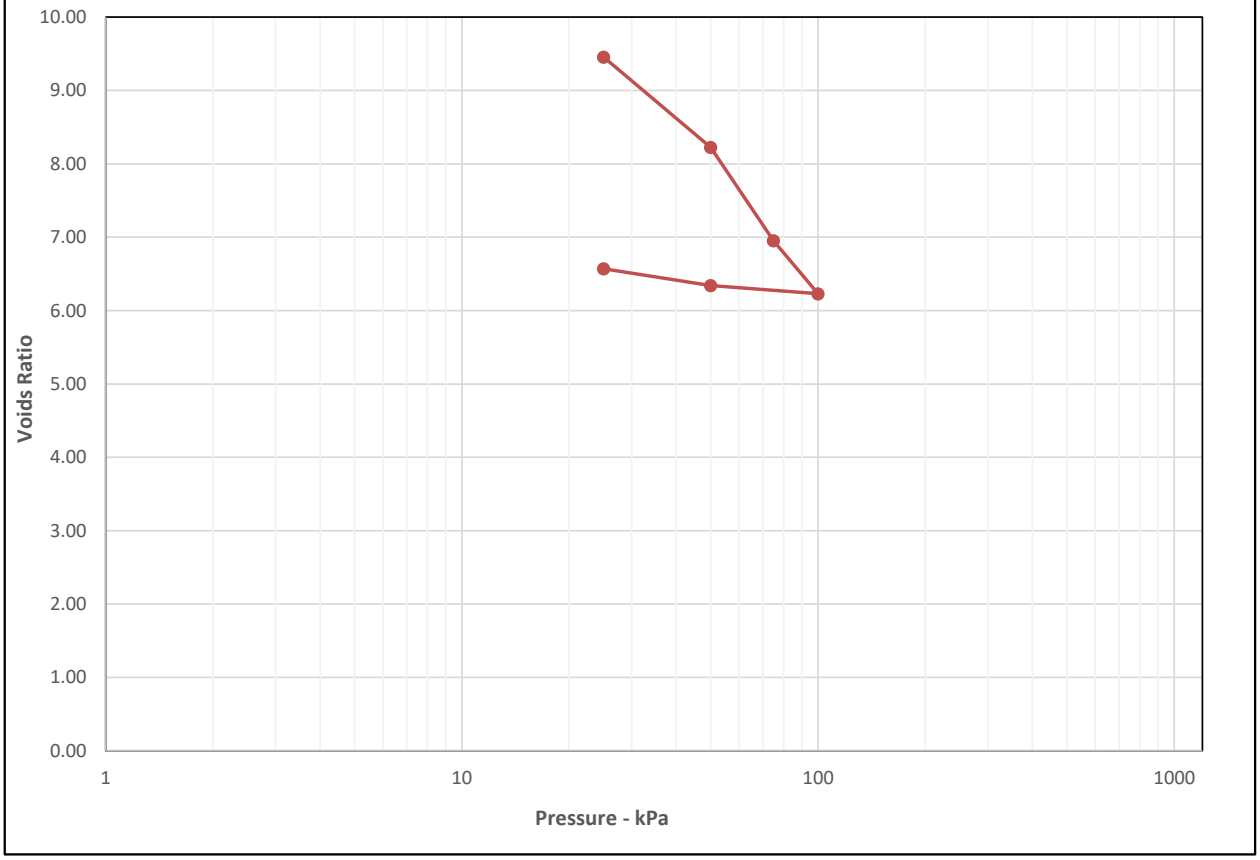
Compaction Point	1	2	3	4	5							
Moisture Content	2.3	4.3	6.5	8.4	11							
Bulk Density	1.26	1.31	1.36	1.36	1.38							
Dry Density	1.23	1.26	1.28	1.25	1.24							

Initial Moisture Content	11	%
Maximum Dry Density	1.28	Mg/m3
Optimum Moisture Content	6.5	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	11	%
Material Retained 20mm	9	%

Operator
Conal

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	63106
		Borehole/Trialpit No.	S1-BH102
Project Name	Global Centre Of Rail Excellence	Sample No.	6
Soil Description	Black brown PEAT	Depth Top (m)	2.00
		Depth Base (m)	2.50
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	22/12/2022		

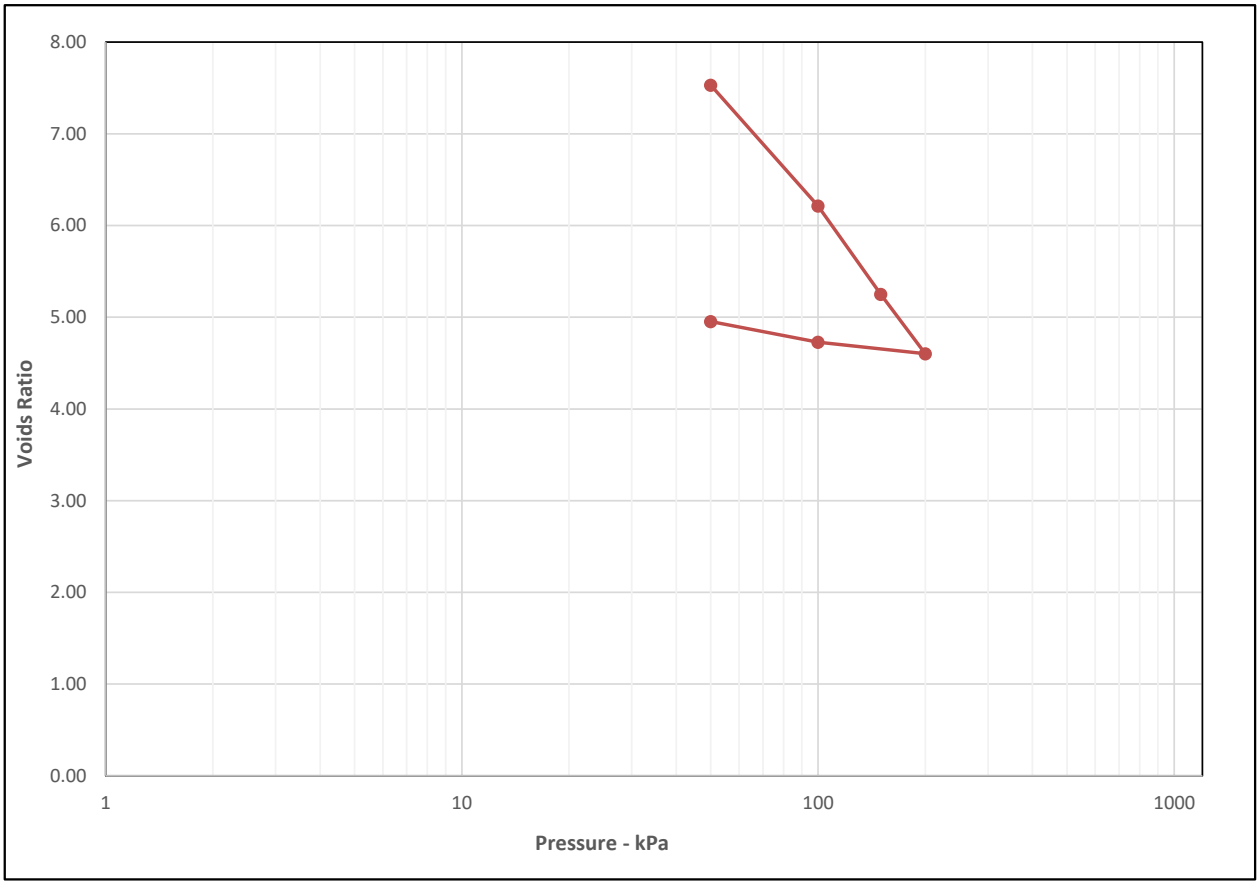


Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	463	0	-	25	8.4	1.1		-			
Bulk Density (Mg/m3)	1.13	25	-	50	4.7	0.27		-			
Dry Density (Mg/m3)	0.20	50	-	75	5.5	0.17		-			
Voids Ratio	12.2137	75	-	100	3.6	0.13		-			
Degree of saturation	100.6	100	-	50	0.31	160		-			
Height (mm)	20	50	-	25	1.3	0.24		-			
Diameter (mm)	75		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	63106
		Borehole/Trialpit No.	S1-BH110
Project Name	Global Centre Of Rail Excellence	Sample No.	8
Soil Description	Black brown PEAT	Depth Top (m)	4.80
		Depth Base (m)	5.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	22/12/2022		

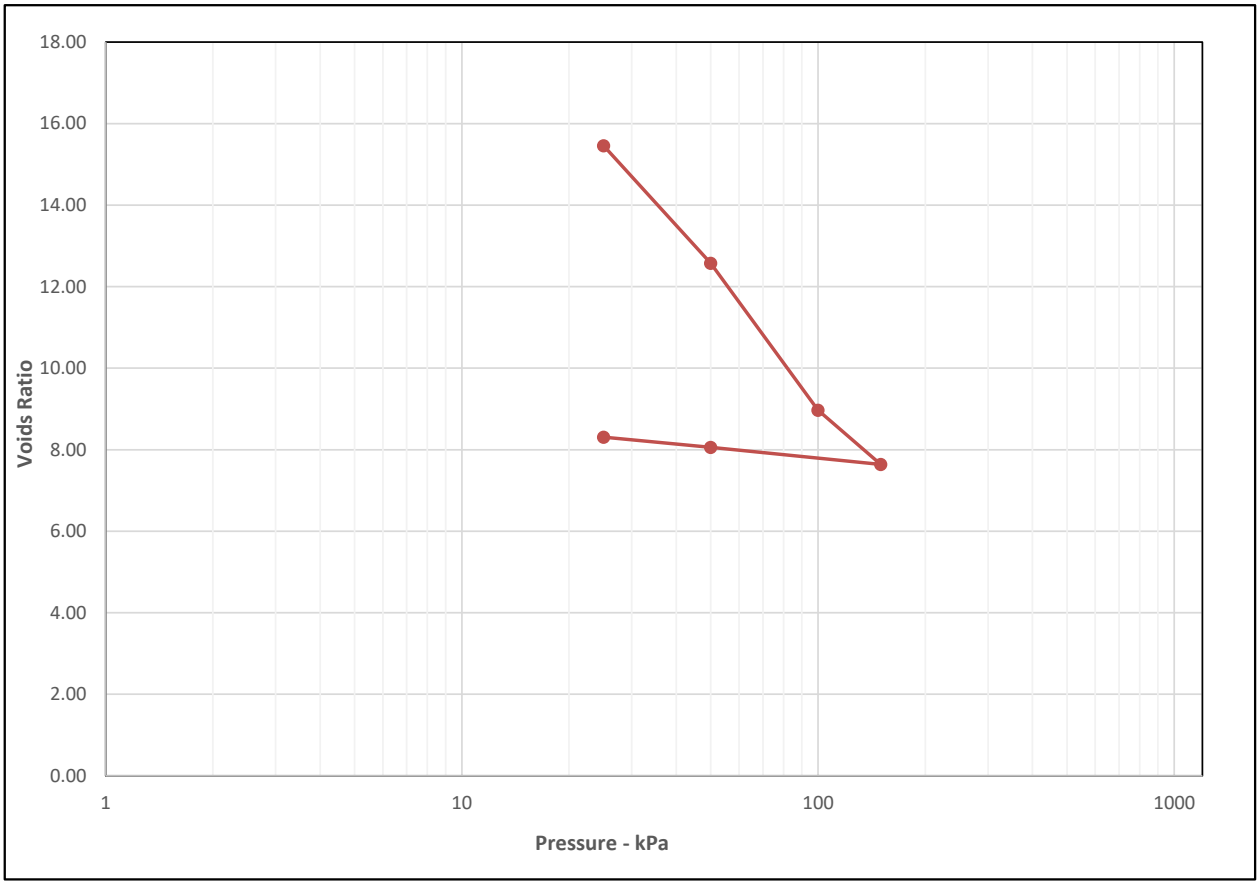


Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	384	0	-	50	4.8	2.6		-			
Bulk Density (Mg/m3)	1.14	50	-	100	3.1	1.2		-			
Dry Density (Mg/m3)	0.24	100	-	150	2.7	0.31		-			
Voids Ratio	10.2301	150	-	200	2.1	0.44		-			
Degree of saturation	99.6	200	-	100	0.23	3.7		-			
Height (mm)	20	100	-	50	0.79	0.55		-			
Diameter (mm)	75		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	63106
		Borehole/Trialpit No.	S1-BH122
Project Name	Global Centre Of Rail Excellence	Sample No.	6
Soil Description	Black brown PEAT	Depth Top (m)	3.00
		Depth Base (m)	3.50
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	03/01/2023		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	738	0	-	25	8.4	0.33		-			
Bulk Density (Mg/m3)	1.07	25	-	50	7.0	0.12		-			
Dry Density (Mg/m3)	0.13	50	-	100	5.3	0.057		-			
Voids Ratio	19.8409	100	-	150	2.7	0.029		-			
Degree of saturation	98.6	150	-	50	0.49	0.20		-			
Height (mm)	20	50	-	25	1.1	26		-			
Diameter (mm)	74.95		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

UKAS TESTING
2788

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

Point Load Test

The complete ISRM suggested methods for rock characterization, testing and monitoring 1974-2006
Determining Point Load Strength

Contract Number	63106
Project Name	Global Centre Of Rail Excellence
Sample Type	Core
Date Tested	13/12/2022

*Please note that GSTL is not accredited for the water content of rock

Hole Reference	Depth (m)			Test Type		Width	Platen Seperation	Failure Load	Equivalent Diameter	Point Load	Size Factor	Point Load Index	Moisture Content	Description	Angle Between Plane of Anisotropy & Core Axis	Type of Anisotropy (Bedding or Cleavage)
				d / a / b / i	I //											
S1-BH102	21.30	-	21.54	d			106	1.66		0.15	1.40	0.21	1.6	SILTSTONE		
S1-BH102	25.40	-	25.60	d			105	0.93		0.08	1.40	0.12	3.2	SILTSTONE		
S1-BH102	28.60	-	29.00	d			106	1.40		0.12	1.40	0.17	1.7	SILTSTONE		

Key	Reported As
Width	(W) mm
Platen Separation	(D) mm
Failure Load	(P) kN
Equivalent Diameter	(De) mm
Point Load	(Is) MPa
Size Factor	(F)
Point Load Index	(Is(50)) MPa
Moisture Content	%
Description	SC

Operator
Julian Jones

UKAS TESTING
2788

ANALYTICAL TEST REPORT

Contract no: 117101

Contract name: Globel Centre of Rail Excellence

Client reference: G22069

Clients name: Geo Site and Testing Services

Clients address: Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

Samples received: 19 December 2022

Analysis started: 19 December 2022

Analysis completed: 23 December 2022

Report issued: 23 December 2022

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing

Approved by:

Rachael Burton

Reporting Manager

Chemtech Environmental Limited

SOILS

Lab number			117101-1	117101-2	117101-3	117101-4	117101-5	117101-6
Sample id			S1-BH102	S1-BH110	S1-BH121	S1-BH122	S1-BH122	S1-BH122
Depth (m)			3.00-3.45	4.75-4.80	3.20-3.30	2.60-2.70	4.20-4.30	5.00-5.45
Sample Type			D8	D109	D105	D102	D103	D10
Date sampled			-	-	-	-	-	-
Test	**Method**	**Units**						
Total Organic Carbon (TOC)	CE197	% w/w C	33.6	36.8	33.3	30.9	5.3	2.3
Estimate of OMC (calculated from TOC)	CE197	% w/w	57.9	63.5	57.4	53.3	9.1	4.0

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments
Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
117101-1	S1-BH102	3.00-3.45	Y	All (NSD)
117101-2	S1-BH110	4.75-4.80	Y	All (NSD)
117101-3	S1-BH121	3.20-3.30	Y	All (NSD)
117101-4	S1-BH122	2.60-2.70	Y	All (NSD)
117101-5	S1-BH122	4.20-4.30	Y	All (NSD)
117101-6	S1-BH122	5.00-5.45	Y	All (NSD)

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.
For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones, where applicable.

Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

Contract Number: 63478

Client Ref: **G22069**
Client PO:

Date Received: **03-01-2023**
Date Completed: **30-01-2023**
Report Date: **30-01-2023**

Client: **Jackson Drilling Holdings Ltd**
Northwood Farm
Coxbridge Road
Baltonsborough
Somerset
BA6 8RA

This report has been checked and approved by:

B. Evans

Brendan Evans
Office Administrator

Contract Title: **Global Centre Of Rail Excellence**
For the attention of: **Adam Putt**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	22
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	13
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	15
Organic Matter Content Sub-contracted Test	4
BRE Suite D Brownfield Site (pyrite present) **includes pH, water & acid soluble sulphate, total sulphur, magnesium, chloride and nitrate** Sub-contracted Test	2
Dry Den/MC (4.5kg Rammer Method 1 litre mould/CBR Mould) BS 1377:1990 - Part 4 : 3.6 - * UKAS	1
Determination of Point Load Value Axial or Diametrical including WC ***Please note GSTL is not accredited for the water content of rock*** ISRM Suggested Method for Point Load Strength - * UKAS	4

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
- denotes test carried out by approved contractor
@ - denotes non accredited tests

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Approved Signatories:
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (Human Resources/ Health and Safety Manager)

GEO Site & Testing Services Ltd
Units 3-4, Heol Aur, Dafen, Llanelli, Carmarthenshire, Wales SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

Contract Number: 63478

Test Description	Qty
Consolidated Drained Peak Shear Strength - set of 3 - 60 x 60mm Shear Box Specimens by Direct Shearing (3 days) BS 1377:1990 - Part 7 : 4 - * UKAS	3
Disposal of samples for job	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
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- denotes test carried out by approved contractor
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Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (Human Resources/ Health and Safety Manager)

GEO Site & Testing Services Ltd
Units 3-4, Heol Aur, Dafen, Llanelli, Carmarthenshire, Wales SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

Natural Moisture Content
(BS 1377:1990 - Part 2 : 3.2)

Contract Number	63478
Project Name	Global Centre Of Rail Excellence
Date Tested	19/01/2023

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Remarks
S1-TP101	6	B	0.50	-	0.80	9.2	
S1-TP103	8	B	1.00	-	1.20	16	
S1-TP104	4	B	0.50	-	0.70	8.2	
S1-TP106	5	D	0.50	-	0.60	13	
S1-TP109	4	B	0.50	-	0.70	6.3	
S1-TP109	8	D	0.90	-	1.00	8.4	
S1-BH108	3	D	0.40	-	0.85	5.6	
S1-BH114	3	B	0.10	-	0.50	4.0	
S1-TP102	14	B	1.90	-	2.10	11	
S1-TP102	17	B	2.90	-	3.10	6.8	
S1-TP104	10	B	1.50	-	1.70	6.9	
S1-BH108	102	D	1.00	-	2.00	16	
S1-BH114	107	D	3.30	-	3.40	10	
				-			
				-			
				-			
				-			
				-			
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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.3 & 5.3)	
Contract Number	63478	
Project Name	Global Centre Of Rail Excellence	
Date Tested	17/01/2023	
	DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
S1-TP103	12	D	2.00	-	2.05	Brown PEAT
S1-TP103	18	B	3.15	-	3.30	Brown fine to medium gravelly silty CLAY
S1-TP106	8	D	0.90	-	1.00	Brown fine to medium gravelly silty CLAY
S1-TP106	14	D	1.90	-	2.00	Brown fine to medium gravelly silty CLAY
S1-TP102	4	D	0.40	-	0.50	Brown slightly clayey GRAVEL
S1-TP102	7	D	0.90	-	1.00	Brown silty CLAY
S1-TP110	1	D	0.10	-	0.15	Brown clayey SILT
S1-TP110	4	D	0.40	-	0.50	Brown silty CLAY
S1-TP110	11	D	1.90	-	2.00	Grey clayey/silty SHALE
S1-BH108	4	D	1.00	-	1.45	Brown gravelly silty CLAY
S1-BH113	114	D	5.90	-	6.00	Black silty CLAY
S1-BH114	102	D	1.40	-	1.50	Brown PEAT
S1-BH114	6	D	2.00	-	2.45	Brown organic silty CLAY
S1-TP109	15	D	2.50	-	2.60	Brown slightly gravelly silty CLAY
S1-BH108	102	D	1.00	-	2.00	Brown fine to coarse sandy fine to medium gravelly silty CLAY
S1-BH113	7	D	7.00	-	7.45	Brown gravelly silty CLAY
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GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

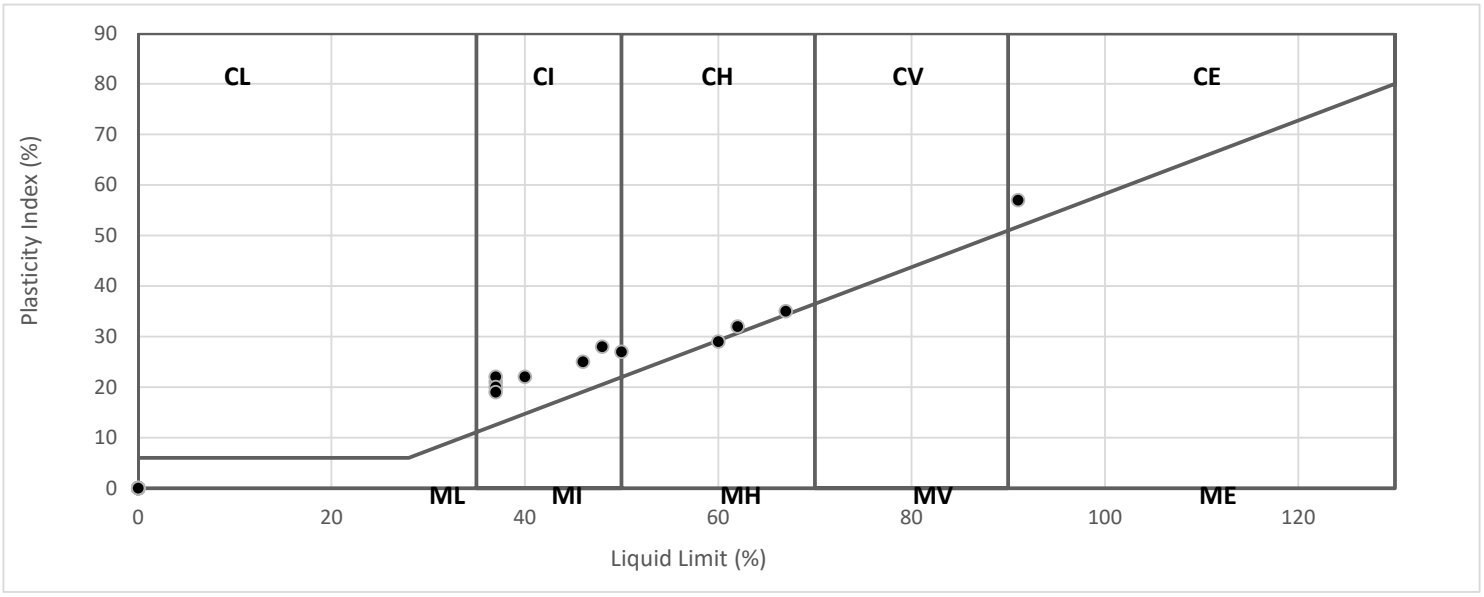
NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)

Contract Number	63478
Project Name	Global Centre Of Rail Excellence
Date Tested	17/01/2023

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
S1-TP103	12	D	2.00	-	2.05	175		NP		100	
S1-TP103	18	B	3.15	-	3.30	14	37	16	21	87	CI Intermediate Plasticity
S1-TP106	8	D	0.90	-	1.00	16	37	15	22	80	CI Intermediate Plasticity
S1-TP106	14	D	1.90	-	2.00	19	48	20	28	90	CI Intermediate Plasticity
S1-TP102	4	D	0.40	-	0.50	9.7		NP		15	
S1-TP102	7	D	0.90	-	1.00	50	62	30	32	100	CH High Plasticity
S1-TP110	1	D	0.10	-	0.15	45	60	31	29	100	MH High Plasticity
S1-TP110	4	D	0.40	-	0.50	51	67	32	35	100	CH High Plasticity
S1-TP110	11	D	1.90	-	2.00	13		NP		20	
S1-BH108	4	D	1.00	-	1.45	19	37	17	20	89	CI Intermediate Plasticity
S1-BH113	114	D	5.90	-	6.00	34	50	23	27	100	CI/H Inter/High Plasticity
S1-BH114	102	D	1.40	-	1.50	166		NP		100	
S1-BH114	6	D	2.00	-	2.45	82	91	34	57	100	CE Extremely High Plasticity
S1-TP109	15	D	2.50	-	2.60	19	40	18	22	98	CI Intermediate Plasticity
S1-BH108	102	D	1.00	-	2.00	16	37	18	19	51	CI Intermediate Plasticity
S1-BH113	7	D	7.00	-	7.45	22	46	21	25	90	CI Intermediate Plasticity
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Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:2015+A1:2020



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Borehole Number:	S1-TP103	Depth from (m):	1.00
Sample Number :	8.0	Depth to (m):	1.20

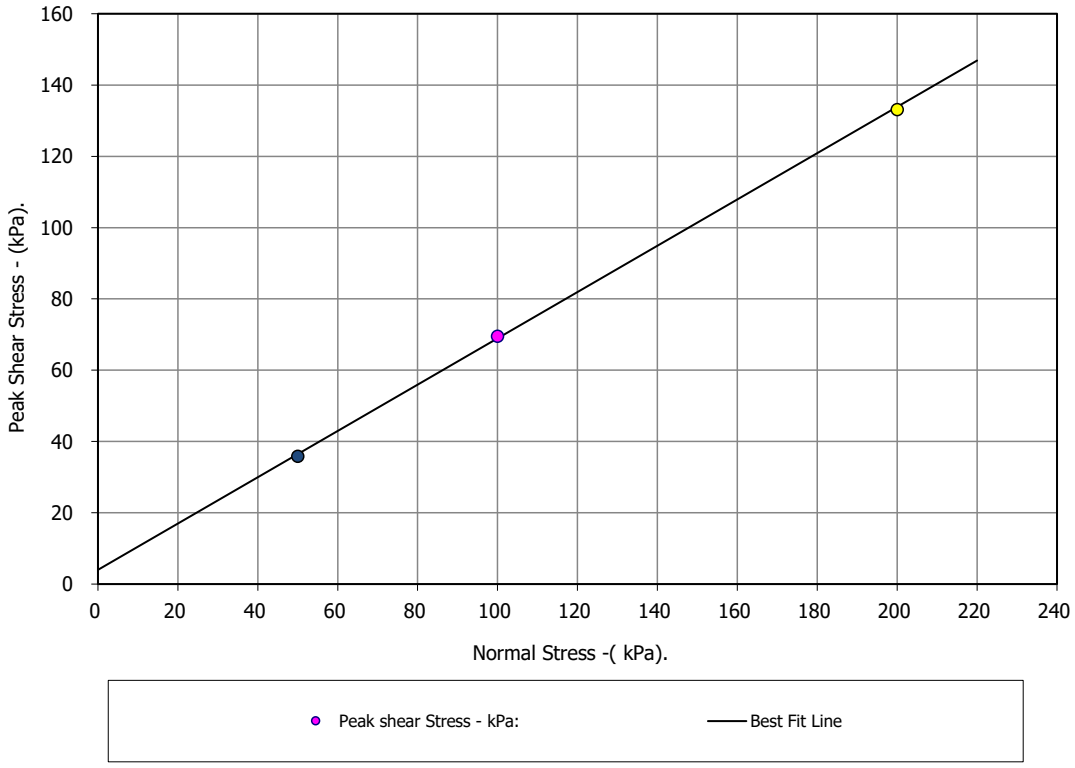
Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Brown slightly gravelly, slightly sandy CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	23.30	23.30	23.30
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	11	11	11
Bulk Density - Mg/m3:	2.08	2.08	2.08
Dry Density - Mg/m3:	1.87	1.87	1.87
Voids Ratio:	0.4194	0.4169	0.4177
Degree of Saturation - %:	71.92	72.36	72.22
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	21.79	20.60	20.25
Shear			
Rate of Horizontal Displacement (mm/min)	0.200	0.200	0.200
Horizontal Displacement at Peak Shear Stress (mm)	5.05	5.94	6.48
Peak shear Stress - kPa:	36	70	133

PEAK	
Angle of Shearing Resistance:(θ)	**33.0**
Effective Cohesion - kPa:	**4.0**

FAILURE CONDITIONS



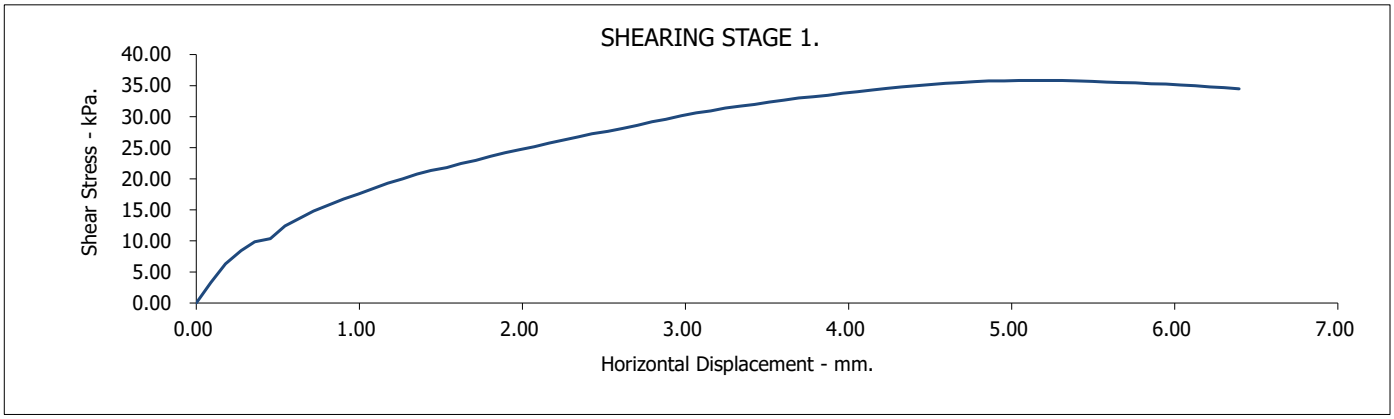
Contract No.:
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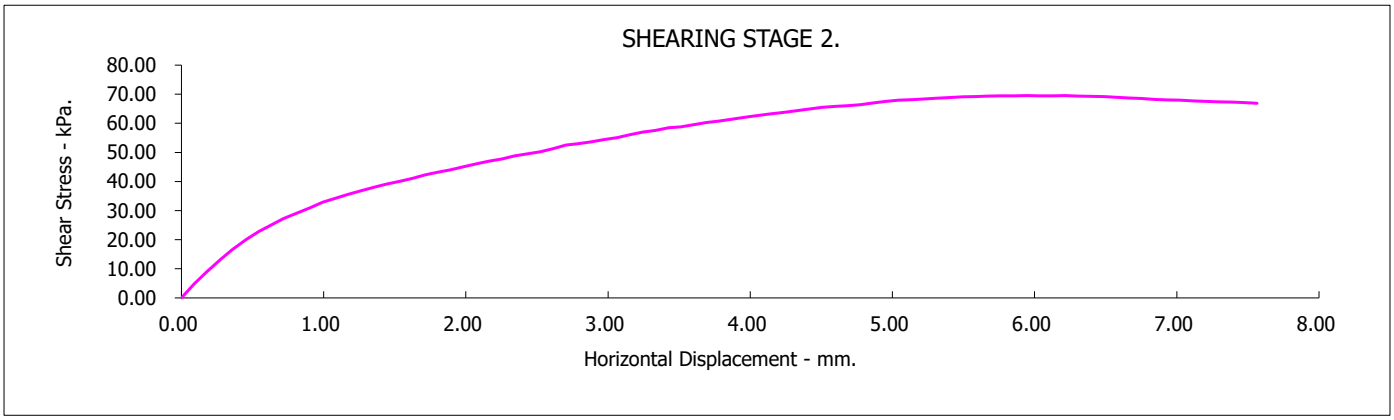
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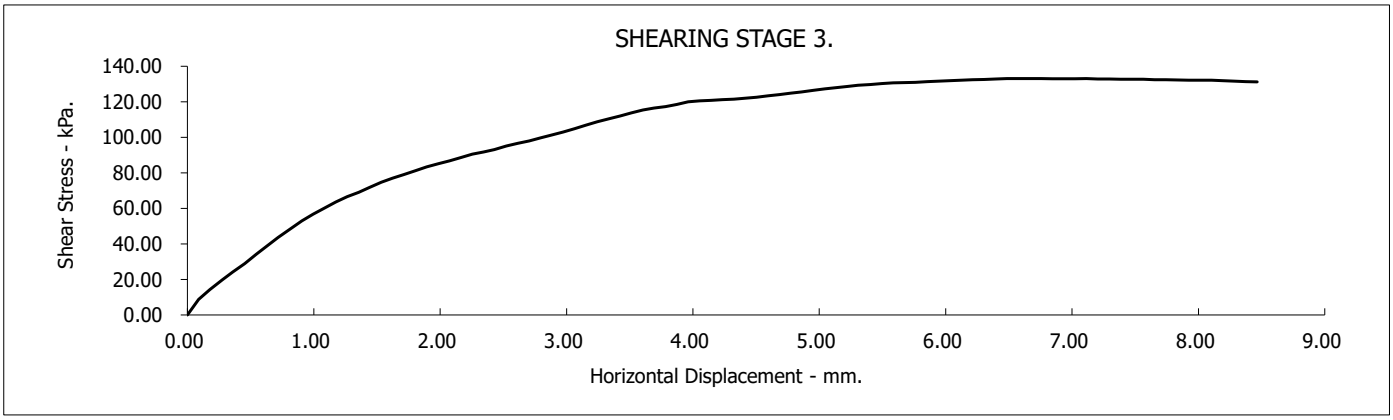
Client Ref Number:
G22069

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES

Borehole Number:	S1-TP103	Depth from (m):	1.00
Sample Number :	8	Depth to (m):	1.20







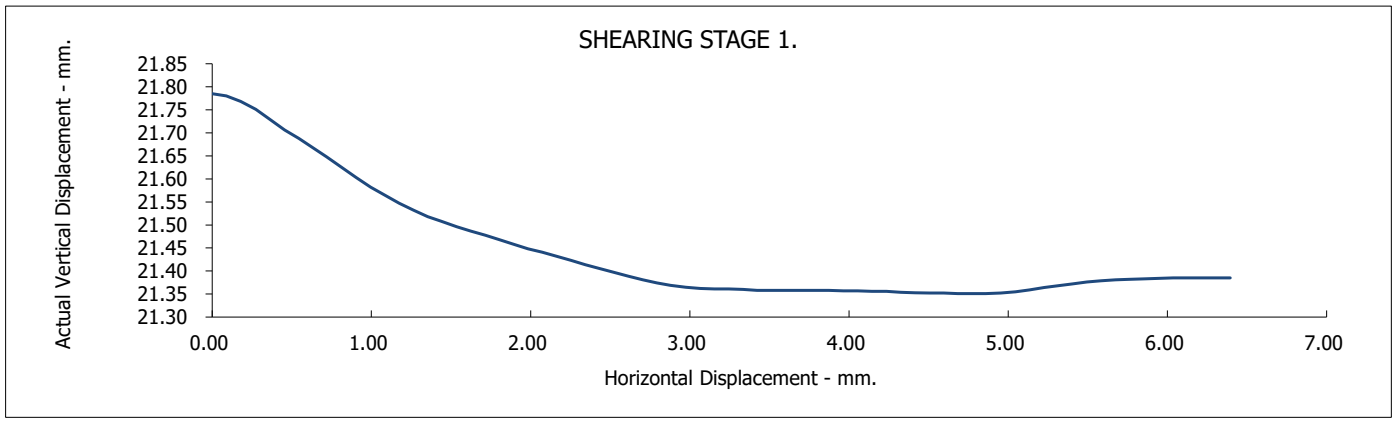
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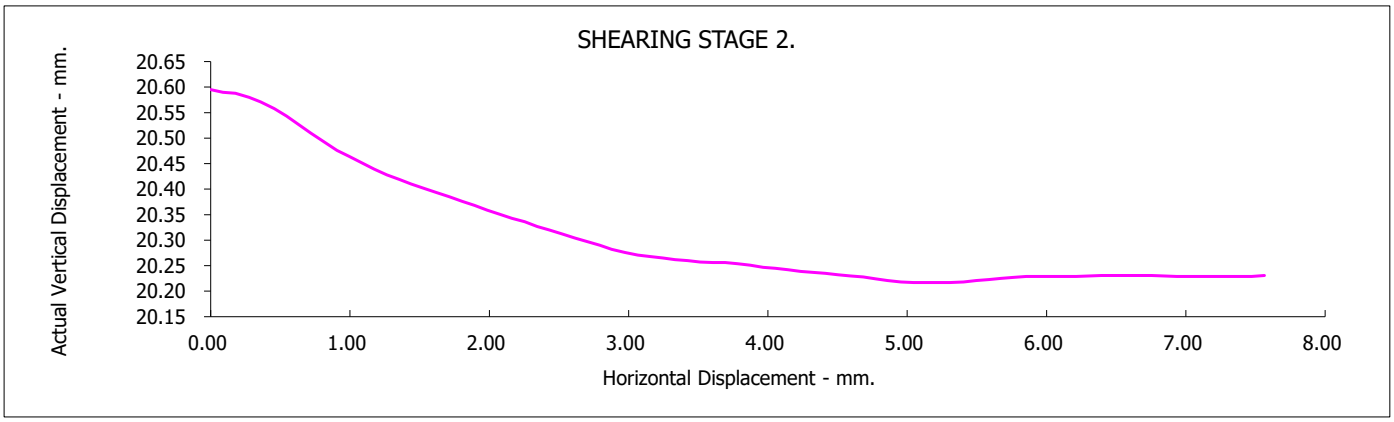
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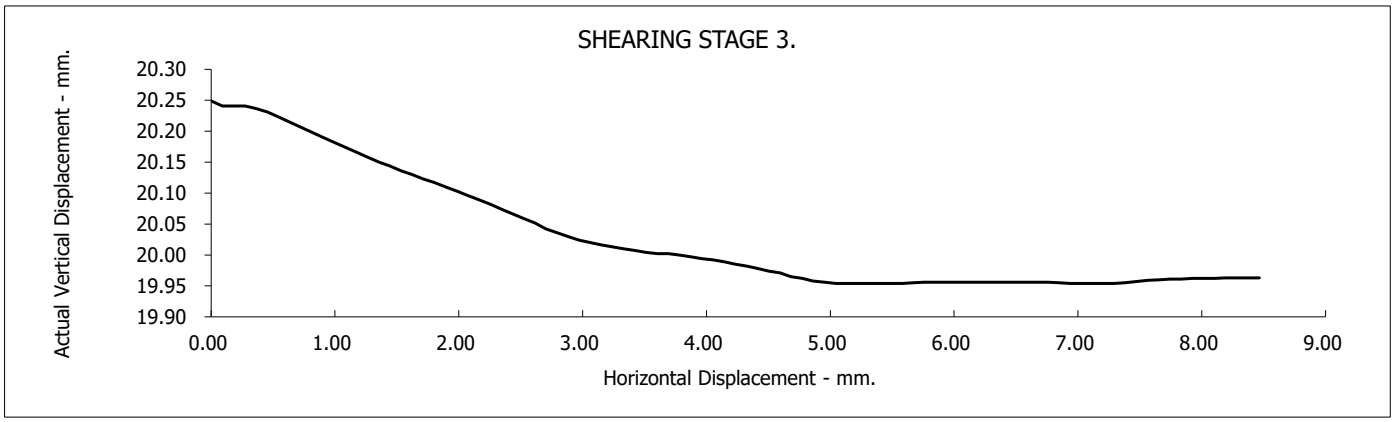
Client Ref Number:
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Figure.

Borehole Number:	S1-TP103	Depth from (m):	1.00
Sample Number :	8	Depth to (m):	1.20





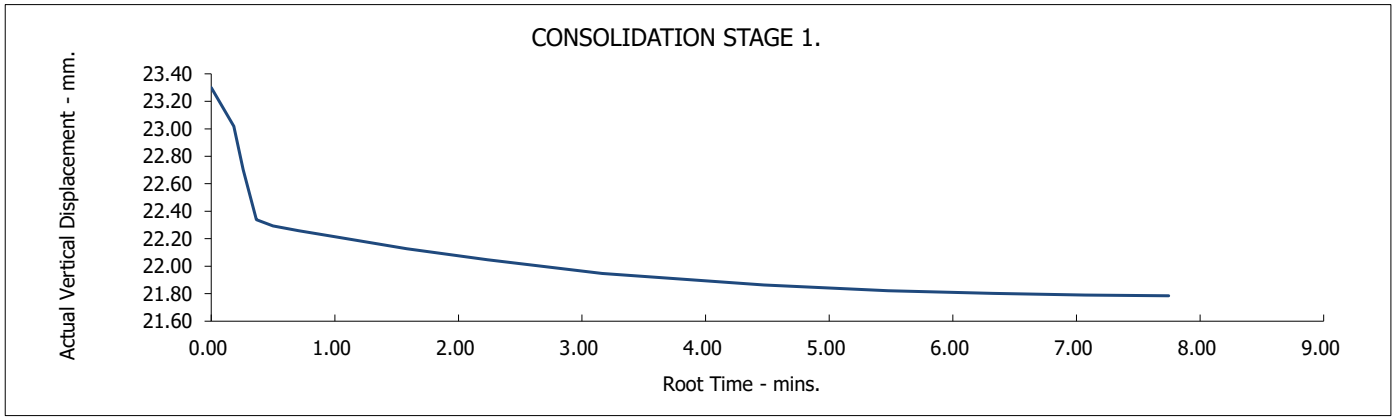


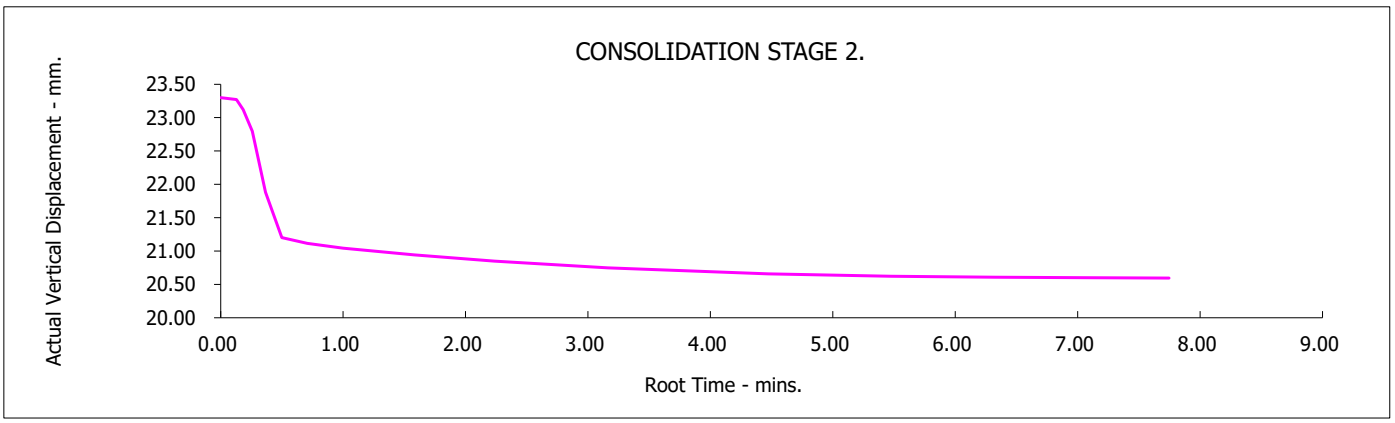
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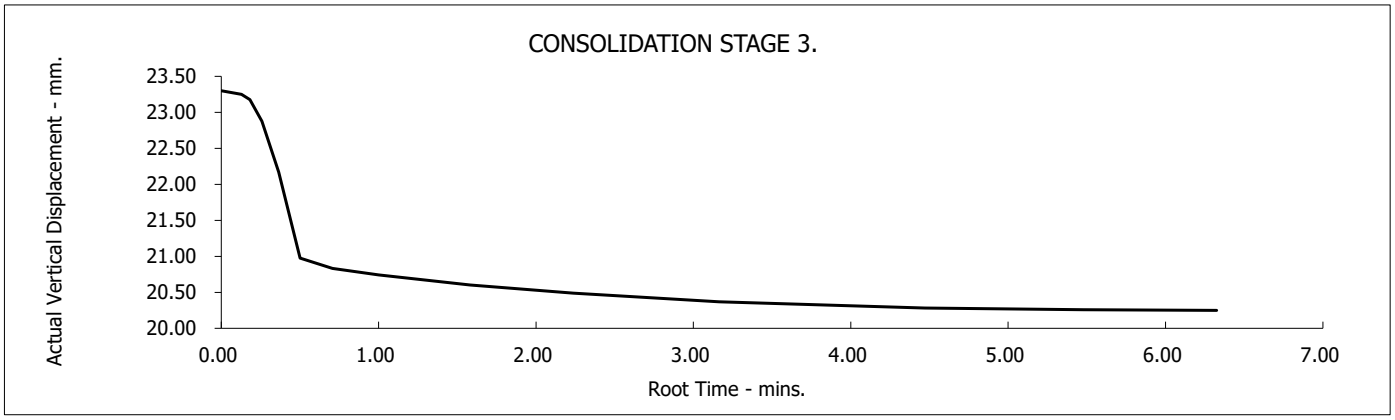
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Borehole Number:	S1-TP103	Depth from (m):	1.00
Sample Number :	8	Depth to (m):	1.20







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Client Ref Number:
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Test Report: MS DIRECT SHEARBOX TEST.BS1377:Part 7:4.5 :1990.

Borehole Number:	S1-TP104	Depth from (m):	2.00
Sample Number :	13	Depth to (m):	2.20

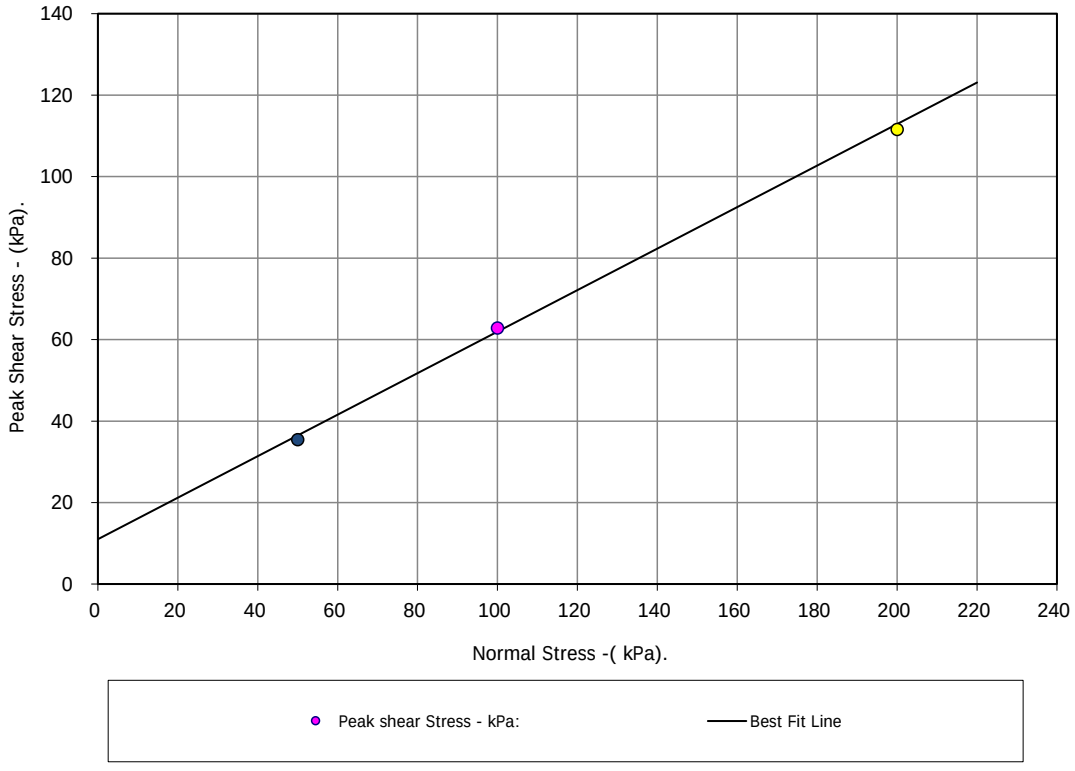
Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Dark Brown CLAY (Gravel removed)

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	23.30	23.30	23.30
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	18	18	18
Bulk Density - Mg/m3:	2.00	2.00	2.00
Dry Density - Mg/m3:	1.70	1.70	1.70
Voids Ratio:	0.5575	0.5610	0.5610
Degree of Saturation - %:	84.57	84.04	84.04
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	22.05	20.91	20.20
Shear			
Rate of Horizontal Displacement (mm/min)	0.200	0.200	0.200
Horizontal Displacement at Peak Shear Stress (mm)	3.07	5.23	5.76
Peak shear Stress - kPa:	35	63	112

PEAK	
Angle of Shearing Resistance:(~~θ~~)	**27.0**
Effective Cohesion - kPa:	**11**

FAILURE CONDITIONS

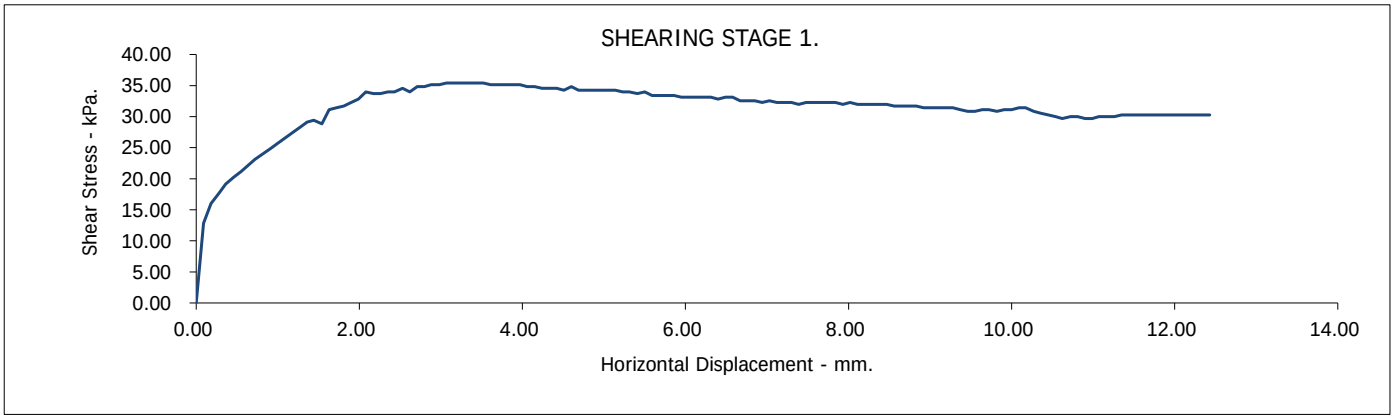


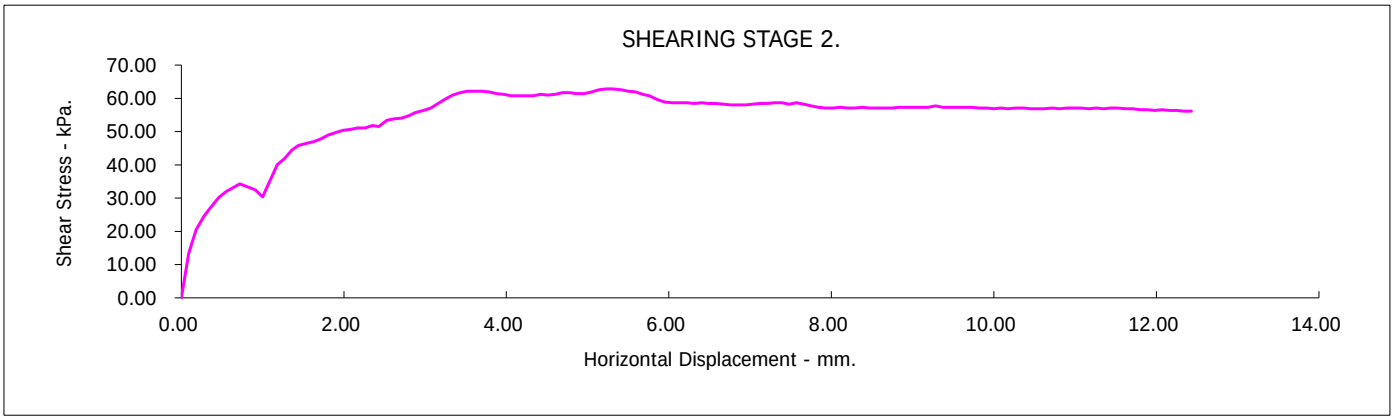
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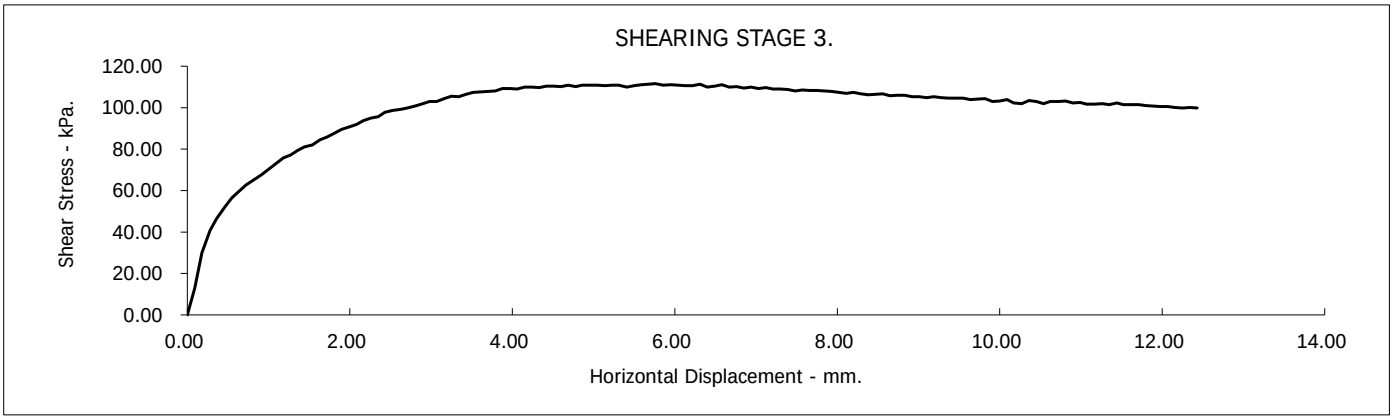
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Client Ref Number:
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Borehole Number:	S1-TP104	Depth from (m):	2.00
Sample Number :	2	Depth to (m):	2.20







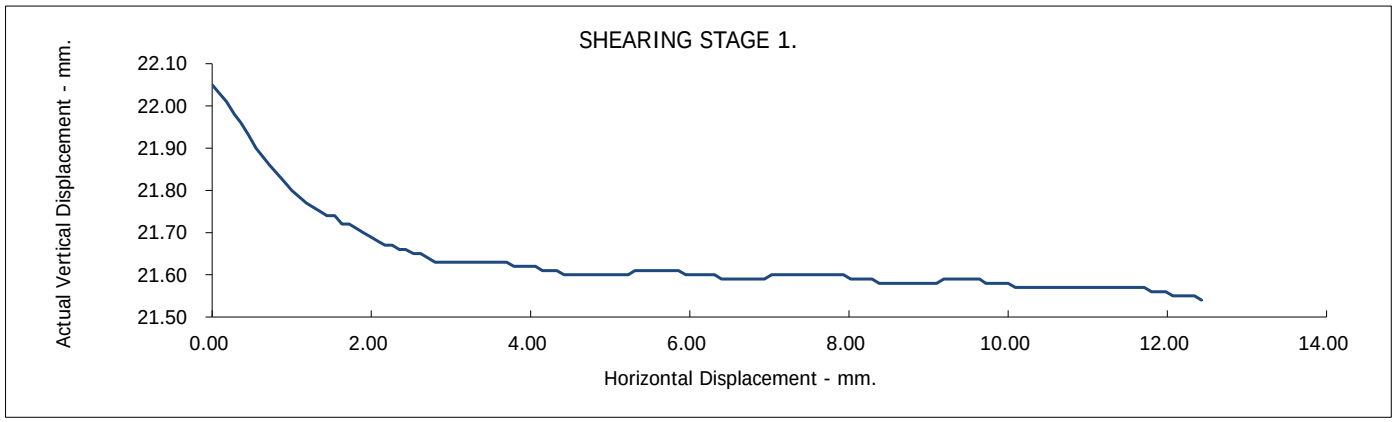
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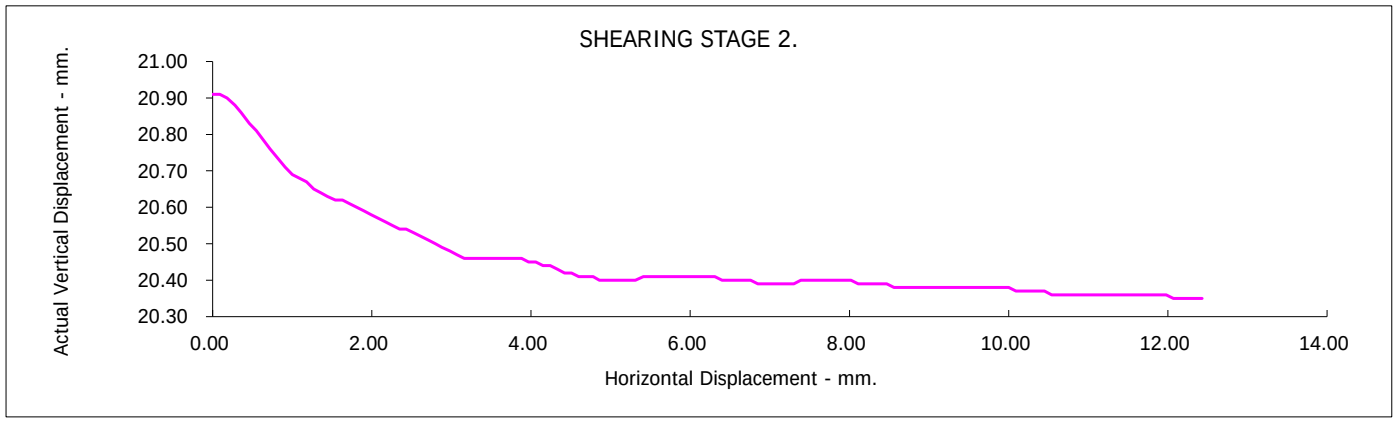
Contract No.: **63478**

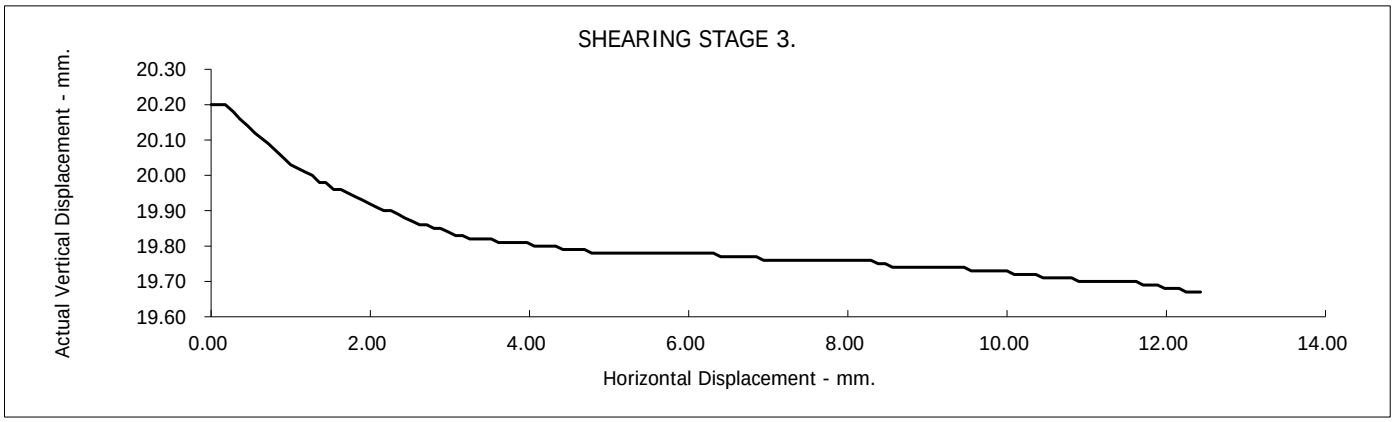
Client Ref Number: **G22069**

Figure.

Borehole Number:	S1-TP104	Depth from (m):	2.00
Sample Number :	2	Depth to (m):	2.20





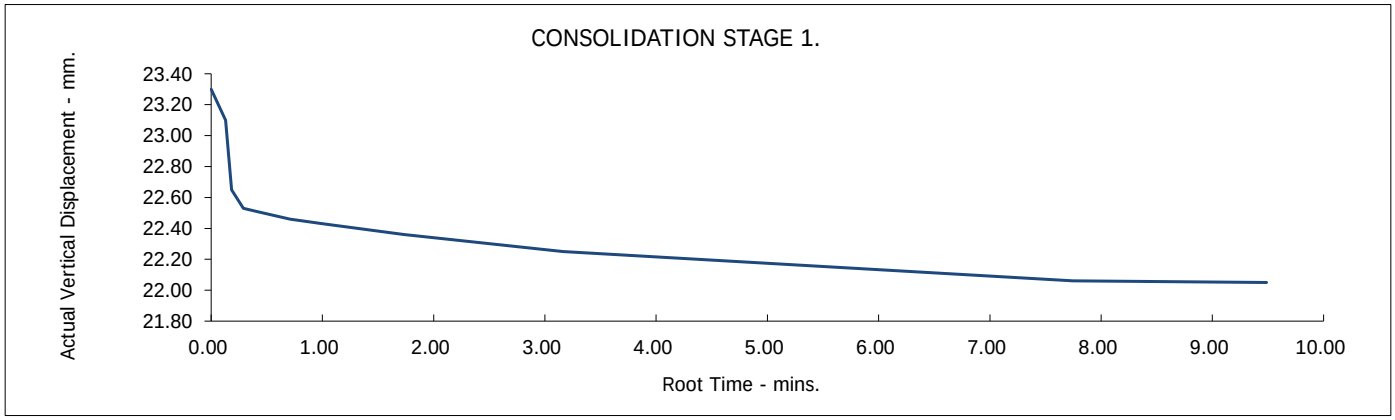


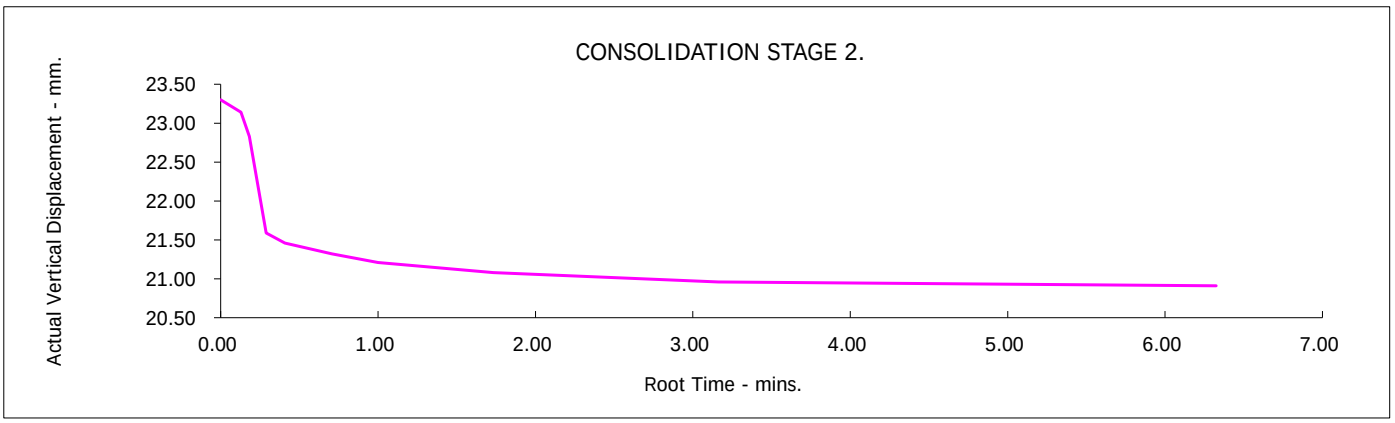
Contract No.:
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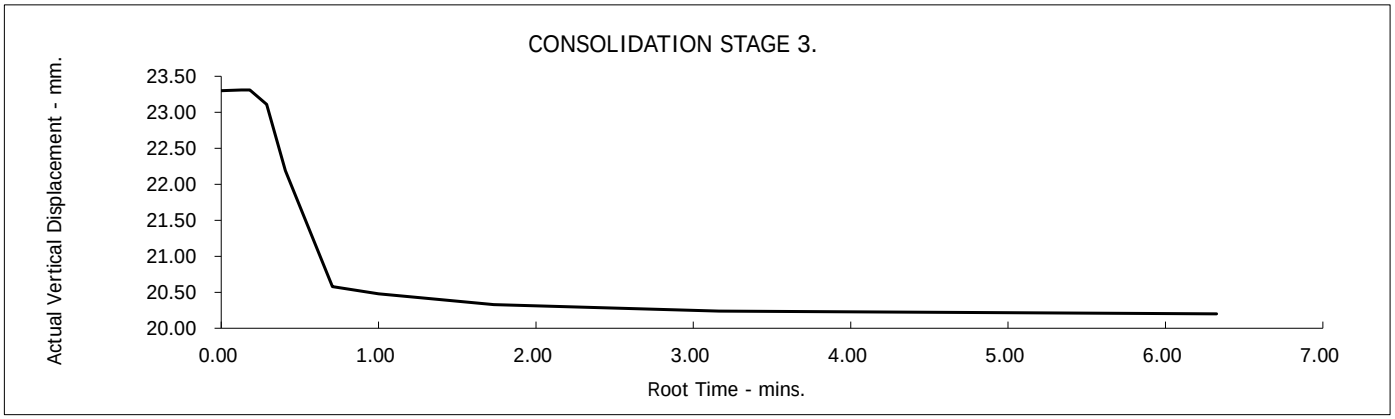
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Client Ref Number:
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Borehole Number:	S1-TP104	Depth from (m):	2.00
Sample Number :	2	Depth to (m):	2.20







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Contract No.: **63478**

Client Ref Number: **G22069**

Borehole Number:	S1-TP106	Depth from (m):	0.50
Sample Number :	4.0	Depth to (m):	0.70

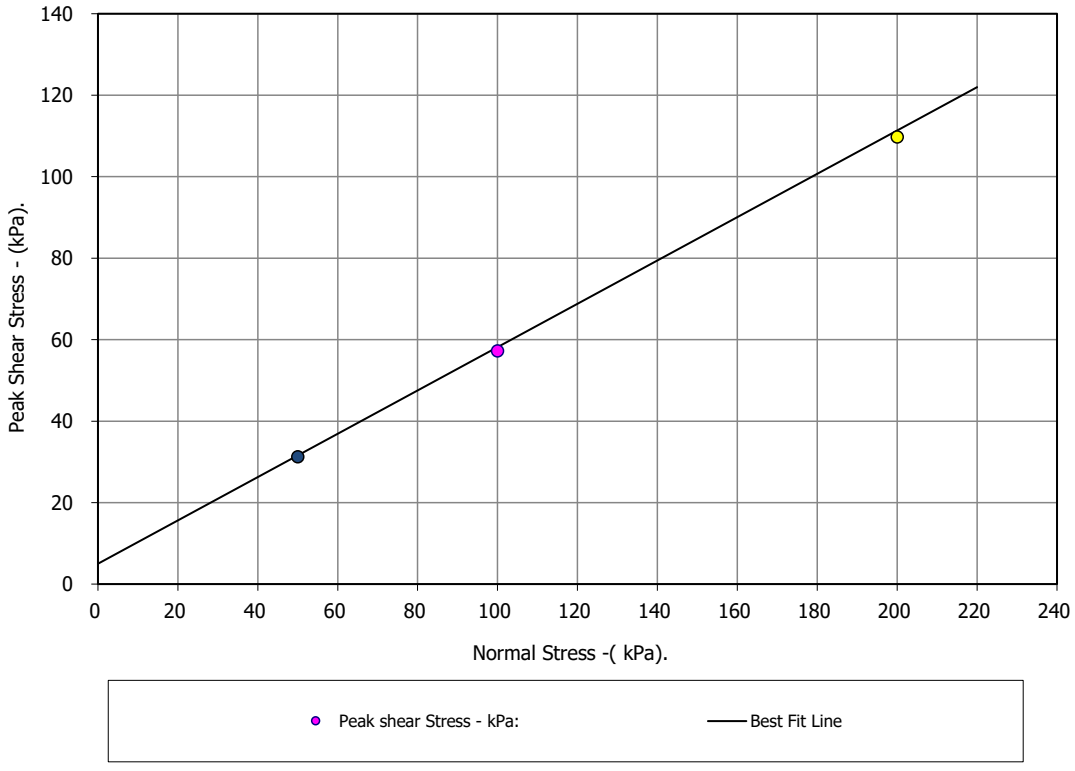
Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Brown CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	23.30	23.30	23.30
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	24	24	24
Bulk Density - Mg/m3:	1.98	1.99	1.99
Dry Density - Mg/m3:	1.60	1.61	1.61
Voids Ratio:	0.6538	0.6504	0.6500
Degree of Saturation - %:	96.21	96.73	96.79
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	20.80	19.97	18.43
Shear			
Rate of Horizontal Displacement (mm/min)	0.200	0.200	0.200
Horizontal Displacement at Peak Shear Stress (mm)	5.14	6.66	6.57
Peak shear Stress - kPa:	31	57	110

PEAK	
Angle of Shearing Resistance:(θ)	**28.0**
Effective Cohesion - kPa:	**5.0**

FAILURE CONDITIONS

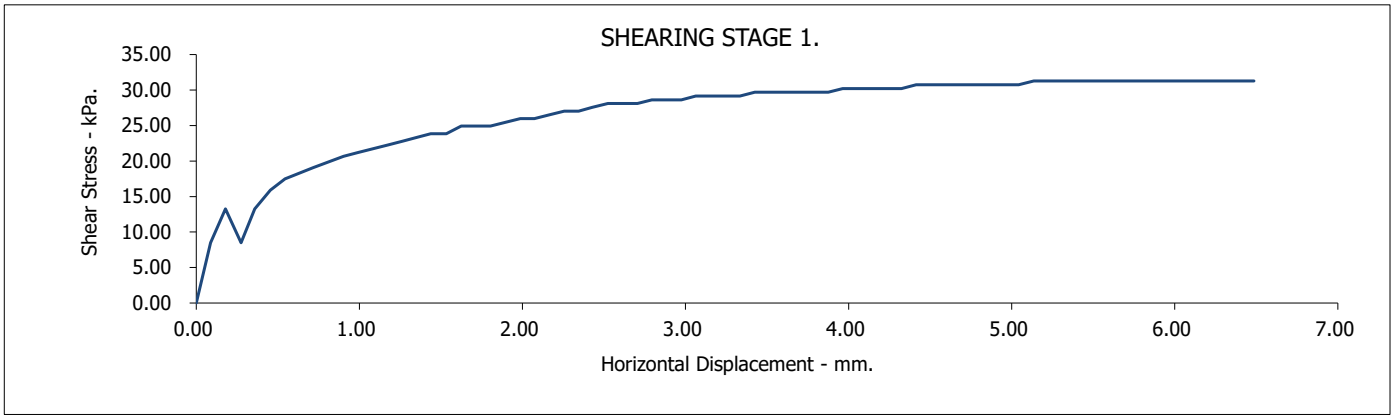


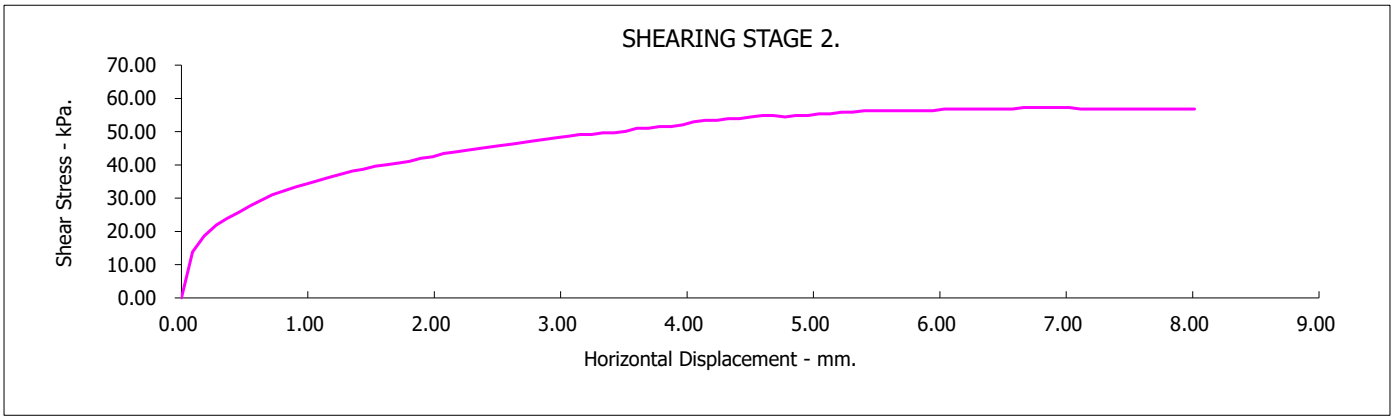
Contract No.:
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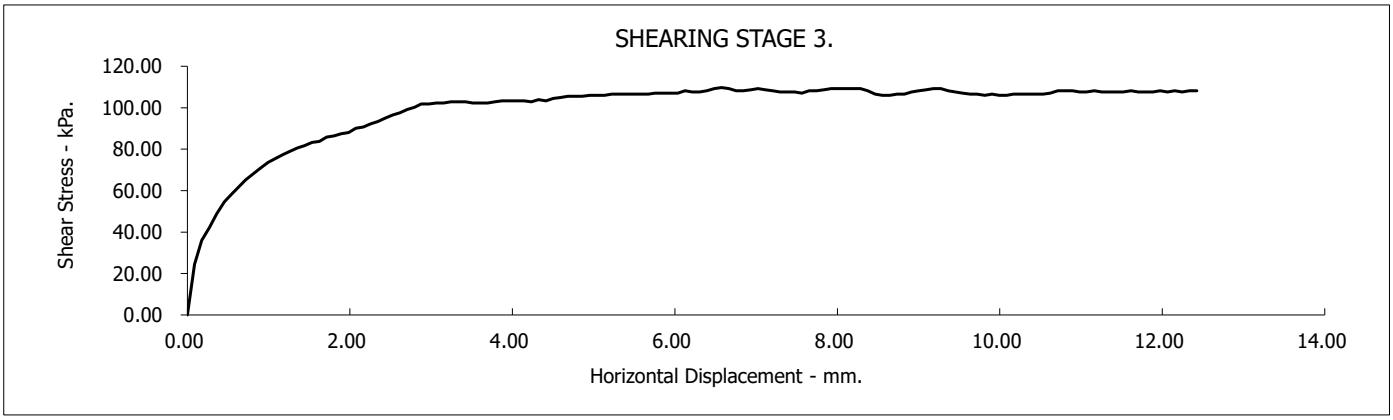
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Client Ref Number:
G22069

Borehole Number:	S1-TP106	Depth from (m):	0.50
Sample Number :	4	Depth to (m):	0.70







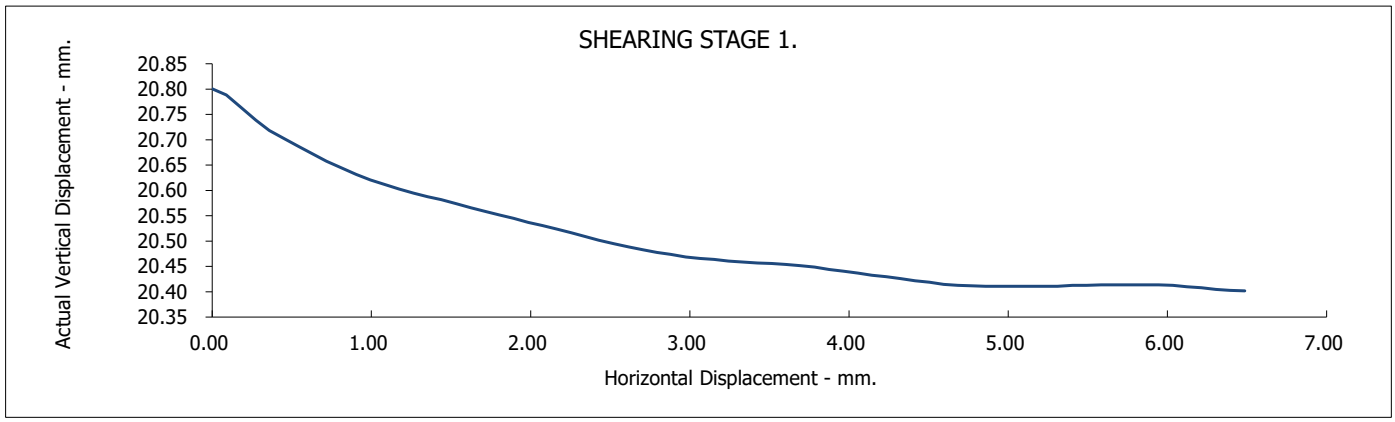
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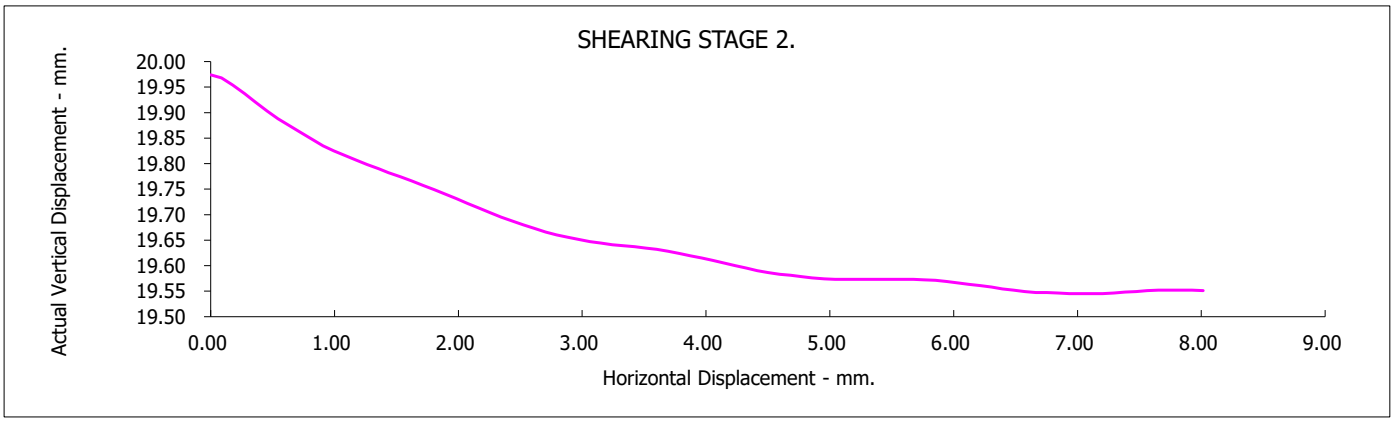
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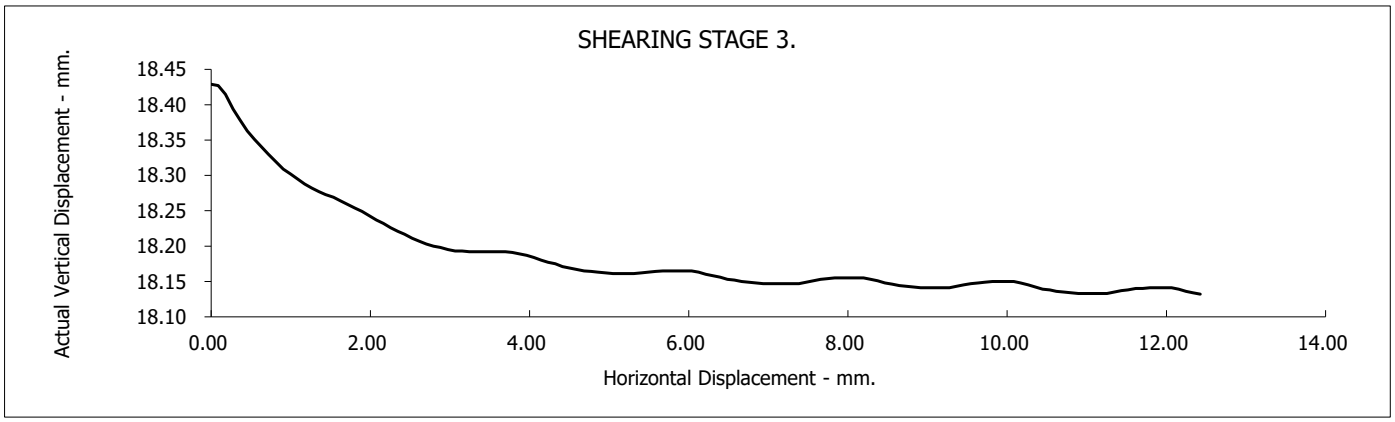
Client Ref Number:
G22069

Figure.

Borehole Number:	S1-TP106	Depth from (m):	0.50
Sample Number :	4	Depth to (m):	0.70





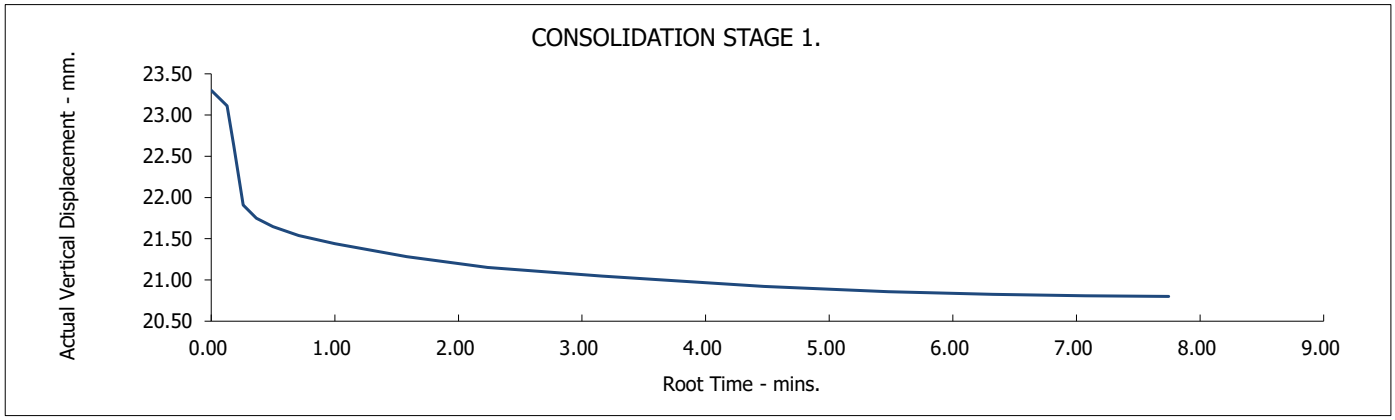


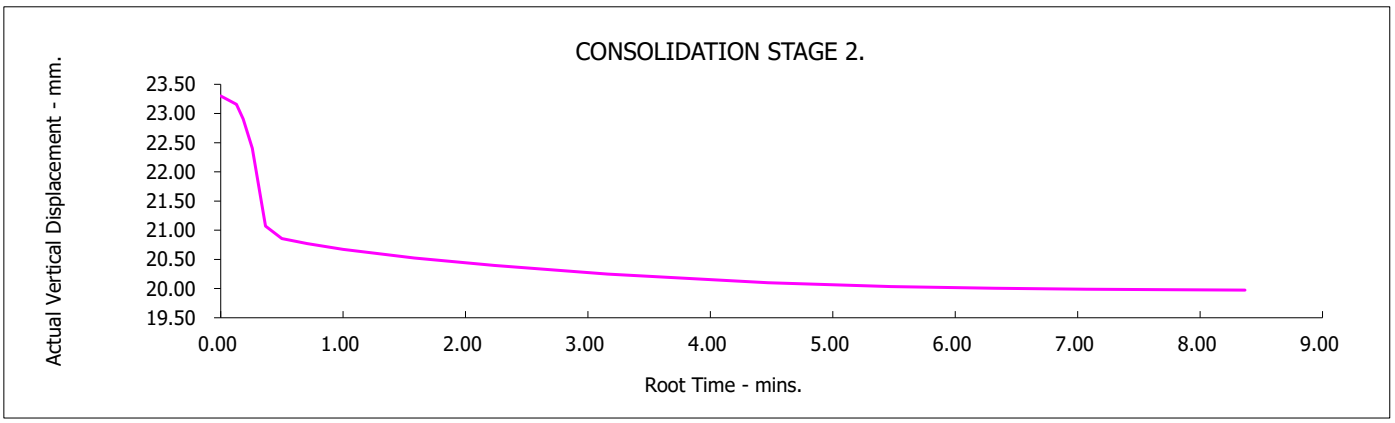
Contract No.:
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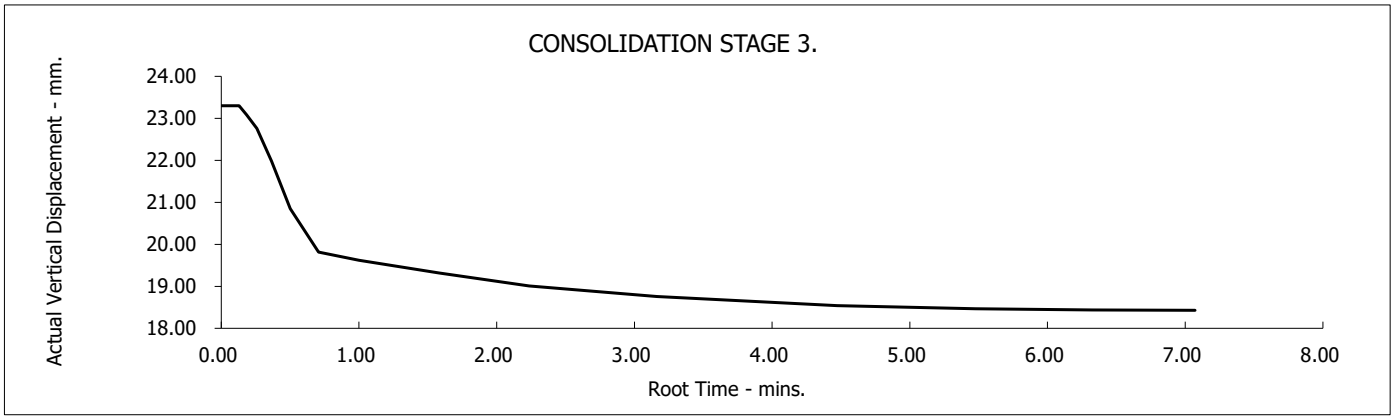
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Client Ref Number:
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Borehole Number:	S1-TP106	Depth from (m):	0.50
Sample Number :	4	Depth to (m):	0.70







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Contract No.:
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Client Ref Number:
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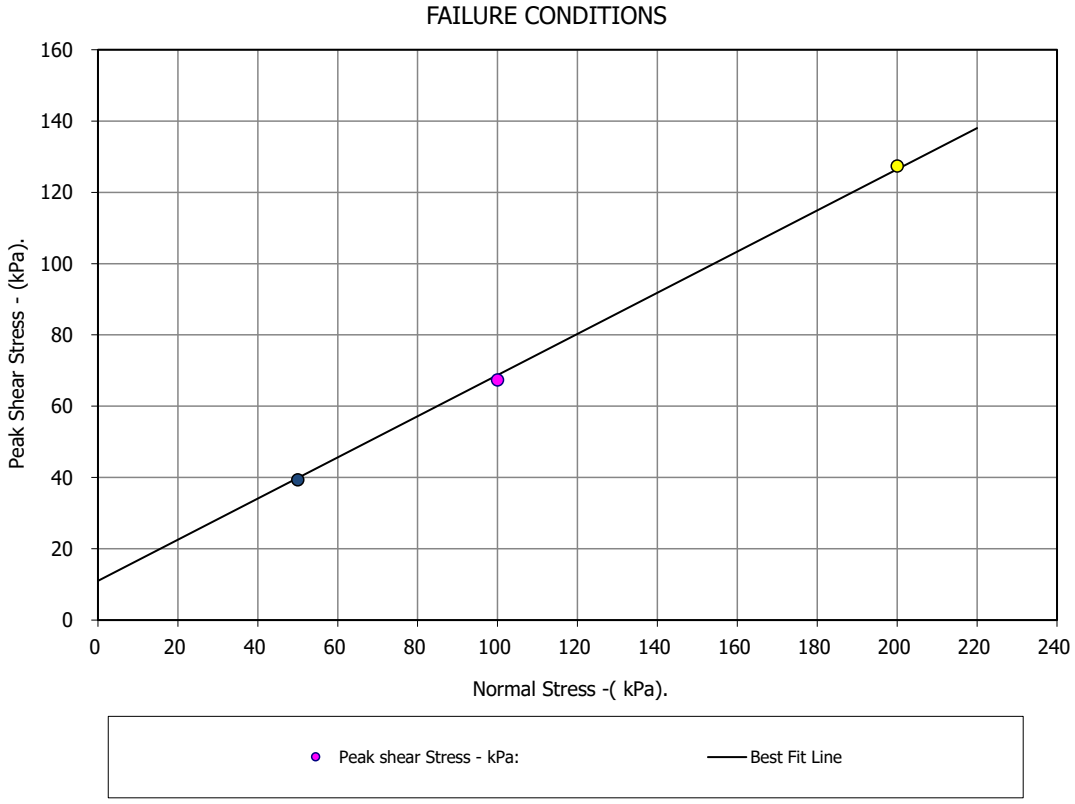
Borehole Number:	S1-TP109	Depth from (m):	0.90
Sample Number :	7.0	Depth to (m):	1.10

Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Dark Brown CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	20	20	20
Bulk Density - Mg/m3:	1.97	1.97	1.97
Dry Density - Mg/m3:	1.64	1.63	1.64
Voids Ratio:	0.6194	0.6211	0.6206
Degree of Saturation - %:	87.39	87.15	87.22
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	23.48	22.49	21.49
Shear			
Rate of Horizontal Displacement (mm/min)	0.200	0.200	0.200
Horizontal Displacement at Peak Shear Stress (mm)	4.05	6.39	9.82
Peak shear Stress - kPa:	39	67	127

PEAK	
Angle of Shearing Resistance:(θ)	**30.0**
Effective Cohesion - kPa:	**11**

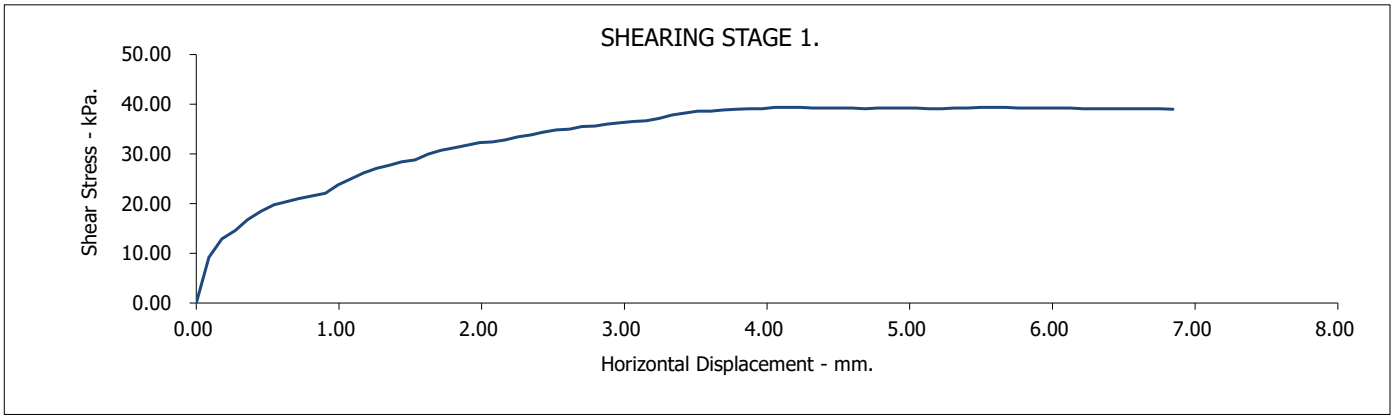


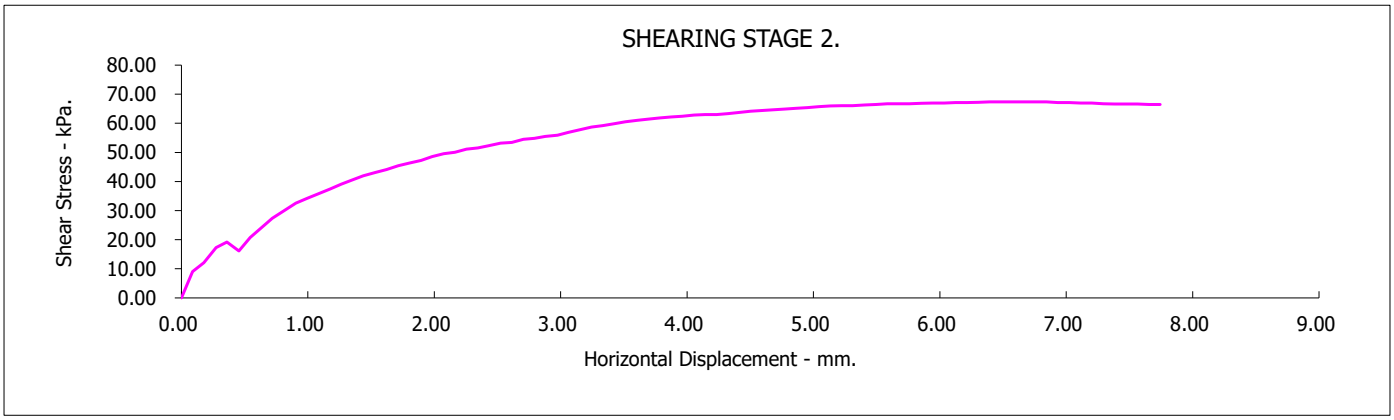
Contract No.:
63478

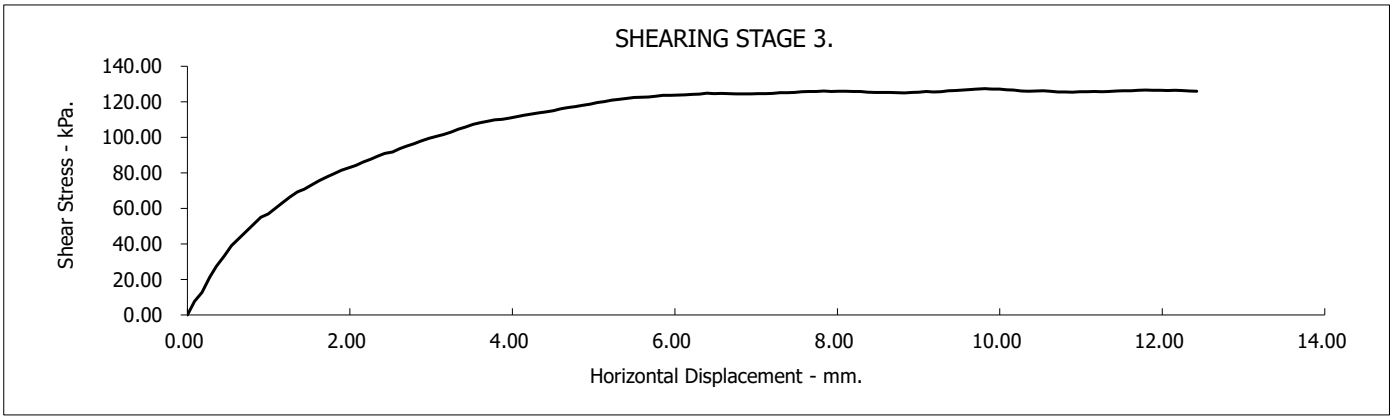
Global Centre Of Rail Excellence

Client Ref Number:
G22069

Borehole Number:	S1-TP109	Depth from (m):	0.90
Sample Number :	7	Depth to (m):	1.10







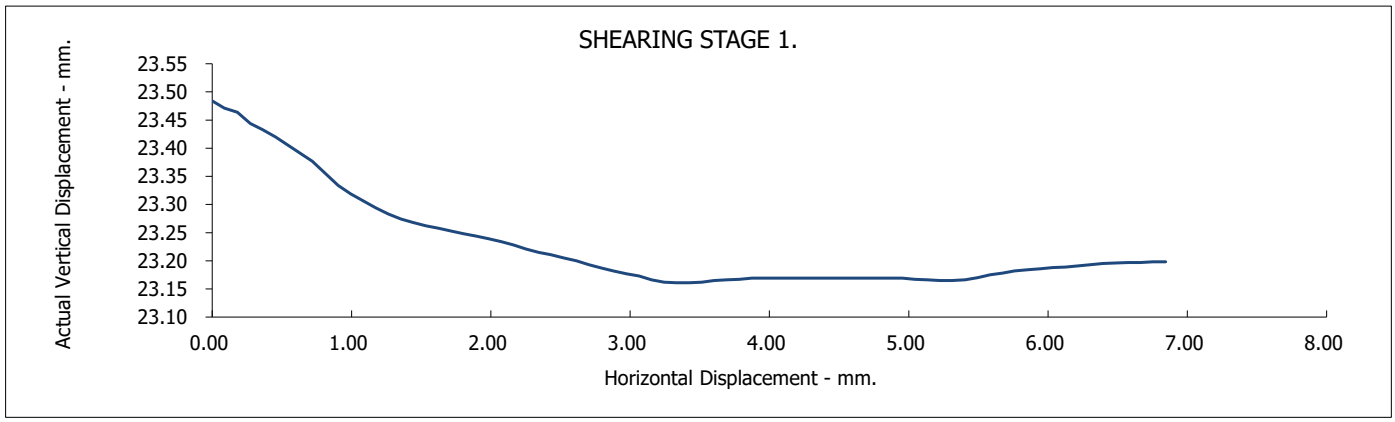
Global Centre Of Rail Excellence

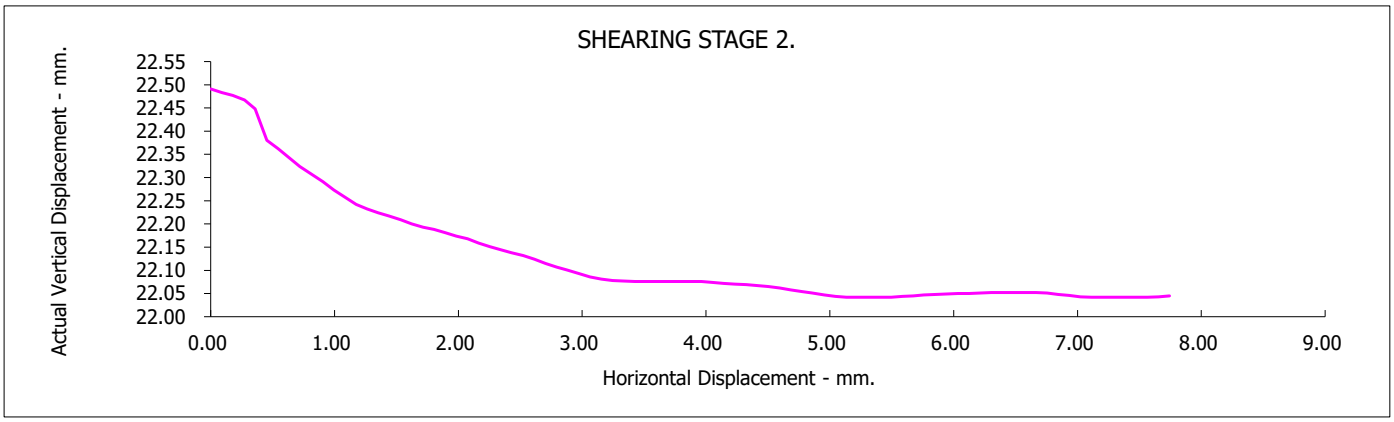
Contract No.:
63478

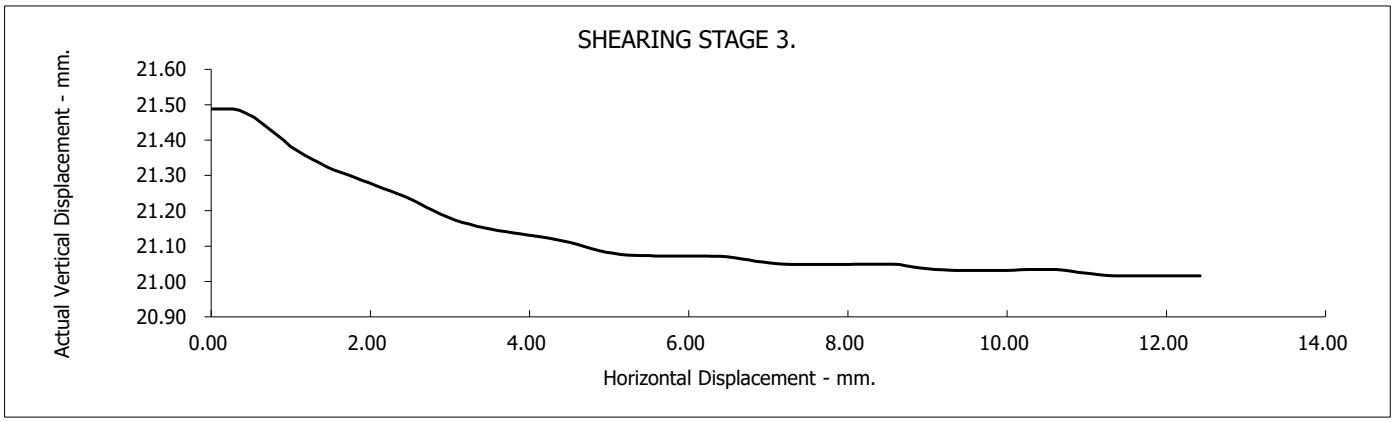
Client Ref Number:
G22069

Figure.

Borehole Number:	S1-TP109	Depth from (m):	0.90
Sample Number :	7	Depth to (m):	1.10





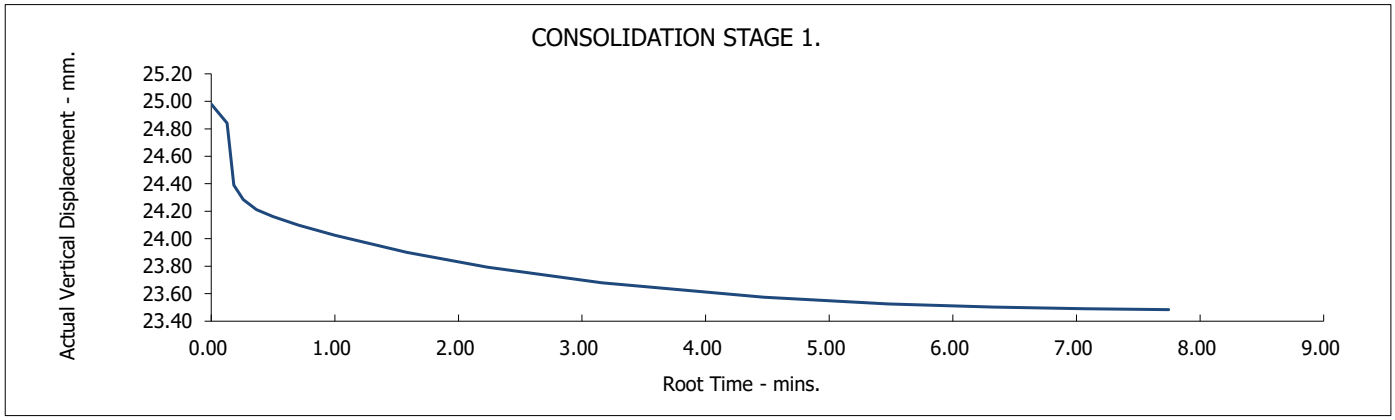


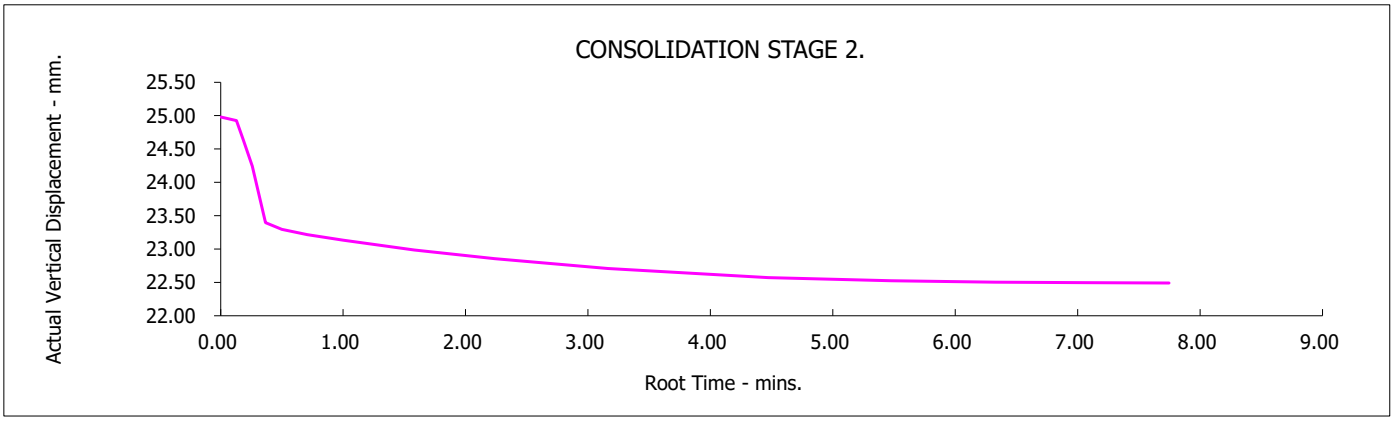
Contract No.:
63478

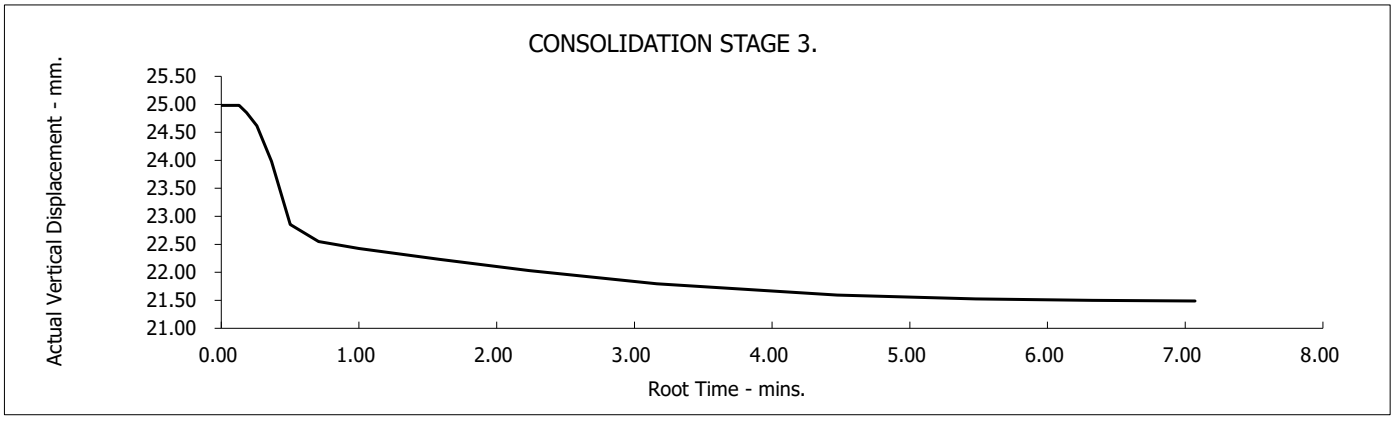
Global Centre Of Rail Excellence

Client Ref Number:
G22069

Borehole Number:	S1-TP109	Depth from (m):	0.90
Sample Number :	7	Depth to (m):	1.10







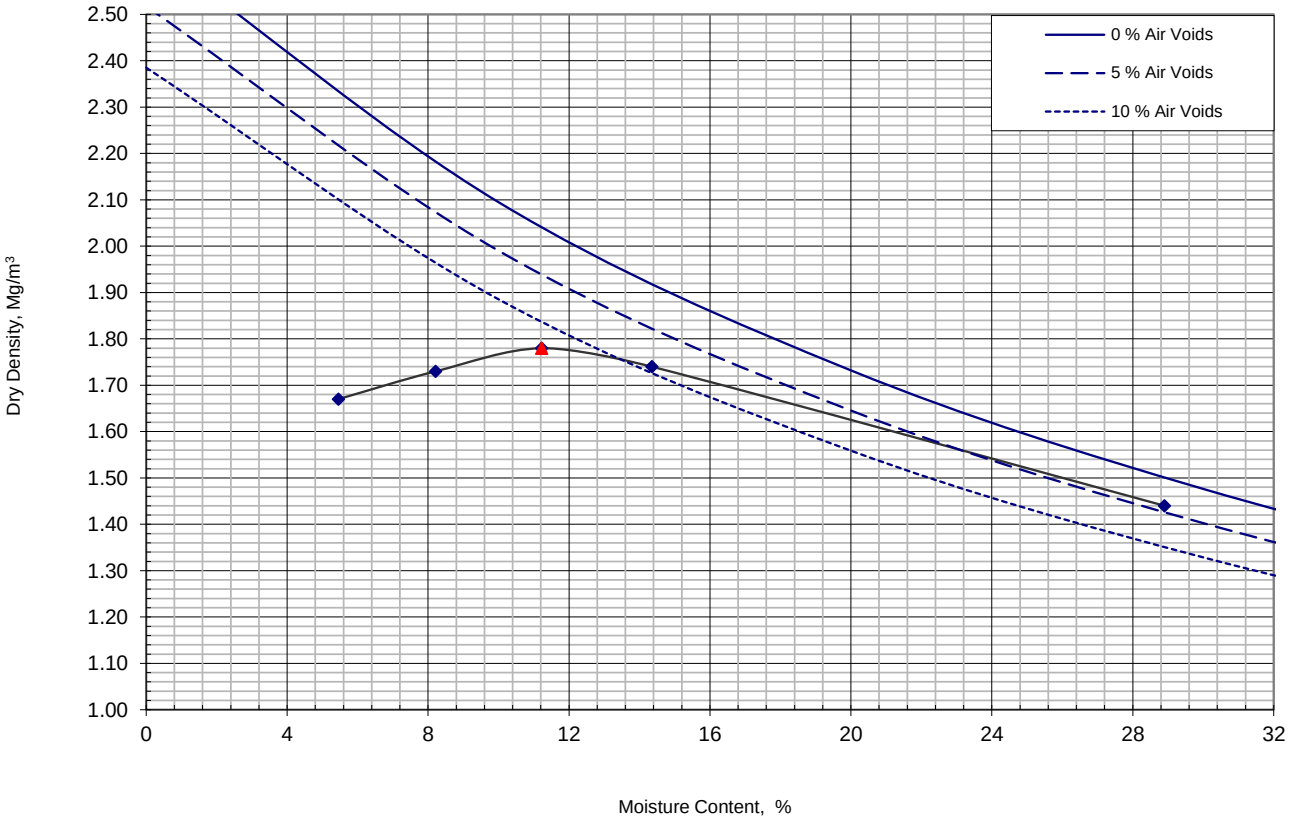
UKAS TESTING 2788

Global Centre Of Rail Excellence

Contract No.: **63478**

Client Ref Number: **G22069**

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	Dry Density / Moisture Content Relationship BS 1377:Part 4:1990	Contract Number	63478
		Borehole / Pit No	S1-BH113
Project Name	Global Centre Of Rail Excellence	Sample No	106
Date Tested	18/01/2023	Depth Top	1.40
Compaction Method	4.5 Kg Rammer	Depth Base	2.00
Compaction Clause	BS1377:Part 4:1990, Clause 3.5	Sample Type	B
Sample Description	Black clayey/silty fine to coarse sandy fine to coarse GRAVEL	Single or Separate Sample Used	Single



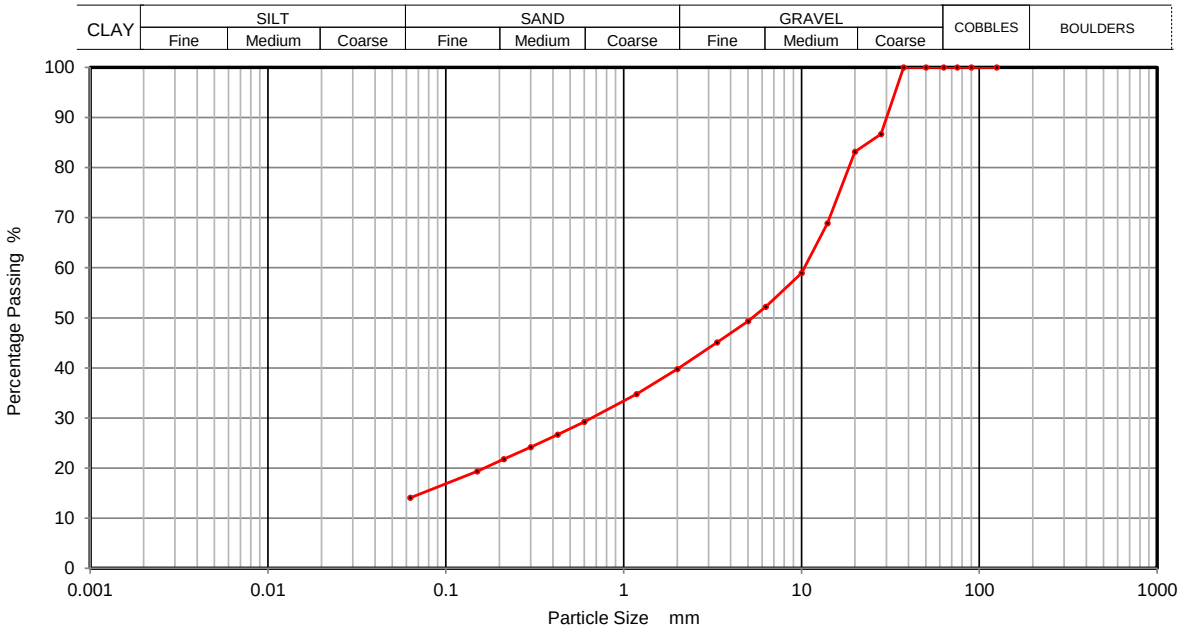
Compaction Point	1	2	3	4	5							
Moisture Content	5.5	8.2	11	14	29							
Bulk Density	1.76	1.87	1.98	1.99	1.86							
Dry Density	1.67	1.73	1.78	1.74	1.44							

Initial Moisture Content	29	%
Maximum Dry Density	1.78	Mg/m3
Optimum Moisture Content	11	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	0	%
Material Retained 20mm	9	%

Operator
Conal

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-BH108
Project Name	Global Centre Of Rail Excellence	Sample No.	3
Soil Description	Black silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.40
		Depth Base	0.85
Date Tested	19/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	87		
20	83		
14	69		
10	59		
6.3	52		
5	49		
3.35	45		
2	40		
1.18	35		
0.6	29		
0.425	27		
0.3	24		
0.212	22		
0.15	19		
0.063	14		

Sample Proportions	% dry mass
Cobbles	0
Gravel	60
Sand	26
Silt and Clay	14

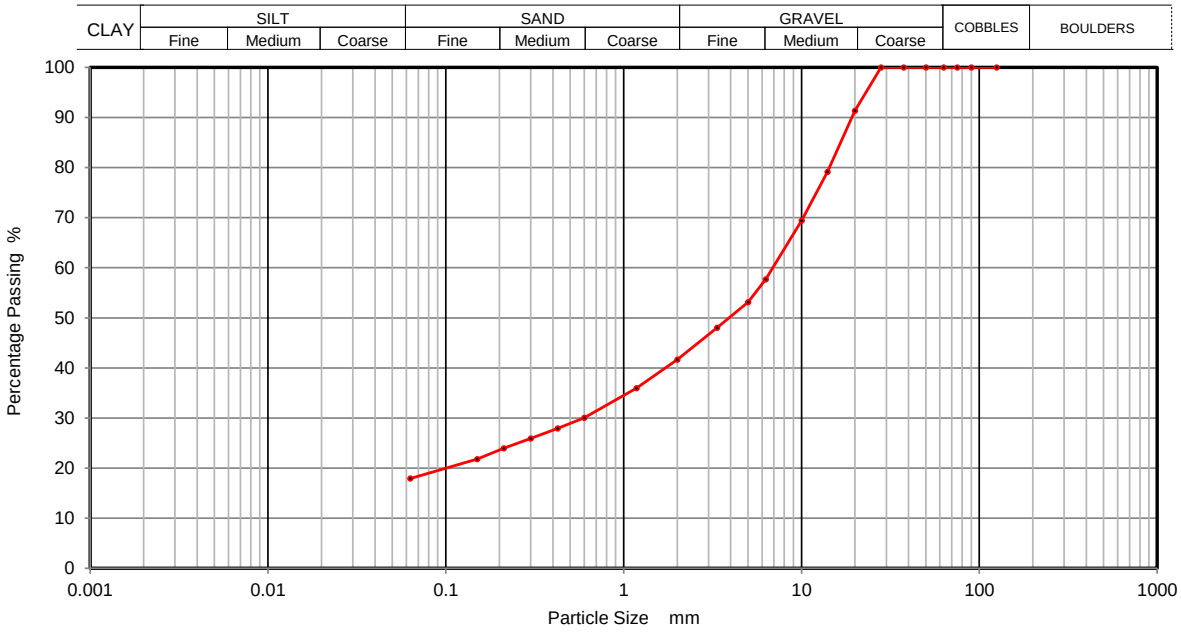
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-BH113
Project Name	Global Centre Of Rail Excellence	Sample No.	106
Soil Description	Black clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.40
		Depth Base	2.00
Date Tested	19/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	91		
14	79		
10	69		
6.3	58		
5	53		
3.35	48		
2	42		
1.18	36		
0.6	30		
0.425	28		
0.3	26		
0.212	24		
0.15	22		
0.063	18		

Sample Proportions	% dry mass
Cobbles	0
Gravel	58
Sand	24
Silt and Clay	18

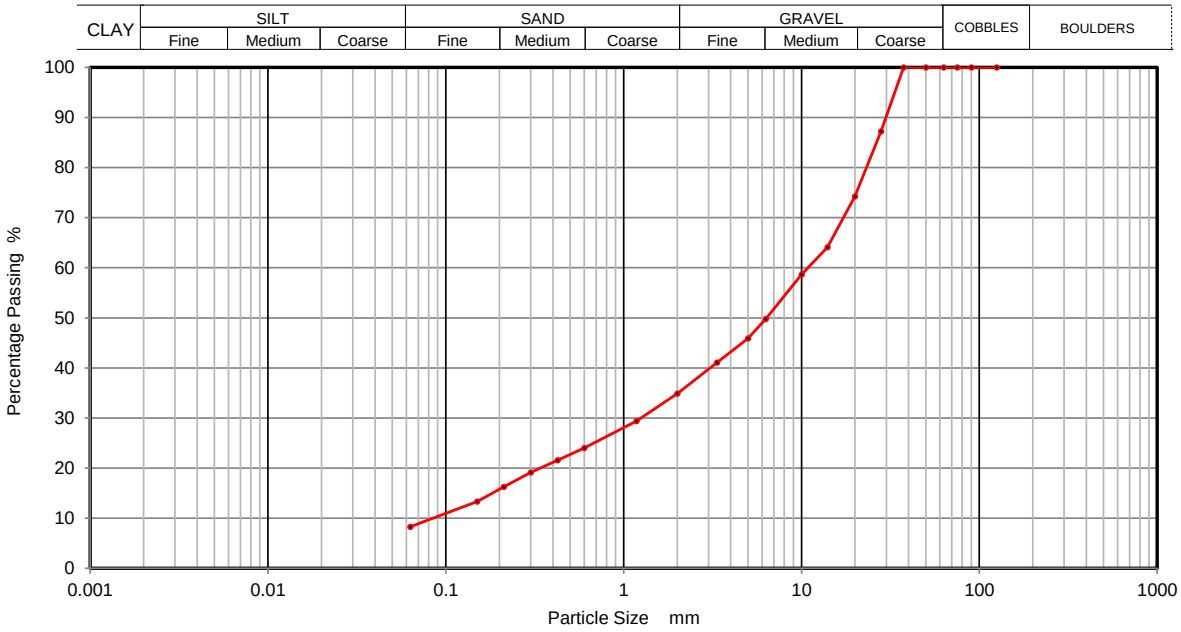
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-BH114
Project Name	Global Centre Of Rail Excellence	Sample No.	3
Soil Description	Black clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.10
		Depth Base	0.50
Date Tested	19/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	87		
20	74		
14	64		
10	59		
6.3	50		
5	46		
3.35	41		
2	35		
1.18	29		
0.6	24		
0.425	22		
0.3	19		
0.212	16		
0.15	13		
0.063	8		

Sample Proportions	% dry mass
Cobbles	0
Gravel	65
Sand	27
Silt and Clay	8

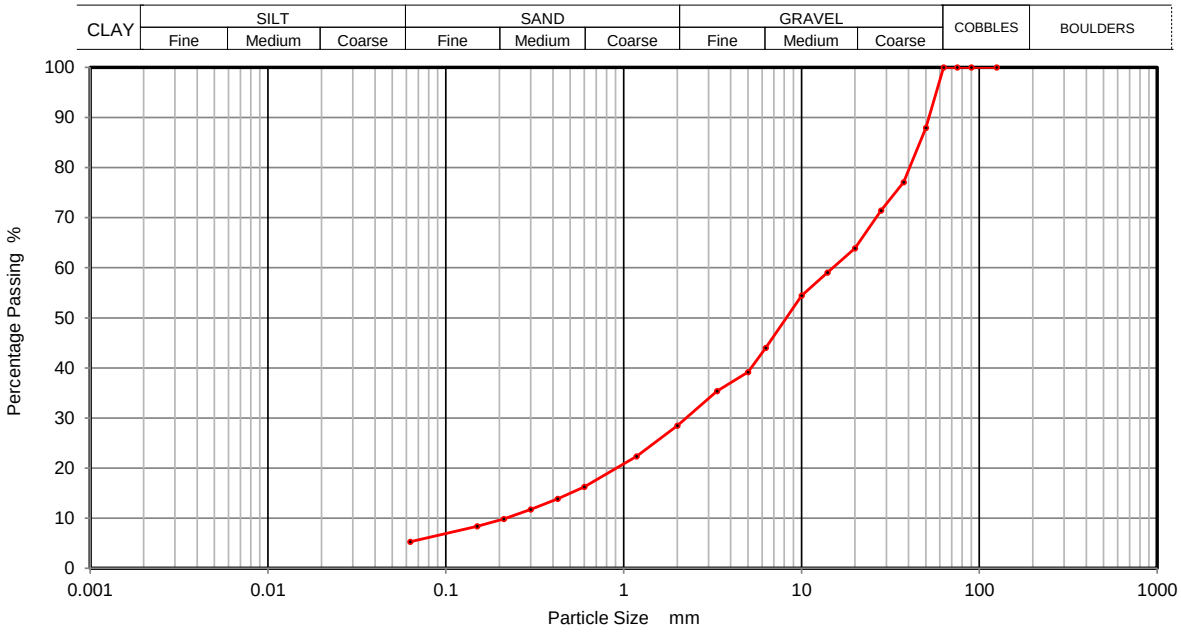
Remarks

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David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP101
Project Name	Global Centre Of Rail Excellence	Sample No.	6
Soil Description	Grey clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.50
		Depth Base	0.80
Date Tested	19/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	88		
37.5	77		
28	71		
20	64		
14	59		
10	54		
6.3	44		
5	39		
3.35	35		
2	28		
1.18	22		
0.6	16		
0.425	14		
0.3	12		
0.212	10		
0.15	8		
0.063	5		

Sample Proportions	% dry mass
Cobbles	0
Gravel	72
Sand	23
Silt and Clay	5

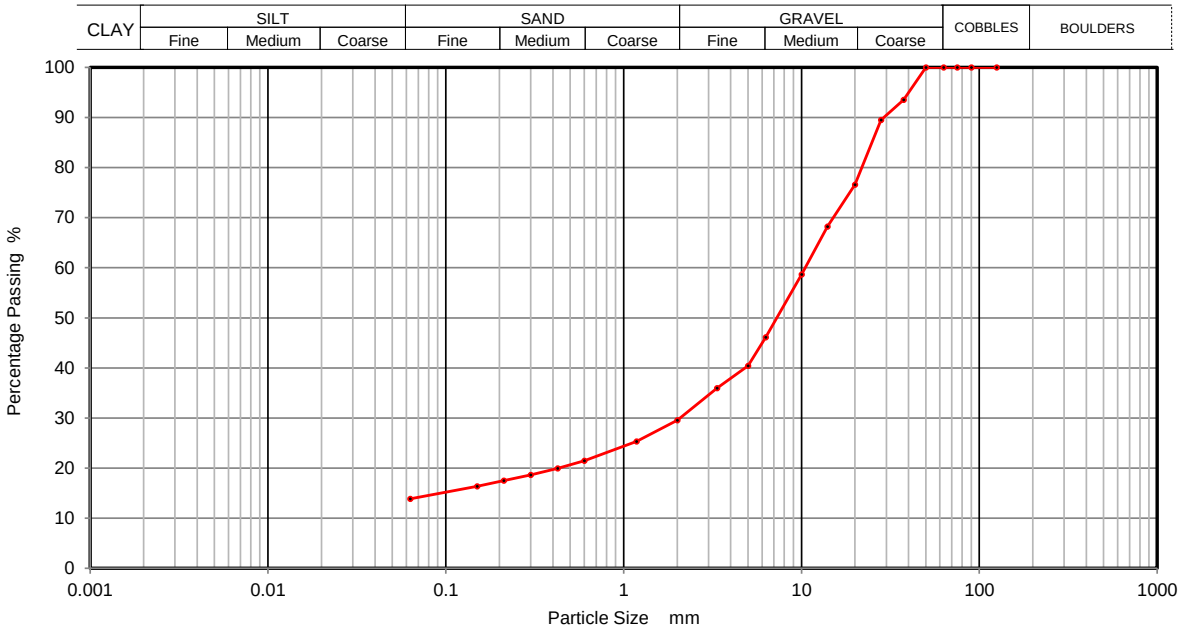
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP102
Project Name	Global Centre Of Rail Excellence	Sample No.	6
Soil Description	Grey silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.40
		Depth Base	0.60
Date Tested	19/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	94		
28	90		
20	77		
14	68		
10	59		
6.3	46		
5	40		
3.35	36		
2	30		
1.18	25		
0.6	21		
0.425	20		
0.3	19		
0.212	17		
0.15	16		
0.063	14		

Sample Proportions	% dry mass
Cobbles	0
Gravel	70
Sand	16
Silt and Clay	14

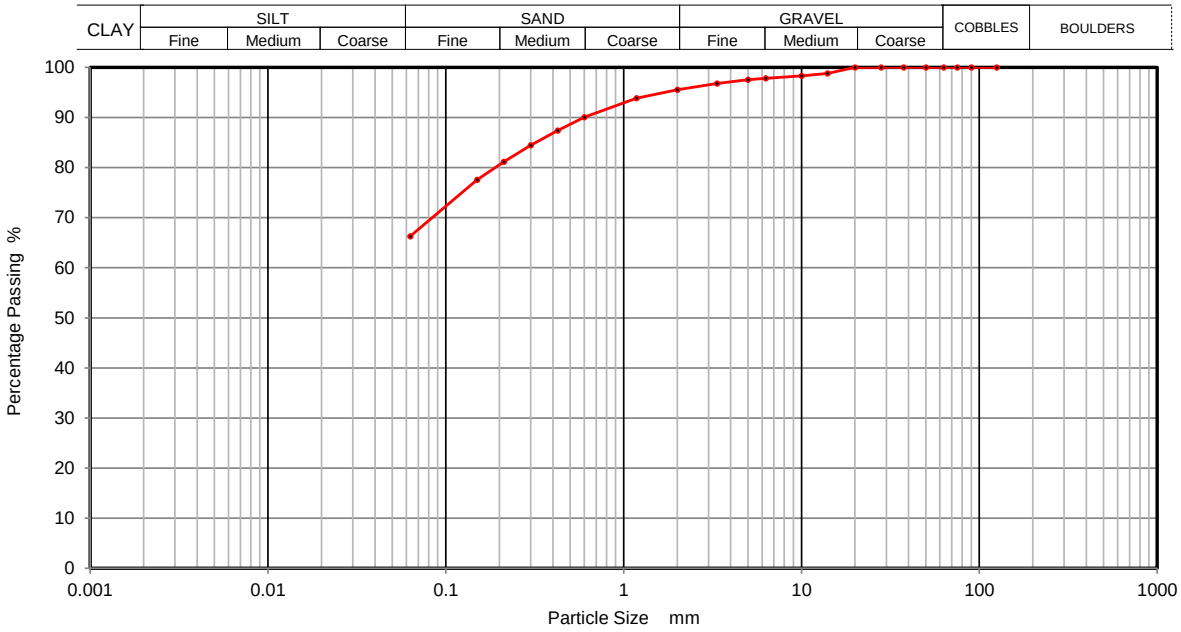
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP102
Project Name	Global Centre Of Rail Excellence	Sample No.	9
Soil Description	Brown slightly fine to medium gravelly fine to coarse sandy SILT/CLAY	Depth Top	0.90
		Depth Base	1.10
Date Tested	19/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	98		
5	98		
3.35	97		
2	96		
1.18	94		
0.6	90		
0.425	87		
0.3	84		
0.212	81		
0.15	78		
0.063	66		

Sample Proportions	% dry mass
Cobbles	0
Gravel	4
Sand	30
Silt and Clay	66

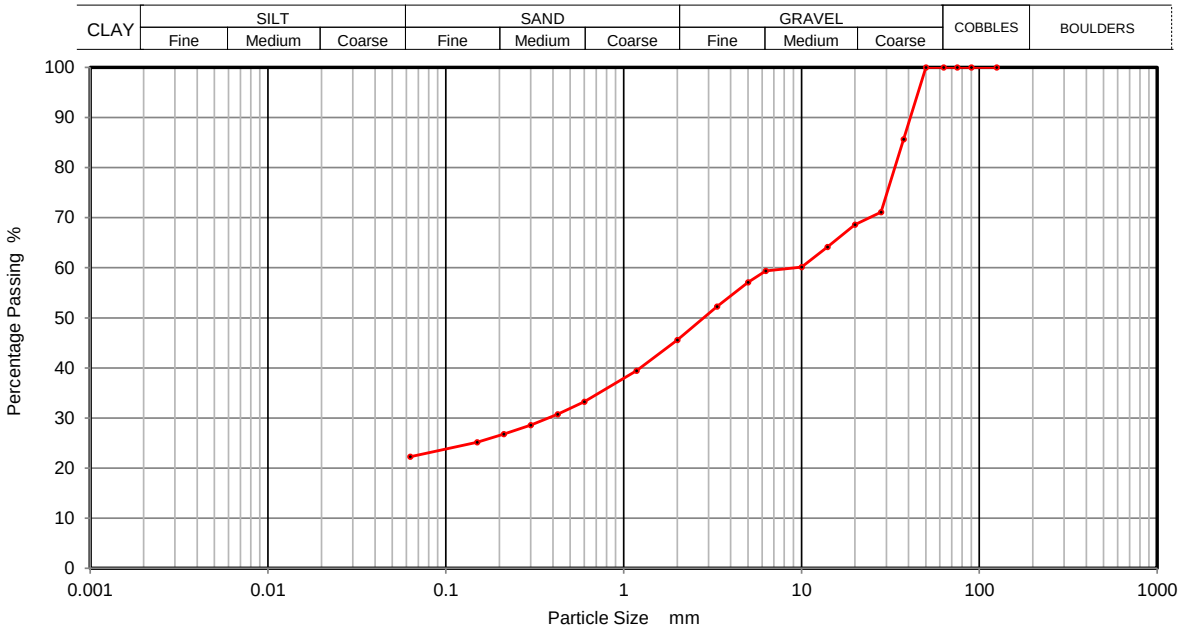
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP103
Project Name	Global Centre Of Rail Excellence	Sample No.	8
Soil Description	Brown grey silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.00
		Depth Base	1.20
Date Tested	19/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	86		
28	71		
20	69		
14	64		
10	60		
6.3	59		
5	57		
3.35	52		
2	46		
1.18	39		
0.6	33		
0.425	31		
0.3	29		
0.212	27		
0.15	25		
0.063	22		

Sample Proportions	% dry mass
Cobbles	0
Gravel	54
Sand	24
Silt and Clay	22

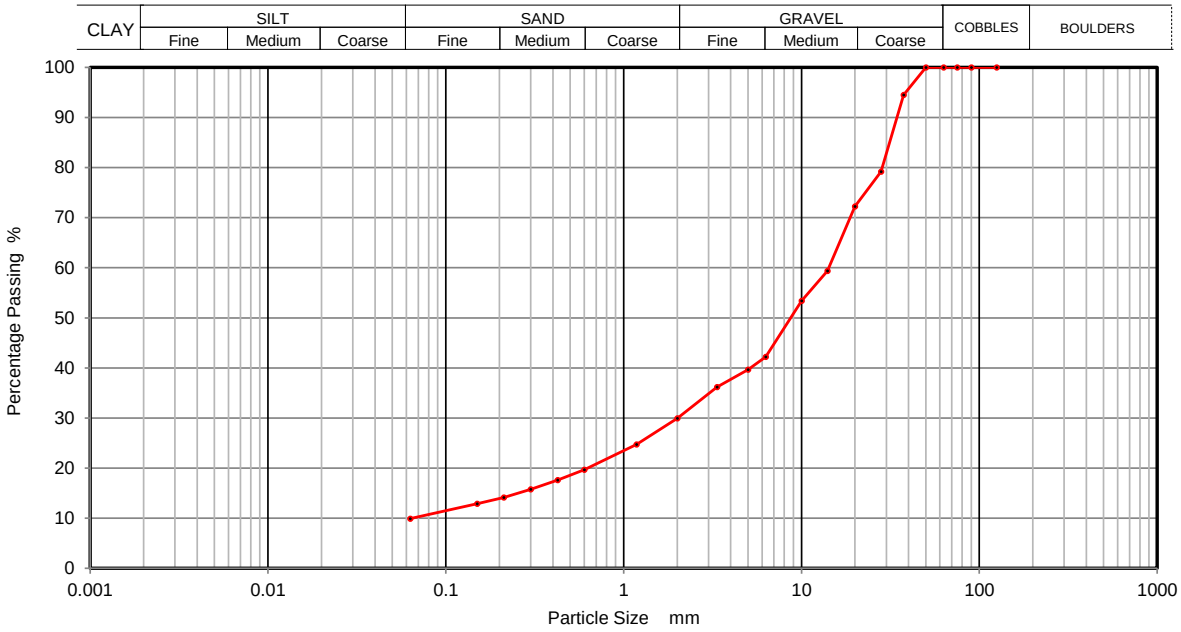
Remarks

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Operator
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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP104
Project Name	Global Centre Of Rail Excellence	Sample No.	4
Soil Description	Grey silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.50
		Depth Base	0.70
Date Tested	19/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	95		
28	79		
20	72		
14	59		
10	53		
6.3	42		
5	40		
3.35	36		
2	30		
1.18	25		
0.6	20		
0.425	18		
0.3	16		
0.212	14		
0.15	13		
0.063	10		

Sample Proportions	% dry mass
Cobbles	0
Gravel	70
Sand	20
Silt and Clay	10

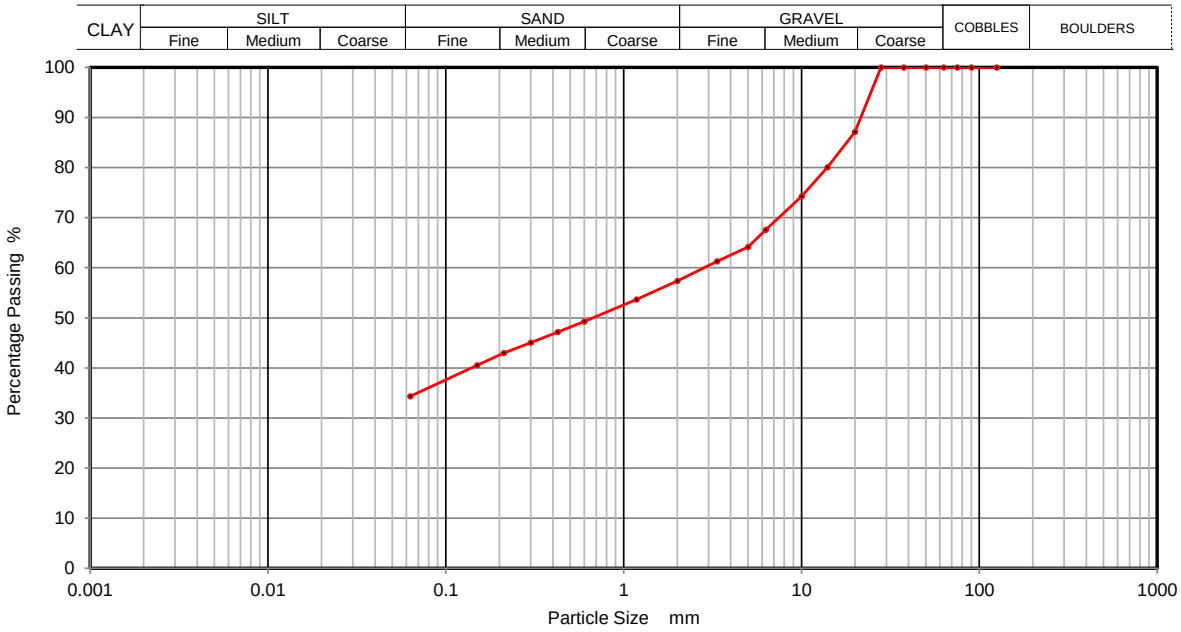
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP106
Project Name	Global Centre Of Rail Excellence	Sample No.	5
Soil Description	Brown fine to coarse sandy silty/clayey fine to coarse GRAVEL	Depth Top	0.50
		Depth Base	0.60
Date Tested	19/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	87		
14	80		
10	74		
6.3	68		
5	64		
3.35	61		
2	57		
1.18	54		
0.6	49		
0.425	47		
0.3	45		
0.212	43		
0.15	41		
0.063	34		

Sample Proportions	% dry mass
Cobbles	0
Gravel	43
Sand	23
Silt and Clay	34

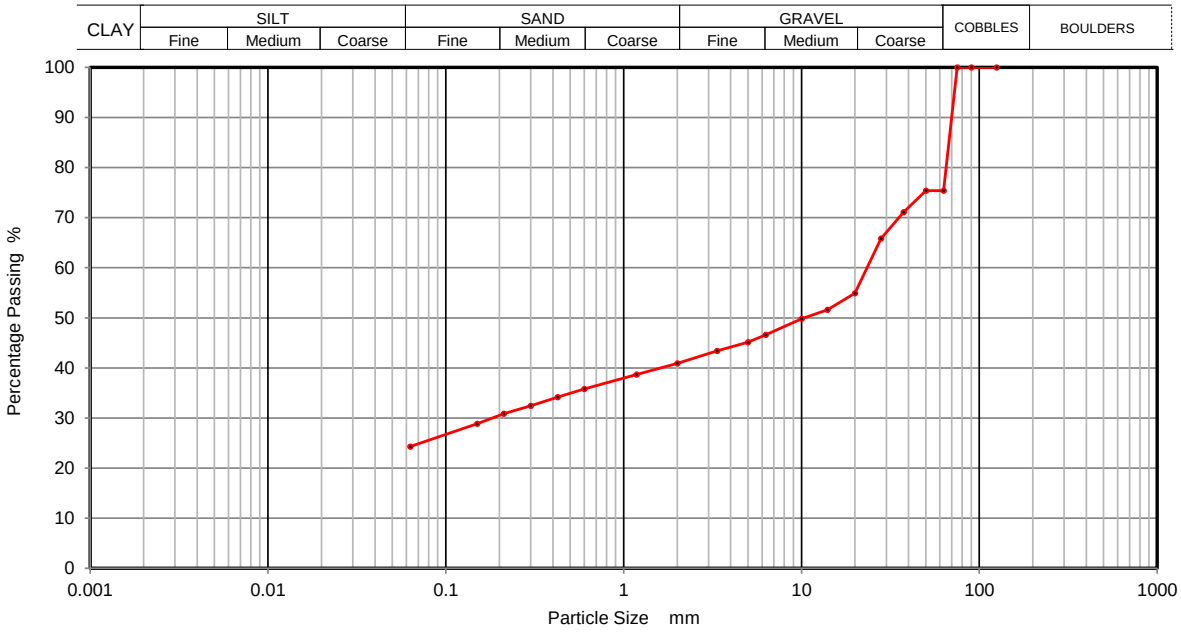
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP106
Project Name	Global Centre Of Rail Excellence	Sample No.	7
Soil Description	Brown fine to coarse sandy silty/clayey fine to coarse GRAVEL (with cobbles)	Depth Top	0.80
		Depth Base	1.00
Date Tested	19/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	75		
50	75		
37.5	71		
28	66		
20	55		
14	52		
10	50		
6.3	47		
5	45		
3.35	43		
2	41		
1.18	39		
0.6	36		
0.425	34		
0.3	32		
0.212	31		
0.15	29		
0.063	24		

Sample Proportions	% dry mass
Cobbles	25
Gravel	34
Sand	17
Silt and Clay	24

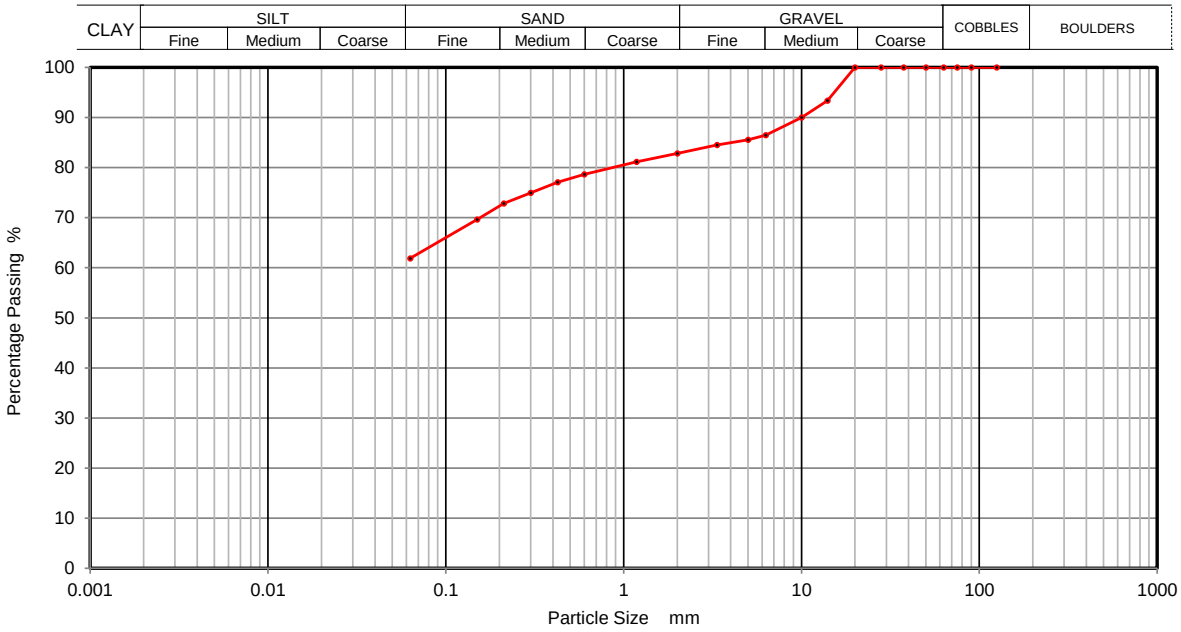
Remarks

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Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP106
Project Name	Global Centre Of Rail Excellence	Sample No.	13
Soil Description	Brown fine to medium gravelly fine to coarse sandy SILT/CLAY	Depth Top	1.90
		Depth Base	2.10
Date Tested	19/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	93		
10	90		
6.3	86		
5	86		
3.35	85		
2	83		
1.18	81		
0.6	79		
0.425	77		
0.3	75		
0.212	73		
0.15	70		
0.063	62		

Sample Proportions	% dry mass
Cobbles	0
Gravel	17
Sand	21
Silt and Clay	62

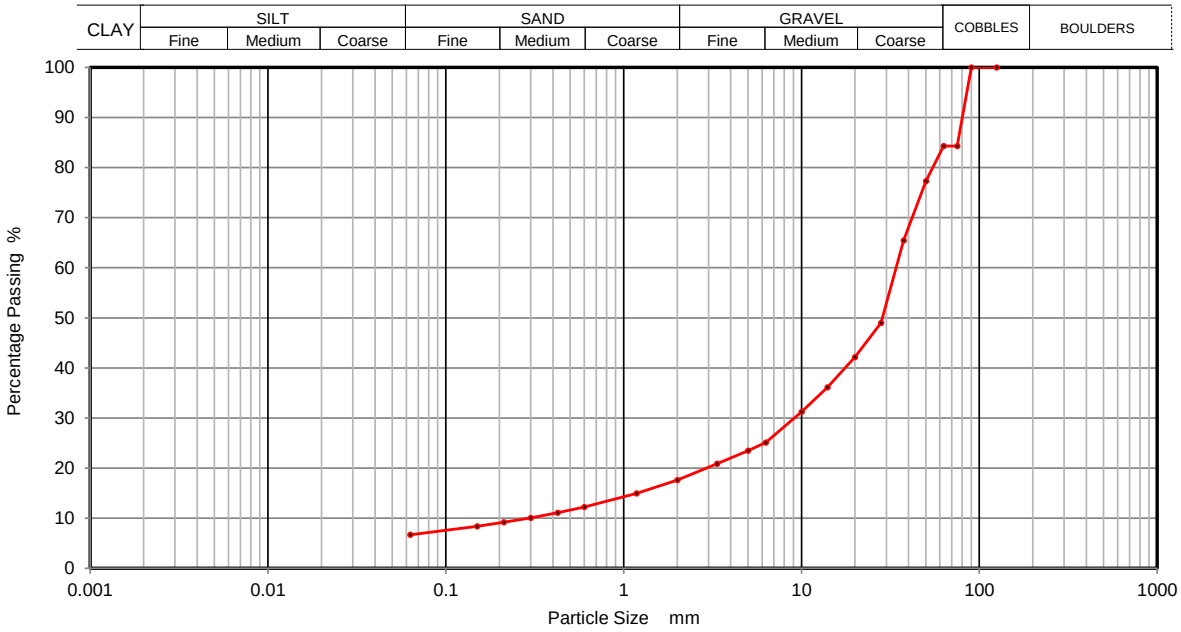
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP109
Project Name	Global Centre Of Rail Excellence	Sample No.	4
Soil Description	Grey silty/clayey fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	0.50
		Depth Base	0.70
Date Tested	19/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	84		
63	84		
50	77		
37.5	65		
28	49		
20	42		
14	36		
10	31		
6.3	25		
5	23		
3.35	21		
2	18		
1.18	15		
0.6	12		
0.425	11		
0.3	10		
0.212	9		
0.15	8		
0.063	7		

Sample Proportions	% dry mass
Cobbles	16
Gravel	66
Sand	11
Silt and Clay	7

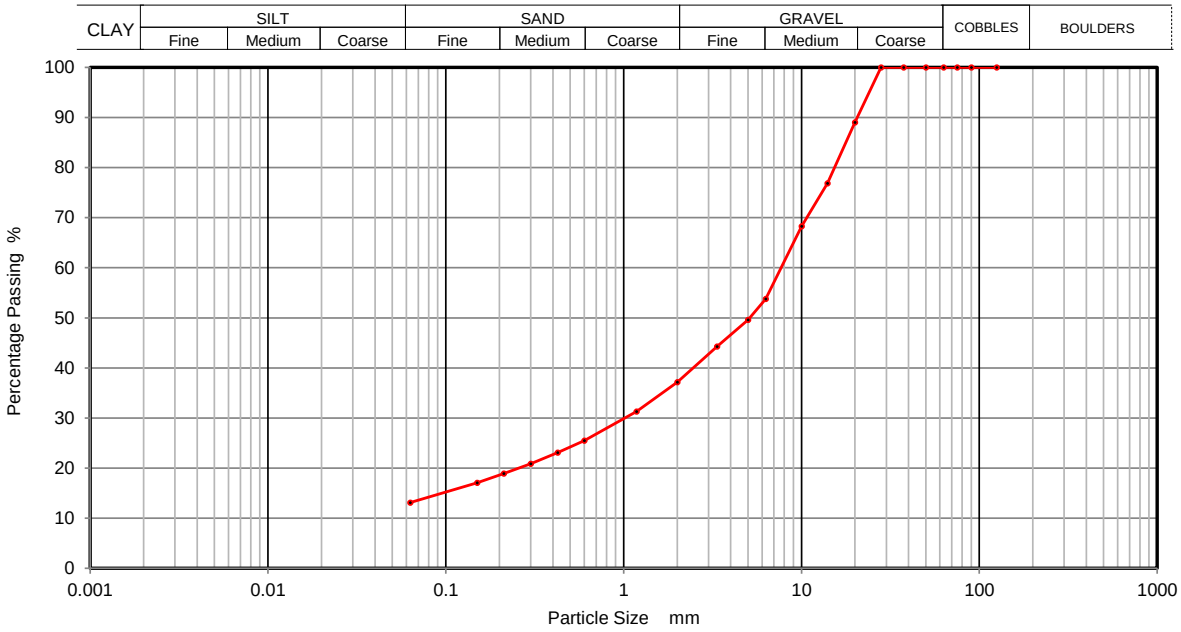
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP109
Project Name	Global Centre Of Rail Excellence	Sample No.	8
Soil Description	Grey silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.90
		Depth Base	1.00
Date Tested	19/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	89		
14	77		
10	68		
6.3	54		
5	50		
3.35	44		
2	37		
1.18	31		
0.6	25		
0.425	23		
0.3	21		
0.212	19		
0.15	17		
0.063	13		

Sample Proportions	% dry mass
Cobbles	0
Gravel	63
Sand	24
Silt and Clay	13

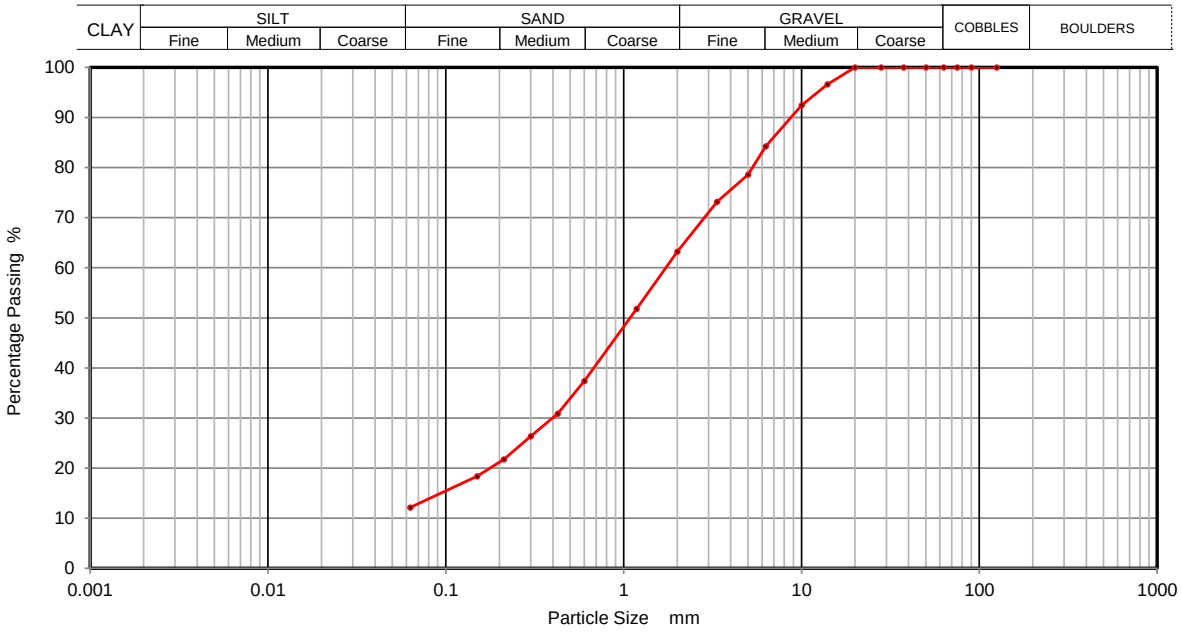
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP110
Project Name	Global Centre Of Rail Excellence	Sample No.	3
Soil Description	Brown organic silty/clayey fine to medium gravelly fine to coarse SAND (with rootlets)	Depth Top	0.00
		Depth Base	0.15
Date Tested	19/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	97		
10	92		
6.3	84		
5	79		
3.35	73		
2	63		
1.18	52		
0.6	37		
0.425	31		
0.3	26		
0.212	22		
0.15	18		
0.063	12		

Sample Proportions	% dry mass
Cobbles	0
Gravel	37
Sand	51
Silt and Clay	12

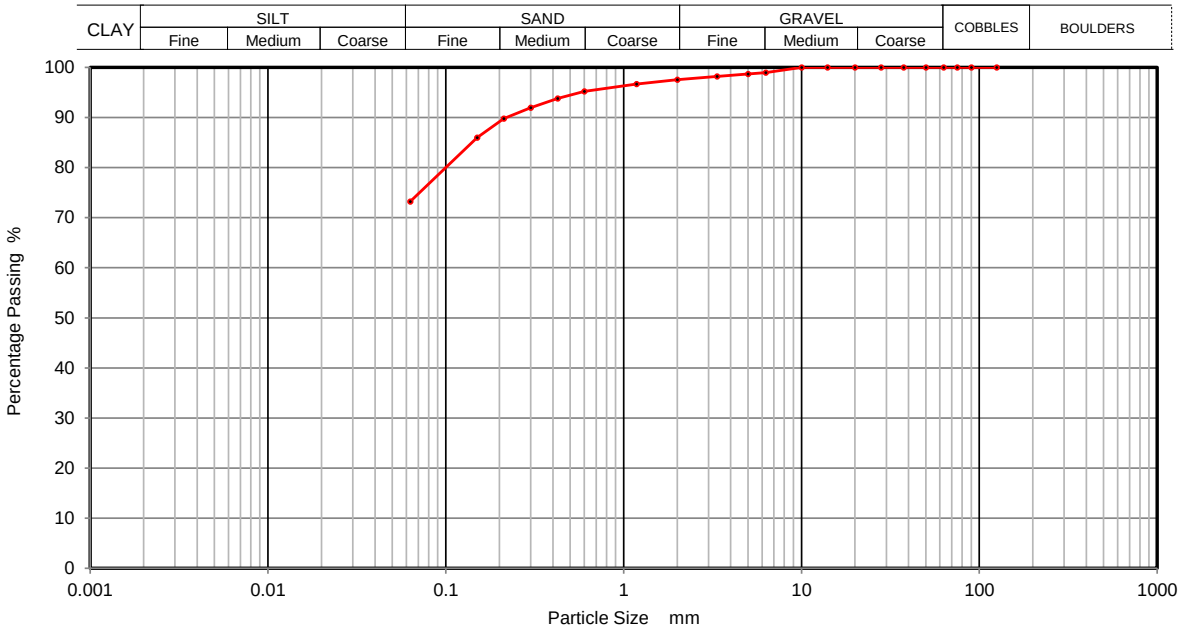
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP110
Project Name	Global Centre Of Rail Excellence	Sample No.	9
Soil Description	Brown slightly fine to medium gravelly fine to coarse sandy SILT/CLAY	Depth Top	0.90
		Depth Base	1.00
Date Tested	19/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	98		
2	98		
1.18	97		
0.6	95		
0.425	94		
0.3	92		
0.212	90		
0.15	86		
0.063	73		

Sample Proportions	% dry mass
Cobbles	0
Gravel	2
Sand	25
Silt and Clay	73

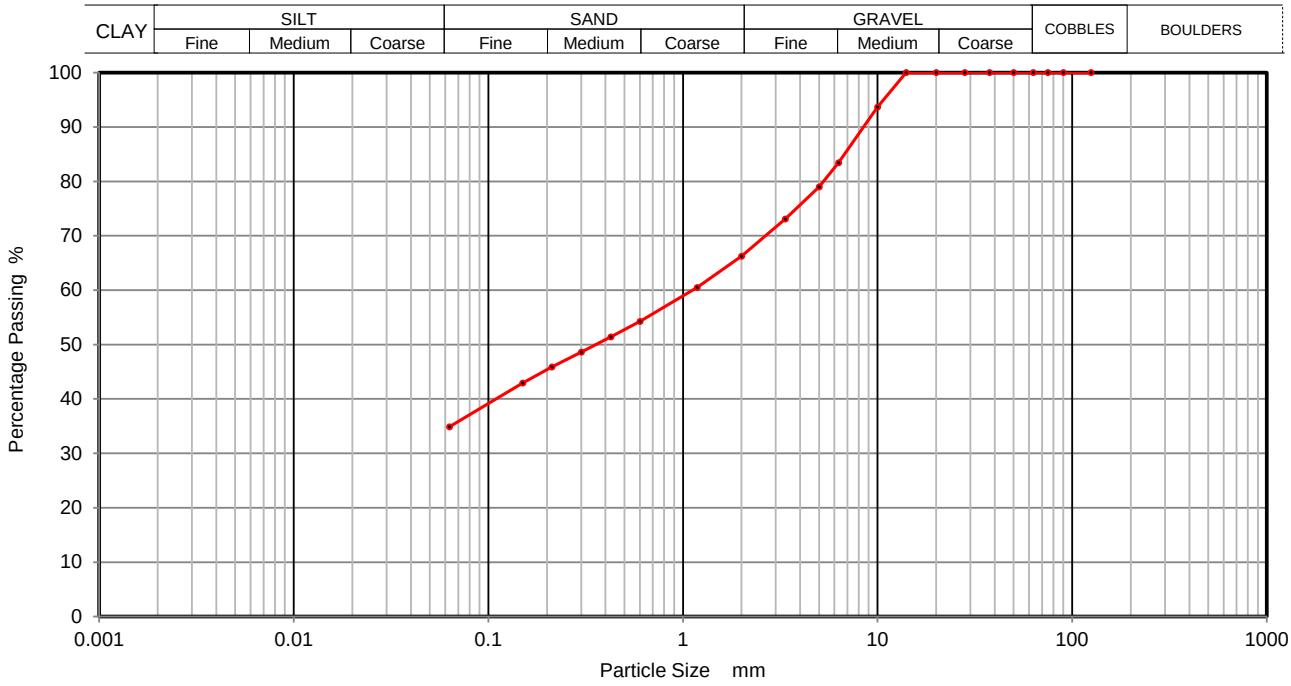
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-BH108
Project Name	Global Centre Of Rail Excellence	Sample No.	102
Soil Description	Brown fine to coarse sandy fine to medium gravelly silty CLAY	Depth Top	1.00
		Depth Base	2.00
Date Tested	04/03/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	94		
6.3	83		
5	79		
3.35	73		
2	66		
1.18	60		
0.6	54		
0.425	51		
0.3	49		
0.212	46		
0.15	43		
0.063	35		

Sample Proportions	% dry mass
Cobbles	0
Gravel	34
Sand	31
Silt and Clay	35

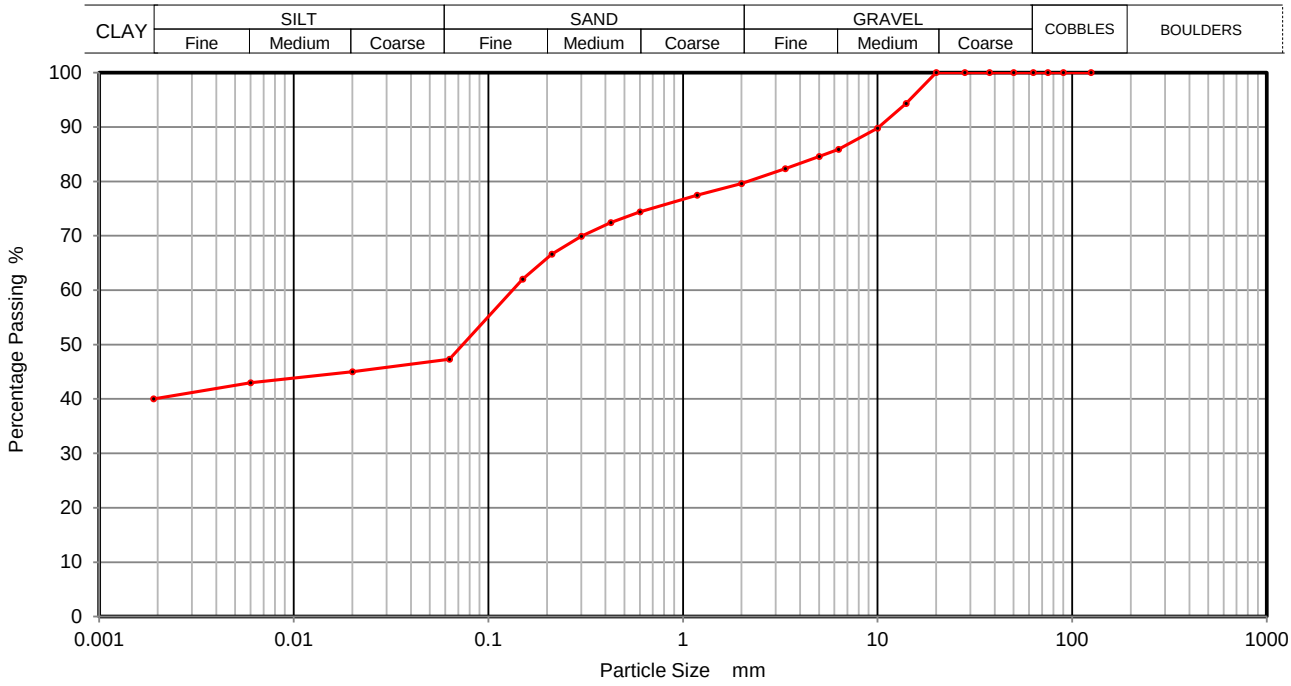
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	63478
		Borehole/Pit No.	S1-BH113
Project Name	Global Centre Of Rail Excellence	Sample No.	116
Soil Description	Brown slightly silty fine to medium gravelly fine to coarse sandy CLAY	Depth Top	6.70
		Depth Base	6.80
Date Tested	04/03/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	45
90	100	0.0060	43
75	100	0.0020	40
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	94		
10	90		
6.3	86		
5	85		
3.35	82		
2	80		
1.18	77		
0.6	74		
0.425	72		
0.3	70		
0.212	67		
0.15	62		
0.063	47		

Sample Proportions	% dry mass
Cobbles	0
Gravel	20
Sand	33
Silt	7
Clay	40

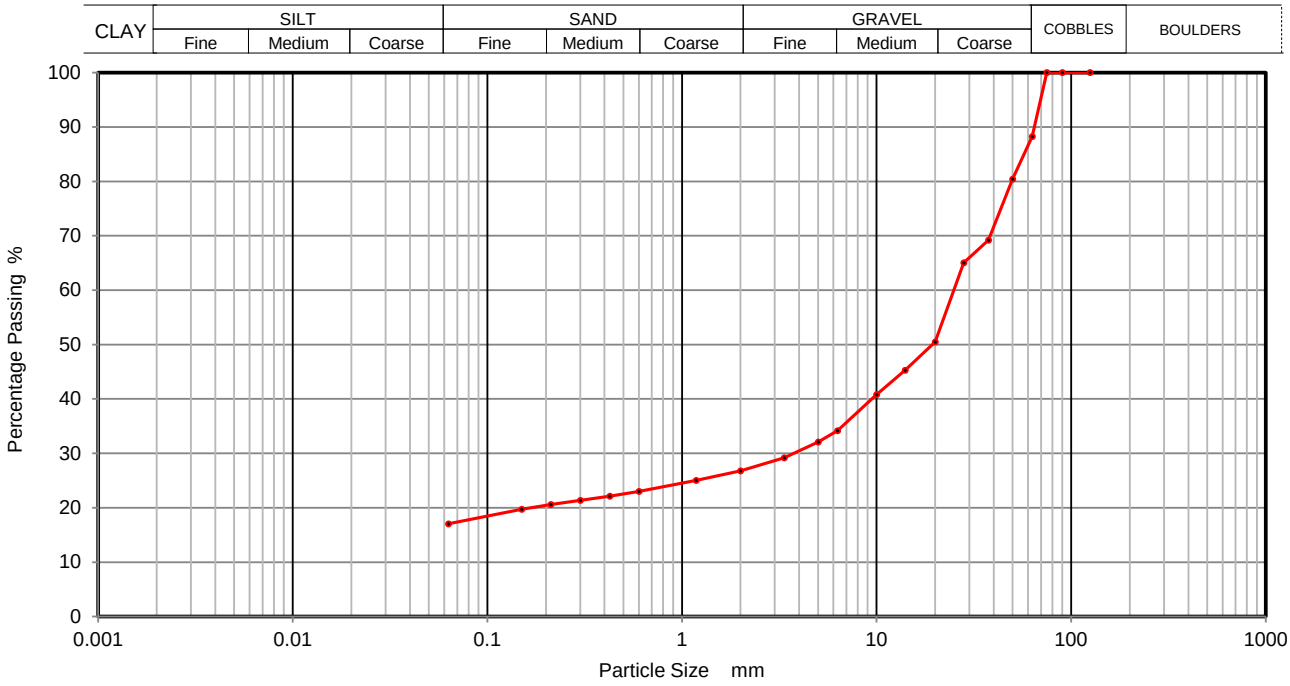
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP102
Project Name	Global Centre Of Rail Excellence	Sample No.	14
Soil Description	Brown fine to coarse sandy silty/clay fine to coarse GRAVEL with cobbles	Depth Top	1.90
		Depth Base	2.10
Date Tested	04/03/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	88		
50	80		
37.5	69		
28	65		
20	50		
14	45		
10	41		
6.3	34		
5	32		
3.35	29		
2	27		
1.18	25		
0.6	23		
0.425	22		
0.3	21		
0.212	21		
0.15	20		
0.063	17		

Sample Proportions	% dry mass
Cobbles	12
Gravel	61
Sand	10
Silt and Clay	17

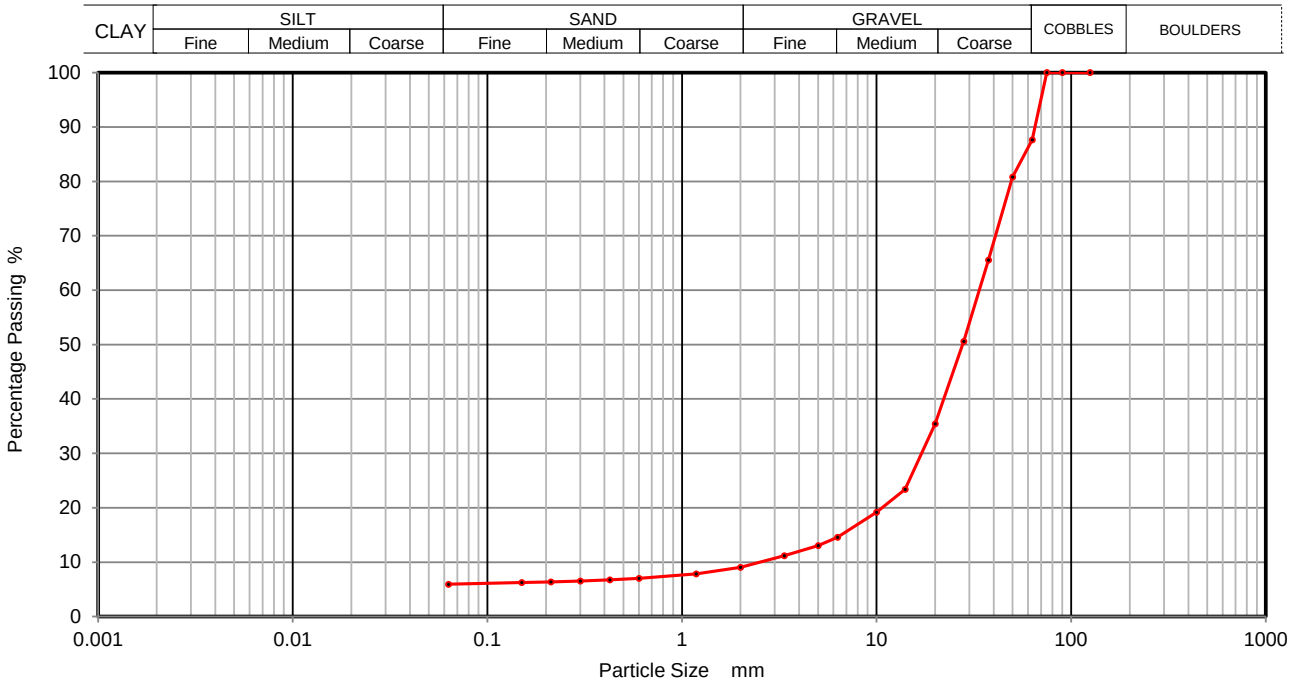
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP102
Project Name	Global Centre Of Rail Excellence	Sample No.	17
Soil Description	Brown slightly fine to coarse sandy slightly silty/clay fine to coarse GRAVEL with cobbles	Depth Top	2.90
		Depth Base	3.10
Date Tested	04/03/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	88		
50	81		
37.5	66		
28	51		
20	35		
14	23		
10	19		
6.3	15		
5	13		
3.35	11		
2	9		
1.18	8		
0.6	7		
0.425	7		
0.3	7		
0.212	6		
0.15	6		
0.063	6		

Sample Proportions	% dry mass
Cobbles	12
Gravel	79
Sand	3
Silt and Clay	6

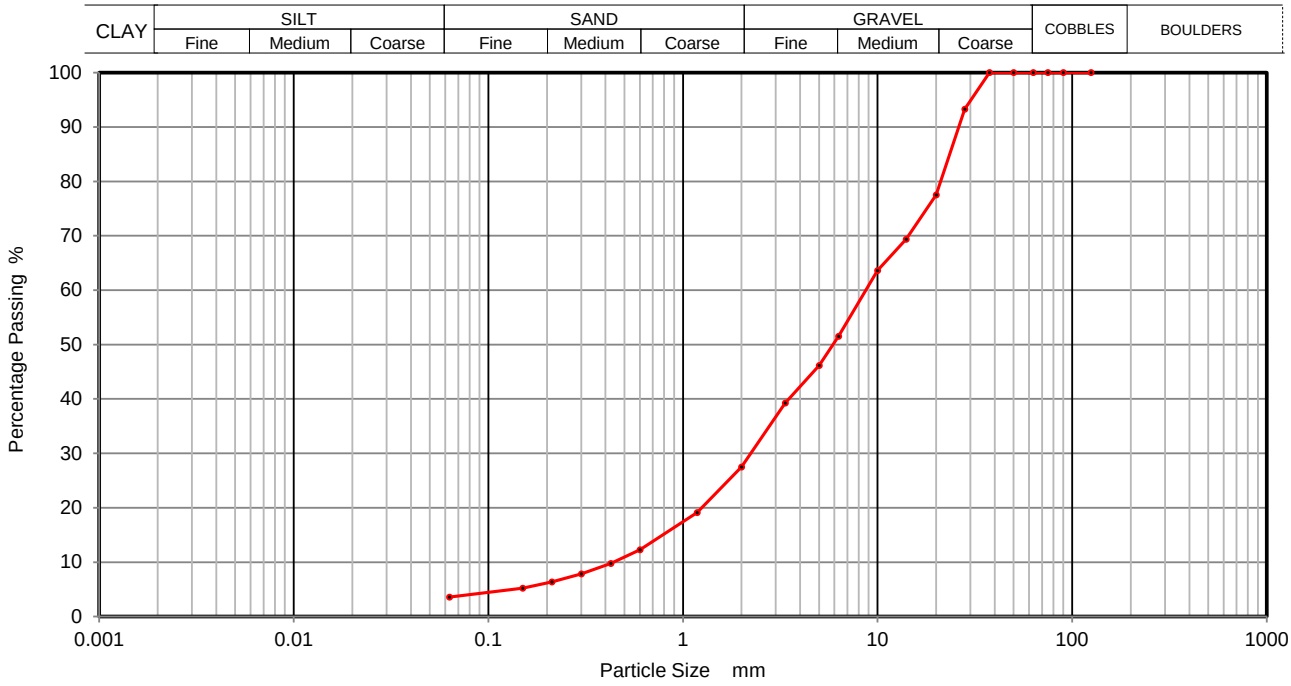
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	63478
		Borehole/Pit No.	S1-TP104
Project Name	Global Centre Of Rail Excellence	Sample No.	10
Soil Description	Black slightly silty/clay fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.50
		Depth Base	1.70
Date Tested	04/03/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	93		
20	78		
14	69		
10	64		
6.3	52		
5	46		
3.35	39		
2	27		
1.18	19		
0.6	12		
0.425	10		
0.3	8		
0.212	6		
0.15	5		
0.063	4		

Sample Proportions	% dry mass
Cobbles	0
Gravel	73
Sand	23
Silt and Clay	4

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

Point Load Test

The complete ISRM suggested methods for rock characterization, testing and monitoring 1974-2006
Determining Point Load Strength

Contract Number	63478
Project Name	Global Centre Of Rail Excellence
Sample Type	Core
Date Tested	06/01/2023

*Please note that GSTL is not accredited for the water content of rock

Hole Reference	Depth (m)			Test Type		Width	Platen Seperation	Failure Load	Equivalent Diameter	Point Load	Size Factor	Point Load Index	Moisture Content	Description	Angle Between Plane of Anisotropy & Core Axis	Type of Anisotropy (Bedding or Cleavage)
				d / a / b / i	I //											
S1-BH113	13.25	-	13.39	d			102	0.22		0.02	1.38	0.03	3.8	SILTSTONE		
S1-BH114	6.20	-	6.32	i		77	46	4.61	67.16	1.02	1.14	1.17	1.7	SILTSTONE		
S1-BH114	8.10	-	8.17	i		90	63	0.30	84.97	0.04	1.27	0.05	2.1	SILTSTONE		
S1-BH114	8.70	-	8.90	d			105	1.03		0.09	1.40	0.13	1.1	SILTSTONE		

Key	Reported As
Width	(W) mm
Platen Separation	(D) mm
Failure Load	(P) kN
Equivalent Diameter	(De) mm
Point Load	(Is) MPa
Size Factor	(F)
Point Load Index	(Is(50)) MPa
Moisture Content	%
Description	SC

Operator
Julian Jones

UKAS TESTING
2788

2531

ANALYTICAL TEST REPORT

Contract no: 117841

Contract name: Global Centre of Rail Excellence

Client reference: G22069

Clients name: Geo Site and Testing Services

Clients address: Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

Samples received: 17 January 2023

Analysis started: 17 January 2023

Analysis completed: 25 January 2023

Report issued: 31 January 2023

This is a supplementary report to report number 117841 issued 25 January 2023.

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing

Approved by:

ANeasham-Bourn

Abbie Neasham-Bourn

Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			117841-1	117841-2	117841-3	117841-4	117841-5	117841-6
Sample id			S1-BH113	S1-BH114	S1-BH114	S1-TP102	S1-TP106	S1-TP110
Unique ID			3969365132020006	633875285104004	387156318587008	193848790521004	761174489632008	784414959038004
Depth (m)			2.00-2.45	0.50-0.95	1.40-1.50	0.40-0.50	0.90-1.00	0.40-0.50
Sample Type			D6	D4	D102	D4	D8	D4
Date sampled			-	-	-	-	-	-
Test	**Method**	**Units**						
pH	CE004 [U]	units	6.0	7.9	-	-	-	-
Magnesium (2:1 water soluble)	CE061	mg/l Mg	<1	1.8	-	-	-	-
Chloride (2:1 water soluble)	CE049 [U]	mg/l Cl	60	7.9	-	-	-	-
Nitrate (2:1 water soluble)	CE049 [U]	mg/l NO_3	<1	1.0	-	-	-	-
Sulphate (2:1 water soluble)	CE061 [U]	mg/l SO_4	22	17	-	-	-	-
Sulphate (acid extractable)	CE062 [U]	mg/kg SO_4	203	136	-	-	-	-
Sulphate (acid extractable)	CE062 [U]	% w/w SO_4	0.02	0.01	-	-	-	-
Sulphur (total)	CE119	mg/kg S	162	160	-	-	-	-
Sulphur (total)	CE119	% w/w S	0.02	0.02	-	-	-	-
Total Organic Carbon (TOC)	CE197	% w/w C	-	-	18.0	14.9	1.5	3.2
Estimate of OMC (calculated from TOC)	CE197	% w/w	-	-	31.0	25.6	2.6	5.4

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE004	pH	Based on BS 1377, pH Meter	As received	U	-	units
CE061	Magnesium (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry		1	mg/l Mg
CE049	Chloride (2:1 water soluble)	Aqueous extraction, IC-COND	Dry	U	1	mg/l Cl
CE049	Nitrate (2:1 water soluble)	Aqueous extraction, IC-COND	Dry	U	1	mg/l NO_3
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	U	10	mg/l SO_4
CE062	Sulphate (acid extractable)	HCl extract, analysed by ICP-OES	Dry	U	100	mg/kg SO4
CE062	Sulphate (acid extractable)	HCl extract, analysed by ICP-OES	Dry	U	0.01	% w/w SO4
CE119	Sulphur (total)	Aqua regia digest, analysed by ICP-OES	Dry		100	mg/kg S
CE119	Sulphur (total)	Aqua regia digest, analysed by ICP-OES	Dry		0.01	% w/w S
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments
Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
117841-1	S1-BH113	0.90-1.00	Y	All (NSD)
117841-2	S1-BH114	0.40-0.50	Y	All (NSD)

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.
For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones, where applicable.

Chemtech Environmental Limited

TEST REPORT REVISIONS

The table below identifies ammendments that have been made to this test report for each revision.

Test Report Reference	Details of amendments to test report	Issue Date
117841	Original report issued	25 January 2023
117841(1)	Sample ID amended on Sample 117841-5 and the Sample Depths amended on all the samples	31 January 2023

ANALYTICAL TEST REPORT

Contract no: 119773

Contract name: Global Centre of Rail Excellence

Client reference: G22069

Clients name: Geo Site and Testing Services

Clients address: Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

Samples received: 28 February 2023

Analysis started: 28 February 2023

Analysis completed: 07 March 2023

Report issued: 07 March 2023

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing

Approved by:

ANeasham-Bourn

Abbie Neasham-Bourn

Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			119773-1
Sample id			S1-BH113
Unique id			#396936513 202007
Depth (m)			7.00-7.45
Sample Type			D
Date sampled			-
Test	**Method**	**Units**	
Total Organic Carbon (TOC)	CE197	% w/w C	5.1
Estimate of OMC (calculated from TOC)	CE197	% w/w	8.7

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.
For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones, where applicable.

Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

Contract Number: 63627

Client Ref: **g22069**
Client PO:

Date Received: **03-01-2023**
Date Completed: **01-02-2023**
Report Date: **01-02-2023**

Client: **Jackson Drilling Holdings Ltd**
Northwood Farm
Coxbridge Road
Baltonsborough
Somerset
BA6 8RA

This report has been checked and approved by:

B. Evans

Brendan Evans
Office Administrator

Contract Title: **Global Centre Of Rail Excellence**
For the attention of: **Adam Putt**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	16
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	8
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	9
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) BS 1377:1990 - Part 2 : 9.4 - * UKAS	1
Organic Matter Content Sub-contracted Test	3
Dry Den/MC (4.5kg Rammer Method 1 litre mould/CBR Mould) BS 1377:1990 - Part 4 : 3.6 - * UKAS	1
Quick Undrained Triaxial Compression test - single specimen at one confining pressure (100mm or 38mm diameter) BS 1377:1990 - Part 7 : 8 - * UKAS	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
- denotes test carried out by approved contractor
@ - denotes non accredited tests

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 test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (Human Resources/ Health and Safety Manager)

GEO Site & Testing Services Ltd
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Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

Contract Number: 63627

Test Description	Qty
One-dimensional Consolidation 75mm or 50mm diameter specimens (up to 5 stages/days) BS 1377:1990 - Part 5 : 3 - * UKAS	1
Determination of Point Load Value Axial or Diametrical including WC ***Please note GSTL is not accredited for the water content of rock*** ISRM Suggested Method for Point Load Strength - * UKAS	3
Consolidated Drained Peak Shear Strength - set of 3 - 60 x 60mm Shear Box Specimens by Direct Shearing (3 days) BS 1377:1990 - Part 7 : 4 - * UKAS	1
Disposal of samples for job	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
- denotes test carried out by approved contractor
@ - denotes non accredited tests

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 test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (Human Resources/ Health and Safety Manager)

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	Summary of Soil Descriptions	
Contract Number	63627	
Project Name	Global Centre Of Rail Excellence	
Client Reference		

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
S1-BH103	108	B	2.40	-	3.20	Grey slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL
S1-BH103	110	B	3.40	-	4.20	Black ASHFIL
S1-BH103	114	B	5.80	-	6.75	Black silty/ clayey fine to coarse gravelly fine to coarse SAND
S1-BH103	115	D	6.80	-	6.90	Black PEAT
S1-BH103	5	UT	7.20	-	7.65	Black PEAT
S1-BH103	118	D	8.80	-	8.90	Grey fine to coarse gravelly fine to coarse sandy SILT/ CLAY
S1-BH103	119	B	8.80	-	9.80	Brown fine to medium gravelly CLAY
S1-BH103	9	D	8.80	-	9.25	Grey peaty fine to medium gravelly CLAY
S1-BH103	11	D	11.30	-	11.75	Grey fine to coarse sandy silty/ clayey fine to coarse GRAVEL
S1-BH114B	3	B	0.40	-	0.60	Black/ brown fine to coarse sandy fine to coarse gravelly SILT/ CLAY
S1-BH114B	102	D	1.30	-	1.35	Black fine to medium gravelly clayey PEAT
S1-BH114B	103	B	1.30	-	1.50	Brown slightly silty clayey fine to coarse sandy fine to coarse GRAVEL
S1-BH114B	6	D	2.00	-	2.45	Brown peaty fine to medium gravelly CLAY
S1-BH114B	106	B	2.10	-	2.40	Brown peaty fine to medium gravelly CLAY
S1-BH105	108	B	2.20	-	3.20	Black fine tocoarse gravelly fine to coarse sandy SILT/ CLAY
S1-BH105	111	B	5.20	-	6.20	Black fine to coarse gravelly silty/ clayey fine to coarse SAND
S1-BH105	8	UT	7.35	-	7.80	Black coarse ASHFILL
S1-BH105	9	D	7.80	-	7.90	Black silty/ clayey fine to coarse gravelly fine to coarse SAND
S1-BH105	117	D	9.70	-	9.80	Grey fine to medium gravelly CLAY
S1-BH105	11	D	9.80	-	10.25	Grey fine to medium gravelly CLAY
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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Natural Moisture Content (BS 1377:1990 - Part 2 : 3.2)**	
Contract Number	63627	
Project Name	Global Centre Of Rail Excellence	
Date Tested	19/01/2023	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Remarks
S1-BH103	108	B	2.40	-	3.20	7.6	
S1-BH103	114	B	5.80	-	6.75	16	
S1-BH103	119	B	8.80	-	9.80	17	
S1-BH103	11	D	11.30	-	11.75	34	
S1-BH105	108	B	2.20	-	3.20	27	
S1-BH105	111	B	5.20	-	6.20	18	
S1-BH105	9	D	7.80	-	7.90	84	
S1-BH114B	3	B	0.40	-	0.60	17	

Operator
Clayton Jenkins

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.3 & 5.3)	
Contract Number	63627	
Project Name	Global Centre Of Rail Excellence	
Date Tested	17/01/2023	
	DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
S1-BH103	115	D	6.80	-	6.90	
S1-BH103	118	D	8.80	-	8.90	
S1-BH103	9	D	8.80	-	9.25	
S1-BH114B	102	D	1.30	-	1.35	
S1-BH114B	6	D	2.00	-	2.45	
S1-BH114B	106	B	2.10	-	2.40	
S1-BH105	117	D	9.70	-	9.80	
S1-BH105	11	D	9.80	-	10.25	
S1-BH103	6	D	7.65	-	7.80	Brown gravelly silty CLAY
S1-BH103	12	D	12.80	-	13.20	Brown gravelly silty CLAY
S1-BH114B	108	D	3.00	-	3.10	Brown gravelly silty CLAY
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Operator
Darcy Etheridge

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

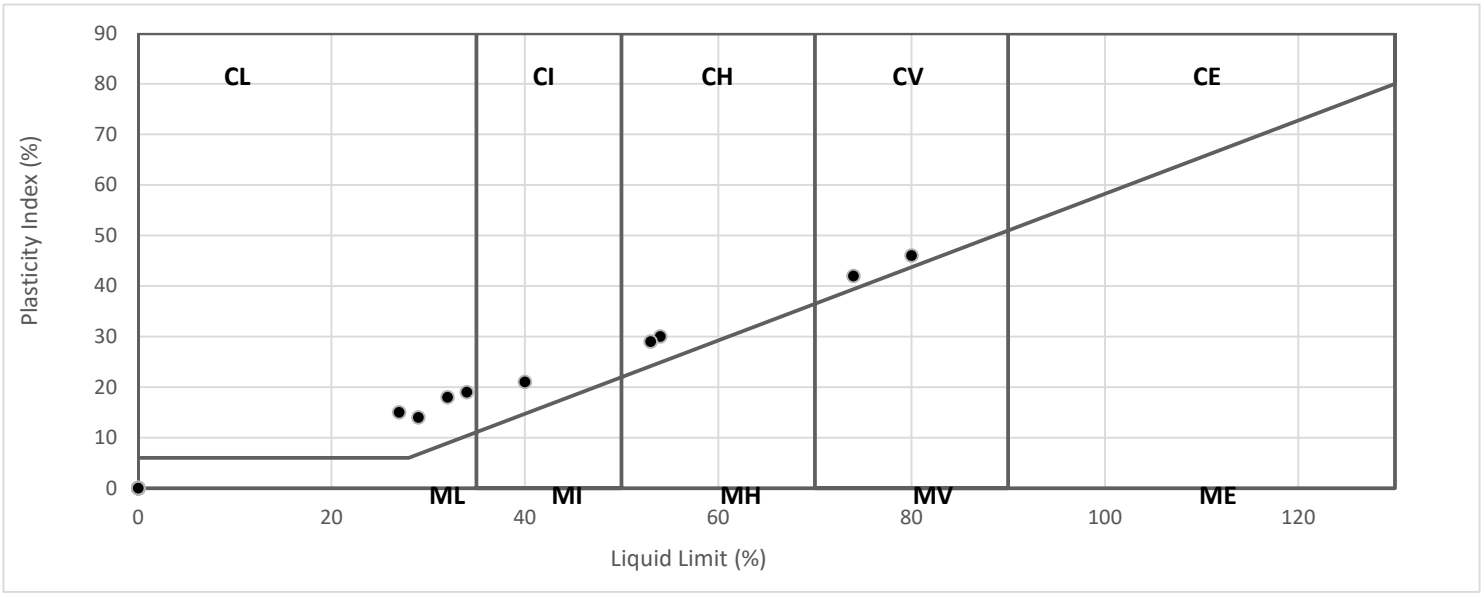
NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)

Contract Number	63627
Project Name	Global Centre Of Rail Excellence
Date Tested	17/01/2023

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
S1-BH103	115	D	6.80	-	6.90	422		NP		100	
S1-BH103	118	D	8.80	-	8.90	14	29	15	14	90	CL Low Plasticity
S1-BH103	9	D	8.80	-	9.25	22	40	19	21	90	CI Intermediate Plasticity
S1-BH114B	102	D	1.30	-	1.35	147		NP		90	
S1-BH114B	6	D	2.00	-	2.45	26	54	24	30	80	CH High Plasticity
S1-BH114B	106	B	2.10	-	2.40	26	53	24	29	80	CH High Plasticity
S1-BH105	117	D	9.70	-	9.80	14	27	12	15	80	CL Low Plasticity
S1-BH105	11	D	9.80	-	10.25	16	32	14	18	80	CL Low Plasticity
S1-BH103	6	D	7.65	-	7.80	48	74	32	42	97	CV Very High Plasticity
S1-BH103	12	D	12.80	-	13.20	15	34	15	19	95	CL Low Plasticity
S1-BH114B	108	D	3.00	-	3.10	51	80	34	46	95	CV Very High Plasticity
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Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

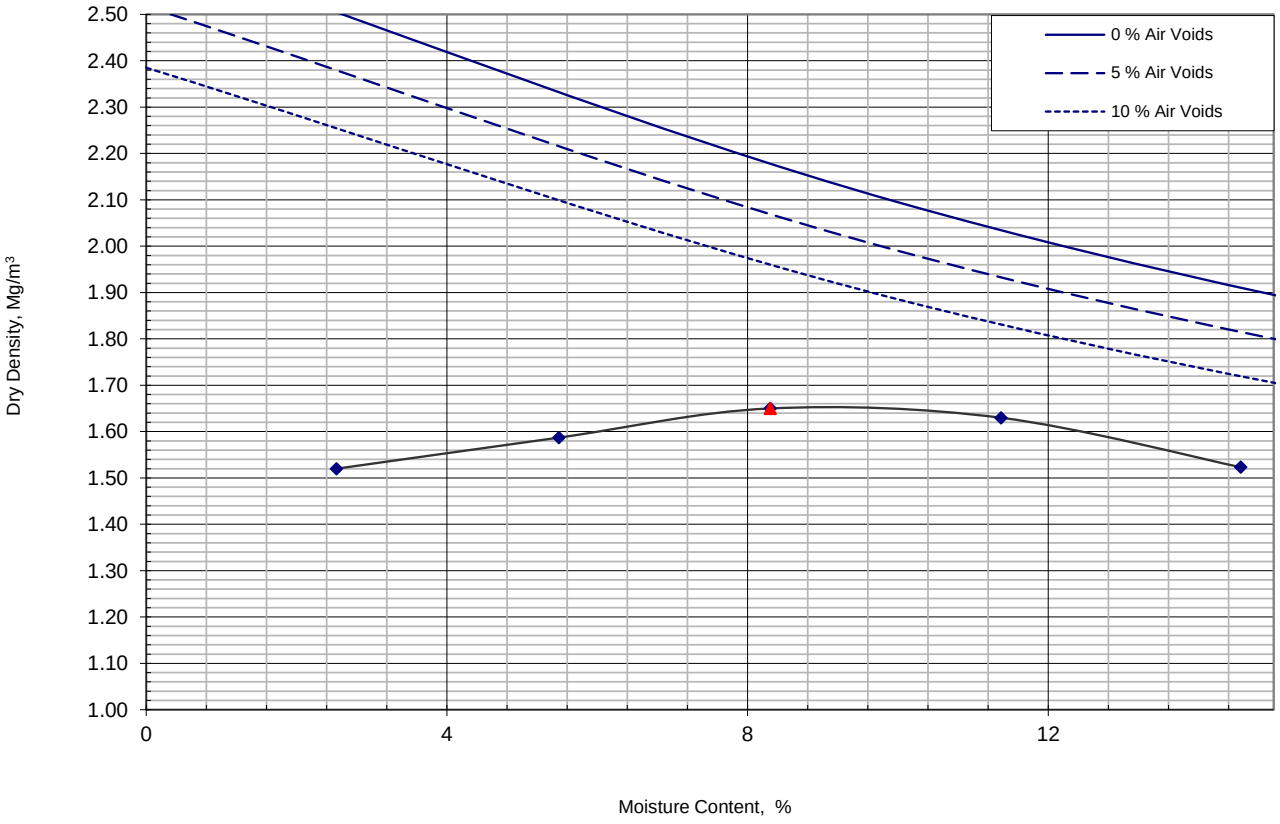
PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:2015+A1:2020



Operator
Darcy Etheridge

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	Dry Density / Moisture Content Relationship BS 1377:Part 4:1990	Contract Number	63627
		Borehole / Pit No	S1-BH103
Project Name	Global Centre Of Rail Excellence	Sample No	110
Date Tested	18/01/2023	Depth Top	3.40
Compaction Method	4.5 Kg Rammer	Depth Base	4.20
Compaction Clause	BS1377:Part 4:1990, Clause 3.5	Sample Type	B
Sample Description	*See Sample Description Sheet	Single or Separate Sample Used	Single



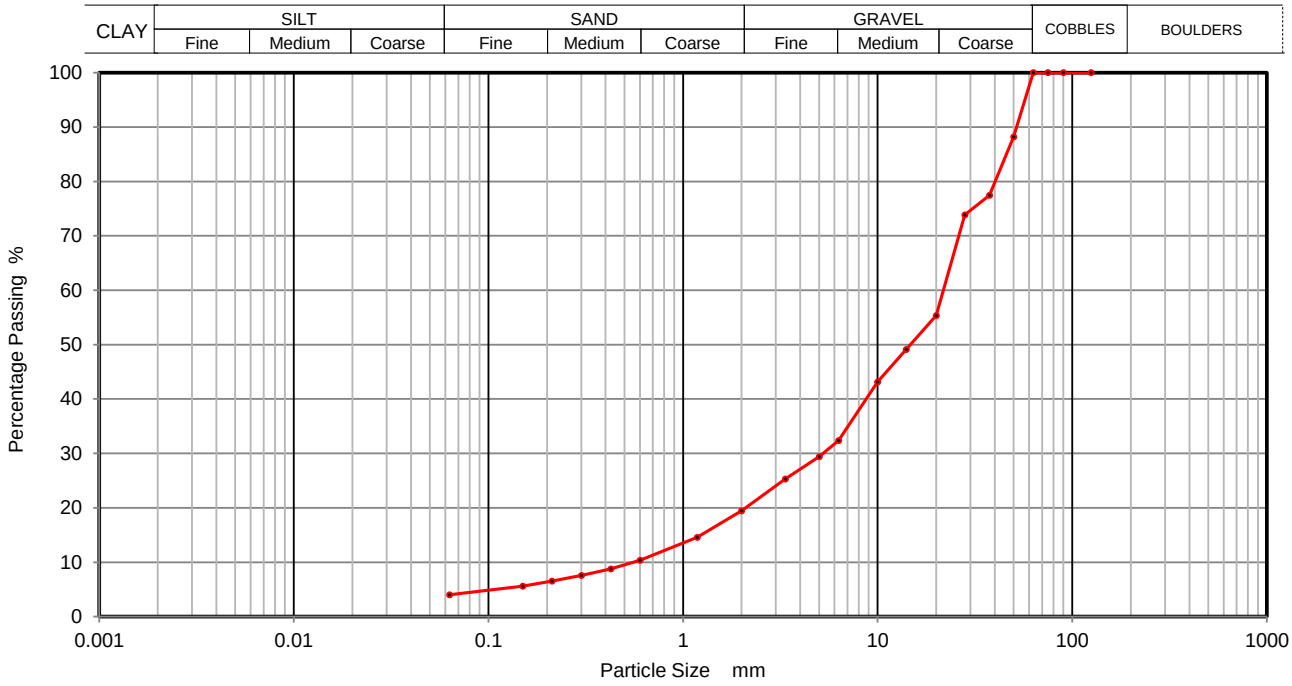
Compaction Point	1	2	3	4	5							
Moisture Content	2.5	5.5	8.3	11	15							
Bulk Density	1.56	1.67	1.79	1.82	1.74							
Dry Density	1.52	1.59	1.65	1.63	1.52							

Initial Moisture Content	15	%
Maximum Dry Density	1.65	Mg/m3
Optimum Moisture Content	8.3	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	8	%
Material Retained 20mm	0	%

Operator
Conal

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	63627
		Borehole/Pit No.	S1-BH103
Project Name	Global Centre Of Rail Excellence	Sample No.	108
Soil Description	*See sample description sheet	Depth Top	2.40
		Depth Base	3.20
Date Tested	21/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	88		
37.5	77		
28	74		
20	55		
14	49		
10	43		
6.3	32		
5	29		
3.35	25		
2	19		
1.18	15		
0.6	10		
0.425	9		
0.3	8		
0.212	7		
0.15	6		
0.063	4		

Sample Proportions	% dry mass
Cobbles	0
Gravel	81
Sand	15
Silt and Clay	4

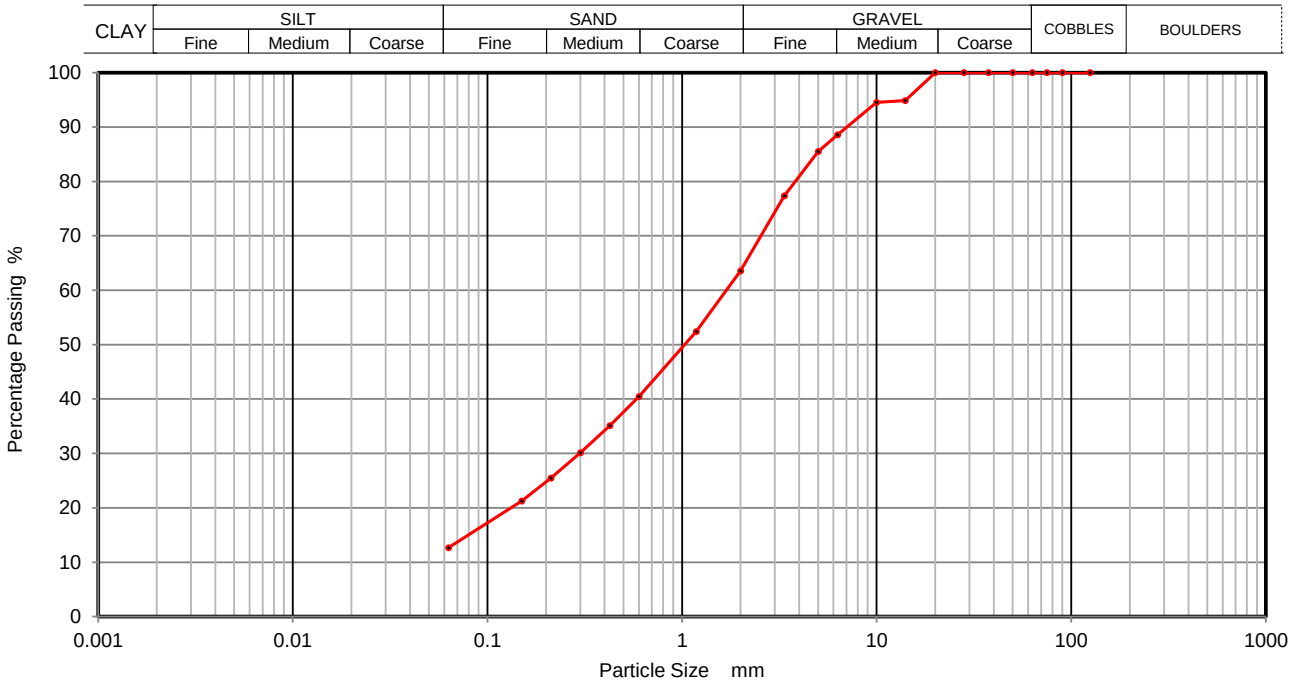
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	63627
		Borehole/Pit No.	S1-BH103
Project Name	Global Centre Of Rail Excellence	Sample No.	114
Soil Description	*See sample description sheet	Depth Top	5.80
		Depth Base	6.75
Date Tested	21/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	95		
10	95		
6.3	89		
5	86		
3.35	77		
2	64		
1.18	52		
0.6	40		
0.425	35		
0.3	30		
0.212	25		
0.15	21		
0.063	13		

Sample Proportions	% dry mass
Cobbles	0
Gravel	36
Sand	51
Silt and Clay	13

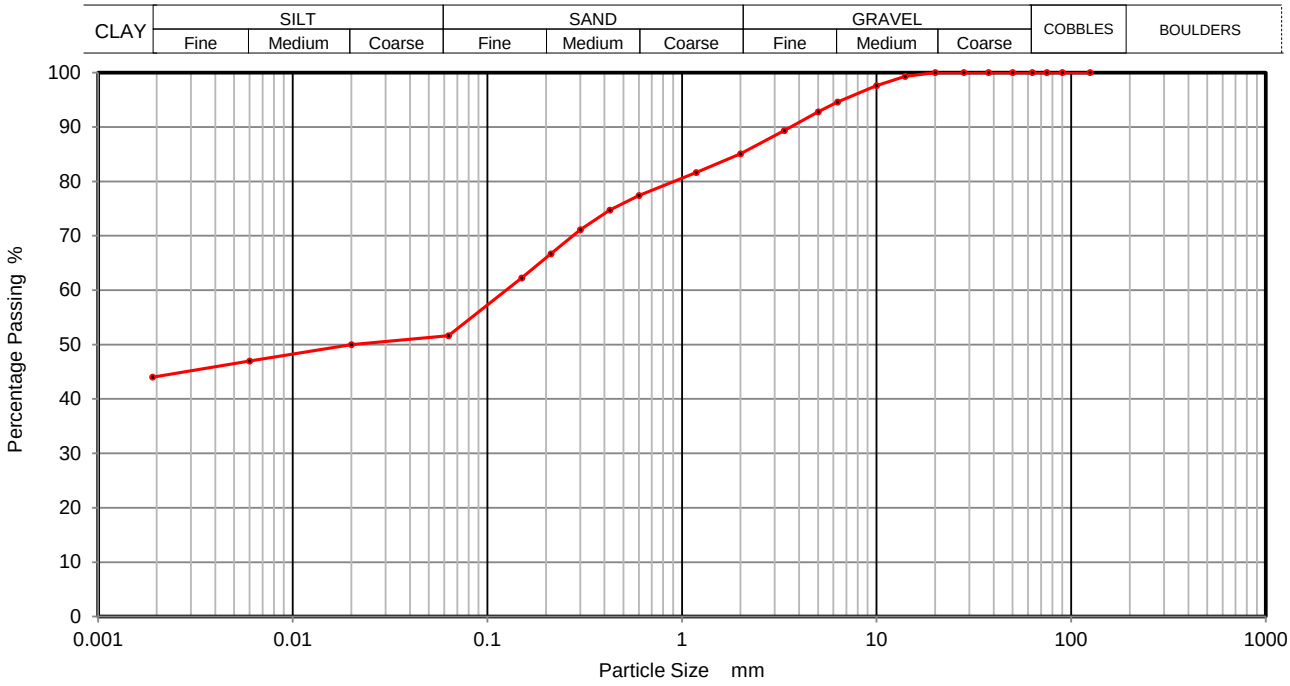
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	63627
		Borehole/Pit No.	S1-BH103
Project Name	Global Centre Of Rail Excellence	Sample No.	117
Soil Description	Grey slightly silty fine to medium gravelly fine to coarse sandy CLAY	Depth Top	7.80
		Depth Base	7.90
Date Tested	04/03/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	50
90	100	0.0060	47
75	100	0.0020	44
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	95		
5	93		
3.35	89		
2	85		
1.18	82		
0.6	77		
0.425	75		
0.3	71		
0.212	67		
0.15	62		
0.063	52		

Sample Proportions	% dry mass
Cobbles	0
Gravel	15
Sand	33
Silt	8
Clay	44

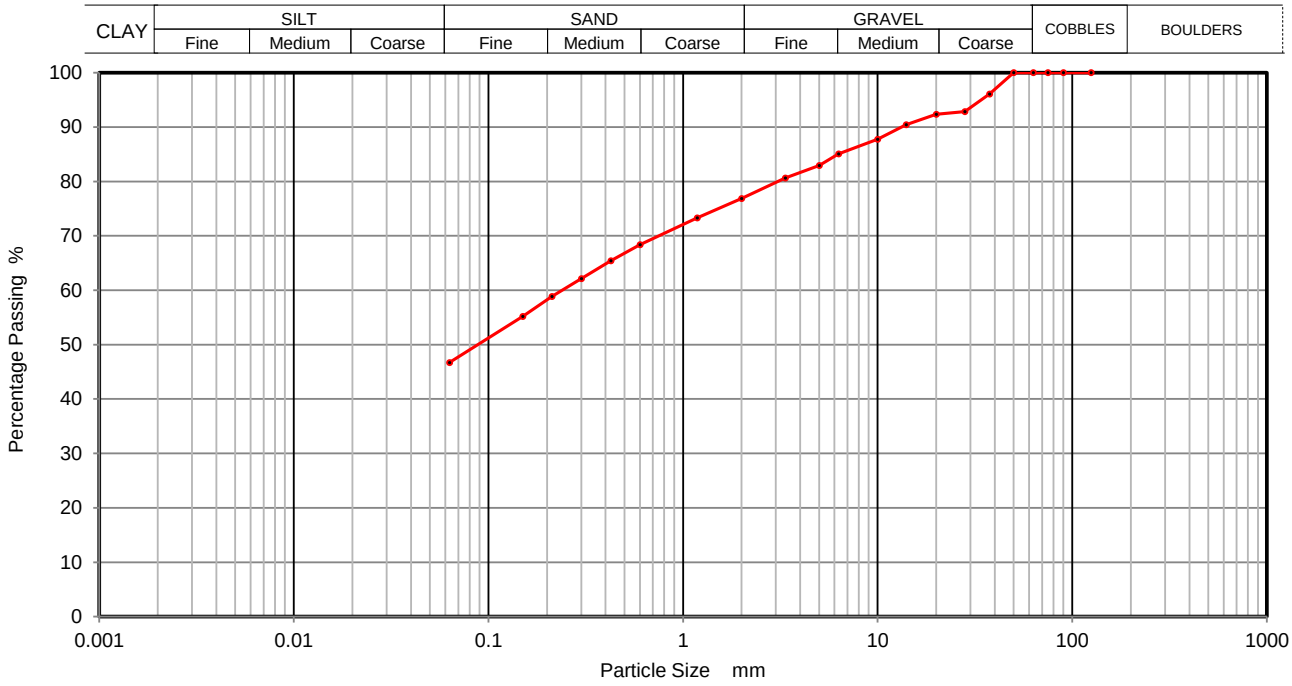
Remarks

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Operator
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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	63627
		Borehole/Pit No.	S1-BH103
Project Name	Global Centre Of Rail Excellence	Sample No.	119
Soil Description	*See sample description sheet	Depth Top	8.80
		Depth Base	9.80
Date Tested	21/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	96		
28	93		
20	92		
14	90		
10	88		
6.3	85		
5	83		
3.35	81		
2	77		
1.18	73		
0.6	68		
0.425	65		
0.3	62		
0.212	59		
0.15	55		
0.063	47		

Sample Proportions	% dry mass
Cobbles	0
Gravel	23
Sand	30
Silt and Clay	47

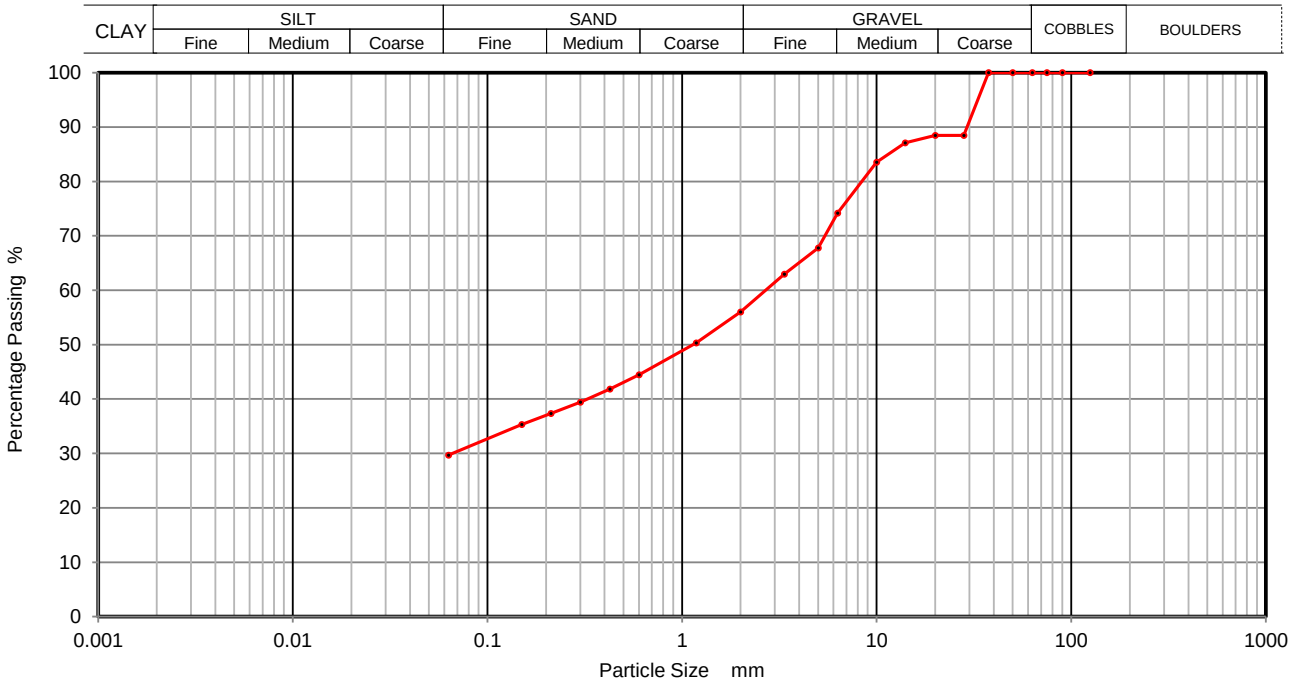
Remarks

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Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	63627
		Borehole/Pit No.	S1-BH103
Project Name	Global Centre Of Rail Excellence	Sample No.	11
Soil Description	*See sample description sheet	Depth Top	11.30
		Depth Base	11.75
Date Tested	21/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	88		
20	88		
14	87		
10	84		
6.3	74		
5	68		
3.35	63		
2	56		
1.18	50		
0.6	44		
0.425	42		
0.3	39		
0.212	37		
0.15	35		
0.063	30		

Sample Proportions	% dry mass
Cobbles	0
Gravel	44
Sand	26
Silt and Clay	30

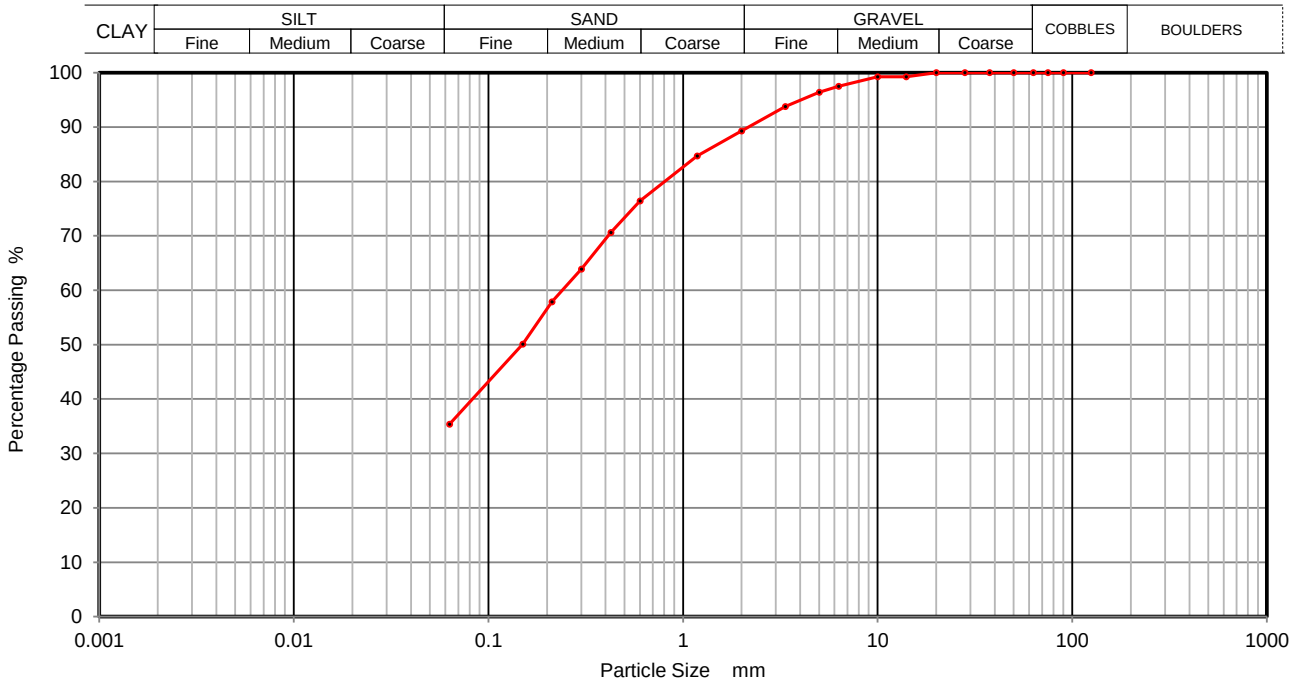
Remarks

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Operator
David Edwards

UKAS TESTING
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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	63627
		Borehole/Pit No.	S1-BH105
Project Name	Global Centre Of Rail Excellence	Sample No.	108
Soil Description	*See sample description sheet	Depth Top	2.20
		Depth Base	3.20
Date Tested	21/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	99		
6.3	97		
5	96		
3.35	94		
2	89		
1.18	85		
0.6	76		
0.425	71		
0.3	64		
0.212	58		
0.15	50		
0.063	35		

Sample Proportions	% dry mass
Cobbles	0
Gravel	11
Sand	54
Silt and Clay	35

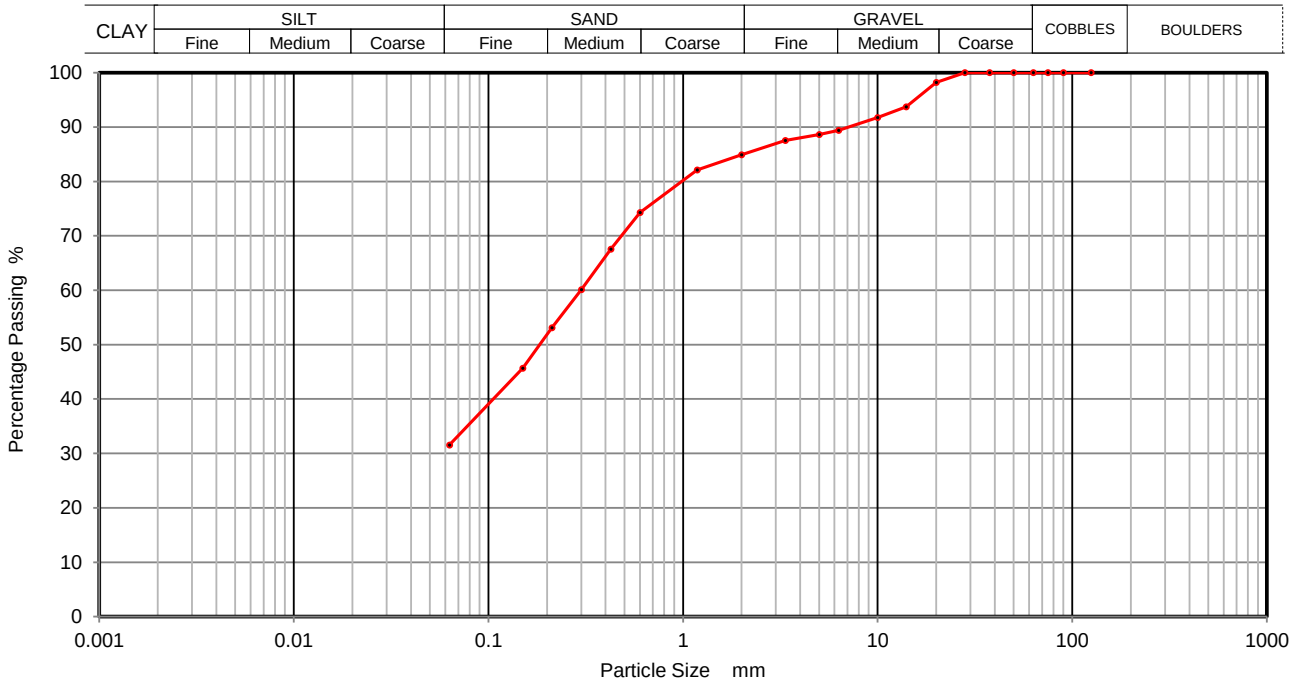
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	63627
		Borehole/Pit No.	S1-BH105
Project Name	Global Centre Of Rail Excellence	Sample No.	111
Soil Description	*See sample description sheet	Depth Top	5.20
		Depth Base	6.20
Date Tested	21/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	94		
10	92		
6.3	89		
5	89		
3.35	88		
2	85		
1.18	82		
0.6	74		
0.425	68		
0.3	60		
0.212	53		
0.15	46		
0.063	32		

Sample Proportions	% dry mass
Cobbles	0
Gravel	15
Sand	53
Silt and Clay	32

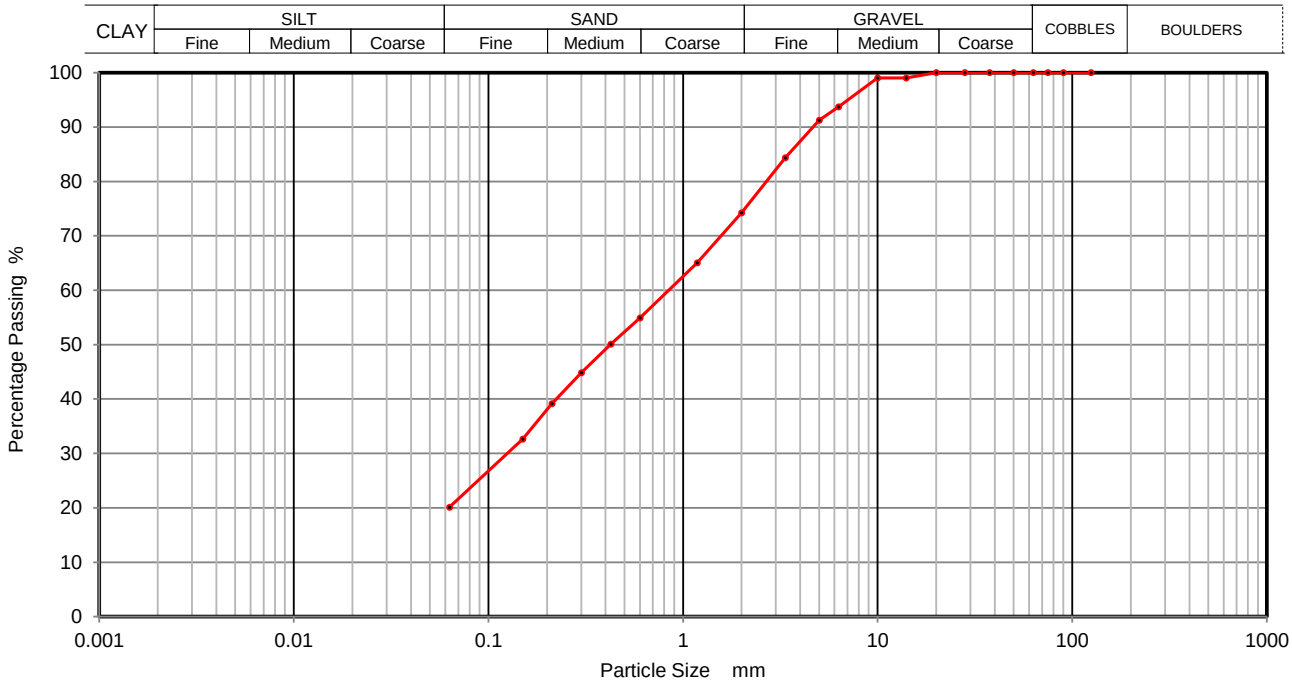
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	63627
		Borehole/Pit No.	S1-BH105
Project Name	Global Centre Of Rail Excellence	Sample No.	9
Soil Description	*See sample description sheet	Depth Top	7.80
		Depth Base	7.90
Date Tested	21/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	99		
6.3	94		
5	91		
3.35	84		
2	74		
1.18	65		
0.6	55		
0.425	50		
0.3	45		
0.212	39		
0.15	33		
0.063	20		

Sample Proportions	% dry mass
Cobbles	0
Gravel	26
Sand	54
Silt and Clay	20

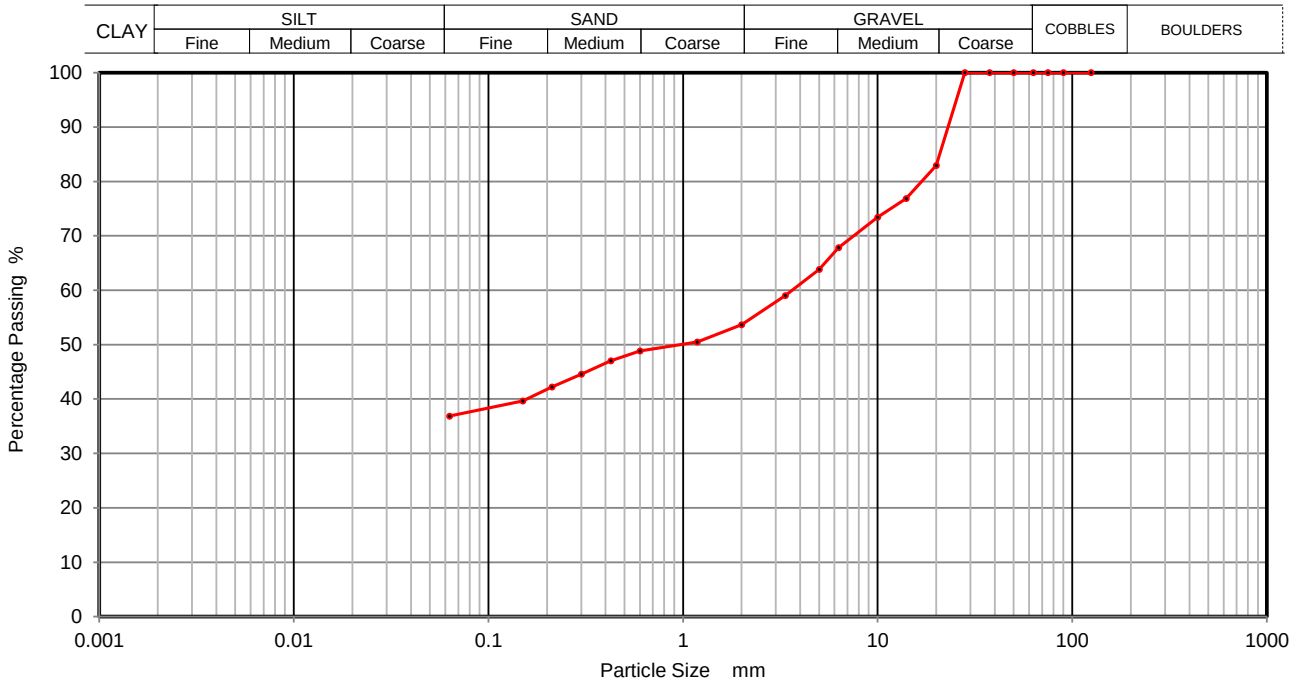
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63627
		Borehole/Pit No.	S1-BH114B
Project Name	Global Centre Of Rail Excellence	Sample No.	3
Soil Description	*See sample description sheet	Depth Top	0.40
		Depth Base	0.60
Date Tested	21/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	83		
14	77		
10	73		
6.3	68		
5	64		
3.35	59		
2	54		
1.18	50		
0.6	49		
0.425	47		
0.3	45		
0.212	42		
0.15	40		
0.063	37		

Sample Proportions	% dry mass
Cobbles	0
Gravel	46
Sand	17
Silt and Clay	37

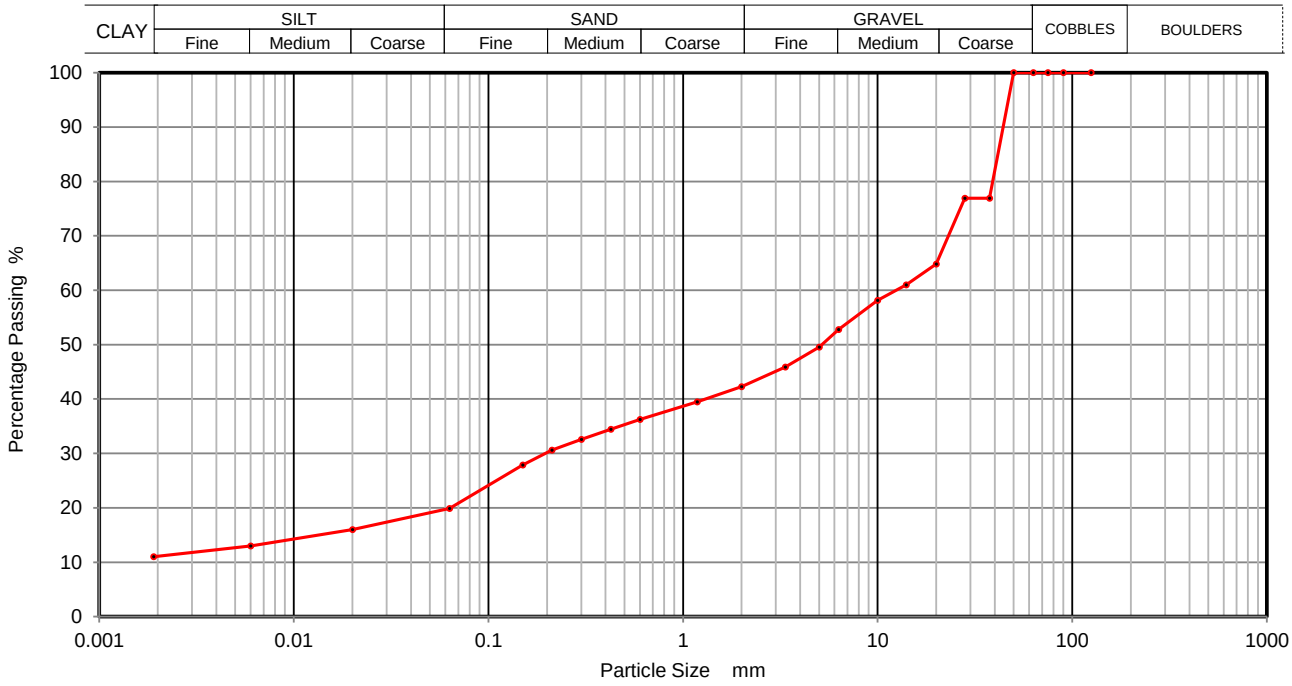
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	63627
		Borehole/Pit No.	S1-BH114B
Project Name	Global Centre Of Rail Excellence	Sample No.	103
Soil Description	*See sample description sheet	Depth Top	1.30
		Depth Base	1.50
Date Tested	21/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	16
90	100	0.0060	13
75	100	0.0020	11
63	100		
50	100		
37.5	77		
28	77		
20	65		
14	61		
10	58		
6.3	53		
5	50		
3.35	46		
2	42		
1.18	40		
0.6	36		
0.425	34		
0.3	33		
0.212	31		
0.15	28		
0.063	20		

Sample Proportions	% dry mass
Cobbles	0
Gravel	58
Sand	22
Silt	9
Clay	11

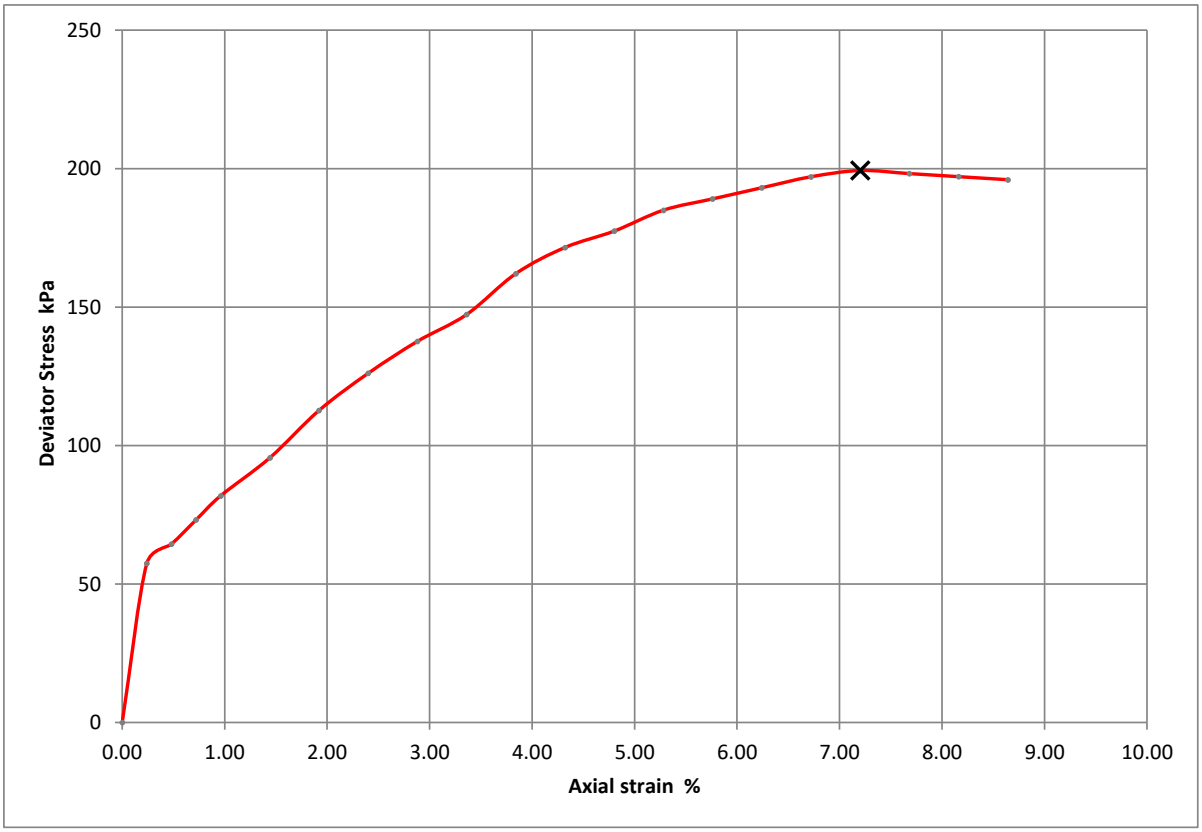
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

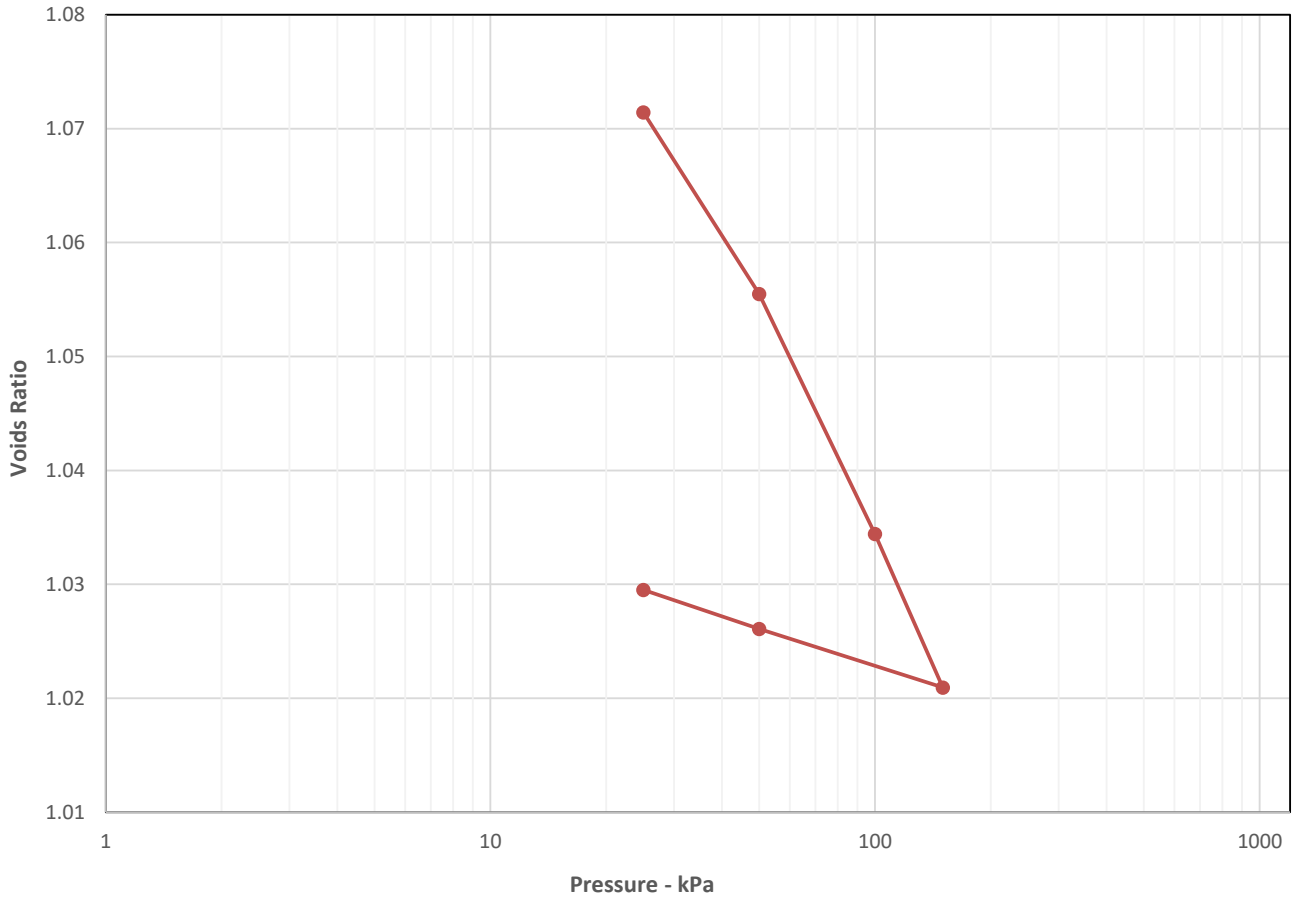
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	63627
		Borehole/Pit No.	S1-BH103
Project Name	Global Centre Of Rail Excellence	Sample No.	5
Soil Description	*See Sample Description Sheet	Depth Top (m)	7.20
		Depth Base (m)	7.65
Date Tested	20/01/2023	Sample Type	UT
		Operator	Jordan



Moisture Content (%)	253
Bulk Density (Mg/m^3)	1.17
Dry Density (Mg/m^3)	0.33
Specimen Length (mm)	208.3
Specimen Diamteter (mm)	107
Cell Pressure (kPa)	144
Deviator Stress (kPa)	199
Undrained Shear Strength (kPa)	100
Failure Strain (%)	7
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.44

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	63627
		Borehole/Trialpit No.	S1-BH105
Project Name	Global Centre Of Rail Excellence	Sample No.	8
Soil Description	*See Sample Description Sheet	Depth Top (m)	7.35
		Depth Base (m)	7.80
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	13/01/2023		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	19	0	-	25	0.68	74		-			
Bulk Density (Mg/m3)	1.49	25	-	50	0.31	21		-			
Dry Density (Mg/m3)	1.26	50	-	100	0.20	16		-			
Voids Ratio	1.1073	100	-	150	0.13	20		-			
Degree of saturation	44.9	150	-	50	0.025	88		-			
Height (mm)	19.71	50	-	25	0.068	110		-			
Diameter (mm)	75.25		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

UKAS TESTING
2788

Borehole Number:	S1-BH105	Depth from (m):	7.80
Sample Number :	113.0	Depth to (m):	8.60

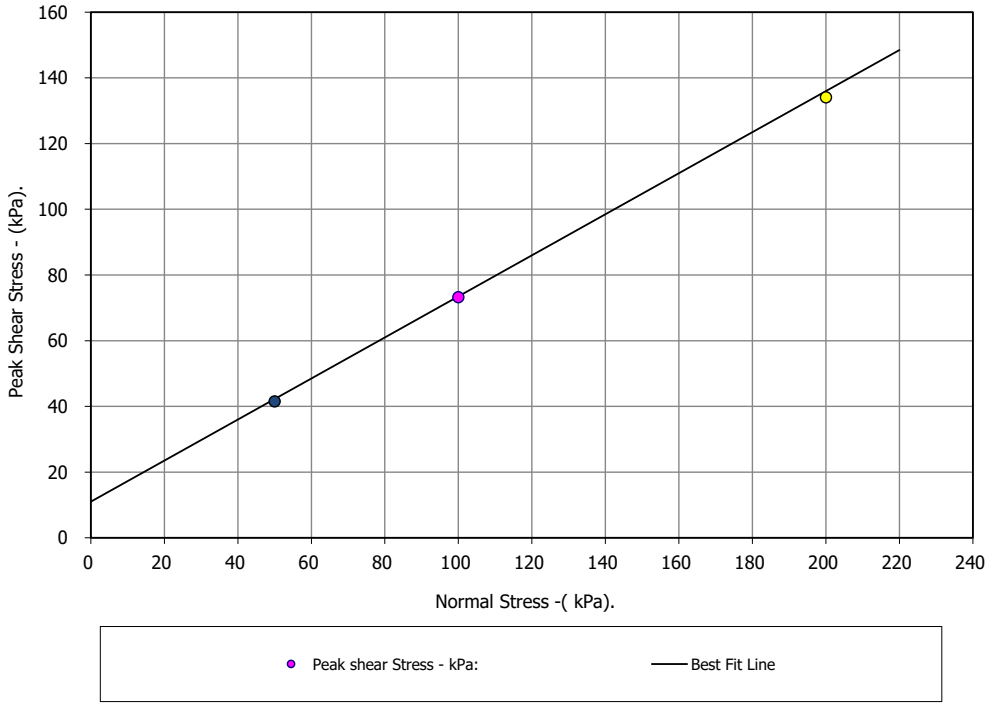
Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Dark Brown slightly sandy, organic CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	23.30	23.30	23.30
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	84	84	84
Bulk Density - Mg/m3:	1.34	1.34	1.34
Dry Density - Mg/m3:	0.73	0.73	0.73
Voids Ratio:	2.6380	2.6390	2.6516
Degree of Saturation - %:	84.54	84.51	84.11
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	19.79	18.65	16.20
Shear			
Rate of Horizontal Displacement (mm/min)	0.200	0.200	0.200
Horizontal Displacement at Peak Shear Stress (mm)	7.74	7.11	11.80
Peak shear Stress - kPa:	42	73	134

PEAK	
Angle of Shearing Resistance:(θ)	**32.0**
Effective Cohesion - kPa:	**11**

FAILURE CONDITIONS



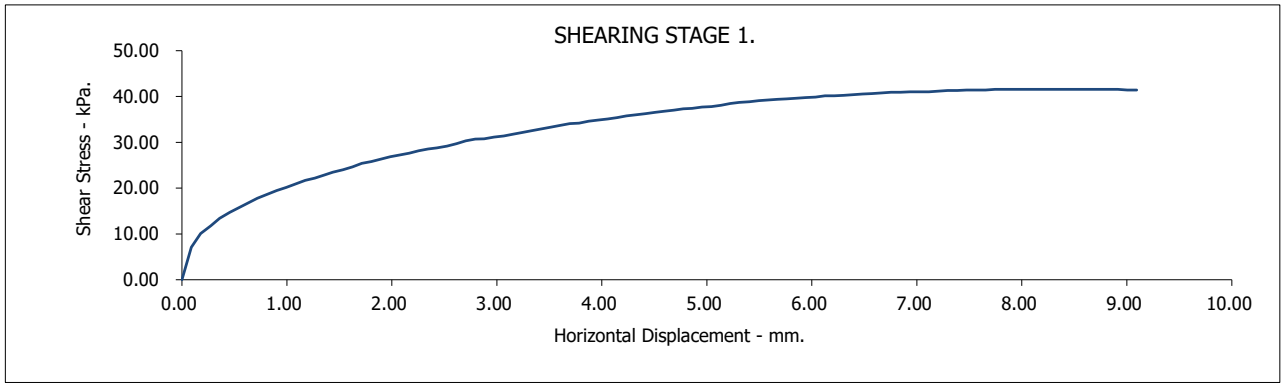
Contract No.:
63627

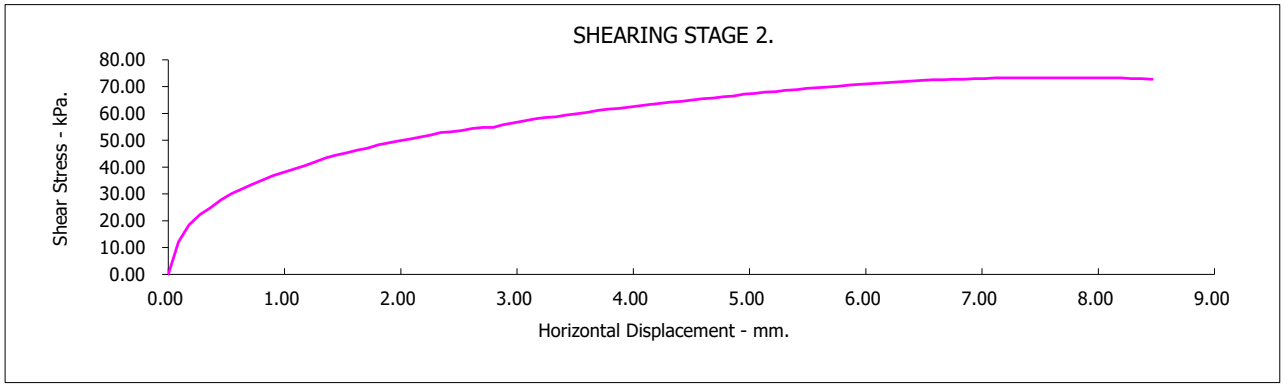
Global Centre Of Rail Excellence

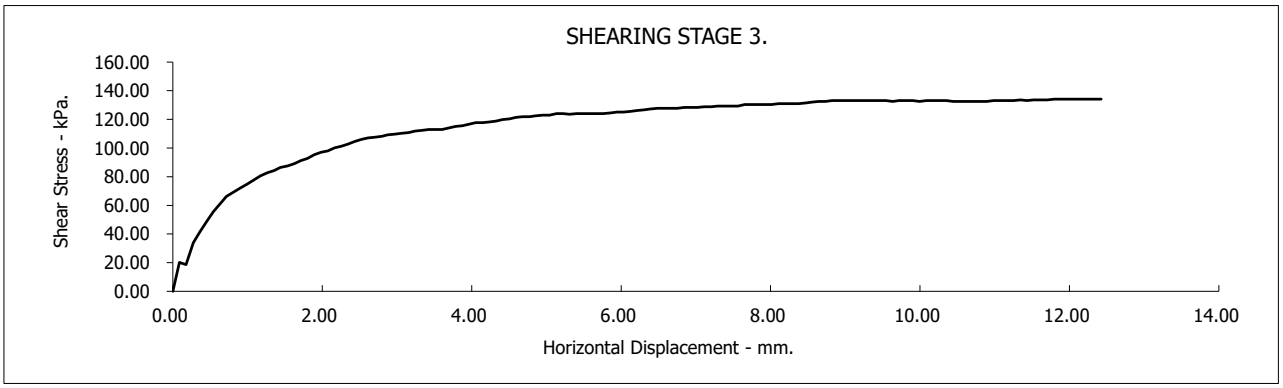
Client Ref Number:

g22069

Borehole Number:	S1-BH105	Depth from (m):	7.80
Sample Number :	113	Depth to (m):	8.60







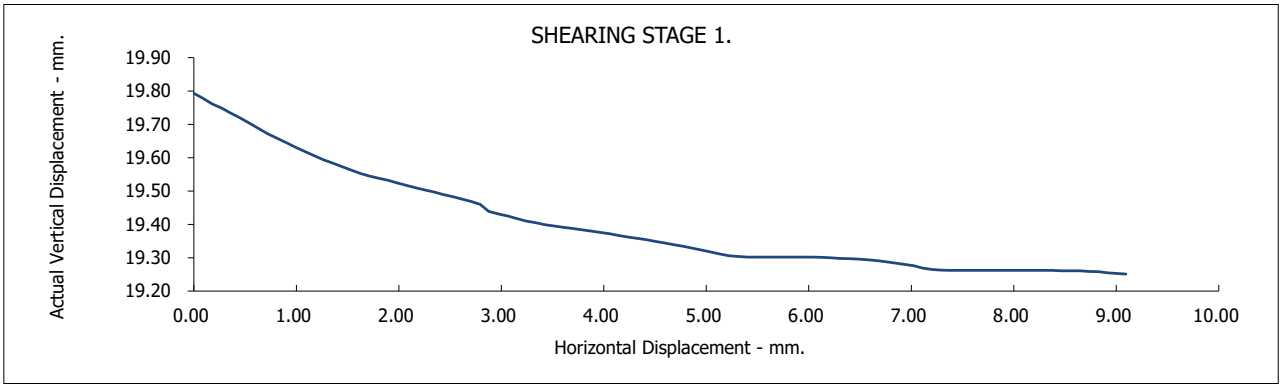
Global Centre Of Rail Excellence

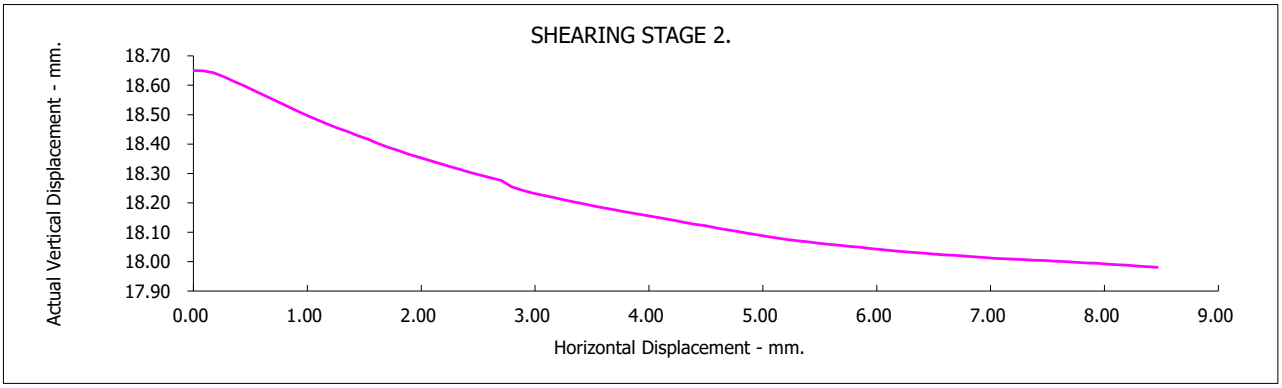
Contract No.: **63627**

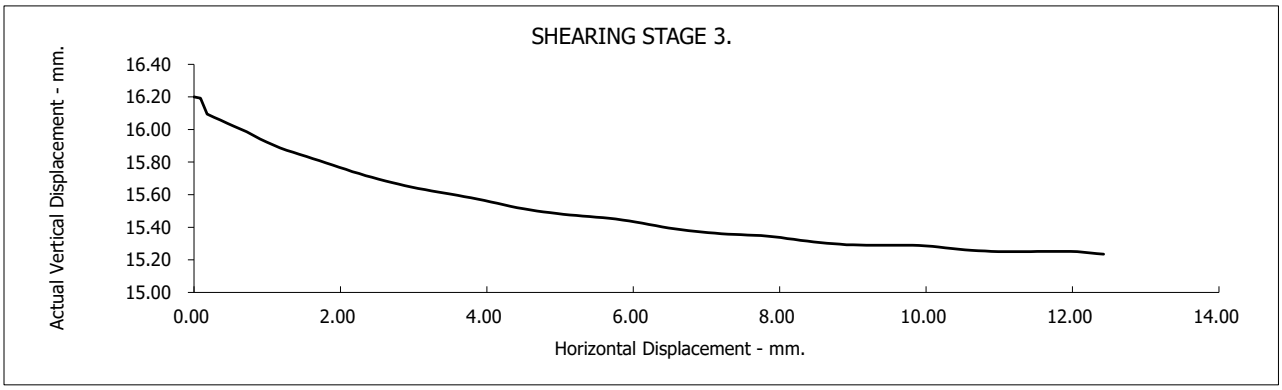
Client Ref Number: **g22069**

Figure.

Borehole Number:	S1-BH105	Depth from (m):	7.80
Sample Number :	113	Depth to (m):	8.60





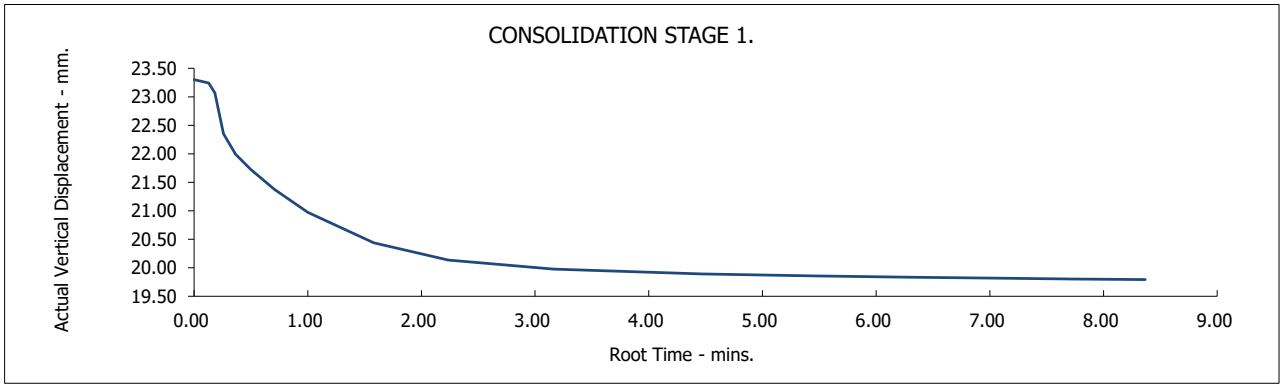


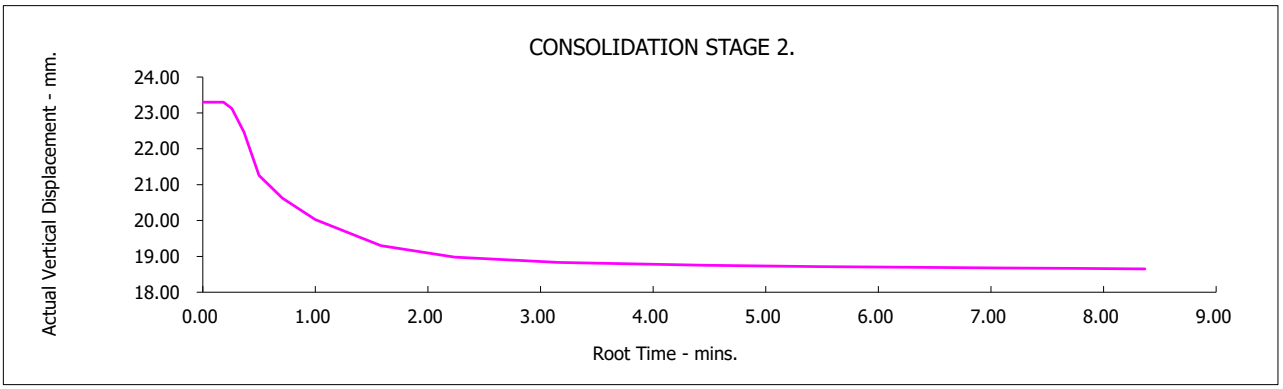
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63627

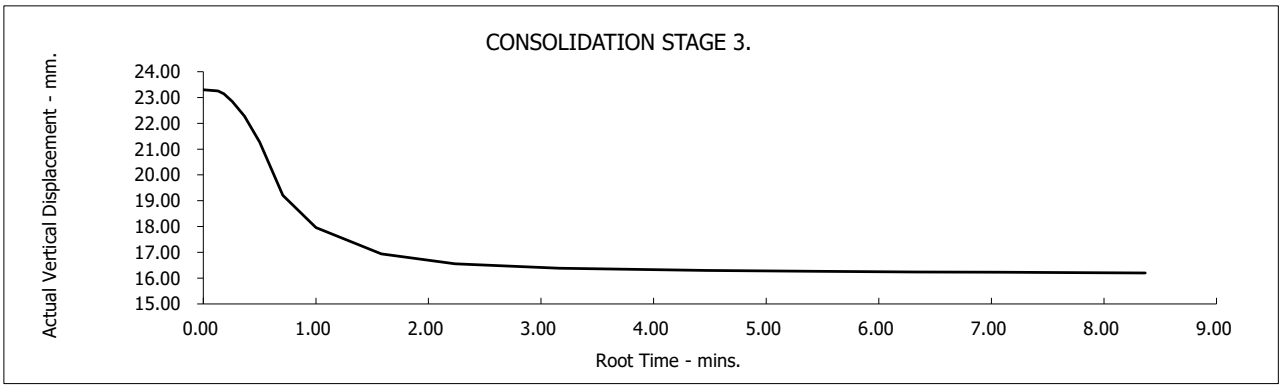
Global Centre Of Rail Excellence

Client Ref Number:
g22069

Borehole Number:	S1-BH105	Depth from (m):	7.80
Sample Number :	113	Depth to (m):	8.60







UKAS TESTING 2788

Global Centre Of Rail Excellence

Contract No.: **63627**

Client Ref Number: **g22069**

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

Point Load Test

The complete ISRM suggested methods for rock characterization, testing and monitoring 1974-2006
Determining Point Load Strength

Contract Number	63627
Project Name	Global Centre Of Rail Excellence
Sample Type	Core
Date Tested	06/01/2023

*Please note that GSTL is not accredited for the water content of rock

Hole Reference	Depth (m)			Test Type		Width	Platen Seperation	Failure Load	Equivalent Diameter	Point Load	Size Factor	Point Load Index	Moisture Content	Description	Angle Between Plane of Anisotropy & Core Axis	Type of Anisotropy (Bedding or Cleavage)
				d / a / b / i	I //											
S1-BH103	14.17	-	14.28	a		102	77	2.17	100.00	0.22	1.37	0.30	2.6	SILTSTONE		
S1-BH103	14.30	-	14.53	d			102	20.79		2.00	1.38	2.75	0.7	SILTSTONE		
S1-BH105	12.10	-	12.25	a			102	3.76		0.36	1.38	0.50	2.3	SILTSTONE		
S1-BH105	18.20	-	18.32	d			102	2.12		0.20	1.38	0.28	1.6	SILTSTONE		

Key	Reported As
Width	(W) mm
Platen Separation	(D) mm
Failure Load	(P) kN
Equivalent Diameter	(De) mm
Point Load	(Is) MPa
Size Factor	(F)
Point Load Index	(Is(50)) MPa
Moisture Content	%
Description	SC

Operator
Julian Jones

UKAS TESTING
2788

ANALYTICAL TEST REPORT

Contract no: 117840

Contract name: Global Centre of Rail Excellence

Client reference: G22069

Clients name: Geo Site and Testing Services

Clients address: Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

Samples received: 17 January 2023

Analysis started: 17 January 2023

Analysis completed: 24 January 2023

Report issued: 24 January 2023

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing

Approved by:

Abbie Neasham-Bourn

Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			117840-1	117840-2	117840-3
Sample id			S1-BH103	S1-BH114B	S1-BH114B
Unique ID			214786635 3450020	358191 338530005	97640203 31080000
Depth (m)			8.80-8.90	1.00-1.45	1.30-1.35
Sample Type			D	D	D
Date sampled			-	-	-
Test	**Method**	**Units**			
Total Organic Carbon (TOC)	CE197	% w/w C	2.4	0.6	12.8
Estimate of OMC (calculated from TOC)	CE197	% w/w	4.2	1.0	22.0

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.
For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones, where applicable.

ANALYTICAL TEST REPORT

Contract no: 119772

Contract name: Global Centre of Rail Excellence

Client reference: G22069

Clients name: Geo Site and Testing Services

Clients address: Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

Samples received: 28 February 2023

Analysis started: 28 February 2023

Analysis completed: 07 March 2023

Report issued: 07 March 2023

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing

Approved by:

Abbie Neasham-Bourn

Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			1119772-1
Sample id			S1-BH103
Unique ID			#2502984852760006
Depth (m)			7.65-7.80
Sample Type			D
Date sampled			-
Test	**Method**	**Units**	
Total Organic Carbon (TOC)	CE197	% w/w C	7.4
Estimate of OMC (calculated from TOC)	CE197	% w/w	12.7

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
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Analytical results are inclusive of stones, where applicable.

Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

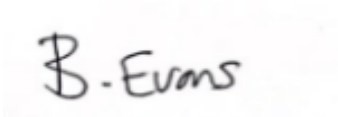
Contract Number: 63638

Client Ref: **G22069**
Client PO:

Date Received: **06-01-2023**
Date Completed: **31-01-2023**
Report Date: **31-01-2023**

Client: **Jackson Drilling Holdings Ltd**
Northwood Farm
Coxbridge Road
Baltonsborough
Somerset
BA6 8RA

This report has been checked and approved by:



Brendan Evans
Office Administrator

Contract Title: **Global Centre Of Rail Excellence**
For the attention of: **Adam Putt**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	19
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	11
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	18
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) BS 1377:1990 - Part 2 : 9.4 - * UKAS	4
Organic Matter Content Sub-contracted Test	8
Dry Den/MC (4.5kg Rammer Method 1 litre mould/CBR Mould) BS 1377:1990 - Part 4 : 3.6 - * UKAS	4
Determination of Point Load Value Axial or Diametrical including WC ***Please note GSTL is not accredited for the water content of rock*** ISRM Suggested Method for Point Load Strength - * UKAS	3

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
- denotes test carried out by approved contractor
@ - denotes non accredited tests

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 test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (Human Resources/ Health and Safety Manager)

GEO Site & Testing Services Ltd
Units 3-4, Heol Aur, Dafen, Llanelli, Carmarthenshire, Wales SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

Contract Number: 63638

Test Description	Qty
Consolidated Drained Peak Shear Strength - set of 3 - 60 x 60mm Shear Box Specimens by Direct Shearing (3 days) BS 1377:1990 - Part 7 : 4 - * UKAS	8
Disposal of samples for job	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
- denotes test carried out by approved contractor
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Wayne Honey (Human Resources/ Health and Safety Manager)

GEO Site & Testing Services Ltd
Units 3-4, Heol Aur, Dafen, Llanelli, Carmarthenshire, Wales SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

Natural Moisture Content
(BS 1377:1990 - Part 2 : 3.2)

Contract Number	63638
Project Name	Global Centre Of Rail Excellence
Date Tested	26/01/2023

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Remarks
S1-BH101	7	D	2.00	-	2.45	7.7	
S1-BH101	12	D	7.00	-	7.45	24	
S1-BH101	112	B	9.00	-	10.00	12	
S1-BH101	16	D	11.50	-	11.95	5.1	
S1-BH106	6	D	1.20	-	1.65	4.8	
S1-BH106	107	B	3.70	-	5.00	14	
S1-BH106	112	B	7.00	-	10.00	18	
S1-BH112	101	B	1.20	-	2.20	12	

Operator
Clayton Jenkins

UKAS TESTING
2788

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)

Contract Number	63638
Project Name	Global Centre Of Rail Excellence
Date Tested	18/01/2023

DESCRIPTIONS

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
S1-BH109	12	D	8.40	-	8.85	Brown gravelly sandy silty CLAY
S1-BH109	13	D	9.40	-	9.85	Brown sandy silty CLAY
S1-BH109	14	D	10.40	-	10.85	Brown sandy silty CLAY
S1-BH116	109	D	5.00	-	5.10	Brown silty CLAY
S1-BH116	111	D	5.40	-	5.50	Brown gravelly silty CLAY
S1-BH116	12	D	6.90	-	7.35	Brown gravelly sandy silty CLAY
S1-BH116	114	D	8.20	-	8.30	Brown gravelly sandy silty CLAY
S1-BH106	15	D	10.00	-	10.45	Brown silty CLAY
S1-BH112	9	D	3.20	-	3.61	Brown silty CLAY
S1-BH112	10	D	5.20	-	5.65	Brown gravelly silty CLAY
S1-BH112	11	D	6.20	-	6.58	Brown silty CLAY
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
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Operator
Clayton Jenkins

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

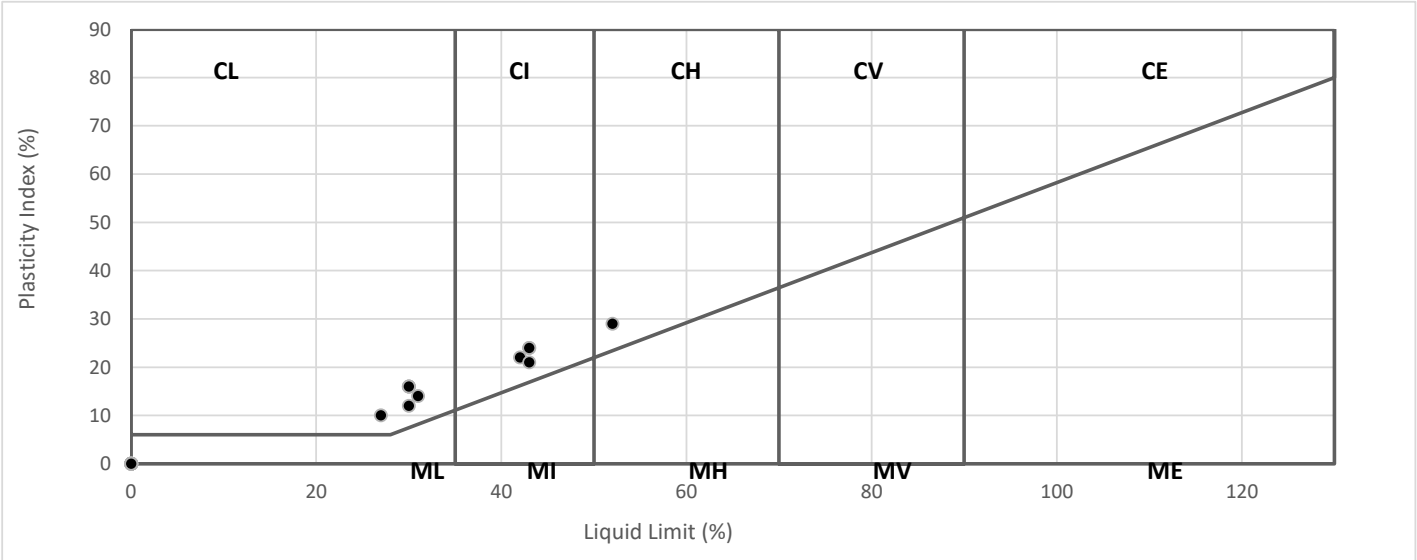
NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)

Contract Number	63638
Project Name	Global Centre Of Rail Excellence
Date Tested	18/01/2023

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
S1-BH109	12	D	8.40	-	8.85	13	30	14	16	89	CL Low Plasticity
S1-BH109	13	D	9.40	-	9.85	16	27	17	10	100	CL Low Plasticity
S1-BH109	14	D	10.40	-	10.85	8.7	30	14	16	100	CL Low Plasticity
S1-BH116	109	D	5.00	-	5.10	24	42	20	22	100	CI Intermediate Plasticity
S1-BH116	111	D	5.40	-	5.50	18	43	19	24	97	CI Intermediate Plasticity
S1-BH116	12	D	6.90	-	7.35	16	30	18	12	80	CL Low Plasticity
S1-BH116	114	D	8.20	-	8.30	15	31	17	14	74	CL Low Plasticity
S1-BH106	15	D	10.00	-	10.45	29	52	23	29	100	CH High Plasticity
S1-BH112	9	D	3.20	-	3.61	24	43	19	24	100	CI Intermediate Plasticity
S1-BH112	10	D	5.20	-	5.65	22	43	22	21	84	CI Intermediate Plasticity
S1-BH112	11	D	6.20	-	6.58	8.2	30	14	16	100	CL Low Plasticity
				-							
				-							
				-							
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				-							

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

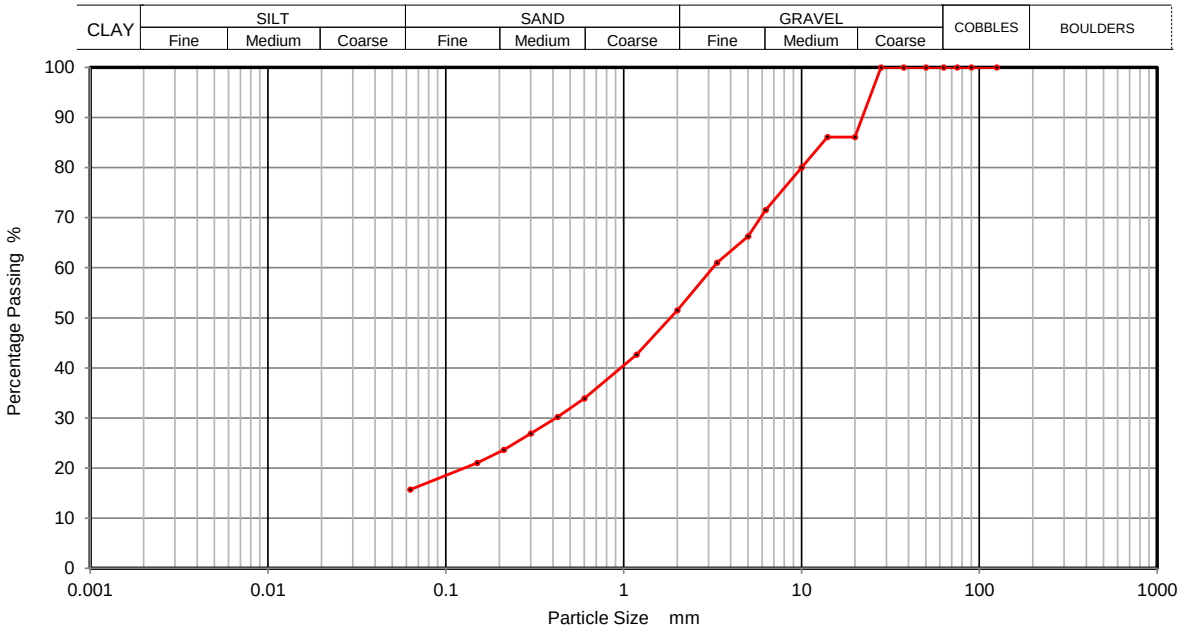
PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:2015+A1:2020



Operator
Clayton Jenkins

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63638
		Borehole/Pit No.	S1-BH101
Project Name	Global Centre Of Rail Excellence	Sample No.	7
Soil Description	Dark grey clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	2.00
		Depth Base	2.45
Date Tested	26/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	86		
14	86		
10	80		
6.3	72		
5	66		
3.35	61		
2	52		
1.18	43		
0.6	34		
0.425	30		
0.3	27		
0.212	24		
0.15	21		
0.063	16		

Sample Proportions	% dry mass
Cobbles	0
Gravel	48
Sand	36
Silt and Clay	16

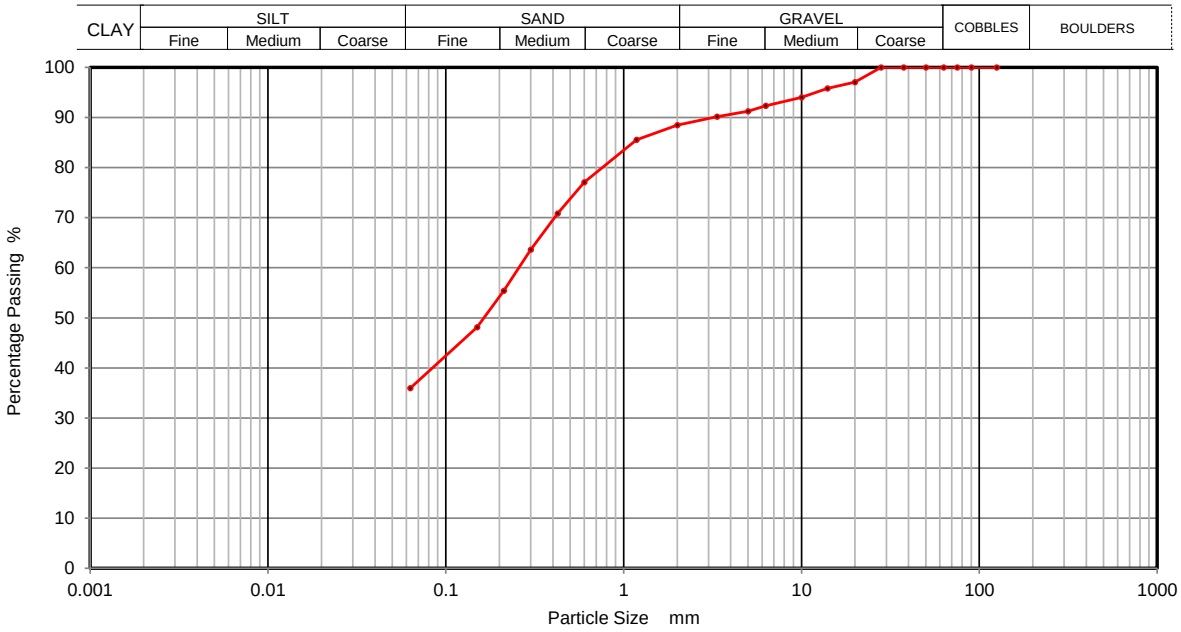
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63638
		Borehole/Pit No.	S1-BH101
Project Name	Global Centre Of Rail Excellence	Sample No.	12
Soil Description	Black fine to coarse gravelly fine to coarse sandy SILT/CLAY	Depth Top	7.00
		Depth Base	7.45
Date Tested	26/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	96		
10	94		
6.3	92		
5	91		
3.35	90		
2	88		
1.18	86		
0.6	77		
0.425	71		
0.3	64		
0.212	55		
0.15	48		
0.063	36		

Sample Proportions	% dry mass
Cobbles	0
Gravel	12
Sand	52
Silt and Clay	36

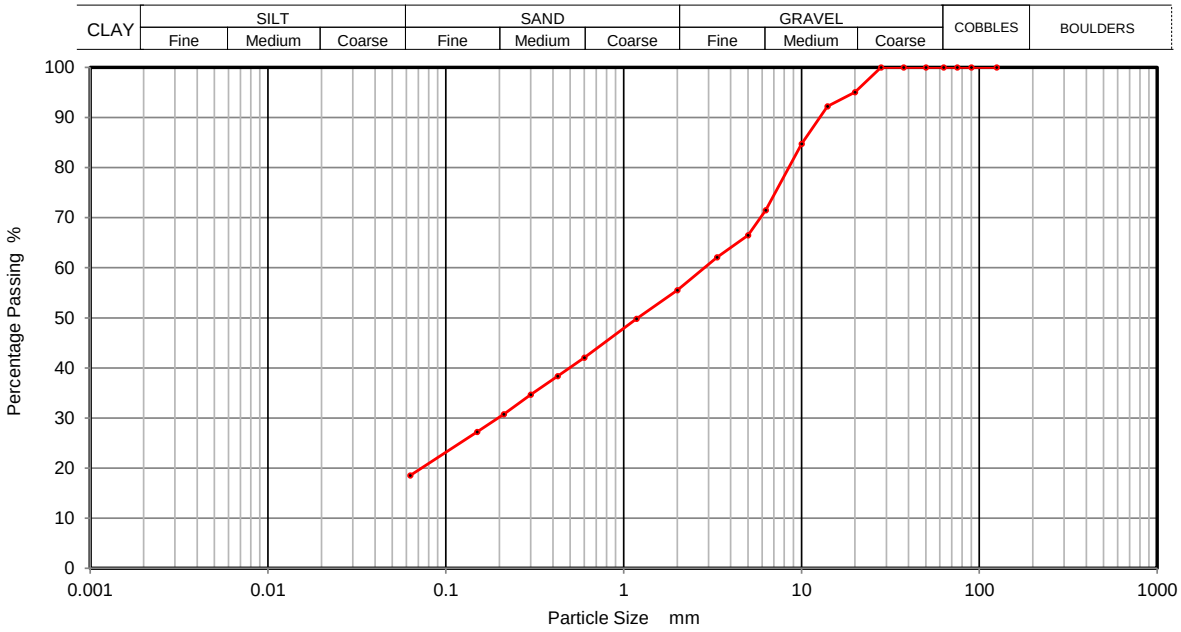
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63638
		Borehole/Pit No.	S1-BH101
Project Name	Global Centre Of Rail Excellence	Sample No.	112
Soil Description	Black clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	9.00
		Depth Base	10.00
Date Tested	26/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	95		
14	92		
10	85		
6.3	71		
5	66		
3.35	62		
2	56		
1.18	50		
0.6	42		
0.425	38		
0.3	35		
0.212	31		
0.15	27		
0.063	19		

Sample Proportions	% dry mass
Cobbles	0
Gravel	44
Sand	37
Silt and Clay	19

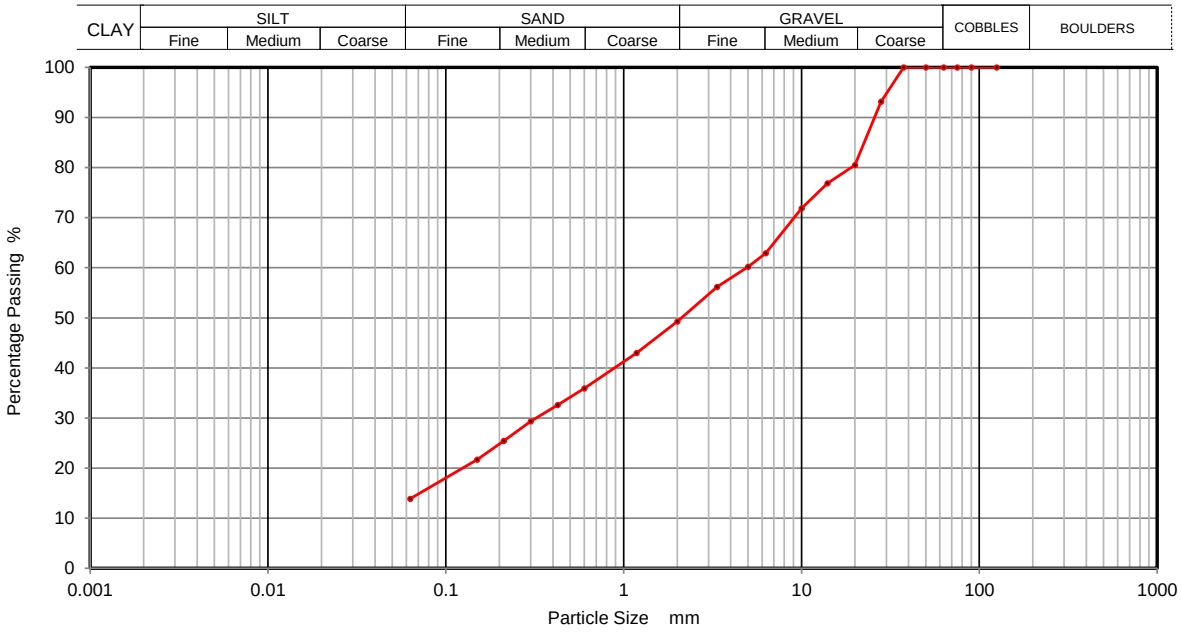
Remarks

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Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63638
		Borehole/Pit No.	S1-BH101
Project Name	Global Centre Of Rail Excellence	Sample No.	16
Soil Description	Black clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	11.50
		Depth Base	11.95
Date Tested	26/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	93		
20	80		
14	77		
10	72		
6.3	63		
5	60		
3.35	56		
2	49		
1.18	43		
0.6	36		
0.425	33		
0.3	29		
0.212	25		
0.15	22		
0.063	14		

Sample Proportions	% dry mass
Cobbles	0
Gravel	51
Sand	35
Silt and Clay	14

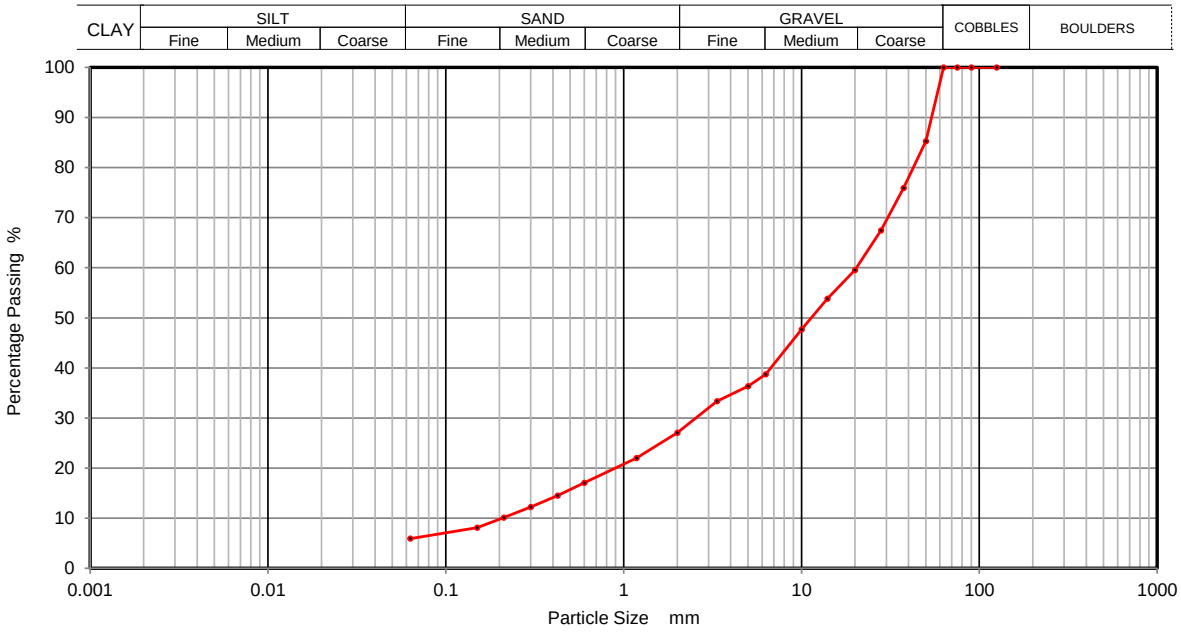
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63638
		Borehole/Pit No.	S1-BH106
Project Name	Global Centre Of Rail Excellence	Sample No.	6
Soil Description	Black clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.20
		Depth Base	1.65
Date Tested	26/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	85		
37.5	76		
28	67		
20	60		
14	54		
10	48		
6.3	39		
5	36		
3.35	33		
2	27		
1.18	22		
0.6	17		
0.425	15		
0.3	12		
0.212	10		
0.15	8		
0.063	6		

Sample Proportions	% dry mass
Cobbles	0
Gravel	73
Sand	21
Silt and Clay	6

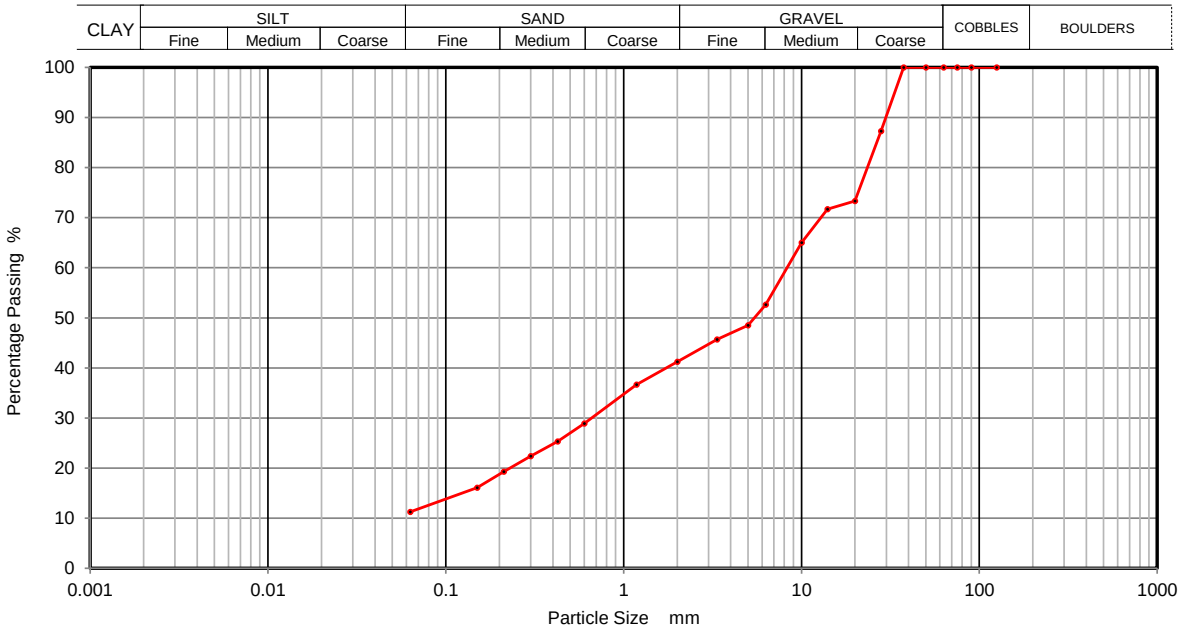
Remarks

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Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63638
		Borehole/Pit No.	S1-BH106
Project Name	Global Centre Of Rail Excellence	Sample No.	107
Soil Description	Dark grey clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	3.70
		Depth Base	5.00
Date Tested	26/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	87		
20	73		
14	72		
10	65		
6.3	53		
5	49		
3.35	46		
2	41		
1.18	37		
0.6	29		
0.425	25		
0.3	22		
0.212	19		
0.15	16		
0.063	11		

Sample Proportions	% dry mass
Cobbles	0
Gravel	59
Sand	30
Silt and Clay	11

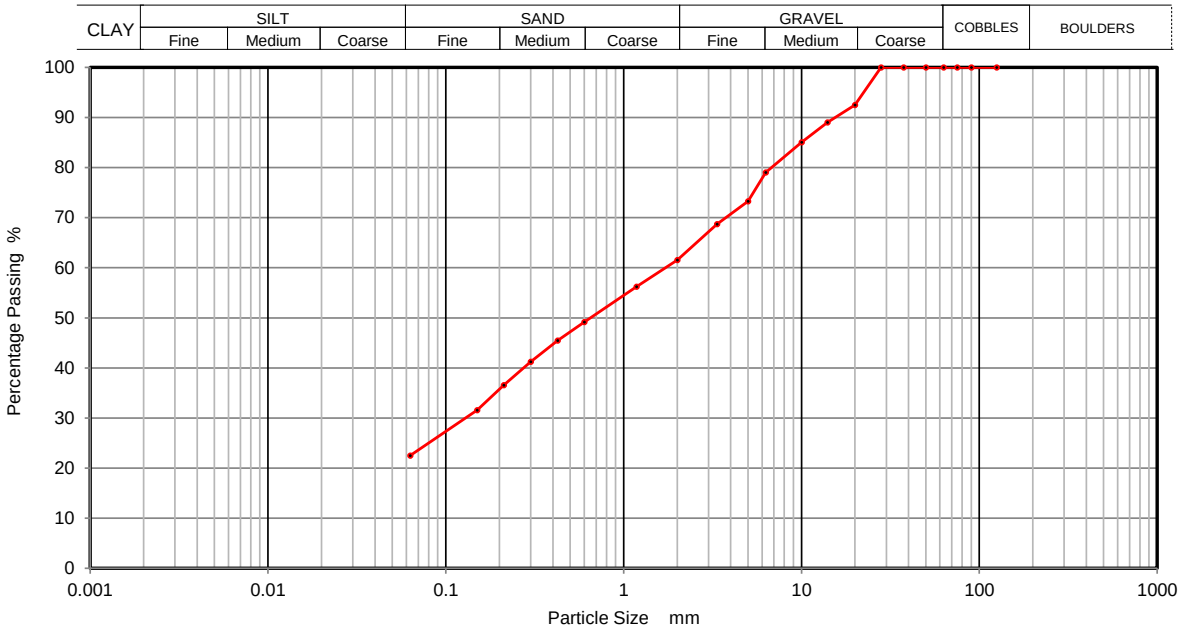
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63638
		Borehole/Pit No.	S1-BH106
Project Name	Global Centre Of Rail Excellence	Sample No.	112
Soil Description	Black clayey/silty fine to coarse gravelly fine to coarse SAND	Depth Top	7.00
		Depth Base	10.00
Date Tested	26/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	93		
14	89		
10	85		
6.3	79		
5	73		
3.35	69		
2	62		
1.18	56		
0.6	49		
0.425	45		
0.3	41		
0.212	37		
0.15	32		
0.063	23		

Sample Proportions	% dry mass
Cobbles	0
Gravel	38
Sand	39
Silt and Clay	23

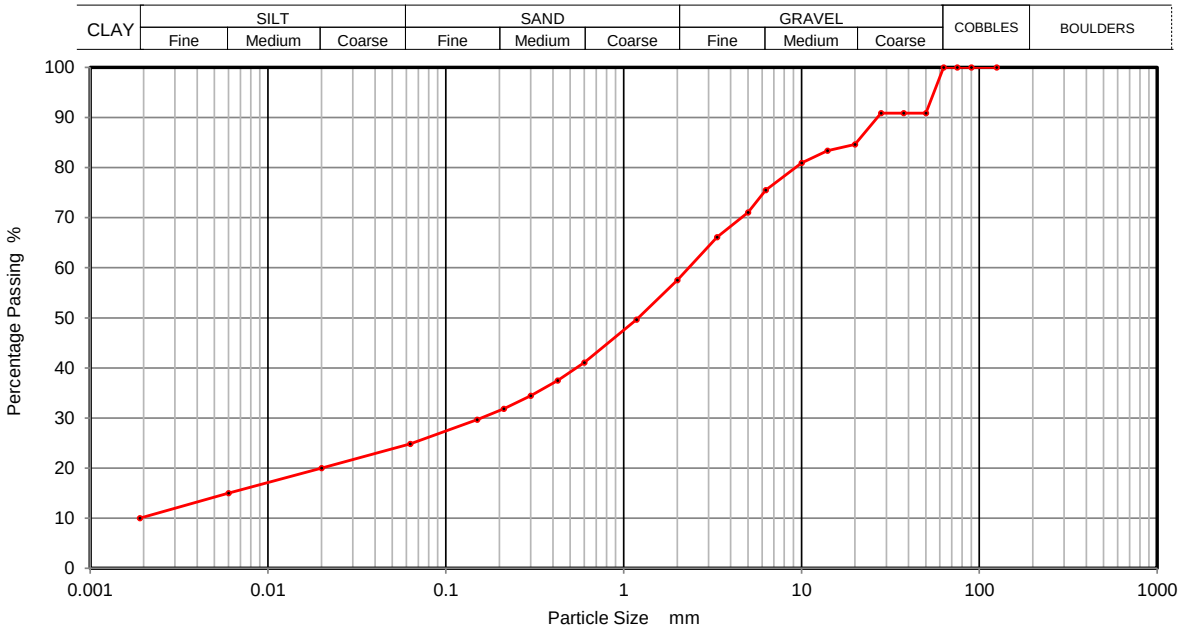
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	63638
		Borehole/Pit No.	S1-BH106
Project Name	Global Centre Of Rail Excellence	Sample No.	114
Soil Description	Dark grey clayey silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	10.00
		Depth Base	11.00
Date Tested	26/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	20
90	100	0.0060	15
75	100	0.0020	10
63	100		
50	91		
37.5	91		
28	91		
20	85		
14	83		
10	81		
6.3	75		
5	71		
3.35	66		
2	57		
1.18	50		
0.6	41		
0.425	37		
0.3	34		
0.212	32		
0.15	30		
0.063	25		

Sample Proportions	% dry mass
Cobbles	0
Gravel	43
Sand	32
Silt	15
Clay	10

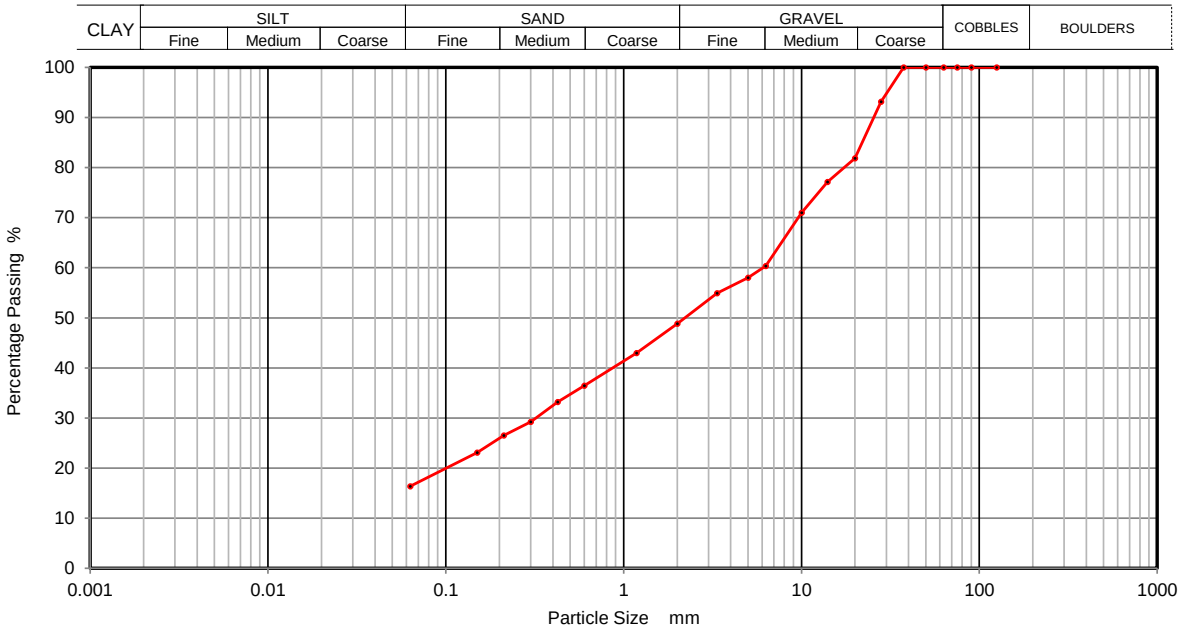
Remarks

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Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63638
		Borehole/Pit No.	S1-BH109
Project Name	Global Centre Of Rail Excellence	Sample No.	106
Soil Description	Black silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	3.20
		Depth Base	4.20
Date Tested	26/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	93		
20	82		
14	77		
10	71		
6.3	60		
5	58		
3.35	55		
2	49		
1.18	43		
0.6	36		
0.425	33		
0.3	29		
0.212	27		
0.15	23		
0.063	16		

Sample Proportions	% dry mass
Cobbles	0
Gravel	51
Sand	33
Silt and Clay	16

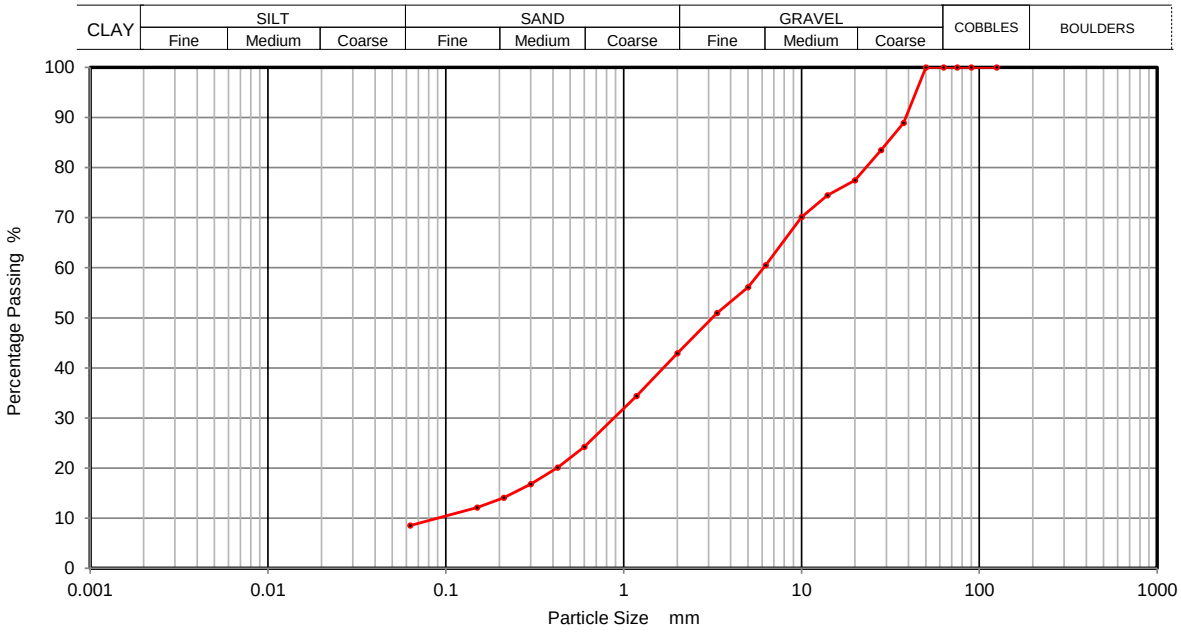
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63638
		Borehole/Pit No.	S1-BH109
Project Name	Global Centre Of Rail Excellence	Sample No.	110
Soil Description	Black clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	5.20
		Depth Base	6.20
Date Tested	26/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	89		
28	84		
20	77		
14	74		
10	70		
6.3	60		
5	56		
3.35	51		
2	43		
1.18	34		
0.6	24		
0.425	20		
0.3	17		
0.212	14		
0.15	12		
0.063	9		

Sample Proportions	% dry mass
Cobbles	0
Gravel	57
Sand	34
Silt and Clay	9

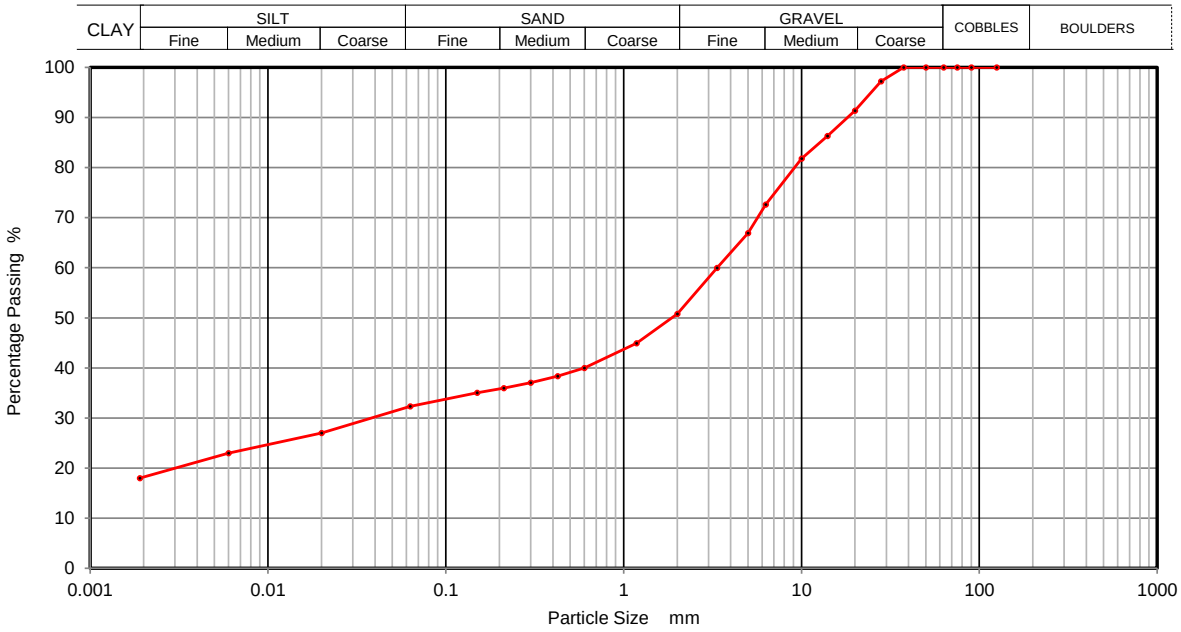
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	63638
		Borehole/Pit No.	S1-BH109
Project Name	Global Centre Of Rail Excellence	Sample No.	115
Soil Description	Grey silty clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	9.40
		Depth Base	10.40
Date Tested	26/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	27
90	100	0.0060	23
75	100	0.0020	18
63	100		
50	100		
37.5	100		
28	97		
20	91		
14	86		
10	82		
6.3	73		
5	67		
3.35	60		
2	51		
1.18	45		
0.6	40		
0.425	38		
0.3	37		
0.212	36		
0.15	35		
0.063	32		

Sample Proportions	% dry mass
Cobbles	0
Gravel	49
Sand	19
Silt	14
Clay	18

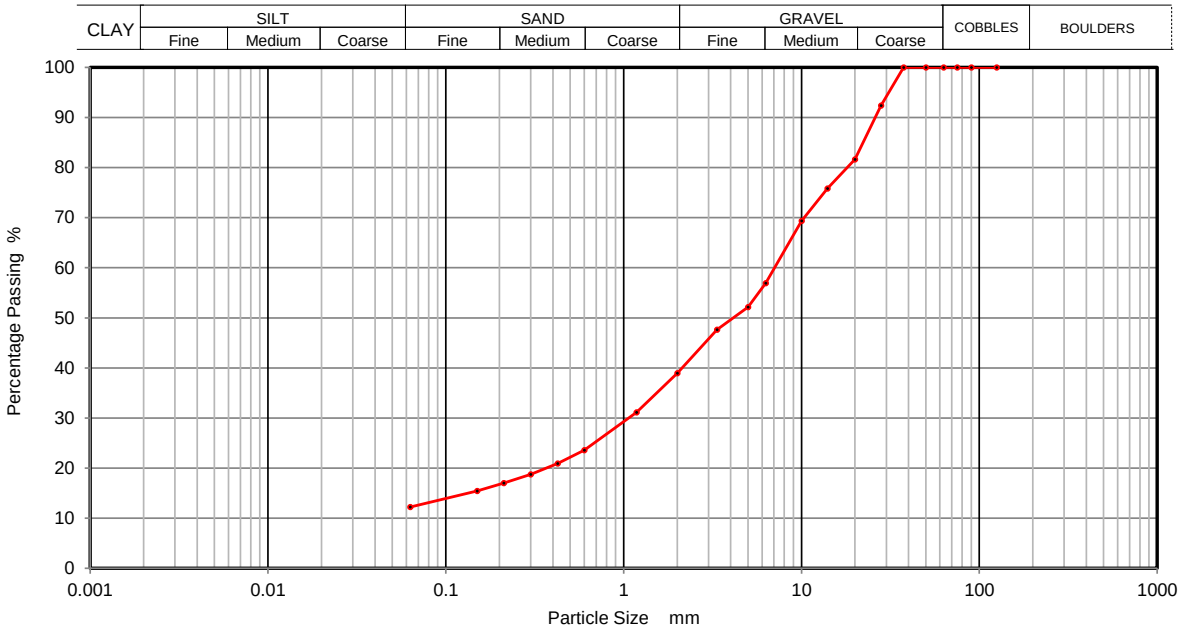
Remarks

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Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63638
		Borehole/Pit No.	S1-BH112
Project Name	Global Centre Of Rail Excellence	Sample No.	6
Soil Description	Black clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.20
		Depth Base	1.65
Date Tested	26/01/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	92		
20	82		
14	76		
10	69		
6.3	57		
5	52		
3.35	48		
2	39		
1.18	31		
0.6	24		
0.425	21		
0.3	19		
0.212	17		
0.15	15		
0.063	12		

Sample Proportions	% dry mass
Cobbles	0
Gravel	61
Sand	27
Silt and Clay	12

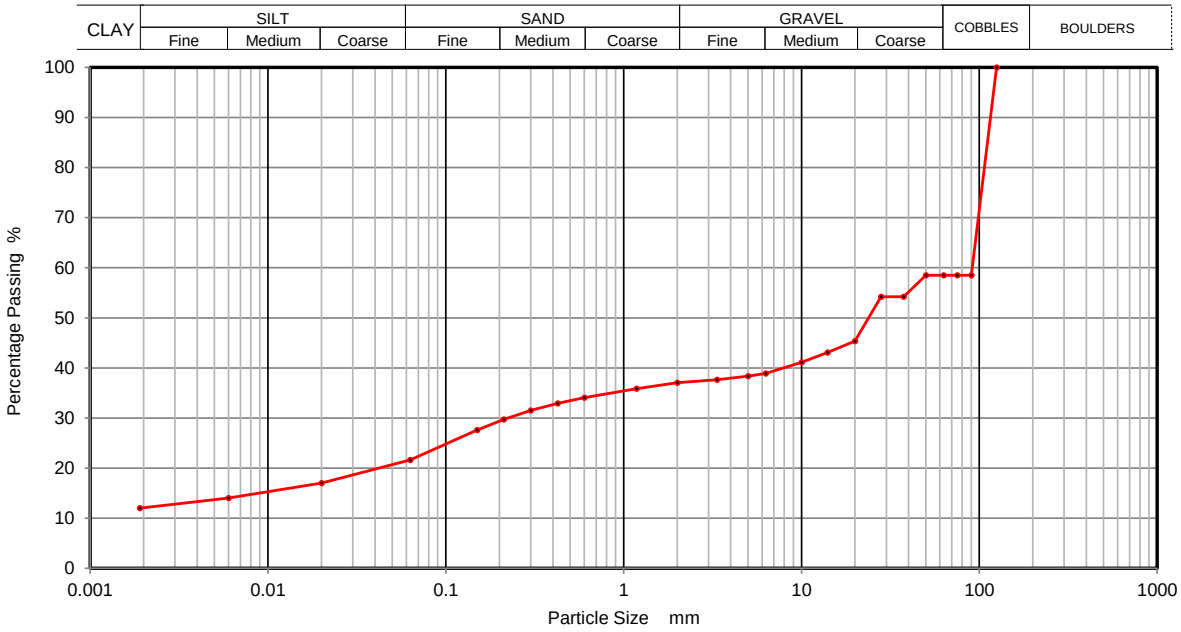
Remarks

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Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	63638
		Borehole/Pit No.	S1-BH112
Project Name	Global Centre Of Rail Excellence	Sample No.	108
Soil Description	Brown silty clayey fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	4.20
		Depth Base	5.10
Date Tested	26/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	17
90	59	0.0060	14
75	59	0.0020	12
63	59		
50	59		
37.5	54		
28	54		
20	45		
14	43		
10	41		
6.3	39		
5	38		
3.35	38		
2	37		
1.18	36		
0.6	34		
0.425	33		
0.3	31		
0.212	30		
0.15	28		
0.063	22		

Sample Proportions	% dry mass
Cobbles	41
Gravel	22
Sand	15
Silt	10
Clay	12

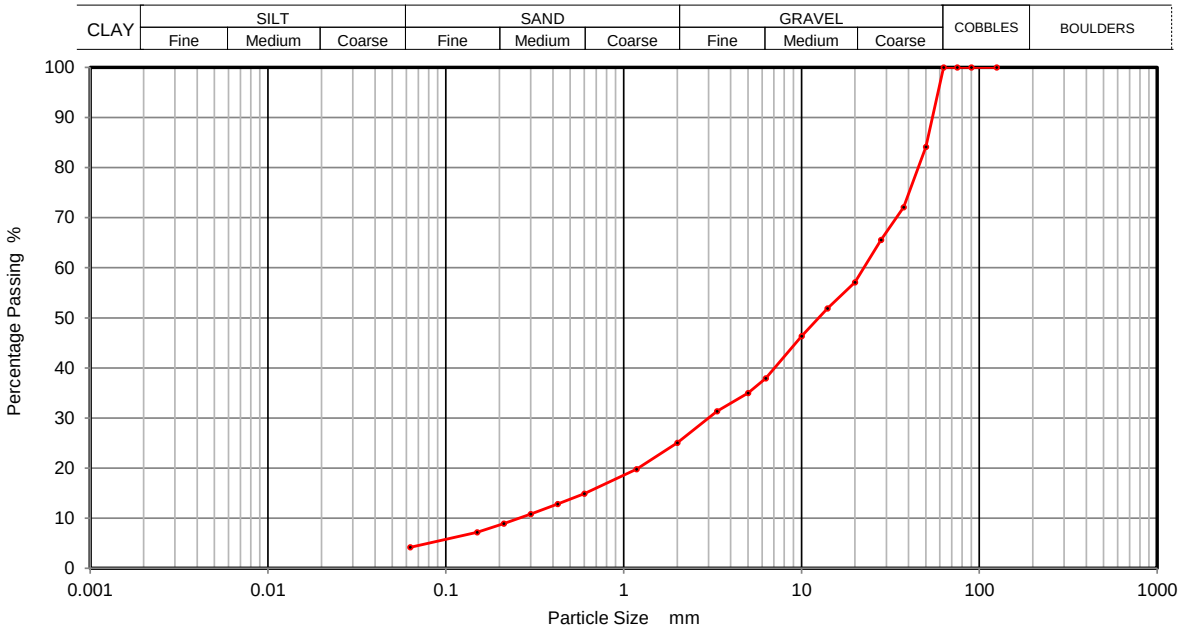
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63638
		Borehole/Pit No.	S1-BH116
Project Name	Global Centre Of Rail Excellence	Sample No.	101
Soil Description	Dark grey slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.30
		Depth Base	2.20
Date Tested	26/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	84		
37.5	72		
28	66		
20	57		
14	52		
10	46		
6.3	38		
5	35		
3.35	31		
2	25		
1.18	20		
0.6	15		
0.425	13		
0.3	11		
0.212	9		
0.15	7		
0.063	4		

Sample Proportions	% dry mass
Cobbles	0
Gravel	75
Sand	21
Silt and Clay	4

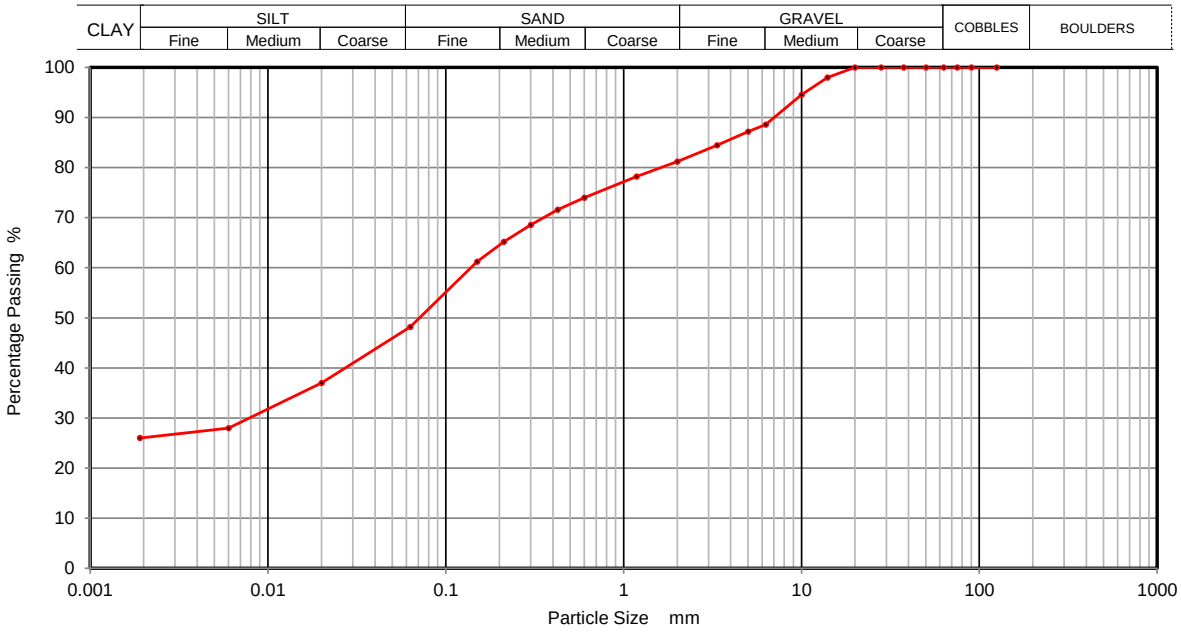
Remarks

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Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	63638
		Borehole/Pit No.	S1-BH116
Project Name	Global Centre Of Rail Excellence	Sample No.	112
Soil Description	Brown grey fine to medium gravelly fine to coarse sandy silty CLAY	Depth Top	5.50
		Depth Base	6.90
Date Tested	26/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	37
90	100	0.0060	28
75	100	0.0020	26
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	95		
6.3	89		
5	87		
3.35	84		
2	81		
1.18	78		
0.6	74		
0.425	72		
0.3	69		
0.212	65		
0.15	61		
0.063	48		

Sample Proportions	% dry mass
Cobbles	0
Gravel	19
Sand	33
Silt	22
Clay	26

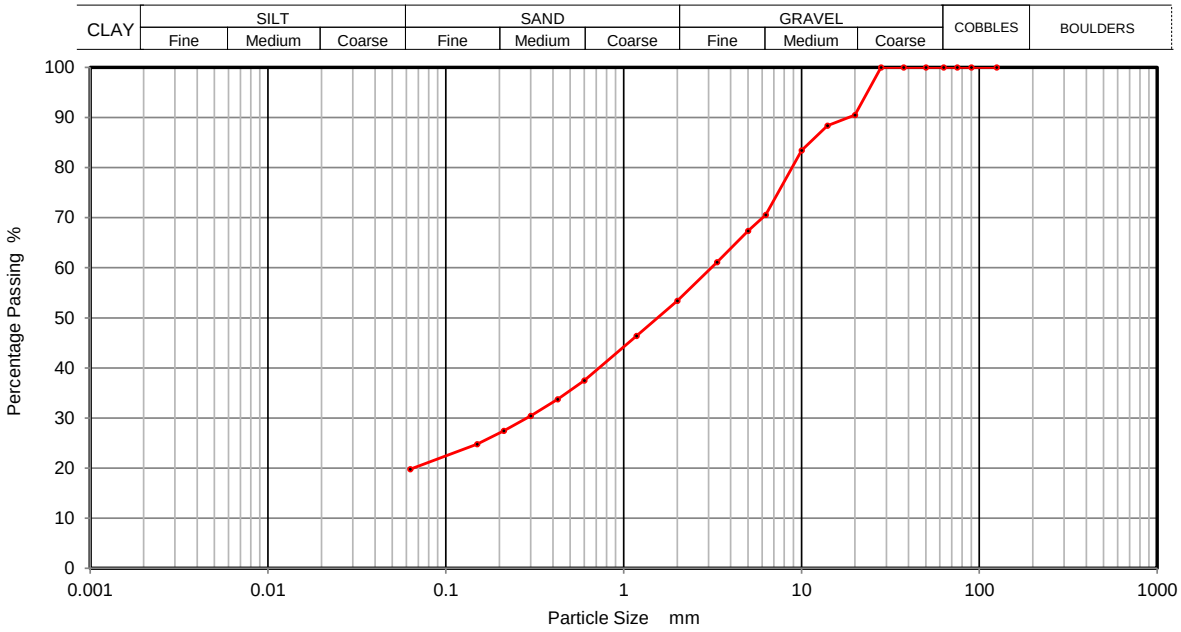
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63638
		Borehole/Pit No.	S1-BH116
Project Name	Global Centre Of Rail Excellence	Sample No.	113
Soil Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	6.90
		Depth Base	8.20
Date Tested	26/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	90		
14	88		
10	83		
6.3	71		
5	67		
3.35	61		
2	53		
1.18	46		
0.6	37		
0.425	34		
0.3	30		
0.212	27		
0.15	25		
0.063	20		

Sample Proportions	% dry mass
Cobbles	0
Gravel	47
Sand	33
Silt and Clay	20

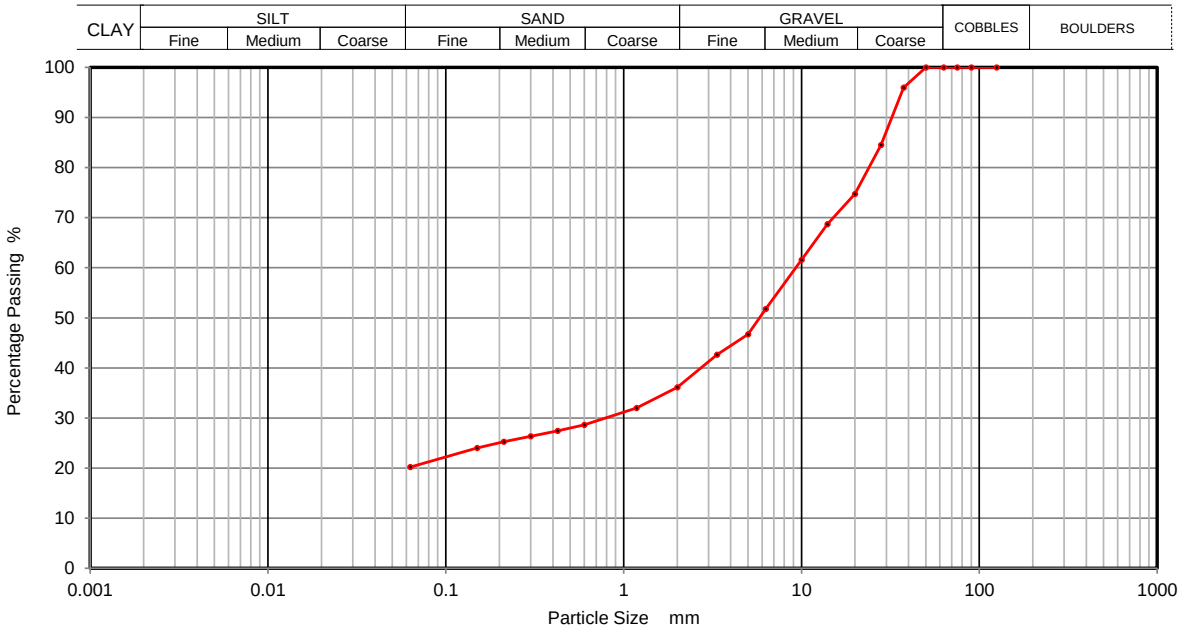
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63638
		Borehole/Pit No.	S1-BH116
Project Name	Global Centre Of Rail Excellence	Sample No.	115
Soil Description	Brown fine to coarse sandy silty/clayey fine to coarse GRAVEL	Depth Top	8.40
		Depth Base	9.90
Date Tested	26/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	96		
28	84		
20	75		
14	69		
10	62		
6.3	52		
5	47		
3.35	43		
2	36		
1.18	32		
0.6	29		
0.425	27		
0.3	26		
0.212	25		
0.15	24		
0.063	20		

Sample Proportions	% dry mass
Cobbles	0
Gravel	64
Sand	16
Silt and Clay	20

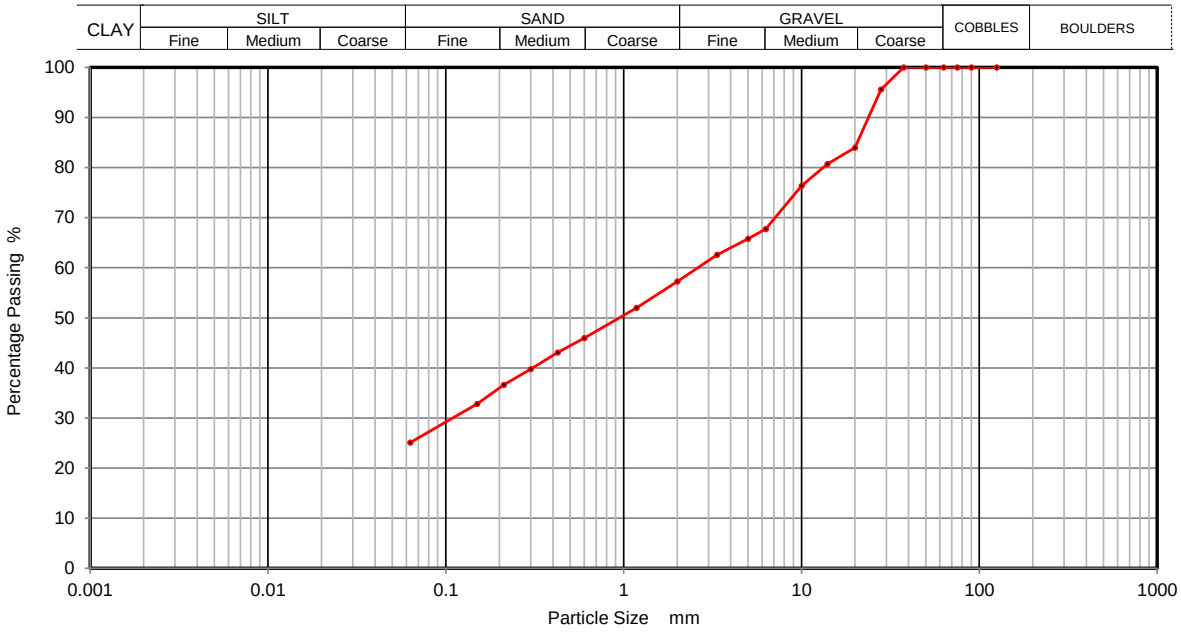
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	63638
		Borehole/Pit No.	S1-TP105
Project Name	Global Centre Of Rail Excellence	Sample No.	3
Soil Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.20
		Depth Base	0.40
Date Tested	26/01/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	96		
20	84		
14	81		
10	76		
6.3	68		
5	66		
3.35	63		
2	57		
1.18	52		
0.6	46		
0.425	43		
0.3	40		
0.212	37		
0.15	33		
0.063	25		

Sample Proportions	% dry mass
Cobbles	0
Gravel	43
Sand	32
Silt and Clay	25

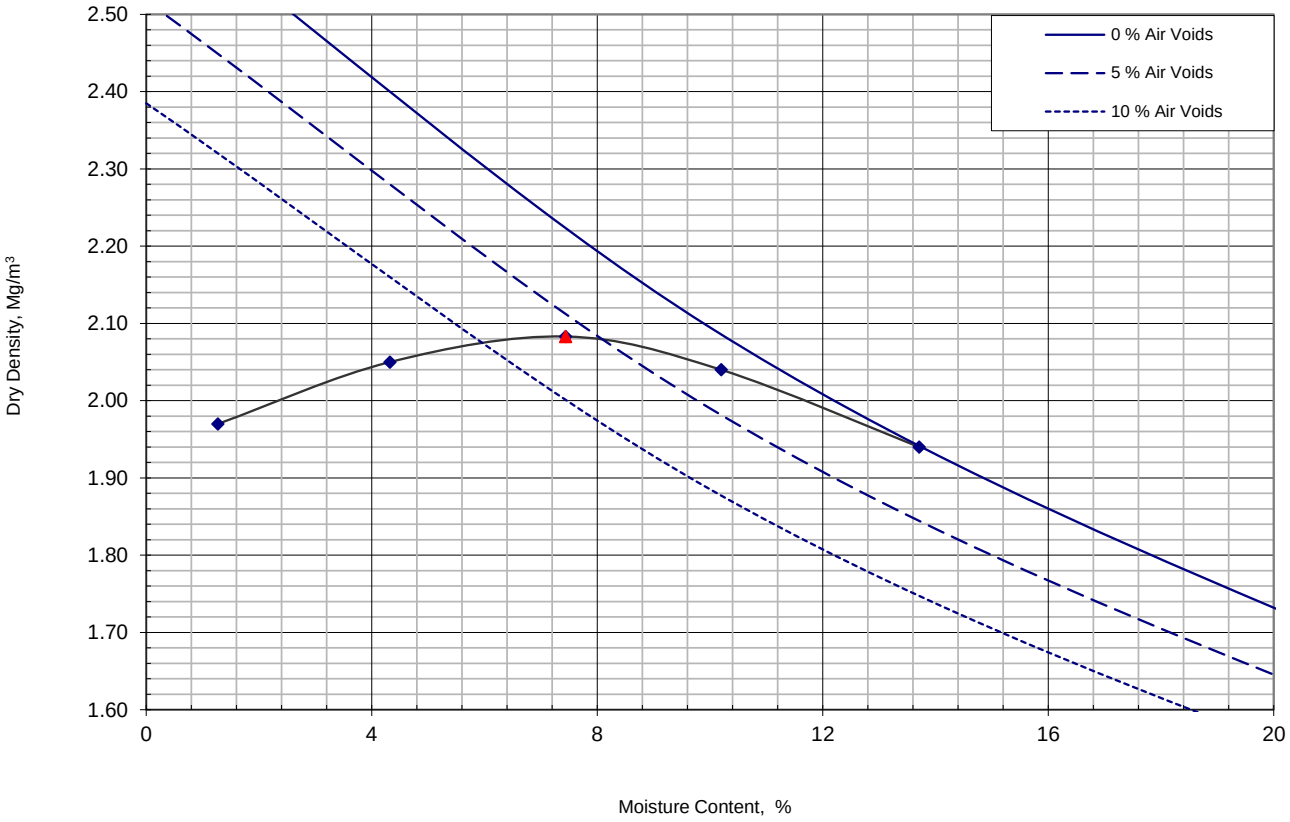
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Dry Density / Moisture Content Relationship BS 1377:Part 4:1990**	Contract Number	63638
		Borehole / Pit No	S1-BH101
Project Name	Global Centre Of Rail Excellence	Sample No	104
Date Tested	23/01/2023	Depth Top	4.00
Compaction Method	4.5 Kg Rammer	Depth Base	5.00
Compaction Clause	BS1377:Part 4:1990, Clause 3.5	Sample Type	B
Sample Description	Black silty clayey fine to coarse GRAVEL	Single or Separate Sample Used	Single



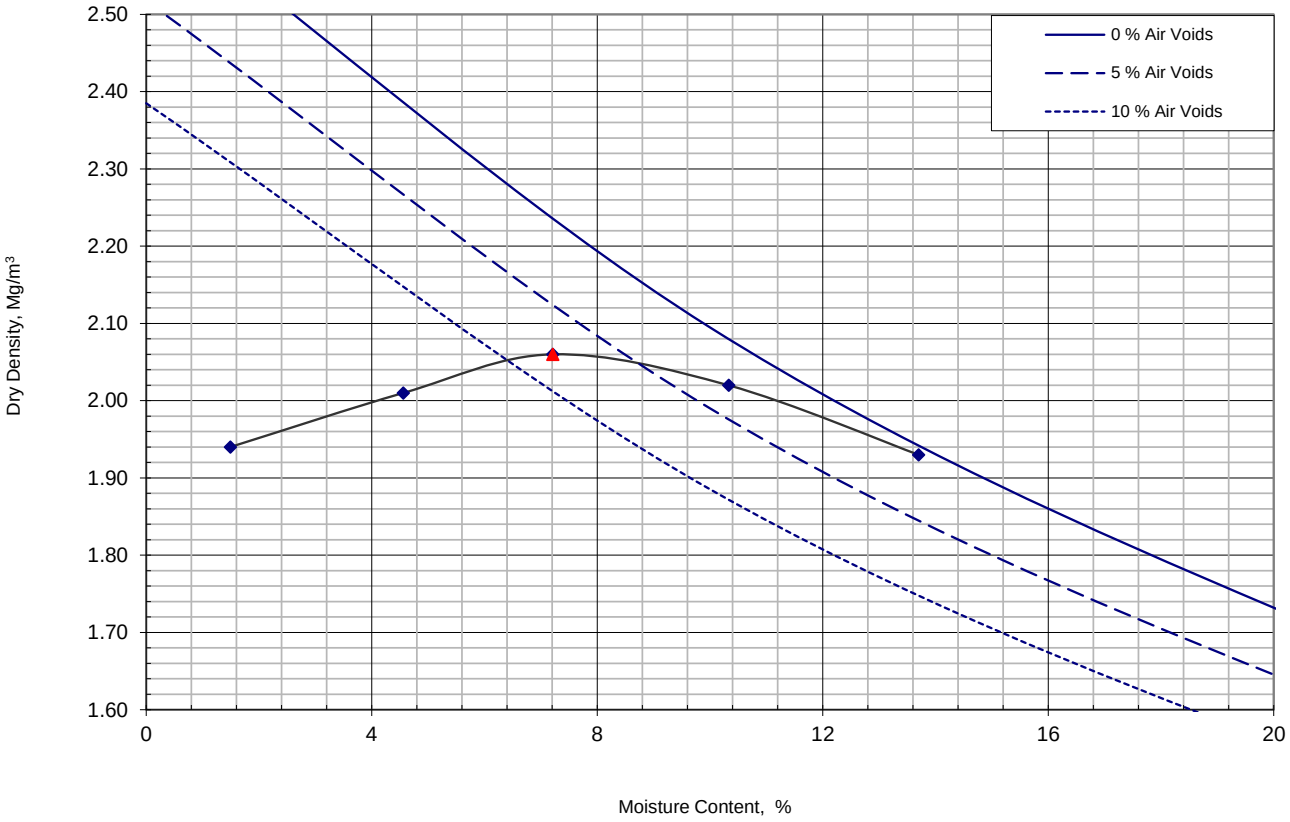
Compaction Point	1	2	3	4	5							
Moisture Content	1.3	4.3	7.4	10	14							
Bulk Density	1.99	2.14	2.24	2.25	2.21							
Dry Density	1.97	2.05	2.08	2.04	1.94							

Initial Moisture Content	14	%
Maximum Dry Density	2.08	Mg/m3
Optimum Moisture Content	7.4	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	10	%
Material Retained 20mm	16	%

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Dry Density / Moisture Content Relationship BS 1377:Part 4:1990**	Contract Number	63638
		Borehole / Pit No	S1-BH106
Project Name	Global Centre Of Rail Excellence	Sample No	103
Date Tested	23/01/2023	Depth Top	2.00
Compaction Method	4.5 Kg Rammer	Depth Base	3.00
Compaction Clause	BS1377:Part 4:1990, Clause 3.5	Sample Type	B
Sample Description	Black silty clayey fine to coarse GRAVEL	Single or Separate Sample Used	Single



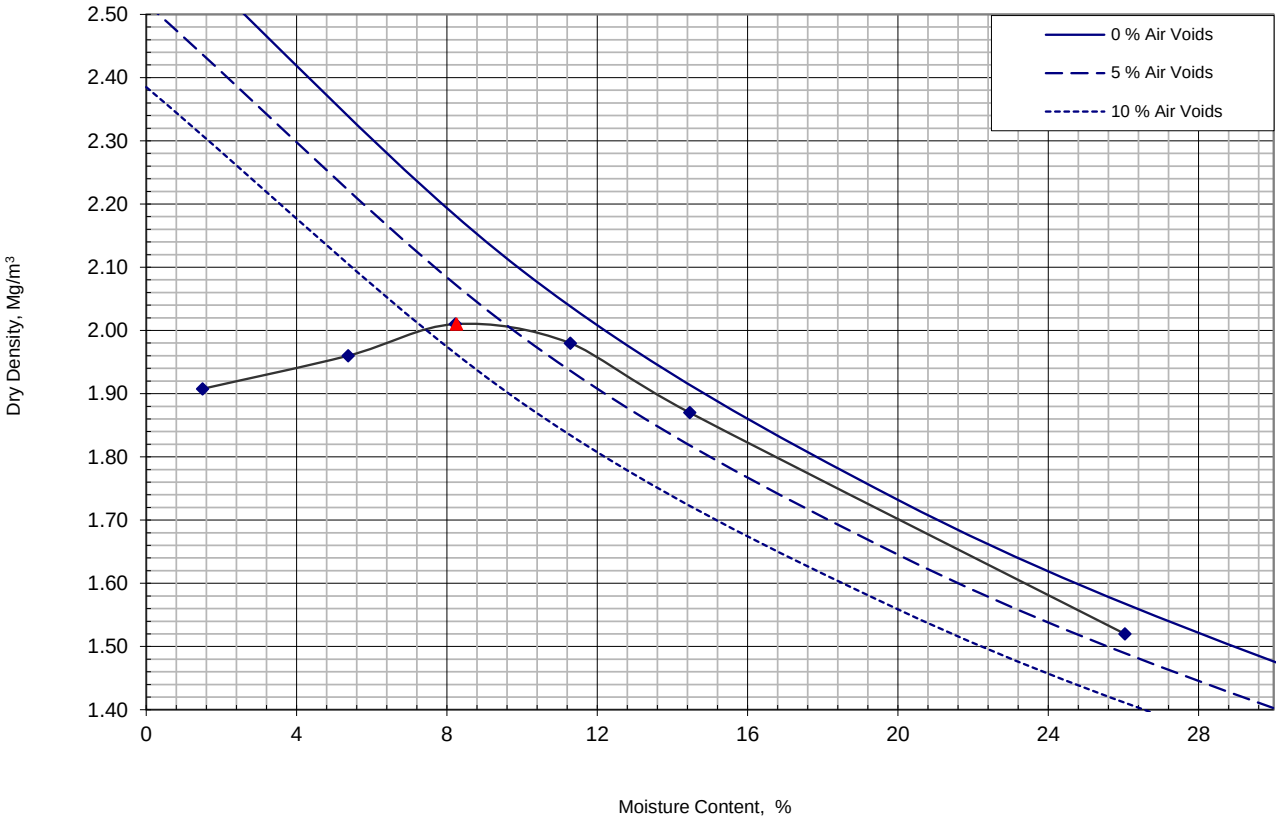
Compaction Point	1	2	3	4	5							
Moisture Content	1.5	4.6	7.2	10	14							
Bulk Density	1.97	2.10	2.21	2.23	2.19							
Dry Density	1.94	2.01	2.06	2.02	1.93							

Initial Moisture Content	14	%
Maximum Dry Density	2.06	Mg/m3
Optimum Moisture Content	7.2	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	7	%
Material Retained 20mm	10	%

Operator
Conal

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Dry Density / Moisture Content Relationship BS 1377:Part 4:1990**	Contract Number	63638
		Borehole / Pit No	S1-BH109
Project Name	Global Centre Of Rail Excellence	Sample No	104
Date Tested	23/01/2023	Depth Top	2.70
Compaction Method	4.5 Kg Rammer	Depth Base	3.20
Compaction Clause	BS1377:Part 4:1990, Clause 3.5	Sample Type	B
Sample Description	Black silty clayey fine to coarse GRAVEL	Single or Separate Sample Used	Single



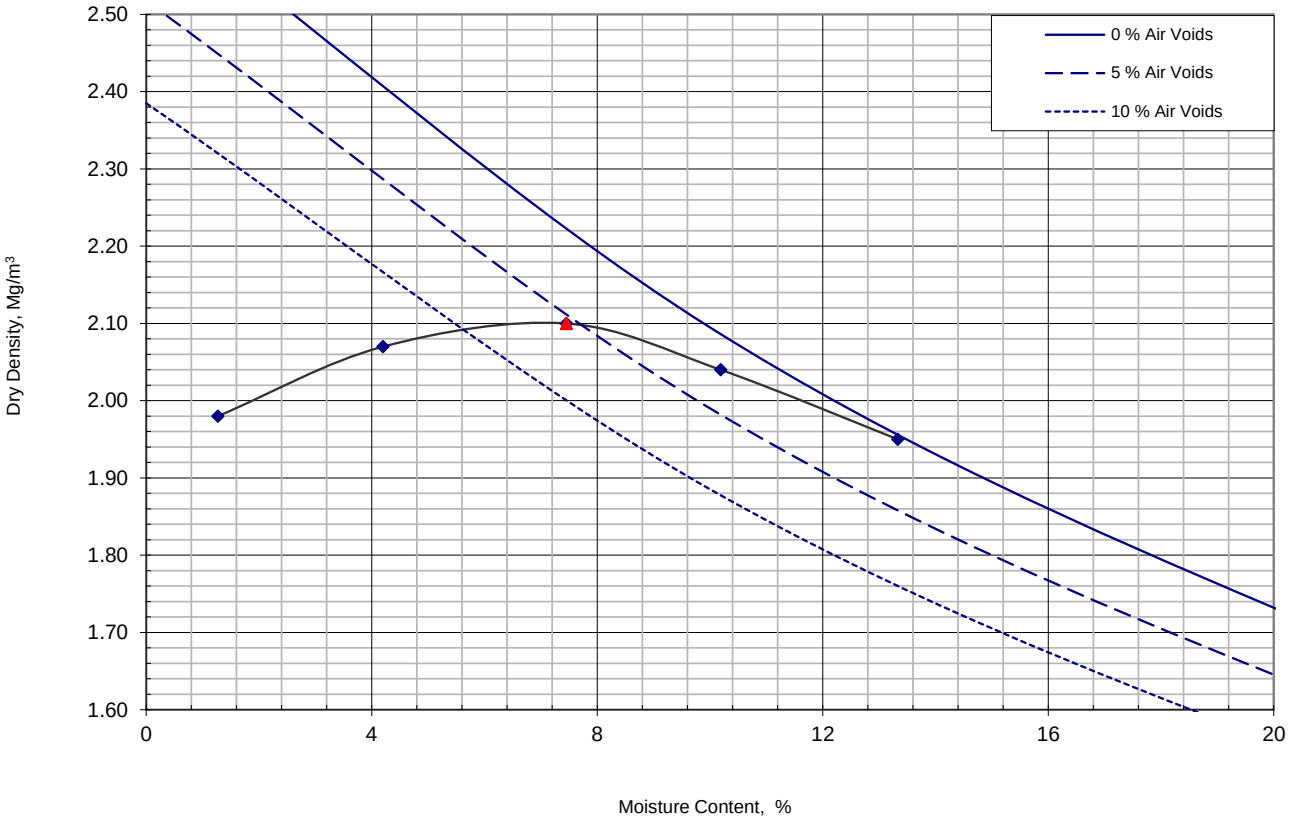
Compaction Point	1	2	3	4	5	6						
Moisture Content	1.5	5.4	8.2	11	14	26						
Bulk Density	1.94	2.07	2.18	2.20	2.14	1.92						
Dry Density	1.91	1.96	2.01	1.98	1.87	1.52						

Initial Moisture Content	26	%
Maximum Dry Density	2.01	Mg/m3
Optimum Moisture Content	8.3	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	7	%
Material Retained 20mm	13	%

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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Dry Density / Moisture Content Relationship BS 1377:Part 4:1990**	Contract Number	63638
		Borehole / Pit No	S1-BH116
Project Name	Global Centre Of Rail Excellence	Sample No	103
Date Tested	23/01/2023	Depth Top	2.20
Compaction Method	4.5 Kg Rammer	Depth Base	3.20
Compaction Clause	BS1377:Part 4:1990, Clause 3.5	Sample Type	B
Sample Description	Black silty clayey fine to coarse GRAVEL	Single or Separate Sample Used	Single



Compaction Point	1	2	3	4	5							
Moisture Content	1.3	4.2	7.5	10	13							
Bulk Density	2.01	2.16	2.26	2.25	2.21							
Dry Density	1.98	2.07	2.10	2.04	1.95							

Initial Moisture Content	13	%
Maximum Dry Density	2.10	Mg/m3
Optimum Moisture Content	7.5	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	8	%
Material Retained 20mm	12	%

Operator
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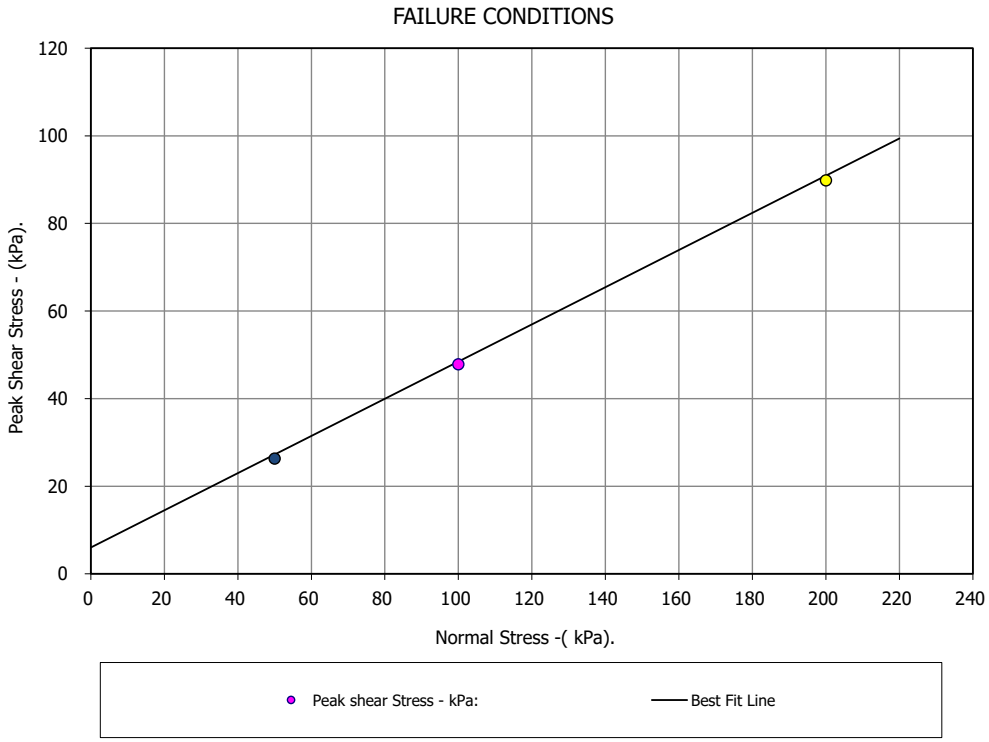
Borehole Number: S1-BH101 Depth from (m): 6.00
Depth to (m): 7.35

Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Black silty CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	24.90	24.90	24.90
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	24	24	24
Bulk Density - Mg/m3:	1.83	1.83	1.83
Dry Density - Mg/m3:	1.47	1.47	1.47
Voids Ratio:	0.8023	0.8029	0.8044
Degree of Saturation - %:	80.21	80.15	80.00
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	22.21	21.66	21.03
Shear			
Rate of Horizontal Displacement (mm/min)	0.200	0.200	0.200
Horizontal Displacement at Peak Shear Stress (mm)	10.35	8.91	10.62
Peak shear Stress - kPa:	26	48	90

PEAK	
Angle of Shearing Resistance:(θ)	**23.0**
Effective Cohesion - kPa:	**6.0**



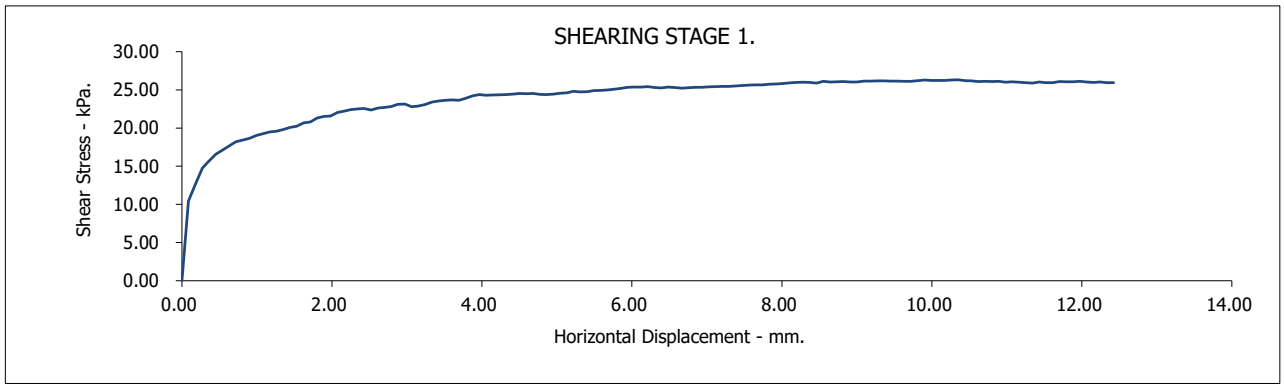
Contract No.:
63638

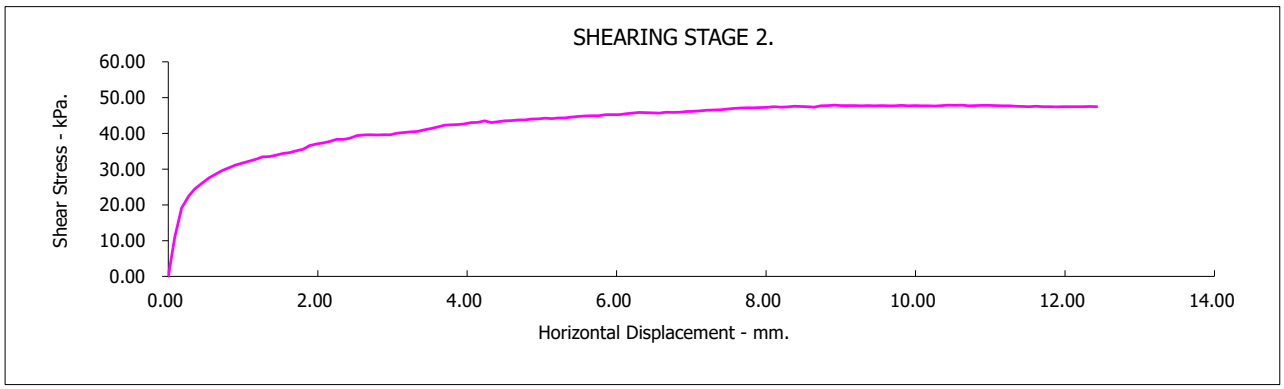
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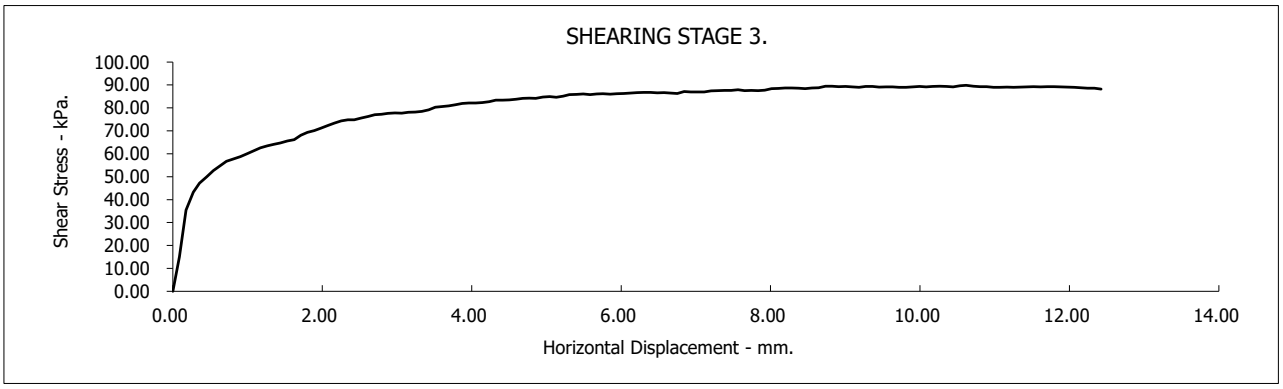
Client Ref Number:

G22069

Borehole Number:	S1-BH101	Depth from (m):	6.00
Sample Number :		Depth to (m):	7.35







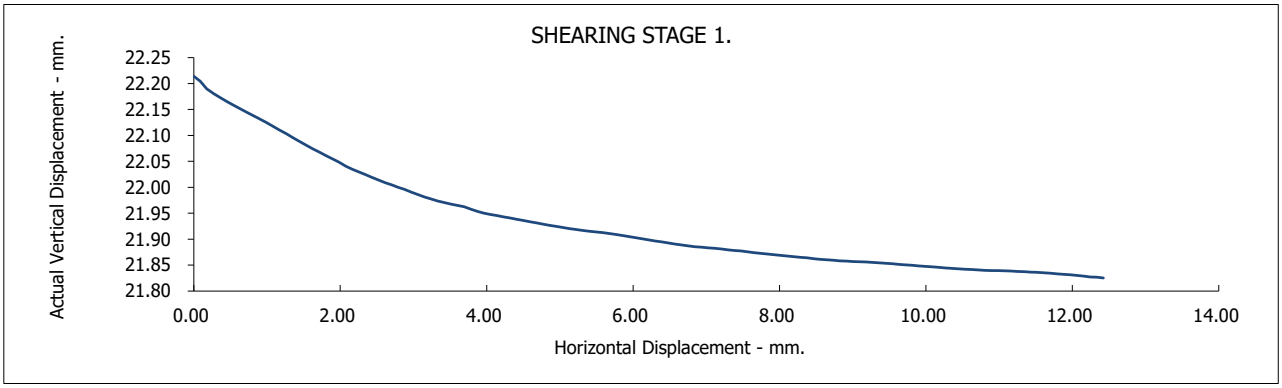
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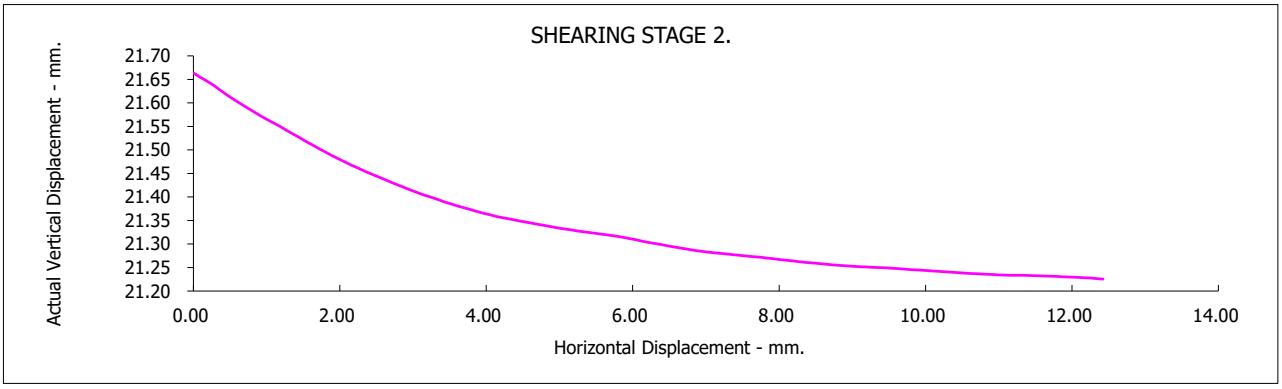
Contract No.: **63638**

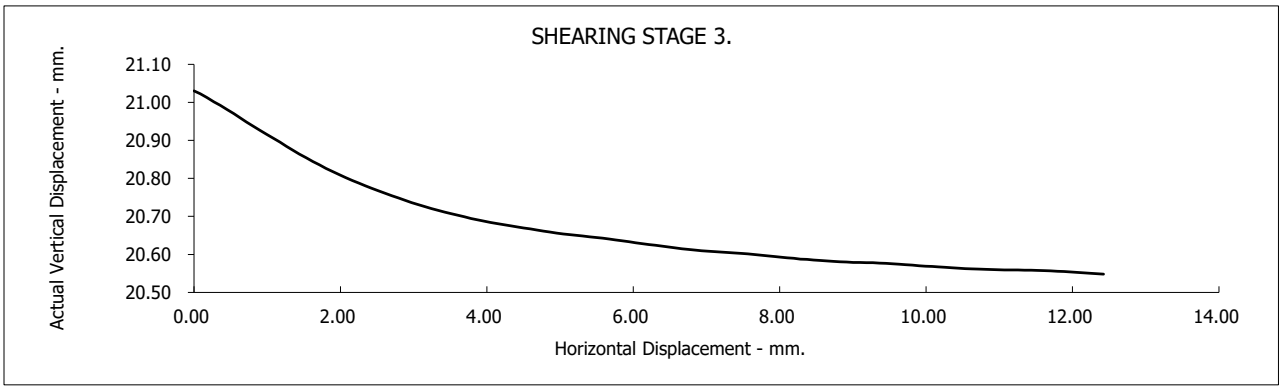
Client Ref Number: **G22069**

Figure.

Borehole Number:	S1-BH101	Depth from (m):	6.00
Sample Number :		Depth to (m):	7.35





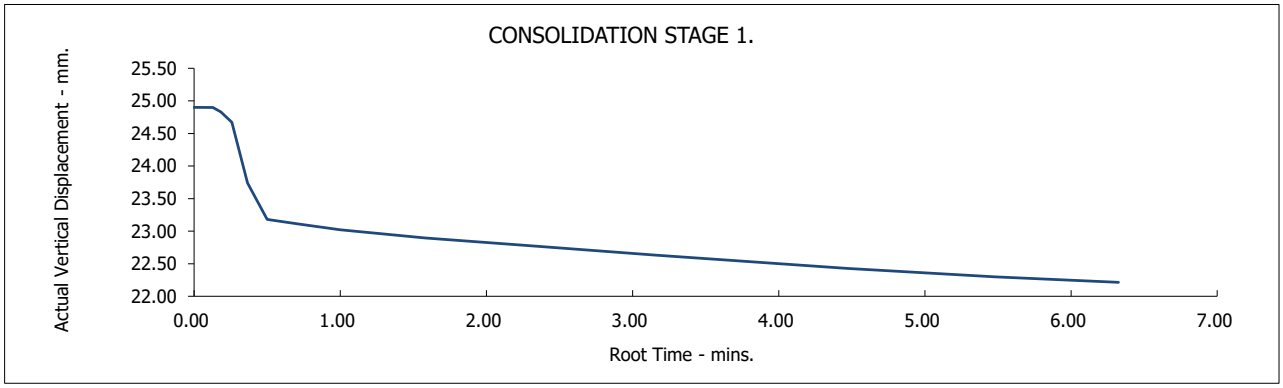


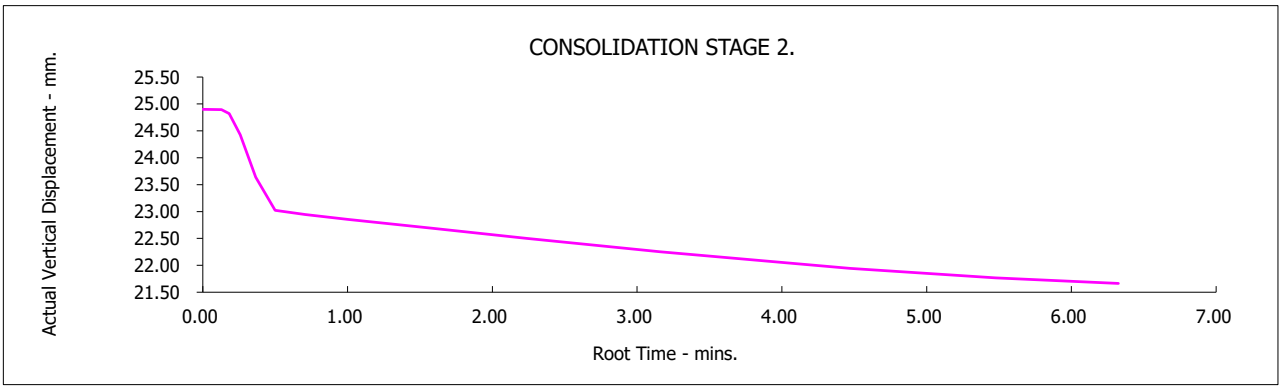
Contract No.:
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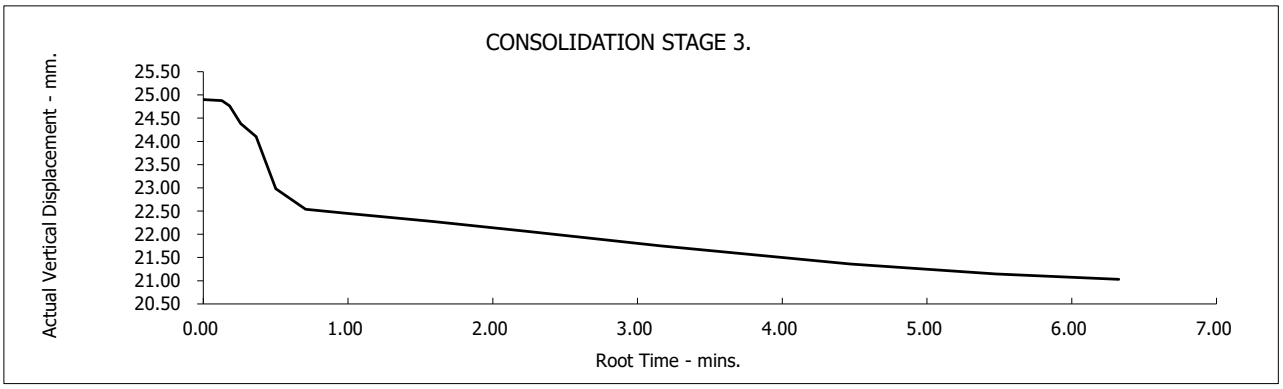
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Client Ref Number:
G22069

Borehole Number:	S1-BH101	Depth from (m):	6.00
Sample Number :		Depth to (m):	7.35







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Contract No.: **63638**

Client Ref Number: **G22069**

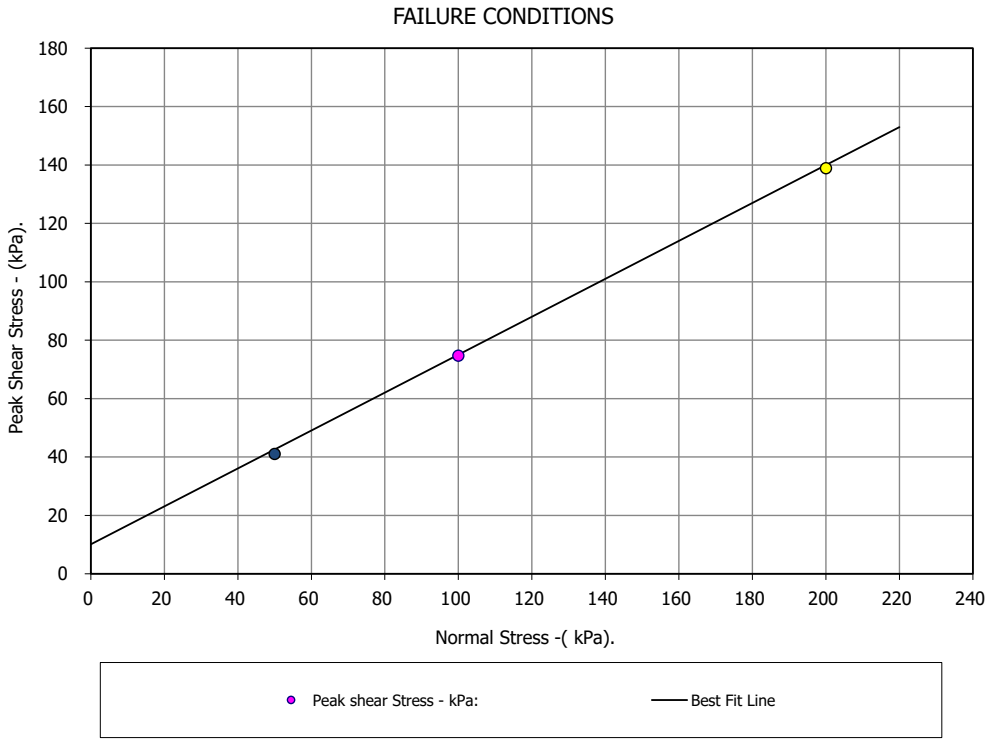
Borehole Number: S1-BH101 Depth from (m): 8.00
Depth to (m): 9.00

Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Black organic, sandy CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	21	21	21
Bulk Density - Mg/m3:	1.86	1.86	1.86
Dry Density - Mg/m3:	1.54	1.54	1.54
Voids Ratio:	0.7259	0.7249	0.7247
Degree of Saturation - %:	76.05	76.16	76.18
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	23.36	22.96	22.22
Shear			
Rate of Horizontal Displacement (mm/min)	0.200	0.200	0.200
Horizontal Displacement at Peak Shear Stress (mm)	4.23	4.68	5.58
Peak shear Stress - kPa:	41	75	139

PEAK	
Angle of Shearing Resistance:(θ)	**33.0**
Effective Cohesion - kPa:	**10**



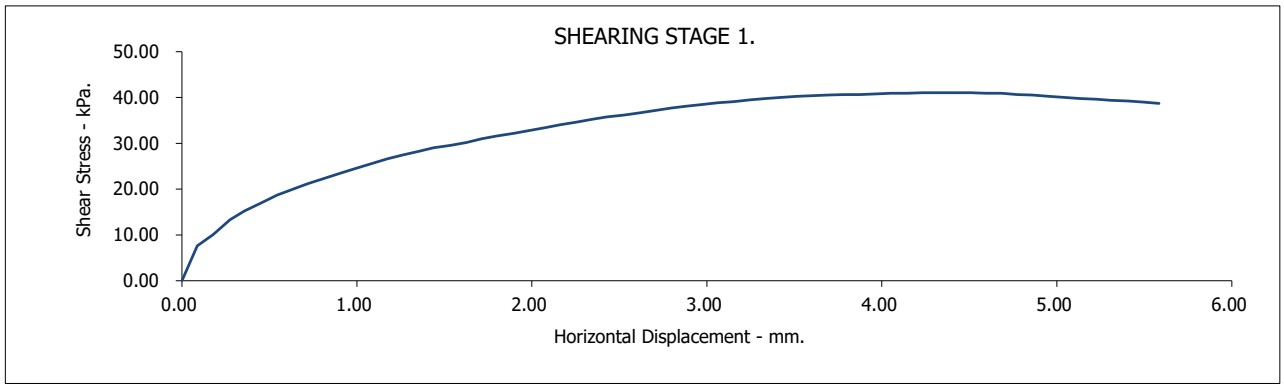
Contract No.:
63638

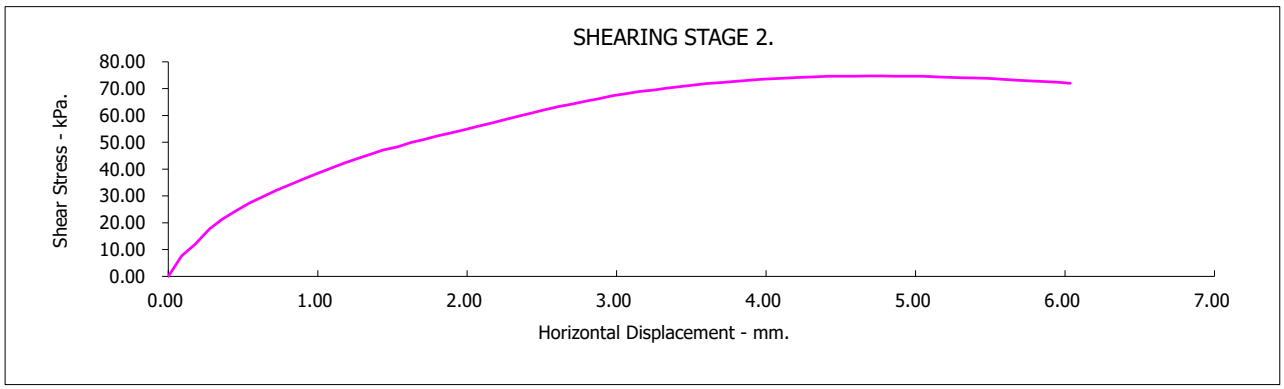
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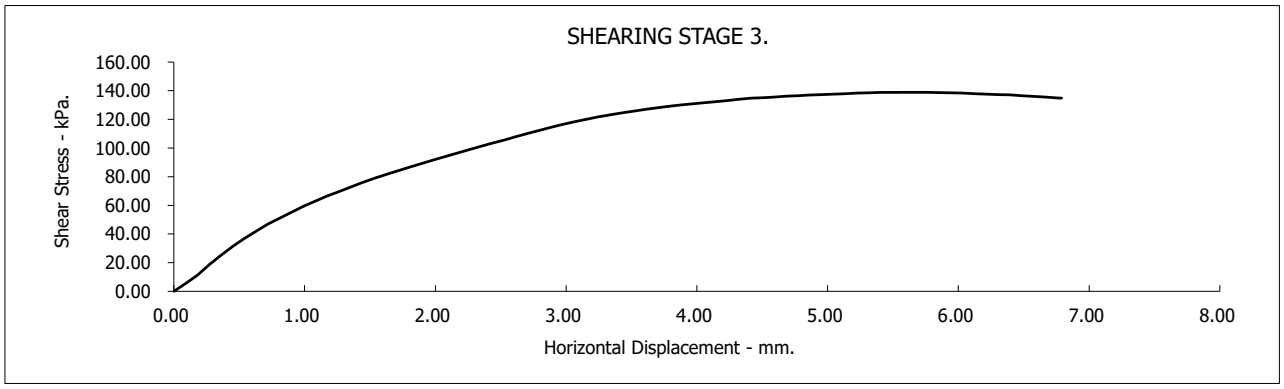
Client Ref Number:

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Borehole Number:	S1-BH101	Depth from (m):	8.00
Sample Number :		Depth to (m):	9.00







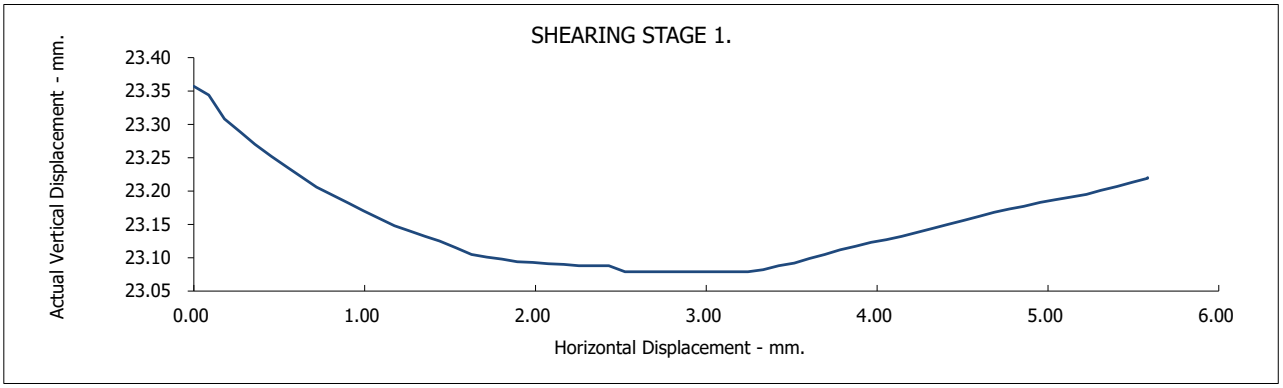
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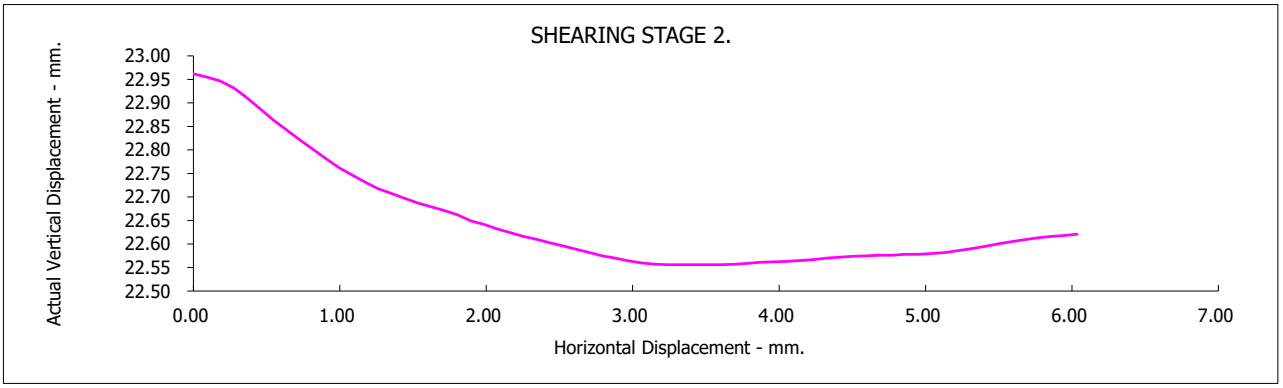
Contract No.: **63638**

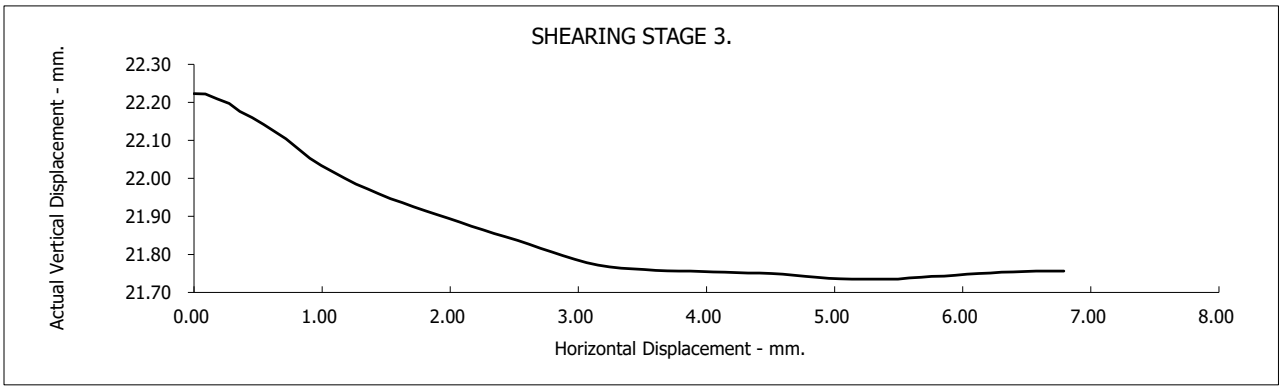
Client Ref Number: **G22069**

Figure.

Borehole Number:	S1-BH101	Depth from (m):	8.00
Sample Number :		Depth to (m):	9.00





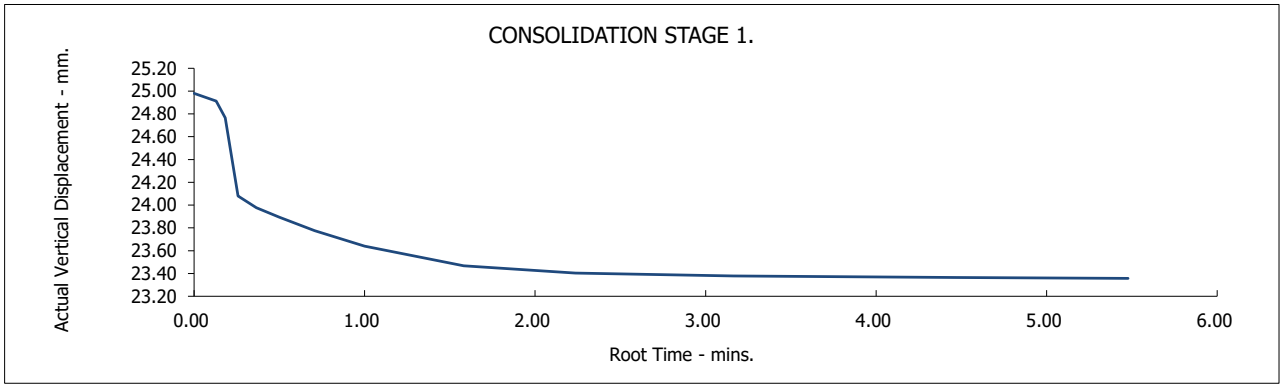


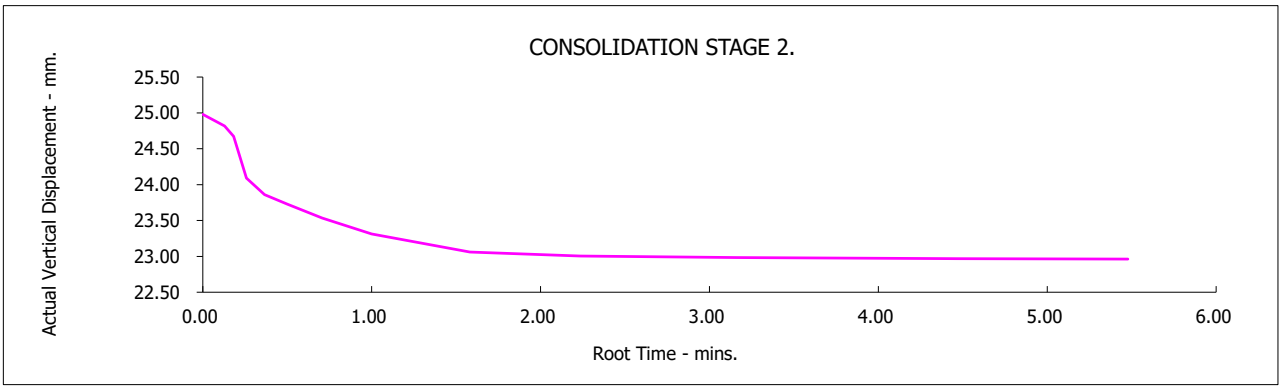
Contract No.:
63638

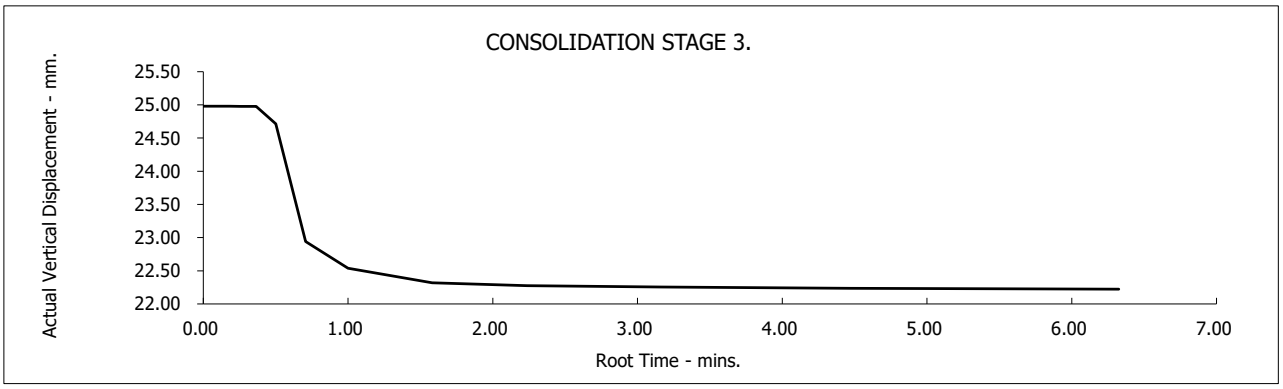
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Client Ref Number:
G22069

Borehole Number:	S1-BH101	Depth from (m):	8.00
Sample Number :		Depth to (m):	9.00







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Contract No.: **63638**

Client Ref Number: **G22069**

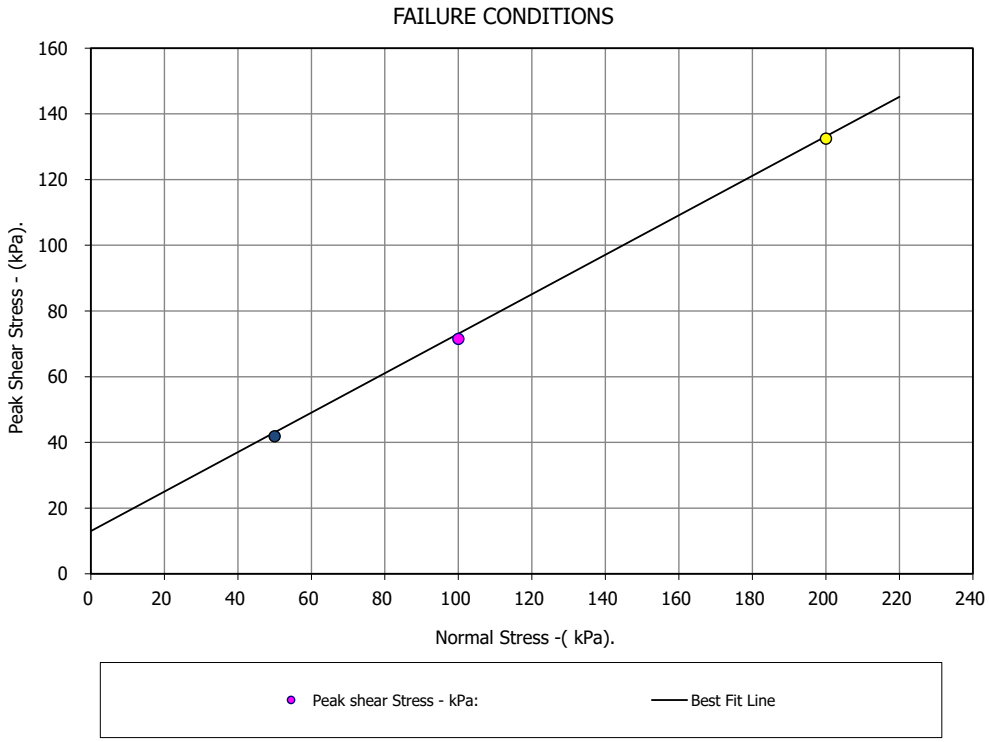
Borehole Number: S1-BH106 Depth from (m): 3.70
Depth to (m): 5.00

Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Brown fine sandy, silty CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	23.30	23.30	23.30
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	19	19	19
Bulk Density - Mg/m3:	1.70	1.71	1.70
Dry Density - Mg/m3:	1.43	1.43	1.43
Voids Ratio:	0.8533	0.8530	0.8542
Degree of Saturation - %:	59.74	59.76	59.68
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	22.30	21.51	20.54
Shear			
Rate of Horizontal Displacement (mm/min)	0.200	0.200	0.200
Horizontal Displacement at Peak Shear Stress (mm)	3.33	3.24	3.69
Peak shear Stress - kPa:	42	72	133

PEAK	
Angle of Shearing Resistance:(θ)	**31.0**
Effective Cohesion - kPa:	**13**

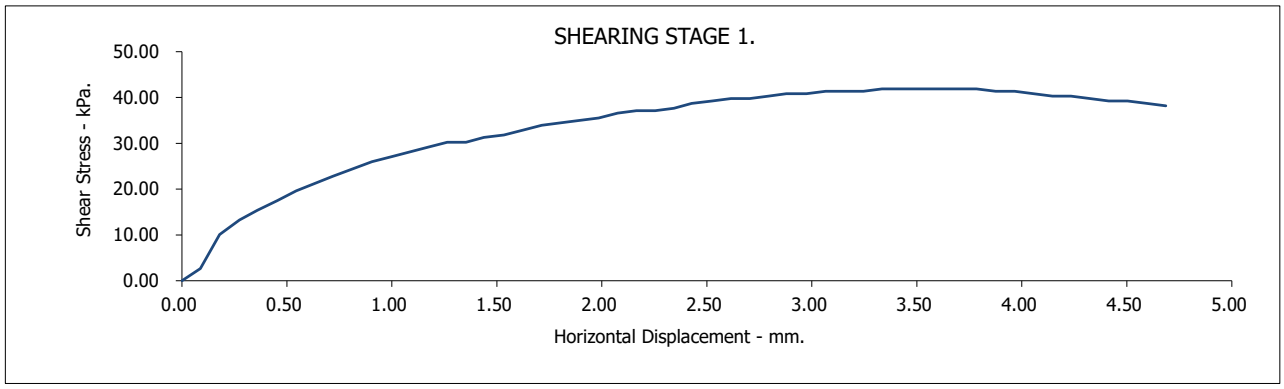


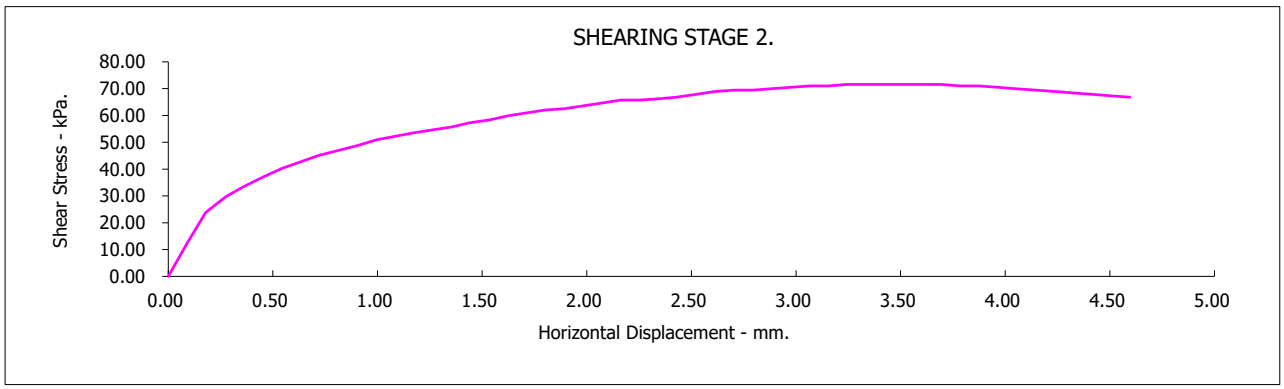
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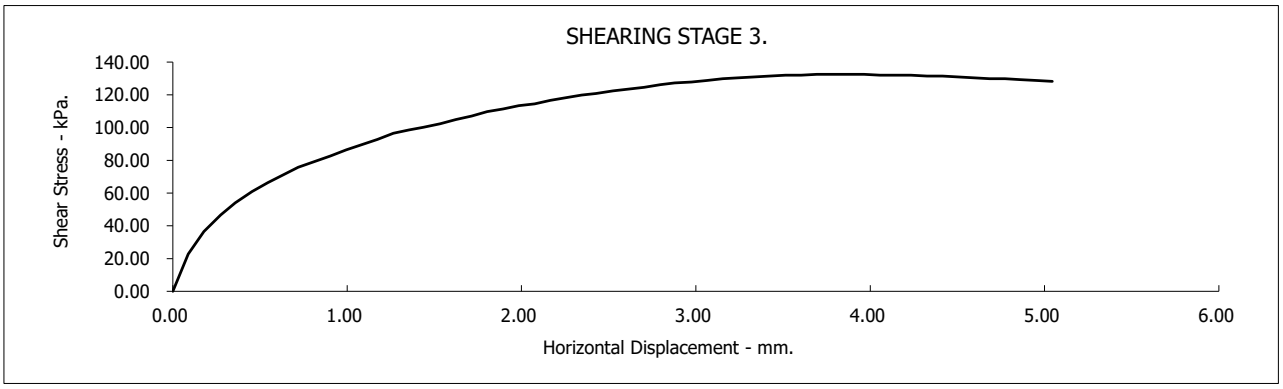
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Client Ref Number:
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Borehole Number:	S1-BH106	Depth from (m):	3.70
Sample Number :		Depth to (m):	5.00







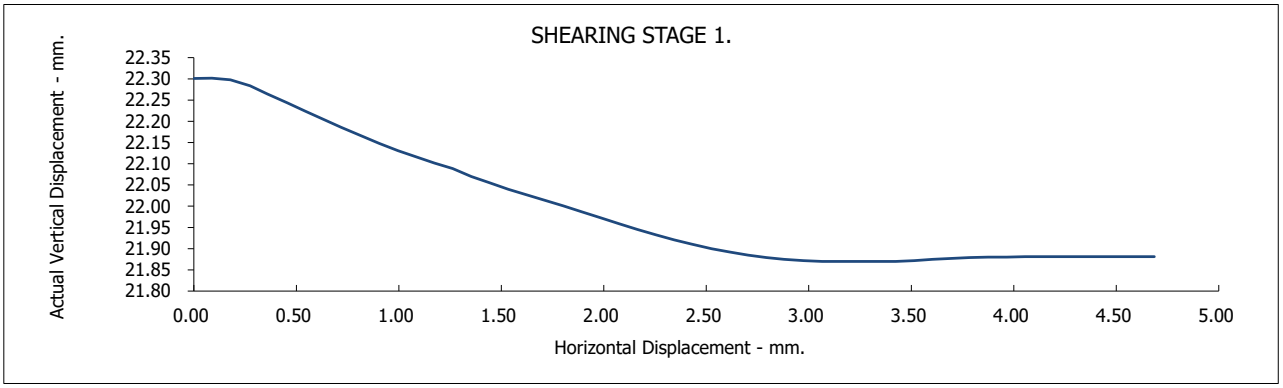
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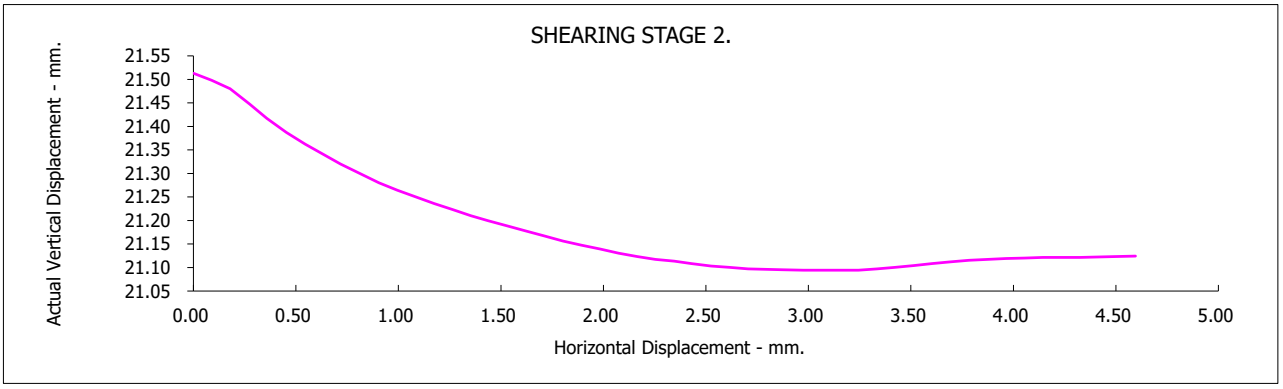
Contract No.: **63638**

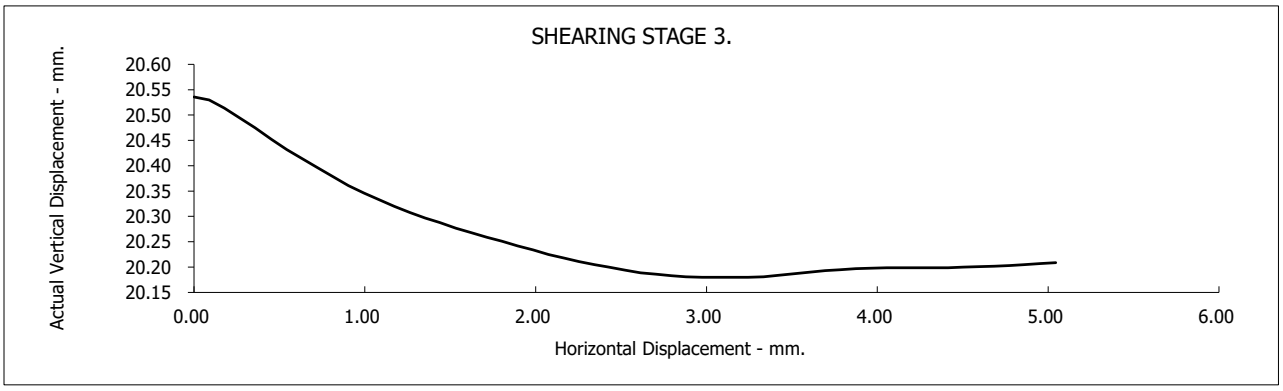
Client Ref Number: **G22069**

Figure.

Borehole Number:	S1-BH106	Depth from (m):	3.70
Sample Number :		Depth to (m):	5.00





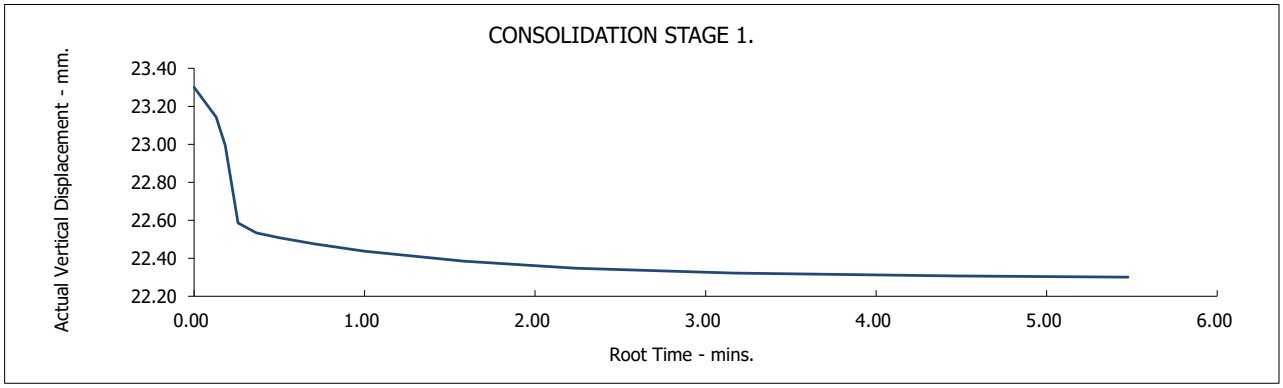


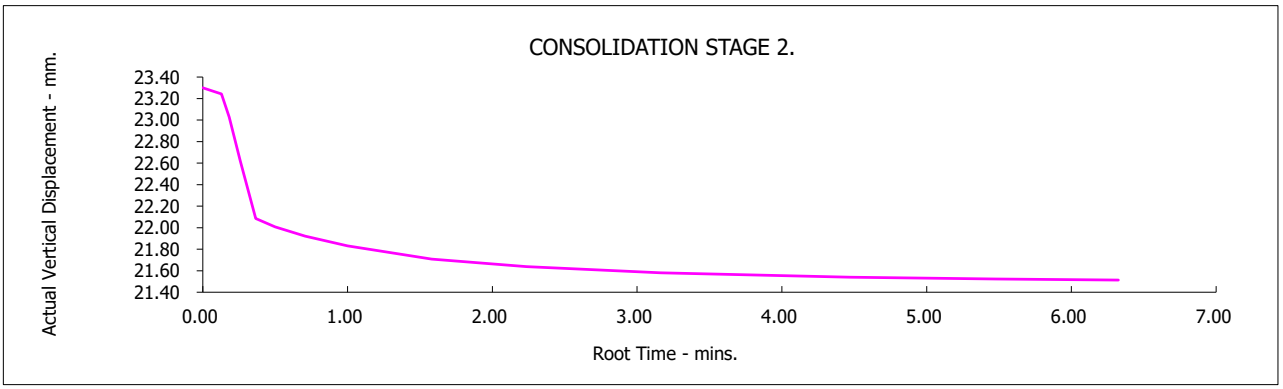
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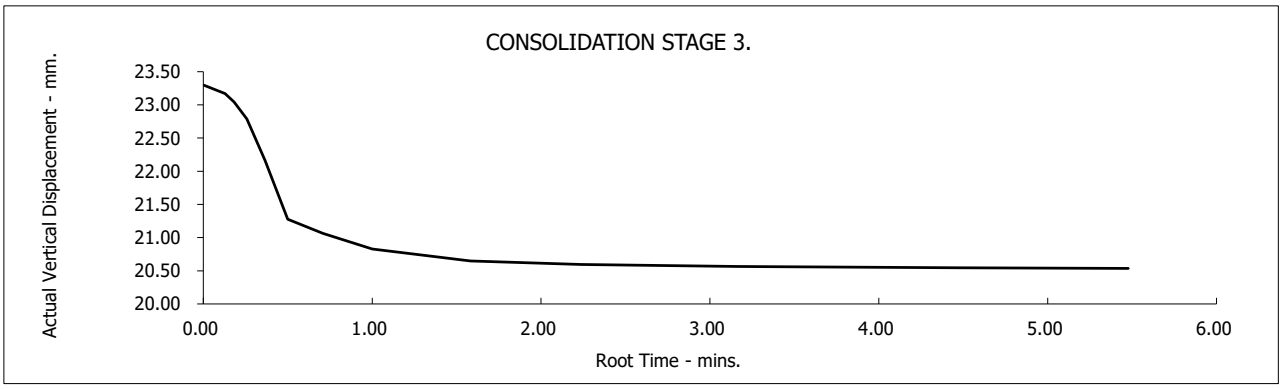
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Client Ref Number:
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Borehole Number:	S1-BH106	Depth from (m):	3.70
Sample Number :		Depth to (m):	5.00







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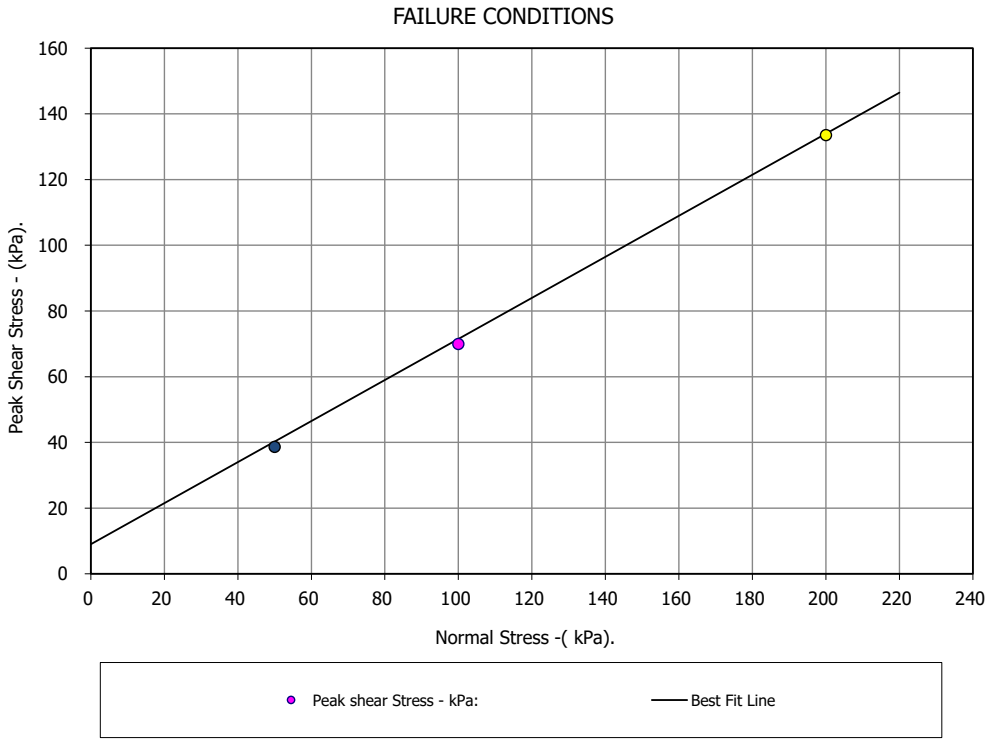
Borehole Number: S1-BH106 Depth from (m): 5.00
Depth to (m): 7.00

Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Black organic, sandy CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	23.30	23.30	23.30
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	28	28	28
Bulk Density - Mg/m3:	1.72	1.73	1.73
Dry Density - Mg/m3:	1.35	1.35	1.35
Voids Ratio:	0.9636	0.9593	0.9623
Degree of Saturation - %:	76.45	76.80	76.56
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	20.72	20.37	19.50
Shear			
Rate of Horizontal Displacement (mm/min)	0.200	0.200	0.200
Horizontal Displacement at Peak Shear Stress (mm)	3.78	4.41	4.68
Peak shear Stress - kPa:	39	70	134

PEAK	
Angle of Shearing Resistance:(θ)	**32.0**
Effective Cohesion - kPa:	**9.0**



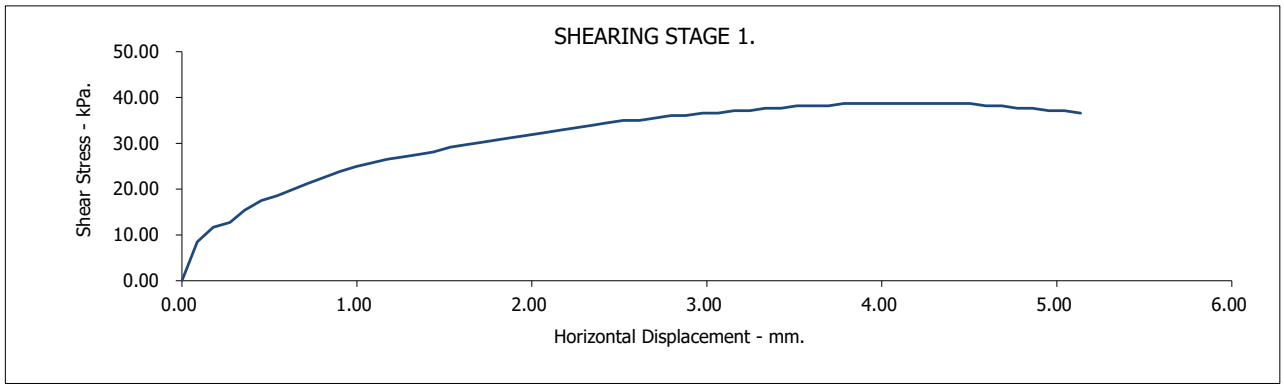
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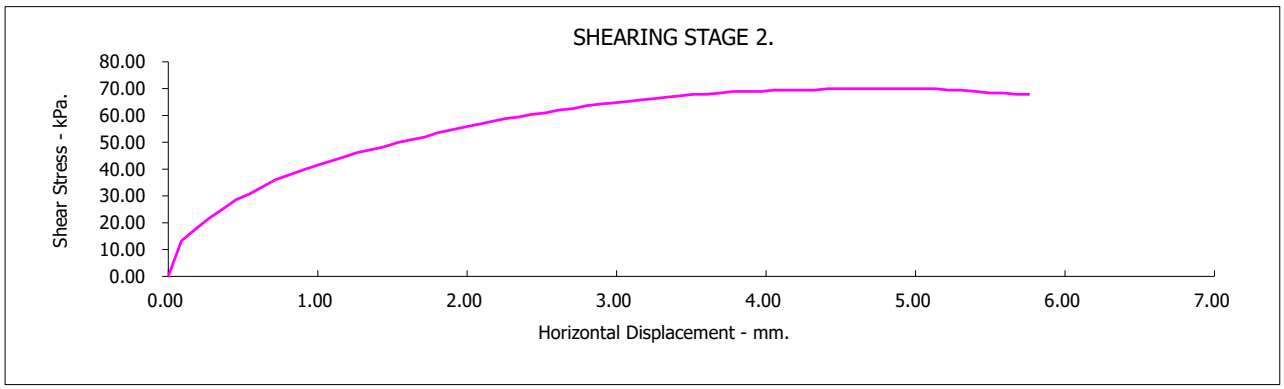
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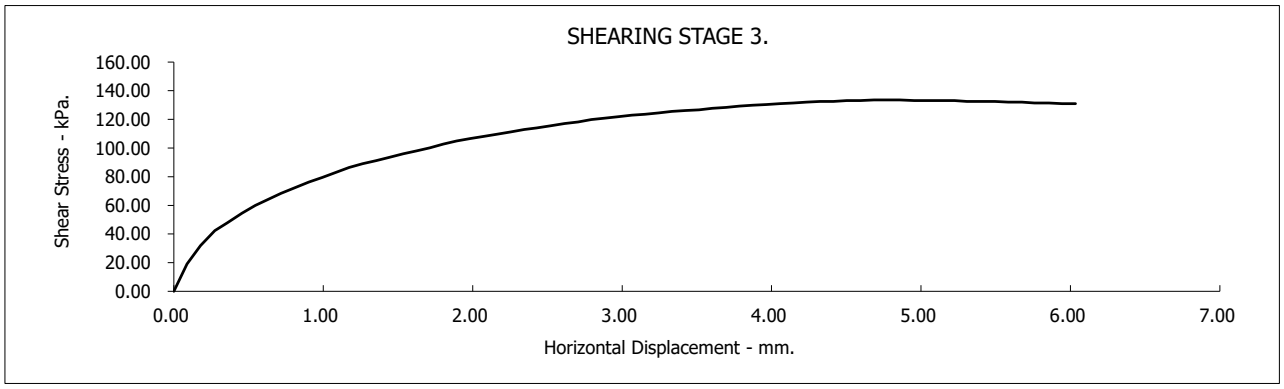
Client Ref Number:

G22069

Borehole Number:	S1-BH106	Depth from (m):	5.00
Sample Number :		Depth to (m):	7.00







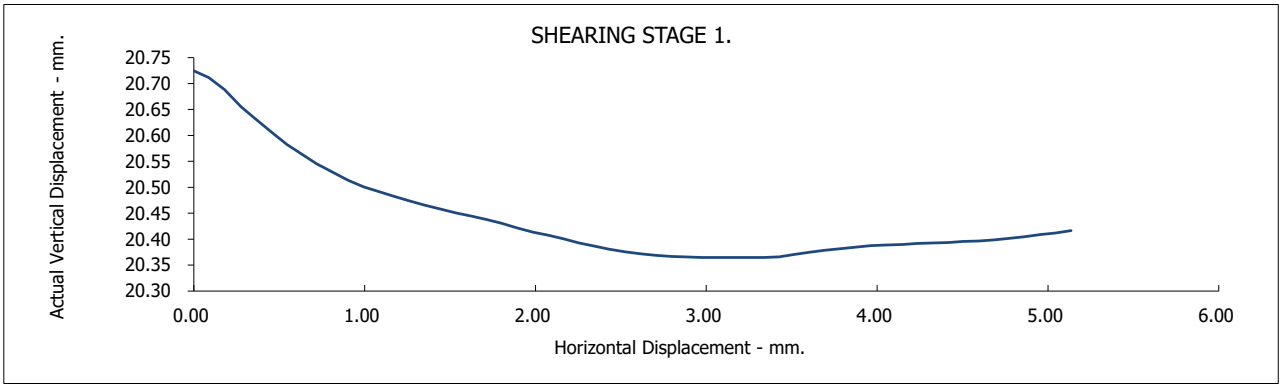
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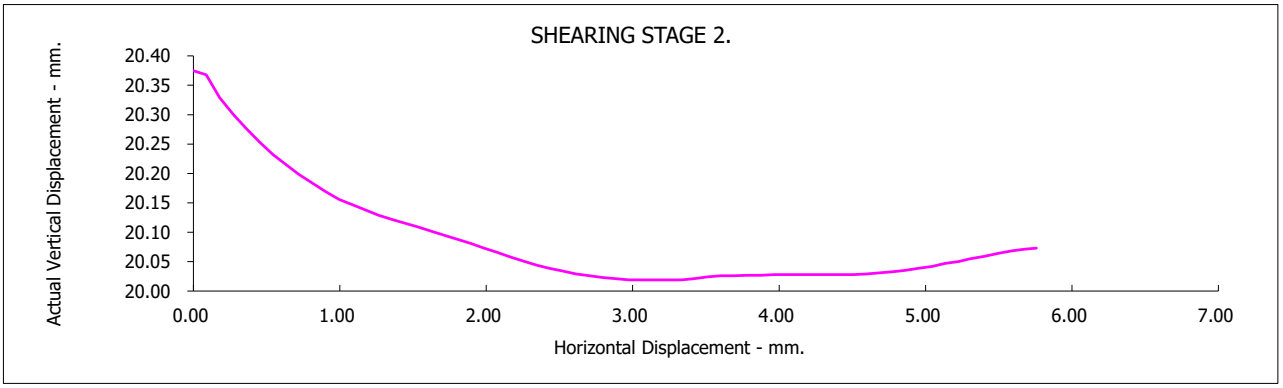
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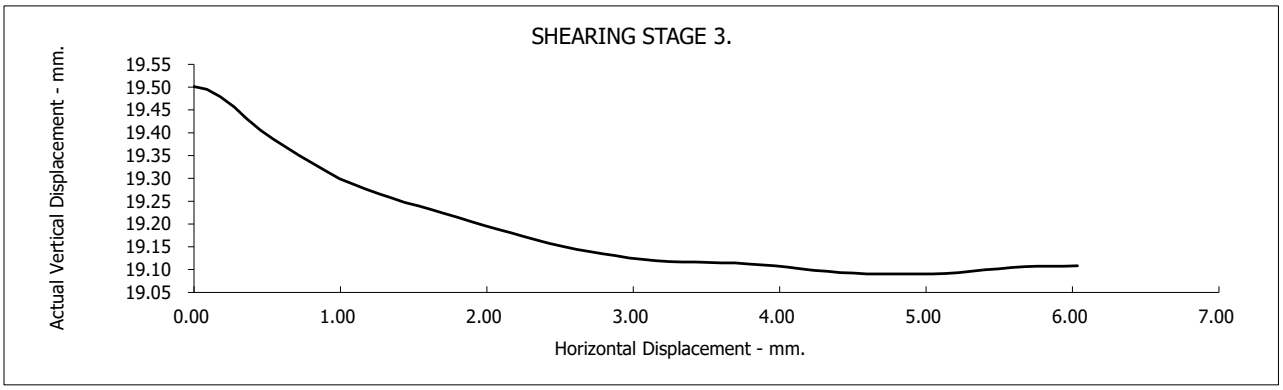
Client Ref Number: **G22069**

Figure.

Borehole Number:	S1-BH106	Depth from (m):	5.00
Sample Number :		Depth to (m):	7.00





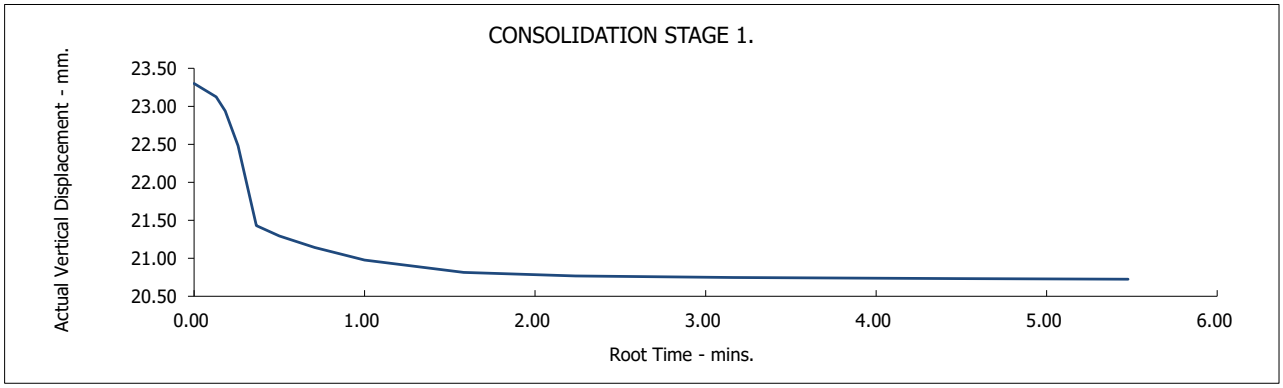


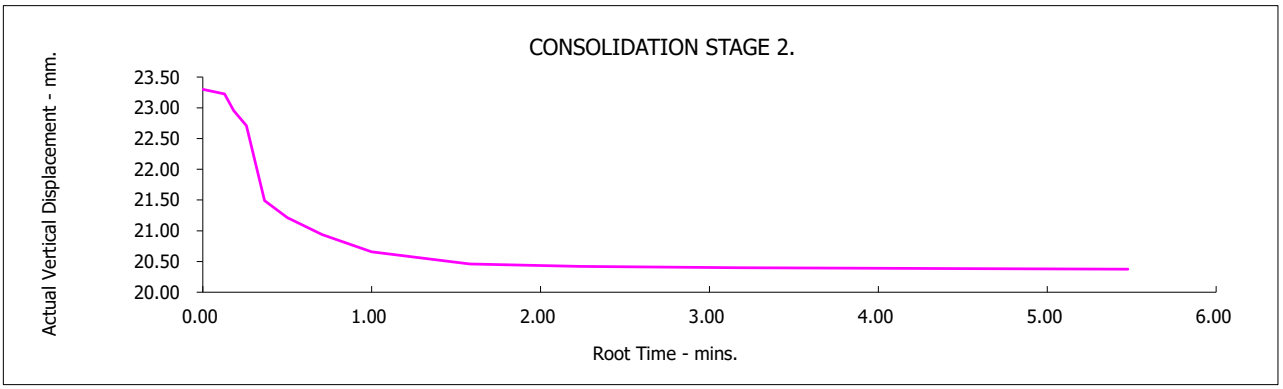
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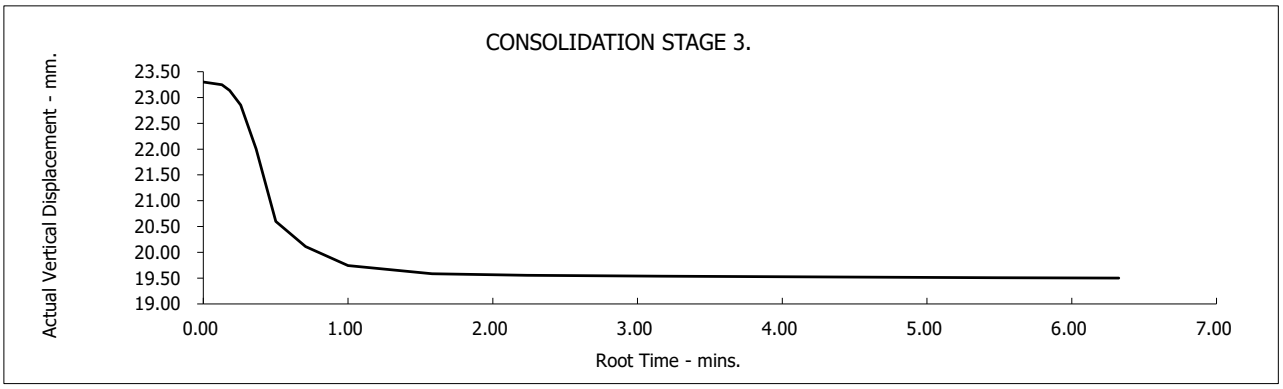
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Client Ref Number:
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Borehole Number:	S1-BH106	Depth from (m):	5.00
Sample Number :		Depth to (m):	7.00







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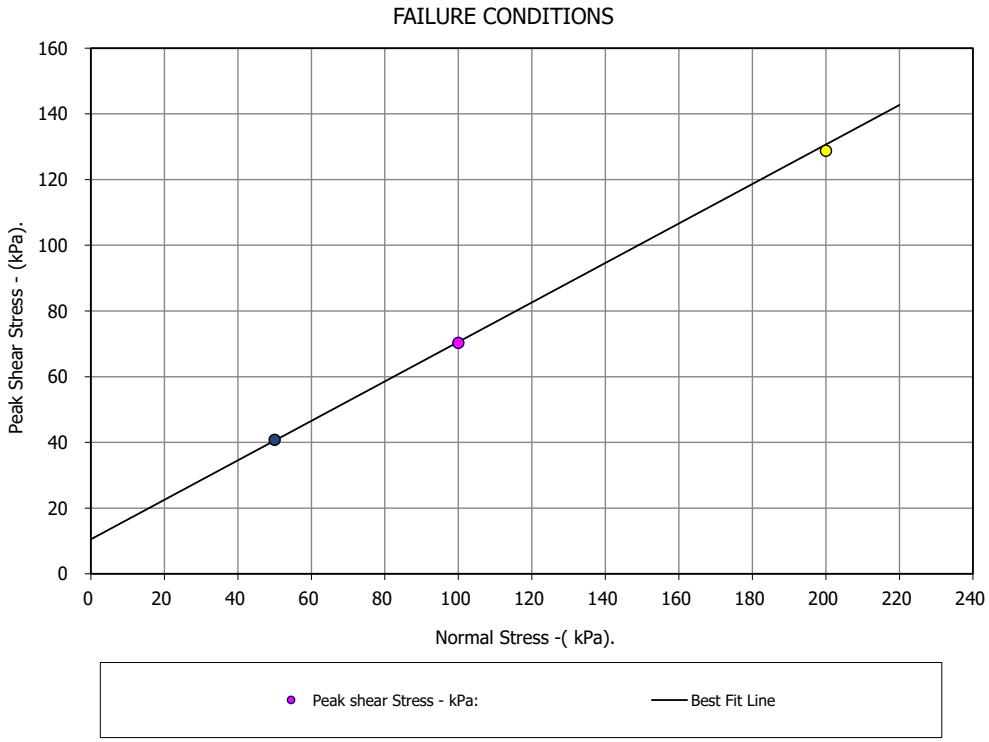
Borehole Number: S1-BH109 Depth from (m): 4.20
Depth to (m): 5.20

Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Black organic, silty CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	22	22	22
Bulk Density - Mg/m3:	1.69	1.69	1.69
Dry Density - Mg/m3:	1.38	1.38	1.38
Voids Ratio:	0.9156	0.9181	0.9192
Degree of Saturation - %:	64.85	64.67	64.59
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	23.82	22.60	22.15
Shear			
Rate of Horizontal Displacement (mm/min)	0.200	0.200	0.200
Horizontal Displacement at Peak Shear Stress (mm)	3.42	4.41	4.68
Peak shear Stress - kPa:	41	70	129

PEAK	
Angle of Shearing Resistance:(θ)	**31.0**
Effective Cohesion - kPa:	**11**



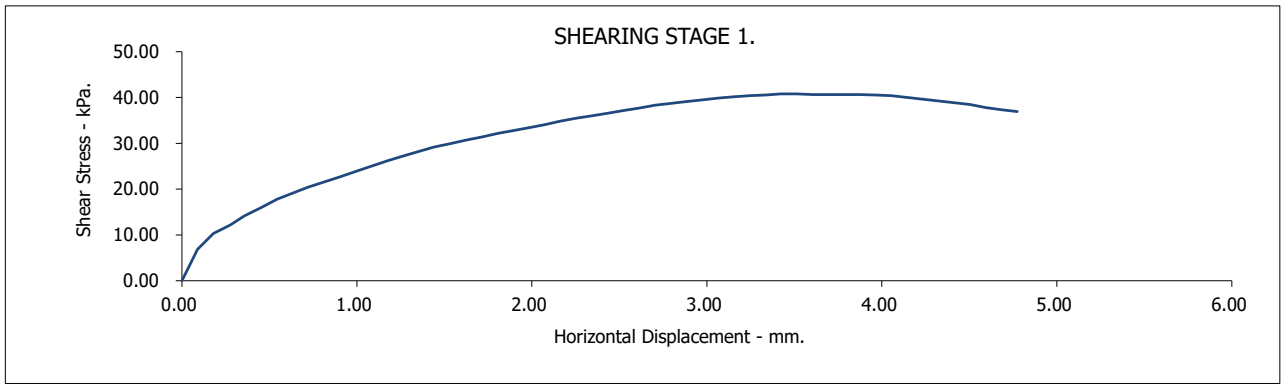
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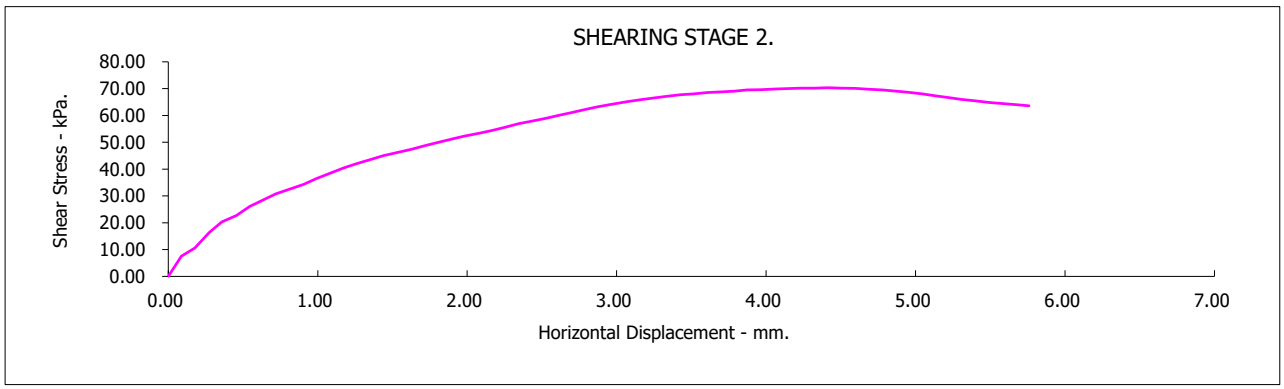
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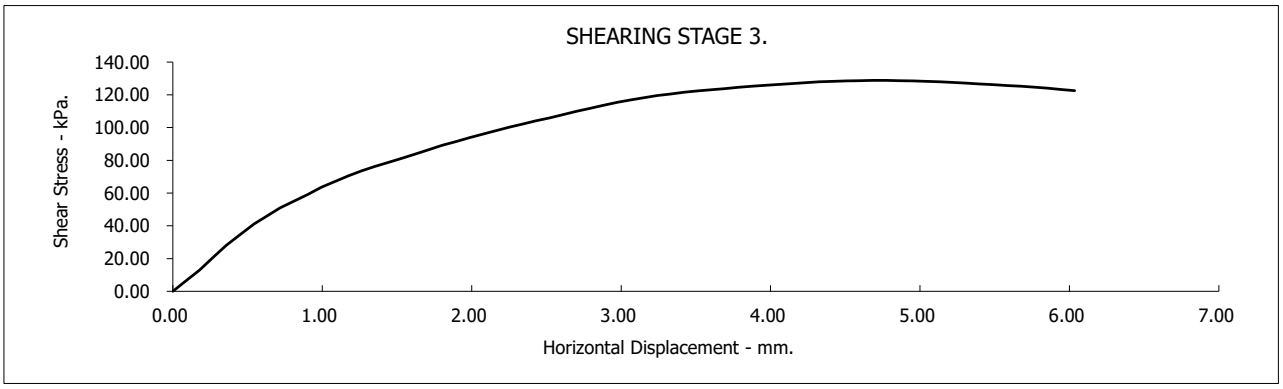
Client Ref Number:

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Borehole Number:	S1-BH109	Depth from (m):	4.20
Sample Number :		Depth to (m):	5.20







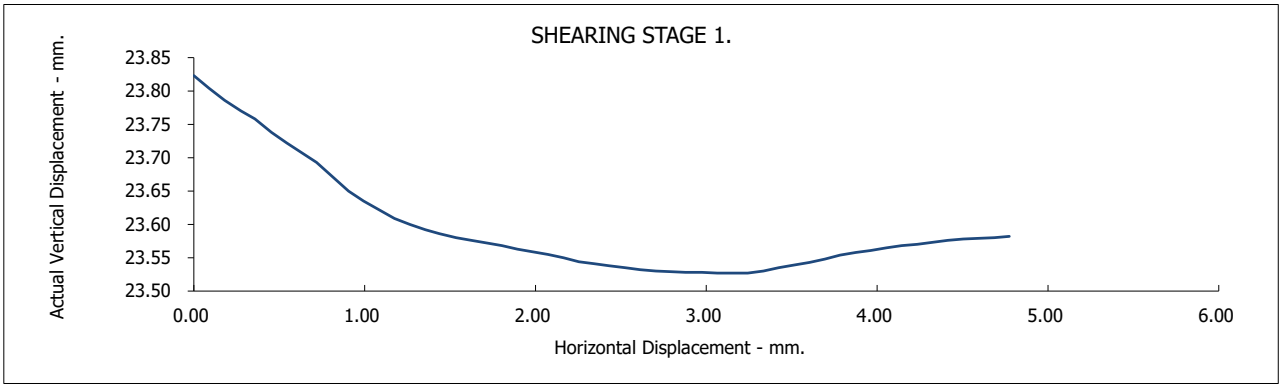
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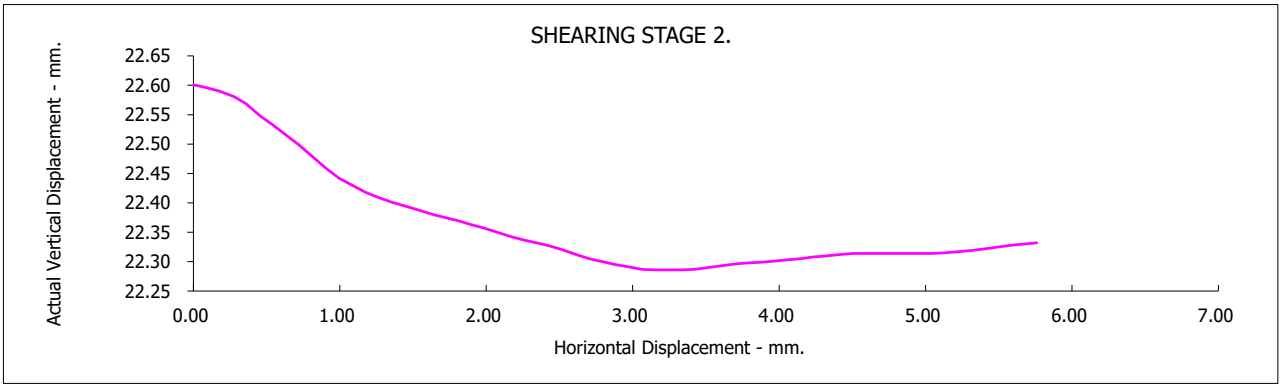
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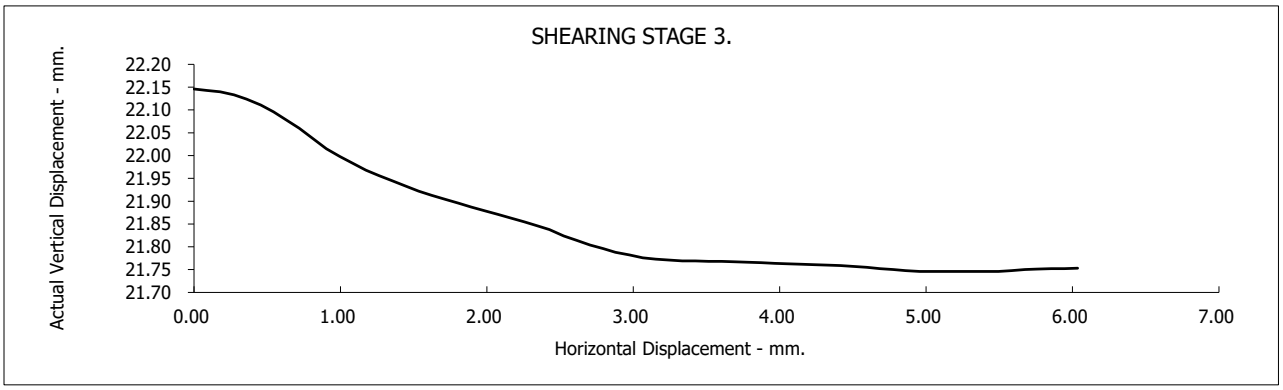
Client Ref Number: **G22069**

Figure.

Borehole Number:	S1-BH109	Depth from (m):	4.20
Sample Number :		Depth to (m):	5.20





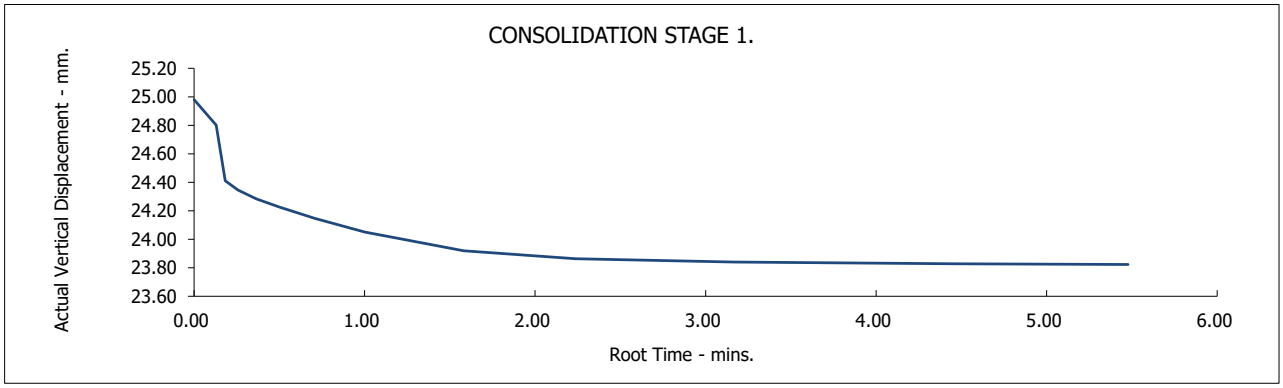


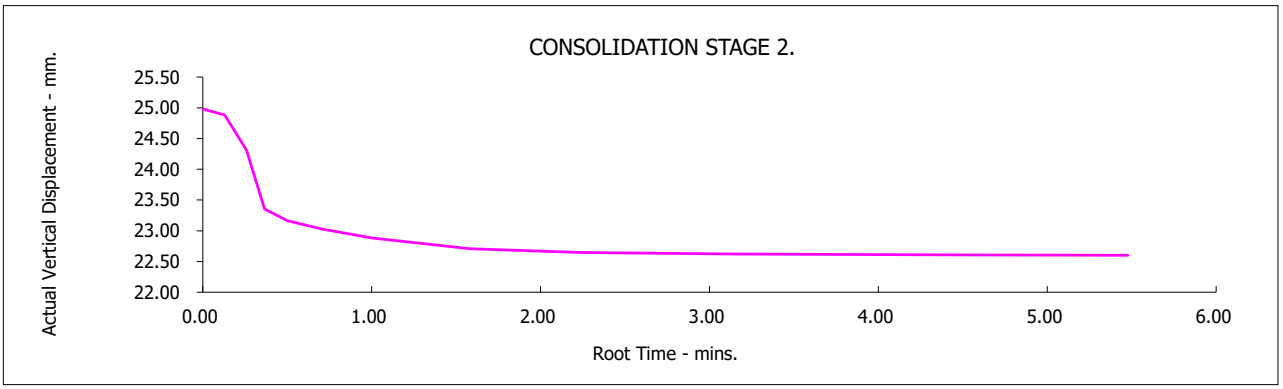
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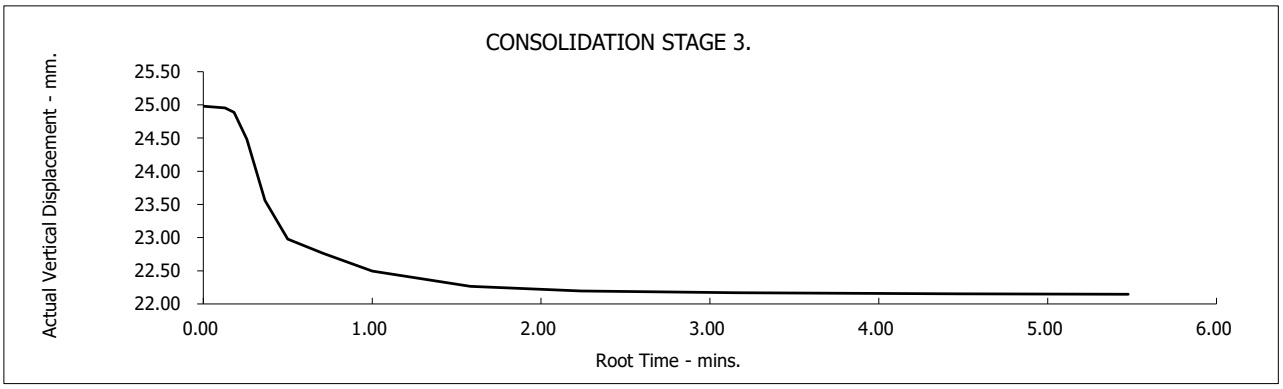
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Client Ref Number:
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Borehole Number:	S1-BH109	Depth from (m):	4.20
Sample Number :		Depth to (m):	5.20







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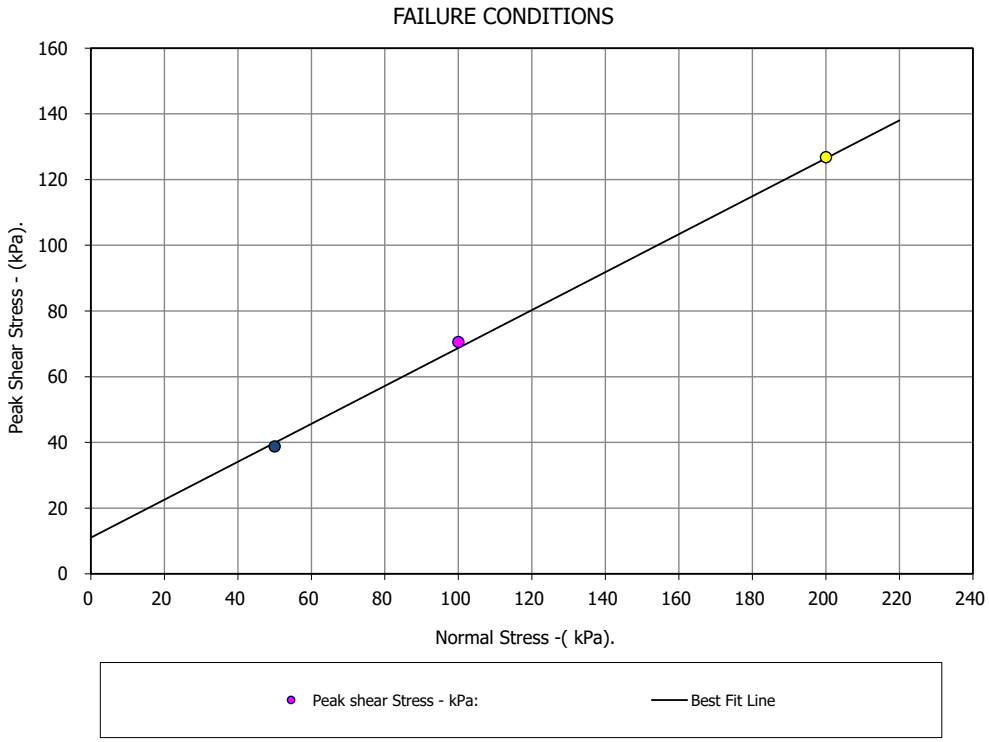
Borehole Number: S1-BH116 Depth from (m): 3.20
Depth to (m): 4.20

Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Brown sandy CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	24.90	24.90	24.90
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	18	18	18
Bulk Density - Mg/m3:	1.87	1.86	1.87
Dry Density - Mg/m3:	1.58	1.58	1.58
Voids Ratio:	0.6758	0.6773	0.6749
Degree of Saturation - %:	70.41	70.25	70.50
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	23.38	23.12	22.25
Shear			
Rate of Horizontal Displacement (mm/min)	0.200	0.200	0.200
Horizontal Displacement at Peak Shear Stress (mm)	2.97	4.05	3.69
Peak shear Stress - kPa:	39	71	127

PEAK	
Angle of Shearing Resistance:(θ)	**30.0**
Effective Cohesion - kPa:	**11**

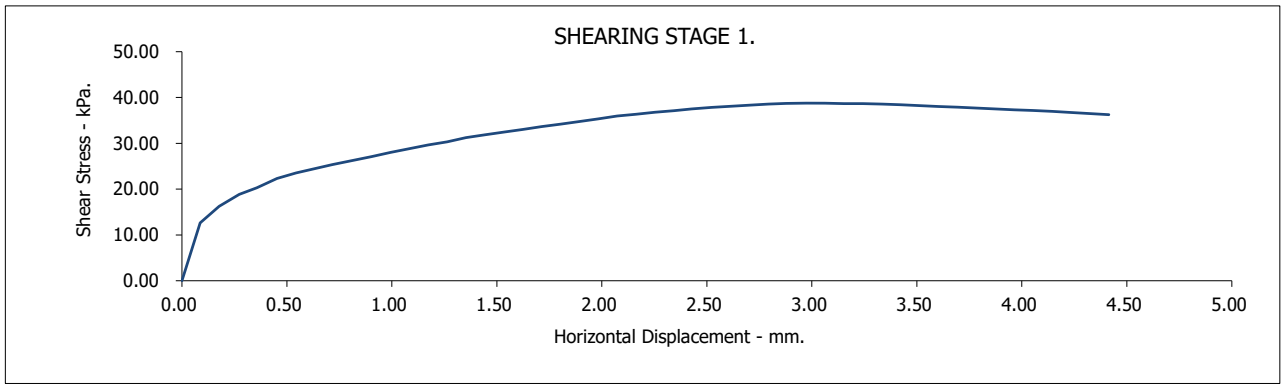


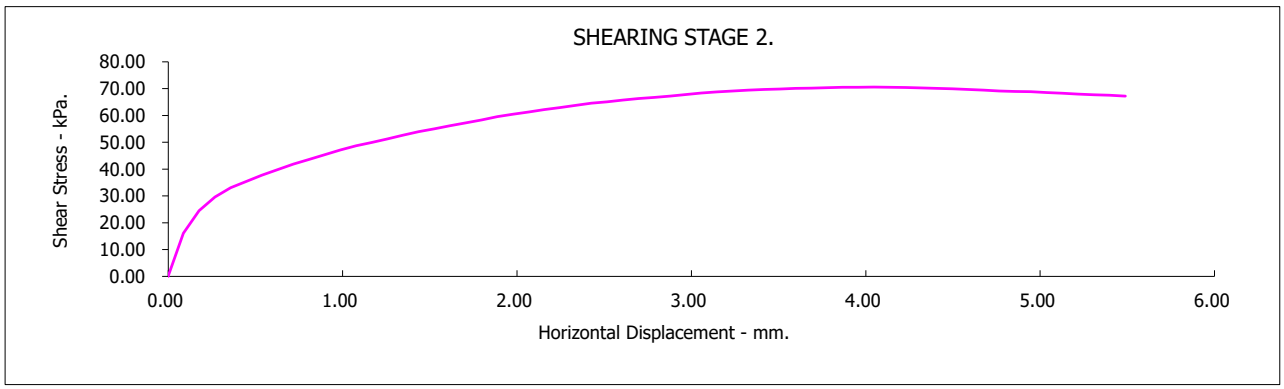
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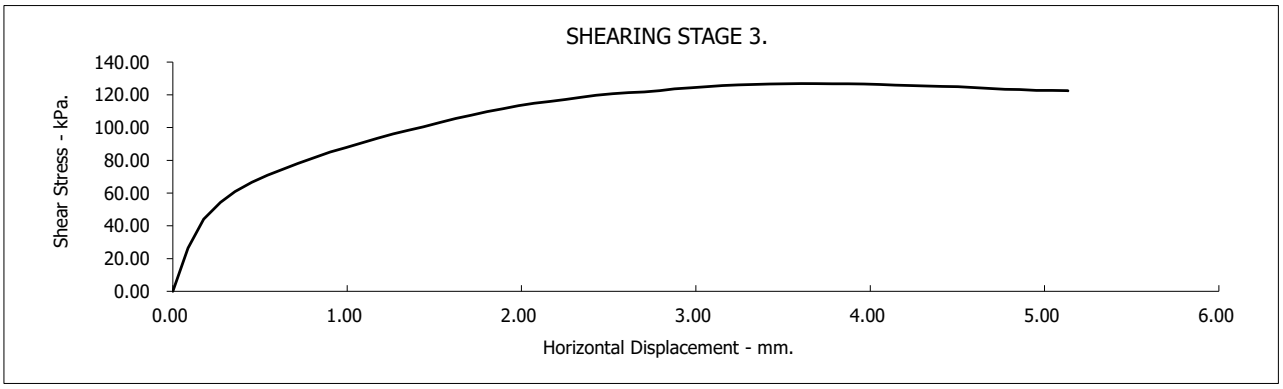
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Borehole Number:	S1-BH116	Depth from (m):	3.20
Sample Number :		Depth to (m):	4.20







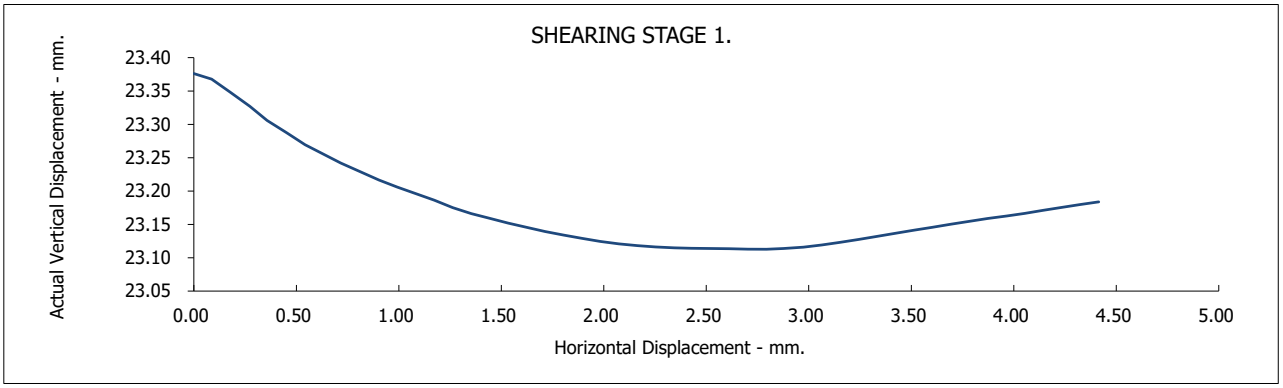
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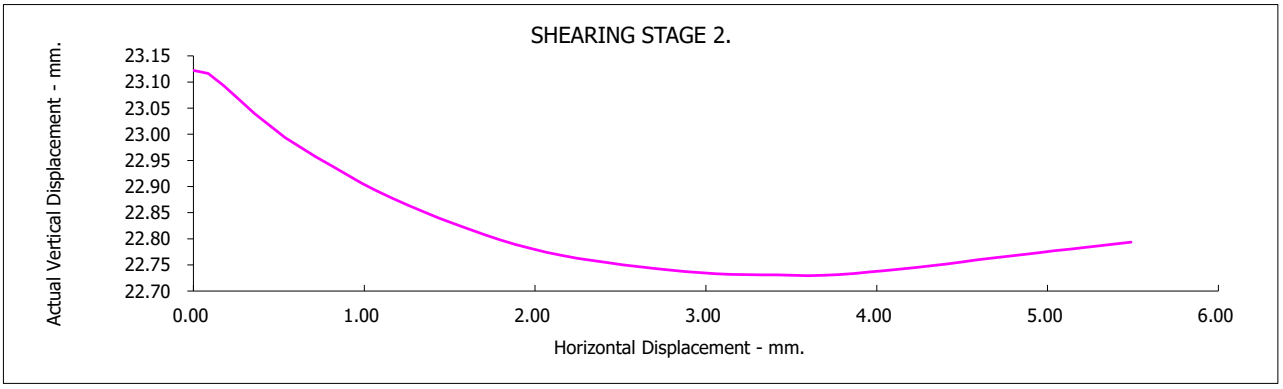
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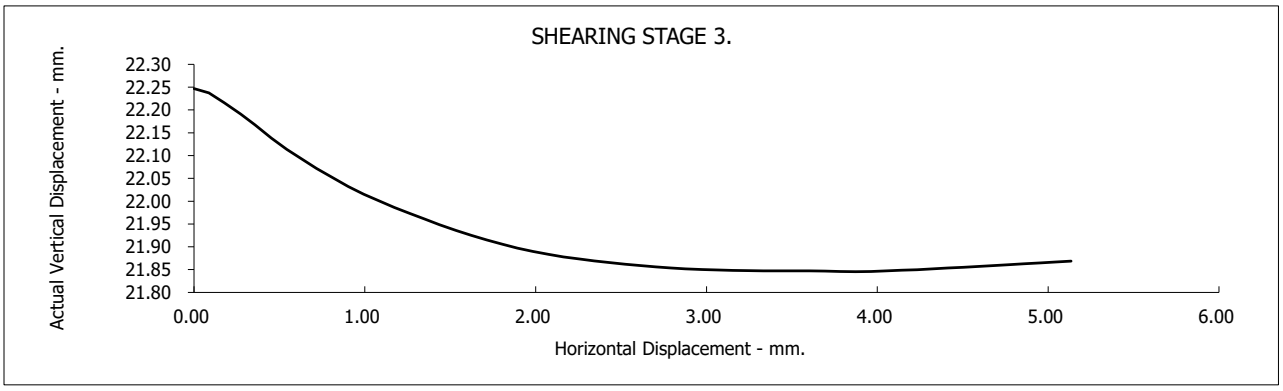
Client Ref Number: **G22069**

Figure.

Borehole Number:	S1-BH116	Depth from (m):	3.20
Sample Number :		Depth to (m):	4.20





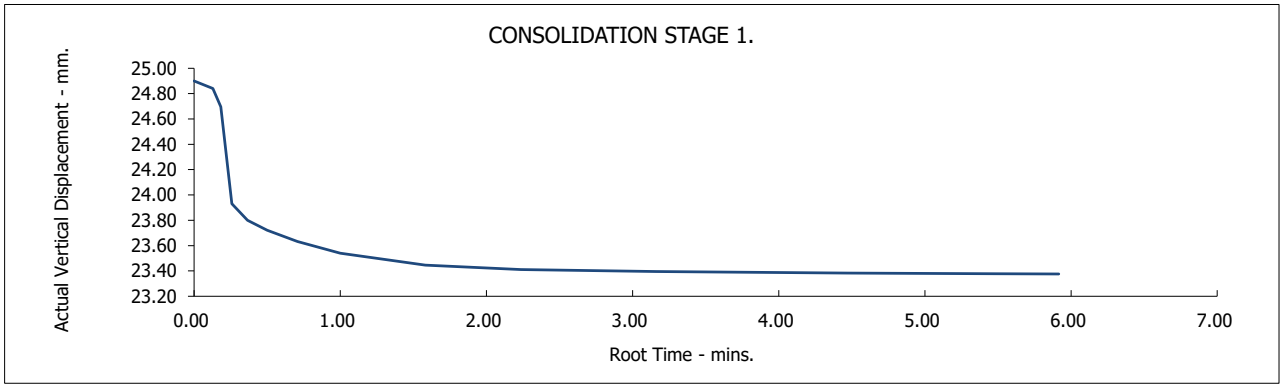


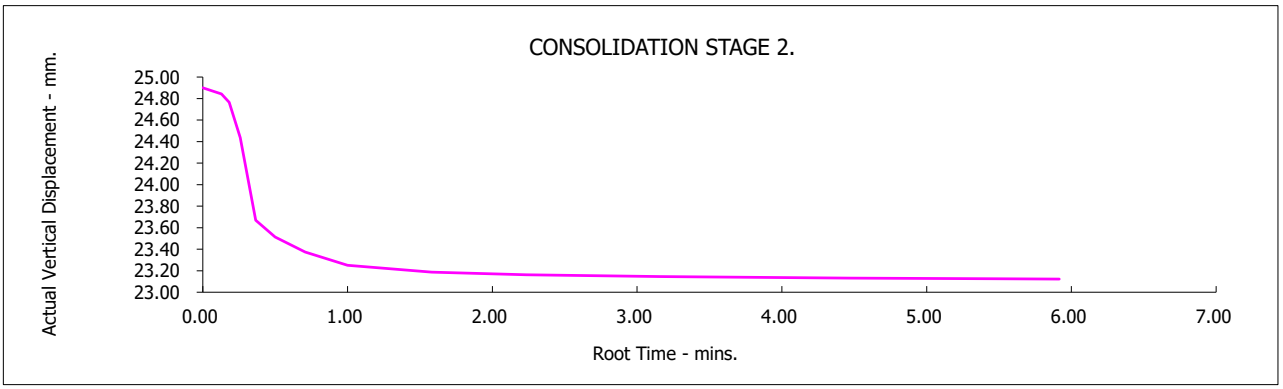
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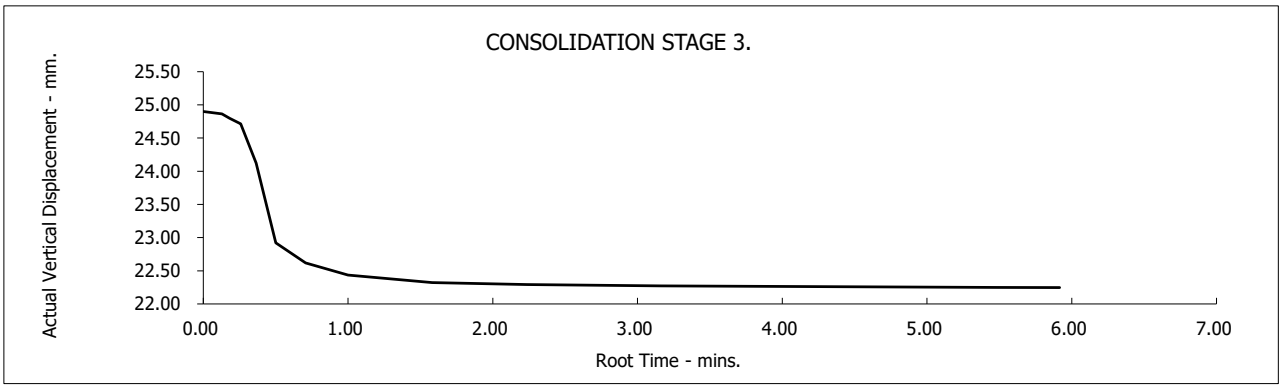
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Client Ref Number:
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Borehole Number:	S1-BH116	Depth from (m):	3.20
Sample Number :		Depth to (m):	4.20







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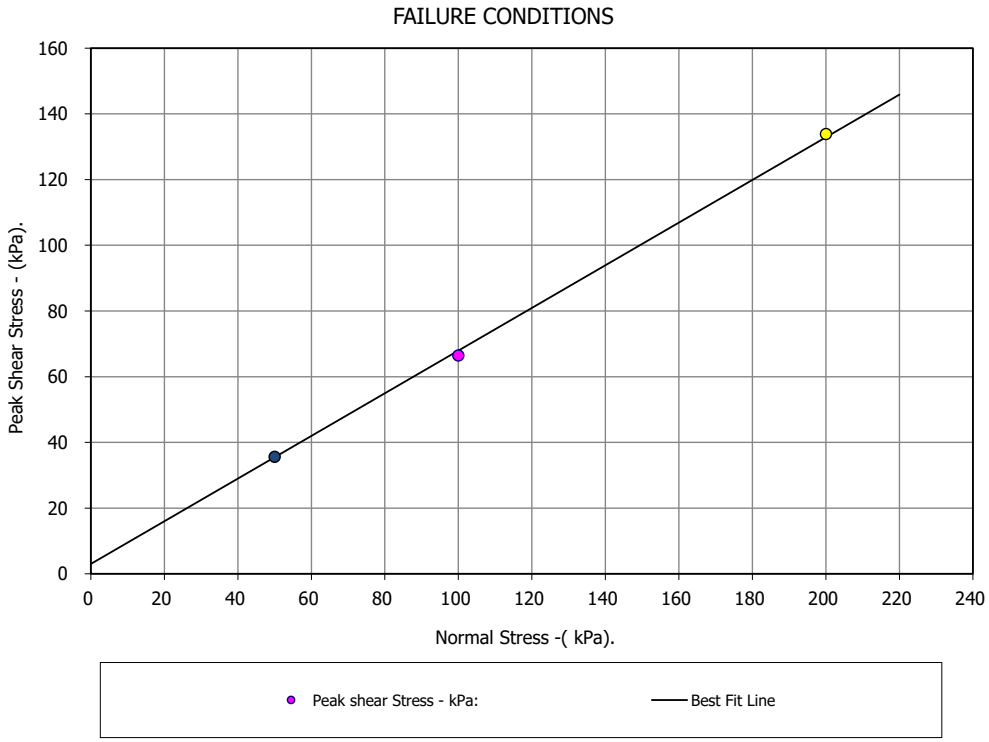
Borehole Number: S1-BH116 Depth from (m): 4.20
Depth to (m): 4.65

Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Black organic, sandy CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	25.03	25.03	25.03
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	26	26	26
Bulk Density - Mg/m3:	1.76	1.76	1.76
Dry Density - Mg/m3:	1.40	1.40	1.40
Voids Ratio:	0.8957	0.8950	0.8942
Degree of Saturation - %:	76.15	76.21	76.28
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	22.31	22.75	21.46
Shear			
Rate of Horizontal Displacement (mm/min)	0.200	0.200	0.200
Horizontal Displacement at Peak Shear Stress (mm)	5.94	6.12	6.21
Peak shear Stress - kPa:	36	66	134

PEAK	
Angle of Shearing Resistance:(θ)	**33.0**
Effective Cohesion - kPa:	**3.0**



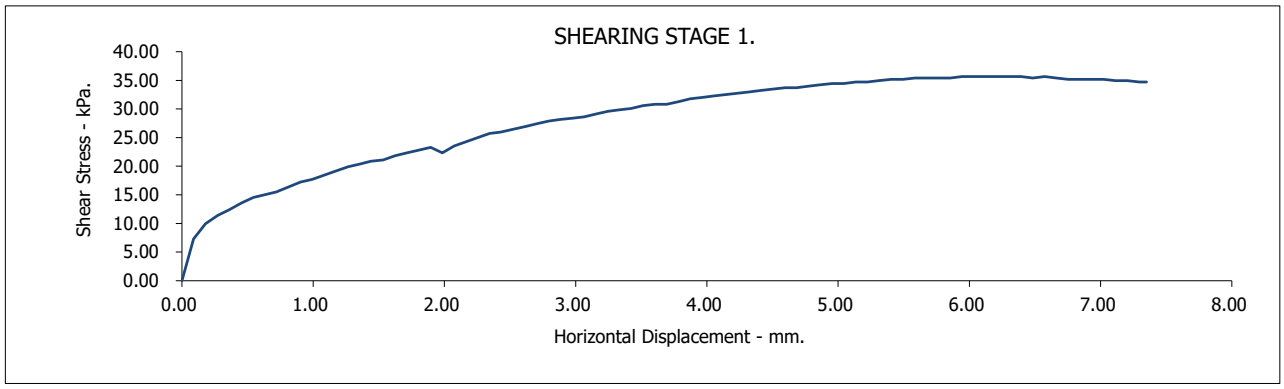
Contract No.:
63638

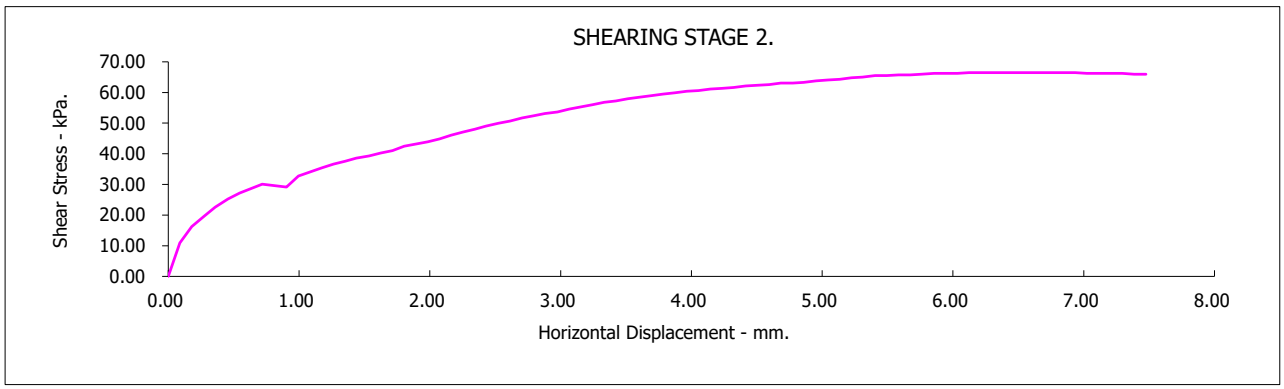
Global Centre Of Rail Excellence

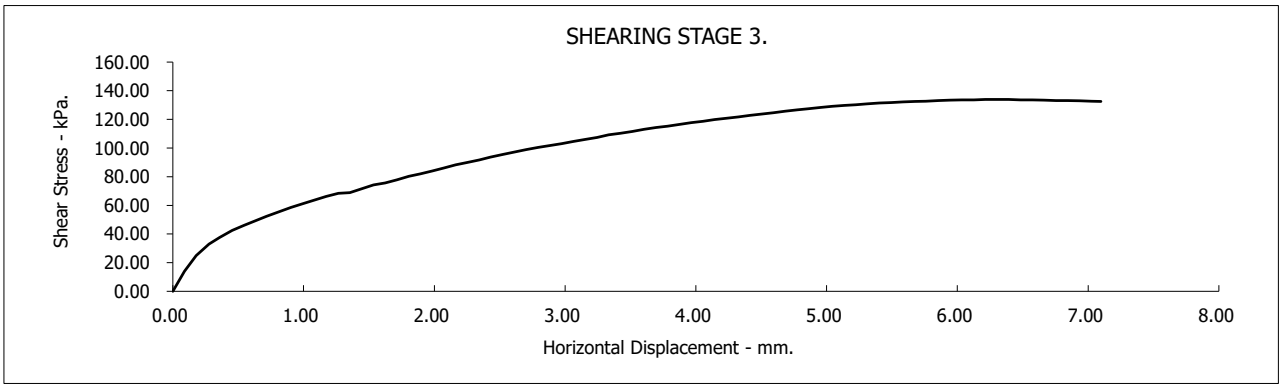
Client Ref Number:
G22069

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GEOTECHNICAL SITE & TESTING LABORATORIES

Borehole Number:	S1-BH116	Depth from (m):	4.20
Sample Number :		Depth to (m):	4.65







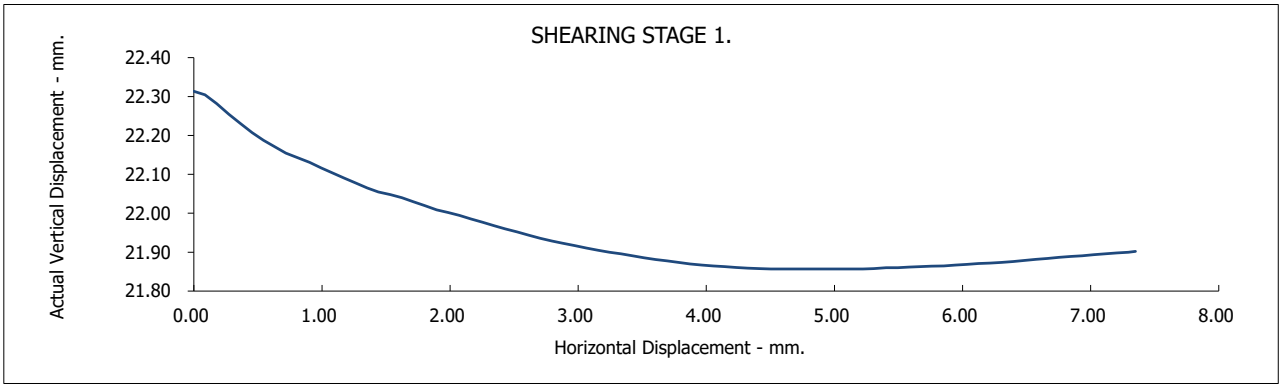
Global Centre Of Rail Excellence

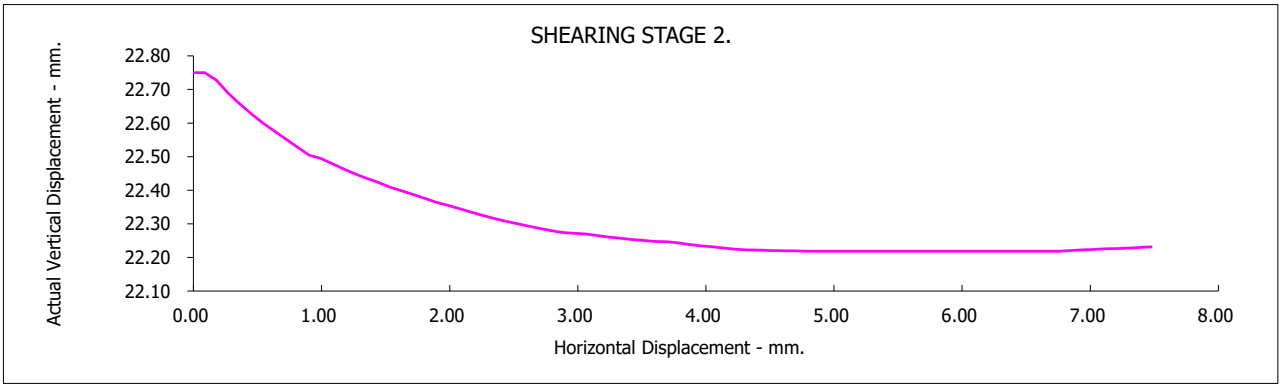
Contract No.: **63638**

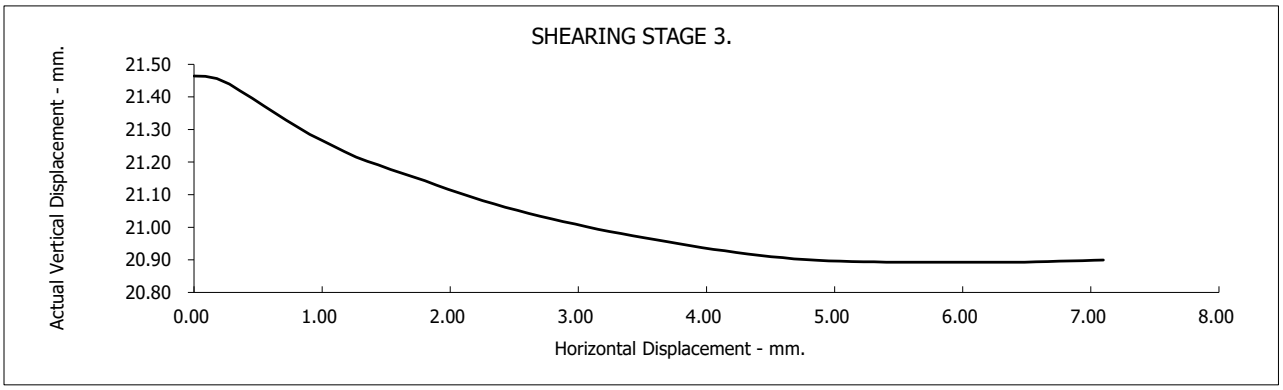
Client Ref Number: **G22069**

Figure.

Borehole Number:	S1-BH116	Depth from (m):	4.20
Sample Number :		Depth to (m):	4.65





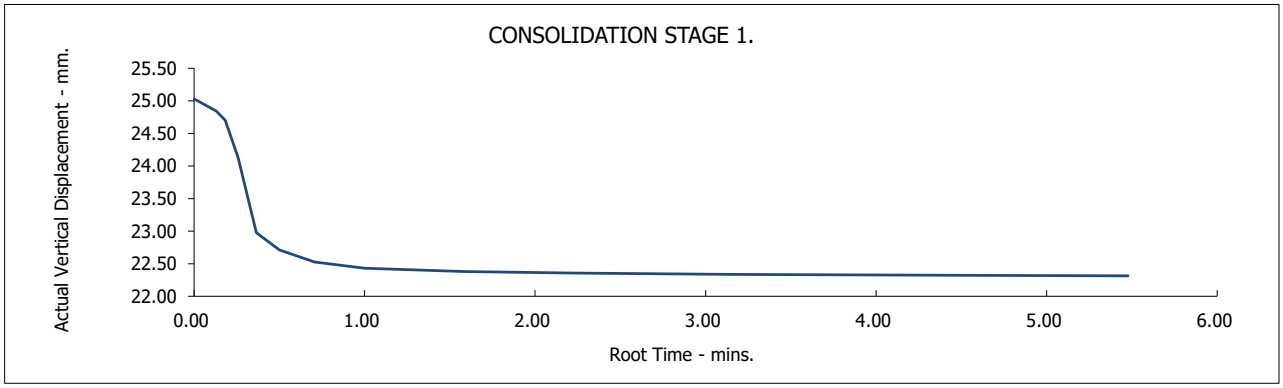


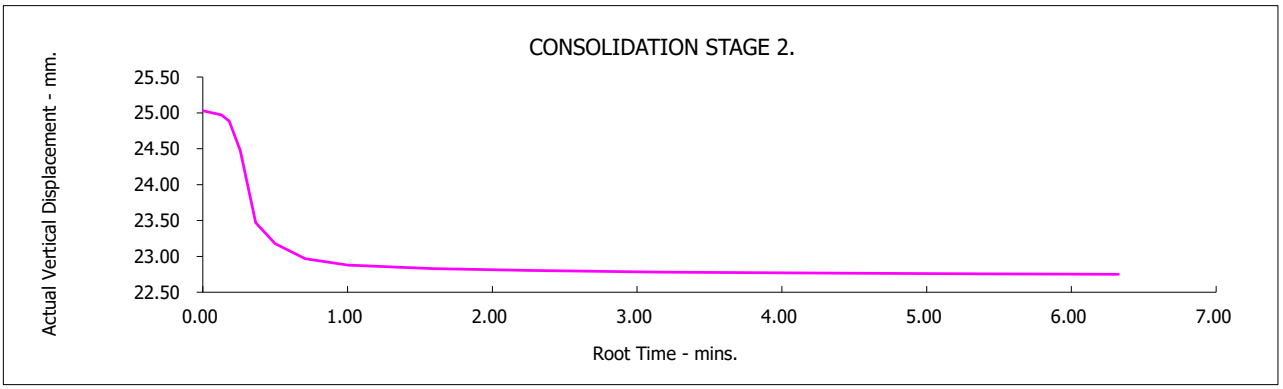
Contract No.:
63638

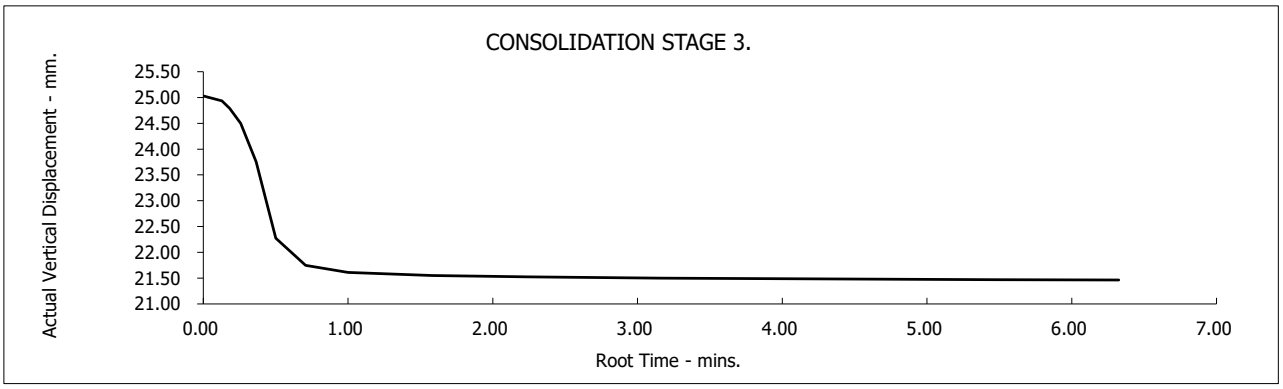
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Client Ref Number:
G22069

Borehole Number:	S1-BH116	Depth from (m):	4.20
Sample Number :		Depth to (m):	4.65







UKAS TESTING 2788

Global Centre Of Rail Excellence

Contract No.: **63638**

Client Ref Number: **G22069**

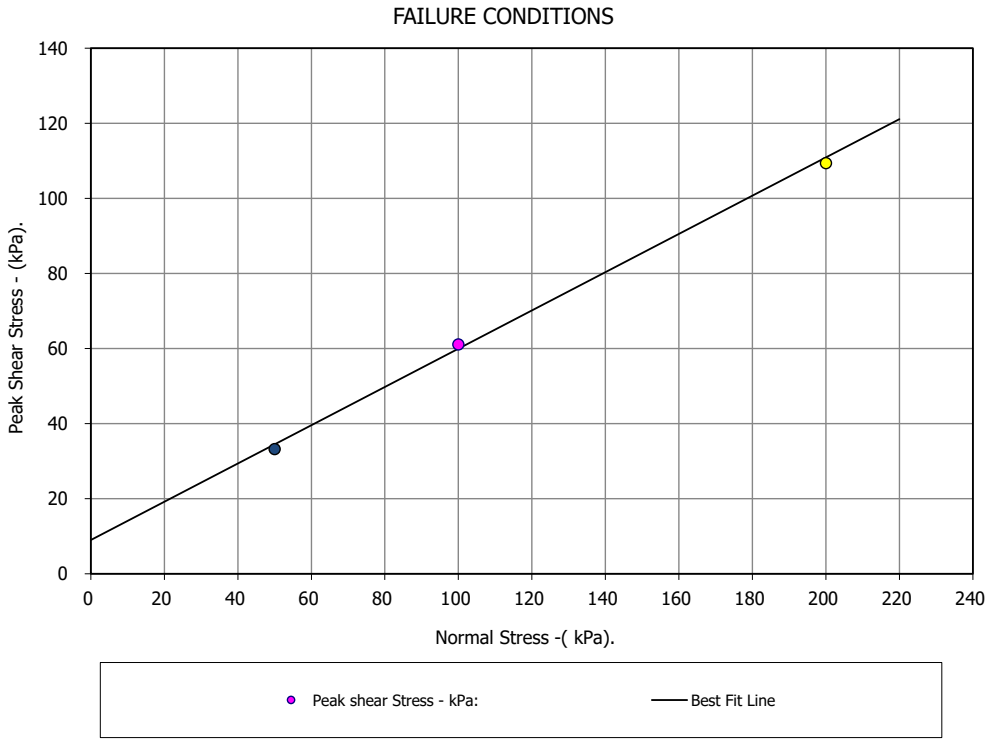
Borehole Number: S1-TP105 Depth from (m): 0.50
Depth to (m): 0.70

Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Brown CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	25.03	25.03	25.03
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	19	19	19
Bulk Density - Mg/m3:	1.91	1.92	1.91
Dry Density - Mg/m3:	1.61	1.61	1.61
Voids Ratio:	0.6476	0.6442	0.6465
Degree of Saturation - %:	77.42	77.82	77.54
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	23.69	23.17	21.74
Shear			
Rate of Horizontal Displacement (mm/min)	0.200	0.200	0.200
Horizontal Displacement at Peak Shear Stress (mm)	4.77	4.50	7.11
Peak shear Stress - kPa:	33	61	109

PEAK	
Angle of Shearing Resistance:(θ)	**27.0**
Effective Cohesion - kPa:	**9.0**

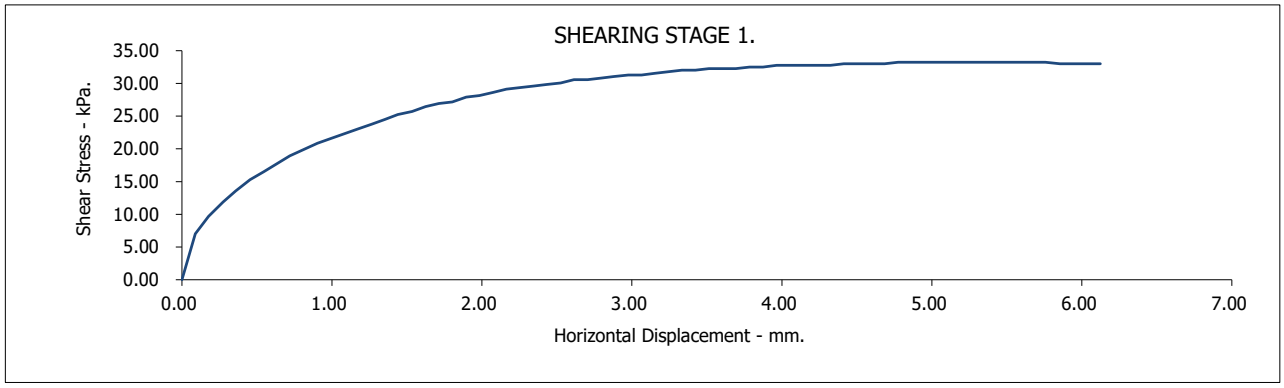


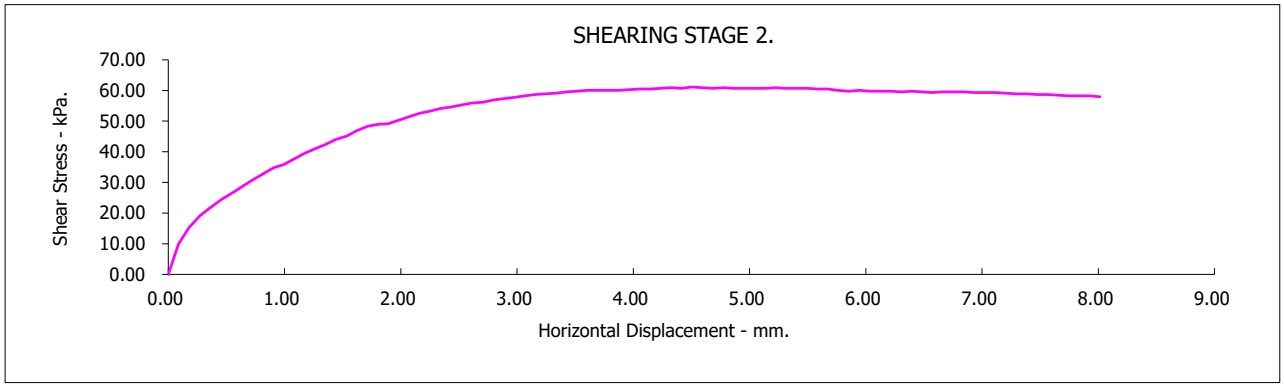
Contract No.:
63638

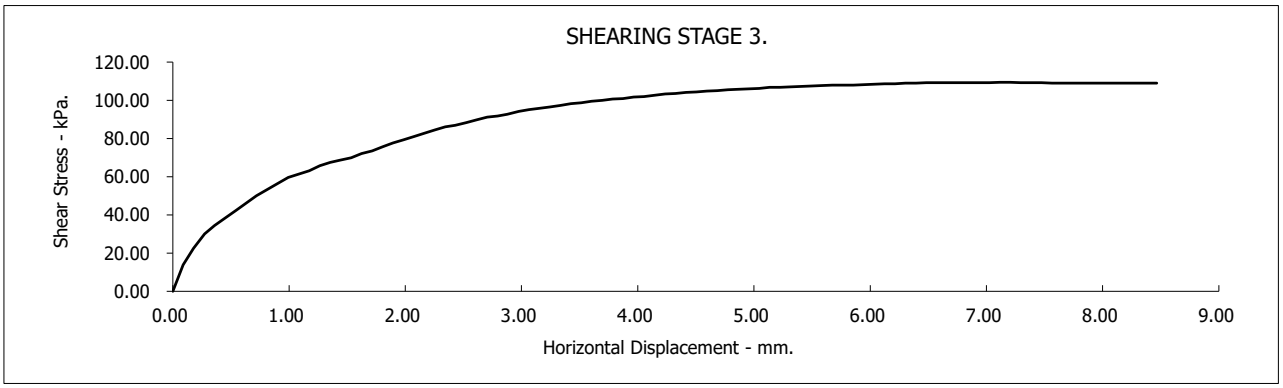
Global Centre Of Rail Excellence

Client Ref Number:
G22069

Borehole Number:	S1-TP105	Depth from (m):	0.50
Sample Number :		Depth to (m):	0.70







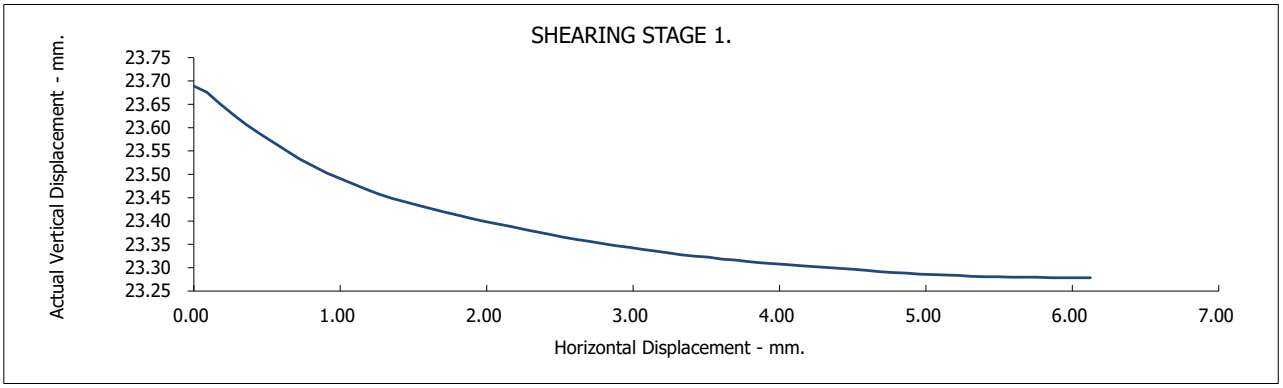
Global Centre Of Rail Excellence

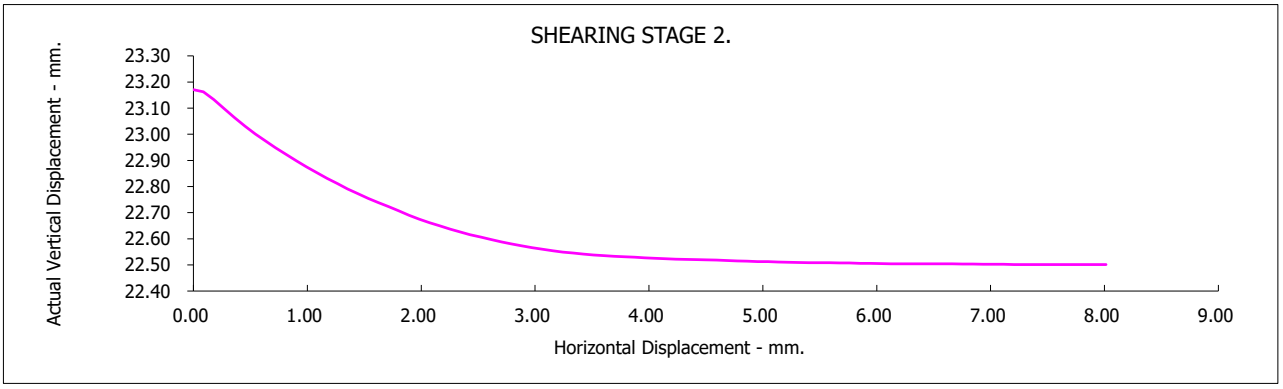
Contract No.: **63638**

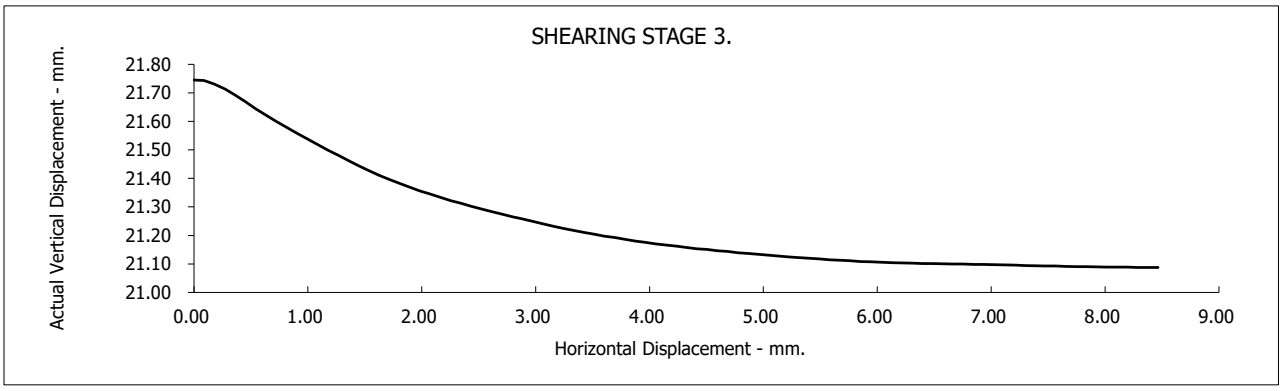
Client Ref Number: **G22069**

Figure.

Borehole Number:	S1-TP105	Depth from (m):	0.50
Sample Number :		Depth to (m):	0.70





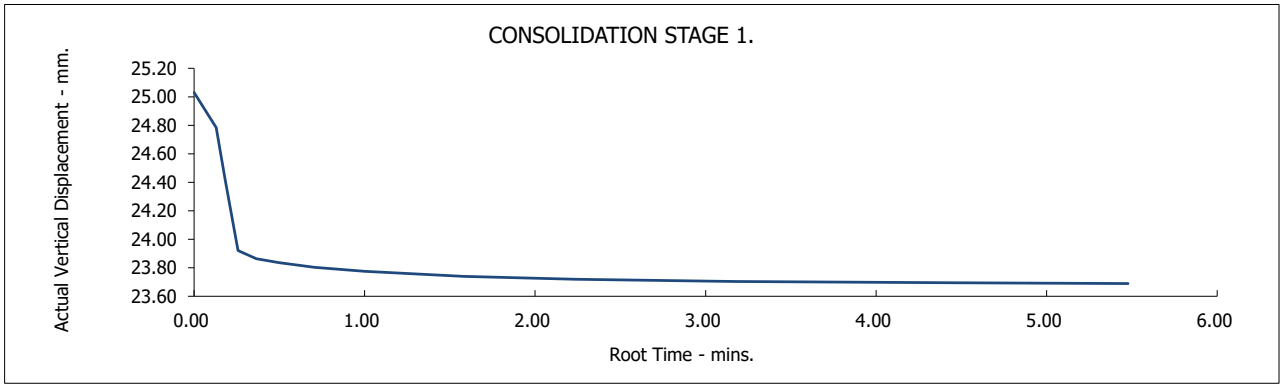


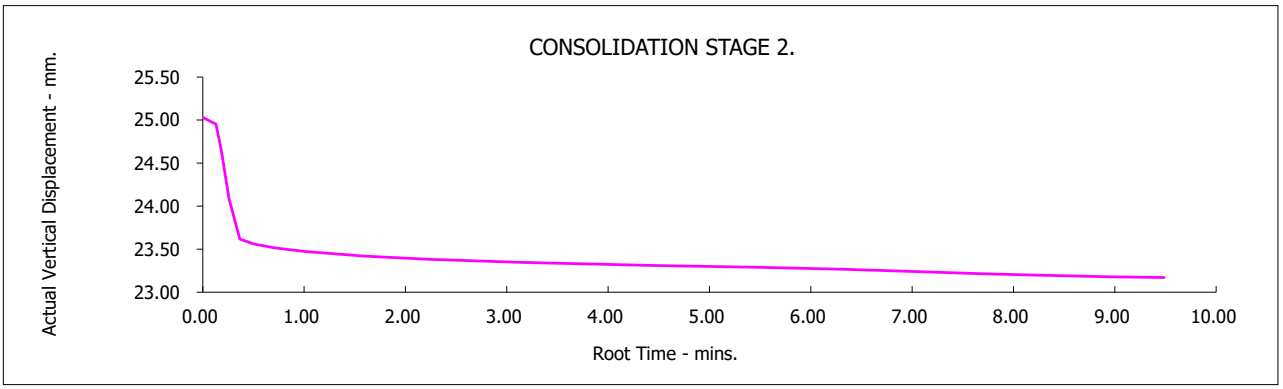
Contract No.:
63638

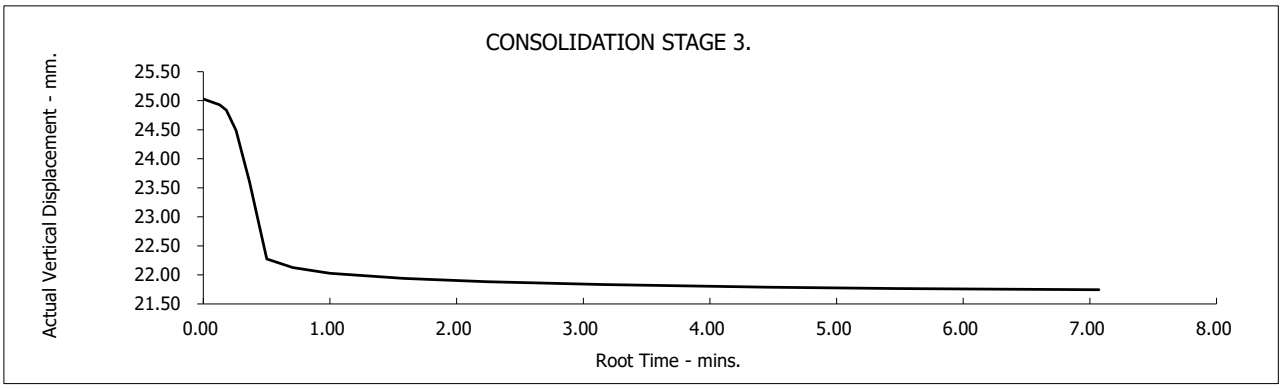
Global Centre Of Rail Excellence

Client Ref Number:
G22069

Borehole Number:	S1-TP105	Depth from (m):	0.50
Sample Number :		Depth to (m):	0.70







UKAS TESTING 2788

Global Centre Of Rail Excellence

Contract No.: **63638**

Client Ref Number: **G22069**

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GEOTECHNICAL SITE & TESTING LABORATORIES

Point Load Test

The complete ISRM suggested methods for rock characterization, testing and monitoring 1974-2006
Determining Point Load Strength

Contract Number	63638
Project Name	Global Centre Of Rail Excellence
Sample Type	Core
Date Tested	09/01/2023

*Please note that GSTL is not accredited for the water content of rock

Hole Reference	Depth (m)			Test Type		Width	Platen Seperation	Failure Load	Equivalent Diameter	Point Load	Size Factor	Point Load Index	Moisture Content	Description	Angle Between Plane of Anisotropy & Core Axis	Type of Anisotropy (Bedding or Cleavage)
				d / a / b / i	I //											
S1-BH116	10.60	-	10.85	a		102	33	3.10	65.47	0.72	1.13	0.82	2.0	SILTSTONE		
S1-BH116	12.79	-	12.90	d			102	1.35		0.13	1.38	0.18	2.3	SILTSTONE		
S1-BH116	15.25	-	15.45	d			102	1.44		0.14	1.38	0.19	2.0	SILTSTONE		

Key	Reported As
Width	(W) mm
Platen Separation	(D) mm
Failure Load	(P) kN
Equivalent Diameter	(De) mm
Point Load	(Is) MPa
Size Factor	(F)
Point Load Index	(Is(50)) MPa
Moisture Content	%
Description	SC

Operator
Julian Jones

UKAS TESTING
2788

ANALYTICAL TEST REPORT

Contract no: 117835

Contract name: Global Centre of Rail Excellence

Client reference: G22069

Clients name: Geo Site and Testing Services

Clients address: Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

Samples received: 17 January 2023

Analysis started: 17 January 2023

Analysis completed: 23 January 2023

Report issued: 23 January 2023

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing

Approved by:

Abbie Neasham-Bourn

Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			117835-1	117835-2	117835-3	117835-4	117835-5	117835-6
Sample id			S1-BH106	S1-BH109	S1-BH109	S1-BH112	S1-BH112	S1-BH116
Unique ID			2770126 606400010	1933567 971880020	193356797 1880020	759647 5043130000	7596475 043130010	355250 7438480020
Depth (m)			10.00-10.45	8.40-8.45	9.40-9.85	3.20-3.61	5.20-5.65	5.00-5.10
Sample Type			D15	D12	D13	D9	D109	D109
Date sampled			-	-	-	-	-	-
Test	**Method**	**Units**						
Total Organic Carbon (TOC)	CE197	% w/w C	28.9	3.4	1.4	5.1	1.5	4.3
Estimate of OMC (calculated from TOC)	CE197	% w/w	49.8	5.8	2.5	8.8	2.7	7.4

Chemtech Environmental Limited

SOILS

Lab number			117835-7	117835-8
Sample id			S1-BH116	S1-BH116
Unique ID			9823753 959400020	2396672 997800010
Depth (m)			5.40-5.50	6.90-7.35
Sample Type			D111	D12
Date sampled			-	-
Test	**Method**	**Units**		
Total Organic Carbon (TOC)	CE197	% w/w C	2.6	3.7
Estimate of OMC (calculated from TOC)	CE197	% w/w	4.5	6.3

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.
For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones, where applicable.

Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

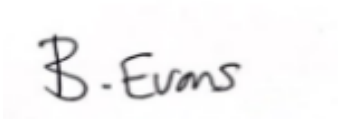
Contract Number: 64570

Client Ref: **G22069**
Client PO:

Date Received: **15-02-2023**
Date Completed: **08-03-2023**
Report Date: **08-03-2023**

Client: **Jackson Drilling Holdings Ltd**
Northwood Farm
Coxbridge Road
Baltonsborough
Somerset
BA6 8RA

This report has been checked and approved by:



Brendan Evans
Office Administrator

Contract Title: **Global Centre Of Rail Excellence**
For the attention of: **Adam Putt**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	2
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	2
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	2
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) BS 1377:1990 - Part 2 : 9.4 - * UKAS	1
Organic Matter Content Sub-contracted Test	1
Determination of Point Load Value Axial or Diametrical including WC ***Please note GSTL is not accredited for the water content of rock*** ISRM Suggested Method for Point Load Strength - * UKAS	1
Consolidated Drained Peak Shear Strength - set of 3 - 60 x 60mm Shear Box Specimens by Direct Shearing (3 days) BS 1377:1990 - Part 7 : 4 - * UKAS	1
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation
*** - denotes test included in laboratory scope of accreditation**
- denotes test carried out by approved contractor
@ - denotes non accredited tests

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 test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (Human Resources/ Health and Safety Manager)

GEO Site & Testing Services Ltd
Units 3-4, Heol Aur, Dafen, Llanelli, Carmarthenshire, Wales SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

Natural Moisture Content
(BS 1377:1990 - Part 2 : 3.2)

Contract Number	64570
Project Name	Global Centre Of Rail Excellence
Date Tested	16/08/2022

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Remarks
S1-BH107B	6	D	2.00	-		20	
				-			
				-			
				-			
				-			
				-			
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Operator
Clayton Jenkins

UKAS TESTING
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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.3 & 5.3)**	
Contract Number	64570	
Project Name	Global Centre Of Rail Excellence	
Date Tested	01/03/2023	
	DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
S1-BH107B	7	D	3.00	-	3.45	Brown fine to medium gravelly sandy silty CLAY
S1-BH107B	103	D	3.50	-	3.60	Brown fine to medium gravelly sandy silty CLAY
				-		
				-		
				-		
				-		
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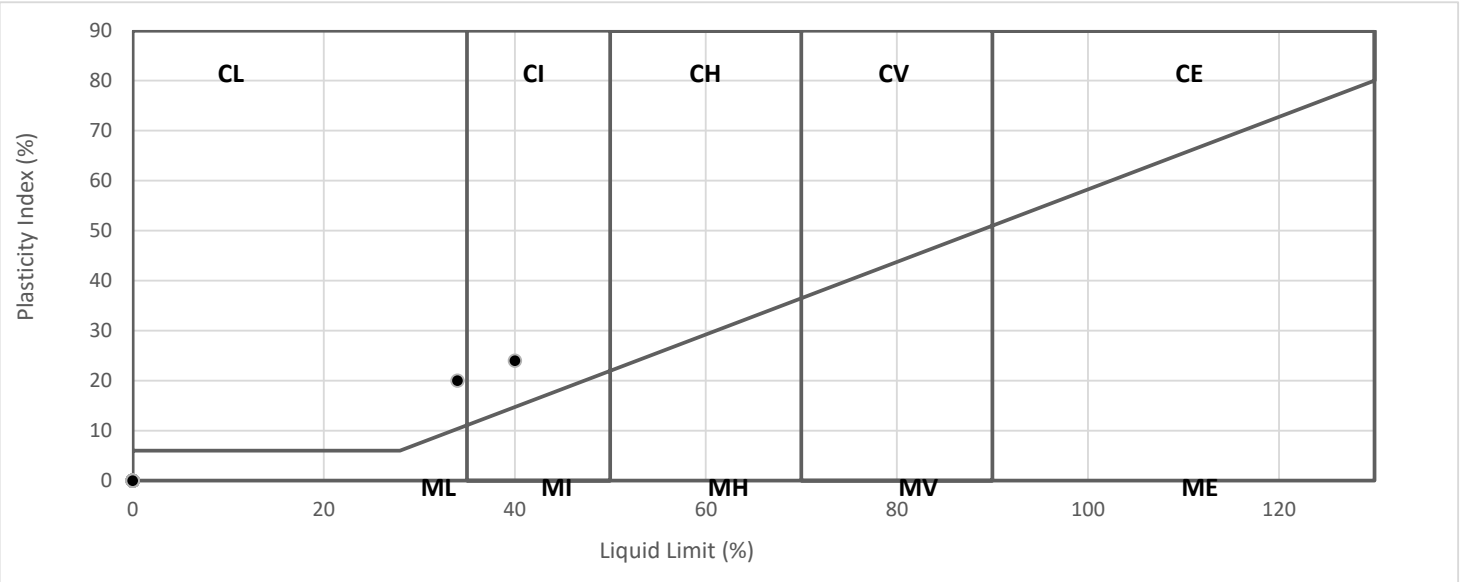
Operator
Clayton Jenkins

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.3 & 5.3)	
Contract Number	64570	
Project Name	Global Centre Of Rail Excellence	
Date Tested	01/03/2023	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
S1-BH107B	7	D	3.00	-	3.45	18	40	16	24	97	CI Intermediate Plasticity
S1-BH107B	103	D	3.50	-	3.60	17	34	14	20	95	CL Low Plasticity
				-							
				-							
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Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

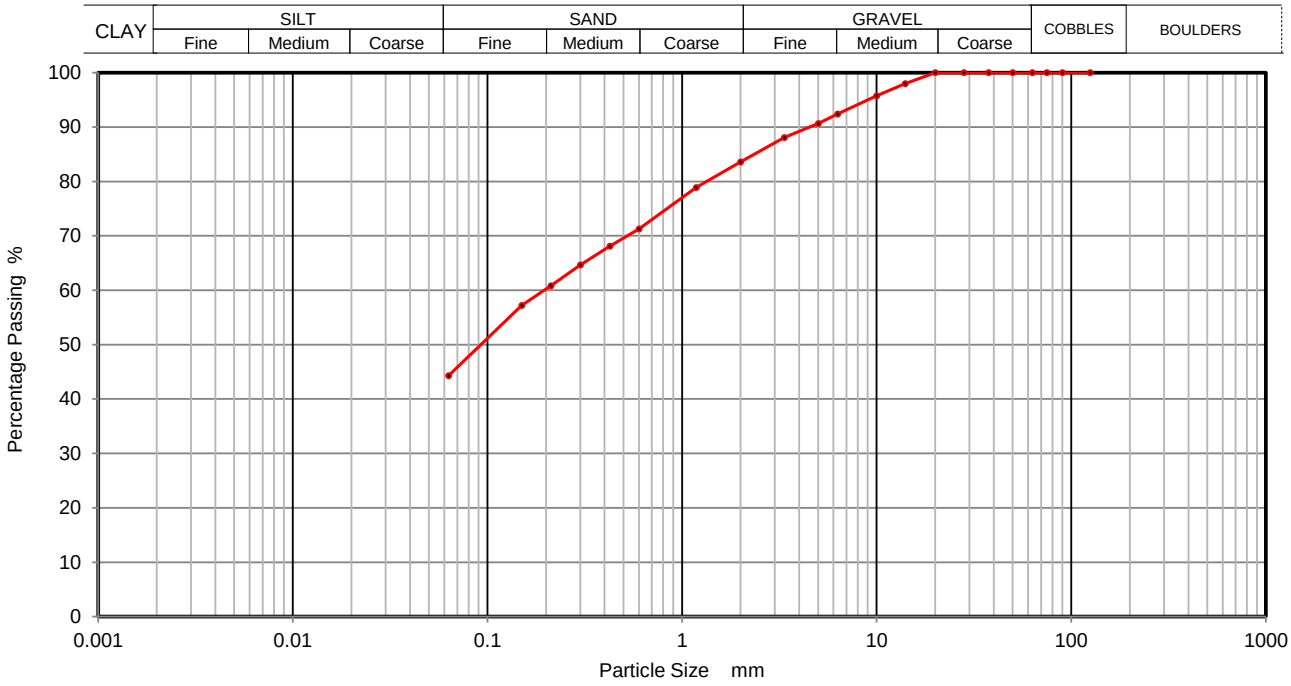
PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:2015+A1:2020



Operator
Clayton Jenkins

UKAS TESTING
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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2**	Contract Number	64570
		Borehole/Pit No.	S1-BH107B
Project Name	Global Centre Of Rail Excellence	Sample No.	6
Soil Description	Brown fine to coarse gravelly fine to coarse sandy SILT/ CLAY	Depth Top	2.00
		Depth Base	2.45
Date Tested	06/03/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	96		
6.3	92		
5	91		
3.35	88		
2	84		
1.18	79		
0.6	71		
0.425	68		
0.3	65		
0.212	61		
0.15	57		
0.063	44		

Sample Proportions	% dry mass
Cobbles	0
Gravel	16
Sand	40
Silt and Clay	44

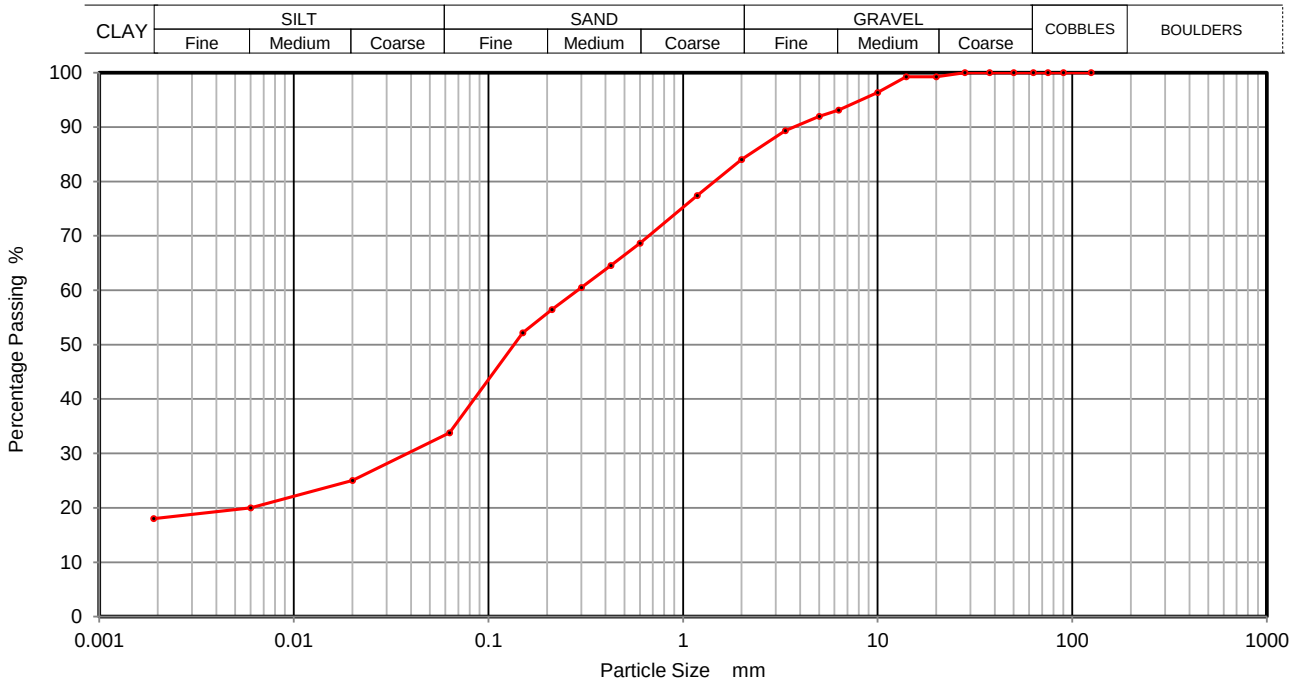
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
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GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	64570
		Borehole/Pit No.	S1-BH107B
Project Name	Global Centre Of Rail Excellence	Sample No.	104
Soil Description	Brown silty fine to coarse gravelly clayey fine to coarse SAND	Depth Top	3.60
		Depth Base	4.00
Date Tested	06/03/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	25
90	100	0.0060	20
75	100	0.0020	18
63	100		
50	100		
37.5	100		
28	100		
20	99		
14	99		
10	96		
6.3	93		
5	92		
3.35	89		
2	84		
1.18	77		
0.6	69		
0.425	65		
0.3	60		
0.212	56		
0.15	52		
0.063	34		

Sample Proportions	% dry mass
Cobbles	0
Gravel	16
Sand	50
Silt	16
Clay	18

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

Point Load Test

The complete ISRM suggested methods for rock characterization, testing and monitoring 1974-2006 Determining Point Load Strength

Contract Number	64570
Project Name	Global Centre Of Rail Excellence
Sample Type	Core
Date Tested	16/02/2023

*Please note that GSTL is not accredited for the water content of rock

Hole Reference	Depth (m)			Sample No	Test Type		Width	Platen Seperation	Failure Load	Equivalent Diameter	Point Load	Size Factor	Point Load Index	Moisture Content	Description	Angle Between Plane of Anisotropy & Core Axis	Type of Anisotropy (Bedding or Cleavage)
					d / a / b / i	I //											
S1-BH107B	7.45	-	7.66	106	d			106	29.13		2.59	1.40	3.64	0.9	SILTSTONE		

Key	Reported As
Width	(W) mm
Platen Separation	(D) mm
Failure Load	(P) kN
Equivalent Diameter	(De) mm
Point Load	(Is) MPa
Size Factor	(F)
Point Load Index	(Is(50)) MPa
Moisture Content	%
Description	SC

Operator
Julian Jones

UKAS TESTING
2788

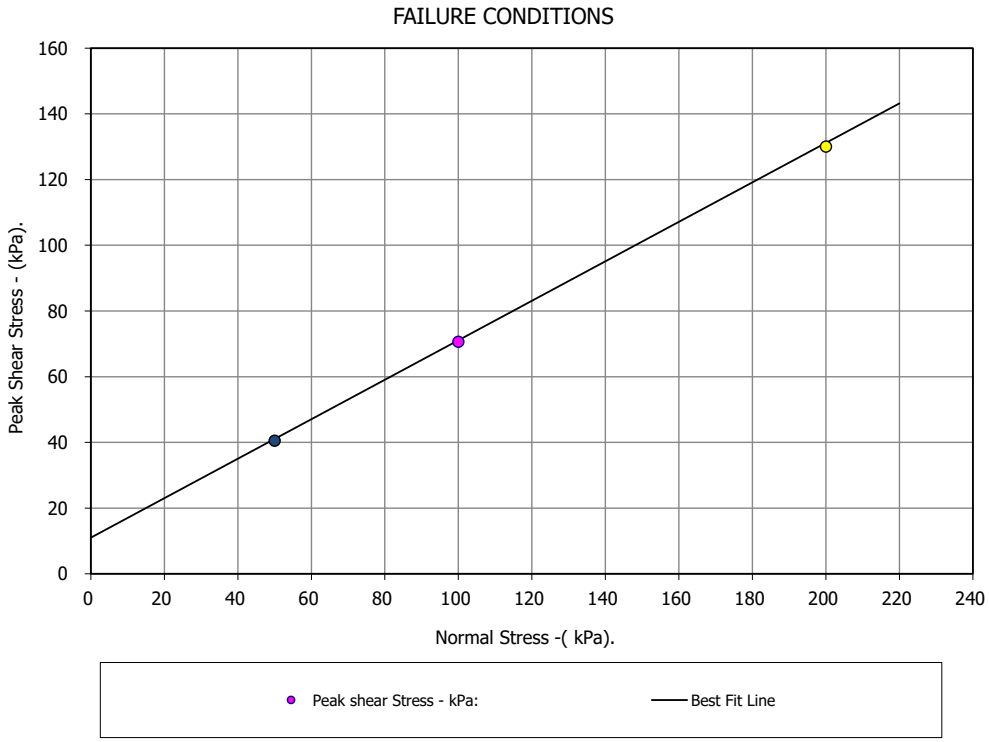
Borehole Number:	S1-BH107B	Depth from (m):	0.00
Sample Number :	1.0	Depth to (m):	1.20

Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Dark Brown clayey, sandy SILT

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	24.83	24.83	24.83
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	35	35	35
Bulk Density - Mg/m3:	1.36	1.36	1.36
Dry Density - Mg/m3:	1.01	1.01	1.01
Voids Ratio:	1.6162	1.6203	1.6186
Degree of Saturation - %:	56.70	56.55	56.61
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	23.56	22.93	22.50
Shear			
Rate of Horizontal Displacement (mm/min)	0.200	0.200	0.200
Horizontal Displacement at Peak Shear Stress (mm)	3.61	4.78	4.51
Peak shear Stress - kPa:	41	71	130

PEAK	
Angle of Shearing Resistance:(θ)	**31.0**
Effective Cohesion - kPa:	**11**



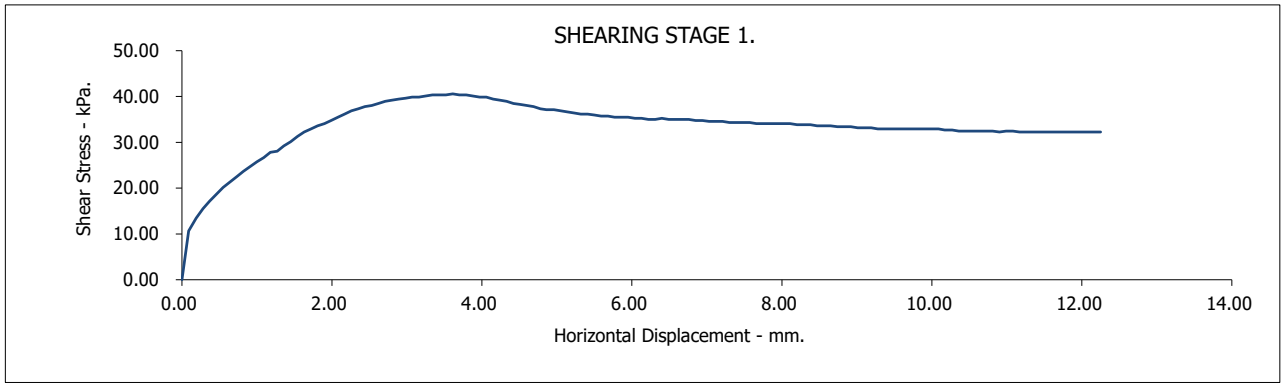
Contract No.:
64570

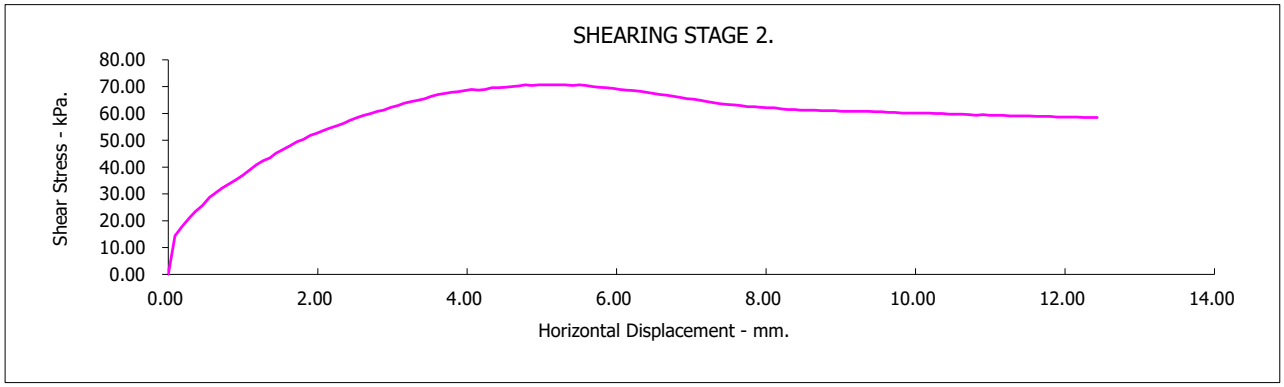
Global Centre Of Rail Excellence

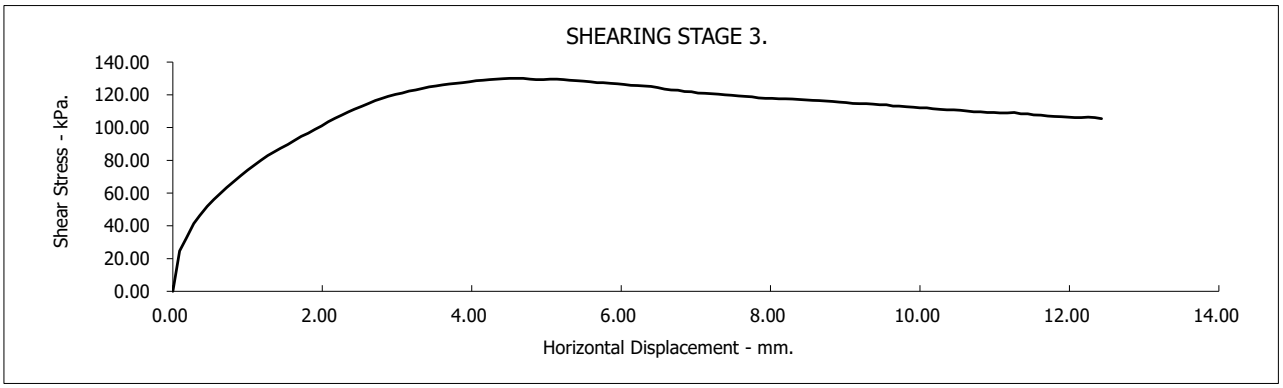
Client Ref Number:

G22069

Borehole Number:	S1-BH107B	Depth from (m):	0.00
Sample Number :	1	Depth to (m):	1.20







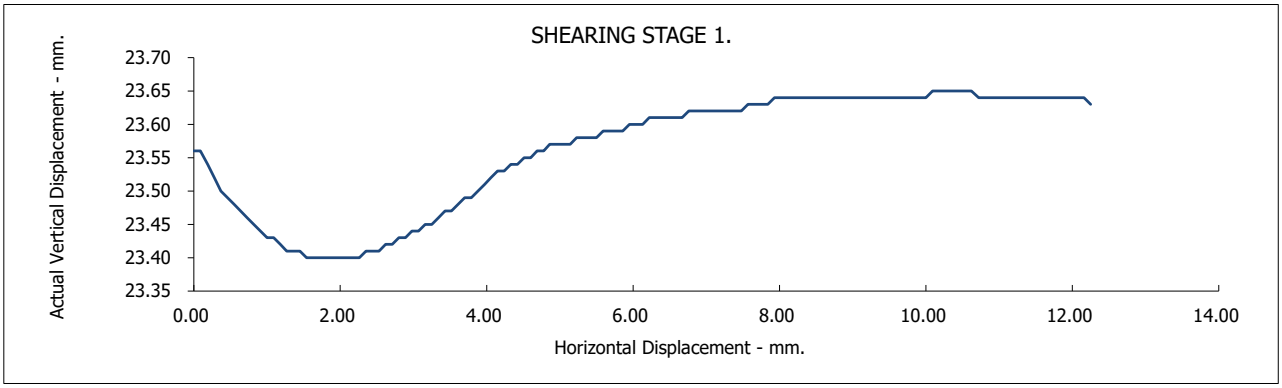
Global Centre Of Rail Excellence

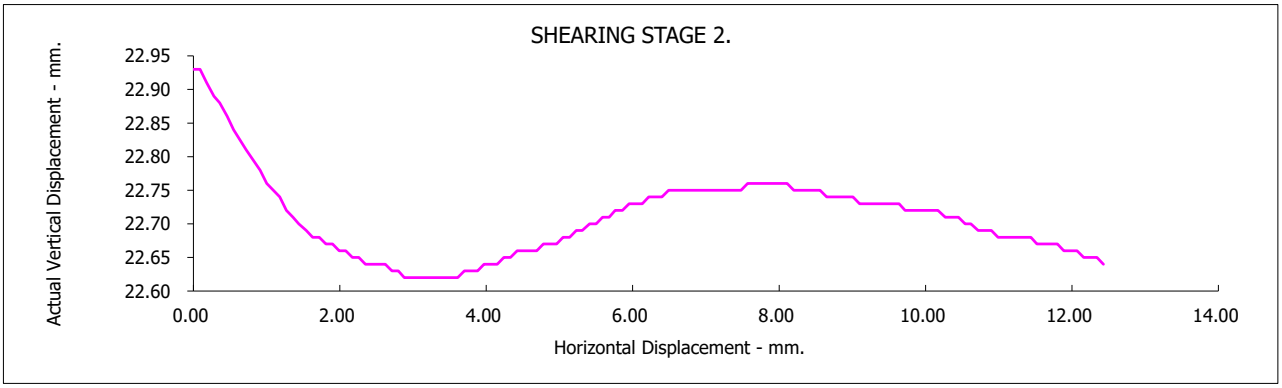
Contract No.: **64570**

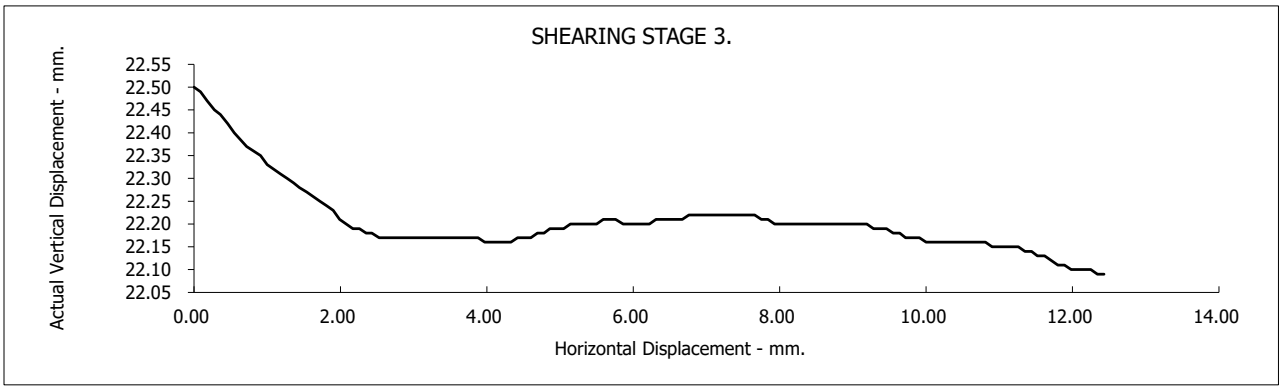
Client Ref Number: **G22069**

Figure.

Borehole Number:	S1-BH107B	Depth from (m):	0.00
Sample Number :	1	Depth to (m):	1.20





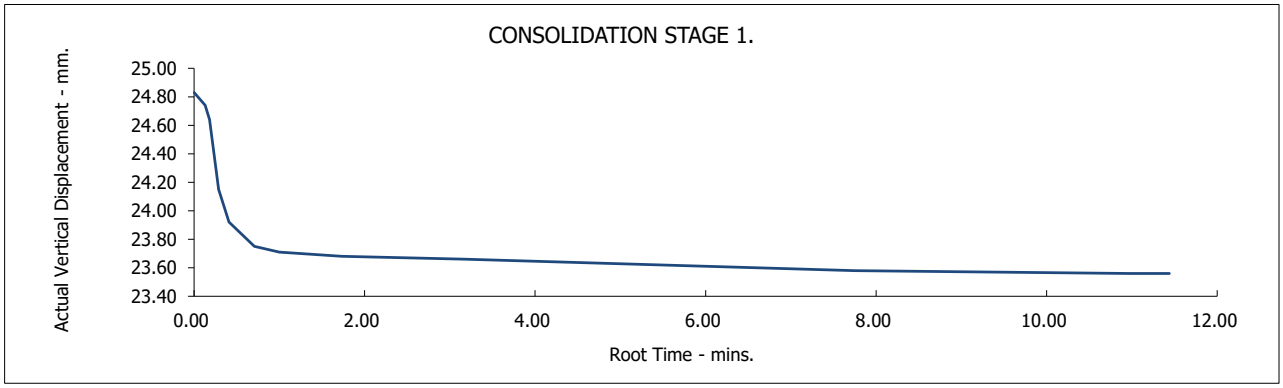


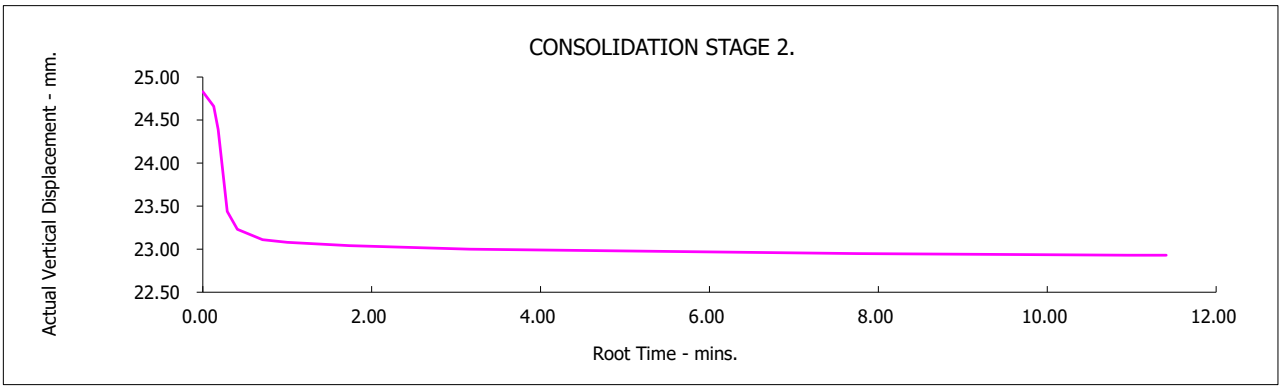
Contract No.:
64570

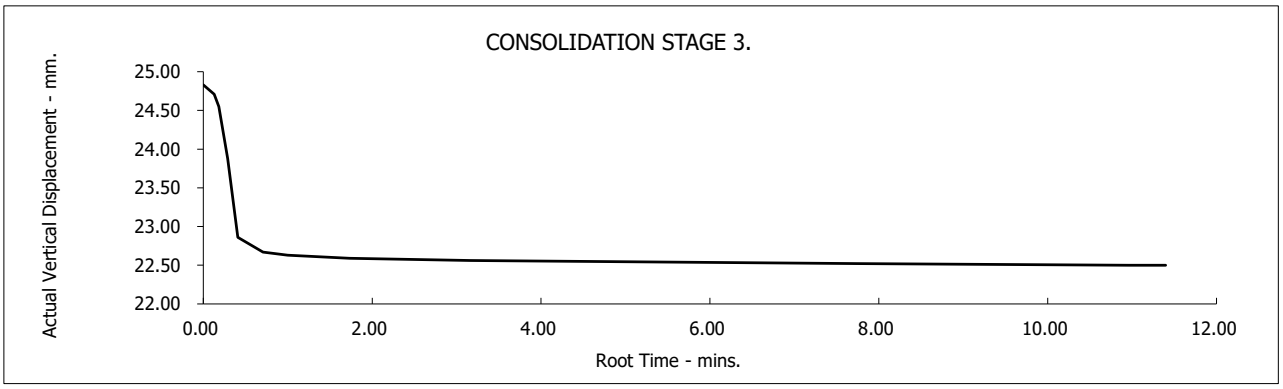
Global Centre Of Rail Excellence

Client Ref Number:
G22069

Borehole Number:	S1-BH107B	Depth from (m):	0.00
Sample Number :	1	Depth to (m):	1.20







UKAS TESTING 2788

Global Centre Of Rail Excellence

Contract No.: **64570**

Client Ref Number: **G22069**

ANALYTICAL TEST REPORT

Contract no: 119592

Contract name: Globel Centre of Rail Excellence

Client reference: G22069

Clients name: Geo Site and Testing Services

Clients address: Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

Samples received: 22 February 2023

Analysis started: 22 February 2023

Analysis completed: 01 March 2023

Report issued: 01 March 2023

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing

Approved by:

Abbie Neasham-Bourn

Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			119592-1
Sample id			S1-BH107B
			#2805702617760007
Depth (m)			3.00-3.45
Sample Type			D7
Date sampled			-
Test	**Method**	**Units**	
Total Organic Carbon (TOC)	CE197	% w/w C	0.9
Estimate of OMC (calculated from TOC)	CE197	% w/w	1.6

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.
For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones, where applicable.

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-46523-5		
Initial Date of Issue:	09-Dec-2022	**Date of Re-Issue:**	12-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	**Date Received:**	05-Dec-2022
Order No.:	2001	**Date Instructed:**	05-Dec-2022
No. of Samples:	13		
Turnaround (Wkdays):	5	**Results Due:**	09-Dec-2022
Date Approved:	09-Dec-2022		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services		**Chemtest Job No.:**			22-46523	22-46523	22-46523	22-46523	22-46523	22-46523	22-46523	22-46523
Quotation No.: Q22-28967		**Chemtest Sample ID.:**			1557745	1557746	1557747	1557748	1557749	1557750	1557751	1557752
Order No.: 2001		Client Sample Ref.:			2	8	2	9	6	6	9	2
		Client Sample ID.:			#3048308344110002	#3048308344110008	#5557391073340002	#5557391073340009	#6084432669940006	#0311441463560006	#0311441463560009	#6547945433540002
		Sample Location:			S1-TP113	S1-TP113	S1-TP111	S1-TP111	S1-TP112	S1-TP114	S1-TP114	S1-TP115
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.50	1.50	0.20	1.50	0.50	0.80	1.50	0.50
		Bottom Depth (m):			0.60	1.50	0.25	1.55	0.60	0.90	1.60	0.60
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Moisture	N	2030	%	0.020	15	20	12	7.8	17	8.5	7.1	8.6
pH (2.5:1)	N	2010		4.0	[A] 8.1	[A] 6.3	[A] 7.1	[A] 5.5	[A] 8.2	[A] 8.1	[A] 8.1	[A] 8.2
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	[A] 0.11	[A] < 0.010	[A] 0.016	[A] < 0.010	[A] < 0.010	[A] 0.071	[A] 0.056	[A] 0.028
Total Sulphur	U	2175	%	0.010	[A] 0.43	[A] 0.018	[A] 0.64	[A] 0.068	[A] 0.016	[A] 0.28	[A] 0.38	[A] 0.46
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.039	[A] < 0.010	[A] 0.11	[A] 0.12	[A] < 0.010	[A] 0.060	[A] 0.044	[A] 0.035

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services		**Chemtest Job No.:**			22-46523	22-46523	22-46523	22-46523	22-46523
Quotation No.: Q22-28967		**Chemtest Sample ID.:**			1557753	1557754	1557755	1557756	1557757
Order No.: 2001		Client Sample Ref.:			3	4	107	5	1
		Client Sample ID.:			#7308259884490003	#5520789993690004	#5930538818200015	#0957395206650005	#2569792309100003
		Sample Location:			S1-BH121	S1-BH110	S1-BH110	S1-BH102	S1-BH122
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.10	0.80	2.80	1.00	0.50
		Bottom Depth (m):			0.60	1.25	3.20	1.45	1.20
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Moisture	N	2030	%	0.020	14	2.0	17	22	23
pH (2.5:1)	N	2010		4.0	[A] 8.0	[A] 8.2	[A] 8.1	[A] 7.7	[A] 7.8
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	[A] < 0.010	[A] 0.056	[A] 0.040	[A] 0.12	[A] 0.15
Total Sulphur	U	2175	%	0.010	[A] 0.38	[A] 0.044	[A] 0.70	[A] 0.56	[A] 0.75
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.022	[A] 0.015	[A] < 0.010	[A] < 0.010	[A] 0.069

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1557745	2	#3048308344110002	S1-TP113		A	Plastic Tub 500g
1557746	8	#3048308344110008	S1-TP113		A	Plastic Tub 500g
1557747	2	#5557391073340002	S1-TP111		A	Plastic Tub 500g
1557748	9	#5557391073340009	S1-TP111		A	Plastic Tub 500g
1557749	6	#6084432669940006	S1-TP112		A	Plastic Tub 500g
1557750	6	#0311441463560006	S1-TP114		A	Plastic Tub 500g
1557751	9	#0311441463560009	S1-TP114		A	Plastic Tub 500g
1557752	2	#6547945433540002	S1-TP115		A	Plastic Tub 500g
1557753	3	#7308259884490003	S1-BH121		A	Plastic Tub 500g
1557754	4	#5520789993690004	S1-BH110		A	Plastic Tub 500g
1557755	107	#5930538818200015	S1-BH110		A	Plastic Tub 500g
1557756	5	#0957395206650005	S1-BH102		A	Plastic Tub 500g
1557757	1	#2569792309100003	S1-BH122		A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-49093-1
Initial Date of Issue:	05-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt
Project	G22069 Global Centre of Rail Excellence
Quotation No.:	Q22-28967
Order No.:	2001
No. of Samples:	4
Turnaround (Wkdays):	5
Date Approved:	05-Jan-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	23-Dec-2022
Date Instructed:	23-Dec-2022
Results Due:	05-Jan-2023

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services		**Chemtest Job No.:**			22-49093	22-49093	22-49093	22-49093
Quotation No.: Q22-28967		**Chemtest Sample ID.:**			1569154	1569155	1569156	1569157
Order No.: 2001		Client Sample Ref.:			1	109	106	8
		Client Sample ID.:			#9764020331080002	#6100979766840020	#2147866353450017	#2502984852760014
		Sample Location:			S1-BH114B	S1-BH105	S1-BH103	S1-BH103
		Sample Type:			SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.2	3.2	1.4	6.2
		Bottom Depth (m):			0.4	4.2	2.2	6.65
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
Moisture	N	2030	%	0.020	6.6	18	8.5	14
pH (2.5:1)	N	2010		4.0	[A] 8.3	[A] 8.2	[A] 8.2	[A] 8.5
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	[A] < 0.010	[A] 0.18	[A] 0.64	[A] 0.047
Total Sulphur	U	2175	%	0.010	[A] 0.24	[A] 1.6	[A] 0.17	[A] 0.86
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.056	[A] 0.080	[A] 0.23	[A] 0.043

Deviations

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Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1569154	1	#9764020331080002	S1-BH114B		A	Plastic Tub 500g
1569155	109	#6100979766840020	S1-BH105		A	Plastic Tub 500g
1569156	106	#2147866353450017	S1-BH103		A	Plastic Tub 500g
1569157	8	#2502984852760014	S1-BH103		A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

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SOP	Standard operating procedure
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customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-00130-1
Initial Date of Issue:	10-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt
Project	G22069 Global Centre of Rail Excellence
Quotation No.:	Q22-28967
Order No.:	2001
No. of Samples:	6
Turnaround (Wkdays):	5
Date Approved:	10-Jan-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	05-Jan-2023
Date Instructed:	05-Jan-2023
Results Due:	11-Jan-2023

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services		**Chemtest Job No.:**			23-00130	23-00130	23-00130	23-00130	23-00130	23-00130
Quotation No.: Q22-28967		**Chemtest Sample ID.:**			1570137	1570138	1570139	1570140	1570141	1570142
Order No.: 2001		Client Sample Ref.:			7	4	101	11	7	10
		Client Sample ID.:			#3080035123540007	#7112198638300004	#5067491743270021	#1259137117880011	#2720128606400007	#2720128606400010
		Sample Location:			S1-BH109	S1-BH116	S1-BH101	S1-BH101	S1-BH106	S1-BH106
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			3.20	0.70	1.20	6.00	2.00	5.00
		Bottom Depth (m):			3.65	1.20	2.00	6.45	2.45	5.45
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Moisture	N	2030	%	0.020	18	5.3	7.7	6.7	13	19
pH (2.5:1)	N	2010		4.0	[A] 8.9	[A] 8.6	[A] 8.4	[A] 7.8	[A] 8.6	[A] 8.1
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	[A] 0.062	[A] 0.045	[A] 0.26	[A] 0.17	[A] 0.018	[A] 0.094
Total Sulphur	U	2175	%	0.010	[A] 0.52	[A] 0.30	[A] 0.18	[A] 0.49	[A] 0.32	[A] 0.54
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.043	[A] 0.095	[A] 0.069	[A] 0.069	[A] 0.041	[A] 0.060

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1570137	7	#3080035123540007	S1-BH109		A	Plastic Tub 500g
1570138	4	#7112198638300004	S1-BH116		A	Plastic Tub 500g
1570139	101	#5067491743270021	S1-BH101		A	Plastic Tub 500g
1570140	11	#1259137117880011	S1-BH101		A	Plastic Tub 500g
1570141	7	#2720128606400007	S1-BH106		A	Plastic Tub 500g
1570142	10	#2720128606400010	S1-BH106		A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	23-04918-2		
Initial Date of Issue:	17-Feb-2023	**Date of Re-Issue:**	20-Feb-2023
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	**Date Received:**	14-Feb-2023
Order No.:	2001	**Date Instructed:**	14-Feb-2023
No. of Samples:	1		
Turnaround (Wkdays):	5	**Results Due:**	20-Feb-2023
Date Approved:	17-Feb-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services			**Chemtest Job No.:**		23-04918
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1589758
Order No.: 2001			Client Sample Ref.:		5
			Client Sample ID.:		#2805702617760005
			Sample Location:		S1-BH107B
			Sample Type:		SOIL
			Top Depth (m):		1.20
			Bottom Depth (m):		1.65
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Moisture	N	2030	%	0.020	4.6
pH (2.5:1)	N	2010		4.0	[A] 8.0
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	[A] 0.026
Total Sulphur	U	2175	%	0.010	[A] 0.16
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.051

Deviations

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Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1589758	5	#2805702617760005	S1-BH107B		A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

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Appendix V

Geoenvironmental Testing

Eurofins Chemtest Lab Report **22-43217, 22-43423, 22-43443, 22-43598, 22-43782, 22-44170, 22-44357, 22-44359, 22-44618, 22-44869, 22-45031, 22-45069, 22-45196, 22-45200, 22-45716, 22-45966, 22-45971, 22-45973, 22-46262, 22-46488, 22-46649, 22-46652, 22-46681, 22-46901, 22-47278, 22-47318, 22-47321, 22-47450, 22-47806, 22-47960, 22-47963, 22-48189, 22-48361, 22-48913, 22-49095, 23-00082, 23-00084, 23-00188, 23-00189, 23-00268, 23-00268, 23-00270, 23-01345, 23-02379, 23-02544, 23-02547, 23-03304, 23-03503, 23-03928, 23-05000, 23-05200**

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-43217-1
Initial Date of Issue:	28-Nov-2022
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 Global Centre of Rail Excellence (GCRE)
Quotation No.:	Q22-28967
Order No.:	
No. of Samples:	3
Turnaround (Wkdays):	10
Date Approved:	28-Nov-2022
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	10-Nov-2022
Date Instructed:	10-Nov-2022
Results Due:	23-Nov-2022

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-43217	22-43217
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1542829	1542830
Order No.:				Client Sample Ref.:		2	1
				Client Sample ID.:		#7308259884490002	#6547945433540001
				Sample Location:		S1-BH121	S1-TP115
				Sample Type:		SOIL	SOIL
				Top Depth (m):		0.50	0.20
				Bottom Depth (m):		0.70	0.30
				Date Sampled:		08-Nov-2022	08-Nov-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**		
pH	U	1010	10:1		N/A	8.8	8.3
Sulphate	U	1220	10:1	mg/l	1.0	2.2	22
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.79	1.4
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	0.53	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	1.7	1.2
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	1.1	1.6
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-43217	22-43217	22-43217
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1542829	1542830	1542831
Order No.:			Client Sample Ref.:		2	1	2
			Client Sample ID.:		#7308259884490002	#6547945433540001	#6547945433540003
			Sample Location:		S1-BH121	S1-TP115	S1-TP115
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.50	0.20	0.50
			Bottom Depth (m):		0.70	0.30	0.60
			Date Sampled:		08-Nov-2022	08-Nov-2022	08-Nov-2022
			Asbestos Lab:		NEW-ASB	NEW-ASB	NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry	U	2192	%	0.001	-		-
Total Asbestos	U	2192	%	0.001	-		-
Moisture	N	2030	%	0.020	19	5.6	9.4
pH	U	2010		4.0	8.1	8.1	8.1
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	< 10	22	25
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	11	7.6	6.9
Cadmium	U	2455	mg/kg	0.10	0.29	0.17	< 0.10
Chromium	U	2455	mg/kg	0.5	10	4.9	2.5
Copper	U	2455	mg/kg	0.50	48	20	19
Mercury	U	2455	mg/kg	0.05	0.07	0.06	0.05
Nickel	U	2455	mg/kg	0.50	31	14	7.1
Lead	U	2455	mg/kg	0.50	30	24	12
Selenium	U	2455	mg/kg	0.25	1.1	0.69	0.54
Vanadium	U	2455	mg/kg	0.5	12	6.9	2.7
Zinc	U	2455	mg/kg	0.50	73	53	27
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	100	52	100
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	150	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	150	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-43217	22-43217	22-43217
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1542829	1542830	1542831
Order No.:			Client Sample Ref.:		2	1	2
			Client Sample ID.:		#7308259884490002	#6547945433540001	#6547945433540003
			Sample Location:		S1-BH121	S1-TP115	S1-TP115
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.50	0.20	0.50
			Bottom Depth (m):		0.70	0.30	0.60
			Date Sampled:		08-Nov-2022	08-Nov-2022	08-Nov-2022
			Asbestos Lab:		NEW-ASB	NEW-ASB	NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	180	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	180	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	330	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.74	0.68	1.7
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.25
Fluorene	U	2800	mg/kg	0.10	0.29	0.16	0.30
Phenanthrene	U	2800	mg/kg	0.10	2.5	0.79	2.5
Anthracene	U	2800	mg/kg	0.10	0.28	0.17	0.34
Fluoranthene	U	2800	mg/kg	0.10	1.7	0.67	2.5
Pyrene	U	2800	mg/kg	0.10	1.2	0.56	1.7
Benzo[a]anthracene	U	2800	mg/kg	0.10	1.2	0.57	0.90
Chrysene	U	2800	mg/kg	0.10	1.4	0.49	1.3
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	1.7	1.0	1.4
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	0.77	0.60	0.39
Benzo[a]pyrene	U	2800	mg/kg	0.10	1.3	0.67	0.94
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	1.1	0.76	0.56
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.60	0.43	0.20
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	1.1	0.72	0.49
Total Of 16 PAH's	N	2800	mg/kg	2.0	16	8.3	16
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-43423-1
Initial Date of Issue:	10-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt
Project	G22069 Global Centre of Rail Excellence
Quotation No.:	Q22-28967
Order No.:	2001
No. of Samples:	6
Turnaround (Wkdays):	10
Date Approved:	10-Jan-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	11-Nov-2022
Date Instructed:	11-Nov-2022
Results Due:	24-Nov-2022

Results - Leachate

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services				**Chemtest Job No.:**		22-43423	22-43423
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1543718	1543720
Order No.: 2001				Client Sample Ref.:		1	3
				Client Sample ID.:		#3965946619370001	#3048308344110003
				Sample Location:		S1-BH122	S1-TP113
				Sample Type:		SOIL	SOIL
				Top Depth (m):		0.20	0.50
				Bottom Depth (m):		0.30	0.60
				Date Sampled:		09-Nov-2022	09-Nov-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**		
pH	U	1010	10:1		N/A	8.5	8.4
Sulphate	U	1220	10:1	mg/l	1.0	1.1	8.5
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	< 0.20	3.2
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	1.4
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	0.96
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	2.4
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	1.9
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services		**Chemtest Job No.:**			22-43423	22-43423	22-43423	22-43423	22-43423	22-43423
Quotation No.: Q22-28967		**Chemtest Sample ID.:**			1543716	1543717	1543718	1543719	1543720	1543721
Order No.: 2001		Client Sample Ref.:			101	102	1	1	3	6
		Client Sample ID.:			#7308259884490004	#7308259884490005	#3965946619370001	#3048308344110001	#3048308344110003	#3048308344110006
		Sample Location:			S1-BH121	S1-BH121	S1-BH122	S1-TP113	S1-TP113	S1-TP113
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			1.20	1.80	0.20	0.20	0.50	0.90
		Bottom Depth (m):			1.40	2.00	0.30	0.30	0.60	1.00
		Date Sampled:			09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022
		Asbestos Lab:			DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
ACM Type	U	2192		N/A	-		-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	13	70	4.6	11	16	21
pH	U	2010		4.0	6.8	6.7	7.5	7.8	7.8	5.7
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	0.73	< 0.40	< 0.40	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	95	89	< 10	< 10	17	< 10
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	10	14	6.7	4.6	9.5	3.2
Cadmium	U	2455	mg/kg	0.10	< 0.10	1.2	< 0.10	< 0.10	0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	3.9	2.7	4.2	6.7	6.6	11
Copper	U	2455	mg/kg	0.50	73	29	29	26	51	10
Mercury	U	2455	mg/kg	0.05	0.18	0.05	< 0.05	< 0.05	0.07	< 0.05
Nickel	U	2455	mg/kg	0.50	21	9.2	36	7.1	20	6.3
Lead	U	2455	mg/kg	0.50	46	58	20	17	38	13
Selenium	U	2455	mg/kg	0.25	2.4	1.3	0.48	0.38	1.1	0.59
Vanadium	U	2455	mg/kg	0.5	5.8	2.7	6.8	7.0	12	17
Zinc	U	2455	mg/kg	0.50	52	110	90	62	110	23
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	28	83	11	98	86	1.2
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services			**Chemtest Job No.:**		22-43423	22-43423	22-43423	22-43423	22-43423	22-43423
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1543716	1543717	1543718	1543719	1543720	1543721
Order No.: 2001			Client Sample Ref.:		101	102	1	1	3	6
			Client Sample ID.:		#7308259884490004	#7308259884490005	#3965946619370001	#3048308344110001	#3048308344110003	#3048308344110006
			Sample Location:		S1-BH121	S1-BH121	S1-BH122	S1-TP113	S1-TP113	S1-TP113
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.20	1.80	0.20	0.20	0.50	0.90
			Bottom Depth (m):		1.40	2.00	0.30	0.30	0.60	1.00
			Date Sampled:		09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022
			Asbestos Lab:		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	7.1	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.39	0.50	0.41	1.7	1.3	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.17	0.25	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.28	0.17	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	0.51	< 0.10	2.1	0.95	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.53	0.23	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10	0.27	< 0.10	1.4	0.71	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10	0.20	< 0.10	1.0	0.58	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.56	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	1.0	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	1.2	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.26	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.51	0.26	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	11	4.5	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-43443-1		
Initial Date of Issue:	25-Nov-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	11-Nov-2022
Order No.:		**Date Instructed:**	11-Nov-2022
No. of Samples:	1		
Turnaround (Wkdays):	10	**Results Due:**	24-Nov-2022
Date Approved:	25-Nov-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-43443								
Chemtest Sample ID:	1543812								
Sample Ref:	1								
Sample ID:	#6547945433540001						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-TP115								
Top Depth(m):	0.20								
Bottom Depth(m):	0.30								
Sampling Date:	08-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			28	3	5	6
Loss On Ignition	2610	M	%			8.6	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			3500	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			29	100	--	--
pH	2010	M				7.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.0090	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0008	0.0005	0.0015	0.0057	0.5	2	25
Barium	1455	U	0.043	0.027	0.086	0.29	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0006	< 0.0005	0.0013	0.0009	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0034	0.0012	0.0067	0.016	0.5	10	30
Nickel	1455	U	0.0014	< 0.0005	0.0029	0.0020	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0005	< 0.0005	0.0010	0.0007	0.06	0.7	5
Selenium	1455	U	0.0016	0.0012	0.0031	0.012	0.1	0.5	7
Zinc	1455	U	< 0.003	0.003	< 0.003	0.022	4	50	200
Chloride	1220	U	1.4	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.27	0.11	< 1.0	1.3	10	150	500
Sulphate	1220	U	75	9.4	150	190	1000	20000	50000
Total Dissolved Solids	1020	N	230	67	460	900	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	6.7	5.4	< 50	56	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	4.9

Leachate Test Information	
Leachant volume 1st extract/l	0.341
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.248

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-43598-1		
Initial Date of Issue:	08-Dec-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	**Date Received:**	14-Nov-2022
Order No.:		**Date Instructed:**	14-Nov-2022
No. of Samples:	1		
Turnaround (Wkdays):	10	**Results Due:**	25-Nov-2022
Date Approved:	08-Dec-2022		
Approved By:			



Details:	Stuart Henderson, Technical Manager

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services			**Chemtest Job No.:**		22-43598
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1544565
Order No.:			Client Sample Ref.:		101
			Client Sample ID.:		#2569792309100008
			Sample Location:		S1-BH122
			Sample Type:		SOIL
			Top Depth (m):		2.00
			Bottom Depth (m):		2.20
			Date Sampled:		10-Nov-2022
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	15
pH	U	2010		4.0	5.0
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	< 10
Cyanide (Free)	U	2300	mg/kg	0.50	0.50
Cyanide (Total)	U	2300	mg/kg	0.50	0.90
Arsenic	U	2455	mg/kg	0.5	< 0.5
Cadmium	U	2455	mg/kg	0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	1.4
Copper	U	2455	mg/kg	0.50	3.2
Mercury	U	2455	mg/kg	0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	4.5
Lead	U	2455	mg/kg	0.50	0.99
Selenium	U	2455	mg/kg	0.25	0.37
Vanadium	U	2455	mg/kg	0.5	1.0
Zinc	U	2455	mg/kg	0.50	4.8
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	U	2625	%	0.40	98
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services			**Chemtest Job No.:**		22-43598
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1544565
Order No.:			Client Sample Ref.:		101
			Client Sample ID.:		#2569792309100008
			Sample Location:		S1-BH122
			Sample Type:		SOIL
			Top Depth (m):		2.00
			Bottom Depth (m):		2.20
			Date Sampled:		10-Nov-2022
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

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N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
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All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-43782-1		
Initial Date of Issue:	02-Dec-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	**Date Received:**	15-Nov-2022
Order No.:		**Date Instructed:**	15-Nov-2022
No. of Samples:	2		
Turnaround (Wkdays):	10	**Results Due:**	28-Nov-2022
Date Approved:	02-Dec-2022		
Approved By:			



Details:	Stuart Henderson, Technical Manager

Results - Leachate

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services				**Chemtest Job No.:**		22-43782
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1545475
Order No.:				Client Sample Ref.:		1
				Sample Location:		S1-BH102
				Sample Type:		SOIL
				Top Depth (m):		0.20
				Bottom Depth (m):		0.30
				Date Sampled:		11-Nov-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	8.2
Sulphate	U	1220	10:1	mg/l	1.0	15
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.21
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	0.66
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	4.9
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services			**Chemtest Job No.:**		22-43782	22-43782
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1545475	1545476
Order No.:			Client Sample Ref.:		1	2
			Sample Location:		S1-BH102	S1-BH102
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.20	0.50
			Bottom Depth (m):		0.30	0.60
			Date Sampled:		11-Nov-2022	11-Nov-2022
			Asbestos Lab:		DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	9.0	13
pH	U	2010		4.0	8.3	7.7
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	0.57
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	51	97
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	20	7.1
Cadmium	U	2455	mg/kg	0.10	0.13	0.18
Chromium	U	2455	mg/kg	0.5	19	10
Copper	U	2455	mg/kg	0.50	81	56
Mercury	U	2455	mg/kg	0.05	0.37	0.10
Nickel	U	2455	mg/kg	0.50	21	25
Lead	U	2455	mg/kg	0.50	45	43
Selenium	U	2455	mg/kg	0.25	2.7	0.87
Vanadium	U	2455	mg/kg	0.5	17	14
Zinc	U	2455	mg/kg	0.50	47	60
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	53	81
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services			**Chemtest Job No.:**		22-43782	22-43782
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1545475	1545476
Order No.:			Client Sample Ref.:		1	2
			Sample Location:		S1-BH102	S1-BH102
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.20	0.50
			Bottom Depth (m):		0.30	0.60
			Date Sampled:		11-Nov-2022	11-Nov-2022
			Asbestos Lab:		DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	1.8	1.3
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	0.12
Fluorene	U	2800	mg/kg	0.10	< 0.10	0.13
Phenanthrene	U	2800	mg/kg	0.10	0.35	0.52
Anthracene	U	2800	mg/kg	0.10	< 0.10	0.12
Fluoranthene	U	2800	mg/kg	0.10	0.14	0.29
Pyrene	U	2800	mg/kg	0.10	< 0.10	0.23
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	0.13
Chrysene	U	2800	mg/kg	0.10	< 0.10	0.18
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	0.30
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	0.11
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	0.12
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	0.17
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	0.12
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	0.18
Total Of 16 PAH's	N	2800	mg/kg	2.0	2.3	4.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-44170-1
Initial Date of Issue:	20-Dec-2022
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 Global Centre of Rail Excellence (GCRE)
Quotation No.:	Q22-28967
Order No.:	2001
No. of Samples:	7
Turnaround (Wkdays):	10
Date Approved:	20-Dec-2022
Approved By:	

Date Received:	17-Nov-2022
Date Instructed:	18-Nov-2022
Results Due:	01-Dec-2022



Details: Stuart Henderson, Technical Manager

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-44170	22-44170	22-44170	22-44170
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1547516	1547519	1547522	1547523
Order No.: 2001				Client Sample Ref.:		101	8	6	1
				Sample Location:		S1-BH102	S1-TP112	S1-TP111	S1-TP111
				Sample Type:		SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		3.00	0.90	0.90	0.20
				Bottom Depth (m):		3.20	10.00	1.00	0.30
				Date Sampled:		15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**				
pH	U	1010	10:1		N/A	6.3	6.8	6.0	6.7
Sulphate	U	1220	10:1	mg/l	1.0	< 1.0	9.1	16	25
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	3.5	0.49	0.50	4.6
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50	< 0.50	1.9
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	0.64	< 0.50	5.0	3.3
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	1.3	0.93	1.9	2.6
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50	< 0.50	2.8
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	1.9	< 0.50	0.92
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50	< 0.50	4.2
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	7.3	3.2	5.8	7.1
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20	< 20	< 20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services					**Chemtest Job No.:**	22-44170	22-44170	22-44170	22-44170	22-44170	22-44170
Quotation No.: Q22-28967					**Chemtest Sample ID.:**	1547516	1547517	1547519	1547520	1547521	1547522	1547523
Order No.: 2001					Client Sample Ref.:	101	3	8	11	5	6	1
					Sample Location:	S1-BH102	S1-TP112	S1-TP112	S1-TP112	S1-TP111	S1-TP111	S1-TP111
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	3.00	0.20	0.90	1.50	0.40	0.90	0.20
					Bottom Depth (m):	3.20	0.30	10.00	1.60	0.50	1.00	0.30
					Date Sampled:	15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022
					Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type	U	2192		N/A			-	-	-	-		-
Asbestos Identification	U	2192		N/A			No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected		No Asbestos Detected
Moisture	N	2030	%	0.020		85	21	9.8	29	12	9.8	16
pH	U	2010		4.0		4.7	8.0	7.3	7.7	6.0	5.5	7.2
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40		1.0	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000		< 10	34	19	14	39	< 10	58
Cyanide (Free)	U	2300	mg/kg	0.50		< 0.50	< 0.50	< 0.50	5.4	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50		1.0	< 0.50	< 0.50	5.4	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5		1.8	18	23	7.5	9.5	6.8	27
Cadmium	U	2455	mg/kg	0.10		< 0.10	0.20	0.13	0.32	0.12	< 0.10	0.27
Chromium	U	2455	mg/kg	0.5		2.8	11	1.5	3.9	9.7	10	8.7
Copper	U	2455	mg/kg	0.50		9.3	120	51	62	29	30	18
Mercury	U	2455	mg/kg	0.05		< 0.05	< 0.05	0.17	0.35	0.07	< 0.05	0.05
Nickel	U	2455	mg/kg	0.50		5.4	43	36	20	19	23	7.4
Lead	U	2455	mg/kg	0.50		6.2	32	36	32	22	19	33
Selenium	U	2455	mg/kg	0.25		0.63	1.6	2.3	1.7	0.93	0.93	1.1
Vanadium	U	2455	mg/kg	0.5		3.7	30	2.8	9.1	12	12	16
Zinc	U	2455	mg/kg	0.50		14	55	45	58	55	64	22
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40		88	55	71	100	44	3.1	3.1
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0		< 1.0	200	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-44170	22-44170	22-44170	22-44170	22-44170	22-44170	22-44170
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1547516	1547517	1547519	1547520	1547521	1547522	1547523
Order No.: 2001			Client Sample Ref.:		101	3	8	11	5	6	1
			Sample Location:		S1-BH102	S1-TP112	S1-TP112	S1-TP112	S1-TP111	S1-TP111	S1-TP111
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		3.00	0.20	0.90	1.50	0.40	0.90	0.20
			Bottom Depth (m):		3.20	0.30	10.00	1.60	0.50	1.00	0.30
			Date Sampled:		15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022
			Asbestos Lab:			DURHAM	DURHAM	DURHAM	DURHAM		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	200	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	200	< 10	< 10	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0	36	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	180	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	24	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	58	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	35	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.85	1.8	0.99	0.35	0.67	0.47	0.68
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	0.12	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	0.12	0.24	0.15	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	0.13	0.19	0.15	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	0.32	2.0	1.4	0.42	0.21	< 0.10	0.25
Anthracene	U	2800	mg/kg	0.10	< 0.10	0.42	0.33	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	0.18	2.8	2.1	0.53	0.12	< 0.10	0.13
Pyrene	U	2800	mg/kg	0.10	0.13	1.9	1.6	0.43	0.12	< 0.10	0.15
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	1.3	0.85	0.19	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	1.8	0.83	0.20	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	2.6	1.2	0.30	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	0.99	0.44	0.11	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	1.7	0.86	0.15	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	1.1	0.52	0.15	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	0.18	0.12	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	0.95	0.47	0.16	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	20	12	3.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

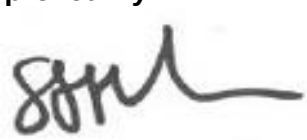
If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-44357-5		
Initial Date of Issue:	14-Dec-2022	**Date of Re-Issue:**	15-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	18-Nov-2022
Order No.:	2001	**Date Instructed:**	21-Nov-2022
No. of Samples:	5		
Turnaround (Wkdays):	10	**Results Due:**	02-Dec-2022
Date Approved:	14-Dec-2022		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-44357	22-44357	22-44357
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1548421	1548423	1548424
Order No.: 2001				Client Sample Ref.:		2	7	1
				Client Sample ID.:		#0311441463560002	#0311441463560007	#4200022576460001
				Sample Location:		S1-TP114	S1-TP114	S1-BH110
				Sample Type:		SOIL	SOIL	SOIL
				Top Depth (m):		0.1	0.9	0.3
				Bottom Depth (m):		0.15	1.0	0.4
				Date Sampled:		16-Nov-2022	16-Nov-2022	16-Nov-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**			
pH	U	1010	10:1		N/A	7.4	7.9	7.0
Sulphate	U	1220	10:1	mg/l	1.0	7.1	15	9.1
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050	0.36	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050	0.36	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	< 0.20	0.48	1.1
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	1.7	< 0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05	< 0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	3.9	0.79	0.81
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	2.5	1.0
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	13	2.6	2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20	< 20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-44357	22-44357	22-44357	22-44357	22-44357
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1548421	1548422	1548423	1548424	1548425
Order No.: 2001			Client Sample Ref.:		2	4	7	1	2
			Client Sample ID.:		#03114414635 60002	#03114414635 60004	#03114414635 60007	#42000225764 60001	#42000225764 60002
			Sample Location:		S1-TP114	S1-TP114	S1-TP114	S1-BH110	S1-BH110
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.1	0.3	0.9	0.3	0.6
			Bottom Depth (m):		0.15	0.35	1.0	0.4	0.7
			Date Sampled:		16-Nov-2022	16-Nov-2022	16-Nov-2022	16-Nov-2022	16-Nov-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
ACM Type	U	2192		N/A	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	9.0	8.9	6.9	3.3	4.1
pH	M	2010		4.0	4.3	5.9	8.4	7.1	8.2
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.44	1.9	1.5	< 0.40	0.41
Sulphate (2:1 Water Soluble) as SO4 mg/l	M	2120	mg/l	10.000	53	140	59	66	100
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	M	2455	mg/kg	0.5	11	11	12	7.0	8.1
Cadmium	M	2455	mg/kg	0.10	< 0.10	0.11	0.21	0.21	0.27
Chromium	M	2455	mg/kg	0.5	1.9	5.7	6.5	6.2	5.0
Copper	M	2455	mg/kg	0.50	17	32	37	37	37
Mercury	M	2455	mg/kg	0.05	< 0.05	0.06	0.12	0.05	0.14
Nickel	M	2455	mg/kg	0.50	3.4	21	25	47	41
Lead	M	2455	mg/kg	0.50	34	36	48	23	23
Selenium	M	2455	mg/kg	0.25	1.5	1.5	2.9	0.83	2.0
Vanadium	U	2455	mg/kg	0.5	4.4	10	8.2	12	7.3
Zinc	M	2455	mg/kg	0.50	11	54	55	120	88
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	26	83	4.4	11	100
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-44357	22-44357	22-44357	22-44357	22-44357
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1548421	1548422	1548423	1548424	1548425
Order No.: 2001			Client Sample Ref.:		2	4	7	1	2
			Client Sample ID.:		#03114414635 60002	#03114414635 60004	#03114414635 60007	#42000225764 60001	#42000225764 60002
			Sample Location:		S1-TP114	S1-TP114	S1-TP114	S1-BH110	S1-BH110
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.1	0.3	0.9	0.3	0.6
			Bottom Depth (m):		0.15	0.35	1.0	0.4	0.7
			Date Sampled:		16-Nov-2022	16-Nov-2022	16-Nov-2022	16-Nov-2022	16-Nov-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	M	2800	mg/kg	0.10	1.0	0.49	1.2	0.56	0.70
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	0.43	0.13	< 0.10	< 0.10	0.38
Phenanthrene	M	2800	mg/kg	0.10	1.1	0.30	0.54	0.25	1.7
Anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10	0.12	< 0.10	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	0.21	< 0.10	0.36	< 0.10	0.13
Pyrene	M	2800	mg/kg	0.10	0.30	< 0.10	0.30	< 0.10	0.17
Benzo[a]anthracene	M	2800	mg/kg	0.10	0.24	< 0.10	< 0.10	< 0.10	0.14
Chrysene	M	2800	mg/kg	0.10	0.33	< 0.10	< 0.10	< 0.10	0.24
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	0.18	< 0.10	< 0.10	< 0.10	0.19
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	0.12	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.11	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	0.20	< 0.10	< 0.10	< 0.10	0.15
Total Of 16 PAH's	N	2800	mg/kg	2.0	4.2	< 2.0	2.5	< 2.0	3.8
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-44357								
Chemtest Sample ID:	1548422								
Sample Ref:	4								
Sample ID:	#0311441463560004						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-TP114								
Top Depth(m):	0.3								
Bottom Depth(m):	0.35								
Sampling Date:	16-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			48	3	5	6
Loss On Ignition	2610	M	%			13	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	M				5.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.015	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0031	0.0017	0.0062	0.019	0.5	2	25
Barium	1455	U	0.049	0.022	0.097	0.25	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0015	0.0015	0.0029	0.015	0.5	10	30
Nickel	1455	U	0.0052	0.0011	0.010	0.017	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0022	0.0013	0.0043	0.014	0.06	0.7	5
Selenium	1455	U	0.0030	0.0013	0.0060	0.015	0.1	0.5	7
Zinc	1455	U	0.003	< 0.003	0.006	0.004	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.21	0.15	< 1.0	1.6	10	150	500
Sulphate	1220	U	59	8.9	120	160	1000	20000	50000
Total Dissolved Solids	1020	N	180	56	360	730	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	7.4	4.6	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	8.9

Leachate Test Information	
Leachant volume 1st extract/l	0.333
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.232

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-44359-8		
Initial Date of Issue:	05-Dec-2022	**Date of Re-Issue:**	06-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	**Date Received:**	18-Nov-2022
Order No.:	2001	**Date Instructed:**	18-Nov-2022
No. of Samples:	2		
Turnaround (Wkdays):	7	**Results Due:**	28-Nov-2022
Date Approved:	05-Dec-2022		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-44359								
Chemtest Sample ID:	1548438								
Sample Ref:	101								
Sample ID:	#0138711356620014						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH102								
Top Depth(m):	3.00								
Bottom Depth(m):	3.20								
Sampling Date:	15-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			60	3	5	6
Loss On Ignition	2610	M	%			11	--	--	10
Total BTEX	2760	M	mg/kg			1.3	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	M				4.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.0080	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.014	0.0038	0.011	0.039	0.5	2	25
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0010	< 0.0005	0.0008	< 0.0005	0.5	10	70
Copper	1455	U	0.0043	0.0051	0.0034	0.0020	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0004	< 0.0002	0.0003	< 0.0002	0.5	10	30
Nickel	1455	U	0.0016	0.0045	0.0013	0.038	0.4	10	40
Lead	1455	U	0.0011	< 0.0005	0.0009	0.0005	0.5	10	50
Antimony	1455	U	0.0009	< 0.0005	0.0007	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	0.021	0.006	0.017	0.057	4	50	200
Chloride	1220	U	9.1	2.1	< 10	22	800	15000	25000
Fluoride	1220	U	0.17	0.13	< 1.0	1.2	10	150	500
Sulphate	1220	U	12	1.0	< 10	14	1000	20000	50000
Total Dissolved Solids	1020	N	50	16	40	150	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	110	120	90	1100	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	80

Leachate Test Information	
Leachant volume 1st extract/l	0.000
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.084

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-44359								
Chemtest Sample ID:	1548439								
Sample Ref:	8								
Sample ID:	#6084432669940008						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-TP112								
Top Depth(m):	0.90								
Bottom Depth(m):	1.00								
Sampling Date:	15-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			39	3	5	6
Loss On Ignition	2610	M	%			17	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	M				7.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0006	0.0004	0.0011	0.0038	0.5	2	25
Barium	1455	U	0.040	0.011	0.079	0.15	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0018	0.0024	0.0036	0.023	0.5	10	30
Nickel	1455	U	0.0007	< 0.0005	0.0014	0.0010	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0006	< 0.0005	0.0012	0.0008	0.06	0.7	5
Selenium	1455	U	0.0013	< 0.0005	0.0026	0.0018	0.1	0.5	7
Zinc	1455	U	0.003	< 0.003	0.007	0.005	4	50	200
Chloride	1220	U	1.8	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.35	0.16	< 1.0	1.9	10	150	500
Sulphate	1220	U	19	3.4	38	56	1000	20000	50000
Total Dissolved Solids	1020	N	130	49	270	610	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	6.3	6.3	< 50	63	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	12

Leachate Test Information	
Leachant volume 1st extract/l	0.327
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.249

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

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I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

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The results relate only to the items tested
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None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-44618-2		
Initial Date of Issue:	12-Dec-2022	**Date of Re-Issue:**	12-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	21-Nov-2022
Order No.:	2001	**Date Instructed:**	23-Nov-2022
No. of Samples:	1		
Turnaround (Wkdays):	10	**Results Due:**	06-Dec-2022
Date Approved:	12-Dec-2022		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-44618
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1549475
Order No.: 2001				Client Sample Ref.:		1
				Client Sample ID.:		#74451491969 70001
				Sample Location:		S1-BH108
				Sample Type:		SOIL
				Top Depth (m):		0.30
				Bottom Depth (m):		0.40
				Date Sampled:		17-Nov-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	8.3
Sulphate	U	1220	10:1	mg/l	1.0	15
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.44
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	1.7
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	0.63
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	1.3
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-44618
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1549475
Order No.: 2001			Client Sample Ref.:		1
			Client Sample ID.:		#74451491969 70001
			Sample Location:		S1-BH108
			Sample Type:		SOIL
			Top Depth (m):		0.30
			Bottom Depth (m):		0.40
			Date Sampled:		17-Nov-2022
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	8.2
pH	U	2010		4.0	8.3
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.71
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	73
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	5.8
Cadmium	U	2455	mg/kg	0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	7.0
Copper	U	2455	mg/kg	0.50	29
Mercury	U	2455	mg/kg	0.05	0.06
Nickel	U	2455	mg/kg	0.50	15
Lead	U	2455	mg/kg	0.50	9.1
Selenium	U	2455	mg/kg	0.25	0.97
Vanadium	U	2455	mg/kg	0.5	3.0
Zinc	U	2455	mg/kg	0.50	28
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	U	2625	%	0.40	100
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-44618
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1549475
Order No.: 2001			Client Sample Ref.:		1
			Client Sample ID.:		#74451491969 70001
			Sample Location:		S1-BH108
			Sample Type:		SOIL
			Top Depth (m):		0.30
			Bottom Depth (m):		0.40
			Date Sampled:		17-Nov-2022
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	U	2760	µg/kg	1.0	6.5
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	1.7
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	1.7
Phenanthrene	U	2800	mg/kg	0.10	7.4
Anthracene	U	2800	mg/kg	0.10	0.24
Fluoranthene	U	2800	mg/kg	0.10	1.2
Pyrene	U	2800	mg/kg	0.10	1.3
Benzo[a]anthracene	U	2800	mg/kg	0.10	0.90
Chrysene	U	2800	mg/kg	0.10	1.9
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	1.3
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	0.28
Benzo[a]pyrene	U	2800	mg/kg	0.10	0.66
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	0.38
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.23
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	0.59
Total Of 16 PAH's	N	2800	mg/kg	2.0	20
Total Phenols	U	2920	mg/kg	0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-44869-1		
Initial Date of Issue:	12-Dec-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	22-Nov-2022
Order No.:		**Date Instructed:**	23-Nov-2022
No. of Samples:	1		
Turnaround (Wkdays):	10	**Results Due:**	06-Dec-2022
Date Approved:	12-Dec-2022		
Approved By:			



Details:	Stuart Henderson, Technical Manager

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-44869
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1550346
Order No.:				Client Sample Ref.:		102
				Sample Location:		S1-BH110
				Sample Type:		SOIL
				Top Depth (m):		1.80
				Bottom Depth (m):		1.90
				Date Sampled:		18-Nov-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	8.3
Sulphate	U	1220	10:1	mg/l	1.0	6.6
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	< 0.20
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-44869
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1550346
Order No.:			Client Sample Ref.:		102
			Sample Location:		S1-BH110
			Sample Type:		SOIL
			Top Depth (m):		1.80
			Bottom Depth (m):		1.90
			Date Sampled:		18-Nov-2022
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	1.1
pH	U	2010		4.0	8.3
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.87
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	17
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	4.9
Cadmium	U	2455	mg/kg	0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	2.2
Copper	U	2455	mg/kg	0.50	77
Mercury	U	2455	mg/kg	0.05	0.09
Nickel	U	2455	mg/kg	0.50	16
Lead	U	2455	mg/kg	0.50	36
Selenium	U	2455	mg/kg	0.25	1.7
Vanadium	U	2455	mg/kg	0.5	4.7
Zinc	U	2455	mg/kg	0.50	40
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	U	2625	%	0.40	33
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-44869
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1550346
Order No.:			Client Sample Ref.:		102
			Sample Location:		S1-BH110
			Sample Type:		SOIL
			Top Depth (m):		1.80
			Bottom Depth (m):		1.90
			Date Sampled:		18-Nov-2022
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.13
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	0.12
Anthracene	U	2800	mg/kg	0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
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I/S	Insufficient Sample
U/S	Unsuitable Sample
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<	"less than"
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SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-45031-1
Initial Date of Issue:	02-Dec-2022
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt
Project	G22069 Global Centre of Rail Excellence
Quotation No.:	Q22-28967
Order No.:	2001
No. of Samples:	1
Turnaround (Wkdays):	7
Date Approved:	02-Dec-2022
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	23-Nov-2022
Date Instructed:	23-Nov-2022
Results Due:	01-Dec-2022

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-45031								
Chemtest Sample ID:	1551055								
Sample Ref:	102								
Sample ID:	#5930538818200010						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH110								
Top Depth(m):	1.80								
Bottom Depth(m):	1.90								
Sampling Date:	18-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			25	3	5	6
Loss On Ignition	2610	M	%			11	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	M				7.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.012	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0003	0.0003	0.0005	0.0032	0.5	2	25
Barium	1455	U	0.031	0.012	0.063	0.15	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0010	< 0.0005	0.0020	0.0015	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0003	0.0002	0.0005	0.0024	0.5	10	30
Nickel	1455	U	0.0007	< 0.0005	0.0015	0.0011	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0013	0.0007	0.0026	0.0080	0.1	0.5	7
Zinc	1455	U	0.003	0.003	0.007	0.028	4	50	200
Chloride	1220	U	1.4	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.36	0.11	< 1.0	1.5	10	150	500
Sulphate	1220	U	11	2.0	22	33	1000	20000	50000
Total Dissolved Solids	1020	N	76	47	150	510	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	3.9	2.6	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	1.8

Leachate Test Information	
Leachant volume 1st extract/l	0.347
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.258

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

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eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-45069-2		
Initial Date of Issue:	04-Dec-2022	**Date of Re-Issue:**	05-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	**Date Received:**	23-Nov-2022
Order No.:	2001	**Date Instructed:**	23-Nov-2022
No. of Samples:	1		
Turnaround (Wkdays):	7	**Results Due:**	01-Dec-2022
Date Approved:	04-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-45069								
Chemtest Sample ID:	1551201								
Sample Ref:	1								
Sample ID:	#7445149196970001						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH108								
Top Depth(m):	0.30								
Bottom Depth(m):	0.40								
Sampling Date:	17-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			76	3	5	6
Loss On Ignition	2610	M	%			31	--	--	10
Total BTEX	2760	M	mg/kg			0.013	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			90	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			66	100	--	--
pH	2010	M				8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0008	0.0006	0.0015	0.0063	0.5	2	25
Barium	1455	U	0.053	0.058	0.10	0.57	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0022	0.0020	0.0043	0.0028	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.012	0.0052	0.024	0.061	0.5	10	30
Nickel	1455	U	0.0011	0.0005	0.0022	0.0059	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0016	0.0009	0.0033	0.010	0.06	0.7	5
Selenium	1455	U	0.0040	0.0027	0.0079	0.029	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	1.0	0.33	2.0	4.2	10	150	500
Sulphate	1220	U	76	18	150	260	1000	20000	50000
Total Dissolved Solids	1020	N	220	90	430	1100	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	5.7	7.1	< 50	69	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	7.0

Leachate Test Information	
Leachant volume 1st extract/l	0.337
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.229

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
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Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-45196-2		
Initial Date of Issue:	12-Dec-2022	**Date of Re-Issue:**	13-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	24-Nov-2022
Order No.:	2001	**Date Instructed:**	25-Nov-2022
No. of Samples:	1		
Turnaround (Wkdays):	10	**Results Due:**	08-Dec-2022
Date Approved:	12-Dec-2022		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-45196
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1551813
Order No.: 2001			Client Sample Ref.:		102
			Client Sample ID.:		#05274161605 70002
			Sample Location:		S1-BH113
			Sample Type:		SOIL
			Top Depth (m):		0.50
			Bottom Depth (m):		0.60
			Date Sampled:		21-Nov-2022
			Asbestos Lab:		NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	10
pH	U	2010		4.0	7.6
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	140
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	6.8
Cadmium	U	2455	mg/kg	0.10	0.11
Chromium	U	2455	mg/kg	0.5	4.5
Copper	U	2455	mg/kg	0.50	33
Mercury	U	2455	mg/kg	0.05	0.07
Nickel	U	2455	mg/kg	0.50	38
Lead	U	2455	mg/kg	0.50	20
Selenium	U	2455	mg/kg	0.25	1.2
Vanadium	U	2455	mg/kg	0.5	5.2
Zinc	U	2455	mg/kg	0.50	66
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	U	2625	%	0.40	32
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-45196
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1551813
Order No.: 2001			Client Sample Ref.:		102
			Client Sample ID.:		#05274161605 70002
			Sample Location:		S1-BH113
			Sample Type:		SOIL
			Top Depth (m):		0.50
			Bottom Depth (m):		0.60
			Date Sampled:		21-Nov-2022
			Asbestos Lab:		NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.39
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

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Eurofins Chemtest Ltd
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Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-45200-1		
Initial Date of Issue:	12-Dec-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	24-Nov-2022
Order No.:		**Date Instructed:**	25-Nov-2022
No. of Samples:	2		
Turnaround (Wkdays):	10	**Results Due:**	08-Dec-2022
Date Approved:	12-Dec-2022		
Approved By:			



Details:	Stuart Henderson, Technical Manager

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-45200
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1551821
Order No.:				Client Sample Ref.:		103
				Sample Location:		S1-BH103
				Sample Type:		SOIL
				Top Depth (m):		1.00
				Bottom Depth (m):		1.10
				Date Sampled:		22-Nov-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	7.9
Sulphate	U	1220	10:1	mg/l	1.0	36
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.74
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	4.5
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	1.4
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-45200	22-45200
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1551819	1551821
Order No.:			Client Sample Ref.:		101	103
			Sample Location:		S1-BH103	S1-BH103
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.30	1.00
			Bottom Depth (m):		0.40	1.10
			Date Sampled:		22-Nov-2022	22-Nov-2022
			Asbestos Lab:		NEW-ASB	NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	9.4	10
pH	U	2010		4.0	8.1	8.3
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	0.42
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	72	240
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	16	11
Cadmium	U	2455	mg/kg	0.10	2.3	0.23
Chromium	U	2455	mg/kg	0.5	8.0	17
Copper	U	2455	mg/kg	0.50	57	40
Mercury	U	2455	mg/kg	0.05	0.59	0.14
Nickel	U	2455	mg/kg	0.50	38	37
Lead	U	2455	mg/kg	0.50	46	150
Selenium	U	2455	mg/kg	0.25	2.0	9.0
Vanadium	U	2455	mg/kg	0.5	9.9	14
Zinc	U	2455	mg/kg	0.50	420	130
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	65	78
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-45200	22-45200
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1551819	1551821
Order No.:			Client Sample Ref.:		101	103
			Sample Location:		S1-BH103	S1-BH103
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.30	1.00
			Bottom Depth (m):		0.40	1.10
			Date Sampled:		22-Nov-2022	22-Nov-2022
			Asbestos Lab:		NEW-ASB	NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	1.1	1.3
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	0.45	< 0.10
Fluorene	U	2800	mg/kg	0.10	0.28	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	1.0	1.0
Anthracene	U	2800	mg/kg	0.10	0.30	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	0.92	0.48
Pyrene	U	2800	mg/kg	0.10	0.67	0.38
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	4.7	3.2
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-45200								
Chemtest Sample ID:	1551819								
Sample Ref:	101						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:									
Sample Location:	S1-BH103								
Top Depth(m):	0.30								
Bottom Depth(m):	0.40								
Sampling Date:	22-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	U	%			38	3	5	6
Loss On Ignition	2610	U	%			2.0	--	--	10
Total BTEX	2760	U	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			4.9	100	--	--
pH	2010	U				8.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.015	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0007	0.0004	0.0014	0.0044	0.5	2	25
Barium	1455	U	0.029	0.031	0.057	0.31	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0005	< 0.0005	0.0010	0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0023	0.0025	0.0046	0.025	0.5	10	30
Nickel	1455	U	0.0006	< 0.0005	0.0013	0.0007	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0008	< 0.0005	0.0015	0.0008	0.06	0.7	5
Selenium	1455	U	0.0057	0.0018	0.011	0.022	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200
Chloride	1220	U	6.7	1.0	13	16	800	15000	25000
Fluoride	1220	U	0.50	0.29	< 1.0	3.1	10	150	500
Sulphate	1220	U	240	35	470	560	1000	20000	50000
Total Dissolved Solids	1020	N	470	130	930	1700	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	3.7	2.6	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	9.4

Leachate Test Information	
Leachant volume 1st extract/l	0.332
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.182

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

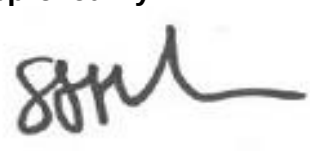
If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-45716-1
Initial Date of Issue:	04-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 Global Centre of Rail Excellence (GCRE)
Quotation No.:	Q22-28967
Order No.:	
No. of Samples:	7
Turnaround (Wkdays):	5
Date Approved:	04-Jan-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	28-Nov-2022
Date Instructed:	05-Dec-2022
Results Due:	09-Dec-2022



Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-45716
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1554036
Order No.:				Client Sample Ref.:		107
				Sample Location:		S1-BH103
				Sample Type:		SOIL
				Top Depth (m):		2.20
				Bottom Depth (m):		2.40
				Date Sampled:		24-Nov-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	8.3
Sulphate	U	1220	10:1	mg/l	1.0	35
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.46
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	3.7
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**	22-45716	22-45716	22-45716	22-45716	22-45716	22-45716	22-45716
Quotation No.: Q22-28967				**Chemtest Sample ID.:**	1554036	1554040	1554041	1554043	1554045	1554049	1554053
Order No.:				Client Sample Ref.:	107	116	2	9	1	11	4
				Sample Location:	S1-BH103	S1-BH103	S1-TP104	S1-TP104	S1-TP103	S1-TP103	S1-TP101
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	2.20	7.00	0.20	0.90	0.20	2.00	0.50
				Bottom Depth (m):	2.40	7.20	0.30	1.00	0.30	2.10	0.60
				Date Sampled:	24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022
				Asbestos Lab:	DURHAM		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
ACM Type	U	2192		N/A	-		-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	2.9	64	8.7	15	13	35	6.7
pH	U	2010		4.0	8.2	5.6	7.1	6.8	7.1	6.5	6.9
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.48	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	0.58
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	7.6	< 0.5	5.3	45	7.9	63	8.0
Cadmium	U	2455	mg/kg	0.10	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.48	< 0.10
Chromium	U	2455	mg/kg	0.5	5.7	0.7	8.7	4.5	14	3.9	7.5
Copper	U	2455	mg/kg	0.50	37	2.3	35	18	27	39	48
Mercury	U	2455	mg/kg	0.05	0.07	< 0.05	< 0.05	0.06	< 0.05	0.07	0.20
Nickel	U	2455	mg/kg	0.50	34	2.0	37	14	26	5.4	23
Lead	U	2455	mg/kg	0.50	20	0.96	19	18	22	100	24
Selenium	U	2455	mg/kg	0.25	1.5	0.38	0.90	2.0	0.89	1.7	1.8
Vanadium	U	2455	mg/kg	0.5	6.1	0.7	9.0	5.9	13	4.9	7.2
Zinc	U	2455	mg/kg	0.50	73	1.6	70	23	67	27	43
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	8.3	54	27	100	41	19	21
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	390	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	67	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	450	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	1100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services					**Chemtest Job No.:**	22-45716	22-45716	22-45716	22-45716	22-45716	22-45716	22-45716
Quotation No.: Q22-28967					**Chemtest Sample ID.:**	1554036	1554040	1554041	1554043	1554045	1554049	1554053
Order No.:					Client Sample Ref.:	107	116	2	9	1	11	4
					Sample Location:	S1-BH103	S1-BH103	S1-TP104	S1-TP104	S1-TP103	S1-TP103	S1-TP101
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	2.20	7.00	0.20	0.90	0.20	2.00	0.50
					Bottom Depth (m):	2.40	7.20	0.30	1.00	0.30	2.10	0.60
					Date Sampled:	24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022
					Asbestos Lab:	DURHAM		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0		1100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0		1500	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10		< 0.10	0.19	0.16	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-45716								
Chemtest Sample ID:	1554043								
Sample Ref:	9								
Sample ID:							**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-TP104								
Top Depth(m):	0.90								
Bottom Depth(m):	1.00								
Sampling Date:	24-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	U	%			66	3	5	6
Loss On Ignition	2610	U	%			2.6	--	--	10
Total BTEX	2760	U	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	U				6.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0014	0.0010	0.0028	0.010	0.5	2	25
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.5	10	30
Nickel	1455	U	0.0012	0.0007	0.0024	0.0072	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0008	< 0.0005	0.0015	0.0010	0.06	0.7	5
Selenium	1455	U	0.0008	0.0006	0.0015	0.0060	0.1	0.5	7
Zinc	1455	U	0.004	< 0.003	0.008	0.005	4	50	200
Chloride	1220	U	3.6	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.15	0.11	< 1.0	1.1	10	150	500
Sulphate	1220	U	4.9	1.1	< 10	16	1000	20000	50000
Total Dissolved Solids	1020	N	36	15	72	180	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	3.2	5.7	< 50	54	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	15

Leachate Test Information	
Leachant volume 1st extract/l	0.319
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.223

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-45716								
Chemtest Sample ID:	1554045								
Sample Ref:	1								
Sample ID:									
Sample Location:	S1-TP103								
Top Depth(m):	0.20								
Bottom Depth(m):	0.30								
Sampling Date:	24-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%			24	3	5	6
Loss On Ignition	2610	U	%			7.3	--	--	10
Total BTEX	2760	U	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	U				7.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0051	0.0022	0.010	0.023	0.5	2	25
Barium	1455	U	0.007	< 0.005	0.014	0.0034	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0026	0.0013	0.0051	0.014	0.5	10	70
Copper	1455	U	0.010	0.0050	0.020	0.0050	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0004	0.0002	0.0008	0.0021	0.5	10	30
Nickel	1455	U	0.0025	0.0014	0.0049	0.015	0.4	10	40
Lead	1455	U	0.0074	0.0033	0.015	0.035	0.5	10	50
Antimony	1455	U	0.0010	< 0.0005	0.0020	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0011	0.0007	0.0022	0.0070	0.1	0.5	7
Zinc	1455	U	0.015	0.007	0.030	0.072	4	50	200
Chloride	1220	U	2.1	1.9	< 10	19	800	15000	25000
Fluoride	1220	U	0.26	0.22	< 1.0	2.2	10	150	500
Sulphate	1220	U	2.1	< 1.0	< 10	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	36	17	70	180	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	12	19	< 50	190	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	13

Leachate Test Information	
Leachant volume 1st extract/l	0.323
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.087

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-45716								
Chemtest Sample ID:	1554053								
Sample Ref:	4								
Sample ID:									
Sample Location:	S1-TP101								
Top Depth(m):	0.50								
Bottom Depth(m):	0.60								
Sampling Date:	24-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%			12	3	5	6
Loss On Ignition	2610	U	%			4.1	--	--	10
Total BTEX	2760	U	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	U				6.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0002	< 0.0002	0.0004	0.0002	0.5	2	25
Barium	1455	U	0.029	0.010	0.058	0.12	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0008	< 0.0005	0.0017	0.0009	0.06	0.7	5
Selenium	1455	U	0.0029	0.0008	0.0058	0.0098	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200
Chloride	1220	U	1.2	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.21	0.20	< 1.0	2.0	10	150	500
Sulphate	1220	U	14	2.1	28	34	1000	20000	50000
Total Dissolved Solids	1020	N	68	30	140	340	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	2.7	11	< 50	100	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	6.7

Leachate Test Information	
Leachant volume 1st extract/l	0.337
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.187

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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Key

U	UKAS accredited
M	MCERTS and UKAS accredited
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S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
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I/S	Insufficient Sample
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<	"less than"
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SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
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Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-45966-1
Initial Date of Issue:	06-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 GCRE
Quotation No.:	Q22-28967
Order No.:	2001
No. of Samples:	3
Turnaround (Wkdays):	5
Date Approved:	06-Jan-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	01-Dec-2022
Date Instructed:	05-Dec-2022
Results Due:	09-Dec-2022



Results - Leachate

Project: G22069_GCRE

Client: Jackson Geo Services				**Chemtest Job No.:**		22-45966
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1555239
Order No.: 2001				Client Sample Ref.:		1
				Sample Location:		S1-BH114
				Sample Type:		SOIL
				Top Depth (m):		0.20
				Bottom Depth (m):		0.30
				Date Sampled:		25-Nov-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	7.7
Sulphate	U	1220	10:1	mg/l	1.0	< 1.0
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.41
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	1.4
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069_GCRE

Client: Jackson Geo Services			**Chemtest Job No.:**		22-45966	22-45966	22-45966
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1555239	1555241	1555242
Order No.: 2001			Client Sample Ref.:		1	2	6
			Sample Location:		S1-BH114	S1-TP106	S1-TP106
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.20	0.20	0.50
			Bottom Depth (m):		0.30	0.30	0.60
			Date Sampled:		25-Nov-2022	28-Nov-2022	28-Nov-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	13	10	13
pH	U	2010		4.0	8.2	7.9	6.9
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	< 10	< 10	66
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	17	7.3	12
Cadmium	U	2455	mg/kg	0.10	0.71	< 0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	13	8.9	14
Copper	U	2455	mg/kg	0.50	130	64	22
Mercury	U	2455	mg/kg	0.05	0.10	0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	27	30	22
Lead	U	2455	mg/kg	0.50	67	26	29
Selenium	U	2455	mg/kg	0.25	1.7	0.99	0.71
Vanadium	U	2455	mg/kg	0.5	24	9.4	14
Zinc	U	2455	mg/kg	0.50	96	71	57
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	50	30	3.3
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069_GCRE

Client: Jackson Geo Services			**Chemtest Job No.:**		22-45966	22-45966	22-45966
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1555239	1555241	1555242
Order No.: 2001			Client Sample Ref.:		1	2	6
			Sample Location:		S1-BH114	S1-TP106	S1-TP106
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.20	0.20	0.50
			Bottom Depth (m):		0.30	0.30	0.60
			Date Sampled:		25-Nov-2022	28-Nov-2022	28-Nov-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	1.0	< 0.10	0.12
Acenaphthylene	N	2800	mg/kg	0.10	0.15	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	0.18	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	2.1	< 0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	0.55	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	3.3	< 0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	2.7	< 0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	1.3	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	2.0	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	2.9	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	0.70	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	1.0	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	0.80	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	0.76	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	19	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: G22069_GCRE

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-45966								
Chemtest Sample ID:	1555242								
Sample Ref:	6						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:									
Sample Location:	S1-TP106								
Top Depth(m):	0.50								
Bottom Depth(m):	0.60								
Sampling Date:	28-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	U	%			1.9	3	5	6
Loss On Ignition	2610	U	%			0.72	--	--	10
Total BTEX	2760	U	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	U				6.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.012	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0005	0.0009	0.0011	0.0088	0.5	2	25
Barium	1455	U	0.005	< 0.005	0.010	0.0025	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0009	0.0015	0.0019	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	0.0007	< 0.0005	0.0063	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.099	0.097	< 1.0	< 1.0	10	150	500
Sulphate	1220	U	16	6.6	32	70	1000	20000	50000
Total Dissolved Solids	1020	N	54	19	110	210	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	8.3	17	< 50	170	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	13

Leachate Test Information	
Leachant volume 1st extract/l	0.324
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.085

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
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2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
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customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-45971-1
Initial Date of Issue:	09-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 GCRE
Quotation No.:	Q22-28967
Order No.:	2001
No. of Samples:	4
Turnaround (Wkdays):	5
Date Approved:	09-Jan-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	01-Dec-2022
Date Instructed:	06-Dec-2022
Results Due:	12-Dec-2022



Results - Soil

Project: G22069_GCRE

Client: Jackson Geo Services			**Chemtest Job No.:**		22-45971	22-45971	22-45971	22-45971
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1555261	1555263	1555264	1555266
Order No.: 2001			Client Sample Ref.:		2	8	2	8
			Sample Location:		S1-TP110	S1-TP110	S1-TP102	S1-TP102
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.10	0.90	0.20	0.90
			Bottom Depth (m):		0.15	1.00	0.30	1.00
			Date Sampled:		29-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
ACM Type	U	2192		N/A	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	40	24	11	30
pH	U	2010		4.0	5.9	5.8	6.9	6.5
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.63	< 0.40	< 0.40	0.42
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	< 10	< 10	< 10	< 10
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	260	7.5	11	8.1
Cadmium	U	2455	mg/kg	0.10	0.17	< 0.10	0.20	< 0.10
Chromium	U	2455	mg/kg	0.5	10	15	17	17
Copper	U	2455	mg/kg	0.50	51	16	38	15
Mercury	U	2455	mg/kg	0.05	0.10	< 0.05	0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	7.0	13	39	7.0
Lead	U	2455	mg/kg	0.50	150	16	28	16
Selenium	U	2455	mg/kg	0.25	1.5	0.71	1.5	1.2
Vanadium	U	2455	mg/kg	0.5	21	16	21	19
Zinc	U	2455	mg/kg	0.50	33	31	110	29
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	11	2.7	27	3.8
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069_GCRE

Client: Jackson Geo Services			**Chemtest Job No.:**		22-45971	22-45971	22-45971	22-45971
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1555261	1555263	1555264	1555266
Order No.: 2001			Client Sample Ref.:		2	8	2	8
			Sample Location:		S1-TP110	S1-TP110	S1-TP102	S1-TP102
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.10	0.90	0.20	0.90
			Bottom Depth (m):		0.15	1.00	0.30	1.00
			Date Sampled:		29-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.13	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.29	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	0.10	< 0.10	0.42	< 0.10
Pyrene	U	2800	mg/kg	0.10	0.11	< 0.10	0.35	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: G22069_GCRE

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-45971								
Chemtest Sample ID:	1555263								
Sample Ref:	8								
Sample ID:									
Sample Location:	S1-TP110								
Top Depth(m):	0.90								
Bottom Depth(m):	1.00								
Sampling Date:	29-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%			1.6	3	5	6
Loss On Ignition	2610	U	%			5.5	--	--	10
Total BTEX	2760	U	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	U				5.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0020	0.0029	0.0039	0.029	0.5	2	25
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0012	0.0019	0.0023	0.019	0.5	10	70
Copper	1455	U	0.0028	0.0034	0.0054	0.0009	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	< 0.0002	0.0003	< 0.0002	0.0031	0.5	10	30
Nickel	1455	U	< 0.0005	0.0005	< 0.0005	0.0052	0.4	10	40
Lead	1455	U	0.0009	0.0014	0.0017	0.014	0.5	10	50
Antimony	1455	U	0.0009	< 0.0005	0.0017	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	0.0005	< 0.0005	0.0052	0.1	0.5	7
Zinc	1455	U	< 0.003	0.007	< 0.003	0.067	4	50	200
Chloride	1220	U	1.3	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.085	0.082	< 1.0	< 1.0	10	150	500
Sulphate	1220	U	1.0	< 1.0	< 10	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	19	6.0	37	64	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	11	21	< 50	210	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	24

Leachate Test Information	
Leachant volume 1st extract/l	0.293
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.059

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069_GCRE

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-45971								
Chemtest Sample ID:	1555266								
Sample Ref:	8								
Sample ID:							**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-TP102								
Top Depth(m):	0.90								
Bottom Depth(m):	1.00								
Sampling Date:	29-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	U	%			2.2	3	5	6
Loss On Ignition	2610	U	%			6.8	--	--	10
Total BTEX	2760	U	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	U				6.5	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0067	0.011	0.013	0.11	0.5	2	25
Barium	1455	U	< 0.005	0.006	< 0.0005	0.055	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0053	0.010	0.010	0.099	0.5	10	70
Copper	1455	U	0.0092	0.014	0.017	0.0026	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0004	0.0007	0.0008	0.0072	0.5	10	30
Nickel	1455	U	0.0011	0.0019	0.0020	0.019	0.4	10	40
Lead	1455	U	0.0042	0.0079	0.0079	0.077	0.5	10	50
Antimony	1455	U	0.0011	0.0008	0.0021	0.0076	0.06	0.7	5
Selenium	1455	U	0.0013	0.0014	0.0024	0.014	0.1	0.5	7
Zinc	1455	U	0.018	0.022	0.034	0.21	4	50	200
Chloride	1220	U	3.2	12	< 10	120	800	15000	25000
Fluoride	1220	U	0.12	0.42	< 1.0	4.1	10	150	500
Sulphate	1220	U	1.3	23	< 10	220	1000	20000	50000
Total Dissolved Solids	1020	N	43	29	81	290	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	21	6.2	< 50	65	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	30

Leachate Test Information	
Leachant volume 1st extract/l	0.274
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.049

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)

Test Methods

SOP	Title	Parameters included	Method summary
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-45973-2		
Initial Date of Issue:	11-Jan-2023	**Date of Re-Issue:**	12-Jan-2023
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 GCRE		
Quotation No.:	Q22-28967	**Date Received:**	01-Dec-2022
Order No.:	2001	**Date Instructed:**	06-Dec-2022
No. of Samples:	6		
Turnaround (Wkdays):	5	**Results Due:**	12-Dec-2022
Date Approved:	12-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 GCRE

Client: Jackson Geo Services				**Chemtest Job No.:**		22-45973
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1555283
Order No.: 2001				Client Sample Ref.:		101
				Sample Location:		S1-BH114
				Sample Type:		SOIL
				Top Depth (m):		0.70
				Bottom Depth (m):		1.00
				Date Sampled:		29-Nov-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	8.6
Sulphate	U	1220	10:1	mg/l	1.0	3.6
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	1.5
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	0.54
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	1.5
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	0.72
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	0.52
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	0.97
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 GCRE

Client: Jackson Geo Services			**Chemtest Job No.:**		22-45973	22-45973	22-45973	22-45973	22-45973	22-45973
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1555278	1555280	1555283	1555284	1555285	1555286
Order No.: 2001			Client Sample Ref.:		3	9	101	103	2	4
			Sample Location:		S1-TP109	S1-TP109	S1-BH114	S1-BH114	S1-TP105	S1-TP105
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.20	1.00	0.70	1.70	0.20	0.50
			Bottom Depth (m):		0.30	1.10	1.00	1.90	0.30	0.60
			Date Sampled:		28-Nov-2022	28-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
ACM Type	U	2192		N/A	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	9.9	7.3	13	24	12	7.1
pH	M	2010		4.0	7.2	7.8	7.7	6.7	6.9	6.9
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	< 0.40	0.41	0.56	0.48	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	M	2120	mg/l	10.000	< 10	< 10	< 10	< 10	< 10	12
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	M	2455	mg/kg	0.5	7.1	9.1	13	9.6	18	10
Cadmium	M	2455	mg/kg	0.10	< 0.10	0.50	< 0.10	< 0.10	< 0.10	< 0.10
Chromium	M	2455	mg/kg	0.5	15	13	5.4	9.8	14	16
Copper	M	2455	mg/kg	0.50	33	46	58	7.1	25	50
Mercury	M	2455	mg/kg	0.05	< 0.05	0.09	0.11	< 0.05	0.08	< 0.05
Nickel	M	2455	mg/kg	0.50	29	41	17	7.9	21	26
Lead	M	2455	mg/kg	0.50	21	31	23	13	28	16
Selenium	M	2455	mg/kg	0.25	0.85	0.89	1.1	0.40	1.0	0.90
Vanadium	U	2455	mg/kg	0.5	13	13	9.5	18	15	13
Zinc	M	2455	mg/kg	0.50	71	200	31	14	61	57
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	15	22	30	2.0	16	2.4
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 GCRE

Client: Jackson Geo Services			**Chemtest Job No.:**		22-45973	22-45973	22-45973	22-45973	22-45973	22-45973
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1555278	1555280	1555283	1555284	1555285	1555286
Order No.: 2001			Client Sample Ref.:		3	9	101	103	2	4
			Sample Location:		S1-TP109	S1-TP109	S1-BH114	S1-BH114	S1-TP105	S1-TP105
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.20	1.00	0.70	1.70	0.20	0.50
			Bottom Depth (m):		0.30	1.10	1.00	1.90	0.30	0.60
			Date Sampled:		28-Nov-2022	28-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	M	2800	mg/kg	0.10	0.19	0.24	0.45	< 0.10	0.13	0.16
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	0.42	0.10	0.29	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10	0.51	0.11	0.34	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	< 0.10	4.3	0.69	2.2	0.27	0.25
Anthracene	M	2800	mg/kg	0.10	< 0.10	1.7	0.24	0.93	0.11	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	< 0.10	8.2	0.60	3.8	0.29	0.30
Pyrene	M	2800	mg/kg	0.10	< 0.10	6.5	0.42	3.0	0.23	0.20
Benzo[a]anthracene	M	2800	mg/kg	0.10	< 0.10	3.0	0.24	1.4	< 0.10	< 0.10
Chrysene	M	2800	mg/kg	0.10	< 0.10	2.5	0.29	1.1	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	< 0.10	3.7	0.40	1.7	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10	1.3	< 0.10	0.62	< 0.10	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	< 0.10	3.1	0.26	1.3	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	< 0.10	2.1	0.24	0.98	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	0.27	< 0.10	0.14	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	< 0.10	2.1	0.10	0.89	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	40	4.1	19	< 2.0	< 2.0
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: G22069 GCRE

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-45973								
Chemtest Sample ID:	1555280								
Sample Ref:	9						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:									
Sample Location:	S1-TP109								
Top Depth(m):	1.00								
Bottom Depth(m):	1.10								
Sampling Date:	28-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			13	3	5	6
Loss On Ignition	2610	M	%			12	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			45	100	--	--
pH	2010	M				7.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0012	0.0008	0.0023	0.0084	0.5	2	25
Barium	1455	U	0.007	< 0.005	0.013	0.0020	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	0.0007	< 0.0005	0.0063	0.5	10	70
Copper	1455	U	0.0017	0.0021	0.0033	0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0005	0.0005	0.0010	0.0045	0.5	10	30
Nickel	1455	U	0.0012	0.0010	0.0024	0.0096	0.4	10	40
Lead	1455	U	< 0.0005	0.0006	< 0.0005	0.0058	0.5	10	50
Antimony	1455	U	0.0017	0.0010	0.0035	0.0099	0.06	0.7	5
Selenium	1455	U	0.0017	0.0007	0.0033	0.0069	0.1	0.5	7
Zinc	1455	U	0.004	0.007	0.008	0.067	4	50	200
Chloride	1220	U	2.1	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.19	0.13	< 1.0	1.3	10	150	500
Sulphate	1220	U	13	3.9	26	42	1000	20000	50000
Total Dissolved Solids	1020	N	53	30	110	300	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	47	7.8	94	90	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	7.3

Leachate Test Information	
Leachant volume 1st extract/l	0.336
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.053

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069 GCRE

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-45973								
Chemtest Sample ID:	1555284								
Sample Ref:	103								
Sample ID:							**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH114								
Top Depth(m):	1.70								
Bottom Depth(m):	1.90								
Sampling Date:	29-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			1.1	3	5	6
Loss On Ignition	2610	M	%			5.0	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			20	100	--	--
pH	2010	M				6.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0032	0.0031	0.0062	0.031	0.5	2	25
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0019	0.0020	0.0037	0.019	0.5	10	70
Copper	1455	U	0.0046	0.0042	0.0089	0.0066	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.5	10	30
Nickel	1455	U	0.0008	< 0.0005	0.0016	0.0012	0.4	10	40
Lead	1455	U	0.0014	0.0012	0.0026	0.013	0.5	10	50
Antimony	1455	U	0.0006	< 0.0005	0.0012	0.0009	0.06	0.7	5
Selenium	1455	U	0.0005	< 0.0005	0.0010	0.0007	0.1	0.5	7
Zinc	1455	U	0.005	0.008	0.010	0.078	4	50	200
Chloride	1220	U	2.2	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.11	0.11	< 1.0	1.1	10	150	500
Sulphate	1220	U	< 1.0	< 1.0	< 10	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	16	12	30	120	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	23	9.2	< 50	110	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	24

Leachate Test Information	
Leachant volume 1st extract/l	0.294
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.250

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069 GCRE

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-45973								
Chemtest Sample ID:	1555286								
Sample Ref:	4								
Sample ID:							**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-TP105								
Top Depth(m):	0.50								
Bottom Depth(m):	0.60								
Sampling Date:	29-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			1.4	3	5	6
Loss On Ignition	2610	M	%			4.3	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	M				6.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.0040	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0007	0.0006	0.0014	0.0063	0.5	2	25
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0008	< 0.0005	0.0016	0.0011	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0020	0.0015	0.0040	0.015	0.06	0.7	5
Selenium	1455	U	< 0.0005	0.0006	< 0.0005	0.0050	0.1	0.5	7
Zinc	1455	U	0.020	< 0.003	0.040	0.028	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.22	0.19	< 1.0	1.9	10	150	500
Sulphate	1220	U	8.3	1.7	17	26	1000	20000	50000
Total Dissolved Solids	1020	N	30	14	59	160	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	4.1	4.9	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	7.1

Leachate Test Information	
Leachant volume 1st extract/l	0.337
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.250

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-46262-1
Initial Date of Issue:	15-Dec-2022
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 GCRE
Quotation No.:	Q22-28967
Order No.:	2001
No. of Samples:	1
Turnaround (Wkdays):	5
Date Approved:	15-Dec-2022
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	02-Dec-2022
Date Instructed:	05-Dec-2022
Results Due:	09-Dec-2022

Results - Leachate

Project: G22069 GCRE

Client: Jackson Geo Services				**Chemtest Job No.:**		22-46262
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1556573
Order No.: 2001				Client Sample Ref.:		1
				Sample Location:		S1-BH105
				Sample Type:		SOIL
				Top Depth (m):		0.20
				Bottom Depth (m):		0.30
				Date Sampled:		30-Nov-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	7.3
Sulphate	U	1220	10:1	mg/l	1.0	32
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	1.0
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	3.5
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	1.2
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 GCRE

Client: Jackson Geo Services			**Chemtest Job No.:**		22-46262
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1556573
Order No.: 2001			Client Sample Ref.:		1
			Sample Location:		S1-BH105
			Sample Type:		SOIL
			Top Depth (m):		0.20
			Bottom Depth (m):		0.30
			Date Sampled:		30-Nov-2022
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	4.1
pH	U	2010		4.0	8.2
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	190
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	5.0
Cadmium	U	2455	mg/kg	0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	4.6
Copper	U	2455	mg/kg	0.50	30
Mercury	U	2455	mg/kg	0.05	0.05
Nickel	U	2455	mg/kg	0.50	18
Lead	U	2455	mg/kg	0.50	13
Selenium	U	2455	mg/kg	0.25	0.91
Vanadium	U	2455	mg/kg	0.5	6.5
Zinc	U	2455	mg/kg	0.50	29
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	U	2625	%	0.40	100
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: G22069 GCRE

Client: Jackson Geo Services			**Chemtest Job No.:**		22-46262
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1556573
Order No.: 2001			Client Sample Ref.:		1
			Sample Location:		S1-BH105
			Sample Type:		SOIL
			Top Depth (m):		0.20
			Bottom Depth (m):		0.30
			Date Sampled:		30-Nov-2022
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	U	2760	µg/kg	1.0	32
Toluene	U	2760	µg/kg	1.0	15
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.53
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	0.47
Anthracene	U	2800	mg/kg	0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
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T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
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Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-46488-2		
Initial Date of Issue:	08-Jan-2023	**Date of Re-Issue:**	09-Jan-2023
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	05-Dec-2022
Order No.:		**Date Instructed:**	09-Dec-2022
No. of Samples:	4		
Turnaround (Wkdays):	5	**Results Due:**	15-Dec-2022
Date Approved:	08-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-46488
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1557606
Order No.:				Client Sample Ref.:		104
				Sample Location:		S1-BH105
				Sample Type:		SOIL
				Top Depth (m):		4.70
				Bottom Depth (m):		4.90
				Date Sampled:		01-Dec-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	8.3
Sulphate	U	1220	10:1	mg/l	1.0	9.8
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.28
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	0.61
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	0.82
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	3.0
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-46488	22-46488	22-46488	22-46488
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1557603	1557604	1557606	1557608
Order No.:			Client Sample Ref.:		101	102	104	106
			Sample Location:		S1-BH105	S1-BH105	S1-BH105	S1-BH105
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.70	2.70	4.70	6.70
			Bottom Depth (m):		1.90	2.90	4.90	6.90
			Date Sampled:		01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
ACM Type	U	2192		N/A	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	14	16	17	17
pH	U	2010		4.0	8.1	8.5	8.2	8.3
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	< 0.40	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	130	120	90	26
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	4.9	6.7	7.4	1.7
Cadmium	U	2455	mg/kg	0.10	0.10	0.11	0.15	< 0.10
Chromium	U	2455	mg/kg	0.5	1.4	2.4	2.2	1.0
Copper	U	2455	mg/kg	0.50	35	40	46	28
Mercury	U	2455	mg/kg	0.05	0.26	0.32	0.39	0.36
Nickel	U	2455	mg/kg	0.50	8.1	11	13	4.3
Lead	U	2455	mg/kg	0.50	27	37	43	14
Selenium	U	2455	mg/kg	0.25	1.3	1.8	2.1	1.1
Vanadium	U	2455	mg/kg	0.5	2.9	4.2	5.1	2.3
Zinc	U	2455	mg/kg	0.50	22	30	37	19
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	100	95	86	100
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	26	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	26	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	6.8	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	12	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	11	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	2.1	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	12	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-46488	22-46488	22-46488	22-46488
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1557603	1557604	1557606	1557608
Order No.:			Client Sample Ref.:		101	102	104	106
			Sample Location:		S1-BH105	S1-BH105	S1-BH105	S1-BH105
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.70	2.70	4.70	6.70
			Bottom Depth (m):		1.90	2.90	4.90	6.90
			Date Sampled:		01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	43	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	69	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	2.6
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	2.4
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	1.6	2.8	3.9	0.55
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	0.24	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	0.30	0.49	0.55	0.29
Fluorene	U	2800	mg/kg	0.10	0.25	0.39	0.41	0.16
Phenanthrene	U	2800	mg/kg	0.10	1.1	1.2	1.2	0.45
Anthracene	U	2800	mg/kg	0.10	0.22	0.17	0.18	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	0.65	0.42	0.48	0.13
Pyrene	U	2800	mg/kg	0.10	0.47	0.34	0.36	0.15
Benzo[a]anthracene	U	2800	mg/kg	0.10	0.28	0.19	0.15	< 0.10
Chrysene	U	2800	mg/kg	0.10	0.41	0.28	0.34	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	0.53	0.40	0.34	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	5.8	6.7	8.2	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	1.4	0.48	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-46649-1
Initial Date of Issue:	19-Dec-2022
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt
Project	G22069 Global Rail Centre of Excellence
Quotation No.:	Q22-28967
Order No.:	2001
No. of Samples:	2
Turnaround (Wkdays):	5
Date Approved:	19-Dec-2022
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	06-Dec-2022
Date Instructed:	06-Dec-2022
Results Due:	12-Dec-2022

Results - Soil

Project: G22069 Global Rail Centre of Excellence

Client: Jackson Geo Services			**Chemtest Job No.:**		22-46649
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1558358
Order No.: 2001			Client Sample Ref.:		2
			Client Sample ID.:		#8693322673750002
			Sample Location:		S1-BH107
			Sample Type:		SOIL
			Top Depth (m):		0.30
			Bottom Depth (m):		0.40
			Date Sampled:		01-Dec-2022
			Time Sampled:		11:35
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	6.3
pH	U	2010		4.0	8.2
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	41
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	9.0
Cadmium	U	2455	mg/kg	0.10	0.20
Chromium	U	2455	mg/kg	0.5	4.1
Copper	U	2455	mg/kg	0.50	36
Mercury	U	2455	mg/kg	0.05	0.15
Nickel	U	2455	mg/kg	0.50	8.7
Lead	U	2455	mg/kg	0.50	35
Selenium	U	2455	mg/kg	0.25	2.3
Vanadium	U	2455	mg/kg	0.5	7.1
Zinc	U	2455	mg/kg	0.50	32
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	U	2625	%	0.40	75
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: G22069 Global Rail Centre of Excellence

Client: Jackson Geo Services			**Chemtest Job No.:**		22-46649
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1558358
Order No.: 2001			Client Sample Ref.:		2
			Client Sample ID.:		#8693322673750002
			Sample Location:		S1-BH107
			Sample Type:		SOIL
			Top Depth (m):		0.30
			Bottom Depth (m):		0.40
			Date Sampled:		01-Dec-2022
			Time Sampled:		11:35
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.20
Acenaphthylene	N	2800	mg/kg	0.10	0.14
Acenaphthene	U	2800	mg/kg	0.10	0.14
Fluorene	U	2800	mg/kg	0.10	0.55
Phenanthrene	U	2800	mg/kg	0.10	2.0
Anthracene	U	2800	mg/kg	0.10	1.8
Fluoranthene	U	2800	mg/kg	0.10	4.1
Pyrene	U	2800	mg/kg	0.10	4.1
Benzo[a]anthracene	U	2800	mg/kg	0.10	4.4
Chrysene	U	2800	mg/kg	0.10	4.5
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	5.0
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	4.7
Benzo[a]pyrene	U	2800	mg/kg	0.10	4.5
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	4.2
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	4.2
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	4.7
Total Of 16 PAH's	N	2800	mg/kg	2.0	49
Total Phenols	U	2920	mg/kg	0.10	< 0.10

Results - Water

Project: G22069 Global Rail Centre of Excellence

Client: Jackson Geo Services			**Chemtest Job No.:**		22-46649
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1558360
Order No.: 2001			Client Sample Ref.:		1
			Client Sample ID.:		#6054730734800001
			Sample Location:		SOP003.16
			Sample Type:		WATER
			Top Depth (m):		11.00
			Bottom Depth (m):		11.00
			Date Sampled:		29-Nov-2022
			Time Sampled:		10:30
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
pH	U	1010		N/A	7.2
Sulphate	U	1220	mg/l	1.0	200
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	mg/l	0.050	< 0.050
Calcium (Dissolved)	U	1455	mg/l	2.00	72
Total Hardness as CaCO3	U	1270	mg/l	15	290
Arsenic (Dissolved)	U	1455	µg/l	0.20	< 0.20
Boron (Dissolved)	U	1455	µg/l	10.0	520
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05
Manganese (Dissolved)	U	1455	µg/l	0.50	1400
Nickel (Dissolved)	U	1455	µg/l	0.50	4.9
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	0.82
Vanadium (Dissolved)	U	1455	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	17
Chromium (Hexavalent)	U	1490	µg/l	20	[B] < 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	< 2.0
Naphthalene	U	1800	µg/l	0.10	0.15
Acenaphthylene	U	1800	µg/l	0.10	< 0.10
Acenaphthene	U	1800	µg/l	0.10	< 0.10
Fluorene	U	1800	µg/l	0.10	< 0.10
Phenanthrene	U	1800	µg/l	0.10	< 0.10
Anthracene	U	1800	µg/l	0.10	< 0.10
Fluoranthene	U	1800	µg/l	0.10	< 0.10
Pyrene	U	1800	µg/l	0.10	< 0.10
Benzo[a]anthracene	U	1800	µg/l	0.10	< 0.10
Chrysene	U	1800	µg/l	0.10	< 0.10
Benzo[b]fluoranthene	U	1800	µg/l	0.10	< 0.10
Benzo[k]fluoranthene	U	1800	µg/l	0.10	< 0.10
Benzo[a]pyrene	U	1800	µg/l	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	µg/l	0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	µg/l	0.10	< 0.10

Results - Water

Project: G22069 Global Rail Centre of Excellence

Client: Jackson Geo Services			**Chemtest Job No.:**		22-46649
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1558360
Order No.: 2001			Client Sample Ref.:		1
			Client Sample ID.:		#6054730734800001
			Sample Location:		SOP003.16
			Sample Type:		WATER
			Top Depth (m):		11.00
			Bottom Depth (m):		11.00
			Date Sampled:		29-Nov-2022
			Time Sampled:		10:30
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Benzo[g,h,i]perylene	U	1800	µg/l	0.10	< 0.10
Total Of 16 PAH's	U	1800	µg/l	2.0	< 2.0
Total Phenols	U	1920	mg/l	0.030	< 0.030

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1558360	1	#6054730734800001	SOP003.16	29-Nov-2022	B	Coloured Winchester 1000ml
1558360	1	#6054730734800001	SOP003.16	29-Nov-2022	B	EPA Vial 40ml
1558360	1	#6054730734800001	SOP003.16	29-Nov-2022	B	Plastic Bottle 1000ml

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

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D - Broken Container
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Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-46652-4		
Initial Date of Issue:	15-Dec-2022	**Date of Re-Issue:**	16-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	**Date Received:**	05-Dec-2022
Order No.:	2001	**Date Instructed:**	06-Dec-2022
No. of Samples:	1		
Turnaround (Wkdays):	7	**Results Due:**	14-Dec-2022
Date Approved:	15-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-46652								
Chemtest Sample ID:	1558367								
Sample Ref:	2								
Sample ID:	#8693322673750002						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH107								
Top Depth(m):	0.30								
Bottom Depth(m):	0.40								
Sampling Date:	01-Dec-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			31	3	5	6
Loss On Ignition	2610	M	%			16	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	M				9.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0007	0.0005	0.0014	0.0053	0.5	2	25
Barium	1455	U	0.36	0.23	0.71	2.4	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0057	0.0006	0.011	0.0083	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.011	0.0037	0.022	0.048	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0017	0.0007	0.0033	0.0086	0.06	0.7	5
Selenium	1455	U	0.0009	0.0006	0.0019	0.0061	0.1	0.5	7
Zinc	1455	U	0.003	< 0.003	0.006	0.005	4	50	200
Chloride	1220	U	20	2.8	40	53	800	15000	25000
Fluoride	1220	U	0.20	0.17	< 1.0	1.7	10	150	500
Sulphate	1220	U	16	5.6	32	71	1000	20000	50000
Total Dissolved Solids	1020	N	260	100	510	1300	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	6.0	3.5	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	13

Leachate Test Information	
Leachant volume 1st extract/l	0.323
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.252

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-46681-2		
Initial Date of Issue:	16-Dec-2022	**Date of Re-Issue:**	16-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	**Date Received:**	06-Dec-2022
Order No.:	2001	**Date Instructed:**	06-Dec-2022
No. of Samples:	1		
Turnaround (Wkdays):	7	**Results Due:**	14-Dec-2022
Date Approved:	16-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-46681								
Chemtest Sample ID:	1558633								
Sample Ref:	107								
Sample ID:	#2147866353450018						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH103								
Top Depth(m):	2.20								
Bottom Depth(m):	2.40								
Sampling Date:	24-Nov-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			1.5	3	5	6
Loss On Ignition	2610	M	%			8.3	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	M				7.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0006	0.0003	0.0011	0.0031	0.5	2	25
Barium	1455	U	0.030	0.028	0.060	0.28	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0007	< 0.0005	0.0014	0.0006	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0044	0.0025	0.0088	0.027	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0009	< 0.0005	0.0017	0.0007	0.06	0.7	5
Selenium	1455	U	0.017	0.0031	0.034	0.043	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200
Chloride	1220	U	5.1	1.1	10	14	800	15000	25000
Fluoride	1220	U	0.44	0.27	< 1.0	2.8	10	150	500
Sulphate	1220	U	160	28	320	390	1000	20000	50000
Total Dissolved Solids	1020	N	390	120	790	1400	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	4.7	4.1	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	2.9

Leachate Test Information	
Leachant volume 1st extract/l	0.345
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.144

Waste Acceptance Criteria

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640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
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customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-46901-2		
Initial Date of Issue:	11-Jan-2023	**Date of Re-Issue:**	11-Jan-2023
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	07-Dec-2022
Order No.:	2001	**Date Instructed:**	13-Dec-2022
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	19-Dec-2022
Date Approved:	11-Jan-2023		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-46901
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1559734
Order No.: 2001				Client Sample Ref.:		101
				Sample Location:		S1-BH107
				Sample Type:		SOIL
				Top Depth (m):		1.0
				Bottom Depth (m):		1.1
				Date Sampled:		06-Dec-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	8.5
Sulphate	U	1220	10:1	mg/l	1.0	2.5
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	1.9
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	1.1
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	3.9
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	2.2
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	1.6
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	1.1
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	1.6
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	6.2
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-46901	22-46901	22-46901
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1559733	1559734	1559736
Order No.: 2001			Client Sample Ref.:		116	101	105
			Sample Location:		S1-BH105	S1-BH107	S1-BH107
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		9.6	1.0	5.0
			Bottom Depth (m):		9.7	1.1	5.1
			Date Sampled:		05-Dec-2022	06-Dec-2022	06-Dec-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	14	15	2.8
pH	U	2010		4.0	5.9	8.4	8.2
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.43	< 0.40	1.0
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	< 10	< 10	590
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	7.6	11	9.9
Cadmium	U	2455	mg/kg	0.10	< 0.10	0.19	0.15
Chromium	U	2455	mg/kg	0.5	14	8.6	33
Copper	U	2455	mg/kg	0.50	22	35	28
Mercury	U	2455	mg/kg	0.05	< 0.05	0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	23	25	37
Lead	U	2455	mg/kg	0.50	18	19	23
Selenium	U	2455	mg/kg	0.25	0.61	0.92	1.1
Vanadium	U	2455	mg/kg	0.5	12	12	41
Zinc	U	2455	mg/kg	0.50	62	76	77
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	10	9.7	7.9
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-46901	22-46901	22-46901
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1559733	1559734	1559736
Order No.: 2001			Client Sample Ref.:		116	101	105
			Sample Location:		S1-BH105	S1-BH107	S1-BH107
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		9.6	1.0	5.0
			Bottom Depth (m):		9.7	1.1	5.1
			Date Sampled:		05-Dec-2022	06-Dec-2022	06-Dec-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	2.5	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	0.28	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10	0.25	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10	0.18	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	2.5	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

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N	Unaccredited
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SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-47278-4		
Initial Date of Issue:	20-Dec-2022	**Date of Re-Issue:**	21-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	**Date Received:**	09-Dec-2022
Order No.:	2001	**Date Instructed:**	09-Dec-2022
No. of Samples:	1		
Turnaround (Wkdays):	7	**Results Due:**	19-Dec-2022
Date Approved:	20-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-47278								
Chemtest Sample ID:	1561595								
Sample Ref:	101								
Sample ID:	#3407941713650008						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH105								
Top Depth(m):	1.70								
Bottom Depth(m):	1.90								
Sampling Date:	01-Dec-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			62	3	5	6
Loss On Ignition	2610	M	%			19	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			140	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			6.5	100	--	--
pH	2010	M				8.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0007	0.0004	0.0014	0.0044	0.5	2	25
Barium	1455	U	0.024	0.023	0.046	0.23	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0012	0.0009	0.0024	0.0016	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0004	0.0003	0.0007	0.0029	0.5	10	30
Nickel	1455	U	0.0021	< 0.0005	0.0041	0.0028	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0013	0.0007	0.0025	0.0075	0.06	0.7	5
Selenium	1455	U	0.0090	0.0013	0.018	0.023	0.1	0.5	7
Zinc	1455	U	0.007	0.003	0.013	0.035	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.26	0.16	< 1.0	1.7	10	150	500
Sulphate	1220	U	110	15	210	270	1000	20000	50000
Total Dissolved Solids	1020	N	240	66	460	880	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	4.9	6.1	< 50	60	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	15

Leachate Test Information	
Leachant volume 1st extract/l	0.319
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.231

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

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U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

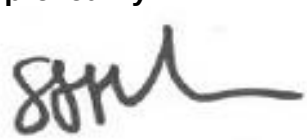
All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-47318-1
Initial Date of Issue:	04-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 Global Centre of Rail Excellent (GCRE)
Quotation No.:	Q22-28967
Date Received:	09-Dec-2022
Order No.:	
Date Instructed:	13-Dec-2022
No. of Samples:	1
Turnaround (Wkdays):	5
Results Due:	19-Dec-2022
Date Approved:	04-Jan-2023
Approved By:	



Details:	Stuart Henderson, Technical Manager

Results - Soil

Project: G22069 Global Centre of Rail Excellent (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-47318
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1561740
Order No.:			Client Sample Ref.:		105
			Sample Location:		S1-BH109
			Sample Type:		SOIL
			Top Depth (m):		3.70
			Bottom Depth (m):		3.90
			Date Sampled:		07-Dec-2022
			Asbestos Lab:		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	17
pH	M	2010		4.0	7.7
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	M	2120	mg/l	10.000	54
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50
Arsenic	M	2455	mg/kg	0.5	6.0
Cadmium	M	2455	mg/kg	0.10	0.16
Chromium	M	2455	mg/kg	0.5	1.7
Copper	M	2455	mg/kg	0.50	35
Mercury	M	2455	mg/kg	0.05	0.12
Nickel	M	2455	mg/kg	0.50	11
Lead	M	2455	mg/kg	0.50	53
Selenium	M	2455	mg/kg	0.25	2.0
Vanadium	U	2455	mg/kg	0.5	3.3
Zinc	M	2455	mg/kg	0.50	32
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	M	2625	%	0.40	82
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellent (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-47318
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1561740
Order No.:			Client Sample Ref.:		105
			Sample Location:		S1-BH109
			Sample Type:		SOIL
			Top Depth (m):		3.70
			Bottom Depth (m):		3.90
			Date Sampled:		07-Dec-2022
			Asbestos Lab:		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	M	2760	µg/kg	1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0
Naphthalene	M	2800	mg/kg	0.10	17
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	1.5
Fluorene	M	2800	mg/kg	0.10	0.91
Phenanthrene	M	2800	mg/kg	0.10	1.9
Anthracene	M	2800	mg/kg	0.10	0.50
Fluoranthene	M	2800	mg/kg	0.10	0.63
Pyrene	M	2800	mg/kg	0.10	0.46
Benzo[a]anthracene	M	2800	mg/kg	0.10	< 0.10
Chrysene	M	2800	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	0.53
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	23
Total Phenols	M	2920	mg/kg	0.10	0.63

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellent (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-47318								
Chemtest Sample ID:	1561740								
Sample Ref:	105						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:									
Sample Location:	S1-BH109								
Top Depth(m):	3.70								
Bottom Depth(m):	3.90								
Sampling Date:	07-Dec-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			48	3	5	6
Loss On Ignition	2610	M	%			33	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			110	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			28	100	--	--
pH	2010	M				7.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.0080	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0029	0.0014	0.0057	0.015	0.5	2	25
Barium	1455	U	0.044	0.022	0.087	0.24	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0006	0.0006	0.0012	0.0006	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0050	0.0015	0.0099	0.018	0.5	10	30
Nickel	1455	U	0.0025	0.0015	0.0049	0.016	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.015	0.0055	0.030	0.063	0.06	0.7	5
Selenium	1455	U	0.0096	0.0030	0.019	0.036	0.1	0.5	7
Zinc	1455	U	0.009	0.003	0.017	0.037	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.24	0.17	< 1.0	1.8	10	150	500
Sulphate	1220	U	21	5.6	41	70	1000	20000	50000
Total Dissolved Solids	1020	N	130	130	260	1300	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	6.9	2.6	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	17

Leachate Test Information	
Leachant volume 1st extract/l	0.313
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.158

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)

Test Methods

SOP	Title	Parameters included	Method summary
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

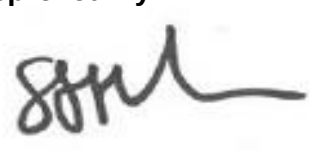
If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-47321-1
Initial Date of Issue:	03-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 Global Centre of Rail Excellence (GCRE)
Quotation No.:	Q22-28967
Order No.:	2001
No. of Samples:	2
Turnaround (Wkdays):	5
Date Approved:	03-Jan-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	09-Dec-2022
Date Instructed:	13-Dec-2022
Results Due:	19-Dec-2022



Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-47321
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1561750
Order No.: 2001				Client Sample Ref.:		1
				Sample Location:		S1-BH109
				Sample Type:		SOIL
				Top Depth (m):		0.20
				Bottom Depth (m):		0.30
				Date Sampled:		06-Dec-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	9.4
Sulphate	U	1220	10:1	mg/l	1.0	6.8
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.42
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	0.73
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	0.60
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	0.98
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-47321	22-47321
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1561750	1561752
Order No.: 2001			Client Sample Ref.:		1	4
			Sample Location:		S1-BH109	S1-BH109
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.20	0.70
			Bottom Depth (m):		0.30	0.80
			Date Sampled:		06-Dec-2022	06-Dec-2022
			Asbestos Lab:		DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	11	7.3
pH	U	2010		4.0	8.1	8.2
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	0.42
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	230	89
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	3.9	3.6
Cadmium	U	2455	mg/kg	0.10	< 0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	4.8	2.2
Copper	U	2455	mg/kg	0.50	22	20
Mercury	U	2455	mg/kg	0.05	< 0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	9.3	15
Lead	U	2455	mg/kg	0.50	10	12
Selenium	U	2455	mg/kg	0.25	0.41	0.80
Vanadium	U	2455	mg/kg	0.5	3.5	3.2
Zinc	U	2455	mg/kg	0.50	31	41
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	100	85
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-47321	22-47321
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1561750	1561752
Order No.: 2001			Client Sample Ref.:		1	4
			Sample Location:		S1-BH109	S1-BH109
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.20	0.70
			Bottom Depth (m):		0.30	0.80
			Date Sampled:		06-Dec-2022	06-Dec-2022
			Asbestos Lab:		DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	9.0	2.1
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	0.35	< 0.10
Fluorene	U	2800	mg/kg	0.10	0.27	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	1.9	< 0.10
Anthracene	U	2800	mg/kg	0.10	0.24	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	0.92	< 0.10
Pyrene	U	2800	mg/kg	0.10	0.55	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	13	2.1
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

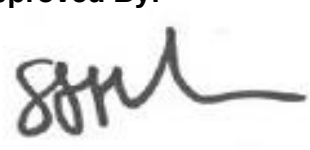
If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-47450-1
Initial Date of Issue:	11-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 Global Centre of Rail Excellence (GCRE)
Quotation No.:	Q22-28967
Order No.:	
No. of Samples:	3
Turnaround (Wkdays):	5
Date Approved:	11-Jan-2023
Approved By:	

Date Received:	12-Dec-2022
Date Instructed:	05-Jan-2023
Results Due:	11-Jan-2023



Details: Stuart Henderson, Technical Manager

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-47450
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1562349
Order No.:				Client Sample Ref.:		2
				Sample Location:		S1-BH101
				Sample Type:		SOIL
				Top Depth (m):		0.30
				Bottom Depth (m):		0.40
				Date Sampled:		09-Dec-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	6.5
Sulphate	U	1220	10:1	mg/l	1.0	< 1.0
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	2.1
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	3.7
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	0.65
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	1.9
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	2.2
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	9.0
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-47450	22-47450	22-47450
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1562348	1562349	1562351
Order No.:			Client Sample Ref.:		111	2	5
			Sample Location:		S1-BH109	S1-BH101	S1-BH101
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		6.70	0.30	1.00
			Bottom Depth (m):		6.90	0.40	1.10
			Date Sampled:		08-Dec-2022	09-Dec-2022	09-Dec-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	11	13	10
pH	U	2010		4.0	7.0	6.9	6.9
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.61	0.59	0.46
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	58	16	79
Cyanide (Free)	U	2300	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Arsenic	U	2455	mg/kg	0.5	15	14	18
Cadmium	U	2455	mg/kg	0.10	0.21	0.38	0.62
Chromium	U	2455	mg/kg	0.5	4.1	5.0	6.3
Copper	U	2455	mg/kg	0.50	48	71	87
Mercury	U	2455	mg/kg	0.05	0.30	0.10	0.08
Nickel	U	2455	mg/kg	0.50	20	38	31
Lead	U	2455	mg/kg	0.50	44	62	66
Selenium	U	2455	mg/kg	0.25	3.3	1.5	1.6
Vanadium	U	2455	mg/kg	0.5	6.2	8.1	7.6
Zinc	U	2455	mg/kg	0.50	58	240	280
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	91	30	29
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-47450	22-47450	22-47450
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1562348	1562349	1562351
Order No.:			Client Sample Ref.:		111	2	5
			Sample Location:		S1-BH109	S1-BH101	S1-BH101
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		6.70	0.30	1.00
			Bottom Depth (m):		6.90	0.40	1.10
			Date Sampled:		08-Dec-2022	09-Dec-2022	09-Dec-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[B] < 10	[B] < 10	[B] < 10
Benzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Toluene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Ethylbenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
o-Xylene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Naphthalene	U	2800	mg/kg	0.10	0.28	1.1	0.86
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	0.20	0.29
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1562348	111		S1-BH109	08-Dec-2022	B	Amber Glass 250ml
1562348	111		S1-BH109	08-Dec-2022	B	Amber Glass 60ml
1562348	111		S1-BH109	08-Dec-2022	B	Plastic Tub 500g
1562349	2		S1-BH101	09-Dec-2022	B	Amber Glass 250ml
1562349	2		S1-BH101	09-Dec-2022	B	Amber Glass 60ml
1562349	2		S1-BH101	09-Dec-2022	B	Plastic Tub 500g
1562351	5		S1-BH101	09-Dec-2022	B	Amber Glass 250ml
1562351	5		S1-BH101	09-Dec-2022	B	Amber Glass 60ml
1562351	5		S1-BH101	09-Dec-2022	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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Key

U	UKAS accredited
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I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
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None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
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Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

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A - Date of sampling not supplied
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C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

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All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-47806-1
Initial Date of Issue:	11-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 Global Centre of Rail Excellence (GCRE)

Quotation No.:	Q22-28967	**Date Received:**	14-Dec-2022
Order No.:	2001	**Date Instructed:**	06-Jan-2023
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	12-Jan-2023
Date Approved:	11-Jan-2023		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-47806
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1563967
Order No.: 2001				Client Sample Ref.:		112
				Sample Location:		S1-BH109
				Sample Type:		SOIL
				Top Depth (m):		8.40
				Bottom Depth (m):		8.60
				Date Sampled:		12-Dec-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	7.7
Sulphate	U	1220	10:1	mg/l	1.0	1.8
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.29
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	0.81
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	0.56
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-47806	22-47806	22-47806
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1563967	1563969	1563971
Order No.: 2001			Client Sample Ref.:		112	2	5
			Sample Location:		S1-BH109	S1-BH116	S1-BH116
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		8.40	0.20	0.90
			Bottom Depth (m):		8.60	0.30	1.00
			Date Sampled:		12-Dec-2022	12-Dec-2022	12-Dec-2022
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	11	8.4	4.1
pH	U	2010		4.0	6.8	7.9	7.1
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	< 0.40	4.9
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	< 10	< 10	16
Cyanide (Free)	U	2300	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Arsenic	U	2455	mg/kg	0.5	2.7	26	5.5
Cadmium	U	2455	mg/kg	0.10	0.14	0.13	0.11
Chromium	U	2455	mg/kg	0.5	14	3.8	3.4
Copper	U	2455	mg/kg	0.50	31	65	41
Mercury	U	2455	mg/kg	0.05	< 0.05	0.38	0.11
Nickel	U	2455	mg/kg	0.50	28	26	25
Lead	U	2455	mg/kg	0.50	15	54	24
Selenium	U	2455	mg/kg	0.25	0.62	4.2	1.7
Vanadium	U	2455	mg/kg	0.5	9.0	6.4	4.1
Zinc	U	2455	mg/kg	0.50	76	50	56
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	1.4	26	28
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-47806	22-47806	22-47806
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1563967	1563969	1563971
Order No.: 2001			Client Sample Ref.:		112	2	5
			Sample Location:		S1-BH109	S1-BH116	S1-BH116
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		8.40	0.20	0.90
			Bottom Depth (m):		8.60	0.30	1.00
			Date Sampled:		12-Dec-2022	12-Dec-2022	12-Dec-2022
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[B] < 10	[B] < 10	[B] < 10
Benzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Toluene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Ethylbenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
o-Xylene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Naphthalene	U	2800	mg/kg	0.10	0.17	0.27	0.23
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	0.23	0.21	0.18
Anthracene	U	2800	mg/kg	0.10	0.11	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	0.24	0.13	0.17
Pyrene	U	2800	mg/kg	0.10	0.18	0.14	0.12
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1563967	112		S1-BH109	12-Dec-2022	B	Amber Glass 250ml
1563967	112		S1-BH109	12-Dec-2022	B	Amber Glass 60ml
1563967	112		S1-BH109	12-Dec-2022	B	Plastic Tub 500g
1563969	2		S1-BH116	12-Dec-2022	B	Amber Glass 250ml
1563969	2		S1-BH116	12-Dec-2022	B	Amber Glass 60ml
1563969	2		S1-BH116	12-Dec-2022	B	Plastic Tub 500g
1563971	5		S1-BH116	12-Dec-2022	B	Amber Glass 250ml
1563971	5		S1-BH116	12-Dec-2022	B	Amber Glass 60ml
1563971	5		S1-BH116	12-Dec-2022	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-47960-1
Initial Date of Issue:	12-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 Global Centre of Rail Excellence (GCRE)

Quotation No.:	Q22-28967	**Date Received:**	15-Dec-2022
Order No.:	2001	**Date Instructed:**	06-Jan-2023
No. of Samples:	4		
Turnaround (Wkdays):	5	**Results Due:**	12-Jan-2023
Date Approved:	12-Jan-2023		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-47960
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1564728
Order No.: 2001				Client Sample Ref.:		109
				Sample Location:		S1-BH101
				Sample Type:		SOIL
				Top Depth (m):		7.50
				Bottom Depth (m):		7.70
				Date Sampled:		13-Dec-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	7.7
Sulphate	U	1220	10:1	mg/l	1.0	7.0
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.24
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	0.66
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-47960	22-47960	22-47960	22-47960
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1564725	1564726	1564728	1564730
Order No.: 2001			Client Sample Ref.:		102	105	109	113
			Sample Location:		S1-BH101	S1-BH101	S1-BH101	S1-BH101
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		2.70	4.50	7.50	9.50
			Bottom Depth (m):		3.00	4.70	7.70	9.70
			Date Sampled:		13-Dec-2022	13-Dec-2022	13-Dec-2022	13-Dec-2022
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
ACM Type	U	2192		N/A	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	8.5	7.0	8.6	7.2
pH	U	2010		4.0	7.8	7.9	7.4	8.0
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.47	0.50	0.42	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	140	25	48	< 10
Cyanide (Free)	U	2300	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Arsenic	U	2455	mg/kg	0.5	21	7.1	12	6.8
Cadmium	U	2455	mg/kg	0.10	0.78	0.18	0.24	0.20
Chromium	U	2455	mg/kg	0.5	7.2	4.9	3.6	4.3
Copper	U	2455	mg/kg	0.50	120	52	61	51
Mercury	U	2455	mg/kg	0.05	0.11	0.10	0.15	0.11
Nickel	U	2455	mg/kg	0.50	34	29	25	31
Lead	U	2455	mg/kg	0.50	150	27	39	42
Selenium	U	2455	mg/kg	0.25	2.8	1.5	2.3	3.2
Vanadium	U	2455	mg/kg	0.5	9.5	6.0	5.0	5.7
Zinc	U	2455	mg/kg	0.50	350	83	63	83
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	55	11	85	44
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-47960	22-47960	22-47960	22-47960
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1564725	1564726	1564728	1564730
Order No.: 2001			Client Sample Ref.:		102	105	109	113
			Sample Location:		S1-BH101	S1-BH101	S1-BH101	S1-BH101
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		2.70	4.50	7.50	9.50
			Bottom Depth (m):		3.00	4.70	7.70	9.70
			Date Sampled:		13-Dec-2022	13-Dec-2022	13-Dec-2022	13-Dec-2022
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[B] < 10	[B] < 10	[B] < 10	[B] < 10
Benzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Toluene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Ethylbenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
o-Xylene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Naphthalene	U	2800	mg/kg	0.10	0.93	0.25	0.93	8.0
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.18	1.4
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.16	0.70
Phenanthrene	U	2800	mg/kg	0.10	0.52	< 0.10	0.70	1.4
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.13	0.35
Fluoranthene	U	2800	mg/kg	0.10	0.21	< 0.10	0.51	0.42
Pyrene	U	2800	mg/kg	0.10	0.17	< 0.10	0.37	0.24
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.20	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.21	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.36	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	3.8	13
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1564725	102		S1-BH101	13-Dec-2022	B	Amber Glass 250ml
1564725	102		S1-BH101	13-Dec-2022	B	Amber Glass 60ml
1564725	102		S1-BH101	13-Dec-2022	B	Plastic Tub 500g
1564726	105		S1-BH101	13-Dec-2022	B	Amber Glass 250ml
1564726	105		S1-BH101	13-Dec-2022	B	Amber Glass 60ml
1564726	105		S1-BH101	13-Dec-2022	B	Plastic Tub 500g
1564728	109		S1-BH101	13-Dec-2022	B	Amber Glass 250ml
1564728	109		S1-BH101	13-Dec-2022	B	Amber Glass 60ml
1564728	109		S1-BH101	13-Dec-2022	B	Plastic Tub 500g
1564730	113		S1-BH101	13-Dec-2022	B	Amber Glass 250ml
1564730	113		S1-BH101	13-Dec-2022	B	Amber Glass 60ml
1564730	113		S1-BH101	13-Dec-2022	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-47963-1
Initial Date of Issue:	11-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 Global Centre of Rail Excellence (GCRE)

Quotation No.:	Q22-28967	**Date Received:**	15-Dec-2022
Order No.:	2001	**Date Instructed:**	05-Jan-2023
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	11-Jan-2023
Date Approved:	11-Jan-2023		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-47963
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1564752
Order No.: 2001				Client Sample Ref.:		104
				Sample Location:		S1-BH116
				Sample Type:		SOIL
				Top Depth (m):		2.70
				Bottom Depth (m):		2.80
				Date Sampled:		13-Dec-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	7.3
Sulphate	U	1220	10:1	mg/l	1.0	4.3
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.91
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	2.5
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-47963	22-47963	22-47963
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1564752	1564754	1564755
Order No.: 2001			Client Sample Ref.:		104	108	110
			Sample Location:		S1-BH116	S1-BH116	S1-BH116
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		2.70	4.50	5.10
			Bottom Depth (m):		2.80	4.65	5.20
			Date Sampled:		13-Dec-2022	13-Dec-2022	13-Dec-2022
			Asbestos Lab:		DURHAM	DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A	-	-	
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	
Moisture	N	2030	%	0.020	7.1	11	22
pH	U	2010		4.0	6.9	6.5	6.5
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	0.52	0.52
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	26	85	32
Cyanide (Free)	U	2300	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Arsenic	U	2455	mg/kg	0.5	7.3	7.3	6.1
Cadmium	U	2455	mg/kg	0.10	0.12	< 0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	2.0	4.3	6.8
Copper	U	2455	mg/kg	0.50	32	33	5.8
Mercury	U	2455	mg/kg	0.05	0.11	0.11	< 0.05
Nickel	U	2455	mg/kg	0.50	16	18	3.1
Lead	U	2455	mg/kg	0.50	22	18	7.3
Selenium	U	2455	mg/kg	0.25	1.9	1.5	0.44
Vanadium	U	2455	mg/kg	0.5	3.4	5.9	9.6
Zinc	U	2455	mg/kg	0.50	58	52	10
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	66	23	2.5
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-47963	22-47963	22-47963
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1564752	1564754	1564755
Order No.: 2001			Client Sample Ref.:		104	108	110
			Sample Location:		S1-BH116	S1-BH116	S1-BH116
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		2.70	4.50	5.10
			Bottom Depth (m):		2.80	4.65	5.20
			Date Sampled:		13-Dec-2022	13-Dec-2022	13-Dec-2022
			Asbestos Lab:		DURHAM	DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[B] < 10	[B] < 10	[B] < 10
Benzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Toluene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Ethylbenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
o-Xylene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Naphthalene	U	2800	mg/kg	0.10	1.4	0.85	0.35
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	0.12	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	0.28	0.39	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10	0.30	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10	0.28	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1564752	104		S1-BH116	13-Dec-2022	B	Amber Glass 250ml
1564752	104		S1-BH116	13-Dec-2022	B	Amber Glass 60ml
1564752	104		S1-BH116	13-Dec-2022	B	Plastic Tub 500g
1564754	108		S1-BH116	13-Dec-2022	B	Amber Glass 250ml
1564754	108		S1-BH116	13-Dec-2022	B	Amber Glass 60ml
1564754	108		S1-BH116	13-Dec-2022	B	Plastic Tub 500g
1564755	110		S1-BH116	13-Dec-2022	B	Amber Glass 250ml
1564755	110		S1-BH116	13-Dec-2022	B	Amber Glass 60ml
1564755	110		S1-BH116	13-Dec-2022	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
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N	Unaccredited
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SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-48189-1
Initial Date of Issue:	12-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 Global Centre of Rail Excellence

Quotation No.:		**Date Received:**	16-Dec-2022
Order No.:		**Date Instructed:**	22-Dec-2022
No. of Samples:	1		
Turnaround (Wkdays):	6	**Results Due:**	05-Jan-2023
Date Approved:	12-Jan-2023		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services			**Chemtest Job No.:**		22-48189
Quotation No.:			**Chemtest Sample ID.:**		1565530
Order No.:			Client Sample Ref.:		2
			Client Sample ID.:		#3554753346150002
			Sample Location:		S1-BH112
			Sample Type:		SOIL
			Top Depth (m):		0.50
			Bottom Depth (m):		0.60
			Date Sampled:		14-Dec-2022
			Asbestos Lab:		NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	8.4
pH	U	2010		4.0	8.0
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.57
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	96
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	7.8
Cadmium	U	2455	mg/kg	0.10	0.19
Chromium	U	2455	mg/kg	0.5	3.8
Copper	U	2455	mg/kg	0.50	36
Mercury	U	2455	mg/kg	0.05	0.10
Nickel	U	2455	mg/kg	0.50	17
Lead	U	2455	mg/kg	0.50	24
Selenium	U	2455	mg/kg	0.25	1.7
Vanadium	U	2455	mg/kg	0.5	5.9
Zinc	U	2455	mg/kg	0.50	94
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	U	2625	%	0.40	41
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services			**Chemtest Job No.:**		22-48189
Quotation No.:			**Chemtest Sample ID.:**		1565530
Order No.:			Client Sample Ref.:		2
			Client Sample ID.:		#3554753346150002
			Sample Location:		S1-BH112
			Sample Type:		SOIL
			Top Depth (m):		0.50
			Bottom Depth (m):		0.60
			Date Sampled:		14-Dec-2022
			Asbestos Lab:		NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	1.3
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	0.21
Fluorene	U	2800	mg/kg	0.10	0.15
Phenanthrene	U	2800	mg/kg	0.10	0.66
Anthracene	U	2800	mg/kg	0.10	0.11
Fluoranthene	U	2800	mg/kg	0.10	0.33
Pyrene	U	2800	mg/kg	0.10	0.20
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	3.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-48189								
Chemtest Sample ID:	1565530								
Sample Ref:	2								
Sample ID:	#3554753346150002						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH112								
Top Depth(m):	0.50								
Bottom Depth(m):	0.60								
Sampling Date:	14-Dec-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	U	%			24	3	5	6
Loss On Ignition	2610	U	%			4.0	--	--	10
Total BTEX	2760	U	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg			60	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			2.9	100	--	--
pH	2010	U				8.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.0050	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0005	0.0005	0.0010	0.0050	0.5	2	25
Barium	1455	U	0.057	0.022	0.11	0.26	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0009	< 0.0005	0.0019	0.0012	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0026	0.0022	0.0053	0.022	0.5	10	30
Nickel	1455	U	0.0005	< 0.0005	0.0011	0.0007	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0009	0.0007	0.0018	0.0072	0.06	0.7	5
Selenium	1455	U	0.0038	0.0019	0.0075	0.021	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.39	0.26	< 1.0	2.8	10	150	500
Sulphate	1220	U	55	8.7	110	150	1000	20000	50000
Total Dissolved Solids	1020	N	220	76	440	940	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	5.0	3.5	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	8.4

Leachate Test Information	
Leachant volume 1st extract/l	0.334
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.228

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)

Test Methods

SOP	Title	Parameters included	Method summary
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

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M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
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LOD	Limit of detection

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All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-48361-1
Initial Date of Issue:	10-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 Global Centre of Rail Excellence (GCRE)
Quotation No.:	Q22-28967
Order No.:	
No. of Samples:	2
Turnaround (Wkdays):	8
Date Approved:	10-Jan-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	19-Dec-2022
Date Instructed:	19-Dec-2022
Results Due:	04-Jan-2023

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-48361
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1566153
Order No.:				Client Sample Ref.:		102
				Sample Location:		S1-BH112
				Sample Type:		SOIL
				Top Depth (m):		1.50
				Bottom Depth (m):		1.60
				Date Sampled:		15-Dec-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	8.3
Sulphate	U	1220	10:1	mg/l	1.0	8.6
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.22
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	7.3
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-48361	22-48361
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1566153	1566155
Order No.:			Client Sample Ref.:		102	106
			Sample Location:		S1-BH112	S1-BH112
			Sample Type:		SOIL	SOIL
			Top Depth (m):		1.50	3.70
			Bottom Depth (m):		1.60	3.80
			Date Sampled:		15-Dec-2022	15-Dec-2022
			Asbestos Lab:			COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192		N/A		-
Asbestos Identification	U	2192		N/A		No Asbestos Detected
Moisture	N	2030	%	0.020	9.5	24
pH	U	2010		4.0	7.1	6.5
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	0.93
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	79	16
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	8.8	15
Cadmium	U	2455	mg/kg	0.10	0.11	< 0.10
Chromium	U	2455	mg/kg	0.5	3.5	23
Copper	U	2455	mg/kg	0.50	38	27
Mercury	U	2455	mg/kg	0.05	0.10	< 0.05
Nickel	U	2455	mg/kg	0.50	27	13
Lead	U	2455	mg/kg	0.50	19	19
Selenium	U	2455	mg/kg	0.25	1.7	1.7
Vanadium	U	2455	mg/kg	0.5	5.2	43
Zinc	U	2455	mg/kg	0.50	47	44
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	81	2.7
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-48361	22-48361
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1566153	1566155
Order No.:			Client Sample Ref.:		102	106
			Sample Location:		S1-BH112	S1-BH112
			Sample Type:		SOIL	SOIL
			Top Depth (m):		1.50	3.70
			Bottom Depth (m):		1.60	3.80
			Date Sampled:		15-Dec-2022	15-Dec-2022
			Asbestos Lab:			COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10
Benzene	U	2760	µg/kg	1.0	22	< 1.0
Toluene	U	2760	µg/kg	1.0	9.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.42	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	0.17	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-48361								
Chemtest Sample ID:	1566155								
Sample Ref:	106								
Sample ID:									
Sample Location:	S1-BH112								
Top Depth(m):	3.70								
Bottom Depth(m):	3.80								
Sampling Date:	15-Dec-2022								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%			1.6	3	5	6
Loss On Ignition	2610	U	%			7.5	--	--	10
Total BTEX	2760	U	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	U				6.5	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.0040	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0025	0.0009	0.0047	0.012	0.5	2	25
Barium	1455	U	0.073	0.047	0.14	0.50	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0027	0.0015	0.0051	0.016	0.5	10	70
Copper	1455	U	0.0073	0.0039	0.014	0.010	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0039	0.0024	0.0075	0.026	0.5	10	30
Nickel	1455	U	0.0084	0.0034	0.016	0.041	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0006	< 0.0005	0.0012	0.0009	0.06	0.7	5
Selenium	1455	U	0.0098	0.0027	0.019	0.037	0.1	0.5	7
Zinc	1455	U	0.023	0.014	0.044	0.16	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.59	0.19	1.1	2.5	10	150	500
Sulphate	1220	U	20	9.1	38	110	1000	20000	50000
Total Dissolved Solids	1020	N	120	65	240	720	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	37	4.2	72	89	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	24

Leachate Test Information	
Leachant volume 1st extract/l	0.294
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.249

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-48913-2		
Initial Date of Issue:	10-Jan-2023	**Date of Re-Issue:**	11-Jan-2023
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	22-Dec-2022
Order No.:		**Date Instructed:**	04-Jan-2023
No. of Samples:	2		
Turnaround (Wkdays):	5	**Results Due:**	10-Jan-2023
Date Approved:	10-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-48913
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1568343
Order No.:				Client Sample Ref.:		3
				Client Sample ID.:		#2720128606400003
				Sample Location:		S1-BH106
				Sample Type:		SOIL
				Top Depth (m):		0.9
				Bottom Depth (m):		1.0
				Date Sampled:		20-Dec-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	8.9
Sulphate	U	1220	10:1	mg/l	1.0	6.6
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	< 0.20
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	0.65
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-48913	22-48913
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1568341	1568343
Order No.:			Client Sample Ref.:		1	3
			Client Sample ID.:		#2720128606400001	#2720128606400003
			Sample Location:		S1-BH106	S1-BH106
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.2	0.9
			Bottom Depth (m):		0.3	1.0
			Date Sampled:		20-Dec-2022	20-Dec-2022
			Asbestos Lab:		DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	8.2	8.7
pH	U	2010		4.0	8.0	8.5
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	0.68
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	71	58
Cyanide (Free)	U	2300	mg/kg	0.50	[B] < 0.50	[B] < 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	[B] < 0.50	[B] < 0.50
Arsenic	U	2455	mg/kg	0.5	12	9.1
Cadmium	U	2455	mg/kg	0.10	0.36	0.20
Chromium	U	2455	mg/kg	0.5	7.1	6.5
Copper	U	2455	mg/kg	0.50	55	36
Mercury	U	2455	mg/kg	0.05	0.10	0.06
Nickel	U	2455	mg/kg	0.50	21	18
Lead	U	2455	mg/kg	0.50	33	23
Selenium	U	2455	mg/kg	0.25	1.7	1.1
Vanadium	U	2455	mg/kg	0.5	7.2	6.2
Zinc	U	2455	mg/kg	0.50	76	54
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	86	48
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[B] < 5.0	[B] < 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-48913	22-48913
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1568341	1568343
Order No.:			Client Sample Ref.:		1	3
			Client Sample ID.:		#2720128606400001	#2720128606400003
			Sample Location:		S1-BH106	S1-BH106
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.2	0.9
			Bottom Depth (m):		0.3	1.0
			Date Sampled:		20-Dec-2022	20-Dec-2022
			Asbestos Lab:		DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[B] < 1.0	[B] < 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[B] < 5.0	[B] < 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[B] < 10	[B] < 10
Benzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0
Toluene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0
Ethylbenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0
o-Xylene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0
Naphthalene	U	2800	mg/kg	0.10	1.8	2.0
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	0.35	0.27
Phenanthrene	U	2800	mg/kg	0.10	2.3	2.0
Anthracene	U	2800	mg/kg	0.10	0.37	0.42
Fluoranthene	U	2800	mg/kg	0.10	1.8	1.6
Pyrene	U	2800	mg/kg	0.10	1.4	1.1
Benzo[a]anthracene	U	2800	mg/kg	0.10	0.51	0.38
Chrysene	U	2800	mg/kg	0.10	0.89	0.72
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	0.97	0.82
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	10	9.3
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1568341	1	#2720128606400001	S1-BH106	20-Dec-2022	B	Amber Glass 250ml
1568341	1	#2720128606400001	S1-BH106	20-Dec-2022	B	Amber Glass 60ml
1568341	1	#2720128606400001	S1-BH106	20-Dec-2022	B	Plastic Tub 500g
1568343	3	#2720128606400003	S1-BH106	20-Dec-2022	B	Amber Glass 250ml
1568343	3	#2720128606400003	S1-BH106	20-Dec-2022	B	Amber Glass 60ml
1568343	3	#2720128606400003	S1-BH106	20-Dec-2022	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-49095-2		
Initial Date of Issue:	10-Jan-2023	**Date of Re-Issue:**	10-Jan-2023
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	23-Dec-2022
Order No.:		**Date Instructed:**	04-Jan-2023
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	10-Jan-2023
Date Approved:	10-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services				**Chemtest Job No.:**		22-49095
Quotation No.: Q22-28967				**Chemtest Sample ID.:**		1569171
Order No.:				Client Sample Ref.:		104
				Client Sample ID.:		#50765685155 30009
				Sample Location:		S1-BH106
				Sample Type:		SOIL
				Top Depth (m):		2.5
				Bottom Depth (m):		2.7
				Date Sampled:		21-Dec-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
pH	U	1010	10:1		N/A	8.8
Sulphate	U	1220	10:1	mg/l	1.0	9.7
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.35
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	1.0
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	2.6
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-49095	22-49095	22-49095
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1569171	1569174	1569176
Order No.:			Client Sample Ref.:		104	110	113
			Client Sample ID.:		#5076568515530009	#5076568515530015	#5076568515530018
			Sample Location:		S1-BH106	S1-BH106	S1-BH106
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		2.5	5.5	8.5
			Bottom Depth (m):		2.7	5.7	8.7
			Date Sampled:		21-Dec-2022	21-Dec-2022	21-Dec-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	13	13	13
pH	U	2010		4.0	7.3	8.1	8.0
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	4.2	0.48	0.56
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	1200	860	1000
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	99	8.3	9.9
Cadmium	U	2455	mg/kg	0.10	14	0.25	1.5
Chromium	U	2455	mg/kg	0.5	440	5.9	12
Copper	U	2455	mg/kg	0.50	130	47	50
Mercury	U	2455	mg/kg	0.05	1.2	0.11	0.15
Nickel	U	2455	mg/kg	0.50	21	18	24
Lead	U	2455	mg/kg	0.50	3300	60	100
Selenium	U	2455	mg/kg	0.25	1.6	2.2	2.2
Vanadium	U	2455	mg/kg	0.5	44	5.4	6.9
Zinc	U	2455	mg/kg	0.50	16000	140	350
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	12	76	93
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		22-49095	22-49095	22-49095
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1569171	1569174	1569176
Order No.:			Client Sample Ref.:		104	110	113
			Client Sample ID.:		#5076568515530009	#5076568515530015	#5076568515530018
			Sample Location:		S1-BH106	S1-BH106	S1-BH106
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		2.5	5.5	8.5
			Bottom Depth (m):		2.7	5.7	8.7
			Date Sampled:		21-Dec-2022	21-Dec-2022	21-Dec-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.24	3.2	6.0
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	0.40	0.84
Fluorene	U	2800	mg/kg	0.10	< 0.10	0.33	0.39
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	1.1	1.5
Anthracene	U	2800	mg/kg	0.10	< 0.10	0.26	0.30
Fluoranthene	U	2800	mg/kg	0.10	0.28	0.59	0.57
Pyrene	U	2800	mg/kg	0.10	0.18	0.38	0.35
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	0.13	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	0.23	0.19
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	0.46	0.37
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	7.1	11
Total Phenols	U	2920	mg/kg	0.10	< 0.10	0.20	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
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I/S	Insufficient Sample
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N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-00082-1		
Initial Date of Issue:	12-Jan-2023		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	04-Jan-2023
Order No.:		**Date Instructed:**	04-Jan-2023
No. of Samples:	1		
Turnaround (Wkdays):	7	**Results Due:**	12-Jan-2023
Date Approved:	12-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-00082								
Chemtest Sample ID:	1569930								
Sample Ref:	1								
Sample ID:									
Sample Location:	S1-BH106								
Top Depth(m):	0.20								
Bottom Depth(m):	0.30								
Sampling Date:	20-Dec-2022								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%			63	3	5	6
Loss On Ignition	2610	M	%			25	--	--	10
Total BTEX	2760	M	mg/kg			[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			[B] 54	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			14	100	--	--
pH	2010	M				8.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.028	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.5	2	25
Barium	1455	U	0.064	0.013	0.13	0.20	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0007	0.0007	0.0013	0.0009	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.015	0.0048	0.030	0.062	0.5	10	30
Nickel	1455	U	0.0007	< 0.0005	0.0013	0.0009	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0013	0.0008	0.0026	0.0084	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200
Chloride	1220	U	2.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.37	0.18	< 1.0	2.1	10	150	500
Sulphate	1220	U	18	1.6	36	39	1000	20000	50000
Total Dissolved Solids	1020	N	230	67	460	900	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	3.0	3.0	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	10

Leachate Test Information	
Leachant volume 1st extract/l	0.330
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.249

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1569930	1		S1-BH106	20-Dec-2022	B	Amber Glass 250ml
1569930	1		S1-BH106	20-Dec-2022	B	Amber Glass 60ml
1569930	1		S1-BH106	20-Dec-2022	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

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Sample Retention and Disposal

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customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-00084-1
Initial Date of Issue:	16-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 Global Centre of Rail Excellence (GCRE)
Quotation No.:	Q22-28967
Order No.:	
No. of Samples:	2
Turnaround (Wkdays):	7
Date Approved:	16-Jan-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	04-Jan-2023
Date Instructed:	04-Jan-2023
Results Due:	12-Jan-2023

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-00084								
Chemtest Sample ID:	1569932								
Sample Ref:	110								
Sample ID:	#5076568515530015						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH106								
Top Depth(m):	5.50								
Bottom Depth(m):	5.70								
Sampling Date:	21-Dec-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			30	3	5	6
Loss On Ignition	2610	M	%			13	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			2.1	100	--	--
pH	2010	M				8.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.023	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0006	0.0004	0.0011	0.0042	0.5	2	25
Barium	1455	U	0.062	0.030	0.12	0.34	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	< 0.0005	0.0006	< 0.0005	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.021	0.0059	0.042	0.078	0.5	10	30
Nickel	1455	U	0.0022	< 0.0005	0.0045	0.0030	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0012	< 0.0005	0.0024	0.0016	0.06	0.7	5
Selenium	1455	U	0.0011	0.0009	0.0022	0.0089	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200
Chloride	1220	U	1.2	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.37	0.19	< 1.0	2.1	10	150	500
Sulphate	1220	U	64	8.8	130	160	1000	20000	50000
Total Dissolved Solids	1020	N	220	80	430	980	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	3.1	3.0	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	12

Leachate Test Information	
Leachant volume 1st extract/l	0.326
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.230

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-00084								
Chemtest Sample ID:	1569933								
Sample Ref:	113								
Sample ID:	#5076568515530018						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH106								
Top Depth(m):	8.50								
Bottom Depth(m):	8.70								
Sampling Date:	21-Dec-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			42	3	5	6
Loss On Ignition	2610	M	%			24	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			99	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			10	100	--	--
pH	2010	M				7.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.010	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0004	0.0003	0.0008	0.0033	0.5	2	25
Barium	1455	U	0.027	0.024	0.054	0.24	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0007	0.0005	0.0013	0.0008	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.011	0.0036	0.022	0.046	0.5	10	30
Nickel	1455	U	0.0056	0.0005	0.011	0.012	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0012	0.0007	0.0024	0.0073	0.06	0.7	5
Selenium	1455	U	0.0036	0.0019	0.0070	0.021	0.1	0.5	7
Zinc	1455	U	< 0.003	0.003	< 0.003	0.028	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.19	0.15	< 1.0	1.5	10	150	500
Sulphate	1220	U	540	54	1100	1200	1000	20000	50000
Total Dissolved Solids	1020	N	180	120	360	1300	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	3.3	< 2.5	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	17

Leachate Test Information	
Leachant volume 1st extract/l	0.315
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.226

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	23-00188-5		
Initial Date of Issue:	13-Jan-2023	**Date of Re-Issue:**	16-Jan-2023
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	05-Jan-2023
Order No.:		**Date Instructed:**	05-Jan-2023
No. of Samples:	2		
Turnaround (Wkdays):	7	**Results Due:**	13-Jan-2023
Date Approved:	13-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-00188								
Chemtest Sample ID:	1570332								
Sample Ref:	5								
Sample ID:	#6101627161760005						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH101								
Top Depth(m):	1.00								
Bottom Depth(m):	1.10								
Sampling Date:	09-Dec-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			16	3	5	6
Loss On Ignition	2610	M	%			18	--	--	10
Total BTEX	2760	M	mg/kg			[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			[B] 63	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	M				8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0005	0.0004	0.0011	0.0045	0.5	2	25
Barium	1455	U	0.038	0.022	0.076	0.23	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0013	0.0009	0.0026	0.0012	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.013	0.0043	0.026	0.051	0.5	10	30
Nickel	1455	U	0.0006	< 0.0005	0.0012	0.0006	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0009	0.0006	0.0018	0.0062	0.06	0.7	5
Selenium	1455	U	0.0041	0.0013	0.0082	0.016	0.1	0.5	7
Zinc	1455	U	0.005	< 0.003	0.011	0.005	4	50	200
Chloride	1220	U	2.6	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.64	0.34	1.3	3.7	10	150	500
Sulphate	1220	U	69	19	140	240	1000	20000	50000
Total Dissolved Solids	1020	N	220	81	430	930	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	2.8	3.2	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	11

Leachate Test Information	
Leachant volume 1st extract/l	0.328
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.158

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-00188								
Chemtest Sample ID:	1570333								
Sample Ref:	111								
Sample ID:	#6503151476610022						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH109								
Top Depth(m):	6.70								
Bottom Depth(m):	6.90								
Sampling Date:	08-Dec-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			36	3	5	6
Loss On Ignition	2610	M	%			18	--	--	10
Total BTEX	2760	M	mg/kg			[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			[B] 27	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			3.7	100	--	--
pH	2010	M				8.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0010	0.0005	0.0019	0.0056	0.5	2	25
Barium	1455	U	0.022	0.016	0.044	0.16	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	< 0.0005	0.0009	< 0.0005	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0008	0.0008	0.0015	0.0076	0.5	10	30
Nickel	1455	U	0.0019	0.0007	0.0038	0.0074	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0040	0.0012	0.0079	0.014	0.06	0.7	5
Selenium	1455	U	0.0080	0.0023	0.016	0.026	0.1	0.5	7
Zinc	1455	U	0.004	< 0.003	0.009	0.003	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.19	0.16	< 1.0	1.6	10	150	500
Sulphate	1220	U	95	18	190	230	1000	20000	50000
Total Dissolved Solids	1020	N	180	180	360	1800	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	3.9	2.6	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	15

Leachate Test Information	
Leachant volume 1st extract/l	0.318
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.111

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1570332	5	#6101627161760005	S1-BH101	09-Dec-2022	B	Amber Glass 250ml
1570332	5	#6101627161760005	S1-BH101	09-Dec-2022	B	Amber Glass 60ml
1570332	5	#6101627161760005	S1-BH101	09-Dec-2022	B	Plastic Tub 500g
1570333	111	#6503151476610022	S1-BH109	08-Dec-2022	B	Amber Glass 250ml
1570333	111	#6503151476610022	S1-BH109	08-Dec-2022	B	Amber Glass 60ml
1570333	111	#6503151476610022	S1-BH109	08-Dec-2022	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-00189-1		
Initial Date of Issue:	13-Jan-2023		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	05-Jan-2023
Order No.:		**Date Instructed:**	05-Jan-2023
No. of Samples:	1		
Turnaround (Wkdays):	7	**Results Due:**	13-Jan-2023
Date Approved:	13-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-00189								
Chemtest Sample ID:	1570334								
Sample Ref:	110								
Sample ID:	#3552507438480021						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH116								
Top Depth(m):	5.10								
Bottom Depth(m):	5.20								
Sampling Date:	12-Dec-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			1.4	3	5	6
Loss On Ignition	2610	M	%			7.1	--	--	10
Total BTEX	2760	M	mg/kg			[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	M				6.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.014	0.0087	0.027	0.091	0.5	2	25
Barium	1455	U	0.006	0.006	0.011	0.064	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0016	0.0032	0.0031	0.031	0.5	10	70
Copper	1455	U	0.0054	0.0014	0.011	0.0043	2	50	100
Mercury	1455	U	0.00006	< 0.00005	0.00012	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0038	0.0008	0.0074	0.011	0.5	10	30
Nickel	1455	U	0.0026	0.0020	0.0050	0.020	0.4	10	40
Lead	1455	U	0.0039	0.0017	0.0076	0.019	0.5	10	50
Antimony	1455	U	0.012	0.0005	0.023	0.014	0.06	0.7	5
Selenium	1455	U	0.0021	0.0014	0.0041	0.014	0.1	0.5	7
Zinc	1455	U	0.005	< 0.003	0.010	0.004	4	50	200
Chloride	1220	U	5.8	2.1	11	24	800	15000	25000
Fluoride	1220	U	0.37	0.23	< 1.0	2.4	10	150	500
Sulphate	1220	U	39	11	76	130	1000	20000	50000
Total Dissolved Solids	1020	N	120	120	230	1200	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	11	21	< 50	200	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	20

Leachate Test Information	
Leachant volume 1st extract/l	0.306
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.138

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1570334	110	#3552507438480021	S1-BH116	12-Dec-2022	B	Amber Glass 250ml
1570334	110	#3552507438480021	S1-BH116	12-Dec-2022	B	Amber Glass 60ml
1570334	110	#3552507438480021	S1-BH116	12-Dec-2022	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
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T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-00268-1		
Initial Date of Issue:	13-Jan-2023		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rial Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	06-Jan-2023
Order No.:	2001	**Date Instructed:**	06-Jan-2023
No. of Samples:	1		
Turnaround (Wkdays):	7	**Results Due:**	16-Jan-2023
Date Approved:	13-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - 2 Stage WAC

Project: G22069 Global Centre of Rial Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-00268								
Chemtest Sample ID:	1570591								
Sample Ref:	5								
Sample ID:	#7112198638300005						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH116								
Top Depth(m):	0.90								
Bottom Depth(m):	1.00								
Sampling Date:	09-Dec-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			11	3	5	6
Loss On Ignition	2610	M	%			16	--	--	10
Total BTEX	2760	M	mg/kg			[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	M				8.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.0050	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0005	0.0004	0.0009	0.0037	0.5	2	25
Barium	1455	U	0.043	0.015	0.085	0.18	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0029	0.0035	0.0058	0.034	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0009	0.0005	0.0018	0.0055	0.06	0.7	5
Selenium	1455	U	0.0056	0.0015	0.011	0.020	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200
Chloride	1220	U	2.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.47	0.25	< 1.0	2.8	10	150	500
Sulphate	1220	U	27	4.3	54	69	1000	20000	50000
Total Dissolved Solids	1020	N	130	66	270	730	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	2.7	2.9	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	6.1

Leachate Test Information	
Leachant volume 1st extract/l	0.339
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.201

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1570591	5	#7112198638300005	S1-BH116	09-Dec-2022	B	Amber Glass 250ml
1570591	5	#7112198638300005	S1-BH116	09-Dec-2022	B	Amber Glass 60ml
1570591	5	#7112198638300005	S1-BH116	09-Dec-2022	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-00270-1
Initial Date of Issue:	13-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt James Power
Project	G22069 Global Centre of Rail Excellence (GCRE)
Quotation No.:	Q22-28967
Order No.:	2001
No. of Samples:	2
Turnaround (Wkdays):	7
Date Approved:	13-Jan-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	06-Jan-2023
Date Instructed:	06-Jan-2023
Results Due:	16-Jan-2023

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-00270								
Chemtest Sample ID:	1570596								
Sample Ref:	105								
Sample ID:	#5067491743270025						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH101								
Top Depth(m):	4.50								
Bottom Depth(m):	4.70								
Sampling Date:	13-Dec-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			10	3	5	6
Loss On Ignition	2610	M	%			14	--	--	10
Total BTEX	2760	M	mg/kg			[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	M				8.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0005	0.0004	0.0010	0.0042	0.5	2	25
Barium	1455	U	0.017	0.010	0.034	0.10	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	0.0007	< 0.0005	0.0059	0.5	10	70
Copper	1455	U	< 0.0005	0.0007	< 0.0005	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0059	0.0038	0.012	0.040	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0014	0.0007	0.0027	0.0072	0.06	0.7	5
Selenium	1455	U	0.0049	0.0012	0.0097	0.015	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.44	0.17	< 1.0	1.9	10	150	500
Sulphate	1220	U	110	17	210	250	1000	20000	50000
Total Dissolved Solids	1020	N	230	50	450	650	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	3.8	4.7	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	5.2

Leachate Test Information	
Leachant volume 1st extract/l	0.340
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.156

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-00270								
Chemtest Sample ID:	1570597								
Sample Ref:	113								
Sample ID:	#5067491743270033						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	S1-BH101								
Top Depth(m):	9.50								
Bottom Depth(m):	9.70								
Sampling Date:	13-Dec-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			16	3	5	6
Loss On Ignition	2610	M	%			18	--	--	10
Total BTEX	2760	M	mg/kg			[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			13	100	--	--
pH	2010	M				7.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0012	0.0007	0.0025	0.0080	0.5	2	25
Barium	1455	U	0.035	0.018	0.069	0.19	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0007	< 0.0005	0.0015	0.0007	0.5	10	70
Copper	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.012	0.0051	0.025	0.059	0.5	10	30
Nickel	1455	U	< 0.0005	0.0005	< 0.0005	0.0047	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0041	0.0021	0.0081	0.023	0.06	0.7	5
Selenium	1455	U	0.0097	0.0024	0.019	0.031	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.36	0.17	< 1.0	1.9	10	150	500
Sulphate	1220	U	67	13	130	190	1000	20000	50000
Total Dissolved Solids	1020	N	210	65	420	800	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	3.4	3.9	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	7.6

Leachate Test Information	
Leachant volume 1st extract/l	0.336
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.177

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1570596	105	#506749174327002 5	S1-BH101	13-Dec-2022	B	Amber Glass 250ml
1570596	105	#506749174327002 5	S1-BH101	13-Dec-2022	B	Amber Glass 60ml
1570596	105	#506749174327002 5	S1-BH101	13-Dec-2022	B	Plastic Tub 500g
1570597	113	#506749174327003 3	S1-BH101	13-Dec-2022	B	Amber Glass 250ml
1570597	113	#506749174327003 3	S1-BH101	13-Dec-2022	B	Amber Glass 60ml
1570597	113	#506749174327003 3	S1-BH101	13-Dec-2022	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-01345-1
Initial Date of Issue:	23-Jan-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	James Power
Project	G22069 Global Centre of Rail Excellence

Quotation No.:		**Date Received:**	18-Jan-2023
Order No.:	2001	**Date Instructed:**	18-Jan-2023
No. of Samples:	5		
Turnaround (Wkdays):	5	**Results Due:**	24-Jan-2023
Date Approved:	23-Jan-2023		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - Water

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services		**Chemtest Job No.:**			23-01345	23-01345	23-01345	23-01345	23-01345
Quotation No.:		**Chemtest Sample ID.:**			1575357	1575358	1575359	1575360	1575361
Order No.: 2001		Client Sample Ref.:			GW1	GW1	1	1	1
		Client Sample ID.:			#4934597203930036	#2677744097380030	#5215307513810001	#4719980314700001	#9658392891110001
		Sample Location:			S1-BH105	S1-BH113	SW1	SW2	SW3
		Sample Type:			WATER	WATER	WATER	WATER	WATER
		Top Depth (m):			6.28	3.86	0.00	0.00	0.00
		Date Sampled:			16-Jan-2023	16-Jan-2023	17-Jan-2023	17-Jan-2023	17-Jan-2023
		Time Sampled:			11:56	10:38	10:27	10:49	11:12
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
pH	U	1010		N/A	6.7	7.2	7.5	7.9	8.2
Sulphate	U	1220	mg/l	1.0	130	180	81	130	75
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium (Dissolved)	U	1455	mg/l	2.00	77	75	45	49	28
Total Hardness as CaCO3	U	1270	mg/l	15	330	320	230	230	270
Arsenic (Dissolved)	U	1455	µg/l	0.20	2.7	1.1	0.60	0.84	0.35
Boron (Dissolved)	U	1455	µg/l	10.0	36	62	40	57	15
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	0.60	< 0.50	0.65
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Manganese (Dissolved)	U	1455	µg/l	0.50	1600	840	50	150	29
Nickel (Dissolved)	U	1455	µg/l	0.50	3.8	5.2	3.2	5.5	1.0
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	1.6	1.8	1.6	1.3	1.8
Vanadium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	13	8.1	3.4	3.7	5.9
Chromium (Hexavalent)	U	1490	µg/l	20	< 20	< 20	< 20	< 20	< 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Naphthalene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services		**Chemtest Job No.:**			23-01345	23-01345	23-01345	23-01345	23-01345
Quotation No.:		**Chemtest Sample ID.:**			1575357	1575358	1575359	1575360	1575361
Order No.: 2001		Client Sample Ref.:			GW1	GW1	1	1	1
		Client Sample ID.:			#4934597203930036	#2677744097380030	#5215307513810001	#4719980314700001	#9658392891110001
		Sample Location:			S1-BH105	S1-BH113	SW1	SW2	SW3
		Sample Type:			WATER	WATER	WATER	WATER	WATER
		Top Depth (m):			6.28	3.86	0.00	0.00	0.00
		Date Sampled:			16-Jan-2023	16-Jan-2023	17-Jan-2023	17-Jan-2023	17-Jan-2023
		Time Sampled:			11:56	10:38	10:27	10:49	11:12
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Total Of 16 PAH's	U	1800	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

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None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	23-02379-6		
Initial Date of Issue:	03-Feb-2023	**Date of Re-Issue:**	03-Feb-2023
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	26-Jan-2023
Order No.:	2001	**Date Instructed:**	26-Jan-2023
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	01-Feb-2023
Date Approved:	03-Feb-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Water

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services		**Chemtest Job No.:**			23-02379	23-02379	23-02379
Quotation No.: Q22-28967		**Chemtest Sample ID.:**			1579586	1579587	1579588
Order No.: 2001		Client Sample Ref.:			28	19	22
		Client Sample ID.:			#6188374020240028	#7397136831360019	#5355956785070022
		Sample Location:			S1-BH102	S1-BH121	S1-BH122
		Sample Type:			WATER	WATER	WATER
		Top Depth (m):			8.72	3.3	1.76
		Date Sampled:			24-Jan-2023	24-Jan-2023	24-Jan-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
pH	U	1010		N/A	7.4	7.6	7.6
Sulphate	U	1220	mg/l	1.0	140	17	250
Cyanide (Total)	U	1300	mg/l	0.050	0.060	0.060	0.060
Cyanide (Free)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050
Calcium (Dissolved)	U	1455	mg/l	2.00	190	190	320
Total Hardness as CaCO3	U	1270	mg/l	15	820	830	1600
Arsenic (Dissolved)	U	1455	µg/l	0.20	1.2	0.57	0.24
Boron (Dissolved)	U	1455	µg/l	10.0	73	36	51
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	µg/l	0.50	0.74	< 0.50	< 0.50
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05
Manganese (Dissolved)	U	1455	µg/l	0.50	69	200	78
Nickel (Dissolved)	U	1455	µg/l	0.50	9.9	2.6	0.72
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Vanadium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	< 2.5	< 2.5	< 2.5
Chromium (Hexavalent)	U	1490	µg/l	20	< 20	< 20	< 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	2.1	2.0	< 2.0
Naphthalene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		23-02379	23-02379	23-02379
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1579586	1579587	1579588
Order No.: 2001			Client Sample Ref.:		28	19	22
			Client Sample ID.:		#6188374020240028	#7397136831360019	#5355956785070022
			Sample Location:		S1-BH102	S1-BH121	S1-BH122
			Sample Type:		WATER	WATER	WATER
			Top Depth (m):		8.72	3.3	1.76
			Date Sampled:		24-Jan-2023	24-Jan-2023	24-Jan-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Total Of 16 PAH's	U	1800	µg/l	2.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

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<	"less than"
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LOD	Limit of detection

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All results are expressed on a dry weight basis

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For all other tests the samples were dried at < 37°C prior to analysis
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Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	23-02544-2		
Initial Date of Issue:	06-Feb-2023	**Date of Re-Issue:**	06-Feb-2023
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	27-Jan-2023
Order No.:	2001	**Date Instructed:**	27-Jan-2023
No. of Samples:	1		
Turnaround (Wkdays):	5	**Results Due:**	02-Feb-2023
Date Approved:	06-Feb-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Water

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		23-02544
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1580262
Order No.: 2001			Client Sample Ref.:		13
			Client Sample ID.:		#60674733650 10013
			Sample Location:		S1-BH114C
			Sample Type:		WATER
			Top Depth (m):		0.0
			Date Sampled:		26-Jan-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
pH	U	1010		N/A	7.6
Sulphate	U	1220	mg/l	1.0	19
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	mg/l	0.050	< 0.050
Calcium (Dissolved)	U	1455	mg/l	2.00	170
Total Hardness as CaCO3	U	1270	mg/l	15	770
Arsenic (Dissolved)	U	1455	µg/l	0.20	0.33
Boron (Dissolved)	U	1455	µg/l	10.0	18
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	µg/l	0.50	0.56
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05
Manganese (Dissolved)	U	1455	µg/l	0.50	700
Nickel (Dissolved)	U	1455	µg/l	0.50	9.8
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	< 0.50
Vanadium (Dissolved)	U	1455	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	6.7
Chromium (Hexavalent)	U	1490	µg/l	20	< 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	< 2.0
Naphthalene	U	1800	µg/l	0.10	< 0.10
Acenaphthylene	U	1800	µg/l	0.10	< 0.10
Acenaphthene	U	1800	µg/l	0.10	< 0.10
Fluorene	U	1800	µg/l	0.10	< 0.10
Phenanthrene	U	1800	µg/l	0.10	< 0.10
Anthracene	U	1800	µg/l	0.10	< 0.10
Fluoranthene	U	1800	µg/l	0.10	< 0.10
Pyrene	U	1800	µg/l	0.10	< 0.10
Benzo[a]anthracene	U	1800	µg/l	0.10	< 0.10
Chrysene	U	1800	µg/l	0.10	< 0.10
Benzo[b]fluoranthene	U	1800	µg/l	0.10	< 0.10
Benzo[k]fluoranthene	U	1800	µg/l	0.10	< 0.10
Benzo[a]pyrene	U	1800	µg/l	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	µg/l	0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	µg/l	0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	µg/l	0.10	< 0.10

Results - Water

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		23-02544
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1580262
Order No.: 2001			Client Sample Ref.:		13
			Client Sample ID.:		#60674733650 10013
			Sample Location:		S1-BH114C
			Sample Type:		WATER
			Top Depth (m):		0.0
			Date Sampled:		26-Jan-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Total Of 16 PAH's	U	1800	µg/l	2.0	< 2.0
Total Phenols	U	1920	mg/l	0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
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1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

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All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

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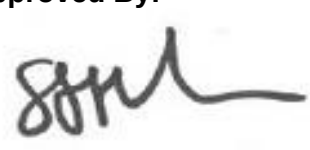
Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	23-02547-2		
Initial Date of Issue:	06-Feb-2023	**Date of Re-Issue:**	06-Feb-2023
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	27-Jan-2023
Order No.:	2001	**Date Instructed:**	27-Jan-2023
No. of Samples:	2		
Turnaround (Wkdays):	5	**Results Due:**	02-Feb-2023
Date Approved:	06-Feb-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Water

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		23-02547	23-02547
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1580265	1580266
Order No.: 2001			Client Sample Ref.:		#87172713357 40036	#11741070361 60002
			Client Sample ID.:		36	2
			Sample Location:		S1-BH103	SOP003.16
			Sample Type:		WATER	WATER
			Top Depth (m):		5.54	13.6
			Date Sampled:		25-Jan-2023	25-Jan-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
pH	U	1010		N/A	8.0	7.7
Sulphate	U	1220	mg/l	1.0	250	160
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	mg/l	0.050	< 0.050	< 0.050
Calcium (Dissolved)	U	1455	mg/l	2.00	340	290
Total Hardness as CaCO3	U	1270	mg/l	15	1500	1100
Arsenic (Dissolved)	U	1455	µg/l	0.20	0.39	0.51
Boron (Dissolved)	U	1455	µg/l	10.0	41	53
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05	< 0.05
Manganese (Dissolved)	U	1455	µg/l	0.50	920	780
Nickel (Dissolved)	U	1455	µg/l	0.50	2.4	2.1
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50
Vanadium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	4.8	11
Chromium (Hexavalent)	U	1490	µg/l	20	< 20	< 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	< 2.0	< 2.0
Naphthalene	U	1800	µg/l	0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	µg/l	0.10	< 0.10	< 0.10
Acenaphthene	U	1800	µg/l	0.10	< 0.10	< 0.10
Fluorene	U	1800	µg/l	0.10	< 0.10	< 0.10
Phenanthrene	U	1800	µg/l	0.10	< 0.10	< 0.10
Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10
Fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10
Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10
Chrysene	U	1800	µg/l	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	µg/l	0.10	< 0.10	< 0.10

Results - Water

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		23-02547	23-02547
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1580265	1580266
Order No.: 2001			Client Sample Ref.:		#8717271335740036	#1174107036160002
			Client Sample ID.:		36	2
			Sample Location:		S1-BH103	SOP003.16
			Sample Type:		WATER	WATER
			Top Depth (m):		5.54	13.6
			Date Sampled:		25-Jan-2023	25-Jan-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Total Of 16 PAH's	U	1800	µg/l	2.0	< 2.0	< 2.0
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

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All results are expressed on a dry weight basis

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All Asbestos testing is performed at the indicated laboratory
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Sample Deviation Codes

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D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

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Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
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Final Report

Report No.:	23-03304-1		
Initial Date of Issue:	13-Feb-2023		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	02-Feb-2023
Order No.:	2001	**Date Instructed:**	02-Feb-2023
No. of Samples:	2		
Turnaround (Wkdays):	5	**Results Due:**	08-Feb-2023
Date Approved:	13-Feb-2023		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - Water

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services			**Chemtest Job No.:**		23-03304	23-03304
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1583195	1583196
Order No.: 2001			Client Sample Ref.:		1	1
			Sample Location:		SW4	SW5
			Sample Type:		WATER	WATER
			Top Depth (m):		0.00	0.00
			Date Sampled:		31-Jan-2023	31-Jan-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
pH	U	1010		N/A	8.2	8.4
Sulphate	U	1220	mg/l	1.0	< 1.0	< 1.0
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	mg/l	0.050	< 0.050	< 0.050
Calcium (Dissolved)	U	1455	mg/l	2.00	22	21
Total Hardness as CaCO3	U	1270	mg/l	15	160	150
Arsenic (Dissolved)	U	1455	µg/l	0.20	0.68	0.68
Boron (Dissolved)	U	1455	µg/l	10.0	61	56
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	14	22
Copper (Dissolved)	U	1455	µg/l	0.50	1.3	1.2
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05	< 0.05
Manganese (Dissolved)	U	1455	µg/l	0.50	1.3	1.2
Nickel (Dissolved)	U	1455	µg/l	0.50	5.3	5.3
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	2.2	2.6
Vanadium (Dissolved)	U	1455	µg/l	0.50	0.60	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	< 2.5	< 2.5
Chromium (Hexavalent)	U	1490	µg/l	20	< 20	< 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	2.8	2.7
Naphthalene	U	1800	µg/l	0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	µg/l	0.10	< 0.10	< 0.10
Acenaphthene	U	1800	µg/l	0.10	< 0.10	< 0.10
Fluorene	U	1800	µg/l	0.10	< 0.10	< 0.10
Phenanthrene	U	1800	µg/l	0.10	< 0.10	< 0.10
Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10
Fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10
Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10
Chrysene	U	1800	µg/l	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	µg/l	0.10	< 0.10	< 0.10
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1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

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Charges may apply to extended sample storage

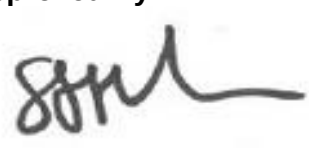
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customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	23-03503-2		
Initial Date of Issue:	13-Feb-2023	**Date of Re-Issue:**	13-Feb-2023
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	**Date Received:**	03-Feb-2023
Order No.:	2001	**Date Instructed:**	06-Feb-2023
No. of Samples:	5		
Turnaround (Wkdays):	5	**Results Due:**	10-Feb-2023
Date Approved:	13-Feb-2023		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - Water

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services		**Chemtest Job No.:**			23-03503	23-03503	23-03503	23-03503	23-03503
Quotation No.: Q22-28967		**Chemtest Sample ID.:**			1583887	1583888	1583889	1583890	1583891
Order No.: 2001		Client Sample Ref.:			29	37	31	20	23
		Client Sample ID.:			#6188374020240029	#0831492608790037	#5362554656030031	#7397136831360020	#5355956785070023
		Sample Location:			S1-BH102	S1-BH105	S1-BH113	S1-BH121	S1-BH122
		Sample Type:			WATER	WATER	WATER	WATER	WATER
		Top Depth (m):			8.85	15.36	5.54	3.32	1.76
		Date Sampled:			01-Feb-2023	01-Feb-2023	01-Feb-2023	01-Feb-2023	01-Feb-2023
		Time Sampled:			11:31	14:51	15:32	10:55	12:19
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
pH	U	1010		N/A	7.6	7.5	7.4	7.6	7.5
Sulphate	U	1220	mg/l	1.0	130	150	290	34	270
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium (Dissolved)	U	1455	mg/l	2.00	57	88	120	62	98
Total Hardness as CaCO3	U	1270	mg/l	15	210	370	490	250	440
Arsenic (Dissolved)	U	1455	µg/l	0.20	0.92	0.33	< 0.20	< 0.20	< 0.20
Boron (Dissolved)	U	1455	µg/l	10.0	46	38	62	30	42
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	2.4	1.7	2.0	1.9	1.9
Copper (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Manganese (Dissolved)	U	1455	µg/l	0.50	370	2000	1500	720	560
Nickel (Dissolved)	U	1455	µg/l	0.50	9.6	6.1	9.4	2.8	1.0
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	2.6	2.4	1.7	1.8	2.3
Vanadium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	4.6	< 2.5	4.3	3.7	< 2.5
Chromium (Hexavalent)	U	1490	µg/l	20	[B] < 20	[B] < 20	[B] < 20	[B] < 20	[B] < 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Naphthalene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services		**Chemtest Job No.:**			23-03503	23-03503	23-03503	23-03503	23-03503
Quotation No.: Q22-28967		**Chemtest Sample ID.:**			1583887	1583888	1583889	1583890	1583891
Order No.: 2001		Client Sample Ref.:			29	37	31	20	23
		Client Sample ID.:			#6188374020240029	#0831492608790037	#5362554656030031	#7397136831360020	#5355956785070023
		Sample Location:			S1-BH102	S1-BH105	S1-BH113	S1-BH121	S1-BH122
		Sample Type:			WATER	WATER	WATER	WATER	WATER
		Top Depth (m):			8.85	15.36	5.54	3.32	1.76
		Date Sampled:			01-Feb-2023	01-Feb-2023	01-Feb-2023	01-Feb-2023	01-Feb-2023
		Time Sampled:			11:31	14:51	15:32	10:55	12:19
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Benzo[g,h,i]perylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	1800	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1583887	29	#6188374020240029	S1-BH102	01-Feb-2023	B	Coloured Winchester 1000ml
1583887	29	#6188374020240029	S1-BH102	01-Feb-2023	B	EPA Vial 40ml
1583887	29	#6188374020240029	S1-BH102	01-Feb-2023	B	Plastic Bottle 1000ml
1583888	37	#0831492608790037	S1-BH105	01-Feb-2023	B	Coloured Winchester 1000ml
1583888	37	#0831492608790037	S1-BH105	01-Feb-2023	B	EPA Vial 40ml
1583888	37	#0831492608790037	S1-BH105	01-Feb-2023	B	Plastic Bottle 1000ml
1583889	31	#5362554656030031	S1-BH113	01-Feb-2023	B	Coloured Winchester 1000ml
1583889	31	#5362554656030031	S1-BH113	01-Feb-2023	B	EPA Vial 40ml
1583889	31	#5362554656030031	S1-BH113	01-Feb-2023	B	Plastic Bottle 1000ml
1583890	20	#7397136831360020	S1-BH121	01-Feb-2023	B	Coloured Winchester 1000ml
1583890	20	#7397136831360020	S1-BH121	01-Feb-2023	B	EPA Vial 40ml
1583890	20	#7397136831360020	S1-BH121	01-Feb-2023	B	Plastic Bottle 1000ml
1583891	23	#5355956785070023	S1-BH122	01-Feb-2023	B	Coloured Winchester 1000ml
1583891	23	#5355956785070023	S1-BH122	01-Feb-2023	B	EPA Vial 40ml
1583891	23	#5355956785070023	S1-BH122	01-Feb-2023	B	Plastic Bottle 1000ml

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-03928-1
Initial Date of Issue:	13-Feb-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt
Project	G22069 Global Centre of Rail Excellence
Quotation No.:	Q22-28967
Order No.:	2001
No. of Samples:	7
Turnaround (Wkdays):	5
Date Approved:	13-Feb-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	07-Feb-2023
Date Instructed:	07-Feb-2023
Results Due:	13-Feb-2023

Results - Water

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services		**Chemtest Job No.:**			23-03928	23-03928	23-03928	23-03928	23-03928	23-03928	23-03928
Quotation No.: Q22-28967		**Chemtest Sample ID.:**			1586085	1586086	1586087	1586088	1586089	1586090	1586091
Order No.: 2001		Client Sample Ref.:			45	37	26	3	2	2	2
		Client Sample ID.:			#47697372570 40045	#87172713357 40037	#36545307578 70026	#11741070361 60003	#16234554497 60002	#24248876247 60002	#51585405064 50002
		Sample Location:			S1-BH101	S1-BH103	S1-BH112	SOP003.16	SW1	SW2	SW3
		Sample Type:			WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Top Depth (m):			13.51	5.52	15.00	13.56	0.00	0.00	0.00
		Date Sampled:			02-Feb-2023	02-Feb-2023	02-Feb-2023	02-Feb-2023	02-Feb-2023	02-Feb-2023	02-Feb-2023
		Time Sampled:			13:10	9:44	12:10	10:32	14:33	15:05	15:42
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
pH	U	1010		N/A	8.1	8.1	7.9	7.3	8.5	8.6	8.4
Sulphate	U	1220	mg/l	1.0	130	240	170	170	110	130	79
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium (Dissolved)	U	1455	mg/l	2.00	60	78	69	71	41	32	34
Total Hardness as CaCO3	U	1270	mg/l	15	320	350	280	280	210	190	300
Arsenic (Dissolved)	U	1455	µg/l	0.20	< 0.20	< 0.20	< 0.20	1.1	0.72	< 0.20	< 0.20
Boron (Dissolved)	U	1455	µg/l	10.0	51	47	54	55	51	54	18
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	0.18	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	2.6	1.5	1.2	1.2	2.5	2.7	1.3
Copper (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.56	0.55	0.57
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Manganese (Dissolved)	U	1455	µg/l	0.50	350	830	1600	870	5.4	6.4	11
Nickel (Dissolved)	U	1455	µg/l	0.50	0.91	2.3	2.6	1.5	3.3	4.4	1.0
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	2.7	2.9	3.1	0.73	0.97	1.2	1.4
Vanadium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	< 2.5	< 2.5	12	8.8	< 2.5	< 2.5	3.9
Chromium (Hexavalent)	U	1490	µg/l	20	[B] < 20	[B] < 20	[B] < 20	[B] < 20	[B] < 20	[B] < 20	[B] < 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.1	2.3	2.2
Naphthalene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services			**Chemtest Job No.:**		23-03928	23-03928	23-03928	23-03928	23-03928	23-03928	23-03928
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1586085	1586086	1586087	1586088	1586089	1586090	1586091
Order No.: 2001			Client Sample Ref.:		45	37	26	3	2	2	2
			Client Sample ID.:		#4769737257040045	#8717271335740037	#3654530757870026	#1174107036160003	#1623455449760002	#2424887624760002	#5158540506450002
			Sample Location:		S1-BH101	S1-BH103	S1-BH112	SOP003.16	SW1	SW2	SW3
			Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER
			Top Depth (m):		13.51	5.52	15.00	13.56	0.00	0.00	0.00
			Date Sampled:		02-Feb-2023	02-Feb-2023	02-Feb-2023	02-Feb-2023	02-Feb-2023	02-Feb-2023	02-Feb-2023
			Time Sampled:		13:10	9:44	12:10	10:32	14:33	15:05	15:42
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
Total Of 16 PAH's	U	1800	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1586085	45	#4769737257040045	S1-BH101	02-Feb-2023	B	Coloured Winchester 1000ml
1586085	45	#4769737257040045	S1-BH101	02-Feb-2023	B	EPA Vial 40ml
1586085	45	#4769737257040045	S1-BH101	02-Feb-2023	B	Plastic Bottle 1000ml
1586086	37	#8717271335740037	S1-BH103	02-Feb-2023	B	Coloured Winchester 1000ml
1586086	37	#8717271335740037	S1-BH103	02-Feb-2023	B	EPA Vial 40ml
1586086	37	#8717271335740037	S1-BH103	02-Feb-2023	B	Plastic Bottle 1000ml
1586087	26	#3654530757870026	S1-BH112	02-Feb-2023	B	Coloured Winchester 1000ml
1586087	26	#3654530757870026	S1-BH112	02-Feb-2023	B	EPA Vial 40ml
1586087	26	#3654530757870026	S1-BH112	02-Feb-2023	B	Plastic Bottle 1000ml
1586088	3	#1174107036160003	SOP003.16	02-Feb-2023	B	Coloured Winchester 1000ml
1586088	3	#1174107036160003	SOP003.16	02-Feb-2023	B	EPA Vial 40ml
1586088	3	#1174107036160003	SOP003.16	02-Feb-2023	B	Plastic Bottle 1000ml
1586089	2	#1623455449760002	SW1	02-Feb-2023	B	Coloured Winchester 1000ml
1586089	2	#1623455449760002	SW1	02-Feb-2023	B	EPA Vial 40ml
1586089	2	#1623455449760002	SW1	02-Feb-2023	B	Plastic Bottle 1000ml
1586090	2	#2424887624760002	SW2	02-Feb-2023	B	Coloured Winchester 1000ml
1586090	2	#2424887624760002	SW2	02-Feb-2023	B	EPA Vial 40ml
1586090	2	#2424887624760002	SW2	02-Feb-2023	B	Plastic Bottle 1000ml
1586091	2	#5158540506450002	SW3	02-Feb-2023	B	Coloured Winchester 1000ml
1586091	2	#5158540506450002	SW3	02-Feb-2023	B	EPA Vial 40ml
1586091	2	#5158540506450002	SW3	02-Feb-2023	B	Plastic Bottle 1000ml

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

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U/S	Unsuitable Sample
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<	"less than"
>	"greater than"
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Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

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C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-05000-1
Initial Date of Issue:	17-Feb-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt
Project	G22069 Global Centre of Rail Excellence
Quotation No.:	Q22-28967
Order No.:	2001
No. of Samples:	3
Turnaround (Wkdays):	3
Date Approved:	17-Feb-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	15-Feb-2023
Date Instructed:	15-Feb-2023
Results Due:	17-Feb-2023

Results - Water

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services		**Chemtest Job No.:**			23-05000	23-05000	23-05000
Quotation No.: Q22-28967		**Chemtest Sample ID.:**			1590125	1590126	1590127
Order No.: 2001		Client Sample Ref.:			30	21	24
		Client Sample ID.:			#6188374020240030	#7397136831360021	#5355956785070024
		Sample Location:			S1-BH102	S1-BH121	S1-BH122
		Sample Type:			WATER	WATER	WATER
		Top Depth (m):			8.75	3.28	1.76
		Date Sampled:			13-Feb-2023	13-Feb-2023	13-Feb-2023
		Time Sampled:			12:08	11:17	14:36
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
pH	U	1010		N/A	4.2	4.1	4.1
Sulphate	U	1220	mg/l	1.0	76	60	260
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050
Calcium (Dissolved)	U	1455	mg/l	2.00	35	69	110
Total Hardness as CaCO3	U	1270	mg/l	15	130	270	440
Arsenic (Dissolved)	U	1455	µg/l	0.20	1.5	< 0.20	< 0.20
Boron (Dissolved)	U	1455	µg/l	10.0	660	500	720
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	3.8	3.1	2.8
Copper (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05
Manganese (Dissolved)	U	1455	µg/l	0.50	220	750	820
Nickel (Dissolved)	U	1455	µg/l	0.50	3.9	1.0	< 0.50
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Vanadium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	< 2.5	3.1	7.1
Chromium (Hexavalent)	U	1490	µg/l	20	< 20	< 20	< 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	< 2.0	< 2.0	< 2.0
Naphthalene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services			**Chemtest Job No.:**		23-05000	23-05000	23-05000
Quotation No.: Q22-28967			**Chemtest Sample ID.:**		1590125	1590126	1590127
Order No.: 2001			Client Sample Ref.:		30	21	24
			Client Sample ID.:		#6188374020240030	#7397136831360021	#5355956785070024
			Sample Location:		S1-BH102	S1-BH121	S1-BH122
			Sample Type:		WATER	WATER	WATER
			Top Depth (m):		8.75	3.28	1.76
			Date Sampled:		13-Feb-2023	13-Feb-2023	13-Feb-2023
			Time Sampled:		12:08	11:17	14:36
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Total Of 16 PAH's	U	1800	µg/l	2.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-05200-1
Initial Date of Issue:	20-Feb-2023
Client	Jackson Geo Services
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA
Contact(s):	Adam Putt
Project	G22069 Global Centre of Rail Excellence
Quotation No.:	Q22-28967
Order No.:	2001
No. of Samples:	8
Turnaround (Wkdays):	3
Date Approved:	20-Feb-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	16-Feb-2023
Date Instructed:	16-Feb-2023
Results Due:	20-Feb-2023

Results - Water

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services		**Chemtest Job No.:**			23-05200	23-05200	23-05200	23-05200	23-05200	23-05200	23-05200	23-05200
Quotation No.: Q22-28967		**Chemtest Sample ID.:**			1590940	1590941	1590942	1590943	1590944	1590945	1590946	1590947
Order No.: 2001		Client Sample Ref.:			46	38	38	27	4	3	3	3
		Client Sample ID.:			476973725704 0046	871727133574 0038	083149260879 0038	365453075787 0027	117410703616 004	162345544976 0003	242488762476 0003	515854050645 0003
		Sample Location:			S1-BH101	S1-BH103	S1-BH105	S1-BH112	SOP003.16	SW1	SW2	SW3
		Sample Type:			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Top Depth (m):			13.47	5.52	15.36	15.17	13.66	0.00	0.00	0.00
		Date Sampled:			14-Feb-2023	14-Feb-2023	14-Feb-2023	14-Feb-2023	14-Feb-2023	14-Feb-2023	14-Feb-2023	14-Feb-2023
		Time Sampled:			15:04	10:00	10:42	14:23	12:43	15:35	15:23	15:56
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
pH	U	1010		N/A	7.0	7.0	4.8	5.5	5.9	7.0	7.5	7.6
Sulphate	U	1220	mg/l	1.0	110	200	100	180	150	110	120	87
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium (Dissolved)	U	1455	mg/l	2.00	59	78	82	73	74	49	29	42
Total Hardness as CaCO3	U	1270	mg/l	15	320	350	330	290	280	240	190	340
Arsenic (Dissolved)	U	1455	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Boron (Dissolved)	U	1455	µg/l	10.0	45	46	32	45	54	61	61	18
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11	< 0.11	0.16	< 0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	2.2	1.2	1.4	< 0.50	0.79	2.8	2.8	1.3
Copper (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.1	< 0.50	< 0.50
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Manganese (Dissolved)	U	1455	µg/l	0.50	250	390	900	1300	740	15	20	66
Nickel (Dissolved)	U	1455	µg/l	0.50	0.57	2.5	2.0	1.5	< 0.50	4.3	5.1	1.2
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Vanadium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	2.6	< 2.5	< 2.5	2.7	< 2.5	31	< 2.5	9.0
Chromium (Hexavalent)	U	1490	µg/l	20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.1	< 2.0	< 2.0
Naphthalene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services		**Chemtest Job No.:**			23-05200	23-05200	23-05200	23-05200	23-05200	23-05200	23-05200	23-05200
Quotation No.: Q22-28967		**Chemtest Sample ID.:**			1590940	1590941	1590942	1590943	1590944	1590945	1590946	1590947
Order No.: 2001		Client Sample Ref.:			46	38	38	27	4	3	3	3
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		Sample Location:			S1-BH101	S1-BH103	S1-BH105	S1-BH112	SOP003.16	SW1	SW2	SW3
		Sample Type:			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Top Depth (m):			13.47	5.52	15.36	15.17	13.66	0.00	0.00	0.00
		Date Sampled:			14-Feb-2023	14-Feb-2023	14-Feb-2023	14-Feb-2023	14-Feb-2023	14-Feb-2023	14-Feb-2023	14-Feb-2023
		Time Sampled:			15:04	10:00	10:42	14:23	12:43	15:35	15:23	15:56
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Total Of 16 PAH's	U	1800	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.
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1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

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If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Global Centre of Rail Excellence (GCRE)

Stage 2 Ground Investigation

Factual Report

G23012

September 2023

GCRE Limited

Global Centre of Rail Excellence
Onllywn
Neath Port Talbot
United Kingdom
SA10 9HN

Unit B3
Fram Enterprise Centre at Parc Busnes Edwards
Llantrisant
Pontyclun
CF72 8QZ

www.jacksongeo.co.uk

JACKSON GEO SERVICES

Report Control Sheet

Report Number

G23012

Date of Issue

September 2023

Site Address

Onllwyn Distribution Centre, Onllwyn, Neath, SA10 9HN

Report Preparation

Revision	Writer	Approver
Rev 0	Adam Putt BSc (Hons) FGS CGeol CSci EurGeol MIEnvSc Registered Ground Engineering Professional	James Power BSc (Hons) FGS
	Signature 	Signature 
Rev 1	James Power BSc (Hons) FGS	Adam Putt BSc (Hons) FGS CGeol CSci EurGeol MIEnvSc Registered Ground Engineering Professional
	Signature 	Signature 

Jackson Geo Services is a trading name of Jackson Drilling Holdings Limited – registered company number 06919550.

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1.3 Scope of Works 1
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1 Introduction

1.1 General

GCRE entered into a contract with Jackson Geo Services (JGS) to complete a ground investigation at the Global Centre of Rail Excellence (GCRE) site (hereafter referred to as The Site). The contract was agreed during March 2023. As per the Construction Design and Management (CDM) Regulations (2015), parties were attributed the following responsibilities:

Table 1: Responsibility Under CDM

Client	GCRE Limited
Designer	Atkins (SNC-Lavalin)
Principal Contractor	Walters UK Limited
Sub-Contractor	Jackson Geo Services

1.2 Proposed Development

The site is proposed to be developed as a new rail testing and training centre, with the proposed development comprising a rail testing, storage and maintenance facility. The Stage 2 proposed works associated to this ground investigation comprise earthworks for the new proposed track layout which will comprise the construction of a new rail track and associated infrastructure.

1.3 Scope of Works

The scope of investigation was defined by Atkins and is detailed within a series of documents referenced as follows:

- GCRE001-AWJV-EW-XX-SP-GE-00001 3.0 (dated November 2022)
- GCRE001-AWJV-EW-XX-SP-GE-00004 4.0 (dated December 2022)
- GCRE001-AWJV-EW-XX-SP-GE-00001 2.0 (dated May 2023)

The documents, when read in conjunction with one another, comprise the full project specification and are hereafter referred to as The Specification within this document.

In summary, the scope of investigation comprised:

- Dynamic Windowless Sampling
- Sonic Sampling
- Sonic Sampling with Rotary Follow-on Coring
- Dynamic Sampling with Rotary Follow-on Coring
- Rotary open holing with Rotary Follow-on Coring
- Rotary open holing (probe holing) for mine workings
- Machine Excavated Trial Pitting
- In-situ Testing
- Geotechnical Testing
- Geoenvironmental Testing
- Factual Reporting
- Production of Digital Data in AGS 4 format

1.4 Limitations

The project has been undertaken in accordance with The Specification and current standards and guidance as applicable (see References).

This report presents the observations made during desk based studies and the fieldwork period on a factual basis. Any observations within the report are limited to those which can be made based upon the information available at the time.

JGS consider the contents of the report have been produced accurately and the data presented is representative of the site conditions at the time. JGS assumes any third party data included in the report is accurate and correct. No responsibility is accepted by JGS for inaccuracies within third party data.

This report has been written to The Specification and is for use only in this context by the named Client and their advisers and is confidential to the named Client.

This report presents information on ground conditions, including groundwater, gas and contamination concentrations and soil properties, which are based upon the available dataset for the investigation. This dataset is considered representative of the site as whole, however is limited by the locations of investigation. Ground conditions, in particular Made Ground, can vary substantially and JGS do not accept responsibility for local unforeseen changes. Furthermore, groundwater, gas concentrations and chemical concentration can vary with time, atmospheric conditions and spatially dependent upon a variety of confining factors.

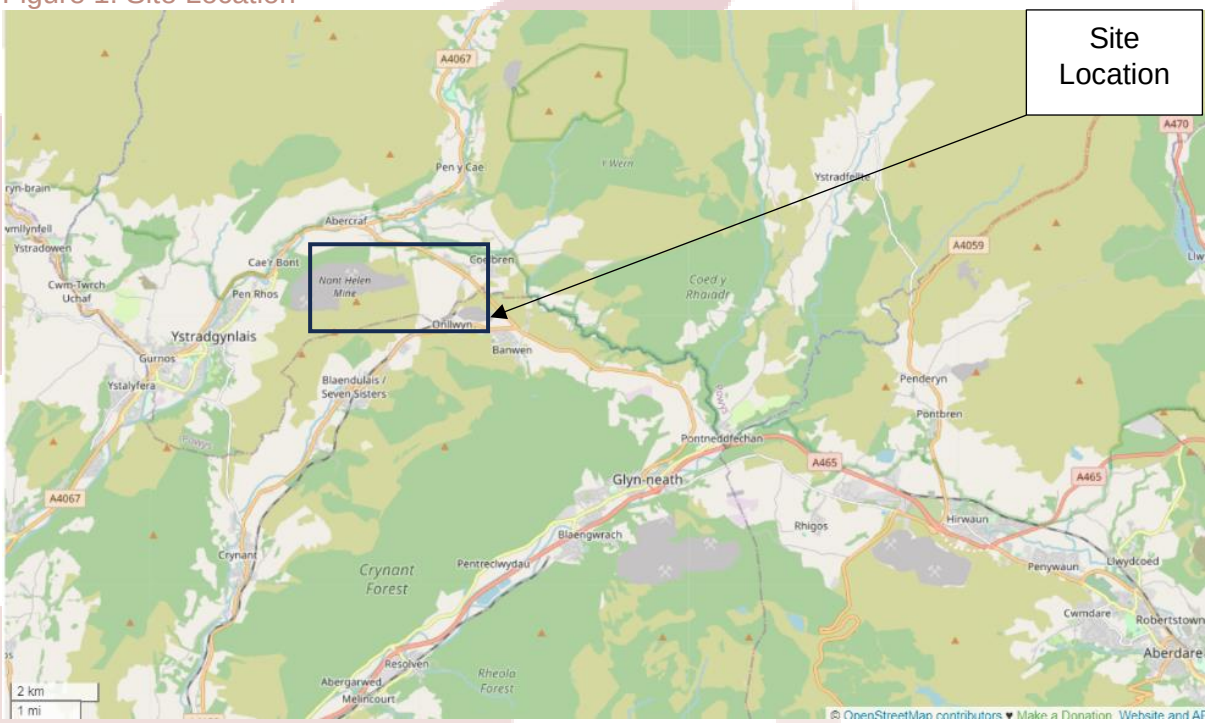
Consideration should be made as to the relevance of the information if the dataset is to be utilised after a significant period of time has elapsed from the date of investigation.

2 The Site

2.1 Site Location

The Site is centred at National Grid Reference (NGR) SN 852 104 approximately 325 m northeast of the hamlet of Dyffryn Cellwen. The location of The Site is shown in Figure 1:

Figure 1: Site Location



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2.2 Current Use

The Site comprises the former Onllwyn Washery and Nant Helen Open Cast and their associated areas. It is oval in shape and measures approximately 3.8 km (west to east) and 1.7 km (north to south) along its longest axes. For descriptive purposes the site has been divided into the following eight sections,

- The Washery
- Delta Junction
- Western Curve – subdivided in to,
  - Common Land
  - Old Opencast
- The Forestry
- Northern Embankment
- Eastern Curve
- Inner Loop North and South
- Nant Helen

The Washery

The Washery has largely been demolished with many of the rail tracks, buildings, conveyors and related concrete slabs and basements having been removed. There are several structures onsite relating to its previous use comprising a mixture of brick structures (substation and laboratory) and metal structures (fitting shops, stores, and associated buildings). Although The Washery steps up in places (west to east) it is predominantly flat rising very gently from west to east. The exception to this is at the northern most point of The Washery where it rises moderately steeply from south to north. There are numerous drainage channels around the site that flow freely (east to west) during periods of rainfall. There are unnamed watercourses along the north and west of the site that feed in to (occasionally via settlement ponds) the Avon Dulais. In the south of The Washery are three brick buildings comprising a bath house, a main reception and a visitor's centre.

Delta Junction

The Delta Junction is reached by following the haul road at the western most point of The Washery. It runs flat and adjacent to the rail track that once serviced The Site running west southwest where it passes under Onllwyn Road. After approximately 220 m the road turns steeply uphill north northwest to a T-junction. To the right is access to Onllwyn Road and left is a continuation of the haul road leading to Nant Helen which heads predominantly north with the ground rising moderately to steeply in the same direction. The haul road is flanked on both sides by grazing land. Approximately halfway between the T-junction and Nant Helen there are two relatively large settlement ponds on the western side of the road. It is just below these that the Western Curve can be accessed.

Western Curve

Access is via a well-established farm track immediately below the settlement ponds adjacent to the haul road and heads west southwest for approximately 1.90 km and rising gently as it contours around the hillside. At this point the track passes and ancient scheduled monument (historic tramway) and heads in a northern direction rising moderately to steeply up hill. The land to the north and east of the track is predominantly land associated with the opencast mining that has been restored to grassland used by commoners for grazing. The land to the south and west of the track is also land used by commoners for the purpose of grazing their livestock. At its highest point it the track crosses from the Common Land into the Old Opencast via a gate and drops steeply at first to the north into the barren landscape of the partially restored opencast. The Western Curve then plateaus before dropping moderately to the east where The Forestry is accessed.

The Forestry

The Forestry is a moderately sloping track that heads down from the opencast in a generally eastern direction through an area of previous opencast that has been restored and is now a mature fir woodland. There are several spurs upslope to the north and downslope to the south that have been created to allow for drilling access.

Northern Embankment

The Northern Embankment is to the east of The Forestry and can be split in to two areas. The eastern most area is open grassland that is used for grazing of livestock and slopes steeply downhill from the south to the north. The western most area which is divided from the previous area by a non-metaled access track and comprises a boggy grassed moorland. Parts of the site show signs that the Northern Embankment was once used as a tip for spoil (likely from

mining at Nant Helen), however much of the eastern area is covered in thick moorland type grass with areas of bog. The area again slopes steeply from south to north with a track in the centre which allows access to six fields with boundaries ranging from mesh fencing to hedgerows and banks.

Eastern Curve
Again, an area of former opencast the Eastern Curve is accessed via the Nant Helen access road or via Onllwyn Road. The area slopes moderately downhill in all directions from the east and is split into a number of fields and is currently used for the grazing of livestock.

Inner Loop North and South
Bisected by the haul road that links The Washery to Nant Helen, the Inner Loop South sits to the west and the Inner Loop North to the east. Predominantly restored opencast the land is now grassland used for the grazing of livestock. The land generally rises moderately to steeply south to north.

Nant Helen
Located roughly at the centre of The Site is Nant Helen where the Celtic Energy former site offices and associated buildings are situated flanking a 60 x 70 m carpark. Immediately to the north of the carpark are fuel storage tanks beyond which are fitting sheds and their associated buildings and storage containers. Of the many haul roads that radiate from the offices the one which runs west for approximately 600 m leads gently downhill to another fitting shed associated with the repair of the heavy plant from the former opencast. The land to the north of this haul road is currently being used to store any remaining heavy plant from the now abandoned mining operations. There are also three man-made trial embankments created during a previous phase of GCRE works.

There are numerous waterways, drainage channels and ponds situated around the site. The vast majority, if not all, of the ponds are probably man-made and associated with the various tasks of mining and preparing coal. Drainage and waterways are a mixture of natural and man-made. Again, with most of them probably associated with the former mining activities at the site. There is a clear watershed at The Site with anything draining north and west leading to the Avon Tawe whilst anything draining south and east leads to the Avon Dulais.

The Site to the north and the east is bound by the A4221 which heads southeast to northwest where it leads to the A4067 and the Tawe Valley. To the north are the settlements of Caehopkin and Abercraf, beyond which is the Upper Tawe Valley and the Bannau Byrcheiniog National Park. To the east is the small settlement of Coelbren beyond which lies grassland and woodland leading to the Bannau Byrcheiniog National Park. The south of the site is bound by the A4109 which leads to Seven Sisters and follows the Dulais Valley, beyond which is fields and grassland used for farming and the grazing of livestock. The west of The Site is bound by open grassland, fields and woodland, beyond which is the small town of Ystradgynlais and the Tawe Valley.

2.3 Anticipated Ground Conditions

The anticipated ground conditions have been assessed using the data available on the British Geological Survey (BGS) GeoIndex (onshore) Map Viewer (2023) and the published BGS map (map no. 231, 1979), these are summarised within Table 2:

Table 2: Anticipated Ground Conditions

Artificial Ground	Worked Ground found across the majority of the site.	Worked Ground (Undivided) - Void
Superficial Deposits	Peat in northern section of the washery and around the western most fitting shed associated with Nant Helen. Anecdotal evidence that there is Peat present on the Western Curve where the Common Land meets the Opencast. Till in areas of The Washery, Delta Junction, Western Curve, Northern Embankment, Eastern Curve and Inner Loop North and South.	Peat Till, Devensian - Diamicton
Solid Geology	South Wales Middle Coal Measures Formation underlies the majority of the site. South Wales Lower Coal Measure Formation in the east underlies the Inner Loop North, Eastern Curve and the eastern part of The Washery.	Mudstone, Siltstone and Sandstone Mudstone, Siltstone and Sandstone

Areas of artificial ground, considered to be associated with the former opencast and washery and related mining activity are located across the majority of the site.

There are four faults shown on the GeoIndex (onshore) Viewer. The eastern most one is unnamed and trends south south-east to north north-west, through the washery. Located approximately 730 m west is Chapel Fault which trends in the same direction. Approximately 730 m west again is Pwllau Bach Fault which trends across site in the same direction as previous. The fourth fault is unnamed and trends north to south through The Forestry turning southwest into the Old Opencast.

It is known that mine workings associated with the South Wales Coal Measures are located beneath the site. There are numerous coal seams that run through the site ranging from the SOAP seam in the Middle Coal Measures Formation through to the RHYD seam in the Lower Coal Measures Formation.

The Department for Environment, Food & Rural Affairs (DEFRA) MAGIC mapping system (2021) indicates The Site is located within an area where the bedrock is classified as a secondary A aquifer. The superficial (peat) deposits are not shown as being classified.

3 Fieldwork

3.1 General Information

The fieldwork was completed between 27 March and 16 June 2023.

The ground investigation was undertaken in accordance with BS5930:2015+A1:2020. The works were supervised by trained and competent JGS engineers.

The layout of the investigation locations and their unique identifiers were determined by Atkins and are listed within Schedule 2 of The Specification. This information was provided to JGS prior to works commencing onsite. Walters UK Limited set out the locations onsite using GPS survey equipment to set out the location to the co-ordinates provided.

Service drawings were provided to JGS by Walters UK Limited prior to works commencing on site and the location of the proposed investigation locations was checked against the service drawings prior to excavation.

Prior to excavation, each exploratory hole location was scanned using a Cable Avoidance Tool (CAT) to confirm the absence of services beneath the proposed excavation.

All exploratory hole locations, with the exception of machine excavated trial pits and rotary open (probe holes), were excavated to a depth of 1.20 m by hand prior to using mechanical plant. As hand excavation progressed, the excavations were scanned using a Cable Avoidance Tool (CAT) to continue to confirm the absence of services. On occasion, progression of the hand pit was not possible due to cobbles/boulders being encountered. Where this occurred open holing techniques were used to penetrate the obstructions encountered.

Where rotary open (probe) holes were completed, a trench was excavated to a depth of 1.20 m depth by hand around each proposed batch of drill hole locations to confirm no services had been laid into the area of investigation.

Where exploratory holes were extended into the Coal Measures, 5 in 1 gas monitors measuring carbon monoxide (CO), methane (CH4), Carbon dioxide (CO2), Oxygen (O2) and Hydrogen Sulphide (H2S) were placed at the well head during drilling in order to confirm gas concentrations, and 4 in 1 personal gas monitors were used within the drilling operatives breathing zones.

Photographs of the materials encountered were taken in accordance with The Specification and are presented in Appendix II.

Following completion of the fieldwork, all investigation locations been surveyed to National Grid and Ordnance Datum using GPS survey equipment. The location of the exploratory holes is shown on the drawings within Appendix I. The survey was completed by Walters UK Limited.

3.2 Exploratory Holes

The proposed numbers of exploratory holes, their unique identifiers, termination depths and installation requirements were provided to JGS within Schedule 2 of The Specification. The details of the as built exploratory holes, including the location ID, construction method, actual termination depth and installation detail, are listed within Table 3.

Table 3: Exploratory Hole Details

Exploratory Hole ID	Construction Method	Termination Depth (m)	Installation Details		
			Type	Diameter (mm)	Response Zone (m bgl)
S1-BH117	RO+DS+RC	31.50	Packer installed at 15.00m. Grouted above		
S1-BH118	IP+DS+RO+RC	30.70	SP	50	8.00 – 15.00
S1-BH119	RO+DS+RC	31.50	SP SP	50 50	2.00 – 4.00 8.00 – 15.00
S1-BH120	IP+DS+RO+RC	30.00	SP	50	12.00 – 20.00
S2-BH201	SNC+RC	38.00	Modified (3no) packers installed at 16.00m. Grouted above		
S2-BH203	IP+RO+RC	40.00	Backfilled with grout		
S2-BH203A	IP+RO+RC	0.40	Backfilled with arisings		
S2-BH204	IP+RO+RC	33.00	SP	50	21.00 – 32.00
S2-BH205	IP+RO+RC	40.00	Backfilled with grout		
S2-BH206	IP+RO+RC	40.00	Backfilled with grout		
S2-BH207	IP+RO+RC	40.00	SP	50	36.00 – 40.00
S2-BH208	IP+RO+RC	40.50	SP	50	32.50 – 40.50
S2-BH209	IP+RO+RC	40.00	Backfilled with grout		
S2-BH210	IP+RO+RC	40.00	SP	50	30.00 – 40.00
S2-BH211	RO+DS+RC	40.00	Backfilled with grout		
S2-BH212	IP+RO+RC	39.50	Backfilled with grout		
S2-BH213	RO+RC	40.00	Backfilled with grout		
S2-BH214	IP+RO+RC	40.00	SP	50	20.00 – 30.00
S2-BH216	RO+RC	40.50	Backfilled with grout		
S2-BH217	RO+RC	40.50	Packer installed at 34.50m. SP SP	 50 19	 2.00 – 6.00 25.00 – 30.00
S2-BH219	IP+RO+RC	39.00	SP SP	50 50	2.00 – 4.00 5.00 – 9.00
S2-BH220	IP+RO+RC	40.00	SP SP	19 50	1.00 – 30.50 31.00 – 39.00
S2-BH221	IP+SNC	10.00	SP	50	4.00 – 10.00
S2-BH222	SNC+RC	25.00	SP SP	50 50	2.00 – 4.00 15.00 – 25.00
S2-BH223	SNC	10.00	SP	50	4.00 – 10.00
S2-BH224	IP+SNC	10.00	SP	50	2.00 – 10.00
S2-BH225	IP+DS+RO+RC	25.60	SP	50	3.00 – 6.90
S2-BH226	SNC	10.00	SP	50	4.00 – 6.00
S2-BH227	IP+DS+RC	20.80	SP SP	19 50	1.00 – 5.50 8.00 – 14.00
S2-BH228	IP+SNC	40.00	SP	50	2.00 – 40.00
S2-BH229	IP+RO+RC	15.00	SP SP	50 50	2.00 – 3.00 8.00 – 14.00
S2-BH230	IP+SNC	28.00	SP	50	2.00 – 28.00
S2-BH231	SNC	25.00	SP	50	2.00 – 25.00
S2-BH232	IP+DS+RC	25.50	SP	50	1.00 – 7.00
S2-BH233	IP+DS+RC	25.00	SP	50	1.00 – 25.00
S2-BH235	IP+DS+RC	15.00	SP	50	8.00 – 15.00
S2-BH236	IP+DS+RO+RC	15.00	SP	50	10.00 – 15.00
S2-BH237	IP+DS+RC	24.80	SP	50	2.00 – 24.80
S2-BH239	IP+DS+RC	10.00	SP SP	50 50	1.00 – 3.60 7.00 – 10.00
S2-BH240	IP+DS+RC	6.50	SP	50	1.00 – 6.00
S2-BH241	IP+DS+RO+RC	15.00	SP	50	10.00 – 15.00
S2-BH242	IP+DS+RC	10.00	SP	50	1.00 – 3.70
S2-BH243	DS+RC	10.00	SP	50	5.00 – 6.00
S2-BH244	IP+DS+RC	10.00	SP SP	50 50	1.00 – 3.50 4.50 – 10.00

Exploratory Hole ID	Construction Method	Termination Depth (m)	Installation Details		
			Type	Diameter (mm)	Response Zone (m bgl)
S2-BH245	IP+DS+RC	10.00	SP	50	1.50 – 4.00
S2-BH246	IP+DS+RC	10.00	SP SP	50 50	1.00 – 2.80 3.50 – 8.00
S2-BH247	DS+RC	10.50	SP SP	50 50	1.00 – 2.00 6.00 – 9.00
S2-BH248	IP+DS+RC	10.00	SP SP	50 50	1.00 – 4.00 6.50 – 9.50
S2-BH249	IP+DS+RC	10.00	SP SP	19 50	1.00 – 2.80 3.50 – 8.00
S2-BH250	IP+DS+RC	10.00	SP SP	50 50	1.00 – 2.00 7.50 – 9.50
S2-BH252	IP+DS+RC	10.00	SP SP	50 50	1.00 – 2.60 6.00 – 9.00
S2-BH253.1	RO	10.00	Backfilled with grout		
S2-BH253.2	RO	10.00	Backfilled with grout		
S2-BH253.3	RO	10.00	Backfilled with grout		
S2-BH253.4	RO	10.00	Backfilled with grout		
S2-BH253.5	RO	10.00	Backfilled with grout		
S2-BH253.6	RO	10.00	Backfilled with grout		
S2-BH253.7	RO	10.00	Backfilled with grout		
S2-BH253.8	RO	10.00	Backfilled with grout		
S2-BH253.9	RO	10.00	Backfilled with grout		
S2-BH253.10	RO	10.00	Backfilled with grout		
S2-BH253.11	RO	10.00	Backfilled with grout		
S2-BH253.12	RO	10.00	Backfilled with grout		
S2-BH253.13	RO	10.00	Backfilled with grout		
S2-BH253.14	RO	10.00	Backfilled with grout		
S2-BH253.15	RO	10.00	Backfilled with grout		
S2-BH253.16	RO	10.00	Backfilled with grout		
S2-BH253.17	RO	10.00	Backfilled with grout		
S2-BH253.18	RO	10.00	Backfilled with grout		
S2-BH253.19	RO	10.00	Backfilled with grout		
S2-BH253.20	RO	10.00	Backfilled with grout		
S2-BH253.21	RO	10.00	Backfilled with grout		
S2-BH253.22	RO	10.00	Backfilled with grout		
S2-BH253.23	RO	10.00	Backfilled with grout		
S2-BH253.24	RO	10.00	Backfilled with grout		
S2-BH253.25	RO	10.00	Backfilled with grout		
S2-BH254.1	RO	8.50	Backfilled with grout		
S2-BH254.2	RO	8.50	Backfilled with grout		
S2-BH254.3	RO	8.50	Backfilled with grout		
S2-BH254.4	RO	8.50	Backfilled with grout		
S2-BH254.5	RO	8.50	Backfilled with grout		
S2-BH254.6	RO	8.50	Backfilled with grout		
S2-BH254.7	RO	8.50	Backfilled with grout		
S2-BH254.8	RO	8.50	Backfilled with grout		
S2-BH254.9	RO	8.50	Backfilled with grout		
S2-BH254.10	RO	8.50	Backfilled with grout		
S2-BH254.11	RO	8.50	Backfilled with grout		
S2-BH254.12	RO	8.50	Backfilled with grout		
S2-BH254.13	RO	8.50	Backfilled with grout		
S2-BH254.14	RO	8.50	Backfilled with grout		
S2-BH254.15	RO	8.50	Backfilled with grout		
S2-BH254.16	RO	8.50	Backfilled with grout		
S2-BH254.17	RO	8.50	Backfilled with grout		
S2-BH254.18	RO	8.50	Backfilled with grout		
S2-BH254.19	RO	8.50	Backfilled with grout		
S2-BH254.20	RO	8.50	Backfilled with grout		
S2-BH254.21	RO	8.50	Backfilled with grout		
S2-BH254.22	RO	8.50	Backfilled with grout		
S2-BH254.23	RO	8.50	Backfilled with grout		
S2-BH254.24	RO	8.50	Backfilled with grout		
S2-BH254.25	RO	8.50	Backfilled with grout		
S2-BH255.1	RO	8.50	Backfilled with grout		
S2-BH255.2	RO	8.50	Backfilled with grout		
S2-BH255.3	RO	8.50	Backfilled with grout		
S2-BH255.4	RO	8.50	Backfilled with grout		

Exploratory Hole ID	Construction Method	Termination Depth (m)	Installation Details		
			Type	Diameter (mm)	Response Zone (m bgl)
S2-BH255.5	RO	8.50	Backfilled with grout		
S2-BH255.6	RO	8.50	Backfilled with grout		
S2-BH255.7	RO	8.50	Backfilled with grout		
S2-BH255.8	RO	8.50	Backfilled with grout		
S2-BH255.9	RO	8.50	Backfilled with grout		
S2-BH255.10	RO	8.50	Backfilled with grout		
S2-BH255.11	RO	8.50	Backfilled with grout		
S2-BH255.12	RO	8.50	Backfilled with grout		
S2-BH255.13	RO	8.50	Backfilled with grout		
S2-BH255.14	RO	8.50	Backfilled with grout		
S2-BH255.15	RO	8.50	Backfilled with grout		
S2-BH255.16	RO	8.50	Backfilled with grout		
S2-BH255.17	RO	8.50	Backfilled with grout		
S2-BH255.18	RO	8.50	Backfilled with grout		
S2-BH255.19	RO	8.50	Backfilled with grout		
S2-BH255.20	RO	8.50	Backfilled with grout		
S2-BH255.21	RO	8.50	Backfilled with grout		
S2-BH255.22	RO	8.50	Backfilled with grout		
S2-BH255.23	RO	8.50	Backfilled with grout		
S2-BH255.24	RO	13.00	Backfilled with grout		
S2-BH255.25	RO	13.00	Backfilled with grout		
S2-BH255.26	RO	8.50	Backfilled with grout		
S2-BH255.46	RO	8.50	Backfilled with grout		
S2-BH255.47	RO	12.00	Backfilled with grout		
S2-BH255.48	RO	12.00	Backfilled with grout		
S2-BH255.49	RO	8.50	Backfilled with grout		
S2-BH255.77	RO	8.50	Backfilled with grout		
S2-BH255.78	RO	8.50	Backfilled with grout		
S2-BH255.79	RO	8.50	Backfilled with grout		
S2-BH255.80	RO	8.50	Backfilled with grout		
S2-BH256.1	RO	20.00	Backfilled with grout		
S2-BH256.2	RO	20.00	Backfilled with grout		
S2-BH256.3	RO	20.00	Backfilled with grout		
S2-BH256.4	RO	20.00	Backfilled with grout		
S2-BH256.5	RO	20.00	Backfilled with grout		
S2-BH256.6	RO	20.00	Backfilled with grout		
S2-BH256.7	RO	20.00	Backfilled with grout		
S2-BH256.8	RO	20.00	Backfilled with grout		
S2-BH256.9	RO	20.00	Backfilled with grout		
S2-BH256.10	RO	20.00	Backfilled with grout		
S2-BH256.11	RO	20.00	Backfilled with grout		
S2-BH256.12	RO	20.00	Backfilled with grout		
S2-BH256.13	RO	20.00	Backfilled with grout		
S2-BH256.26	RO	20.00	Backfilled with grout		
S2-BH256.27	RO	20.00	Backfilled with grout		
S2-BH256.28	RO	20.00	Backfilled with grout		
S2-BH256.29	RO	20.00	Backfilled with grout		
S2-BH256.30	RO	20.00	Backfilled with grout		
S2-BH257.1	RO	20.00	Backfilled with grout		
S2-BH257.2	RO	20.00	Backfilled with grout		
S2-BH257.3	RO	22.20	Backfilled with grout		
S2-BH257.4	RO	22.20	Backfilled with grout		
S2-BH257.5	RO	20.30	Backfilled with grout		
S2-BH257.8	RO	20.30	Backfilled with grout		
S2-BH257.11	RO	20.50	Backfilled with grout		
S2-BH257.17	RO	20.50	Backfilled with grout		
S2-BH257.23	RO	20.50	Backfilled with grout		
S2-BH257.55	RO	21.00	Backfilled with grout		
S2-BH257.56	RO	21.00	Backfilled with grout		
S2-BH257.57	RO	21.00	Backfilled with grout		
S2-BH257.92	RO	22.00	Backfilled with grout		
S2-BH257.93	RO	22.00	Backfilled with grout		
S2-BH257.94	RO	22.00	Backfilled with grout		
S2-BH257.95	RO	21.00	Backfilled with grout		
S2-BH257.96	RO	21.00	Backfilled with grout		
S2-BH258/1.1	RO	20.50	Packer installed at 15.00m. Grouted above		
S2-BH258/1.2	RO	20.50	Packer installed at 15.00m. Grouted above		

Exploratory Hole ID	Construction Method	Termination Depth (m)	Installation Details		
			Type	Diameter (mm)	Response Zone (m bgl)
S2-BH258/1.3	RO	20.50	Packer installed at 15.00m. Grouted above		
S2-BH258/1.4	RO	20.00	Packer installed at 7.00m. Grouted above		
S2-BH258/1.5	RO	21.00	Packer installed at 7.00m. Grouted above		
S2-BH258/2.1	RO	18.00	Packer installed at 12.00m. Grouted above		
S2-BH258/2.2	RO	18.00	Packer installed at 12.00m. Grouted above		
S2-BH258/2.3	RO	20.50	Packer installed at 12.00m. Grouted above		
S2-BH258/2.4	RO	18.00	Backfilled with grout		
S2-BH258/2.5	RO	18.00	Backfilled with grout		
S2-BH258/3.1	RO	20.00	Backfilled with grout		
S2-BH258/3.2	RO	20.00	Backfilled with grout		
S2-BH258/3.3	RO	20.00	Backfilled with grout		
S2-BH258/3.4	RO	20.00	Backfilled with grout		
S2-BH258/3.5	RO	20.00	Backfilled with grout		
S2-BH258/4.1	RO	19.50	Packer installed at 15.00m. Grouted above		
S2-BH258/4.2	RO	19.50	Packer installed at 15.00m. Grouted above		
S2-BH258/4.3	RO	19.50	Packer installed at 15.00m. Grouted above		
S2-BH258/4.4	RO	19.50	Packer installed at 15.00m. Grouted above		
S2-BH258/4.5	RO	18.50	Packer installed at 15.00m. Grouted above		
S2-BH258/5.1	RO	20.00	Packer installed at 12.00m. Grouted above		
S2-BH258/5.2	RO	20.00	Packer installed at 12.00m. Grouted above		
S2-BH258/5.3	RO	20.00	Packer installed at 12.00m. Grouted above		
S2-BH258/5.4	RO	20.00	Packer installed at 12.00m. Grouted above		
S2-BH258/5.5	RO	20.00	Packer installed at 12.00m. Grouted above		
S2-BH259.1	RO	20.00	Backfilled with grout		
S2-BH259.2	RO	20.00	Backfilled with grout		
S2-BH259.3	RO	20.00	Backfilled with grout		
S2-BH259.4	RO	20.00	Backfilled with grout		
S2-BH259.5	RO	20.00	Backfilled with grout		
S2-BH259.6	RO	20.00	Backfilled with grout		
S2-BH259.7	RO	20.00	Backfilled with grout		
S2-BH259.8	RO	20.00	Backfilled with grout		
S2-BH259.9	RO	20.00	Backfilled with grout		
S2-BH259.10	RO	20.00	Backfilled with grout		
S2-BH259.11	RO	20.00	Backfilled with grout		
S2-BH259.12	RO	20.00	Backfilled with grout		
S2-BH259.13	RO	20.00	Backfilled with grout		
S2-BH259.14	RO	20.00	Backfilled with grout		
S2-BH259.15	RO	20.00	Backfilled with grout		
S2-BH259.16	RO	20.00	Backfilled with grout		
S2-BH259.17	RO	20.00	Backfilled with grout		
S2-BH259.18	RO	20.00	Backfilled with grout		
S2-BH259.19	RO	20.00	Backfilled with grout		
S2-BH259.20	RO	20.00	Backfilled with grout		
S2-BH259.21	RO	20.00	Backfilled with grout		
S2-BH259.22	RO	20.00	Backfilled with grout		
S2-BH259.23	RO	20.00	Backfilled with grout		
S2-BH259.24	RO	20.00	Backfilled with grout		
S2-BH259.25	RO	20.00	Backfilled with grout		
S2-BH259.26	RO	20.00	Backfilled with grout		
S2-BH259.27	RO	20.00	Backfilled with grout		
S2-BH259.28	RO	20.00	Backfilled with grout		
S2-BH260	IP+RO+RC	7.00	Backfilled with grout		
S2-BH260a	IP+RO+RC	25.00	Backfilled with grout		
S2-BH261	IP+RO+RC	25.00	SP SP	50 50	3.00 – 8.00 10.00 – 15.00
S2-BH262.1	RO	21.00	Backfilled with grout		
S2-BH262.2	RO	21.00	Backfilled with grout		
S2-BH262.3	RO	21.00	Backfilled with grout		
S2-BH262.4	RO	21.00	Backfilled with grout		
S2-BH262.5	RO	21.00	Backfilled with grout		
S2-BH262.6	RO	21.00	Backfilled with grout		
S2-BH262.7	RO	11.50	Packer installed at 10.00m. Grouted above		
S2-BH262.8	RO	11.50	Packer installed at 10.00m. Grouted above		
S2-BH262.9	RO	11.50	Packer installed at 10.00m. Grouted above		
S2-BH262.10	RO	21.00	Backfilled with grout		
S2-BH262.11	RO	11.50	Packer installed at 10.00m. Grouted above		
S2-BH262.12	RO	21.00	Backfilled with grout		

Exploratory Hole ID	Construction Method	Termination Depth (m)	Installation Details		
			Type	Diameter (mm)	Response Zone (m bgl)
S2-BH263.1	RO	21.00	Backfilled with grout		
S2-BH263.2	RO	13.50	Packer installed at 10.00m. Grouted above		
S2-BH263.26	RO	13.50	Packer installed at 11.00m. Grouted above		
S2-BH263.27	RO	13.50	Packer installed at 11.00m. Grouted above		
S2-BH263.28	RO	13.50	Packer installed at 11.00m. Grouted above		
S2-BH263.29	RO	13.50	Packer installed at 11.00m. Grouted above		
S2-BH263.31	RO	20.00	Backfilled with grout		
S2-BH263.32	RO	20.00	Backfilled with grout		
S2-BH263.33	RO	20.00	Backfilled with grout		
S2-BH263.34	RO	20.00	Backfilled with grout		
S2-BH263.35	RO	20.00	Backfilled with grout		
S2-BH264.1	RO	25.00	Backfilled with grout		
S2-BH264.2	RO	25.00	Backfilled with grout		
S2-BH264.3	RO	25.00	Backfilled with grout		
S2-BH264.4	RO	2.00	Backfilled with grout		
S2-BH264.5	RO	23.00	Packer installed at 15.00m. Grouted above		
S2-BH264.7	RO	23.00	Packer installed at 15.00m. Grouted above		
S2-BH264.8	RO	23.00	Packer installed at 15.00m. Grouted above		
S2-BH264.9	RO	23.00	Packer installed at 15.00m. Grouted above		
S2-BH264.10	RO	23.00	Packer installed at 14.00m. Grouted above		
S2-BH264.11	RO	24.50	Packer installed at 15.00m. Grouted above		
S2-BH264.12	RO	24.50	Packer installed at 15.00m. Grouted above		
S2-BH264.13	RO	24.50	Packer installed at 15.00m. Grouted above		
S2-BH265.1	RO	25.00	Backfilled with grout		
S2-BH265.2	RO	25.00	Backfilled with grout		
S2-BH265.3	RO	25.00	Backfilled with grout		
S2-BH265.4	RO	25.00	Backfilled with grout		
S2-BH265.5	RO	25.00	Backfilled with grout		
S2-BH265.6	RO	25.00	Backfilled with grout		
S2-TP201	TP	3.50	Backfilled with arisings		
S2-TP202	TP	3.50	Backfilled with arisings		
S2-TP203	TP	3.50	Backfilled with arisings		
S2-TP204	TP	4.00	Backfilled with arisings		
S2-TP205	TP	3.50	Backfilled with arisings		
S2-TP206	TP	3.50	Backfilled with arisings		
S2-TP207	TP	3.10	Backfilled with arisings		
S2-TP208	TP	2.80	Backfilled with arisings		
S2-TP209	TP	3.50	Backfilled with arisings		
S2-TP210	TP	3.50	Backfilled with arisings		
S2-TP2100	TP	4.00	Backfilled with arisings		
S2-TP2101	TP	4.00	Backfilled with arisings		
S2-TP2104	TP	4.00	Backfilled with arisings		
S2-TP2105	TP	2.80	Backfilled with arisings		
S2-TP2106	TP	4.00	Backfilled with arisings		
S2-TP2107	TP	1.10	Backfilled with arisings		
S2-TP2108	TP	4.00	Backfilled with arisings		
S2-TP2109	TP	3.50	Backfilled with arisings		
S2-TP211	TP	3.50	Backfilled with arisings		
S2-TP2110	TP	3.40	Backfilled with arisings		
S2-TP2112	TP	4.00	Backfilled with arisings		
S2-TP2113	TP	4.00	Backfilled with arisings		
S2-TP2114	TP	4.00	Backfilled with arisings		
S2-TP2115	TP	4.00	Backfilled with arisings		
S2-TP2116	TP	3.50	Backfilled with arisings		
S2-TP2117	TP	3.50	Backfilled with arisings		
S2-TP212	TP	3.00	Backfilled with arisings		
S2-TP2122	TP	2.50	Backfilled with arisings		
S2-TP2123	TP	3.00	Backfilled with arisings		
S2-TP2124	TP	3.80	Backfilled with arisings		
S2-TP2125	TP	3.40	Backfilled with arisings		
S2-TP2126	TP	3.40	Backfilled with arisings		
S2-TP213	TP	3.50	Backfilled with arisings		
S2-TP214	TP	3.00	Backfilled with arisings		
S2-TP215	TP	3.00	Backfilled with arisings		
S2-TP216	TP	4.00	Backfilled with arisings		
S2-TP217	TP	3.40	Backfilled with arisings		
S2-TP218	TP	2.80	Backfilled with arisings		

Exploratory Hole ID	Construction Method	Termination Depth (m)	Installation Details		
			Type	Diameter (mm)	Response Zone (m bgl)
S2-TP219	TP	1.50	Backfilled with arisings		
S2-TP220	TP	2.60	Backfilled with arisings		
S2-TP223	TP	2.20	Backfilled with arisings		
S2-TP224	TP	4.00	Backfilled with arisings		
S2-TP225	TP	2.90	Backfilled with arisings		
S2-TP226	TP	4.00	Backfilled with arisings		
S2-TP227	TP	3.00	Backfilled with arisings		
S2-TP228	TP	1.50	Backfilled with arisings		
S2-TP229	TP	4.00	Backfilled with arisings		
S2-TP230	TP	3.50	Backfilled with arisings		
S2-TP235	TP	4.00	Backfilled with arisings		
S2-TP237	TP	3.20	Backfilled with arisings		
S2-TP238	TP	3.50	Backfilled with arisings		
S2-TP239	TP	4.00	Backfilled with arisings		
S2-TP240	TP	3.50	Backfilled with arisings		
S2-TP241	TP	3.50	Backfilled with arisings		
S2-TP242	TP	3.50	Backfilled with arisings		
S2-TP243	TP	3.00	Backfilled with arisings		
S2-TP244	TP	3.00	Backfilled with arisings		
S2-TP245	TP	3.50	Backfilled with arisings		
S2-TP250	TP	3.50	Backfilled with arisings		
S2-TP251	TP	3.00	Backfilled with arisings		
S2-TP252	TP	3.50	Backfilled with arisings		
S2-TP255	TP	2.60	Backfilled with arisings		
S2-TP256	TP	4.00	Backfilled with arisings		
S2-TP258	TP	4.00	Backfilled with arisings		
S2-TP259	TP	3.50	Backfilled with arisings		
S2-TP260	TP	2.50	Backfilled with arisings		
S2-TP261	TP	3.00	Backfilled with arisings		
S2-TP262	TP	2.00	Backfilled with arisings		
S2-TP263	TP	3.00	Backfilled with arisings		
S2-TP264	TP	2.00	Backfilled with arisings		
S2-TP265	TP	3.41	Backfilled with arisings		
S2-TP266	TP	3.50	Backfilled with arisings		
S2-TP267	TP	1.60	Backfilled with arisings		
S2-TP268	TP	3.50	Backfilled with arisings		
S2-TP270	TP	2.10	Backfilled with arisings		
S2-TP271	TP	2.10	Backfilled with arisings		
S2-TP272	TP	4.00	Backfilled with arisings		
S2-TP273	TP	1.95	Backfilled with arisings		
S2-TP275	TP	2.10	Backfilled with arisings		
S2-TP276	TP	4.00	Backfilled with arisings		
S2-TP277	TP	2.00	Backfilled with arisings		
S2-TP278	TP	1.60	Backfilled with arisings		
S2-TP279	TP	3.10	Backfilled with arisings		
S2-TP280	TP	3.50	Backfilled with arisings		
S2-TP282	TP	2.20	Backfilled with arisings		
S2-TP284	TP	2.00	Backfilled with arisings		
S2-TP288	TP	4.00	Backfilled with arisings		
S2-TP289	TP	0.50	Backfilled with arisings		
S2-TP289b	TP	1.60	Backfilled with arisings		
S2-TP292	TP	2.60	Backfilled with arisings		
S2-TP294	TP	4.00	Backfilled with arisings		
S2-TP294A	TP	0.50	Backfilled with arisings		
S2-TP294B	TP	1.00	Backfilled with arisings		
S2-TP298	TP	3.20	Backfilled with arisings		
S2-TP299	TP	4.00	Backfilled with arisings		
S2-TP300	TP	6.50	Backfilled with arisings		
S2-WS01	IP	0.85	Backfilled with arisings		
S2-WS01b	IP	0.90	Backfilled with arisings		
S2-WS02	IP+WLS	3.00	Backfilled with arisings		
S2-WS03	IP+WLS	3.60	Backfilled with arisings		
S2-WS04	IP+WLS	3.30	Backfilled with arisings		
S2-WS05	IP+WLS	5.45	Backfilled with arisings		
S2-WS06	IP+WLS	1.00	Backfilled with arisings		
S2-WS07	IP	0.60	Backfilled with arisings		

Notes: DS – Dynamic Sampling, IP – Inspection Pit, RC- Rotary Coring, RO – Rotary Open Holing, SNC – Sonic Drilling, TP – Trial Pit, WLS – Dynamic Windowless Sampling, SP – Standpipe piezometer

- S2-BH203A was moved 1 m east due to an obstruction in the pit and renamed S2-BH203
- S2-BH260 was moved 2 m east due to a metal obstruction at 7.00 m depth and renamed S2-BH260A
- S2-TP289 was moved 1m east due to a concrete obstruction and renamed S2-TP289B
- S2-TP294A was moved perpendicular to the edge of a concrete obstruction encountered at 0.50 m depth and renamed S2-TP294B
- S2-TP294B was moved 3 m south due to a concrete obstruction encountered at 1.00 m and renamed S2-TP294
- Trial Pits that were located inside buildings were changed in scope and converted to Windowless Dynamic Samples that were completed using a modular rig.
    - S2-TP296 became S2-WS01
    - S2-TP2103 became S2-WS02
    - S2-TP2102 became S2-WS03
    - S2-TP290 became S2-WS04
    - S2-TP291 became S2-WS05
    - S2-TP293 became S2-WS06
    - S2-TP295 became S2-WS07
- S2-WS01 was moved 3 m to the northwest due to ACM being encountered in the inspection pit and renamed S2-WS01B
- Probe holes were relocated under the guidance of Atkins as and when mining features were encountered in an attempt to further delineate them.

Fair copy logs, which record the method, samples obtained, in-situ testing completed within the exploratory holes, backfill and descriptions of the material encountered, are presented within Appendix II.

3.3 Logging and Sampling

Samples of the materials encountered were obtained in accordance with The Specification for descriptive and geotechnical and geoenvironmental testing purposes.

The description of the materials encountered was completed in accordance with BS5930:2015+A1:2020, BS EN ISO 14688-1 (2018) and BS EN ISO 14689 (2018).

Geotechnical samples were stored at ambient temperature and protected from extremes of weather until lab testing commenced at the onsite sample storage facility. Once scheduled for testing, the samples were transported to Geo Site and Testing Services (GSTL).

Geoenvironmental samples were packaged appropriately and dispatched directly from site to Eurofins Chemtest ensuring compliance with the deviant sampling policy. The samples were subsequently stored under laboratory conditions until testing commenced.

3.4 In-situ Testing, Monitoring and Well Development during Fieldwork

In-situ testing was completed in accordance with The Specification and relevant associated technical standards. In summary, the in-situ testing comprised the following:

- Standard Penetration testing
- Hand Shear Vane testing
- Headspace testing using a Photo Ionisation Detector
- Soakaway Testing

The lateral and vertical spacing of the in-situ testing was determined by Atkins.

None of the soakaway tests reached the 25 % effective depth and as such it has not been possible to determine the infiltration rate of the materials tested. It was agreed with Atkins that each test could be terminated after a minimum test duration of 120 minutes.

The in-situ testing results are presented within Appendix II. Where an in-situ test is not listed as separate item on the appendix cover page, the results of the in-situ testing are presented on the exploratory hole logs. Calibration certificates for the equipment used are presented within Appendix II as appropriate.

Monitoring of the groundwater was undertaken during fieldwork by JGS in accordance with The Specification and relevant technical standards. Monitoring undertaken during the fieldwork period is presented within Appendix III.

Each installation was developed during the fieldwork period. The well development was undertaken in accordance with The Specification and groundwater extracted using an in-situ impellor pump. Records of the well development are presented within Appendix III.

3.5 Post Fieldwork Monitoring and Sampling

Monitoring of the groundwater and ground gas and sampling of the groundwater is being undertaken post fieldwork by JGS. At the time of issue of this report, the post fieldwork monitoring and sampling is ongoing. The results of this monitoring are to be presented within JGS report G23012C separately to this report.

4 Laboratory Testing

4.1 Geotechnical Testing

Laboratory testing for geotechnical purposes was completed at Geo Site and Testing Services Limited, UKAS registration number 2788. The testing requirements were specified by Aktins and the testing has been completed in accordance with the requirements of The Specification and relevant technical standards. The geotechnical testing was completed on 5 July 2023. The testing is summarised in Table 4 and the results are presented within Appendix IV.

Table 4: Geotechnical Testing Summary

Test Type	Number of Tests
Moisture Content	221
Atterberg Limits	115
Particle Density (Gas Jar)	10
Particle Size Distribution - Sieve	151
Particle Size Distribution - Sedimentation	74
Dry Density/Moisture Content Relationship	44
Uniaxial Compressive Strength of Rock	26
Point Load Index	46
Consolidated Drained Peak Shear Strength (60mm x 60mm)	35

4.2 Geoenvironmental and Geochemical Testing

Laboratory testing for geoenvironmental and geochemical purposes was completed at Eurofins Chemtest, UKAS registration number 2183. The testing requirements were specified by Atkins and the testing has been completed in accordance with The Specification and relevant technical standards. The geoenvironmental testing was completed on 27 June 2023. The testing in summarised within Table 5 and the results are presented within Appendix V.

Table 5: Geoenvironmental Testing Summary

Test Type	Number of Tests
Suite D – BRE Brownfield	139
Suite E – Soil	296
Suite F – Leachate	91
Suite I – Inert Waste WAC	21
Asbestos ID and Quantification	272
Asbestos gravimetric analysis	6
WAC 2 stage inert suite	30
Organic Matter Content	51

5 References

- AGS. Electronic Transfer of Geotechnical and Geoenvironmental Data (Edition 4.1.1). Association of Geotechnical and Geoenvironmental Specialists. (2022)
- BGS England and Wales Sheet 231, Merthyr Tydfil,1:50000 geological map (solid and drift). British Geological Survey. (1979)
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- BRE Digest DG 365. Soakaway design. Building Research Establishment, Garston, Watford. (2016)
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- BS 1377. Methods of test for soils for civil engineering purposes. British Standards Institution. (1990)
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- BS EN ISO 14688-2. Geotechnical investigation and testing. Identification and classification of soil. Part 2 Principles for a classification (2018)
- BS EN ISO 14689. Geotechnical investigation and testing. Identification, description and classification of rock (2018)
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- BS EN ISO 22475-1. Geotechnical investigation and testing. Sampling methods and groundwater measurements. Part 1 Technical principles for the sampling of soil, rock and groundwater. British Standards Institution. (2021)
- BS EN ISO 22476-1. Geotechnical investigation and testing. Field testing. Part 1 Electrical cone and piezocone penetration test. British Standards Institution. (2012, incorporating corrigendum January 2013)
- BS EN ISO 22476-2:2005+A. Geotechnical investigation and testing. Field testing. Part 2 Dynamic probing. British Standards Institution. (2011)
- BS EN ISO 22476-3:2005+A1. Geotechnical investigation and testing. Field testing. Part 3 Standard penetration test. British Standards Institution. (2011)
- Department for Environment, Food and Rural Affairs (DEFRA) MAGIC maps online application. DEFRA (2023)
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- Open Street Map (2023)

Appendix I

Drawings

Exploratory Hole Plan **Drawing Numbers:**

G23012-JGS-001 to G23012-JGS-025

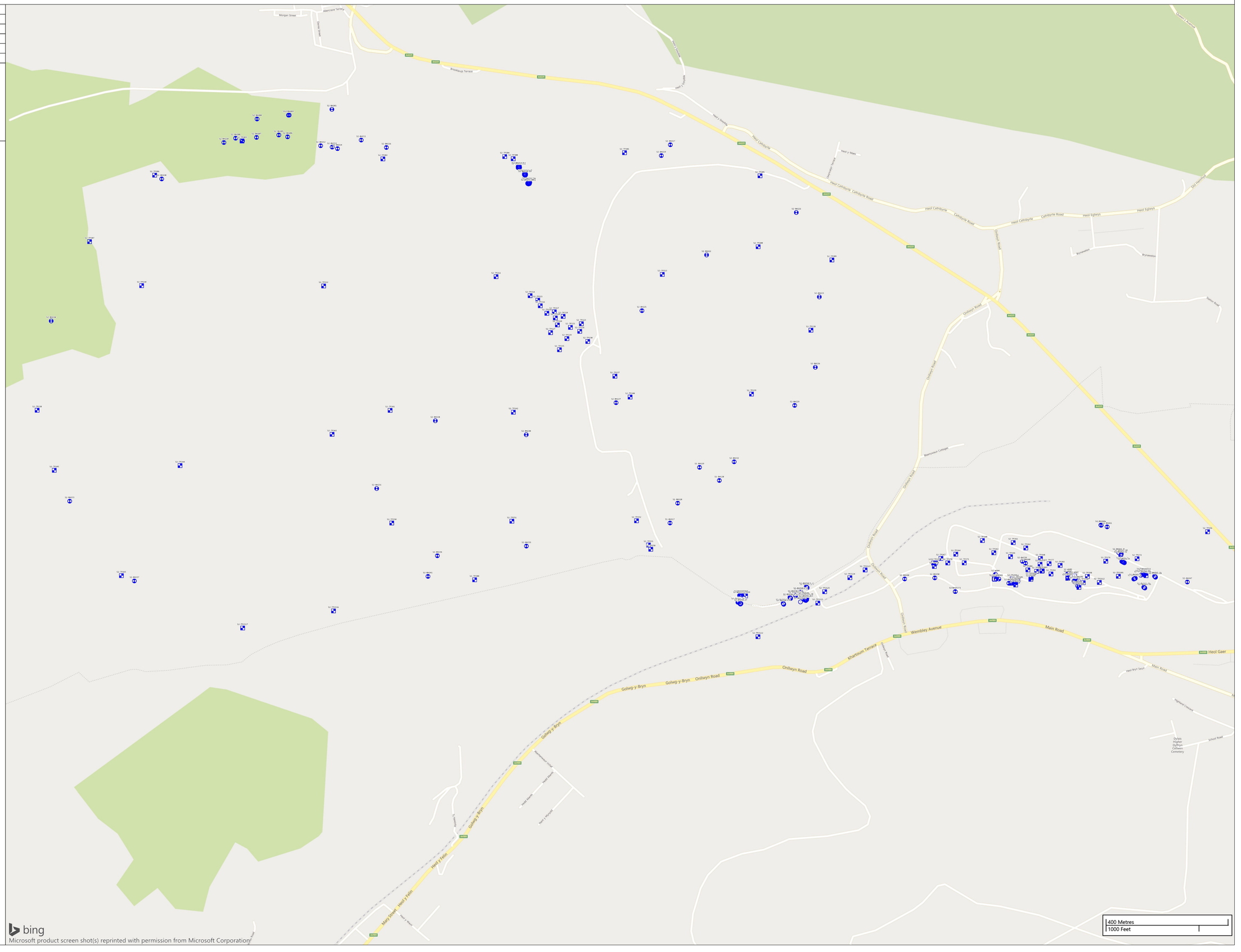
SITE PLAN

Project	Global Centre of Rail Excellence Stage 2
Client	Walters UK Ltd
Project Number	G23012
Drawing Number	G23012-JGS-001
Scale	1:8000
Printed	13/07/2023 11:38

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Legend Key

- Locations By Type - DS+RC
- Locations By Type - IP
- Locations By Type - IP+DS+RC
- Locations By Type - IP+DS+RO+RC
- Locations By Type - IP+RO+RC
- Locations By Type - IP+SNC
- Locations By Type - IP+WLS
- Locations By Type - RO
- Locations By Type - RO+DS+RC
- Locations By Type - RO+RC
- Locations By Type - SNC
- Locations By Type - SNC+RC
- Locations By Type - TP



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