

Factual Site Investigation

Whitby Maritime Hub

Willmott Dixon Construction Ltd

S230311

Solmek Ltd

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FACTUAL SITE INVESTIGATION REPORT

WHITBY MARITIME HUB

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APPENDICES

Revision	Date	Prepared By	Signed
Draft	December 2023	L Cassidy *Principal Environmental Engineer*	[redacted]
		Checked By	
		R Woods *Principal Geotechnical Engineer*	[redacted]
		Approved By	
		R Woods *Principal Geotechnical Engineer*	[redacted]

1 INTRODUCTION

1.1 Authorisation

The site investigation described in this report was carried out by Solmek to the instructions of Fairhurst, on behalf of Wilmott Dixon Construction, on land at Endeavour car park, Whitby. A site location plan is presented as Figure 1 in Appendix A.

1.2 Scope of Works

The site is expected to be developed with a new commercial building.

A geotechnical and environmental investigation including a ground gas assessment was requested. The type and position of exploratory positions and the scope and nature of testing were all determined by Fairhurst.

The fieldwork and testing was generally carried out according to the recommendations of BS5930:2015+A1:2020 “Code of Practice for Ground Investigations” and where applicable BS EN 1997-2:2007 with soil descriptions to BS EN 14688-1:2013 where applicable. The information provided in this report is based on the investigation fieldwork and is subject to the comments and approval of the various regulatory authorities.

There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report. Solmek reserve the right to alter conclusions and recommendations should further information be available or provided. Any schematic representation or opinion of the possible configuration of ground conditions between exploratory holes is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

2 SITE DESCRIPTION AND FIELDWORK

The site is located at 489952, 510865 and is approximately 0.3Ha. The site consists of hardstanding (variably concrete/tarmacadam) forming a parking area, serving the centre of Whitby. The car park is generally busy and access is via Langborne Road, to the west.

The site falls slightly towards the east.

The site is bounded to the north and west by roads/commercial developments, and the River Esk to the east.

2.1 Fieldwork

The fieldwork was undertaken in two phases, with Phase 1 commencing on 13th March 2023 and Phase 2 commencing on 16th October 2023. The extent of the investigation was:

- Ground penetrating radar (GPR) scan of the exploratory positions to check for underground utilities.
- 2no. cable percussive boreholes (BH104 & BH104A) to a maximum depth of 3.70mbgl.
  - The borehole locations and depths were specified by Fairhurst.
  - These boreholes were both terminated due to encountering shallow obstructions.
- 4no. cable percussive boreholes with rotary follow-on (BH101-BH103 & BH105) to a maximum depth of 28.50mbgl.
  - The borehole locations and depths were specified by Fairhurst.
- 4no. small percussive boreholes (WS101-WS102 & WS104-WS105) to a maximum depth of 6.45mbgl.
  - The borehole locations and depths were specified by Fairhurst.
  - WS103 was cancelled.
- Gas monitoring wells were installed within all boreholes (except BH104 & BH104A).
  - Gas response zones were designed by Fairhurst and are shown on the borehole logs and are summarised in Table 2.
- 5no. machine excavated trial pits (PLT01-PLT05) to a maximum depth of 0.70mbgl.
  - These locations were specified by Fairhurst for Plate Load Tests to be undertaken.
- Insitu testing in the exploratory boreholes as Standard Penetration Tests (SPTs).

Retrieval of samples for geotechnical and contamination testing.
Topographic survey of fieldwork positions.

The boreholes were backfilled with gas pipe installations, and the trial pits were backfilled with clean arisings.

Descriptions of the strata encountered in the exploratory positions together with details of sampling and groundwater are presented in Appendix B of this report. A plan showing the location of all positions can be found in Appendix A (Figure 2).

3 GROUND CONDITIONS

A brief summary of the ground conditions encountered is given below.

3.1 Made Ground

Made ground was variable across the site and was encountered to a minimum depth of 3.30mbgl (BH102) and a maximum depth of 4.30mbgl (BH101).

The made ground was not fully penetrated within BH104, BH104A, WS104, which terminated at depths between 1.70 and 3.70mbgl.

The made ground broadly consisted of a surface covering of concrete, which ranged in thickness from 0.22 to 0.40m.

Within BH102, BH105, PLT01, PLT04 and WS105, the concrete was overlain by macadam, ranging in thickness from 0.17-0.30m.

The underlying made ground was variable, with a granular subbase of dolomite (0.03-0.35m thick) generally present beneath the concrete.

The remainder of the made ground generally consisted of granular material of varying composition, with ash, brick, sandstone, limestone, chalk, ceramics, coal and metal present.

Locally, bands of cohesive made ground were encountered, as summarised below:

BH101 – 3.00-4.30m: Soft slightly sandy gravelly silt
BH104 – 3.20-3.60m: Soft slightly sandy slightly gravelly silt
BH105 – 2.60-3.40m: Soft slightly sandy slightly gravelly silty clay
WS102 – 0.60-1.50m: Soft sandy slightly gravelly clay
WS104 – 0.60-3.45m: Soft sandy slightly gravelly clay
WS105 – 0.75-3.50m: Soft sandy slightly gravelly clay

Within BH101 only, a hydrocarbon sheen was noted at 3.10mbgl.

3.2 Obstructions

The below buried obstructions (other than surface hardstanding) were encountered during the intrusive works:

BH101 – buried concrete from 0.45-0.70m
BH102 – SPT result of 50+ at 1.20mbgl
BH103 – SPT result of 50+ at 2.00mbgl
BH104 – SPT result of 50+ at 1.20mbgl, metal obstruction encountered at 3.70mbgl resulting in the borehole being terminated
BH104A – concrete obstruction encountered at 1.70mbgl, resulting in the borehole being terminated

3.3 Natural Deposits

Proven to underlie the made ground deposits across the site, natural deposits variably comprised interbedded bands of generally loose sands and soft silts/clays to depths of between 12.30 and 15.50mbgl,

at which point a band of dense to very dense sandy gravel (locally cobbles) was encountered and then proven to the base of the natural deposits.

Peat was encountered locally, within BH102 (7.10-8.90mbgl) and BH105 (7.10-8.70mbgl), whilst peat bands were noted within the clay between 8.90 and 12.00mbgl within BH102. Plant matter was present within BH101 (7.00-12.30mbgl) and BH103 (7.90-12.40mbgl).

3.4 Solid Geology

Rockhead was encountered between 17.20mbgl within BH101 and BH105 and18.00mbgl within BH103, generally comprising mudstone (sandstone within BH103).

The rock was cored to a maximum depth of 28.50mbgl and generally comprised mudstone with localised bands of siltstone and sandstone.

3.5 Groundwater

Groundwater strikes, where encountered, are presented on the exploratory logs (Appendix B) and are summarised below in Table 1:

TABLE 1: SUMMARY OF GROUNDWATER STRIKES

Exploratory Position	Depth Encountered (mbgl)	Depth after 20 minutes (mbgl)	Strata
BH101	3.10	2.95	MADE GROUND
	12.40	6.10	SANDY GRAVEL
BH102	2.60	2.40	MADE GROUND
	12.40	8.20	SANDY GRAVEL
BH103	2.90	2.40	MADE GROUND
	12.10	7.30	SANDY GRAVEL
BH104	3.40	-	MADE GROUND
BH105	12.00	7.90	SANDY GRAVEL

It should be noted the rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including season, rainfall, dewatering and pumping activities. Therefore, water levels significantly higher than those found during this investigation may be encountered.

4 CONTAMINATION TESTING RESULTS

The proposed development of the site is to involve the construction of a commercial building. The chemical samples were generally retrieved in line with BS ISO 18400-105:2017 “Soil Quality. Sampling”. The chemical results are presented in Appendix C.

4.1 Contamination Testing

4.1.1 Soil Contamination Testing

To provide information upon the possibility of ground contamination, 15no samples of made ground and 4no samples of natural material were selected for contamination testing. The number and type of samples chosen were specified by Fairhurst, and are detailed below:

Schedule 1: 17th March

WS101 – 0.80-1.00m (Made ground – cohesive)
WS101 – 3.70-3.90m (Natural sand)
WS102 – 0.60-0.80m (Made ground – cohesive)
WS102 – 1.50-1.60m (Made ground – cohesive)
WS102 – 3.80-4.00m (Natural sand)
WS104 – 0.60-0.80m (Made ground – cohesive)
WS105 – 1.20-1.50m (Made ground – cohesive)
WS105 – 3.50-4.00m (Natural sand)

Schedule 2: 20th October

BH102 – 0.60m (Made ground – granular)
BH102 – 1.00m (Made ground – granular)
BH102 – 7.50m (Peat)
BH105 – 2.20m (Made ground – granular)
BH105 – 3.50m (Made ground – cohesive)

Schedule 3: 25th October

BH104 – 0.80m (Made ground – granular)
BH104 – 1.00m (Made ground – cohesive)

Schedule 4: 27th October

BH101 – 0.80m (Made ground – granular)
BH101 – 3.10m (Made ground – cohesive, hydrocarbon sheen)
BH101 – 3.80m (Made ground – cohesive)
BH103 – 0.70m (Made ground – granular)

The samples selected are considered to provide coverage of both the made ground and shallow natural strata from across the site that would be most likely to be exposed during future site works. The samples were tested for the following contaminant suites:

16no Metals, semi-metals, non-metals, inorganic determinants
16no Speciated Polyaromatic Hydrocarbons (PAHs)
16no Total Petroleum Hydrocarbon Criteria Working Group fractions (TPHCWG)
16no Total Petroleum Hydrocarbons (DRO/MRO Splits)
16no Phenol
14no Asbestos identification screenings
5no Methyl Tert-Butyl Ether (MTBE)
5no Benzene, Toluene, Ethylbenzene & Xylenes (BTEX)
5no Waste Acceptance Criteria (WAC)
4no Organic Matter
4no Calorific Value
3no Chlorine
3no Nitrate
3no Polychlorinated Biphenyls (PCBs)
2no Asbestos quantification tests

4.1.2 Leachate Contamination Testing

The following samples were also sent for leachate analysis, at the request of Fairhurst:

Schedule 1: 17th March

WS101 – 0.80-1.00m (Made ground – cohesive)

WS102 – 1.50-1.60m (Made ground – cohesive)
WS102 – 3.80-4.00m (Natural sand)
WS104 – 0.60-0.80m (Made ground – cohesive)
WS105 – 1.20-1.50m (Made ground – cohesive)

Schedule 2: 20th October

BH102 – 1.00m (Made ground – granular)
BH105 – 2.20m (Made ground – granular)

Schedule 3: 25th October

BH104 – 0.80m (Made ground – granular)

Schedule 4: 27th October

BH101 – 0.80m (Made ground – granular)
BH101 – 3.10m (Made ground – cohesive, hydrocarbon sheen)
BH103 – 0.70m (Made ground – granular)

The leachates were tested for the following contaminant suites:

11no Metals, semi-metals, non-metals, inorganic determinants
11no Speciated Polyaromatic Hydrocarbons (PAHs)
11no Total Petroleum Hydrocarbon Criteria Working Group fractions (TPHCWG)
11no Phenol
3no Methyl Tert-Butyl Ether (MTBE)
3no Benzene, Toluene, Ethylbenzene & Xylenes (BTEX)
2no Polychlorinated Biphenyls (PCBs)

4.1.3 Water Contamination Testing

During the gas monitoring fieldwork, samples of groundwater were retrieved where possible. Samples were retrieved once the wells were purged 3x the well volume and then allowed to recharge. The following samples were sent for water analysis, at the request of Fairhurst:

BH101 – 3.07m
BH102 – 1.86m
BH103 – 1.45m
BH105 – 2.10m
WS101 – 2.10m

The water samples were tested for the following contaminant suites:

5no Metals, semi-metals, non-metals, inorganic determinants
5no Water Hardness
5no Speciated Polyaromatic Hydrocarbons (PAHs)
5no Total Petroleum Hydrocarbon Criteria Working Group fractions (TPHCWG)
5no Phenol
3no Methyl Tert-Butyl Ether (MTBE)
3no Benzene, Toluene, Ethylbenzene & Xylenes (BTEX)
3no Polychlorinated Biphenyls (PCBs)

The water sampling results are outstanding and will be added to a future revision of this report.

4.2 Test Results

The contamination test results are presented in Appendix C.

5 GROUND GAS/WATER MONITORING

The proposed development includes the construction of a commercial building.

Ground gases such as carbon dioxide (CO_2), methane (CH_4), carbon monoxide (CO) and volatile organic compounds (VOCs) can be classed as a form of contamination where there is a potential risk to human health.

For this report, gas monitoring was via measuring emissions from eight standpipes (all boreholes except BH104 & BH104A) that were installed during the sitework. The gas monitoring will consist of six visits.

5.1 Monitoring Wells and Response Zones

During the site investigation works, gas monitoring wells were installed within fourteen boreholes, at the request of Fairhurst. The response zones were specified by Fairhurst and are briefly summarised below in Table 2.

TABLE 2: SUMMARY OF MONITORING WELL RESPONSE ZONES

Borehole	Pipework	Installation Depth (mbgl)	Response zone of slotted pipework (mbgl)	Response Zone Stratum
BH101	50mm HDPE pipe	12.30	7.00-12.30	Silt
BH102	50mm HDPE pipe	17.00	12.00-17.00	Sand/Gravel
BH103	50mm HDPE pipe	12.40	7.90-12.40	Silt
BH105	50mm HDPE pipe	8.70	7.10-8.70	Peat
WS101	50mm HDPE pipe	3.70	1.20-3.70	Made Ground
*WS102**	*50mm HDPE pipe*	*5.00*	*3.60-5.00*	*Sand*
WS104	50mm HDPE pipe	3.00	1.20-3.00	Made Ground
WS105	50mm HDPE pipe	2.50	1.20-2.50	Made Ground
**install removed/destroyed between installation and commencement of monitoring*				

5.2 Ground Gas Results

Two monitoring visits have been completed to date. The atmospheric pressure has an impact on the concentrations of gas released. Atmospheric pressure was between 999 and 1003 during the visits to date. The results of the visits undertaken to date are summarised below in Table 3 and are presented in full in Appendix E.

TABLE 3: SUMMARY OF GAS MONITORING RESULTS

Borehole	Flow Range (l/hr)	CH_4 Range (%v/v)	CO_2 Range (%v/v)	O_2 Range (%v/v)	PID Range (ppm)	CO Range (ppm)	H_2S Range (ppm)	GW Range (mbgl)
BH101	0.1	3.0 – 8.0	0.0 – 0.3	14.0 – 18.4	0.2 – 0.4	0	0	1.28 – 3.07
BH102	0.1	6.7 – 9.4	0.3 – 0.5	14.3 – 16.2	0.1 – 0.8	0	0	1.82 – 1.86
BH103	0.1	6.7 – 7.3	0.2	17.9 – 18.0	0.3 – 0.6	0	0	1.23 – 1.45
BH105	0.1	0	0.2	19.2 – 19.4	0	0	0	2.10
WS101	0.1	0	2.2 – 4.9	3.9 – 18.0	0	0	0	2.20 – 2.30
WS104	0.1	0	0.0	20.0 – 20.4	0	0	0	1.28 – 2.60
WS105	0.1	0	0.7 – 0.8	19.1 – 19.4	0	0	0	2.00 – 2.05

6 GEOTECHNICAL TESTING

Samples taken from the boreholes underwent a series of geotechnical tests to aid design and soil description. In addition, insitu Standard Penetration Tests (SPTs) were undertaken at regular intervals during drilling.

The geotechnical results are presented in Appendix D.

The scope of the testing undertaken was determined by Fairhurst.

6.1 In-Situ Testing

The in-situ testing results are shown on the logs (Appendix B). The Plate Load Test results are shown in Appendix D.
Generally, Standard Penetration Tests (SPTs) within the made ground yielded N values ranging from 6 to 35 within cohesive made ground (locally 50+), and between 3 and 38 within granular made ground (locally 50+).

SPTs within the localised shallow sand deposits ranged from 1 to 35, indicating very loose to dense deposits.

SPTs within the silt deposits ranged from 0 to 12, indicating very low to medium strength deposits.

SPTs within the localised peat deposits ranged from 7.

SPTs within the deeper granular deposits ranged from 17 to 50+, generally increasing with depth, indicating medium dense to very dense deposits.

SPTs within the clay deposits ranged from 6 to 19, indicating low to high strength deposits.

SPTs upon/within the rockhead ranged from 50+, generally increasing with depth.

6.2 Laboratory Testing

The scope of the laboratory testing to be undertaken was determined by Fairhurst. The below soils testing was scheduled:

16no K1.1 Moisture contents
16no K1.2 Atterberg limits
12no K1.9 Particle Size Distribution (PSD)
11no K1.12 Sedimentation by hydrometer
6no K2.1 Organic Matter Content (OMC)
9no K2.4 Sulphate
9no K2.12 pH
3no K3.9 CBR
1no K1.8 Particle Density
4no K4.1 One dimensional consolidation
4no K6.16 Undrained shear strength in triaxial

The below rock testing was scheduled:

6no K8.14 Uniaxial Compressive Strength (UCS)
8no K8.21 Point Load Test (PLT)
1no Point Load Test (Axial & Diametral)
3no Direct Shear
5no K2.4 Sulphate
5no K2.12 pH
5no Water Content

The geotechnical results are presented in Appendix D. Some geotechnical results are outstanding and will be added as an addendum to this report.

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APPENDIX A:
Figures & Drawings

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Figure Title

Site Location Plan

Project Number

S230311

Project Name

Whitby Maritime Hub, Whitby

Client

Willmott Dixon Construction

Date

October 2023

DRG Number

Figure 1

Scale

1:3500 @ A4 [DO NOT SCALE]

Legend Key

Project Bounds - Project Bounds

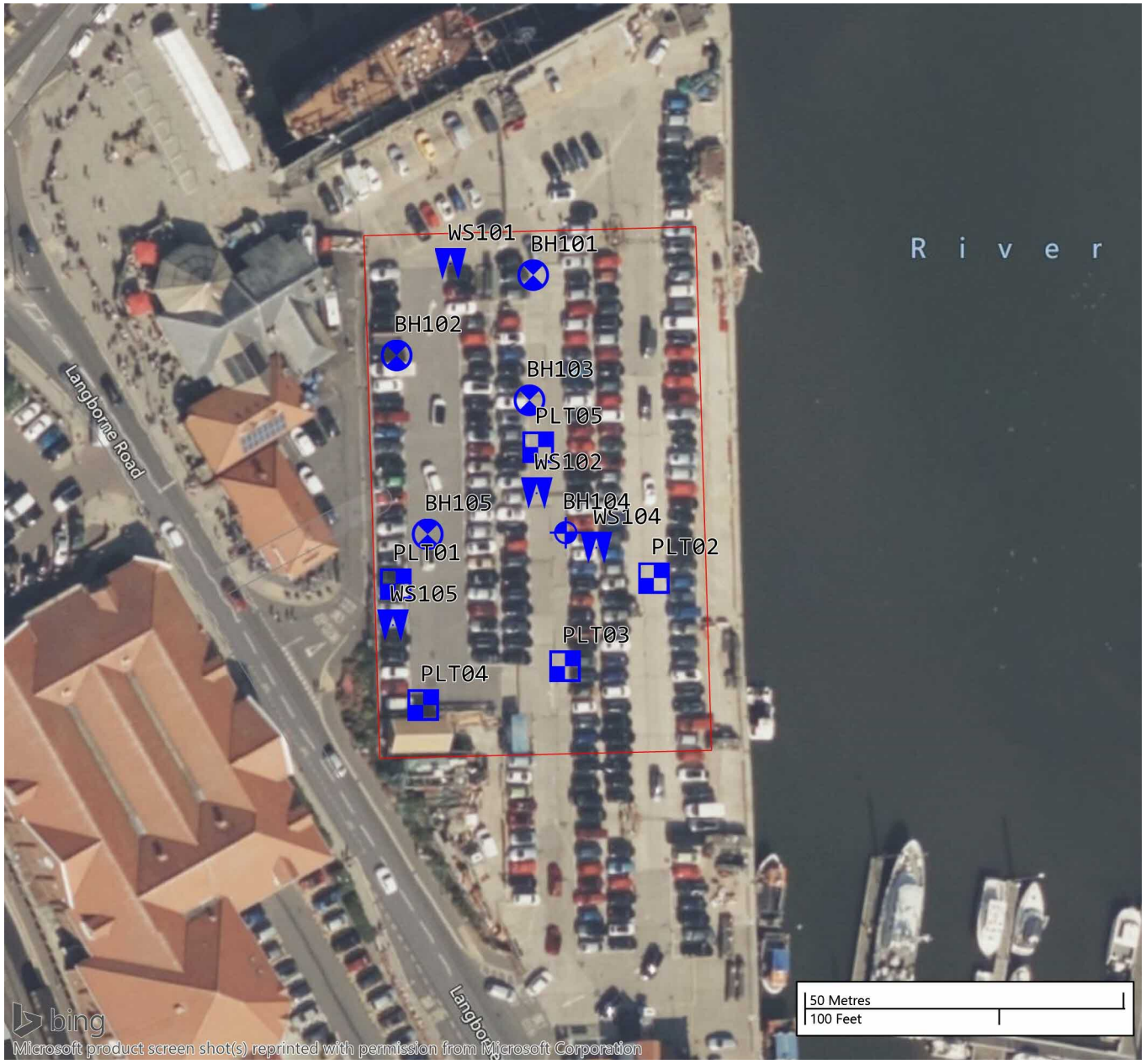

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Figure Title

Exploratory Hole Location Plan

Project Number

S230311

Project Name

Whitby Maritime Hub, Whitby

Client

Willmott Dixon Construction

Date

October 2023

DRG Number

Figure 2

Scale

1:1000 @ A4 [DO NOT SCALE]

Legend Key

- Locations By Type - BH
- Locations By Type - CP
- Locations By Type - CP+RC
- Locations By Type - TP
- Locations By Type - WS
- Project Bounds - Project Bounds

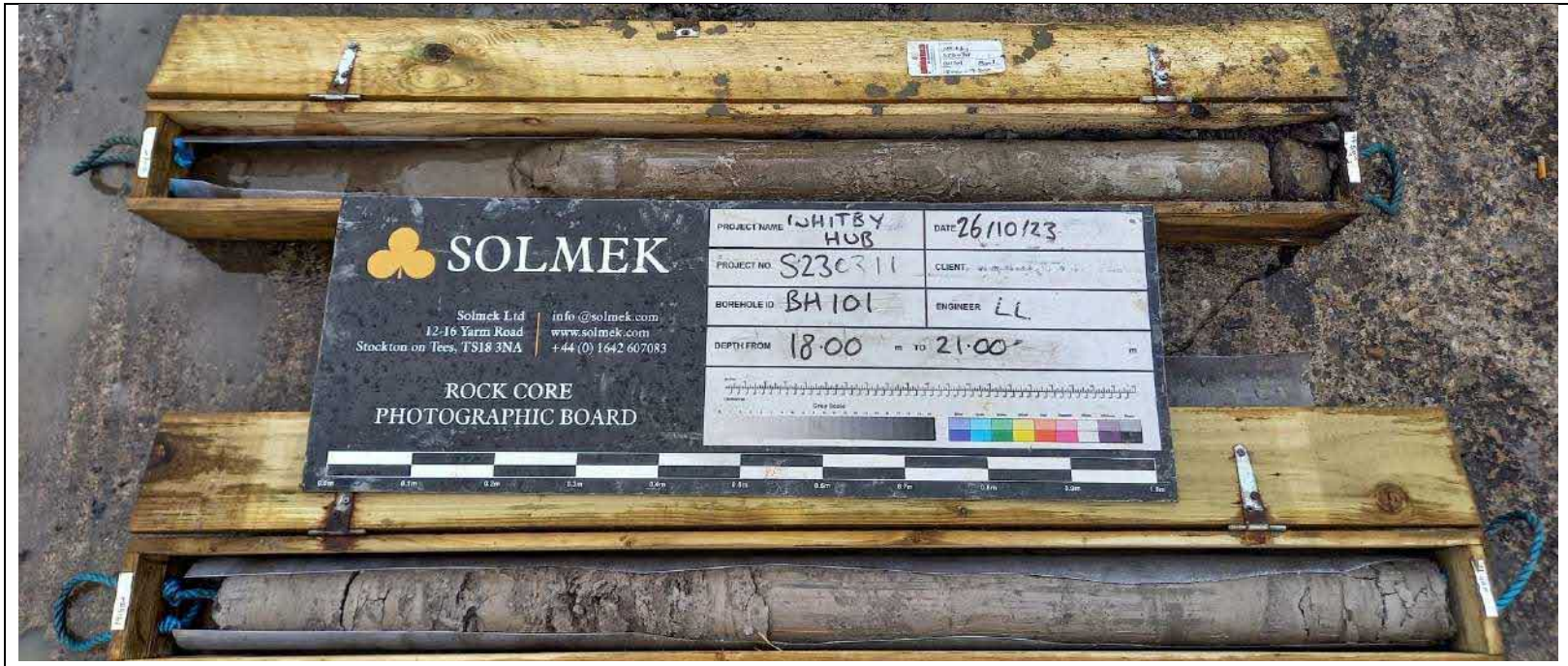

Figure 3: BH101 18.00-21.00m

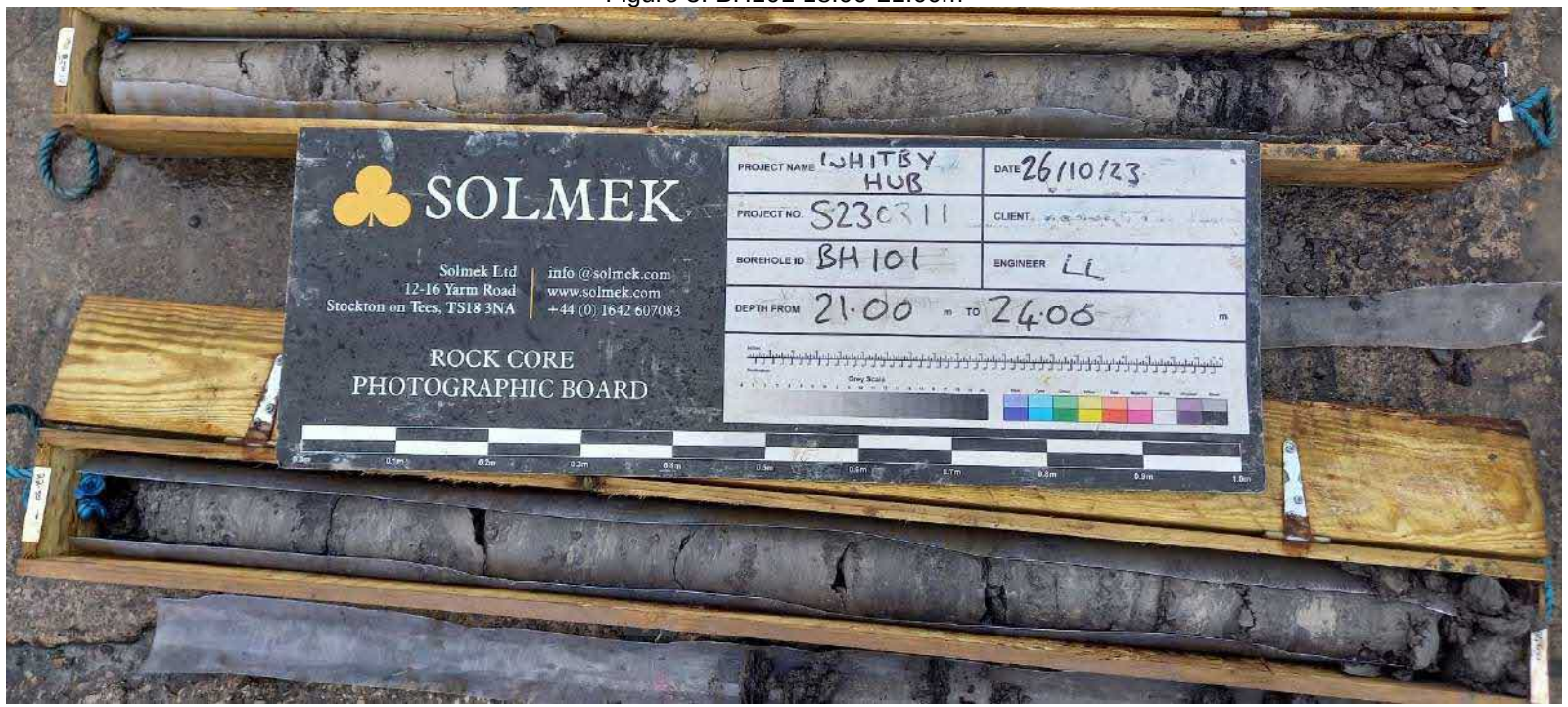

Figure 4: BH101 21.00-24.00m

Title
Rock Core Photographs
Project
Whitby Maritime Hub
Client
Wilmott Dixon Construction
Date
December 2023
Fig No.
Figures 3 & 4
Scale
N/A
Key

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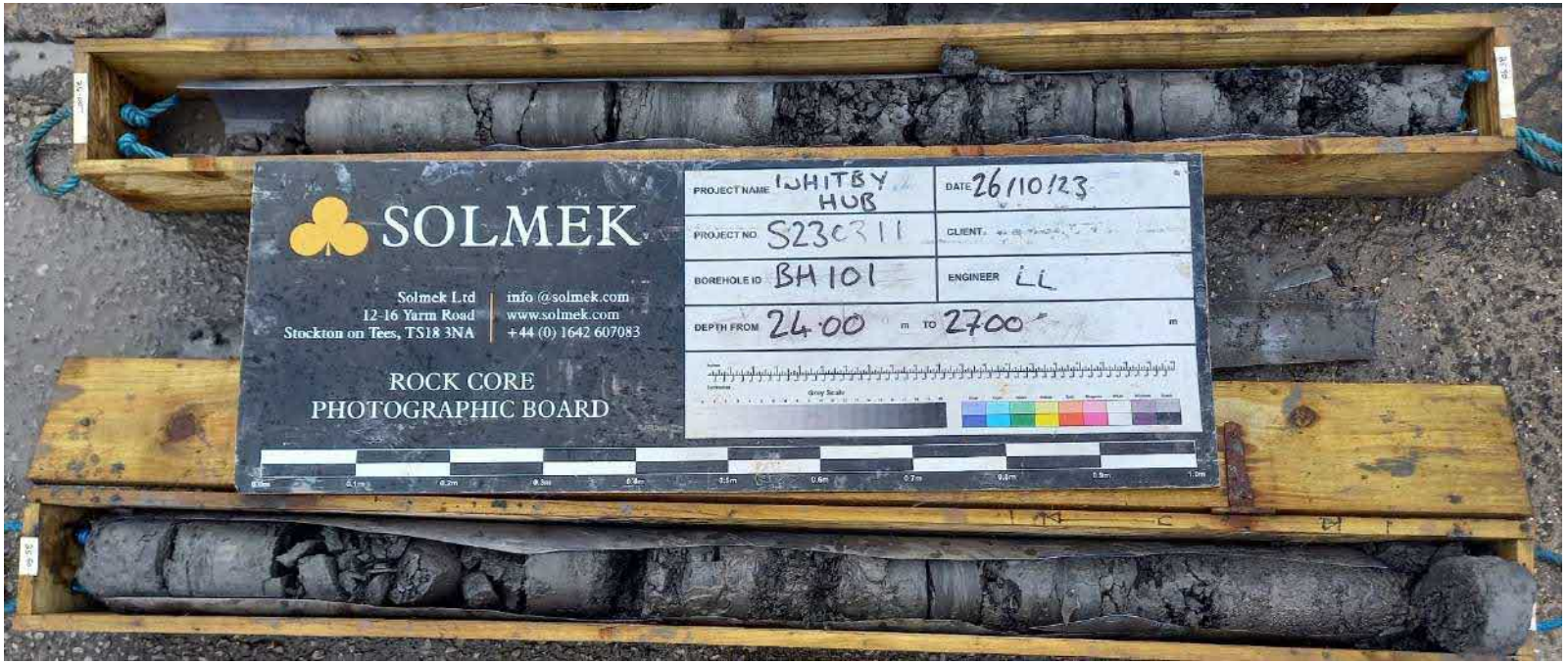

Figure 5: BH101 24.00-27.00m

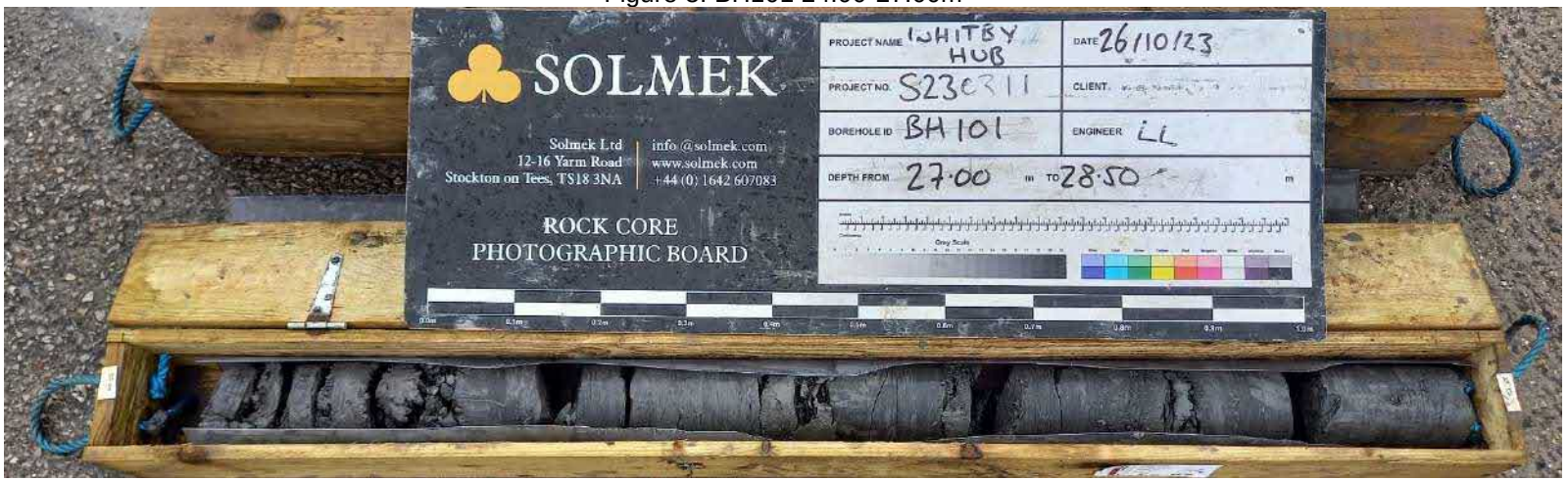

Figure 6: BH101 27.00-28.50m

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Figure 7: BH102 18.00-21.00m

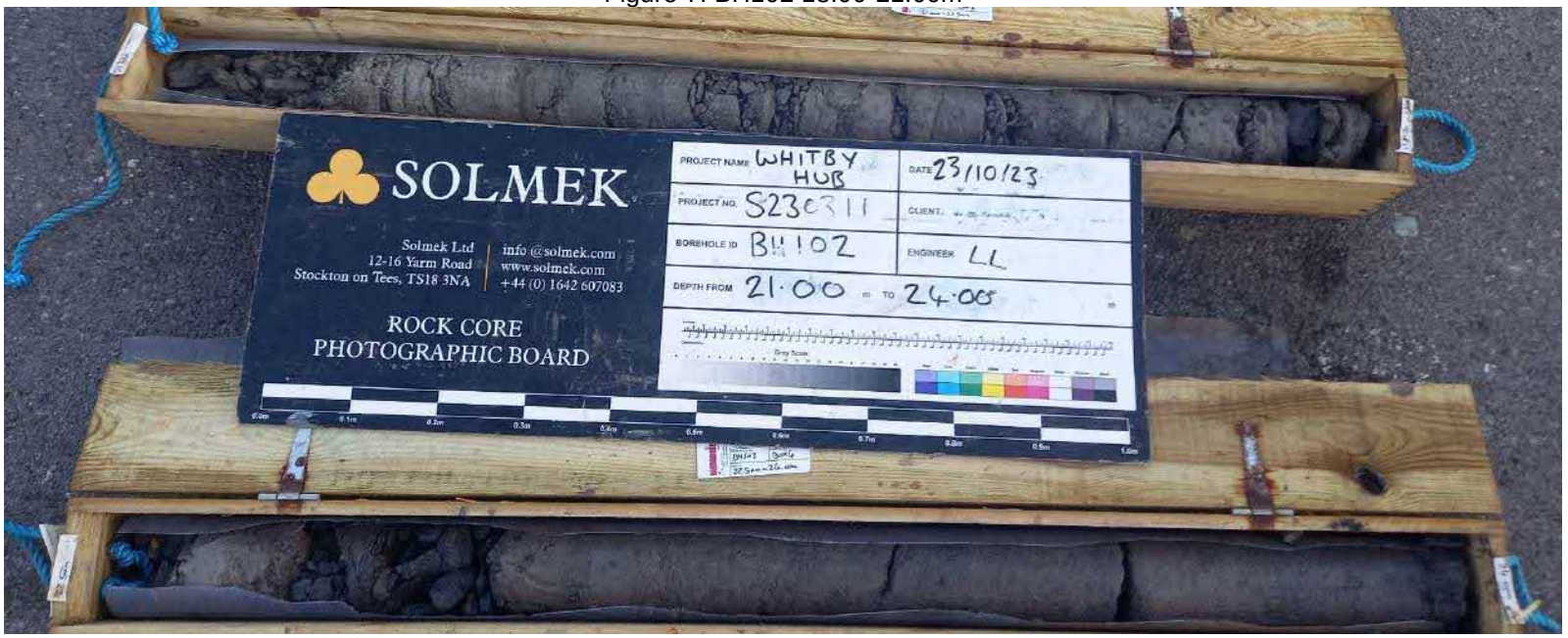

Figure 8: BH102 21.00-24.00m

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Figure 9: BH102 24.00-27.00m

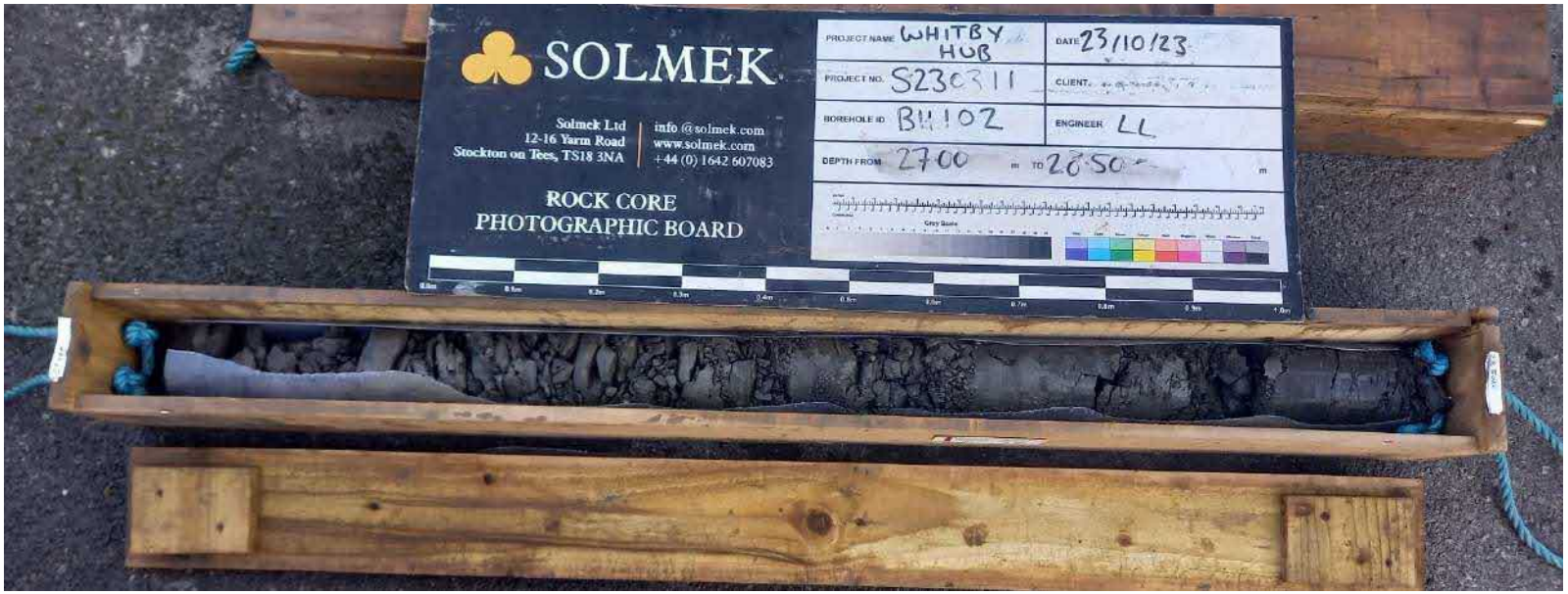

Figure 10: BH102 27.00-26.50m

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Fig No.
Figures 9 & 10
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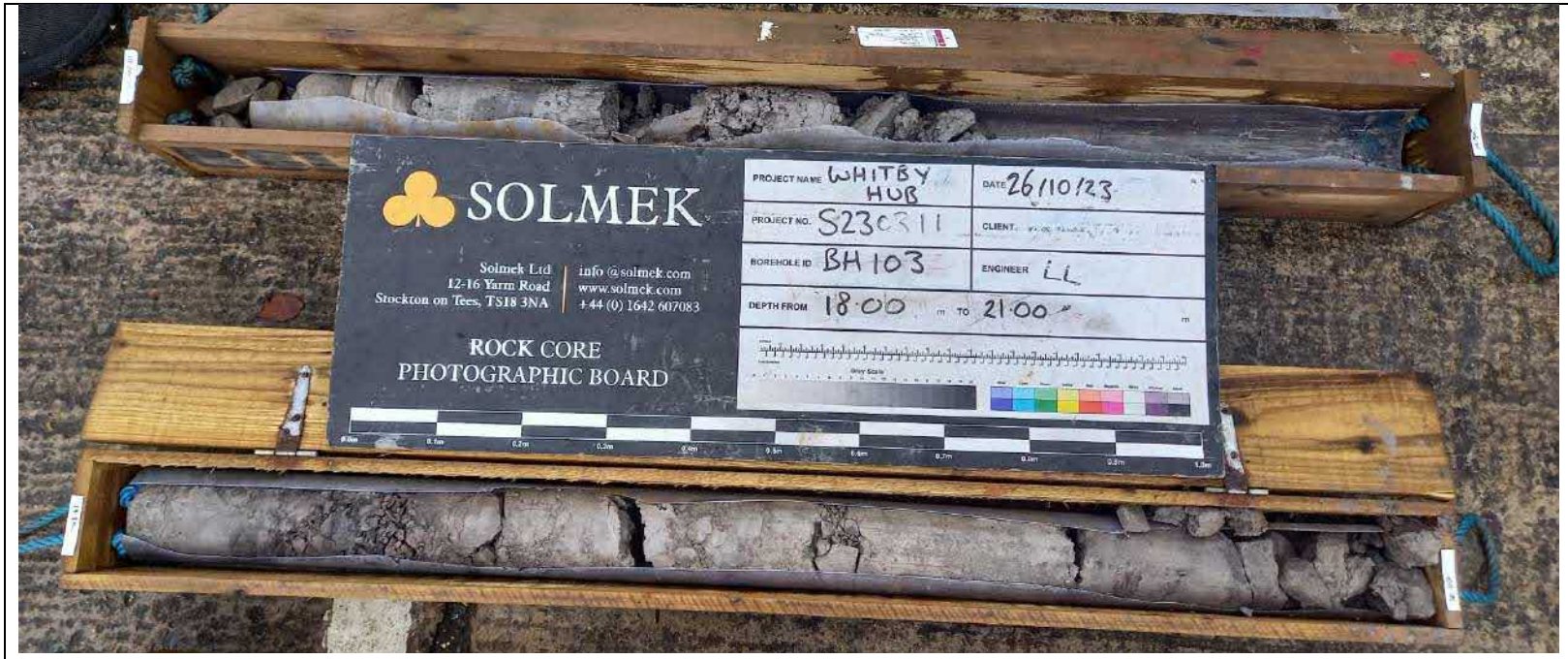

Figure 11: BH103 18.00-21.00m

Figure 12: BH103 21.00-24.00m

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Figures 11 & 12
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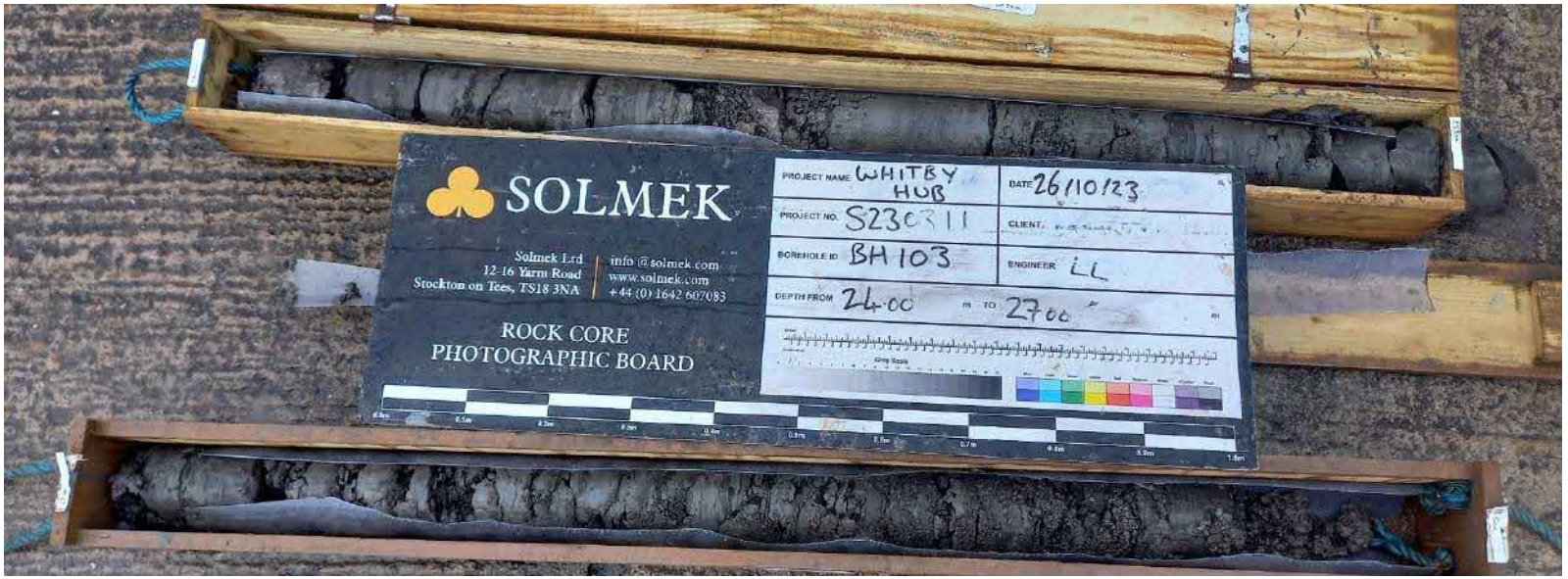

Figure 13: BH103 18.00-21.00m

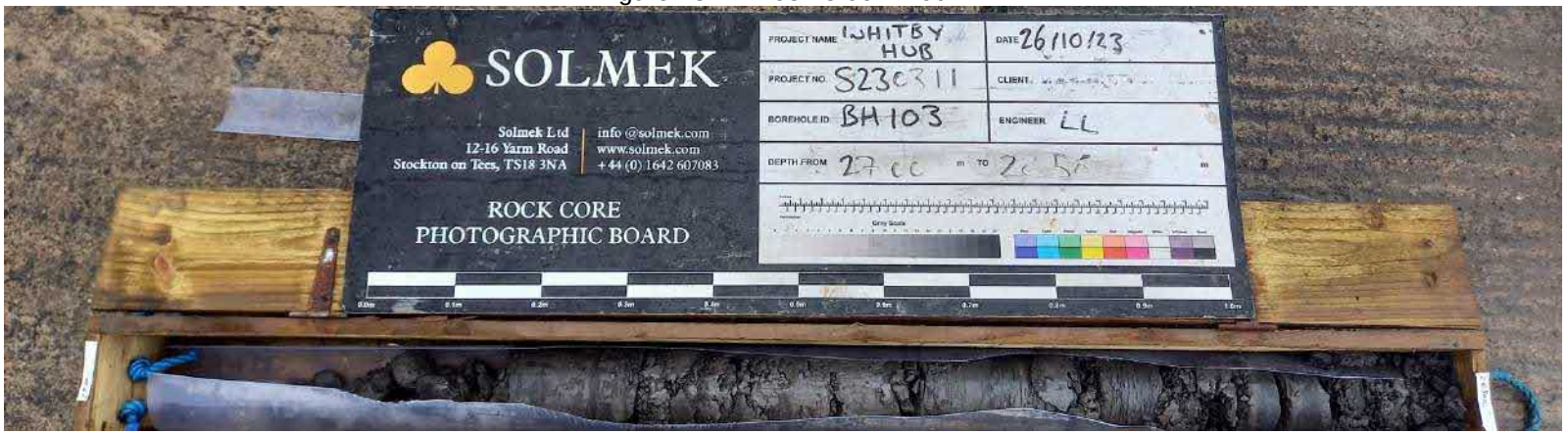

Figure 14: BH103 21.00-24.00m

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Figures 13 & 14
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Figure 15: BH105 18.00-21.00m

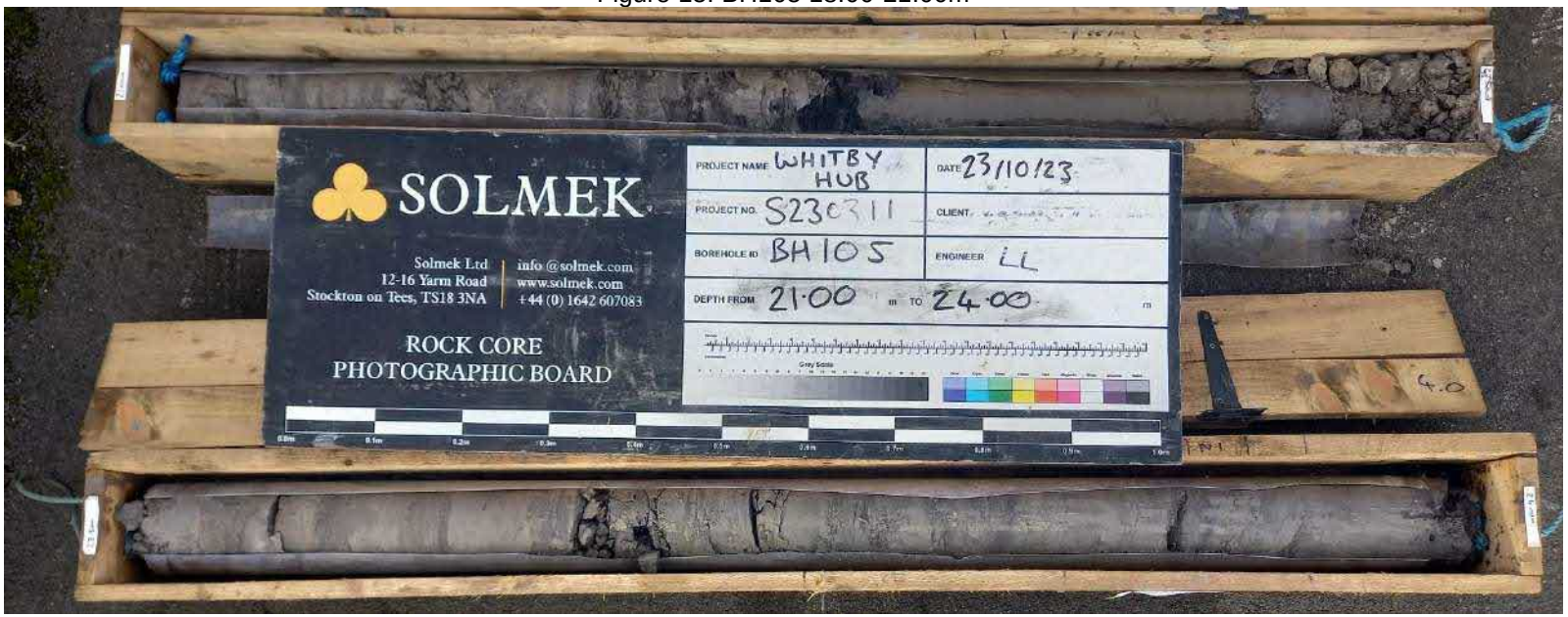

Figure 16: BH105 21.00-24.00m

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Figures 15 & 16
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Figure 17: BH105 18.00-21.00m

Figure 18: BH105 21.00-24.00m

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SOLMEK

APPENDIX B:
Borehole & Trial Pit Logs

	Backfill / Installation

Backfill / Installation

	Backfill / Installation

Backfill / Installation

	Backfill / Installation

Backfill / Installation

	Back‖ ll / Installaeon

	Back‖ ll / Installaeon

	Backfill / Installation

	Backfill / Installation

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend
	Depth	Type	Results			
				0.25	3.48	
				0.65 0.70	3.08 3.03	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend
	Depth	Type	Results			
				0.24 0.30	3.46 3.40	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend
	Depth	Type	Results			
				0.22 0.30	3.22 3.14	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend
	Depth	Type	Results			
				0.17	3.56	
				0.55	3.18	
				0.60	3.14	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend
	Depth	Type	Results			
				0.22 0.25	3.16 3.13	

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	Back‖ ll / Installaeon

	Back‖ ll / Installaeon

APPENDIX C:
Contamination Laboratory Results

Certificate of Analysis

Certificate Number	23-06584	*Issued:*	29-Mar-23

Client SOLMEK
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference	23-06584
Client Reference	S230311
Order No	SOL7164LC
Contract Title	Whitby Maritime Hub, Whitby
Description	8 Soil samples, 9 Leachate samples.
Date Received	20-Mar-23
Date Started	20-Mar-23
Date Completed	29-Mar-23
Test Procedures	Identified by prefix DETSn (details on request).

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

Approved By [redacted]

Kirk Bridgewood
General Manager

MCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

ilac-MRA

UKAS TESTING 2139

Summary of Chemical Analysis
Matrix Descriptions

Our Ref 23-06584
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

Sample ID	Depth	Lab No	Completed	Matrix Description
WS101	0.80-1.00	2142976	29/03/2023	Very gravelly, sandy CLAY (Possible made ground - brick)
WS101	3.70-3.90	2142977	29/03/2023	Black very gravelly, sandy CLAY
WS102	0.60-0.80	2142978	29/03/2023	Brown very gravelly, sandy CLAY (Possible made ground - brick) (Possible made ground - slate)
WS102	1.50-1.60	2142979	29/03/2023	Brown very gravelly, sandy CLAY (Possible made ground - brick)
WS102	3.80-4.00	2142980	29/03/2023	Dark brown slightly gravelly, sandy CLAY
WS104	0.60-0.80	2142981	29/03/2023	Brown gravelly, sandy CLAY (Possible made ground - brick)
WS105	1.20-1.50	2142982	29/03/2023	Brown gravelly, sandy CLAY (Possible made ground - brick)
WS105	3.50-4.00	2142983	29/03/2023	Brown slightly gravelly, sandy CLAY (Possible made ground - brick)

Summary of Chemical Analysis
Soil Samples

Our Ref 23-06584
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

			Lab No	2142976	2142977	2142979	2142980	2142981	2142982	2142983
			.Sample ID	WS101	WS101	WS102	WS102	WS104	WS105	WS105
			Depth	0.80-1.00	3.70-3.90	1.50-1.60	3.80-4.00	0.60-0.80	1.20-1.50	3.50-4.00
			Other ID							
			Sample Type	ES	ES	ES	ES	ES	ES	ES
			Sampling Date	15/03/2023	15/03/2023	14/03/2023	14/03/2023	14/03/2023	15/03/2023	15/03/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units							
Metals										
Antimony	DETSC 2301*	1	mg/kg	5.3	< 1.0	1.2	< 1.0	1.6	1.8	< 1.0
Arsenic	DETSC 2301#	0.2	mg/kg	14	7.8	4.0	12	9.1	15	8.9
Barium	DETSC 2301#	1.5	mg/kg	220	71	220	68	160	88	71
Beryllium	DETSC 2301#	0.2	mg/kg	1.7	0.2	0.9	0.4	1.0	0.7	0.3
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.1	1.6	2.7	4.7	2.4	1.1	1.9
Cadmium	DETSC 2301#	0.1	mg/kg	0.6	0.1	< 0.1	< 0.1	0.2	0.1	< 0.1
Chromium III	DETSC 2301*	0.15	mg/kg	14	13	15	13	16	13	8.7
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	94	23	28	13	32	29	29
Iron	DETSC 2301	25	mg/kg	23000	19000	41000	26000	34000	36000	18000
Lead	DETSC 2301#	0.3	mg/kg	370	110	23	28	190	81	130
Manganese	DETSC 2301#	20	mg/kg	550	450	230	240	400	350	160
Mercury	DETSC 2325#	0.05	mg/kg	0.12	0.41	< 0.05	0.08	0.20	0.15	0.38
Molybdenum	DETSC 2301#	0.4	mg/kg	3.1	0.5	< 0.4	1.1	0.8	1.9	0.7
Nickel	DETSC 2301#	1	mg/kg	22	11	47	15	27	18	10
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	37	63	25	30	31	31	20
Zinc	DETSC 2301#	1	mg/kg	250	78	58	63	100	58	37
Inorganics										
pH	DETSC 2008#		pH	9.9	8.2	8.8	8.6	8.7	9.6	8.4
Calorific Value	DETSC 5008	1	MJ/kg					< 1.0		
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.5	0.2	< 0.1	< 0.1	0.6	0.5	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Cyanide, Complex	DETSC 2130*	0.2	mg/kg	0.4	< 0.2	< 0.2	< 0.2	0.5	0.5	< 0.2
Thiocyanate	DETSC 2130#	0.6	mg/kg	< 0.6	0.9	< 0.6	0.7	0.7	< 0.6	0.8
Organic matter	DETSC 2002#	0.1	%					1.9		
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg	2.5	3.4	4.6	6.7	4.7	4.1	5.5
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	170	210	32	340	140	260	340
Sulphur as S, Total	DETSC 2320	0.01	%	0.11	0.18	0.02	0.39	0.07	0.10	0.95
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.16	0.14	0.04	0.20	0.10	0.14	0.25
Petroleum Hydrocarbons										
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >EC10-EC12: EH_2D_AL	DETSC 3521#	1.5	mg/kg	6.32	3.40	2.04	< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic >EC12-EC16: EH_2D_AL	DETSC 3521#	1.2	mg/kg	27.45	3.94	2.07	< 1.20	1.51	1.60	< 1.20
Aliphatic >EC16-EC21: EH_2D_AL	DETSC 3521#	1.5	mg/kg	25.72	4.66	2.31	< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic >EC21-EC35: EH_2D_AL	DETSC 3521#	3.4	mg/kg	335.1	13.28	6.50	4.89	< 3.40	6.72	< 3.40
Aliphatic >EC35-EC40: EH_2D_AL	DETSC 3521#	3.4	mg/kg	133.6	13.25	3.90	< 3.40	< 3.40	< 3.40	< 3.40
Aliphatic >EC40-EC44: EH_2D_AL	DETSC 3521*	3.4	mg/kg	34.29	12.68	< 3.40	< 3.40	< 3.40	< 3.40	< 3.40
Aliphatic C5-C44: EH_2D+HS_1D_AL	DETSC 3521*	10	mg/kg	562.5	51.22	16.81	< 10.00	< 10.00	< 10.00	< 10.00

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

Summary of Chemical Analysis
Soil Samples

Our Ref 23-06584
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

			Lab No	2142976	2142977	2142979	2142980	2142981	2142982	2142983
			.Sample ID	WS101	WS101	WS102	WS102	WS104	WS105	WS105
			Depth	0.80-1.00	3.70-3.90	1.50-1.60	3.80-4.00	0.60-0.80	1.20-1.50	3.50-4.00
			Other ID							
			Sample Type	ES	ES	ES	ES	ES	ES	ES
			Sampling Date	15/03/2023	15/03/2023	14/03/2023	14/03/2023	14/03/2023	15/03/2023	15/03/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units							
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >EC10-EC12: EH_2D_AR	DETSC 3521#	0.9	mg/kg	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Aromatic >EC12-EC16: EH_2D_AR	DETSC 3521#	0.5	mg/kg	1.97	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aromatic >EC16-EC21: EH_2D_AR	DETSC 3521#	0.6	mg/kg	20.63	1.14	1.09	0.99	3.17	1.14	8.05
Aromatic >EC21-EC35: EH_2D_AR	DETSC 3521#	1.4	mg/kg	19.13	3.54	4.44	< 1.40	3.98	< 1.40	4.48
Aromatic >EC35-EC40: EH_2D_AR	DETSC 3521*	1.4	mg/kg	2.28	3.73	6.16	< 1.40	< 1.40	< 1.40	< 1.40
Aromatic >EC40-EC44: EH_2D_AR	DETSC 3521*	1.4	mg/kg	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40
Aromatic C5-C44: EH_2D+HS_1D_AR	DETSC 3521*	10	mg/kg	44.02	< 10.00	11.69	< 10.00	< 10.00	< 10.00	12.53
TPH Ali/Aro C5-C44: EH_2D+HS_1D_Total	DETSC 3521*	10	mg/kg	606.5	51.22	28.51	< 10.00	< 10.00	< 10.00	12.53
C5-C10 Gasoline Range Organics (GRO): HS_1D_Total	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C6-C10): HS_1D_Total	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
C10-C24 Diesel Range Organics (DRO): EH_1D_Total	DETSC 3311#	10	mg/kg	230	< 10	< 10	< 10	99	< 10	87
EPH (C10-C40): EH_1D_Total	DETSC 3311#	10	mg/kg	490	< 10	< 10	< 10	240	81	120
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01				< 0.01		
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01				< 0.01		
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01				< 0.01		
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01				< 0.01		
MTBE	DETSC 3321	0.01	mg/kg	< 0.01				< 0.01		
C24-C40 Lube Oil Range Organics (LORO): EH_1D_Total	DETSC 3311#	10	mg/kg	260	< 10	< 10	< 10	140	74	38
PAHs										
Naphthalene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1	0.8	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	0.6	< 0.1	< 0.1	< 0.1	0.7	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	1.0	< 0.1	< 0.1	< 0.1	0.9	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	7.4	< 0.1	< 0.1	< 0.1	6.8	0.2	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	2.0	< 0.1	< 0.1	< 0.1	1.3	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	24	< 0.1	< 0.1	< 0.1	11	0.3	0.6
Pyrene	DETSC 3301	0.1	mg/kg	21	< 0.1	< 0.1	< 0.1	10	0.6	0.8
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	12	< 0.1	< 0.1	< 0.1	4.9	< 0.1	0.4
Chrysene	DETSC 3301	0.1	mg/kg	13	< 0.1	< 0.1	< 0.1	5.1	< 0.1	0.4
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	9.0	< 0.1	< 0.1	< 0.1	3.3	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	5.6	< 0.1	< 0.1	< 0.1	2.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	12	< 0.1	< 0.1	< 0.1	4.4	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	8.1	< 0.1	< 0.1	< 0.1	2.7	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	1.3	< 0.1	< 0.1	< 0.1	0.6	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	7.4	< 0.1	< 0.1	< 0.1	2.4	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	120	< 1.6	< 1.6	< 1.6	57	< 1.6	2.2

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

Summary of Chemical Analysis
Soil Samples

Our Ref 23-06584
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

				Lab No	2142976	2142977	2142979	2142980	2142981	2142982	2142983
				.Sample ID	WS101	WS101	WS102	WS102	WS104	WS105	WS105
				Depth	0.80-1.00	3.70-3.90	1.50-1.60	3.80-4.00	0.60-0.80	1.20-1.50	3.50-4.00
				Other ID							
				Sample Type	ES	ES	ES	ES	ES	ES	ES
				Sampling Date	15/03/2023	15/03/2023	14/03/2023	14/03/2023	14/03/2023	15/03/2023	15/03/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units								
PCBs											
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg	< 0.01				< 0.01		
PCB 52	DETSC 3401#	0.01	mg/kg	< 0.01				< 0.01		
PCB 101	DETSC 3401#	0.01	mg/kg	< 0.01				< 0.01		
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01				< 0.01		
PCB 153	DETSC 3401#	0.01	mg/kg	< 0.01				< 0.01		
PCB 138	DETSC 3401#	0.01	mg/kg	< 0.01				< 0.01		
PCB 180	DETSC 3401#	0.01	mg/kg	< 0.01				< 0.01		
PCB 7 Total	DETSC 3401#	0.01	mg/kg	< 0.01				< 0.01		
Phenols											
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis
Leachate Samples

Our Ref 23-06584
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

			Lab No	2142984	2142985	2142986	2142987	2142988
			.Sample ID	WS101	WS102	WS102	WS104	WS105
			Depth	0.80-1.00	1.50-1.60	3.80-4.00	0.60-0.80	1.20-1.50
			Other ID					
			Sample Type	ES	ES	ES	ES	ES
			Sampling Date	15/03/2023	14/03/2023	14/03/2023	14/03/2023	15/03/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units					
Metals								
Antimony, Dissolved	DETSC 2306	0.17	ug/l	0.81	< 0.17	0.32	0.63	0.41
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	3.4	0.47	1.6	1.4	1.4
Barium, Dissolved	DETSC 2306	0.26	ug/l	5.5	2.0	10	7.6	5.4
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Boron, Dissolved	DETSC 2306*	12	ug/l	< 12	74	130	28	< 12
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chromium III, Dissolved	DETSC 2306*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium, Hexavalent	DETSC 2203	7	ug/l	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	9.0	7.0	3.1	1.8	3.8
Iron, Dissolved	DETSC 2306	5.5	ug/l	140	150	61	140	130
Lead, Dissolved	DETSC 2306	0.09	ug/l	2.1	0.40	0.12	2.2	1.2
Manganese, Dissolved	DETSC 2306	0.22	ug/l	1.3	1.5	2.3	1.9	1.3
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.01	< 0.01
Molybdenum, Dissolved	DETSC 2306	1.1	ug/l	1.2	< 1.1	7.2	1.7	< 1.1
Nickel, Dissolved	DETSC 2306	0.5	ug/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.38	0.35	< 0.25	0.25	0.31
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	7.1	1.4	1.9	1.4	1.3
Zinc, Dissolved	DETSC 2306	1.3	ug/l	1.9	< 1.3	< 1.3	< 1.3	< 1.3
Inorganics								
pH	DETSC 2008		pH	8.3	7.9	7.5	7.4	7.4
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40
Cyanide, Free	DETSC 2130	20	ug/l	< 20	< 20	< 20	< 20	< 20
Cyanide, Complex	DETSC 2130*	40	ug/l	< 40	< 40	< 40	< 40	< 40
Thiocyanate	DETSC 2130	20	ug/l	< 20	300	< 20	59	44
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.074	0.095	0.66	0.12	0.14
Sulphate as SO4	DETSC 2055	0.1	mg/l	6.4	6.1	6.5	10	12
Petroleum Hydrocarbons								
Aliphatic C5-C6: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	15	2.4	< 1.0	< 1.0
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	100	5.5	< 1.0	< 1.0
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	14	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	24	1.4	< 1.0	< 1.0
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	36	1.0	< 1.0	< 1.0
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	13	< 1.0	< 1.0	< 1.0
Aromatic C5-C7: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Leachate Samples

Our Ref 23-06584
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

				Lab No	2142984	2142985	2142986	2142987	2142988
				.Sample ID	WS101	WS102	WS102	WS104	WS105
				Depth	0.80-1.00	1.50-1.60	3.80-4.00	0.60-0.80	1.20-1.50
				Other ID					
				Sample Type	ES	ES	ES	ES	ES
				Sampling Date	15/03/2023	14/03/2023	14/03/2023	14/03/2023	15/03/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units						
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072*	1	ug/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072*	1	ug/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1	ug/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	1	ug/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	1	ug/l		< 1.0	100	5.5	< 1.0	< 1.0
PAHs									
Naphthalene	DETSC 3304	0.05	ug/l		0.06	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l		0.05	< 0.01	0.03	0.02	0.03
Acenaphthene	DETSC 3304	0.01	ug/l		0.03	< 0.01	< 0.01	0.04	< 0.01
Fluorene	DETSC 3304	0.01	ug/l		0.03	< 0.01	< 0.01	0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l		0.21	0.03	< 0.01	0.04	0.01
Anthracene	DETSC 3304	0.01	ug/l		0.14	< 0.01	< 0.01	0.04	0.02
Fluoranthene	DETSC 3304	0.01	ug/l		0.76	0.04	0.02	0.23	0.04
Pyrene	DETSC 3304	0.01	ug/l		0.65	0.04	0.03	0.26	0.04
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l		0.43	0.02	0.02	0.13	0.03
Chrysene	DETSC 3304	0.01	ug/l		0.52	0.03	0.03	0.18	0.04
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l		0.58	0.04	0.02	0.30	0.07
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l		0.23	< 0.01	< 0.01	0.13	0.02
Benzo(a)pyrene	DETSC 3304	0.01	ug/l		0.50	0.02	0.02	0.28	0.05
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l		0.43	0.02	0.01	0.25	0.05
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l		0.08	< 0.01	< 0.01	0.03	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l		0.42	0.03	0.01	0.25	0.05
PAH Total	DETSC 3304	0.2	ug/l		5.1	0.29	< 0.20	2.2	0.46
Phenols									
Phenol - Monohydric	DETSC 2130	100	ug/l		< 100	< 100	< 100	< 100	< 100

Key: * -not accredited. n/s -not supplied.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-06584
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby
Sample Id WS101 0.80-1.00

Sample Numbers 2142976 2142989 2142990
Date Analysed 29/03/2023

Test Results On Waste

Determinand and Method Reference	Units	Result	WAC Limit Values: Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	10.0	3	5	6
DETSC2003# Loss On Ignition	%		n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	490.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	120.0	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate

Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		WAC Limit Values Limit values for LS10 Leachate: Inert Waste	SNRHW	Hazardous Waste
	2:1	8:1	LS2	LS10			
DETSC 2306 Arsenic as As	6	3.4	0.012	0.038	0.5	2	25
DETSC 2306 Barium as Ba	6.5	4.2	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.94	0.61	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	15	7.7	0.03	0.088	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	2.4	1.3	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.62	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	2.8	2.7	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	1.8	1	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.77	0.46	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	2.6	4	0.005	0.038	4	50	200
DETSC 2055 Chloride as Cl	12000	150	24	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	290	130	0.58	1.54	10	150	500
DETSC 2055 Sulphate as SO4	17000	3800	34	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	120000	46000	240	570.2	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	8200	9500	16.4	93.1	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Additional Information

DETSC 2008 pH	6.5	8.1
DETSC 2009 Conductivity uS/cm	171.0	65.2
* Temperature*	17.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.111

Stage 1

Volume of Leachant L2*	0.192
Volume of Eluate VE1*	0.165

Stage 2

Volume of Leachant L8*	0.887
Volume of Eluate VE2*	0.84

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

V.2.06 * DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-06584
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby
Sample Id WS104 0.60-0.80

Sample Numbers 2142981 2142991 2142992
Date Analysed 29/03/2023

Test Results On Waste

Determinand and Method Reference	Units	Result	WAC Limit Values: Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	2.0	3	5	6
DETSC2003# Loss On Ignition	%		n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	240.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	57.0	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate

Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		WAC Limit Values Limit values for LS10 Leachate: Inert Waste	SNRHW	Hazardous Waste
	2:1	8:1	LS2	LS10			
DETSC 2306 Arsenic as As	3.5	1.3	0.007	0.017	0.5	2	25
DETSC 2306 Barium as Ba	23	11	0.05	0.13	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	2.1	0.97	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	4.3	3.4	0.009	0.036	2	50	100
DETSC 2306 Mercury as Hg	0.022	0.015	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	4.1	1.8	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.63	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	3.7	2.1	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	2.5	1	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.96	0.48	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	2.6	2	0.005	0.021	4	50	200
DETSC 2055 Chloride as Cl	17000	2200	34	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	930	170	1.86	2.97	10	150	500
DETSC 2055 Sulphate as SO4	50000	7300	100	144.2	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	170000	55000	340	741.7	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	9100	7500	18.2	77.7	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Additional Information

DETSC 2008 pH	8.0	7.7
DETSC 2009 Conductivity uS/cm	241.0	78.1
* Temperature*	18.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.118

Stage 1

Volume of Leachant L2*	0.213
Volume of Eluate VE1*	0.196

Stage 2

Volume of Leachant L8*	0.94
Volume of Eluate VE2*	0.894

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

V.2.06 * DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-06584
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2142976	WS101 0.80-1.00	SOIL	NAD	none	Pierce Booth
2142978	WS102 0.60-0.80	SOIL	NAD	none	Pierce Booth
2142981	WS104 0.60-0.80	SOIL	NAD	none	Pierce Booth
2142982	WS105 1.20-1.50	SOIL	NAD	none	Pierce Booth

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-06584
Client Ref S230311
Contract Whitby Maritime Hub, Whitby

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2142976	WS101 0.80-1.00 SOIL	15/03/23	GJ 250ml x2, PT 1L	Ammonia (3 days)	
2142977	WS101 3.70-3.90 SOIL	15/03/23	GJ 250ml x2, PT 1L	Ammonia (3 days)	
2142978	WS102 0.60-0.80 SOIL	14/03/23	GJ 250ml x2, PT 1L		
2142979	WS102 1.50-1.60 SOIL	14/03/23	GJ 250ml x2, PT 1L	Ammonia (3 days)	
2142980	WS102 3.80-4.00 SOIL	14/03/23	GJ 250ml x2, PT 1L	Ammonia (3 days)	
2142981	WS104 0.60-0.80 SOIL	14/03/23	GJ 250ml x2, PT 1L	Ammonia (3 days)	
2142982	WS105 1.20-1.50 SOIL	15/03/23	GJ 250ml x2, PT 1L	Ammonia (3 days)	
2142983	WS105 3.50-4.00 SOIL	15/03/23	GJ 250ml x2, PT 1L	Ammonia (3 days)	
2142984	WS101 0.80-1.00 LEACHATE	15/03/23	GJ 250ml x2, PT 1L		
2142985	WS102 1.50-1.60 LEACHATE	14/03/23	GJ 250ml x2, PT 1L		
2142986	WS102 3.80-4.00 LEACHATE	14/03/23	GJ 250ml x2, PT 1L		
2142987	WS104 0.60-0.80 LEACHATE	14/03/23	GJ 250ml x2, PT 1L		
2142988	WS105 1.20-1.50 LEACHATE	15/03/23	GJ 250ml x2, PT 1L		
2142989	WS101 0.80-1.00 LEACHATE	15/03/23	GJ 250ml x2, PT 1L		
2142990	WS101 0.80-1.00 LEACHATE	15/03/23	GJ 250ml x2, PT 1L		
2142991	WS104 0.60-0.80 LEACHATE	14/03/23	GJ 250ml x2, PT 1L		
2142992	WS104 0.60-0.80 LEACHATE	14/03/23	GJ 250ml x2, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

Certificate of Analysis

Certificate Number	23-24975	*Issued:*	02-Nov-23

Client SOLMEK
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference	23-24975
Client Reference	S230311
Order No	SOL--7796
Contract Title	WHITBY MARITIME HUB, WHITBY
Description	5 Soil samples, 4 Leachate samples.
Date Received	23-Oct-23
Date Started	23-Oct-23
Date Completed	02-Nov-23
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By [redacted]

Kirk Bridgewood
General Manager

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

ilac-MRA

UKAS TESTING
2139

Summary of Chemical Analysis
Matrix Descriptions

Our Ref 23-24975
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

Sample ID	Depth	Lab No	Completed	Matrix Description
BH102	1	2251104	02/11/2023	Brown/ orange very gravelly CLAY (Made ground - brick)
BH102	7.5	2251105	02/11/2023	Dark slightly gravelly, sandy CLAY
BH105	2.2	2251106	02/11/2023	Dark brown slightly gravelly, sandy CLAY including odd rootlets (Possible made ground - brick)
BH105	3.5	2251107	02/11/2023	Dark brown slightly gravelly, sandy CLAY including odd rootlets

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24975
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

Test	Method	LOD	Units	Lab No	2251104	2251105	2251106	2251107
				.Sample ID	BH102	BH102	BH105	BH105
				Depth	1.00	7.50	2.20	3.50
				Other ID				
				Sample Type	ES	ES	ES	ES
				Sampling Date	16/10/2023	16/10/2023	16/10/2023	16/10/2023
				Sampling Time	n/s	n/s	n/s	n/s
Metals								
Antimony	DETSC 2301*	1	mg/kg		1.4		1.3	< 1.0
Arsenic	DETSC 2301#	0.2	mg/kg		7.1		11	13
Barium	DETSC 2301#	1.5	mg/kg		59		130	57
Beryllium	DETSC 2301#	0.2	mg/kg		0.4		1.1	0.4
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg		2.3		2.0	3.7
Cadmium	DETSC 2301#	0.1	mg/kg		1.1		0.3	0.1
Chromium III	DETSC 2301*	0.15	mg/kg		11		15	14
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0		< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg		12		32	12
Iron	DETSC 2301	25	mg/kg		16000		30000	32000
Lead	DETSC 2301#	0.3	mg/kg		17		92	40
Manganese	DETSC 2301#	20	mg/kg		180		570	270
Mercury	DETSC 2325#	0.05	mg/kg		< 0.05		0.13	0.05
Molybdenum	DETSC 2301#	0.4	mg/kg		1.6		1.6	1.1
Nickel	DETSC 2301#	1	mg/kg		9.2		16	14
Selenium	DETSC 2301#	0.5	mg/kg		< 0.5		0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg		16		36	35
Zinc	DETSC 2301#	1	mg/kg		72		72	54
Inorganics								
pH	DETSC 2008#		pH		9.6		8.3	8.6
Calorific Value	DETSC 5008	1	MJ/kg		< 1.0			
Cyanide, Total	DETSC 2130#	0.1	mg/kg		< 0.1		0.2	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg		< 0.1		< 0.1	< 0.1
Cyanide, Complex	DETSC 2130*	0.2	mg/kg		< 0.2		< 0.2	< 0.2
Thiocyanate	DETSC 2130#	0.6	mg/kg		< 0.6		0.9	0.8
Organic matter	DETSC 2002#	0.1	%			3.2		
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg		1.4		43	4.7
Nitrate as N	*	1	mg/kg		< 1.0		< 1.0	< 1.0
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		1000		210	360
Sulphur as S, Total	DETSC 2320	0.01	%		0.27		0.13	0.39
Sulphate as SO4, Total	DETSC 2321#	0.01	%		0.69		0.13	0.13
Petroleum Hydrocarbons								
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg		< 1.5		< 1.5	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg		< 1.2		< 1.2	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg		< 1.5		< 1.5	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg		< 3.4		< 3.4	< 3.4
Aliphatic C35-C40: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg		< 3.4		< 3.4	< 3.4
Aliphatic C5-C40: EH_CU+HS_1D_AL	DETSC 3072*	10	mg/kg		< 10		< 10	< 10

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

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24975
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

			Lab No	2251104	2251105	2251106	2251107
			.Sample ID	BH102	BH102	BH105	BH105
			Depth	1.00	7.50	2.20	3.50
			Other ID				
			Sample Type	ES	ES	ES	ES
			Sampling Date	16/10/2023	16/10/2023	16/10/2023	16/10/2023
			Sampling Time	n/s	n/s	n/s	n/s
Test	Method	LOD	Units				
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9		< 0.9	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5		< 0.5	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6		< 0.6	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4		< 1.4	< 1.4
Aromatic C35-C40: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4		< 1.4	< 1.4
Aromatic C5-C40: EH_CU+HS_1D_AR	DETSC 3072*	10	mg/kg	< 10		< 10	< 10
TPH Ali/Aro C5-C40: EH_CU+HS_1D_Total	DETSC 3072*	10	mg/kg	< 10		< 10	< 10
TPH (C6-C40): EH_CU+HS_1D_Total	DETSC 3311*	10	mg/kg	< 10		94	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01			
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01			
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01			
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01			
MTBE	DETSC 3321	0.01	mg/kg	< 0.01			
PAHs							
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1		0.2	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1		0.4	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1		0.3	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1		0.7	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.1		2.8	0.2
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1		0.8	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.5		4.4	0.2
Pyrene	DETSC 3301	0.1	mg/kg	0.3		3.7	0.2
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.2		2.2	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	0.3		2.5	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.2		1.7	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.2		1.2	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.3		2.5	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1		2.4	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1		0.5	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1		1.2	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	2.0		27	< 1.6
PCBs							
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg	< 0.01			
PCB 52	DETSC 3401#	0.01	mg/kg	< 0.01			
PCB 101	DETSC 3401#	0.01	mg/kg	< 0.01			
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01			
PCB 153	DETSC 3401#	0.01	mg/kg	< 0.01			
PCB 138	DETSC 3401#	0.01	mg/kg	< 0.01			
PCB 180	DETSC 3401#	0.01	mg/kg	< 0.01			

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

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24975
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

			Lab No	2251104	2251105	2251106	2251107
			.Sample ID	BH102	BH102	BH105	BH105
			Depth	1.00	7.50	2.20	3.50
			Other ID				
			Sample Type	ES	ES	ES	ES
			Sampling Date	16/10/2023	16/10/2023	16/10/2023	16/10/2023
			Sampling Time	n/s	n/s	n/s	n/s
Test	Method	LOD	Units				
PCB 7 Total	DETSC 3401#	0.01	mg/kg	< 0.01			
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3		< 0.3	0.3

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

Summary of Chemical Analysis
Leachate Samples

Our Ref 23-24975
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

			Lab No	2251108	2251109
			.Sample ID	BH102	BH102
			Depth	1.00	7.50
			Other ID		
			Sample Type	ES	ES
			Sampling Date	16/10/2023	16/10/2023
			Sampling Time	n/s	n/s
Test	Method	LOD	Units		
Preparation					
NRA Leachate Preparation	DETSC 1009*			Y	Y
Metals					
Antimony, Dissolved	DETSC 2306	0.17	ug/l	2.6	1.5
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	1.7	2.5
Barium, Dissolved	DETSC 2306	0.26	ug/l	30	12
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1
Boron, Dissolved	DETSC 2306*	12	ug/l	71	93
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03
Chromium III, Dissolved	DETSC 2306*	1	ug/l	21	14
Chromium, Hexavalent	DETSC 2203	7	ug/l	< 7.0	< 7.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	1.7	0.5
Iron, Dissolved	DETSC 2306	5.5	ug/l	< 5.5	7.3
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.29	0.31
Manganese, Dissolved	DETSC 2306	0.22	ug/l	0.95	1.3
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01
Molybdenum, Dissolved	DETSC 2306	1.1	ug/l	3.4	4.7
Nickel, Dissolved	DETSC 2306	0.5	ug/l	< 0.5	< 0.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.46	< 0.25
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	4.3	2.9
Zinc, Dissolved	DETSC 2306	1.3	ug/l	< 1.3	< 1.3
Inorganics					
pH	DETSC 2008		pH	8.1	8.3
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40
Cyanide, Free	DETSC 2130	20	ug/l	< 20	< 20
Cyanide, Complex	DETSC 2130*	40	ug/l	< 40	< 40
Thiocyanate	DETSC 2130	20	ug/l	< 20	25
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	< 0.015	< 0.015
Sulphate as SO4	DETSC 2055	0.1	mg/l	130	20

Key: * -not accredited. n/s -not supplied.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-24975
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY
Sample Id BH102 1.00
Sample Numbers 2251104 2251110
Date Analysed 31/10/2023

Test Results On Waste

Determinand and Method Reference	Units	Result	WAC Limit Values: Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	2.1	3	5	6
DETSC2003# Loss On Ignition	%		n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	2.0	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate

Determinand and Method Reference	Conc in Eluate ug/l 10:1	Amount Leached* mg/kg LS10	WAC Limit Values Limit values for LS10 Leachate: Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	1.3	0.013	0.5	2	25
DETSC 2306 Barium as Ba	47	0.47	20	100	300
DETSC 2306 Cadmium as Cd	0.054	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	2.4	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	1.6	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	0.021	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	10	0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.62	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.53	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.36	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	1.8	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	25000	250	800	15,000	25,000
DETSC 2055* Fluoride as F	250	2.5	10	150	500
DETSC 2055 Sulphate as SO4	240000	2400	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	450000	4500	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Additional Information

DETSC 2008 pH	8.6
DETSC 2009 Conductivity uS/cm	639.0
* Temperature*	18.0

Mass of Sample Kg*	0.100
Mass of dry Sample Kg*	0.092

Stage 1

Volume of Leachant L2*	0.913
Volume of Eluate VE1*	0.85

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

V.2.06 * DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-24975
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY
Sample Id BH105 2.20
Sample Numbers 2251106 2251111
Date Analysed 31/10/2023

Test Results On Waste

Determinand and Method Reference	Units	Result	WAC Limit Values: Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	3.5	3	5	6
DETSC2003# Loss On Ignition	%		n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	94.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	27.0	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate

Determinand and Method Reference	Conc in Eluate ug/l 10:1	Amount Leached* mg/kg LS10	WAC Limit Values Limit values for LS10 Leachate: Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	1.2	0.012	0.5	2	25
DETSC 2306 Barium as Ba	15	0.15	20	100	300
DETSC 2306 Cadmium as Cd	0.11	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	1.3	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	2.1	0.021	2	50	100
DETSC 2306 Mercury as Hg	0.021	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	4.7	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	1.3	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	4.4	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.44	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	1.5	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	20	0.2	4	50	200
DETSC 2055 Chloride as Cl	8500	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	12000	120	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	76000	760	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	2200	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Additional Information

DETSC 2008 pH	6.8
DETSC 2009 Conductivity uS/cm	109.0
* Temperature*	18.0

Mass of Sample Kg*	0.100
Mass of dry Sample Kg*	0.092

Stage 1

Volume of Leachant L2*	0.913
Volume of Eluate VE1*	0.85

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

V.2.06 * DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-24975
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2251103	BH102 0.60	SOIL	NAD	none	Ben Rose
2251104	BH102 1.00	SOIL	NAD	none	Ben Rose
2251106	BH105 2.20	SOIL	NAD	none	Ben Rose
2251107	BH105 3.50	SOIL	NAD	none	Ben Rose

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-24975
Client Ref S230311
Contract WHITBY MARITIME HUB, WHITBY

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2251103	BH102 0.60 SOIL	16/10/23	GJ 250ml, PT 1L x2		
2251104	BH102 1.00 SOIL	16/10/23	GJ 250ml, PT 1L x2		
2251105	BH102 7.50 SOIL	16/10/23	PT 500ml		
2251106	BH105 2.20 SOIL	16/10/23	GJ 250ml, PT 1L x2		
2251107	BH105 3.50 SOIL	16/10/23	GJ 250ml, PT 1L x2		
2251108	BH102 1.00 LEACHATE	16/10/23	GJ 250ml, PT 1L x2		
2251109	BH102 7.50 LEACHATE	16/10/23	PT 500ml		
2251110	BH102 1.00 LEACHATE	16/10/23	GJ 250ml, PT 1L x2		
2251111	BH105 2.20 LEACHATE	16/10/23	PT 500ml		

Key: G-Glass P-Plastic J-Jar T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC 2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC 2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC 2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC 2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC 2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2311	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	As Received	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3321	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3521	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3521	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3521	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

Certificate of Analysis

Certificate Number 23-24975-1 *Issued:* 11-Dec-23

Client SOLMEK
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference 23-24975-1

Client Reference S230311

Order No SOL--7796

Contract Title WHITBY MARITIME HUB, WHITBY

Description 5 Soil samples, 4 Leachate prepared by DETS samples.

Date Received 23-Oct-23

Date Started 23-Oct-23

Date Completed 11-Dec-23

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

Notes **This report supersedes 23-24975, amendments made**
Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By [redacted]

Kirk Bridgewood
General Manager

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

ilac-MRA

UKAS TESTING
2139

Summary of Chemical Analysis
Matrix Descriptions

Our Ref 23-24975-1
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

Sample ID	Depth	Lab No	Completed	Matrix Description
BH102	1	2251104	02/11/2023	Brown/ orange very gravelly CLAY (Made ground - brick)
BH102	7.5	2251105	02/11/2023	Dark slightly gravelly, sandy CLAY
BH105	2.2	2251106	02/11/2023	Dark brown slightly gravelly, sandy CLAY including odd rootlets (Possible made ground - brick)
BH105	3.5	2251107	02/11/2023	Dark brown slightly gravelly, sandy CLAY including odd rootlets

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24975-1
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

				Lab No	2251104	2251105	2251106	2251107
				.Sample ID	BH102	BH102	BH105	BH105
				Depth	1.00	7.50	2.20	3.50
				Other ID				
				Sample Type	ES	ES	ES	ES
				Sampling Date	16/10/2023	16/10/2023	16/10/2023	16/10/2023
				Sampling Time	n/s	n/s	n/s	n/s
Test	Method	LOD	Units					
Metals								
Antimony	DETSC 2301*	1	mg/kg	1.4		1.3	< 1.0	
Arsenic	DETSC 2301#	0.2	mg/kg	7.1		11	13	
Barium	DETSC 2301#	1.5	mg/kg	59		130	57	
Beryllium	DETSC 2301#	0.2	mg/kg	0.4		1.1	0.4	
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	2.3		2.0	3.7	
Cadmium	DETSC 2301#	0.1	mg/kg	1.1		0.3	0.1	
Chromium III	DETSC 2301*	0.15	mg/kg	11		15	14	
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0		< 1.0	< 1.0	
Copper	DETSC 2301#	0.2	mg/kg	12		32	12	
Iron	DETSC 2301	25	mg/kg	16000		30000	32000	
Lead	DETSC 2301#	0.3	mg/kg	17		92	40	
Manganese	DETSC 2301#	20	mg/kg	180		570	270	
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05		0.13	0.05	
Molybdenum	DETSC 2301#	0.4	mg/kg	1.6		1.6	1.1	
Nickel	DETSC 2301#	1	mg/kg	9.2		16	14	
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5		0.5	< 0.5	
Vanadium	DETSC 2301#	0.8	mg/kg	16		36	35	
Zinc	DETSC 2301#	1	mg/kg	72		72	54	
Inorganics								
pH	DETSC 2008#		pH	9.6		8.3	8.6	
Calorific Value	DETSC 5008	1	MJ/kg	< 1.0				
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1		0.2	< 0.1	
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1		< 0.1	< 0.1	
Cyanide, Complex	DETSC 2130*	0.2	mg/kg	< 0.2		< 0.2	< 0.2	
Thiocyanate	DETSC 2130#	0.6	mg/kg	< 0.6		0.9	0.8	
Organic matter	DETSC 2002#	0.1	%		3.2			
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg	1.4		43	4.7	
Nitrate as N	*	1	mg/kg	< 1.0		< 1.0	< 1.0	
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	1000		210	360	
Sulphur as S, Total	DETSC 2320	0.01	%	0.27		0.13	0.39	
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.69		0.13	0.13	
Petroleum Hydrocarbons								
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5		< 1.5	< 1.5	
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2		< 1.2	< 1.2	
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5		< 1.5	< 1.5	
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4		< 3.4	< 3.4	
Aliphatic C35-C40: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4		< 3.4	< 3.4	
Aliphatic C5-C40: EH_CU+HS_1D_AL	DETSC 3072*	10	mg/kg	< 10		< 10	< 10	

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

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24975-1
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

			Lab No	2251104	2251105	2251106	2251107
			.Sample ID	BH102	BH102	BH105	BH105
			Depth	1.00	7.50	2.20	3.50
			Other ID				
			Sample Type	ES	ES	ES	ES
			Sampling Date	16/10/2023	16/10/2023	16/10/2023	16/10/2023
			Sampling Time	n/s	n/s	n/s	n/s
Test	Method	LOD	Units				
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9		< 0.9	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5		< 0.5	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6		< 0.6	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4		< 1.4	< 1.4
Aromatic C35-C40: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4		< 1.4	< 1.4
Aromatic C5-C40: EH_CU+HS_1D_AR	DETSC 3072*	10	mg/kg	< 10		< 10	< 10
TPH Ali/Aro C5-C40: EH_CU+HS_1D_Total	DETSC 3072*	10	mg/kg	< 10		< 10	< 10
TPH (C6-C40): EH+HS_1D_Total	DETSC 3311*	10	mg/kg	< 10		94	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01			
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01			
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01			
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01			
MTBE	DETSC 3321	0.01	mg/kg	< 0.01			
PAHs							
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1		0.2	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1		0.4	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1		0.3	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1		0.7	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.1		2.8	0.2
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1		0.8	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.5		4.4	0.2
Pyrene	DETSC 3301	0.1	mg/kg	0.3		3.7	0.2
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.2		2.2	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	0.3		2.5	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.2		1.7	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.2		1.2	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.3		2.5	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1		2.4	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1		0.5	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1		1.2	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	2.0		27	< 1.6
PCBs							
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg	< 0.01			
PCB 52	DETSC 3401#	0.01	mg/kg	< 0.01			
PCB 101	DETSC 3401#	0.01	mg/kg	< 0.01			
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01			
PCB 153	DETSC 3401#	0.01	mg/kg	< 0.01			
PCB 138	DETSC 3401#	0.01	mg/kg	< 0.01			
PCB 180	DETSC 3401#	0.01	mg/kg	< 0.01			

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

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24975-1
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

			Lab No	2251104	2251105	2251106	2251107
			.Sample ID	BH102	BH102	BH105	BH105
			Depth	1.00	7.50	2.20	3.50
			Other ID				
			Sample Type	ES	ES	ES	ES
			Sampling Date	16/10/2023	16/10/2023	16/10/2023	16/10/2023
			Sampling Time	n/s	n/s	n/s	n/s
Test	Method	LOD	Units				
PCB 7 Total	DETSC 3401#	0.01	mg/kg	< 0.01			
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3		< 0.3	0.3

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

Summary of Chemical Analysis
Leachate Samples

Our Ref 23-24975-1
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

Test	Method	LOD	Units	Lab No 2251108	2251109	2251111
				.Sample ID BH102	BH102	BH105
				Depth 1.00	7.50	2.20
				Other ID		
				Sample Type ES	ES	ES
				Sampling Date 16/10/2023	16/10/2023	16/10/2023
				Sampling Time n/s	n/s	n/s
Metals						
Antimony, Dissolved	DETSC 2306	0.17	ug/l	2.6	1.5	0.44
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	1.7	2.5	1.2
Barium, Dissolved	DETSC 2306	0.26	ug/l	30	12	15
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1	< 0.1
Boron, Dissolved	DETSC 2306*	12	ug/l	71	93	33
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	0.11
Chromium III, Dissolved	DETSC 2306*	1	ug/l	21	14	1.3
Chromium, Hexavalent	DETSC 2203	7	ug/l	< 7.0	< 7.0	< 7.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	1.7	0.5	2.1
Iron, Dissolved	DETSC 2306	5.5	ug/l	< 5.5	7.3	24
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.29	0.31	4.5
Manganese, Dissolved	DETSC 2306	0.22	ug/l	0.95	1.3	9.8
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	0.02
Molybdenum, Dissolved	DETSC 2306	1.1	ug/l	3.4	4.7	4.7
Nickel, Dissolved	DETSC 2306	0.5	ug/l	< 0.5	< 0.5	1.3
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.46	< 0.25	1.5
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	4.3	2.9	1.9
Zinc, Dissolved	DETSC 2306	1.3	ug/l	< 1.3	< 1.3	20
Inorganics						
pH	DETSC 2008		pH	8.1	8.3	
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	
Cyanide, Free	DETSC 2130	20	ug/l	< 20	< 20	
Cyanide, Complex	DETSC 2130*	40	ug/l	< 40	< 40	
Thiocyanate	DETSC 2130	20	ug/l	< 20	25	
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	< 0.015	< 0.015	
Sulphate as SO4	DETSC 2055	0.1	mg/l	130	20	

Key: * -not accredited. n/s -not supplied.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-24975
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY
Sample Id BH102 1.00
Sample Numbers 2251104 2251110
Date Analysed 31/10/2023

Test Results On Waste

Determinand and Method Reference	Units	Result	WAC Limit Values: Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	2.1	3	5	6
DETSC2003# Loss On Ignition	%		n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	2.0	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate

Determinand and Method Reference	Conc in Eluate ug/l 10:1	Amount Leached* mg/kg LS10	WAC Limit Values (Limit values for LS10 Leachate): Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	1.3	0.013	0.5	2	25
DETSC 2306 Barium as Ba	47	0.47	20	100	300
DETSC 2306 Cadmium as Cd	0.054	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	2.4	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	1.6	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	0.021	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	10	0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.62	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.53	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.36	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	1.8	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	25000	250	800	15,000	25,000
DETSC 2055* Fluoride as F	250	2.5	10	150	500
DETSC 2055 Sulphate as SO4	240000	2400	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	450000	4500	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Additional Information

DETSC 2008 pH	8.6
DETSC 2009 Conductivity uS/cm	639.0
* Temperature*	18.0

Mass of Sample Kg*	0.100
Mass of dry Sample Kg*	0.092

Stage 1

Volume of Leachant L2*	0.913
Volume of Eluate VE1*	0.85

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

V.2.06 * DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-24975
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY
Sample Id BH105 2.20
Sample Numbers 2251106 2251111
Date Analysed 31/10/2023

Test Results On Waste

Determinand and Method Reference	Units	Result	WAC Limit Values: Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	3.5	3	5	6
DETSC2003# Loss On Ignition	%		n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	94.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	27.0	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate

Determinand and Method Reference	Conc in Eluate ug/l 10:1	Amount Leached* mg/kg LS10	WAC Limit Values (Limit values for LS10 Leachate): Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	1.2	0.012	0.5	2	25
DETSC 2306 Barium as Ba	15	0.15	20	100	300
DETSC 2306 Cadmium as Cd	0.11	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	1.3	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	2.1	0.021	2	50	100
DETSC 2306 Mercury as Hg	0.021	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	4.7	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	1.3	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	4.4	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.44	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	1.5	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	20	0.2	4	50	200
DETSC 2055 Chloride as Cl	8500	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	12000	120	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	76000	760	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	2200	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Additional Information

DETSC 2008 pH	6.8
DETSC 2009 Conductivity uS/cm	109.0
* Temperature*	18.0

Mass of Sample Kg*	0.100
Mass of dry Sample Kg*	0.092

Stage 1

Volume of Leachant L2*	0.913
Volume of Eluate VE1*	0.85

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

V.2.06 * DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-24975-1
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2251103	BH102 0.60	SOIL	NAD	none	Ben Rose
2251104	BH102 1.00	SOIL	NAD	none	Ben Rose
2251106	BH105 2.20	SOIL	NAD	none	Ben Rose
2251107	BH105 3.50	SOIL	NAD	none	Ben Rose

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-24975-1
Client Ref S230311
Contract WHITBY MARITIME HUB, WHITBY

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2251103	BH102 0.60 SOIL	16/10/23	GJ 250ml, PT 1L x2		
2251104	BH102 1.00 SOIL	16/10/23	GJ 250ml, PT 1L x2	Ammonia (3 days)	BTEX / C5-C10
2251105	BH102 7.50 SOIL	16/10/23	PT 500ml		
2251106	BH105 2.20 SOIL	16/10/23	GJ 250ml, PT 1L x2	Ammonia (3 days)	BTEX / C5-C10
2251107	BH105 3.50 SOIL	16/10/23	GJ 250ml, PT 1L x2	Ammonia (3 days)	BTEX / C5-C10
2251108	BH102 1.00 LEACHATE	16/10/23	GJ 250ml, PT 1L x2		
2251109	BH102 7.50 LEACHATE	16/10/23	PT 500ml		
2251110	BH102 1.00 LEACHATE	16/10/23	GJ 250ml, PT 1L x2		
2251111	BH105 2.20 LEACHATE	16/10/23	PT 500ml		

Key: G-Glass P-Plastic J-Jar T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC 2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC 2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC 2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC 2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC 2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2311	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	As Received	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3321	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3521	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3521	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3521	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

Certificate of Analysis

Certificate Number	23-27300	*Issued:*	01-Dec-23

Client SOLMEK
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference	23-27300
Client Reference	S230311
Order No	SOL--7796
Contract Title	WHITBY MARITIME HUB, WHITBY
Description	1 Soil sample, 2 Leachate prepared by DETS samples.
Date Received	23-Oct-23
Date Started	20-Nov-23
Date Completed	01-Dec-23
Test Procedures	Identified by prefix DETSn (details on request).

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

Approved By [redacted]

Kirk Bridgewood
General Manager

ilac-MRA

UKAS TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 23-27300
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

Lab No	2264873
.Sample ID	BH105
Depth	2.20
Other ID	
Sample Type	ES
Sampling Date	16/10/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Inorganics				
Calorific Value	DETSC 5008	1	MJ/kg	< 1.0

Key: n/s -not supplied.

Summary of Chemical Analysis
Leachate Samples

Our Ref 23-27300
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

			Lab No	2264874	2264875
			.Sample ID	BH102	BH105
			Depth	1.00	2.20
			Other ID		
			Sample Type	ES	ES
			Sampling Date	16/10/2023	16/10/2023
			Sampling Time	n/s	n/s
Test	Method	LOD	Units		
Preparation					
NRA Leachate Preparation	DETSC 1009*			Y	Y
Petroleum Hydrocarbons					
Aliphatic C5-C6: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aliphatic C6-C8: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aliphatic C8-C10: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C35-C40: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C5-C40: EH_CU+HS_1D_AL	DETSC 3072*	10	ug/l	< 10	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aromatic C7-C8: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aromatic C8-C10: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C35-C40: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C5-C40: EH_CU+HS_1D_AR	DETSC 3072*	10	ug/l	< 10	< 10
TPH Ali/Aro C5-C40: EH_CU+HS_1D_Total	DETSC 3072*	10	ug/l	< 10	< 10
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0
MTBE	DETSC 3322	1	ug/l	< 1.0	< 1.0
PAHs					
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	0.09
Acenaphthene	DETSC 3304	0.01	ug/l	0.02	0.27
Fluorene	DETSC 3304	0.01	ug/l	0.02	0.17
Phenanthrene	DETSC 3304	0.01	ug/l	0.12	0.46
Anthracene	DETSC 3304	0.01	ug/l	0.04	0.19
Fluoranthene	DETSC 3304	0.01	ug/l	0.11	0.79
Pyrene	DETSC 3304	0.01	ug/l	0.13	0.62
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	0.06	0.34
Chrysene	DETSC 3304	0.01	ug/l	0.06	0.37
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	0.07	0.49
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	0.03	0.24
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	0.06	0.39
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	0.04	0.31

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Leachate Samples

Our Ref 23-27300
Client Ref S230311
Contract Title WHITBY MARITIME HUB, WHITBY

			Lab No	2264874	2264875
			.Sample ID	BH102	BH105
			Depth	1.00	2.20
			Other ID		
			Sample Type	ES	ES
			Sampling Date	16/10/2023	16/10/2023
			Sampling Time	n/s	n/s
Test	Method	LOD	Units		
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	0.05
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	0.05	0.26
PAH Total	DETSC 3304	0.2	ug/l	0.79	5.0
PCBs					
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3	< 0.3
PCB 52	DETSC 3402	0.2	ug/l	< 0.2	< 0.2
PCB 101	DETSC 3402	0.3	ug/l	< 0.3	< 0.3
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6	< 0.6
PCB 138	DETSC 3402	0.2	ug/l	< 0.2	< 0.2
PCB 153	DETSC 3402	0.2	ug/l	< 0.2	< 0.2
PCB 180	DETSC 3402	0.2	ug/l	< 0.2	< 0.2
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0	< 1.0
Phenols					
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100

Key: * -not accredited. n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 23-27300
Client Ref S230311
Contract WHITBY MARITIME HUB, WHITBY

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2264873	BH105 2.20 SOIL	16/10/23	GJ 250ml, PT 1L x2		
2264874	BH102 1.00 LEACHATE	16/10/23	GJ 250ml, PT 1L x2		
2264875	BH105 2.20 LEACHATE	16/10/23	GJ 250ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C40	EH_CU_1D_AL
Aliphatic C5-C40	EH_CU+HS_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C40	EH_CU_1D_AR
Aromatic C5-C40	EH_CU+HS_1D_AR
TPH Ali/Aro C5-C40	EH_CU+HS_1D_Total

End of Report

Certificate of Analysis

Certificate Number	23-27302	*Issued:*	28-Nov-23

Client SOLMEK
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference	23-27302
Client Reference	S230311
Order No	SOL-7810
Contract Title	Whitby Maritime Hub, Whitby
Description	2 Soil samples.
Date Received	26-Oct-23
Date Started	20-Nov-23
Date Completed	28-Nov-23
Test Procedures	Identified by prefix DETSn (details on request).

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

Approved By [redacted]

Kirk Bridgewood
General Manager

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-27302
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

			Lab No	2264877	2264878
			.Sample ID	BH104	BH104
			Depth	0.80	1.00
			Other ID		
			Sample Type	ES	ES
			Sampling Date	19/10/2023	19/10/2023
			Sampling Time	n/s	n/s
Test	Method	LOD	Units		
Metals					
Antimony	DETSC 2301*	1	mg/kg	1.5	1.6
Arsenic	DETSC 2301#	0.2	mg/kg	3.8	3.6
Barium	DETSC 2301#	1.5	mg/kg	51	45
Beryllium	DETSC 2301#	0.2	mg/kg	< 0.2	< 0.2
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.8	0.6
Cadmium	DETSC 2301#	0.1	mg/kg	0.1	< 0.1
Chromium III	DETSC 2301*	0.15	mg/kg	4.5	4.0
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	13	12
Iron	DETSC 2301	25	mg/kg	7800	7500
Lead	DETSC 2301#	0.3	mg/kg	54	42
Manganese	DETSC 2301#	20	mg/kg	280	290
Mercury	DETSC 2325#	0.05	mg/kg	0.08	0.07
Molybdenum	DETSC 2301#	0.4	mg/kg	0.5	0.5
Nickel	DETSC 2301#	1	mg/kg	8.9	7.6
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	8.8	7.4
Zinc	DETSC 2301#	1	mg/kg	43	38
Inorganics					
pH	DETSC 2008#		pH	8.4	8.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Cyanide, Complex	DETSC 2130*	0.2	mg/kg	< 0.2	< 0.2
Thiocyanate	DETSC 2130#	0.6	mg/kg	4.5	4.3
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg	2.0	2.4
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	200	170
Sulphur as S, Total	DETSC 2320	0.01	%	0.04	0.04
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.09	0.08
Petroleum Hydrocarbons					
TPH (C6-C40): EH+HS_1D_Total	DETSC 3311*	10	mg/kg	< 10	< 10

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

Information in Support of the Analytical Results

Our Ref 23-27302
Client Ref S230311
Contract Whitby Maritime Hub, Whitby

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2264877	BH104 0.80 SOIL	19/10/23	GJ 250ml, PT 1L x2		
2264878	BH104 1.00 SOIL	19/10/23	GJ 250ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

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Soil Analysis Notes

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

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

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

Disposal

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

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

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
TPH (C6-C40)	EH+HS_1D_Total

End of Report

Certificate of Analysis

Certificate Number	23-27292	*Issued:*	23-Nov-23

Client SOLMEK
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference	23-27292
Client Reference	S230311
Order No	SOL-7819
Contract Title	Whitby Maritime Hub, Whitby
Description	2 Soil samples.
Date Received	01-Nov-23
Date Started	20-Nov-23
Date Completed	23-Nov-23
Test Procedures	Identified by prefix DETSn (details on request).

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

Approved By [redacted]

Kirk Bridgewood
General Manager

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Summary of Asbestos Analysis
Samples

Our Ref 23-27292
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

Lab No	Sample ID	Sample Location	Material Type	Result	Comment*	Analyst

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Summary of Asbestos Quantification Analysis
Soil Samples

Our Ref 23-27292
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

		Lab No	2264823	2264824
		.Sample ID	BH101	BH103
		Depth	3.10	0.70
		Other ID		
		Sample Type	ES	ES
		Sampling Date	23/10/2023	23/10/2023
		Sampling Time		
Test	Method	Units		
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	**< 0.001**	**0.002**
Gravimetric Quantification (a)	DETSC 1102	Mass %	na	0.002
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	<0.001	na
Quantification by PCOM (c)	DETSC 1102	Mass %	na	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na	na
Breakdown of Gravimetric Analysis (a)				
Mass of Sample		g	957.67	771.29
ACMs present*		type		Cement
Mass of ACM in sample		g		0.12
% ACM by mass		%		0.02
% asbestos in ACM		%		15
% asbestos in sample		%		0.002
Breakdown of Detailed Gravimetric Analysis (b)				
% Amphibole bundles in sample		Mass %	na	na
% Chrysotile bundles in sample		Mass %	<0.001	na
Breakdown of PCOM Analysis (c)				
% Amphibole fibres in sample		Mass %	na	na
% Chrysotile fibres in sample		Mass %	na	na
Breakdown of Potentially Respirable Fibre Analysis (d)				
Amphibole fibres		Fibres/g	na	na
Chrysotile fibres		Fibres/g	na	na

* Denotes test or material description outside of UKAS accreditation.
% asbestos in Asbestos Containing Materials (ACMs) is determined by
by reference to HSG 264.
Recommended sample size for quantification is approximately 1kg
# denotes deviating sample

Information in Support of the Analytical Results

Our Ref 23-27292
Client Ref S230311
Contract Whitby Maritime Hub, Whitby

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2264823	BH101 3.10 SOIL	23/10/23	GJ 250ml, PT 1L x2		
2264824	BH103 0.70 SOIL	23/10/23	GJ 250ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

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Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number	23-27301	*Issued:*	22-Nov-23

Client SOLMEK
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference	23-27301
Client Reference	S230311
Order No	SOL-7819
Contract Title	Whitby Maritime Hub, Whitby
Description	One Soil sample.
Date Received	01-Nov-23
Date Started	20-Nov-23
Date Completed	22-Nov-23
Test Procedures	Identified by prefix DETSn (details on request).

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

Approved By [redacted]

Kirk Bridgewood
General Manager

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-27301
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

Lab No	2264876
.Sample ID	BH101
Depth	3.10
Other ID	
Sample Type	ES
Sampling Date	23/10/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Inorganics				
Calorific Value	DETSC 5008	1	MJ/kg	< 1.0

Key: n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 23-27301
Client Ref S230311
Contract Whitby Maritime Hub, Whitby

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2264876	BH101 3.10 SOIL	23/10/23	GJ 250ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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

End of Report

Certificate of Analysis

Certificate Number	23-25774	*Issued:*	14-Nov-23

Client SOLMEK
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference	23-25774
Client Reference	S230311
Order No	SOL-7819
Contract Title	Whitby Maritime Hub, Whitby
Description	4 Soil samples, 5 Leachate samples.
Date Received	01-Nov-23
Date Started	01-Nov-23
Date Completed	14-Nov-23
Test Procedures	Identified by prefix DETSn (details on request).

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

Approved By [redacted]

Kirk Bridgewood
General Manager

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-25774
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

			Lab No	2256396	2256397	2256398	2256399
			.Sample ID	BH101	BH101	BH101	BH103
			Depth	0.80	3.10	3.80	0.70
			Other ID				
			Sample Type	ES	ES	ES	ES
			Sampling Date	23/10/2023	23/10/2023	23/10/2023	23/10/2023
			Sampling Time	n/s	n/s	n/s	n/s
Test	Method	LOD	Units				
Metals							
Antimony	DETSC 2301*	1	mg/kg	1.2	1.1	1.3	2.4
Arsenic	DETSC 2301#	0.2	mg/kg	10	7.3	7.8	8.5
Barium	DETSC 2301#	1.5	mg/kg	110	150	130	160
Beryllium	DETSC 2301#	0.2	mg/kg	0.5	1.5	1.1	0.6
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	4.4	5.4	3.4	1.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.1	0.2	0.1	0.1
Chromium III	DETSC 2301*	0.15	mg/kg	11	13	17	13
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	33	32	120	2100
Iron	DETSC 2301	25	mg/kg	25000	16000	19000	20000
Lead	DETSC 2301#	0.3	mg/kg	110	120	150	230
Manganese	DETSC 2301#	20	mg/kg	360	580	520	410
Mercury	DETSC 2325#	0.05	mg/kg	0.38	0.16	0.63	0.10
Molybdenum	DETSC 2301#	0.4	mg/kg	1.1	1.1	7.4	1.1
Nickel	DETSC 2301#	1	mg/kg	21	15	16	18
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	1.1	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	27	30	27	23
Zinc	DETSC 2301#	1	mg/kg	81	100	100	100
Inorganics							
pH	DETSC 2008#		pH	9.2	9.4	8.9	9.1
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.3	< 0.1	< 0.1	0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Cyanide, Complex	DETSC 2130*	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Thiocyanate	DETSC 2130#	0.6	mg/kg	3.8	1.0	< 0.6	2.1
Organic matter	DETSC 2002#	0.1	%	1.8	1.4		
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg	1.6	1.5	1.4	1.5
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	77	510	53	820
Sulphur as S, Total	DETSC 2320	0.01	%	0.05	0.29	0.32	0.13
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.08	0.17	0.19	0.27

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

Summary of Chemical Analysis
Soil Samples

Our Ref 23-25774
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

			Lab No	2256396	2256397	2256398	2256399
			.Sample ID	BH101	BH101	BH101	BH103
			Depth	0.80	3.10	3.80	0.70
			Other ID				
			Sample Type	ES	ES	ES	ES
			Sampling Date	23/10/2023	23/10/2023	23/10/2023	23/10/2023
			Sampling Time	n/s	n/s	n/s	n/s
Test	Method	LOD	Units				
Petroleum Hydrocarbons							
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35: EH_CU+HS_1D_AL	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	4.2	< 0.9	< 0.9	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	1.9	< 0.5	< 0.5	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	0.8	< 0.6	< 0.6	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35: EH_CU+HS_1D_AR	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35: EH_CU+HS_1D_Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
EPH (C10-C40): EH_1D_Total	DETSC 3311#	10	mg/kg	15	69	60	130
Benzene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	
Ethylbenzene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	
Toluene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	
Xylene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	
MTBE	DETSC 3321	0.01	mg/kg		< 0.01	< 0.01	

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

Summary of Chemical Analysis
Soil Samples

Our Ref 23-25774
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

			Lab No	2256396	2256397	2256398	2256399
			.Sample ID	BH101	BH101	BH101	BH103
			Depth	0.80	3.10	3.80	0.70
			Other ID				
			Sample Type	ES	ES	ES	ES
			Sampling Date	23/10/2023	23/10/2023	23/10/2023	23/10/2023
			Sampling Time	n/s	n/s	n/s	n/s
Test	Method	LOD	Units				
PAHs							
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.5
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	1.6
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.1	0.4
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	0.3	2.7
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	1.2	1.8	9.6
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.7	0.4	2.7
Fluoranthene	DETSC 3301	0.1	mg/kg	0.1	3.9	3.4	7.4
Pyrene	DETSC 3301	0.1	mg/kg	0.1	3.3	2.8	6.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	1.6	1.1	2.8
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	1.4	1.1	2.9
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	1.0	0.8	1.4
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.6	0.5	1.0
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	1.4	1.2	2.2
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.9	0.8	1.2
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.3	0.2	0.3
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	0.8	0.6	0.9
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	17	15	44
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.7	0.7	< 0.3

Summary of Chemical Analysis
Leachate Samples

Our Ref 23-25774
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

			Lab No	2256400	2256401	2256402
			.Sample ID	BH101	BH101	BH103
			Depth	0.80	3.10	0.70
			Other ID			
			Sample Type	ES	ES	ES
			Sampling Date	23/10/2023	23/10/2023	23/10/2023
			Sampling Time	n/s	n/s	n/s
Test	Method	LOD	Units			
Preparation						
BS EN 12457 10:1	DETSC 1009*					
NRA Leachate Preparation	DETSC 1009*			Y	Y	Y
Metals						
Antimony, Dissolved	DETSC 2306	0.17	ug/l	1.6	1.5	1.7
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	9.9	1.8	0.70
Barium, Dissolved	DETSC 2306	0.26	ug/l	3.0	18	37
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1	< 0.1
Boron, Dissolved	DETSC 2306*	12	ug/l	41	90	32
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	< 0.03
Chromium III, Dissolved	DETSC 2306*	1	ug/l	5.6	< 1.0	4.3
Chromium, Hexavalent	DETSC 2203	7	ug/l	< 7.0	< 7.0	< 7.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	1.8	< 0.4	1.8
Iron, Dissolved	DETSC 2306	5.5	ug/l	100	< 5.5	< 5.5
Lead, Dissolved	DETSC 2306	0.09	ug/l	1.5	0.10	1.0
Manganese, Dissolved	DETSC 2306	0.22	ug/l	1.7	14	4.0
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.01	< 0.01	< 0.01
Molybdenum, Dissolved	DETSC 2306	1.1	ug/l	3.0	6.2	2.1
Nickel, Dissolved	DETSC 2306	0.5	ug/l	0.6	< 0.5	< 0.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.83	0.53	0.61
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	2.9	2.9	0.8
Zinc, Dissolved	DETSC 2306	1.3	ug/l	< 1.3	< 1.3	4.0
Inorganics						
pH	DETSC 2008		pH	8.2	7.8	7.4
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40
Cyanide, Free	DETSC 2130	20	ug/l	< 20	< 20	< 20
Cyanide, Complex	DETSC 2130*	40	ug/l	< 40	< 40	< 40
Thiocyanate	DETSC 2130	20	ug/l	95	< 20	< 20
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.019	< 0.015	< 0.015
Sulphate as SO4	DETSC 2055	0.1	mg/l	8.0	45	140

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Leachate Samples

Our Ref 23-25774
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

			Lab No	2256400	2256401	2256402
			.Sample ID	BH101	BH101	BH103
			Depth	0.80	3.10	0.70
			Other ID			
			Sample Type	ES	ES	ES
			Sampling Date	23/10/2023	23/10/2023	23/10/2023
			Sampling Time	n/s	n/s	n/s
Test	Method	LOD	Units			
Petroleum Hydrocarbons						
Aliphatic C5-C6: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35: EH_CU+HS_1D_AL	DETSC 3072*	10	ug/l	< 10	< 10	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aromatic C7-C8: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aromatic C8-C10: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C5-C35: EH_CU+HS_1D_AR	DETSC 3072*	10	ug/l	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35: EH_CU+HS_1D_Total	DETSC 3072*	10	ug/l	< 10	< 10	< 10
Benzene	DETSC 3322	1	ug/l		< 1.0	
Toluene	DETSC 3322	1	ug/l		< 1.0	
Ethylbenzene	DETSC 3322	1	ug/l		< 1.0	
Xylene	DETSC 3322	1	ug/l		< 1.0	
MTBE	DETSC 3322	1	ug/l		< 1.0	
PAHs						
Naphthalene	DETSC 3304	0.05	ug/l	0.07	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	0.01	0.03
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	0.07	0.02
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	0.04	0.03
Phenanthrene	DETSC 3304	0.01	ug/l	0.01	0.10	0.07
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	0.04	0.03
Fluoranthene	DETSC 3304	0.01	ug/l	0.01	0.22	0.17
Pyrene	DETSC 3304	0.01	ug/l	0.01	0.19	0.16
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	0.09	0.09
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	0.10	0.10
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	0.12	0.14
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	0.05	0.05
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	0.10	0.13
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	0.07	0.09
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	0.02	0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	0.07	0.08
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	1.3	1.2

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Leachate Samples

Our Ref 23-25774
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

			Lab No	2256400	2256401	2256402
			.Sample ID	BH101	BH101	BH103
			Depth	0.80	3.10	0.70
			Other ID			
			Sample Type	ES	ES	ES
			Sampling Date	23/10/2023	23/10/2023	23/10/2023
			Sampling Time	n/s	n/s	n/s
Test	Method	LOD	Units			
Phenols						
Phenol - Monohydric	DETSC 2130	100	ug/l	140	< 100	< 100

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-25774
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby
Sample Id BH101 3.10
Sample Numbers 2256397 2256403
Date Analysed 10/11/2023

Test Results On Waste

Determinand and Method Reference	Units	Result	WAC Limit Values: Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	2.7	3	5	6
DETSC2003# Loss On Ignition	%		n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	69.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	17.0	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate

Determinand and Method Reference	Conc in Eluate ug/l 10:1	Amount Leached* mg/kg LS10	WAC Limit Values (Limit values for LS10 Leachate): Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	1.1	0.011	0.5	2	25
DETSC 2306 Barium as Ba	16	0.16	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.34	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	< 0.40	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	4.3	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.25	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	1	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.27	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	2.2	0.022	4	50	200
DETSC 2055 Chloride as Cl	190000	1900	800	15,000	25,000
DETSC 2055* Fluoride as F	150	1.5	10	150	500
DETSC 2055 Sulphate as SO4	31000	310	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	710000	7100	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Additional Information

DETSC 2008 pH	7.5
DETSC 2009 Conductivity uS/cm	1020.0
* Temperature*	17.0

Mass of Sample Kg*	0.120
Mass of dry Sample Kg*	0.099

Stage 1

Volume of Leachant L2*	0.966
Volume of Eluate VE1*	0.91

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

V.2.06 * DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-25774
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby
Sample Id BH103 0.70

Sample Numbers 2256399 2256404
Date Analysed 10/11/2023

Test Results On Waste

Determinand and Method Reference	Units	Result	WAC Limit Values: Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	1.4	3	5	6
DETSC2003# Loss On Ignition	%		n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	130.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	44.0	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate

Determinand and Method Reference	Conc in Eluate ug/l 10:1	Amount Leached* mg/kg LS10	WAC Limit Values (Limit values for LS10 Leachate): Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	0.62	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	33	0.33	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	1.4	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	1.7	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	1.6	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	1.3	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	2.5	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.64	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	4.7	0.047	4	50	200
DETSC 2055 Chloride as Cl	72000	720	800	15,000	25,000
DETSC 2055* Fluoride as F	290	2.9	10	150	500
DETSC 2055 Sulphate as SO4	140000	1400	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	760000	7600	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Additional Information

DETSC 2008 pH	7.1
DETSC 2009 Conductivity uS/cm	1090.0
* Temperature*	17.0

Mass of Sample Kg*	0.120
Mass of dry Sample Kg*	0.099

Stage 1

Volume of Leachant L2*	0.974
Volume of Eluate VE1*	0.92

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

V.2.06 * DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-25774
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2256396	BH101 0.80	SOIL	NAD	none	Ben Rose
2256397	BH101 3.10	SOIL	Chrysotile	Chrysotile present as fibre bundles	Ben Rose
2256399	BH103 0.70	SOIL	Chrysotile	Chrysotile present in microscopic cement fragments	Ben Rose

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-25774
Client Ref S230311
Contract Whitby Maritime Hub, Whitby

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2256396	BH101 0.80 SOIL	23/10/23	GJ 250ml, PT 1L x2	Ammonia (3 days), Total Sulphur ICP (7 days), pH + Conductivity (7 days)	BTEX / C5-C10
2256397	BH101 3.10 SOIL	23/10/23	GJ 250ml, PT 1L x2	Ammonia (3 days), Total Sulphur ICP (7 days), pH + Conductivity (7 days)	BTEX / C5-C10
2256398	BH101 3.80 SOIL	23/10/23	GJ 250ml, PT 1L x2	Ammonia (3 days), Total Sulphur ICP (7 days), pH + Conductivity (7 days)	BTEX / C5-C10
2256399	BH103 0.70 SOIL	23/10/23	GJ 250ml, PT 1L x2	Ammonia (3 days), Total Sulphur ICP (7 days), pH + Conductivity (7 days)	BTEX / C5-C10
2256400	BH101 0.80 LEACHATE	23/10/23	GJ 250ml, PT 1L x2		
2256401	BH101 3.10 LEACHATE	23/10/23	GJ 250ml, PT 1L x2		
2256402	BH103 0.70 LEACHATE	23/10/23	GJ 250ml, PT 1L x2		
2256403	BH101 3.10 LEACHATE	23/10/23	GJ 250ml, PT 1L x2		
2256404	BH103 0.70 LEACHATE	23/10/23	GJ 250ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C5-C35	EH_CU+HS_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C5-C35	EH_CU+HS_1D_AR
TPH Ali/Aro Total C5-C35	EH_CU+HS_1D_Total
EPH (C10-C40)	EH_1D_Total
TPH (C10-C40)	EH_1D_Total

End of Report

Certificate of Analysis

Certificate Number	23-25310	*Issued:*	09-Nov-23

Client SOLMEK
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference	23-25310
Client Reference	S230311
Order No	SOL-7810
Contract Title	Whitby Maritime Hub, Whitby
Description	2 Soil samples, 2 Leachate samples.
Date Received	26-Oct-23
Date Started	26-Oct-23
Date Completed	09-Nov-23
Test Procedures	Identified by prefix DETSn (details on request).

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

Approved By [redacted]

Kirk Bridgewood
General Manager

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

ilac-MRA

UKAS TESTING
2139

Summary of Chemical Analysis
Matrix Descriptions

Our Ref 23-25310
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

Sample ID	Depth	Lab No	Completed	Matrix Description
BH104	0.8	2253351	09/11/2023	Light brown very gravelly, sandy CLAY
BH104	1	2253352	09/11/2023	Light brown very gravelly, sandy CLAY

Summary of Chemical Analysis
Soil Samples

Our Ref 23-25310
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

			Lab No	2253351	2253352
			.Sample ID	BH104	BH104
			Depth	0.80	1.00
			Other ID		
			Sample Type	ES	ES
			Sampling Date	19/10/2023	19/10/2023
			Sampling Time	n/s	n/s
Test	Method	LOD	Units		
Petroleum Hydrocarbons					
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	0.40	0.43
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	0.99	0.07
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C5-C35: EH_CU+HS_1D_AL	DETSC 3072*	10	mg/kg	< 10	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4
Aromatic C5-C35: EH_CU+HS_1D_AR	DETSC 3072*	10	mg/kg	< 10	< 10
TPH Ali/Aro Total C5-C35: EH_CU+HS_1D_Total	DETSC 3072*	10	mg/kg	< 10	< 10
PAHs					
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	0.2	0.2
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.5

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

Summary of Chemical Analysis
Leachate Samples

Our Ref 23-25310
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

Lab No	2253353
.Sample ID	BH104
Depth	0.80
Other ID	
Sample Type	ES
Sampling Date	19/10/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Preparation				
BS EN 12457 10:1	DETSC 1009*			Y
BS EN 12457 10:1	DETSC 1009*			
Metals				
Antimony, Dissolved	DETSC 2306	0.17	ug/l	2.8
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	1.3
Barium, Dissolved	DETSC 2306	0.26	ug/l	24
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1
Boron, Dissolved	DETSC 2306*	12	ug/l	27
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.12
Chromium III, Dissolved	DETSC 2306*	1	ug/l	4.0
Chromium, Hexavalent	DETSC 2203	7	ug/l	< 7.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	2.3
Iron, Dissolved	DETSC 2306	5.5	ug/l	74
Lead, Dissolved	DETSC 2306	0.09	ug/l	6.0
Manganese, Dissolved	DETSC 2306	0.22	ug/l	14
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.03
Molybdenum, Dissolved	DETSC 2306	1.1	ug/l	6.0
Nickel, Dissolved	DETSC 2306	0.5	ug/l	1.7
Selenium, Dissolved	DETSC 2306	0.25	ug/l	1.9
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	2.6
Zinc, Dissolved	DETSC 2306	1.3	ug/l	36
Inorganics				
pH	DETSC 2008		pH	6.6
Cyanide, Total	DETSC 2130	40	ug/l	< 40
Cyanide, Free	DETSC 2130	20	ug/l	< 20
Cyanide, Complex	DETSC 2130*	40	ug/l	< 40
Thiocyanate	DETSC 2130	20	ug/l	< 20
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.070
Sulphate as SO4	DETSC 2055	0.1	mg/l	28
Petroleum Hydrocarbons				
Aliphatic C5-C6: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C6-C8: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C8-C10: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C5-C35: EH_CU+HS_1D_AL	DETSC 3072*	10	ug/l	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C7-C8: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C8-C10: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Leachate Samples

Our Ref 23-25310
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

Lab No	2253353
.Sample ID	BH104
Depth	0.80
Other ID	
Sample Type	ES
Sampling Date	19/10/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0
Aromatic C5-C35: EH_CU+HS_1D_AR	DETSC 3072*	10	ug/l	< 10
TPH Ali/Aro Total C5-C35: EH_CU+HS_1D_Total	DETSC 3072*	10	ug/l	< 10
PAHs				
Naphthalene	DETSC 3304	0.05	ug/l	0.07
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	0.02
Anthracene	DETSC 3304	0.01	ug/l	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.02
Pyrene	DETSC 3304	0.01	ug/l	0.02
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20
Phenols				
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100

Key: * -not accredited. n/s -not supplied.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-25310
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby
Sample Id BH104 0.80
Sample Numbers 2253351 2253354
Date Analysed 06/11/2023

Test Results On Waste

Determinand and Method Reference	Units	Result	WAC Limit Values: Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	9.0	3	5	6
DETSC2003# Loss On Ignition	%		n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate

Determinand and Method Reference	Conc in Eluate ug/l 10:1	Amount Leached* mg/kg LS10	WAC Limit Values Limit values for LS10 Leachate: Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	0.32	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	15	0.15	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	2	0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.18	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	2.7	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.44	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	5.9	0.059	4	50	200
DETSC 2055 Chloride as Cl	25000	250	800	15,000	25,000
DETSC 2055* Fluoride as F	180	1.8	10	150	500
DETSC 2055 Sulphate as SO4	30000	300	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	170000	1700	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

Additional Information

DETSC 2008 pH	7.2
DETSC 2009 Conductivity uS/cm	239.0
* Temperature*	18.0

Mass of Sample Kg*	0.110
Mass of dry Sample Kg*	0.095

Stage 1

Volume of Leachant L2*	0.936
Volume of Eluate VE1*	0.88

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

V.2.06 * DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-25310
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2253351	BH104 0.80	SOIL	NAD	none	Ben Rose
2253352	BH104 1.00	SOIL	NAD	none	Ben Rose

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-25310
Client Ref S230311
Contract Whitby Maritime Hub, Whitby

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2253351	BH104 0.80 SOIL	19/10/23	GJ 250ml, PT 1L x2		BTEX / C5-C10
2253352	BH104 1.00 SOIL	19/10/23	GJ 250ml, PT 1L x2		BTEX / C5-C10
2253353	BH104 0.80 LEACHATE	19/10/23	GJ 250ml, PT 1L x2		
2253354	BH104 0.80 LEACHATE	19/10/23	GJ 250ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC 2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC 2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC 2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC 2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC 2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2311	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	As Received	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3321	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3521	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3521	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3521	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

Certificate of Analysis

Certificate Number 23-27958 *Issued:* 11-Dec-23

Client SOLMEK
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference 23-27958

Client Reference S230311

Order No SOL-7906

Contract Title Whitby Maritime Hub, Whitby

Description 5 Water samples.

Date Received 28-Nov-23

Date Started 28-Nov-23

Date Completed 11-Dec-23

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

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

Approved By [redacted]

Kirk Bridgewood
General Manager

2139

Summary of Chemical Analysis
Water Samples

Our Ref 23-27958
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

			Lab No	2268784	2268785	2268786	2268787	2268788
			.Sample ID	BH101	BH102	BH103	BH105	WS101
			Depth	2.07	1.86	1.86	2.00	2.30
			Other ID					
			Sample Type	WATER	WATER	WATER	WATER	WATER
			Sampling Date	27/11/2023	27/11/2023	27/11/2023	27/11/2023	27/11/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units					
Metals								
Antimony, Dissolved	DETSC 2306	0.17	ug/l	1.1	0.19	< 0.17	0.68	0.89
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	2.8	1.7	1.3	2.0	2.4
Barium, Dissolved	DETSC 2306	0.26	ug/l	140	610	480	350	290
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Boron, Dissolved	DETSC 2306*	12	ug/l	62	140	110	130	880
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.13	0.03	< 0.03	< 0.03	0.04
Chromium III, Dissolved	DETSC 2306*	1	ug/l	12	2.3	7.9	5.5	< 1.0
Chromium, Hexavalent	DETSC 2203	7	ug/l	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	11	1.6	1.2	1.7	0.9
Iron, Dissolved	DETSC 2306	5.5	ug/l	84	27	24	32	110
Lead, Dissolved	DETSC 2306	0.09	ug/l	1.6	0.55	1.1	0.46	0.18
Manganese, Dissolved	DETSC 2306	0.22	ug/l	9.6	520	210	51	4500
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.03	0.01	< 0.01	< 0.01	< 0.01
Molybdenum, Dissolved	DETSC 2306	1.1	ug/l	21	14	5.6	15	10
Nickel, Dissolved	DETSC 2306	0.5	ug/l	2.1	0.7	0.6	1.8	5.3
Selenium, Dissolved	DETSC 2306	0.25	ug/l	2.1	0.63	0.33	0.45	0.35
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	5.8	< 0.6	< 0.6	< 0.6	0.6
Zinc, Dissolved	DETSC 2306	1.3	ug/l	20	55	76	95	84
Inorganics								
pH	DETSC 2008		pH	9.5	8.0	7.7	7.8	7.3
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40
Cyanide, Free	DETSC 2130	20	ug/l	< 20	< 20	< 20	< 20	< 20
Cyanide, Complex	DETSC 2130*	40	ug/l	< 40	< 40	< 40	< 40	< 40
Thiocyanate	DETSC 2130	20	ug/l	< 20	< 20	< 20	< 20	< 20
Total Hardness as CaCO3	DETSC 2303	0.1	mg/l	74.5	144	121	138	1310
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.26	0.45	0.43	1.3	1.8
Sulphate as SO4	DETSC 2055	0.1	mg/l	76	11	5.1	110	610
Petroleum Hydrocarbons								
Aliphatic C5-C6: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35: EH_CU+HS_1D_AL	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 23-27958
Client Ref S230311
Contract Title Whitby Maritime Hub, Whitby

			Lab No	2268784	2268785	2268786	2268787	2268788
			.Sample ID	BH101	BH102	BH103	BH105	WS101
			Depth	2.07	1.86	1.86	2.00	2.30
			Other ID					
			Sample Type	WATER	WATER	WATER	WATER	WATER
			Sampling Date	27/11/2023	27/11/2023	27/11/2023	27/11/2023	27/11/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units					
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35: EH_CU+HS_1D_AR	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35: EH_CU+HS_1D_Total	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0			< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0			< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0			< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0			< 1.0
MTBE	DETSC 3322	1	ug/l	< 1.0	< 1.0			< 1.0
PAHs								
Naphthalene	DETSC 3304	0.05	ug/l	0.07	0.08	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.02
Acenaphthene	DETSC 3304	0.01	ug/l	0.01	0.01	< 0.01	0.01	0.02
Fluorene	DETSC 3304	0.01	ug/l	0.01	0.01	< 0.01	< 0.01	0.02
Phenanthrene	DETSC 3304	0.01	ug/l	0.03	0.02	0.01	< 0.01	0.10
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.07
Fluoranthene	DETSC 3304	0.01	ug/l	0.02	< 0.01	< 0.01	< 0.01	0.33
Pyrene	DETSC 3304	0.01	ug/l	0.02	< 0.01	< 0.01	< 0.01	0.29
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.12
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.14
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.20
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.07
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.17
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.13
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.03
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.12
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20	1.8
PCBs								
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3	< 0.3			< 0.3
PCB 52	DETSC 3402	0.2	ug/l	< 0.2	< 0.2			< 0.2
PCB 101	DETSC 3402	0.3	ug/l	< 0.3	< 0.3			< 0.3
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6	< 0.6			< 0.6
PCB 138	DETSC 3402	0.2	ug/l	< 0.2	< 0.2			< 0.2
PCB 153	DETSC 3402	0.2	ug/l	< 0.2	< 0.2			< 0.2
PCB 180	DETSC 3402	0.2	ug/l	< 0.2	< 0.2			< 0.2
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0	< 1.0			< 1.0
Phenols								
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100	< 100	< 100	< 100

Key: * -not accredited. n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 23-27958
Client Ref S230311
Contract Whitby Maritime Hub, Whitby

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2268784	BH101 2.07 WATER	27/11/23	GB to 500ml x4, GV		
2268785	BH102 1.86 WATER	27/11/23	GB to 500ml x4, GV		
2268786	BH103 1.86 WATER	27/11/23	GB to 500ml x4, GV		
2268787	BH105 2.00 WATER	27/11/23	GB to 500ml x4, GV		
2268788	WS101 2.30 WATER	27/11/23	GB to 500ml x2, GV		

Key: G-Glass B-Bottle V-Vial

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

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C5-C35	EH_CU+HS_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C5-C35	EH_CU+HS_1D_AR
TPH Ali/Aro Total C5-C35	EH_CU+HS_1D_Total

End of Report

APPENDIX D:
Geotechnical Laboratory Results

Laboratory Report Front Sheet

Site name	Job number
Whitby	S230311

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

UKAS TESTING
10258

Client details:

Reference:	S230311
Name:	Solmek
Address:	12 Yarm Road, Stockton-on-tees, TS18 3NA
Telephone:	01642 607083
Email:	lcassidy@solmek.com
FAO:	Leo Cassidy

Samples received:

Date commenced: 31/03/2023

Date reported: 19/04/2023

Observations and interpretations are outside of the UKAS Accreditiation

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

Samples will be held at the laboratory for a period of 4 weeks after the report date. After the above reporting date the samples will be disposed of. Should further testing be required then the office should be informed before the above date.

Signature:	Approved Signitories:
[redacted]	☐ D.Anderson (Managing Director) ☑ J. Brischuk (Laboratory Manager) ☐ T. Finnimore (Quality/Technical Manager)

Summary of Classification Tests

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

UKAS TESTING
10258

Site name	Job number
Whitby	S230311

Hole	Depth Top m	Depth Base m	Type	*w* %	Oven temp. oc	wa %	Pa %	Pr %	wL %	wP %	IP %	IL	Plasticity class	Preparation method
WS101	2.40		D	24	105	65	37	63	38-s	26	12	3.250	MI	Tested after >425µm removed by hand
WS102	1.20		B	16	105	30	54	46	37-s	27	10	0.300	MI	Tested after washing to remove >425µm
WS104	1.80		B	26	105	84	31	69	34-s	25	9	6.556	ML	Tested after >425µm removed by hand
WS105	3.30		B	23	105	256	9	91	35-s	25	10	23.100	MI	Tested after washing to remove >425µm

All tests found in G2M Testing UKAS Schedule of Accreditation are tested to standard unless otherwise indicated

Key	Description		Category	BS Test Code
w	Moisture content			BS 1377:1990 Part 2 Clause 3.2
wa	Equivalent moisture content passing 425µm sieve			BS 1377:1990 Part 2 Clause 3.2
wL	Liquid limit	Single point	-s	BS 1377:1990 Part 2 Clause 4.4
		Four point	-f	BS 1377:1990 Part 2 Clause 4.3
wP	Plastic limit			BS 1377:1990 Part 2 Clause 5.2
Pa	Percentage passing 425um sieve			
Pr	Percentage retained 425um sieve			
IP	Plasticity index			BS 1377:1990 Part 2 Clause 5.4
IL	Liquidity index			BS 1377:1990 Part 2 Clause 5.4
	Suffix indicating test is "Not UKAS Accredited"		*	

Approved by	JBrischuk
Approval date	14/04/2023 16:08
Date report generated	
Report Number	

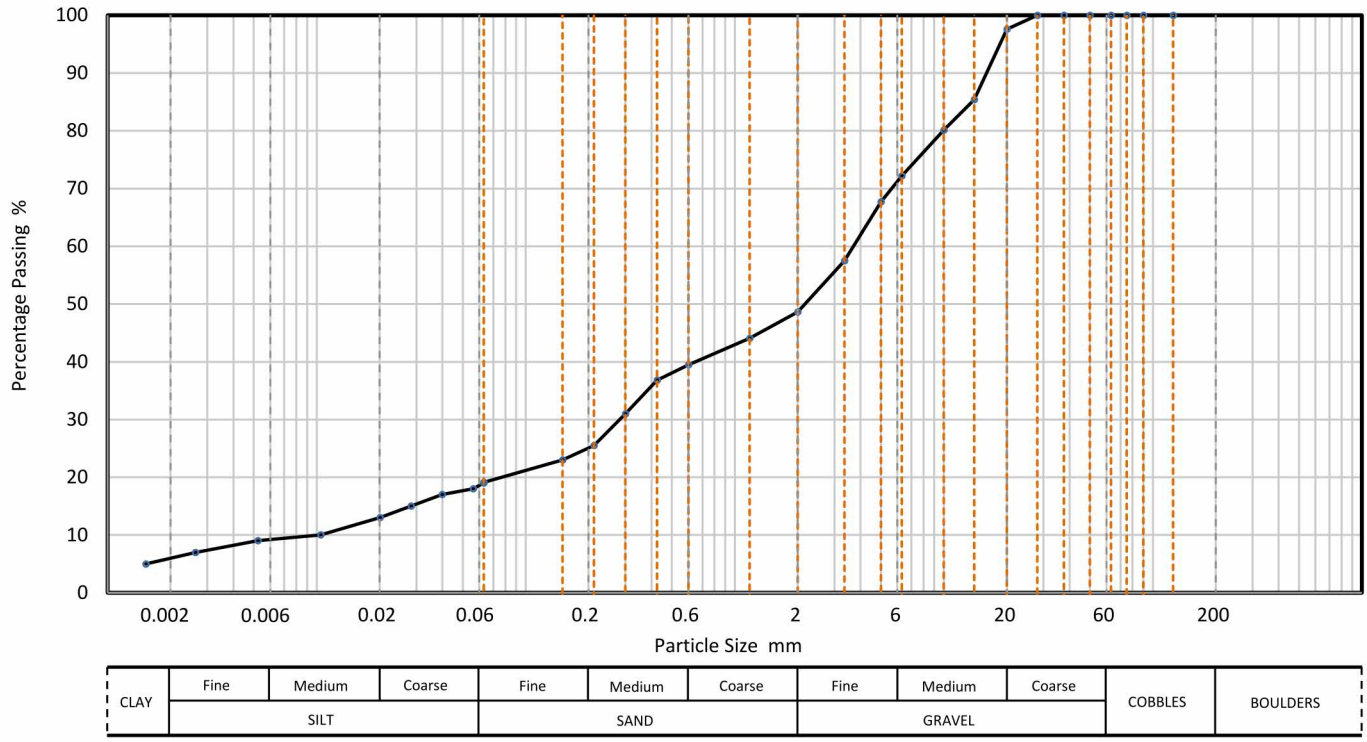
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Whitby	S230311

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

UKAS TESTING
10258

Hole		WS102	Lab sample ID	G2MT2023033123
Depth (Top)	m	0.40	Test Method	BS 1377 - 2 : 1990 Clauses 9.2 and 9.5
Depth (Base)	m		Soil Description	Clayey, Silty, Sandy GRAVEL
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	19
90	100	0.0561	18
75	100	0.0398	17
63	100	0.0283	15
50	100	0.0201	13
37.5	100	0.0104	10
28	100	0.0052	9
20	98	0.0026	7
14	85	0.0015	5
10	80		
6.3	72		
5	68		
3.35	58		
2	49		
1.18	44		
0.6	40	Particle density	(assumed)
0.425	37	2.65	Mg/m3
0.3	31		
0.212	26		
0.15	23		
0.063	19		

Dry Mass of sample, g: 814

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	51.4
Sand	29.5
Silt	13.0
Clay	6.1

Grading Analysis		
D100	mm	
D60	mm	3.7
D30	mm	0.282
D10	mm	0.00877
Uniformity Coefficient		420
Curvature Coefficient		2.5

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	11/04/2023 10:39

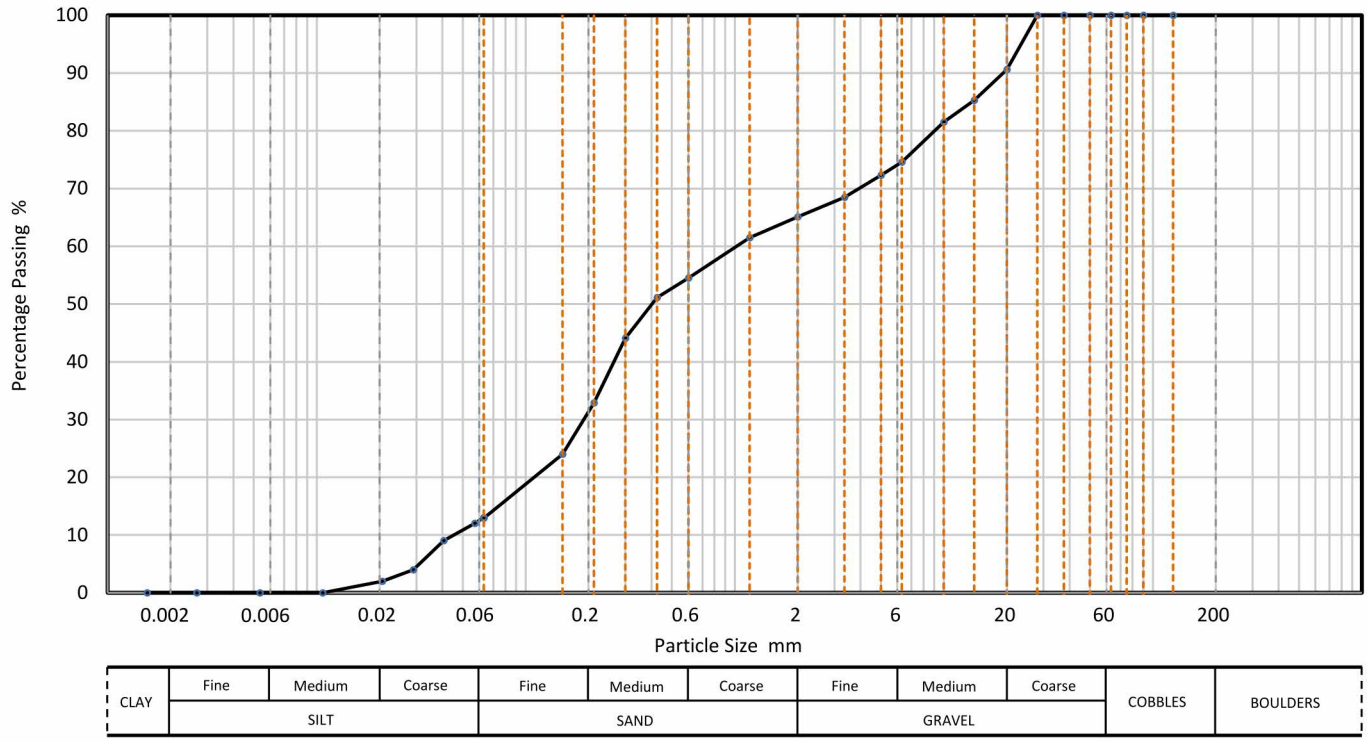
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Whitby	S230311

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
[redacted]

UKAS TESTING
10258

Hole		WS102	Lab sample ID	G2MT2023033124
Depth (Top)	m	3.60	Test Method	BS 1377 - 2 : 1990 Clauses 9.2 and 9.5
Depth (Base)	m		Soil Description	Silty, Very Gravelly SAND
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	13
90	100	0.0570	12
75	100	0.0406	9
63	100	0.0290	4
50	100	0.0206	2
37.5	100	0.0107	0
28	100	0.0053	0
20	91	0.0027	0
14	85	0.0015	0
10	82		
6.3	75		
5	72		
3.35	69		
2	65		
1.18	62		
0.6	55	Particle density	(assumed)
0.425	51	2.65	Mg/m3
0.3	44		
0.212	33		
0.15	24		
0.063	13		

Dry Mass of sample, g	1281

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	34.9
Sand	52.3
Silt	12.8
Clay	0.0

Grading Analysis		
D100	mm	
D60	mm	1.02
D30	mm	0.189
D10	mm	0.0452
Uniformity Coefficient		22
Curvature Coefficient		0.78

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	14/04/2023 15:26

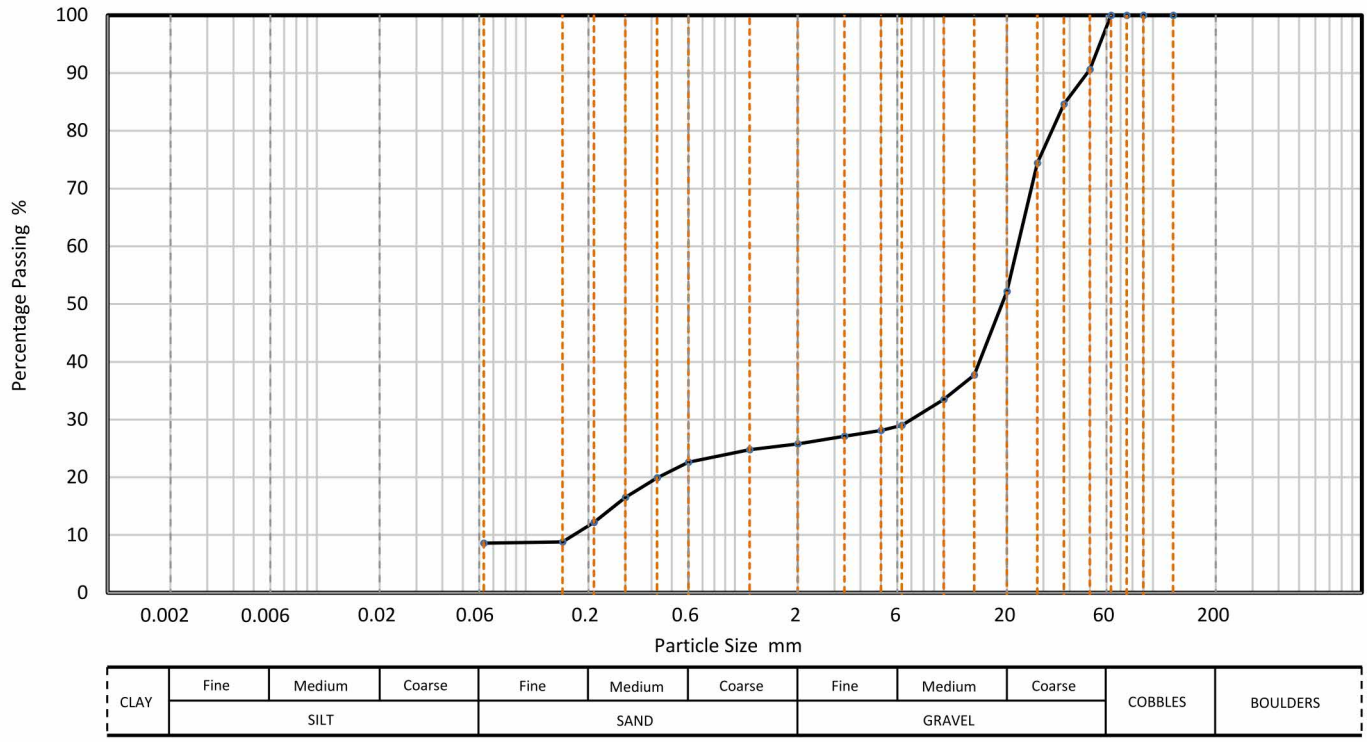
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Whitby	S230311

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

UKAS TESTING
10258

Hole		WS104	Lab sample ID	G2MT2023033125
Depth (Top)	m	0.40	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base)	m		Soil Description	Silty Sandy GRAVEL
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	85		
28	74		
20	52		
14	38		
10	34		
6.3	29		
5	28		
3.35	27		
2	26		
1.18	25		
0.6	23		
0.425	20		
0.3	17		
0.212	12		
0.15	9		
0.063	9		

Dry Mass of sample, g: 4228

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	74.2
Sand	17.2
Fines <0.063mm	9.0

Grading Analysis		
D100	mm	
D60	mm	22.5
D30	mm	6.98
D10	mm	0.169
Uniformity Coefficient		130
Curvature Coefficient		13

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

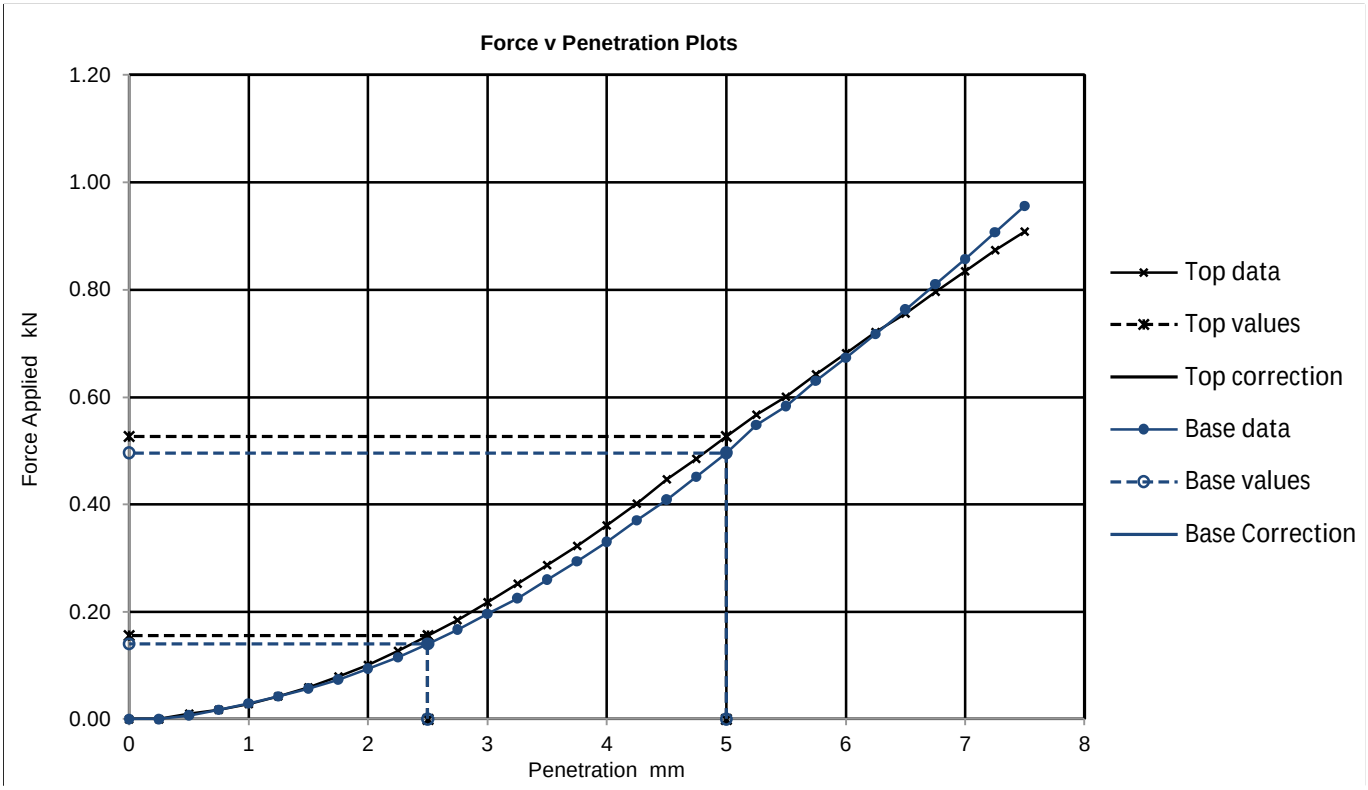
Approved by	D Anderson
Approval date	14/04/2023 15:26

California Bearing Ratio (CBR)

					Job Ref	S230311
					Borehole/Pit No.	WS102
Site Name	Whitby				Sample No.	
Soil Description					Depth m	0.40
Specimen Reference	WS102	Specimen Depth	0.40	m	Sample Type	B
Specimen Description					KeyLAB ID	G2MT2023033123
Test Method	BS1377 : Part 4 : 1990, clause 7				CBR Test Number	1

Specimen Preparation

Condition	REMOULDED				Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer				Period of soaking		days
					Time to surface		days
					Amount of swell recorded		mm
Material retained on 20mm sieve removed			31	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density		2.07	Mg/m3	Surcharge applied	2	kg
	Dry density		1.75	Mg/m3		1	kPa
	Moisture content		18.6	%			



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP		1.2	2.6	2.6	2.6	18.9
BASE		1.1	2.5	2.5		19.0

General remarks	Test specific remarks	Approved
		JBrischuk

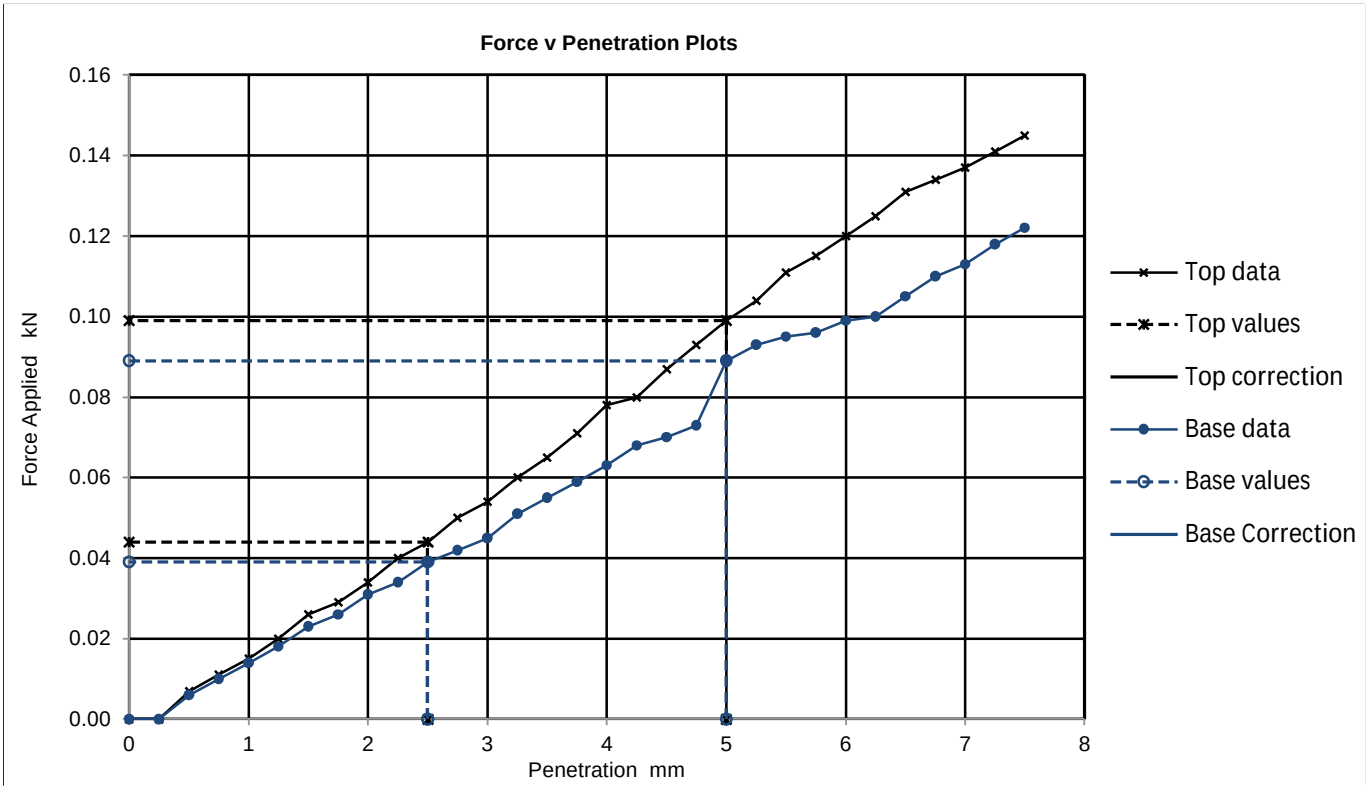
Fig No.	1
Sheet No	1

Lab Sheet Reference :

	California Bearing Ratio (CBR)				Job Ref	S230311
					Borehole/Pit No.	WS104
Site Name	Whitby				Sample No.	
Soil Description					Depth m	0.40
Specimen Reference	WS104	Specimen Depth	0.40	m	Sample Type	B
Specimen Description					KeyLAB ID	G2MT2023033125
Test Method	BS1377 : Part 4 : 1990, clause 7				CBR Test Number	1

Specimen Preparation

Condition	REMOULDED				Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer				Period of soaking		days
					Time to surface		days
					Amount of swell recorded		mm
Material retained on 20mm sieve removed			21	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density		1.91	Mg/m3	Surcharge applied	2	kg
	Dry density		1.51	Mg/m3		1	kPa
	Moisture content		26.8	%			



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP		0.3	0.5	0.5	0.5	26.6
BASE		0.3	0.5	0.5		26.0

General remarks	Test specific remarks	Approved
		JBrischuk

Fig No.	1
Sheet No	2

Lab Sheet Reference :

Certificate of Analysis

Certificate Number 23-07997 *Issued:* 12-Apr-23

Client G2M Testing Ltd
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference 23-07997

Client Reference S230311

Order No LAB1840

Contract Title WHITBY

Description 3 Soil samples.

Date Received 04-Apr-23

Date Started 04-Apr-23

Date Completed 12-Apr-23

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

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

Approved By [redacted]

Kirk Bridgewood
General Manager

ilac-MRA

UKAS TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 23-07997
Client Ref S230311
Contract Title WHITBY

Test	Method	LOD	Units	Lab No 2151135	2151136	2151137
			.Sample ID	WS104	WS105	WS101
			Depth	3.30	3.30	4.00
			Other ID			
			Sample Type	SOIL	SOIL	SOIL
			Sampling Date	31/03/2023	31/03/2023	31/03/2023
			Sampling Time	n/s	n/s	n/s
Inorganics						
pH	DETSC 2008#		pH	11.1	8.5	
Organic matter	DETSC 2002#	0.1	%	0.7	0.4	0.4
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	140	170	

Information in Support of the Analytical Results

Our Ref 23-07997
Client Ref S230311
Contract WHITBY

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2151135	WS104 3.30 SOIL	31/03/23	PT 1L		
2151136	WS105 3.30 SOIL	31/03/23	PT 1L		
2151137	WS101 4.00 SOIL	31/03/23	PT 1L		

Key: P-Plastic T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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

End of Report

Laboratory Report Front Sheet

Site name	Job number
Whitby	S230311

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

UKAS TESTING
10258

Client details:

Reference:	S230311_2
Name:	Solmek
Address:	12 Yarm Road, Stockton-on-tees, TS18 3NA
Telephone:	01642 607083
Email:	lcassidy@solmek.com
FAO:	Leo Cassidy

Samples received:

Date commenced: 09/11/2023

Date reported: 22/11/2023

Observations and interpretations are outside of the UKAS Accreditiation

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

Samples will be held at the laboratory for a period of 4 weeks after the report date. After the above reporting date the samples will be disposed of. Should further testing be required then the office should be informed before the above date.

Signature:	Approved Signitories:
[redacted]	☐ D.Anderson (Managing Director) ☑ J. Brischuk (Laboratory Manager) ☐

Summary of Classification Tests

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

UKAS TESTING
10258

Site name	Job number
Whitby	S230311

Hole	Depth Top m	Depth Base m	Type	w %	Oven temp. oc	wa %	Pa %	Pr %	wL %	wP %	IP %	IL	Plasticity class	Preparation method
BH101	3.00		D	25	50	33	75	25	25-s	19	6	2.333	ML	Tested after >425µm removed by hand
BH101	5.00		D	27	50	27	99	1	27-s	11	16	1.000	CL	Tested after >425µm removed by hand
BH101	7.50		D	40	105	40	100	0	48-s	35	13	0.385	MI	Tested in natural condition
BH101	15.00		D	16	105	22	74	26	30-s	15	15	0.467	CL	Tested after >425µm removed by hand
BH101	19.50		C	14	105									
BH101	24.50		C	12	105									
BH102	7.50		D	43	105	43	100	0	59-s	39	20	0.200	MH	Tested in natural condition
BH102	10.50		D	45	50	45	100	0	65-s	28	37	0.459	CH	Tested in natural condition
BH102	21.35		C	13	105									
BH103	4.00		D	20	50	20	100	0	24-s	19	5	0.200	ML	Tested in natural condition
BH103	6.00		D	29	105	29	100	0	29-s	23	6	1.000	ML	Tested in natural condition
BH103	10.50		D	49	105	49	100	0	63-s	32	31	0.548	MH	Tested in natural condition
BH103	21.90		C	9.2	105									
BH103	23.70		C	11	105									
BH105	4.00		D	18	105	18	100	0	28-s	21	7	-0.429	CL	Tested in natural condition
BH105	10.50		D	36	105	36	100	0	60-s	34	26	0.077	MH	Tested in natural condition
BH105	13.50		D	22	105	22	100	0	28-s	19	9	0.333	CL	Tested in natural condition

All tests found in G2M Testing UKAS Schedule of Accreditation are tested to standard unless otherwise indicated

Key	Description		Category	BS Test Code
w	Moisture content			BS 1377:1990 Part 2 Clause 3.2
wa	Equivalent moisture content passing 425µm sieve			BS 1377:1990 Part 2 Clause 3.2
wL	Liquid limit	Single point	-s	BS 1377:1990 Part 2 Clause 4.4
		Four point	-f	BS 1377:1990 Part 2 Clause 4.3
wP	Plastic limit			BS 1377:1990 Part 2 Clause 5.2
Pa	Percentage passing 425um sieve			
Pr	Percentage retained 425um sieve			
IP	Plasticity index			BS 1377:1990 Part 2 Clause 5.4
IL	Liquidity index			BS 1377:1990 Part 2 Clause 5.4
	Suffix indicating test is "Not UKAS Accredited"		*	

Approved by	D Anderson
Approval date	16/11/2023 09:34
Date report generated	
Report Number	

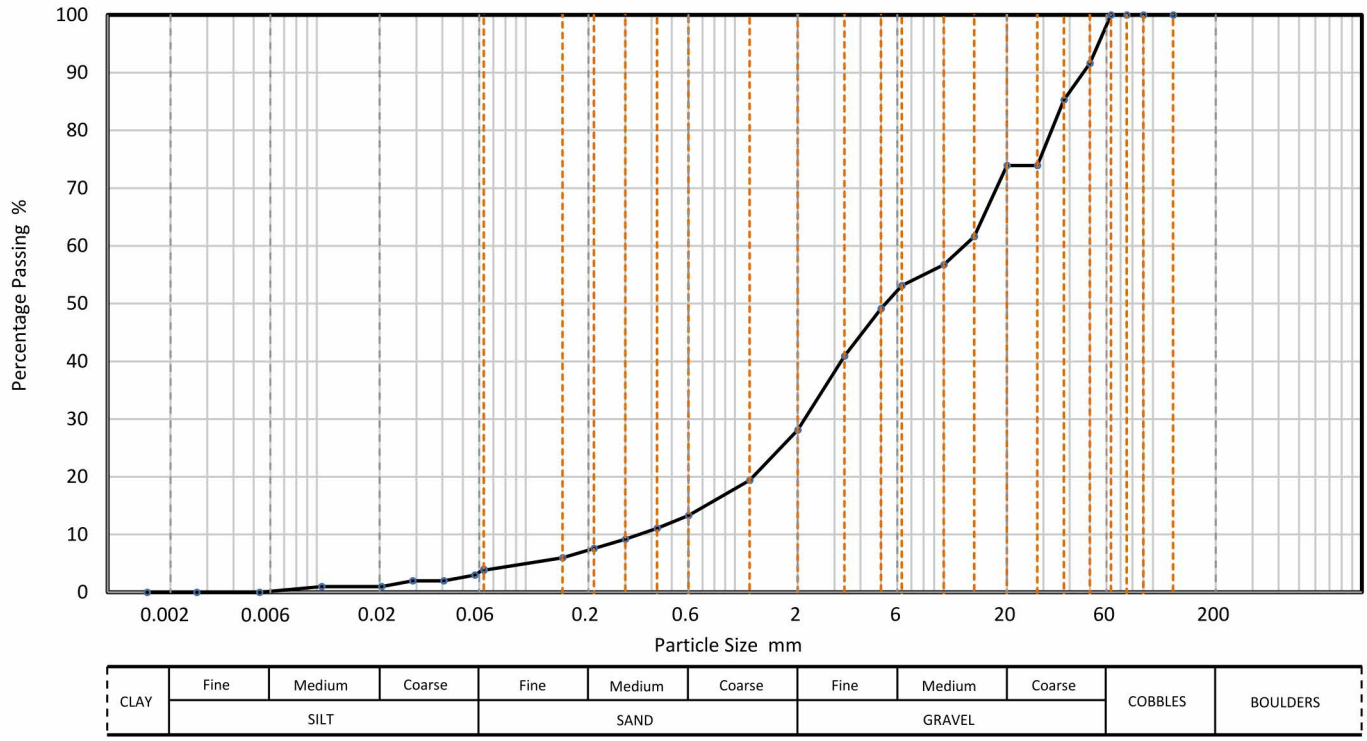
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Whitby	S230311

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

UKAS TESTING
10258

Hole		BH101	Lab sample ID	G2MT2023110911
Depth (Top)	m	16.50	Test Method	BS 1377 - 2 : 1990 Clauses 9.2 and 9.5
Depth (Base)	m		Soil Description	Slightly Silty, very Sandy, GRAVEL
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	4
90	100	0.0570	3
75	100	0.0405	2
63	100	0.0288	2
50	92	0.0204	1
37.5	85	0.0106	1
28	74	0.0053	0
20	74	0.0027	0
14	62	0.0015	0
10	57		
6.3	53		
5	49		
3.35	41		
2	28		
1.18	19		
0.6	13	Particle density	(assumed)
0.425	11	2.65	Mg/m3
0.3	9		
0.212	8		
0.15	6		
0.063	4		

Dry Mass of sample, g	6896

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	71.9
Sand	24.2
Silt	3.9
Clay	0.0

Grading Analysis		
D100	mm	
D60	mm	12.5
D30	mm	2.16
D10	mm	0.346
Uniformity Coefficient		36
Curvature Coefficient		1.1

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	20/11/2023 08:33

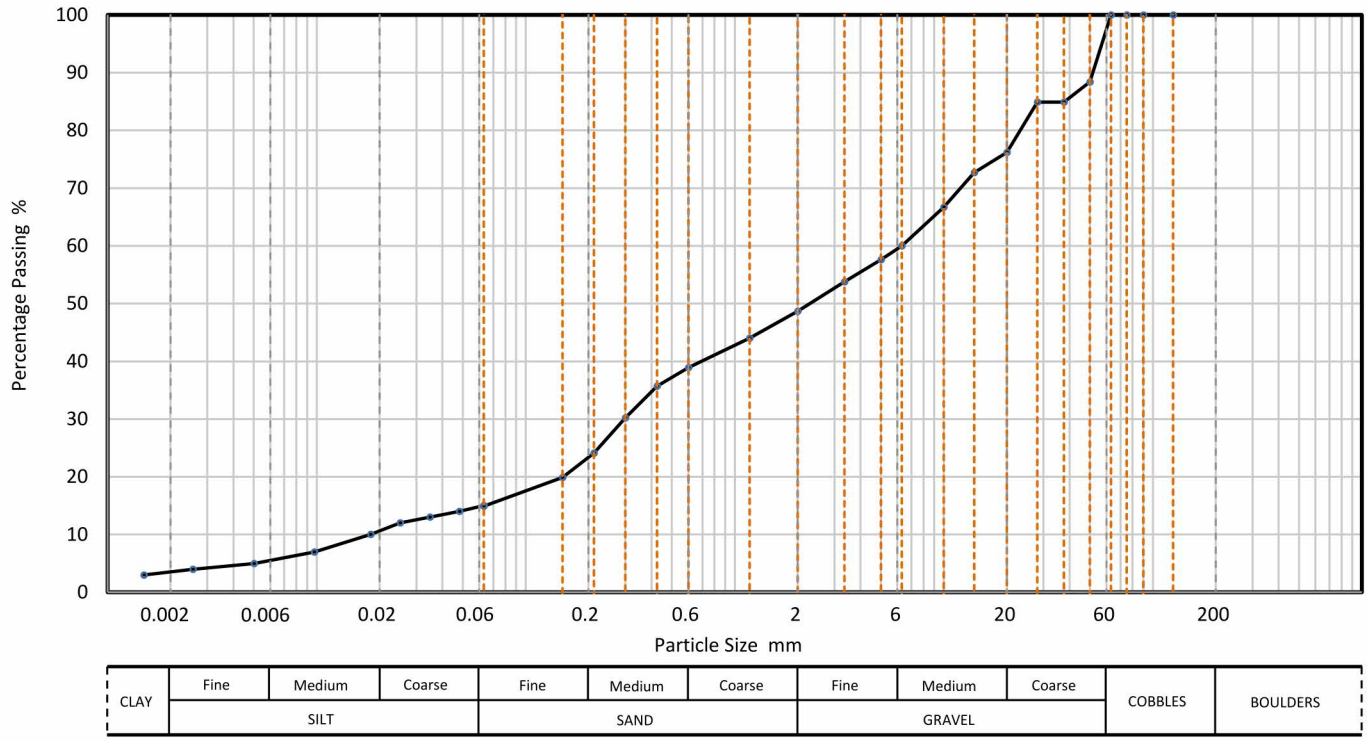
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Whitby	S230311

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

UKAS TESTING
10258

Hole		BH102	Lab sample ID	G2MT2023110912
Depth (Top)	m	2.00	Test Method	BS 1377 - 2 : 1990 Clauses 9.2 and 9.5
Depth (Base)	m		Soil Description	Slightly Clayey, Silty, very Sandy, GRAVEL
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	15
90	100	0.0481	14
75	100	0.0348	13
63	100	0.0251	12
50	88	0.0181	10
37.5	85	0.0097	7
28	85	0.0050	5
20	76	0.0026	4
14	73	0.0015	3
10	67		
6.3	60		
5	58		
3.35	54		
2	49		
1.18	44		
0.6	39	Particle density	(assumed)
0.425	36	2.65	Mg/m3
0.3	30		
0.212	24		
0.15	20		
0.063	15		

Dry Mass of sample, g: 4702

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	51.3
Sand	33.7
Silt	11.7
Clay	3.3

Grading Analysis		
D100	mm	
D60	mm	6.3
D30	mm	0.296
D10	mm	0.0174
Uniformity Coefficient		360
Curvature Coefficient		0.8

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	20/11/2023 08:36

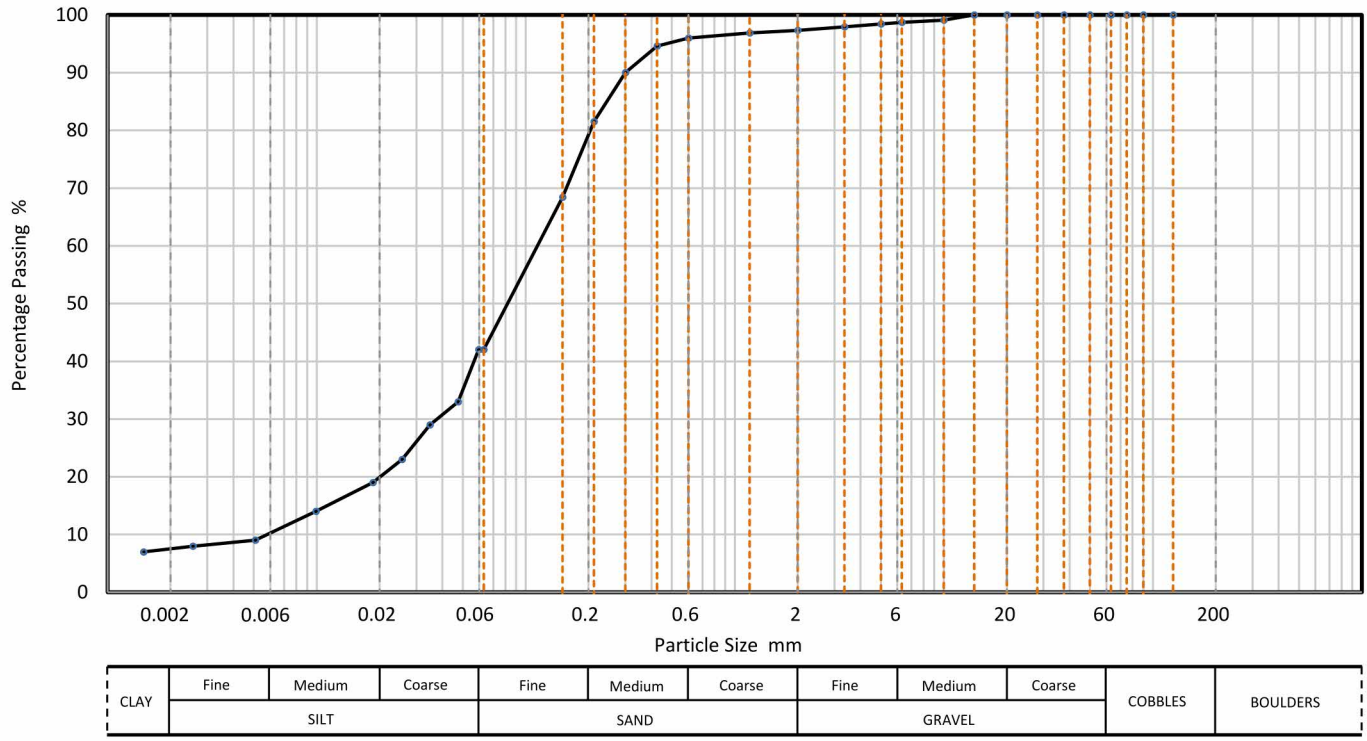
PARTICLE SIZE DISTRIBUTION

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

UKAS TESTING
10258

Site name	Job number
Whitby	S230311

Hole	BH102	Lab sample ID	G2MT2023110913
Depth (Top) m	5.00	Test Method	BS 1377 - 2 : 1990 Clauses 9.2 and 9.5
Depth (Base) m		Soil Description	Slightly Gravelly, slightly Clayey, very Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0595	42
90	100	0.0475	33
75	100	0.0348	29
63	100	0.0256	23
50	100	0.0186	19
37.5	100	0.0099	14
28	100	0.0051	9
20	100	0.0026	8
14	100	0.0015	7
10	99		
6.3	99		
5	98		
3.35	98		
2	97		
1.18	97		
0.6	96	Particle density (assumed)	
0.425	95	2.65	Mg/m3
0.3	90		
0.212	82		
0.15	68		
0.063	42		

Dry Mass of sample, g: 490

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	2.7
Sand	55.4
Silt	34.4
Clay	7.5

Grading Analysis		
D100	mm	
D60	mm	0.114
D30	mm	0.0379
D10	mm	0.00593
Uniformity Coefficient		19
Curvature Coefficient		2.1

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	17/11/2023 08:07

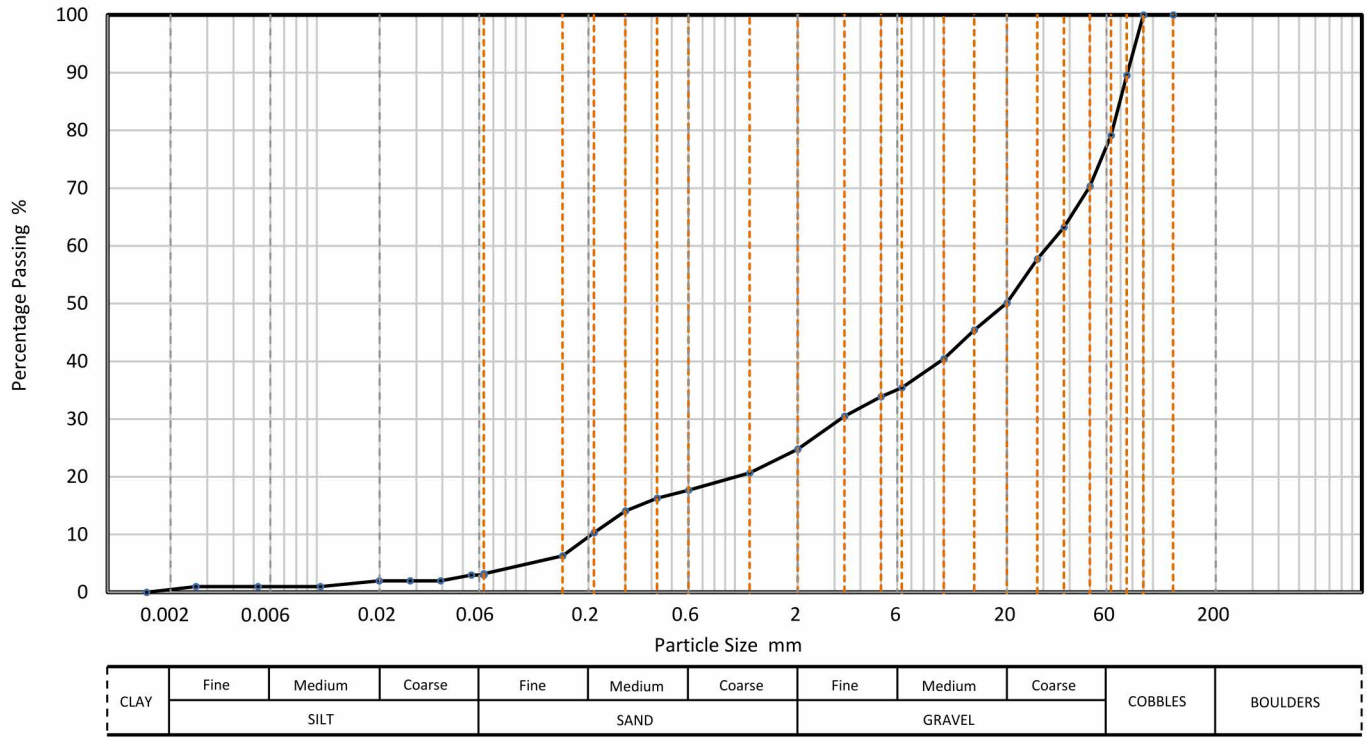
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Whitby	S230311

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

UKAS TESTING
10258

Hole		BH102	Lab sample ID	G2MT2023110917
Depth (Top)	m	13.50	Test Method	BS 1377 - 2 : 1990 Clauses 9.2 and 9.5
Depth (Base)	m		Soil Description	Very slightly Clayey, slightly Silty, very Cobbly, very Sandy, GRAVEL
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	3
90	100	0.0550	3
75	90	0.0391	2
63	79	0.0279	2
50	70	0.0199	2
37.5	63	0.0104	1
28	58	0.0052	1
20	50	0.0026	1
14	45	0.0015	0
10	40		
6.3	35		
5	34		
3.35	31		
2	25		
1.18	21		
0.6	18	Particle density	(assumed)
0.425	16	2.65	Mg/m3
0.3	14		
0.212	10		
0.15	6		
0.063	3		

Dry Mass of sample, g: 14653

Sample Proportions	% dry mass
Very coarse	20.9
Gravel	54.4
Sand	21.6
Silt	2.7
Clay	0.4

Grading Analysis		
D100	mm	
D60	mm	31.6
D30	mm	3.2
D10	mm	0.207
Uniformity Coefficient		150
Curvature Coefficient		1.6

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	20/11/2023 08:41

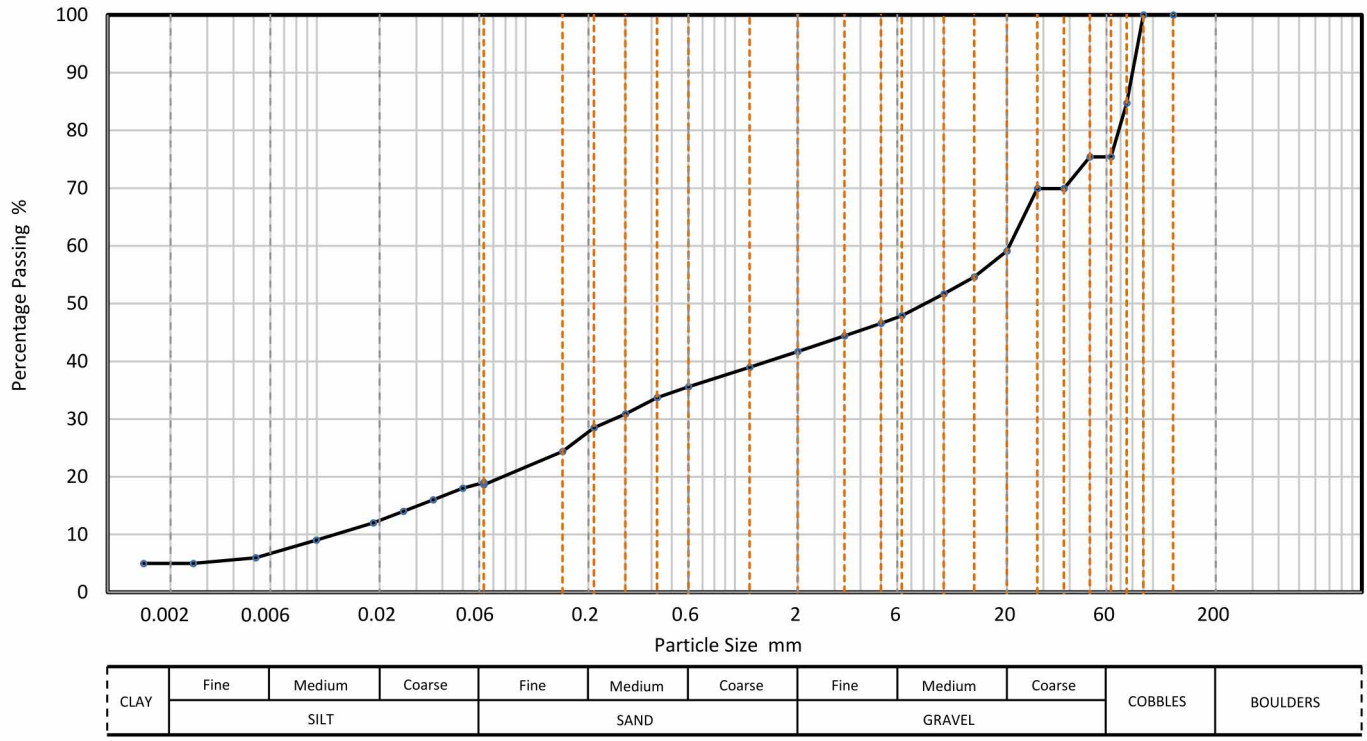
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Whitby	S230311

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

UKAS TESTING
10258

Hole		BH103	Lab sample ID	G2MT2023110918
Depth (Top)	m	2.00	Test Method	BS 1377 - 2 : 1990 Clauses 9.2 and 9.5
Depth (Base)	m		Soil Description	Slightly Clayey, Silty, very Sandy, very Cobbly, GRAVEL
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	19
90	100	0.0499	18
75	85	0.0360	16
63	75	0.0260	14
50	75	0.0187	12
37.5	70	0.0099	9
28	70	0.0051	6
20	59	0.0026	5
14	55	0.0015	5
10	52		
6.3	48		
5	47		
3.35	44		
2	42		
1.18	39		
0.6	36	Particle density (assumed)	
0.425	34	2.65	Mg/m3
0.3	31		
0.212	29		
0.15	24		
0.063	19		

Dry Mass of sample, g: 3923

Sample Proportions	% dry mass
Very coarse	24.6
Gravel	33.7
Sand	23.1
Silt	13.7
Clay	4.9

Grading Analysis		
D100	mm	
D60	mm	20.6
D30	mm	0.263
D10	mm	0.0124
Uniformity Coefficient		1700
Curvature Coefficient		0.27

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	20/11/2023 08:45

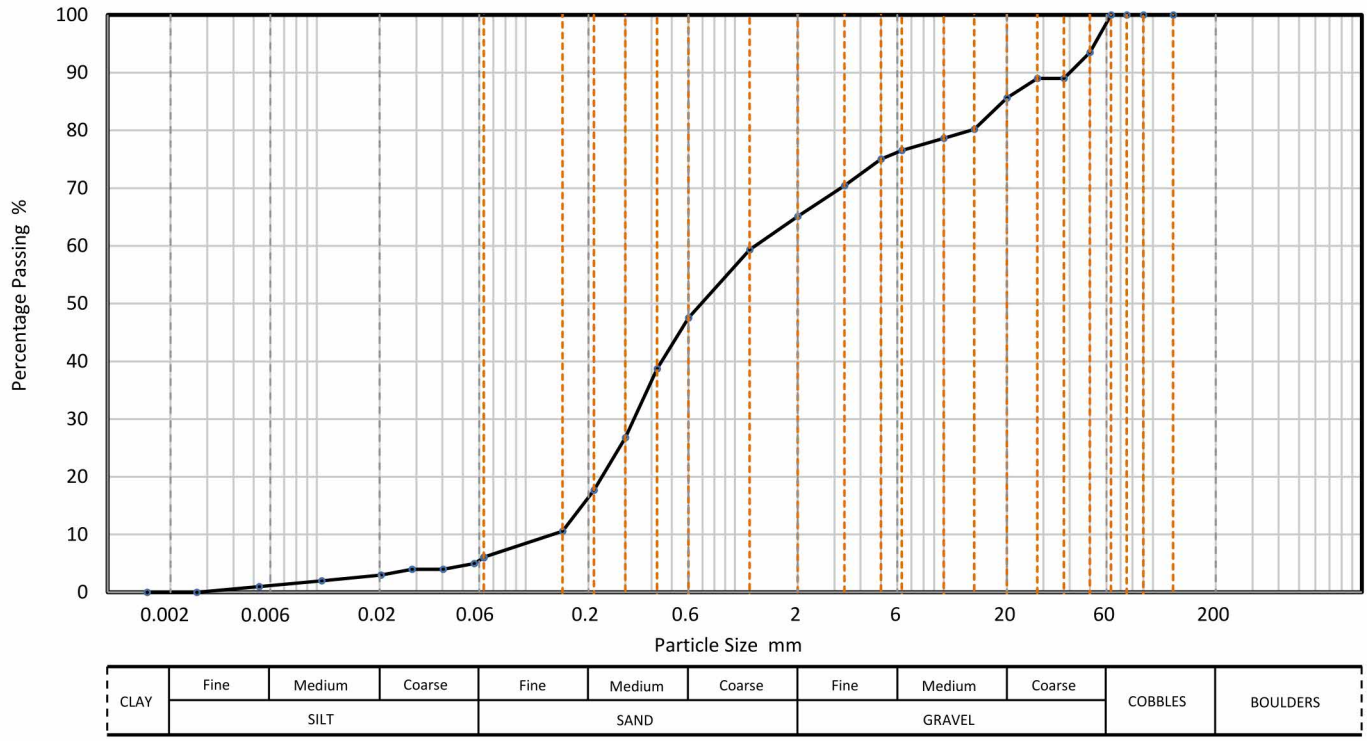
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Whitby	S230311

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
[redacted]

UKAS TESTING
10258

Hole		BH103	Lab sample ID	G2MT2023110923
Depth (Top)	m	13.50	Test Method	BS 1377 - 2 : 1990 Clauses 9.2 and 9.5
Depth (Base)	m		Soil Description	Slightly Silty, very Gravelly, SAND
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	6
90	100	0.0565	5
75	100	0.0402	4
63	100	0.0286	4
50	94	0.0203	3
37.5	89	0.0105	2
28	89	0.0053	1
20	86	0.0027	0
14	80	0.0015	0
10	79		
6.3	77		
5	75		
3.35	70		
2	65		
1.18	59		
0.6	48	Particle density	(assumed)
0.425	39	2.65	Mg/m3
0.3	27		
0.212	18		
0.15	11		
0.063	6		

Dry Mass of sample, g	3679

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	34.9
Sand	58.9
Silt	6.2
Clay	0.0

Grading Analysis		
D100	mm	
D60	mm	1.26
D30	mm	0.329
D10	mm	0.133
Uniformity Coefficient		9.5
Curvature Coefficient		0.65

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	20/11/2023 08:49

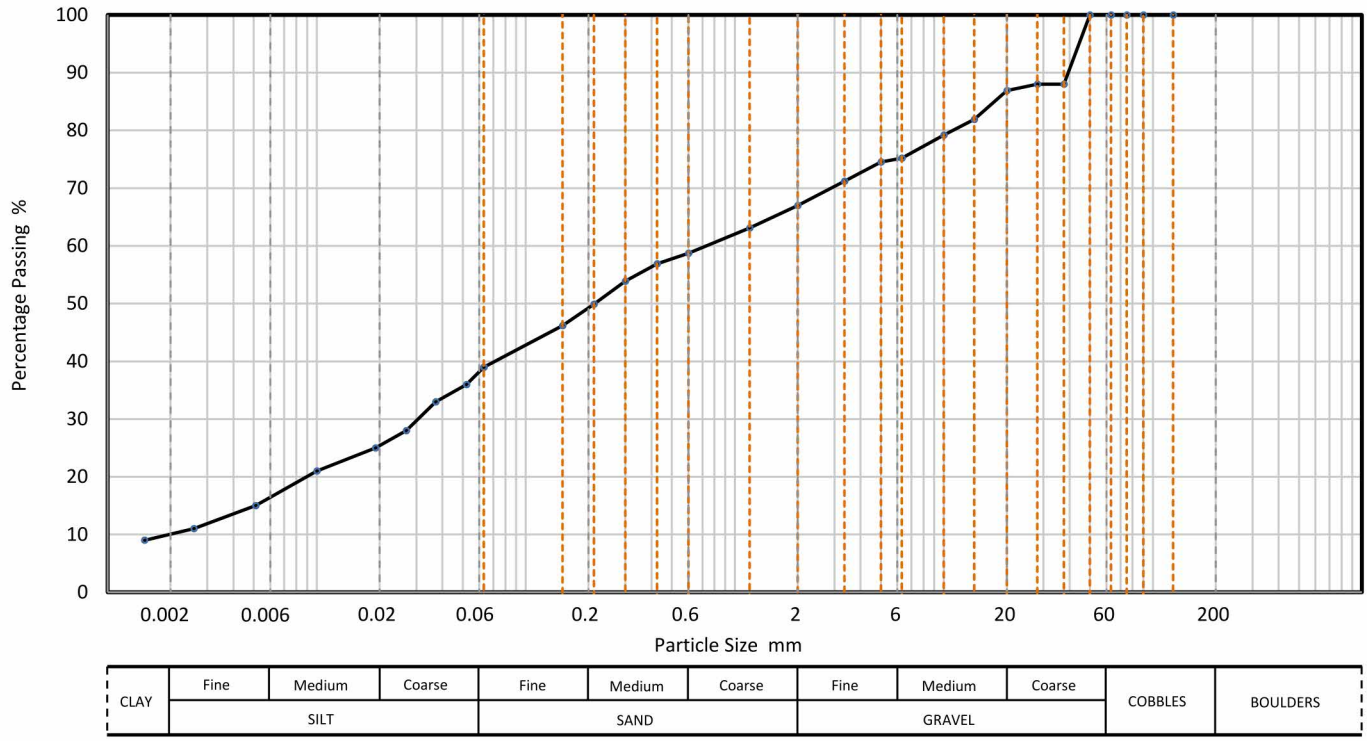
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Whitby	S230311

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

UKAS TESTING
10258

Hole		BH104	Lab sample ID	G2MT2023110924
Depth (Top)	m	1.20	Test Method	BS 1377 - 2 : 1990 Clauses 9.2 and 9.5
Depth (Base)	m		Soil Description	Clayey, very Sandy, very Silty, GRAVEL
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	39
90	100	0.0520	36
75	100	0.0371	33
63	100	0.0268	28
50	100	0.0191	25
37.5	88	0.0100	21
28	88	0.0051	15
20	87	0.0026	11
14	82	0.0015	9
10	79		
6.3	75		
5	75		
3.35	71		
2	67		
1.18	63		
0.6	59	Particle density	(assumed)
0.425	57	2.65	Mg/m3
0.3	54		
0.212	50		
0.15	46		
0.063	39		

Dry Mass of sample, g	2567

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	33.0
Sand	27.9
Silt	29.1
Clay	10.0

Grading Analysis		
D100	mm	
D60	mm	0.728
D30	mm	0.0307
D10	mm	0.002
Uniformity Coefficient		360
Curvature Coefficient		0.65

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/11/2023 08:14

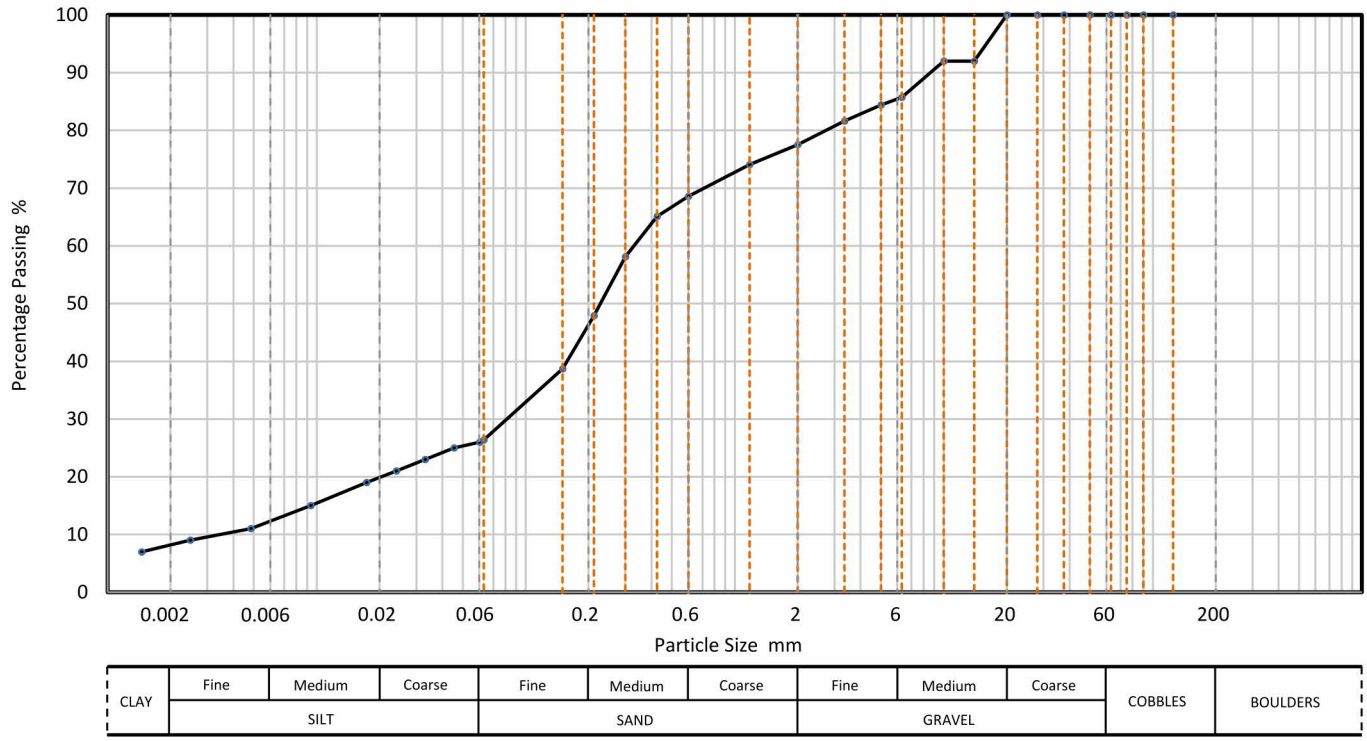
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Whitby	S230311

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

UKAS TESTING
10258

Hole		BH105	Lab sample ID	G2MT2023110925
Depth (Top)	m	2.00	Test Method	BS 1377 - 2 : 1990 Clauses 9.2 and 9.5
Depth (Base)	m		Soil Description	Slightly Clayey, Silty, very Gravelly, SAND
Sample type		D		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0601	26
90	100	0.0454	25
75	100	0.0330	23
63	100	0.0240	21
50	100	0.0173	19
37.5	100	0.0094	15
28	100	0.0048	11
20	100	0.0025	9
14	92	0.0015	7
10	92		
6.3	86		
5	84		
3.35	82		
2	78		
1.18	74		
0.6	69	Particle density	(assumed)
0.425	65	2.65	Mg/m3
0.3	58		
0.212	48		
0.15	39		
0.063	26		

Dry Mass of sample, g	220

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	22.5
Sand	51.2
Silt	18.2
Clay	8.1

Grading Analysis		
D100	mm	
D60	mm	0.33
D30	mm	0.0813
D10	mm	0.00348
Uniformity Coefficient		95
Curvature Coefficient		5.7

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	17/11/2023 08:34

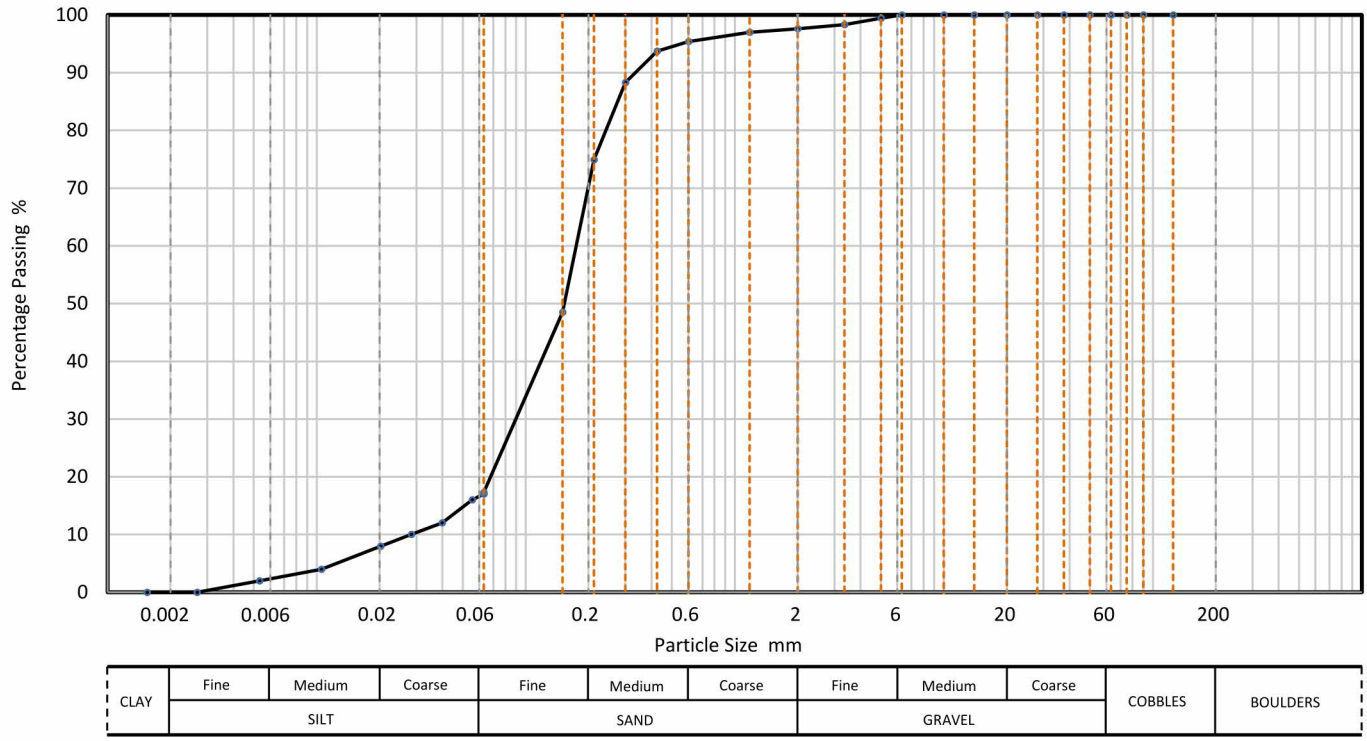
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Whitby	S230311

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

UKAS TESTING
10258

Hole		BH105	Lab sample ID	G2MT2023110928
Depth (Top)	m	6.00	Test Method	BS 1377 - 2 : 1990 Clauses 9.2 and 9.5
Depth (Base)	m		Soil Description	Slightly Gravelly, Silty, SAND
Sample type		D		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	17
90	100	0.0555	16
75	100	0.0398	12
63	100	0.0284	10
50	100	0.0202	8
37.5	100	0.0105	4
28	100	0.0053	2
20	100	0.0027	0
14	100	0.0015	0
10	100		
6.3	100		
5	99		
3.35	98		
2	98		
1.18	97		
0.6	95	Particle density	(assumed)
0.425	94	2.65	Mg/m3
0.3	88		
0.212	75		
0.15	49		
0.063	17		

Dry Mass of sample, g	128

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	2.4
Sand	80.2
Silt	17.4
Clay	0.0

Grading Analysis		
D100	mm	
D60	mm	0.174
D30	mm	0.0896
D10	mm	0.0304
Uniformity Coefficient		5.7
Curvature Coefficient		1.5

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	17/11/2023 08:41

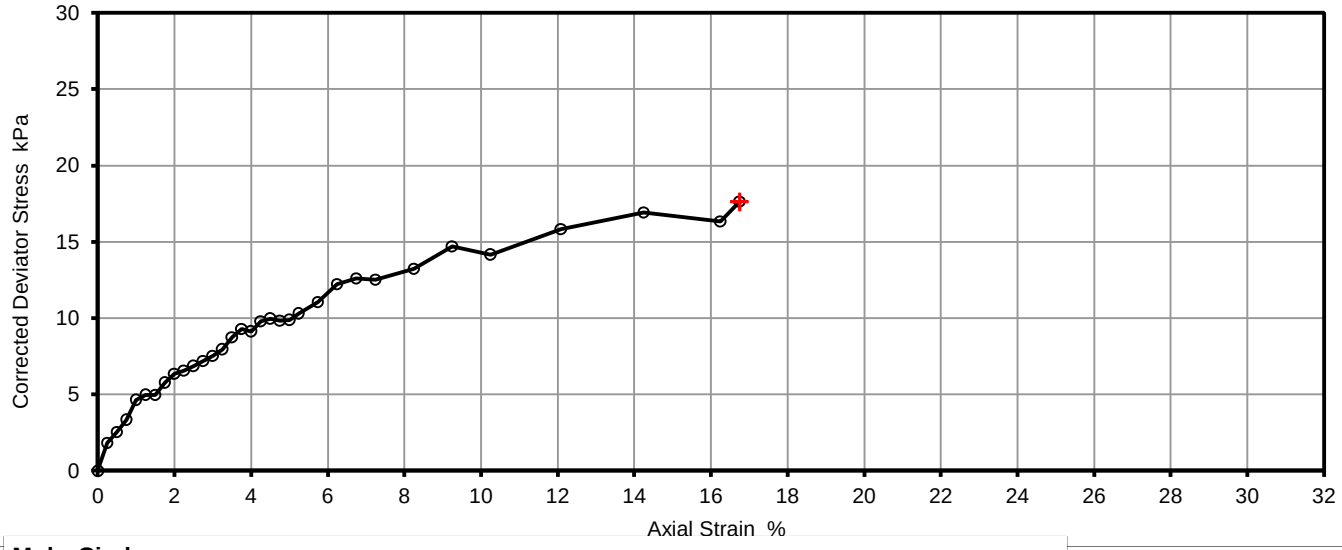
UKAS TESTING 10258	**Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen**			Job Ref	S230311
				Borehole/Pit No.	BH101
Site Name	Whitby			Sample No.	
Soil Description				Depth	9.00
Specimen Reference	BH101	Specimen Depth	9.00 m	Sample Type	U
Specimen Description	Extremely Low Strength CLAY			KeyLAB ID	G2MT202311098
Test Method				Date of test	10/11/2023

Test Number	1	
Length	200.0	mm
Diameter	102.0	mm
Bulk Density	1.84	Mg/m3
Moisture Content	42.7	%
Dry Density	1.29	Mg/m3
Rate of Strain	1.0	%/min
Cell Pressure	180	kPa
At failure: Axial Strain	16.7	%
At failure: Deviator Stress, (σ1 - σ3)f	18	kPa
At failure: Undrained Shear Strength, cu	9	kPa ½(σ1 - σ3)f
At failure: Mode of Failure	Plastic	

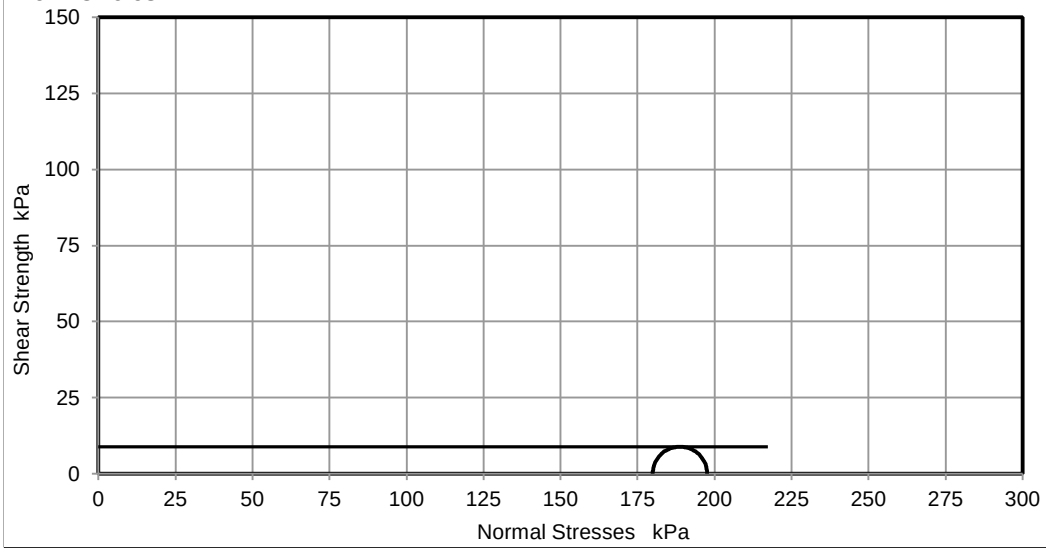
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 003
Pressure Gauge	PRE 006
Digital Caliper	CAL 006
Balance	BAL 011

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377 Part 8- 1990. This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.25
Membrane Correction
Membrane Type

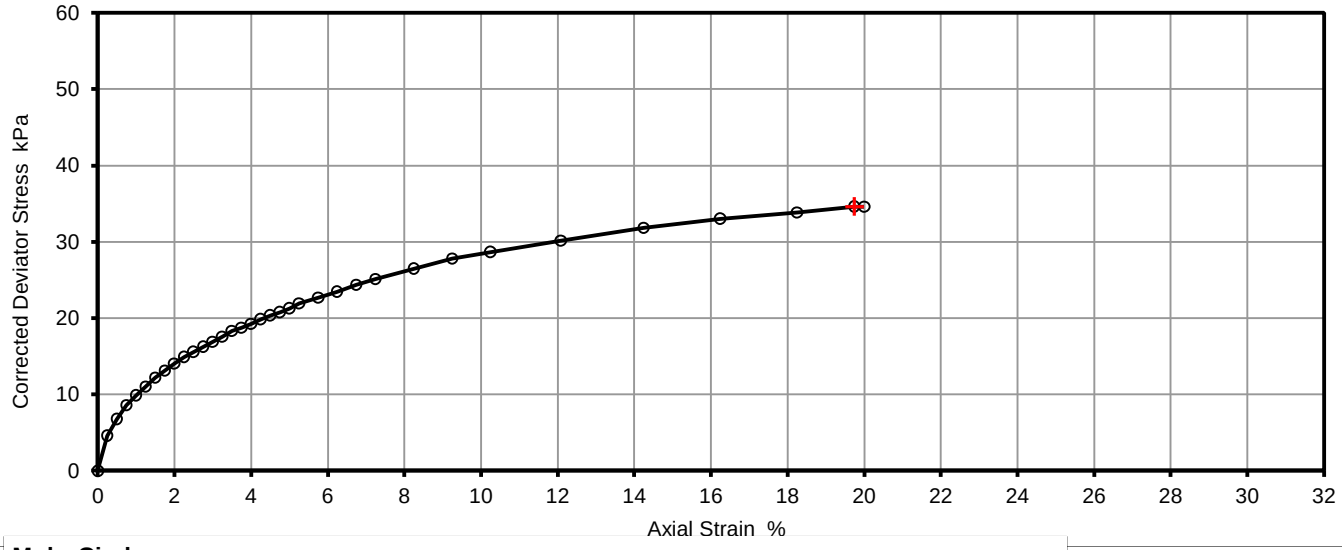
UKAS TESTING 10258	**Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen**			Job Ref	S230311
				Borehole/Pit No.	BH102
Site Name	Whitby			Sample No.	
Soil Description				Depth	9.00
Specimen Reference	BH102	Specimen Depth	9.00 m	Sample Type	U
Specimen Description	Very Low Strength CLAY			KeyLAB ID	G2MT2023110915
Test Method				Date of test	10/11/2023

Test Number	1	
Length	202.0	mm
Diameter	102.0	mm
Bulk Density	1.81	Mg/m3
Moisture Content	46.5	%
Dry Density	1.23	Mg/m3
Rate of Strain	1.0	%/min
Cell Pressure	180	kPa
At failure: Axial Strain	19.7	%
At failure: Deviator Stress, (σ1 - σ3)f	35	kPa
At failure: Undrained Shear Strength, cu	17	kPa ½(σ1 - σ3)f
At failure: Mode of Failure	Plastic	

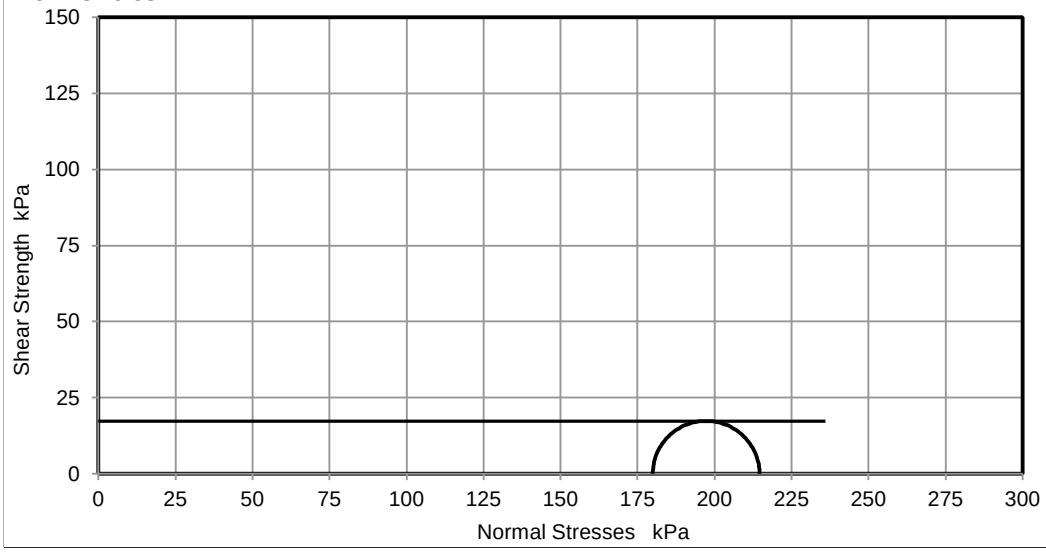
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 003
Pressure Gauge	PRE 006
Digital Caliper	CAL 006
Balance	BAL 011

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377 Part 8- 1990. This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.25
Membrane Correction
Membrane Type

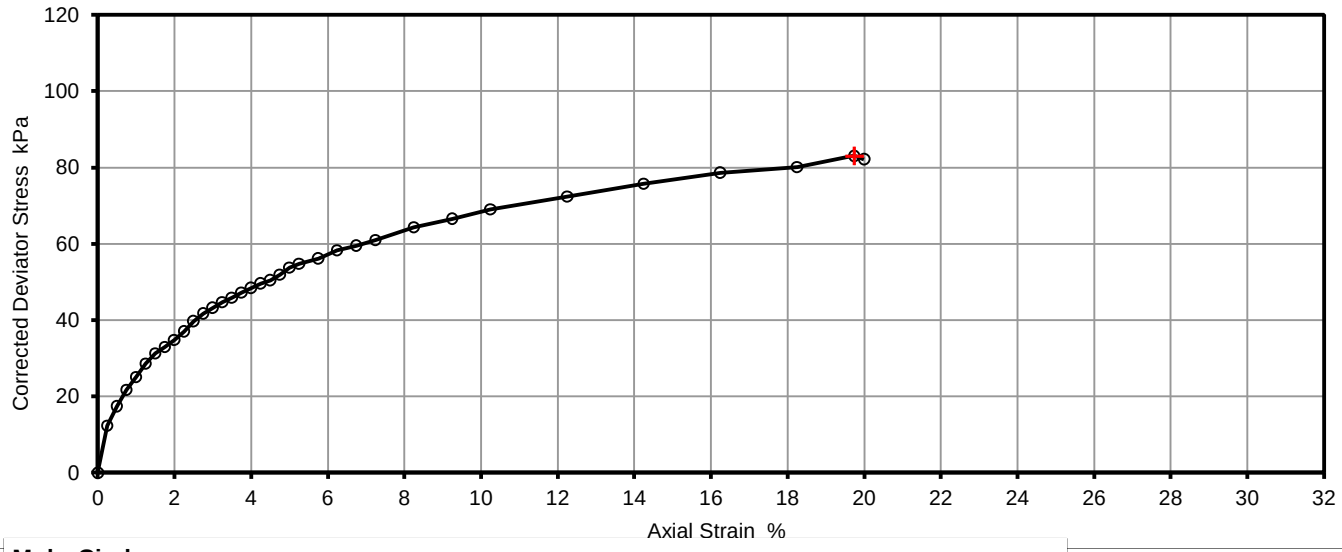
UKAS TESTING 10258	**Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen**			Job Ref	S230311
				Borehole/Pit No.	BH105
Site Name	Whitby			Sample No.	
Soil Description				Depth	3.00
Specimen Reference	Bh105	Specimen Depth	3.00 m	Sample Type	U
Specimen Description	Medium Strength CLAY			KeyLAB ID	G2MT2023110926
Test Method				Date of test	10/11/22023

Test Number	1	
Length	202.0	mm
Diameter	102.0	mm
Bulk Density	2.05	Mg/m3
Moisture Content	23.9	%
Dry Density	1.65	Mg/m3
Rate of Strain	1.0	%/min
Cell Pressure	60	kPa
At failure: Axial Strain	19.7	%
At failure: Deviator Stress, (σ1 - σ3)f	83	kPa
At failure: Undrained Shear Strength, cu	42	kPa ½(σ1 - σ3)f
At failure: Mode of Failure	Plastic	

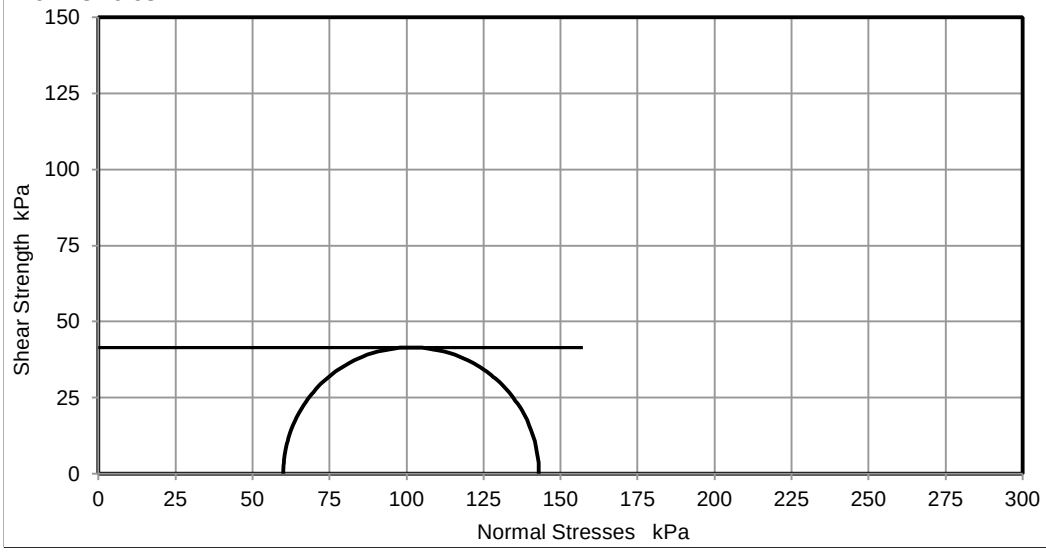
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 003
Pressure Gauge	PRE 006
Digital Caliper	CAL 006
Balance	BAL 011

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377 Part 8- 1990. This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.25
Membrane Correction
Membrane Type

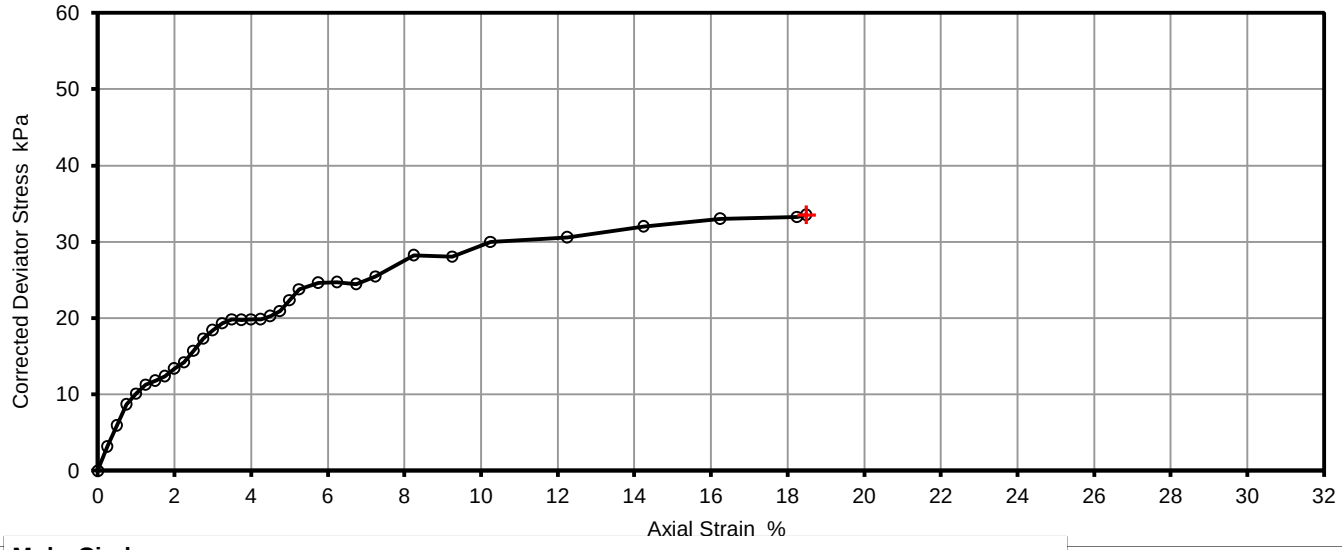
UKAS TESTING 10258	**Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen**			Job Ref	S230311
				Borehole/Pit No.	BH105
Site Name	Whitby			Sample No.	
Soil Description				Depth	9.00
Specimen Reference	BH105	Specimen Depth	9.00 m	Sample Type	U
Specimen Description	Very Low Strength CLAY			KeyLAB ID	G2MT2023110930
Test Method				Date of test	10/11/2023

Test Number	1	
Length	202.0	mm
Diameter	102.0	mm
Bulk Density	1.74	Mg/m3
Moisture Content	46.3	%
Dry Density	1.19	Mg/m3
Rate of Strain	1.0	%/min
Cell Pressure	180	kPa
At failure: Axial Strain	18.5	%
At failure: Deviator Stress, (σ1 - σ3)f	34	kPa
At failure: Undrained Shear Strength, cu	17	kPa ½(σ1 - σ3)f
At failure: Mode of Failure	Plastic	

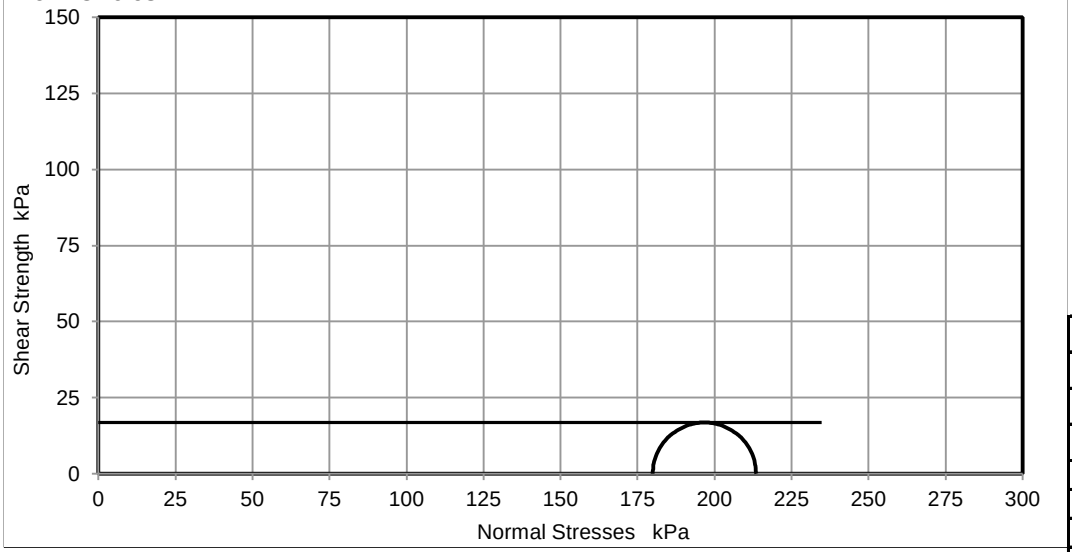
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 003
Pressure Gauge	PRE 006
Digital Caliper	CAL 006
Balance	BAL 011

Deviator Stress v Axial Strain



Mohr Circles

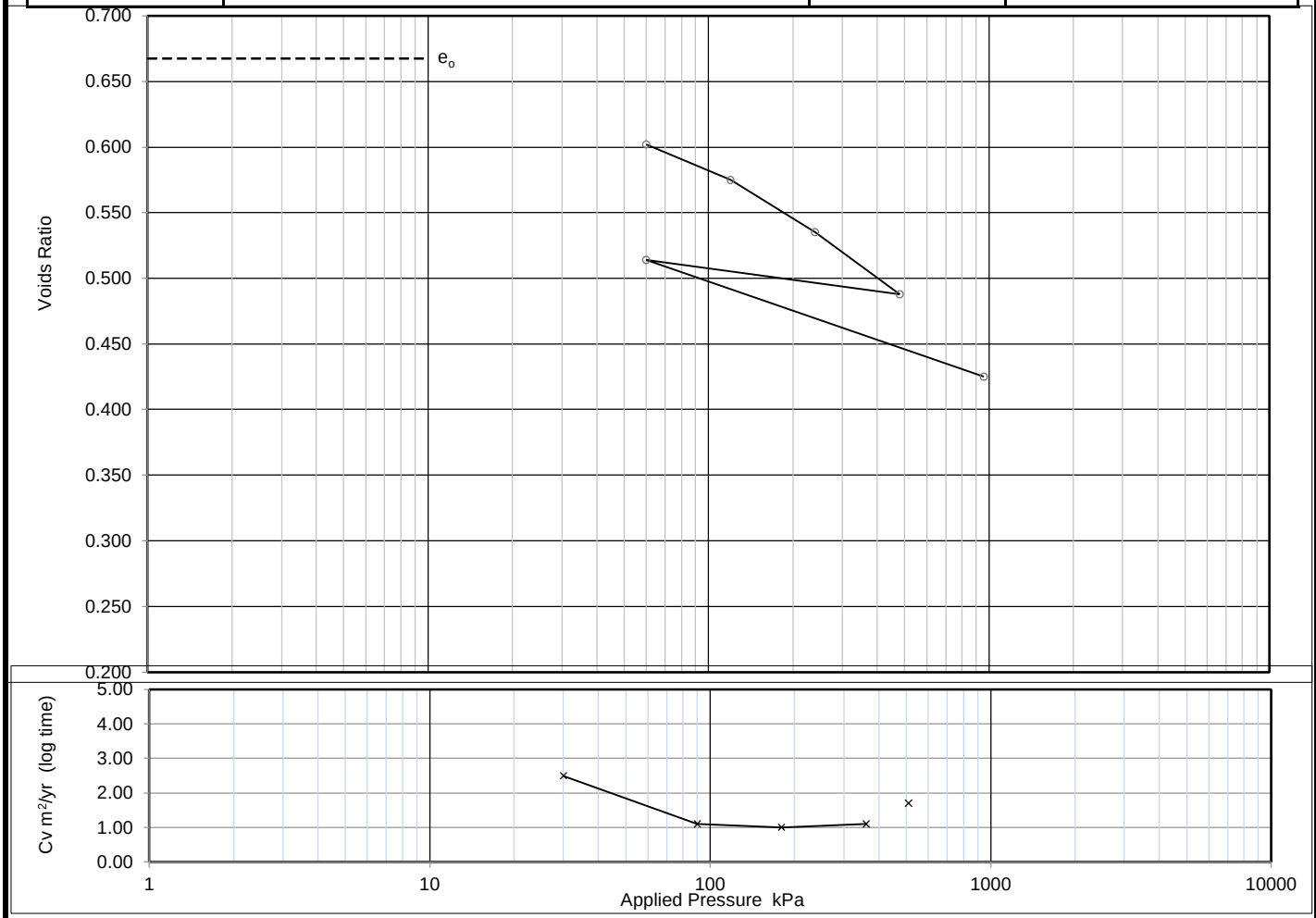


Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377 Part 8- 1990. This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.25
Membrane Correction
Membrane Type

UKAS TESTING 10258	**ONE DIMENSIONAL CONSOLIDATION TEST BS EN ISO 17892 -5, clause 3**			Job Ref	S230311
				Borehole/Pit No.	BH105
Site Name	Whitby			Sample No.	
Soil Description				Depth	3
Specimen Reference	BH105	Specimen Depth	3 m	Sample Type	U
Specimen Description				KeyLAB ID	G2MT2023110926
Test Method	BS EN ISI 17892 :Part 5			Date started	13/11/2023



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root) m2/yr	Csec
0.0	0.667	-	-	-	-
60	0.602	0.65	2.5	8.9	0.0018
120	0.575	0.29	1.1	5.6	0.002
240	0.535	0.21	1	3.9	0.0024
480	0.488	0.13	1.1	4.3	0.0027
60	0.514	0.041			
960	0.425	0.066	1.7	6.3	0.0029

Preparation

Index tests Liquid limit % Plastic limit %

Particle density assumed 2.65 Mg/m3

Specimen details	Initial	Final	
Diameter	74.76	-	mm
Height	20.23	17.28	mm
Moisture Content	25.4	19.6	%
Bulk density	1.99		Mg/m3
Dry density	1.59		Mg/m3
Voids Ratio	0.667		
Saturation	101		%
Average temperature for test	21.0		oC
Swelling Pressure			kPa
Settlement on saturation			%

Remarks

Final values should be used with caution Cv plotted at mid point of load increments Cv corrected to 20oC	Tested	Checked	Approved	Printed : 22/11/2023 10:33	Fig. No 1

Particle Density by Gas Jar Tests - Summary of Results

Project No.	Project Name
S230311	Whitby

Hole No.	Sample				Soil Description at test horizon	Particle Density Mg/m^3	Remarks
	Ref	Top	Base	Type			
BH104		1.20		B	Soft, Brown, Gravelly, Slightly Sandy, Slightly Silty, CLAY	2.69	

Notes	Date Printed	Table
Tests performed in accordance with BS 1377 unless annotated otherwise Gas Jar tests to BS1377: Part 2 : 1990, clause 8.2	22/11/2023	sheet

Summary of Rock Point Load Tests

Site name	Job number
Whitby	S230311

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
[redacted]

Hole	Sample			Specimen		Rock type and test condition	Test Type		Failure validity	Dimensions			Is	Is(50)	Remarks
	Depth m	Ref	Type	Depth m	Ref		Type	Dir.		W mm	D mm	D' mm	MPa	MPa	
BH101	18.60		C	18.60	BH101	As received	A	P	Valid	100	120		0.00	0.01	CLAY
BH101	22.95		C	22.95	Bh101	Mudstone	A	P	Valid	100	120		0.01	0.01	
BH101	25.65		C	25.65	BH101	Mudstone	A	P	Valid	100	40		0.20	0.23	
BH101	27.22		C	27.22	BH101	Mudstone	A	P	Valid	100	80		0.13	0.18	
BH102	19.90		C	19.90	BH102	Mudstone	A	P	Valid	40	100		0.91	1.07	
BH102	20.10		C	20.10	BH102	Mudstone	A	P	Valid	100	60		0.01	0.02	
BH102	24.40		C	24.40	BH102	Sandstone	A	P	Valid	100	50		0.38	0.47	
BH102	26.30		C	26.30	BH102	Mudstone	A	P	Valid	100	50		0.75	0.93	
BH103	18.30		C	18.30	BH103	Mudstone	A	P	Valid	105	60		0.02	0.02	
BH103	20.10		C	20.10	BH103	Mudstone	A	P	Valid	100	60		0.28	0.35	
BH103	21.10		C	21.10	BH103	Mudstone	A	P	Valid	100	60		0.08	0.10	
BH103	22.20		C	22.20	BH103	Mudstone	A	P	Valid	100	60		0.01	0.02	
BH103	22.90		C	22.90	BH103	Mudstone	A	P	Valid	100	60		0.40	0.52	
BH103	24.77		C	24.77	BH103	As received	A	P	Valid	100	60		0.03	0.03	
BH103	26.35		C	26.35	BH103	As received	A	P	Valid	100	60		1.22	1.57	

Test not currently within the scope of G2M Testing UKAS accrediation schedule

Column	Key	Description
Test Type	A	Axial
	B	Block
	D	Diametral
	I	Irregular lump
Test Direction	L	Parallel to planes of weakness
	P	Perpendicular to planes of weakness
	U	Unknown
Dimensions	W	Width
	D	Platen seperation at start of test
	D'	Platen seperation at sample failure
	Is	Point Load Index
	Is(50)	Corrected Point Load Index to equivalent 50 mm diameter

Approved by	[redacted]
Approval date	11/12/2023 13:16
Date report generated	
Report Number	

Total Stress Triaxial Compression

Unconfined Compression

Summary Report

Sample Details

sketch showing specimen location in original sample

Depth	20.20-20.55 m		
Description	Undisturbid		
Type	Mudstone		
Initial Sample Length	L_0	(mm)	216.0
Initial Sample Diameter	D_0	(mm)	103.8
Initial Sample Weight	W_0	(gr)	4285.0
Bulk Density	ρ_0	(Mg/m3)	2.34
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

Strain Rate	ε	(%/min)	1.816
MembraneThickness	m_b	(mm)	0.00
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 1
Initial Moisture	$\omega_i\%$	(%)	7.63
Initial Dry Density	ρ_{d0}	(Mg/m3)	2.18
Initial Voids Ratio	e_0	.	0.22
Initial Degree of Saturation	S_o	(%)	93

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	201.72
Strain At Max Stress	$\varepsilon_f\%$	(%)	3.14
Final Moisture	$\omega_f\%$	(%)	7.63
Final Dry Density	ρ_{df}	(Mg/m3)	2.18
Final Voids Ratio	e_f	.	0.22
Final Degree of Saturation	S_f	(%)	93.3

Notes

Failure Sketch

(surface inclination)

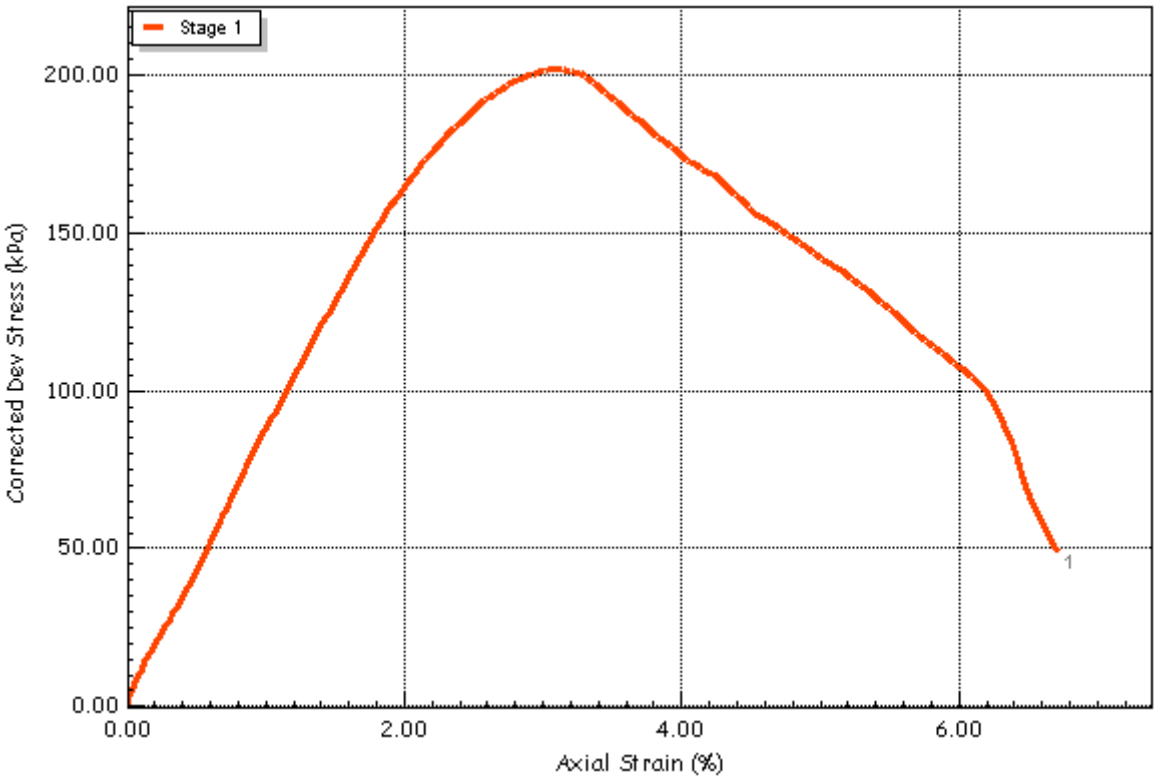
Test Method	BS1377: Part 7 1990 : Clause 7			Test Name	UCS 071223 SOLMEK BH101 20.20
Database: DESKTOP-IBEJL9B\SQLEXPRESS2019 \				Test Date	07/12/2023
Site Reference				Borehole	BH101
Jobfile	S230311			Sample	BH101 20.20-20.55m
Client	SOLMEK			Depth	20.20-20.55 m
Operator	Ali	Checked	Graham	Approved	Aiston

G2M TESTING

Total Stress Triaxial Compression

Unconfined Compression

Test Results Plots



Test Method	BS1377: Part 7 1990 : Clause 7		Test Name	UCS 071223 SOLMEK BH101 20.20	
Database: DESKTOP-IBEJL9B\SQLEXPRESS2019 \			Test Date	07/12/2023	
Site Reference			Borehole	BH101	
Jobfile	S230311		Sample	BH101 20.20-20.55m	
Client	SOLMEK		Depth	20.20-20.55 m	
Operator	Ali	Checked	Graham	Approved	Aiston

Total Stress Triaxial Compression

Unconfined Compression

Summary Report

Sample Details

sketch showing specimen location in original sample

Depth			
Description			UNDISTURBID
Type			MUDSTONE
Initial Sample Length	L_0	(mm)	204.0
Initial Sample Diameter	D_0	(mm)	102.3
Initial Sample Weight	W_0	(gr)	3489.5
Bulk Density	ρ_0	(Mg/m3)	2.08
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

Strain Rate	ε	(%/min)	1.943
MembraneThickness	m_b	(mm)	0.00
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 1
Initial Moisture	$\omega_i\%$	(%)	11
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.88
Initial Voids Ratio	e_0	.	0.41
Initial Degree of Saturation	S_o	(%)	69

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	58.09
Strain At Max Stress	$\varepsilon_f\%$	(%)	5.95
Final Moisture	$\omega_f\%$	(%)	11
Final Dry Density	ρ_{df}	(Mg/m3)	1.88
Final Voids Ratio	e_f	.	0.41
Final Degree of Saturation	S_f	(%)	68.7

Notes

Failure Sketch

(surface inclination)

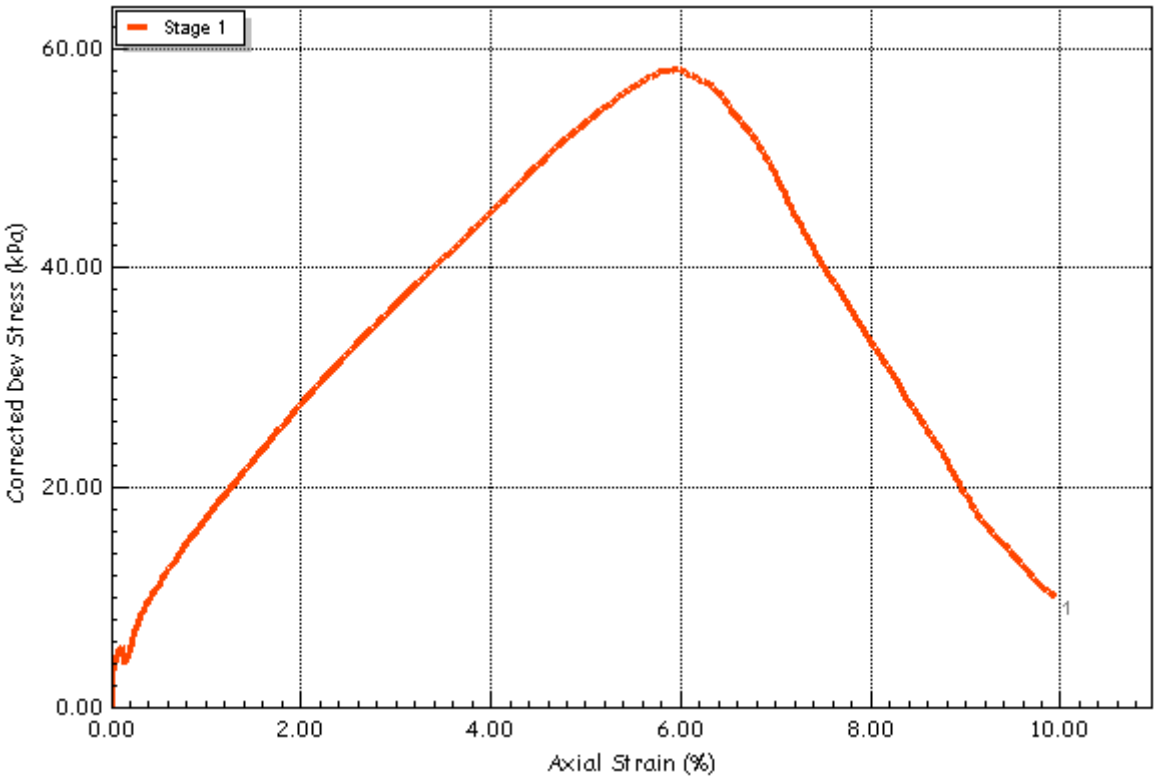
Test Method	BS1377: Part 7 1990 : Clause 7			Test Name	UCS 071223 BH102
Database: DESKTOP-IBEJL9B\SQLEXPRESS2019 \				Test Date	07/12/2023
Site Reference				Borehole	BH102
Jobfile	S230311			Sample	BH102 23-05-23 40
Client	SOLMEK			Depth	
Operator	Ali	Checked	Graham	Approved	Aiston

G2M TESTING

Total Stress Triaxial Compression

Unconfined Compression

Test Results Plots



Test Method	BS1377: Part 7 1990 : Clause 7		Test Name	UCS 071223 BH102	
Database: DESKTOP-IBEJL9B\SQLEXPRESS2019 \			Test Date	07/12/2023	
Site Reference			Borehole	BH102	
Jobfile	S230311		Sample	BH102 23-05-23 40	
Client	SOLMEK		Depth		
Operator	Ali	Checked	Graham	Approved	Aiston

Total Stress Triaxial Compression

Unconfined Compression

Summary Report

Sample Details				
 *sketch showing specimen location in original sample*	Depth	19.95-20.25		
	Description	UNDISTURBID		
	Type	Mudstone		
	Initial Sample Length	L_0	(mm)	209.0
	Initial Sample Diameter	D_0	(mm)	103.5
	Initial Sample Weight	W_0	(gr)	3886.2
	Bulk Density	ρ_0	(Mg/m3)	2.21
	Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

Strain Rate	ε	(%/min)	1.886
MembraneThickness	m_b	(mm)	0.00
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 1
Initial Moisture	$\omega_i\%$	(%)	10
Initial Dry Density	ρ_{d0}	(Mg/m3)	2.01
Initial Voids Ratio	e_0	.	0.32
Initial Degree of Saturation	S_o	(%)	84

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	44.95
Strain At Max Stress	$\varepsilon_f\%$	(%)	3.15
Final Moisture	$\omega_f\%$	(%)	10
Final Dry Density	ρ_{df}	(Mg/m3)	2.01
Final Voids Ratio	e_f	.	0.32
Final Degree of Saturation	S_f	(%)	83.8

Notes

Failure Sketch

(surface inclination)

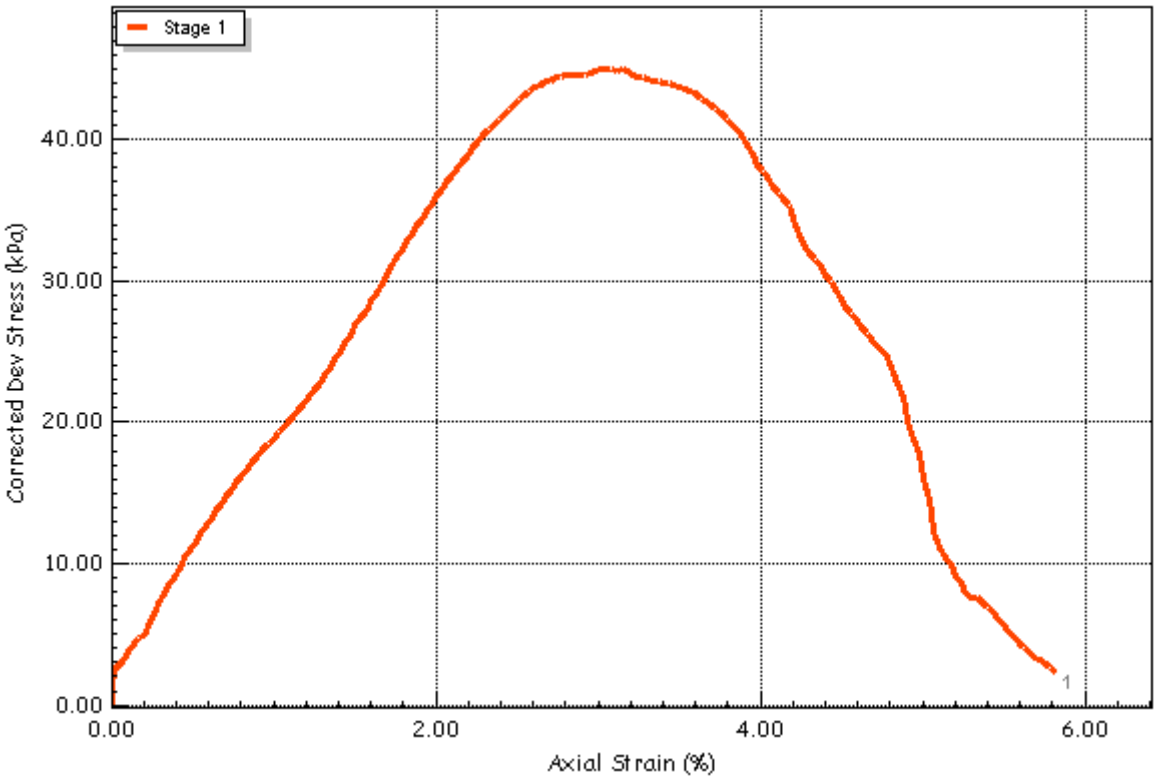
Test Method	BS1377: Part 7 1990 : Clause 7			Test Name	UCS 071223 SOLMEK BH105
Database: DESKTOP-IBEJL9B\SQLEXPRESS2019 \				Test Date	07/12/2023
Site Reference				Borehole	BH105
Jobfile	S230311			Sample	BH105 19.95-20.25 m
Client	SOLMEK			Depth	19.95-20.25
Operator	Ali	Checked	Graham	Approved	Aiston

G2M TESTING

Total Stress Triaxial Compression

Unconfined Compression

Test Results Plots



Test Method	BS1377: Part 7 1990 : Clause 7		Test Name	UCS 071223 SOLMEK BH105	
Database: DESKTOP-IBEJL9B\SQLEXPRESS2019 \			Test Date	07/12/2023	
Site Reference			Borehole	BH105	
Jobfile	S230311		Sample	BH105 19.95-20.25 m	
Client	SOLMEK		Depth	19.95-20.25	
Operator	Ali	Checked	Graham	Approved	Aiston

LABORATORY REPORT

Contract Number: PSL23/9618

Report Date: 04 December 2023

Client's Reference: S230311

Client Name: G2M Testing
Unit 5e
Edwardson Road
Meadowfield
Durham
DH7 8RL

For the attention of: James Eglintine

Contract Title: Whitby

Date Received: 15/11/2023
Date Commenced: 15/11/2023
Date Completed: 4/12/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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

Checked and Approved Signatories:

L Knight
(Assistant Laboratory Manager)

R Berriman
(Associate Director)

S Royle
(Laboratory Manager)

[redacted]

A Watkins
(Managing Director)

S Eyre
(Senior Technical Coordinator)

T Watkins
(Senior Technician)

5 – 7 Hexthorpe Road,
Hexthorpe,
Doncaster,
DN4 0AR
[redacted]

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH101		U	9.00	9.45	Brown slightly sandy very silty CLAY.
BH102		U	9.00	9.45	Brown slightly sandy very silty CLAY.
BH105		U	9.00	9.45	Brown slightly sandy very silty CLAY.

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Whitby

Contract No:

PSL23/9618

Client Ref:

S230311

ONE DIMENSIONAL CONSOLIDATION TEST

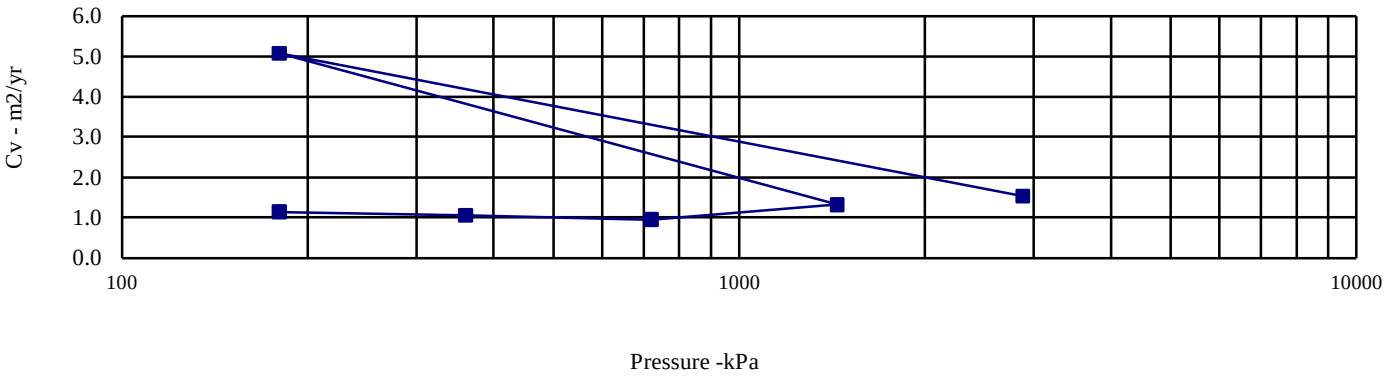
BS 1377: Part 5: 1990: Clause 3

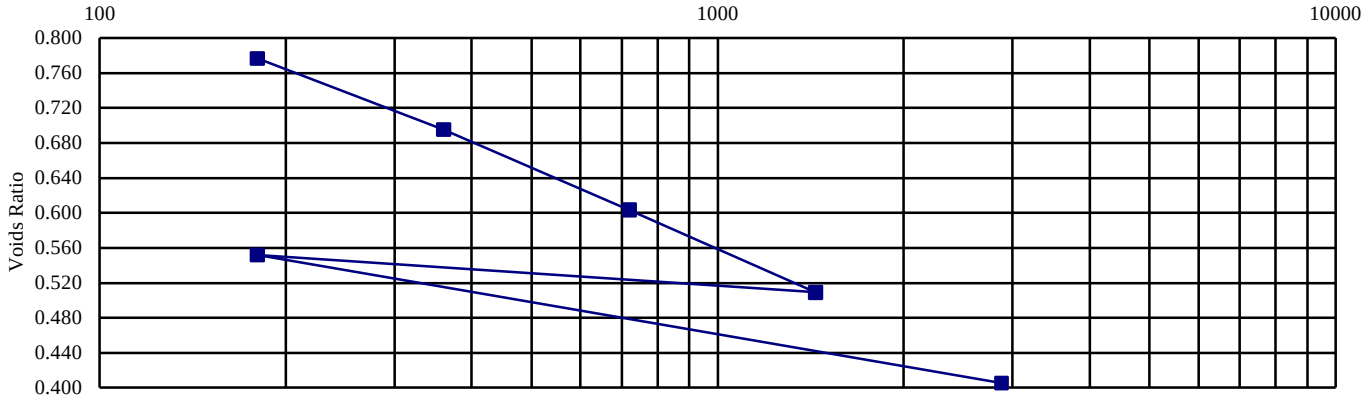
Hole Number: **BH101** **Top Depth (m):** **9.00**

Sample Number: **Base Depth (m) :** **9.45**

Sample Type: **U**

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	41						
Bulk Density (Mg/m3):	1.81	0	180	0.774	1.142	Method used to	
Dry Density (Mg/m3):	1.28	180	360	0.254	1.056	determine CV:	T90
Voids Ratio:	1.064	360	720	0.151	0.953	Nominal temperature	
Degree of saturation:	102.1	720	1440	0.082	1.323	during test ' C:	20
Height (mm):	20.014	1440	180	0.022	5.071	Remarks:	
Diameter (mm)	75.028	180	2880	0.035	1.532	See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Whitby**	**Contract No:** **PSL23/9618** **Client Ref:** **S230311**

ONE DIMENSIONAL CONSOLIDATION TEST

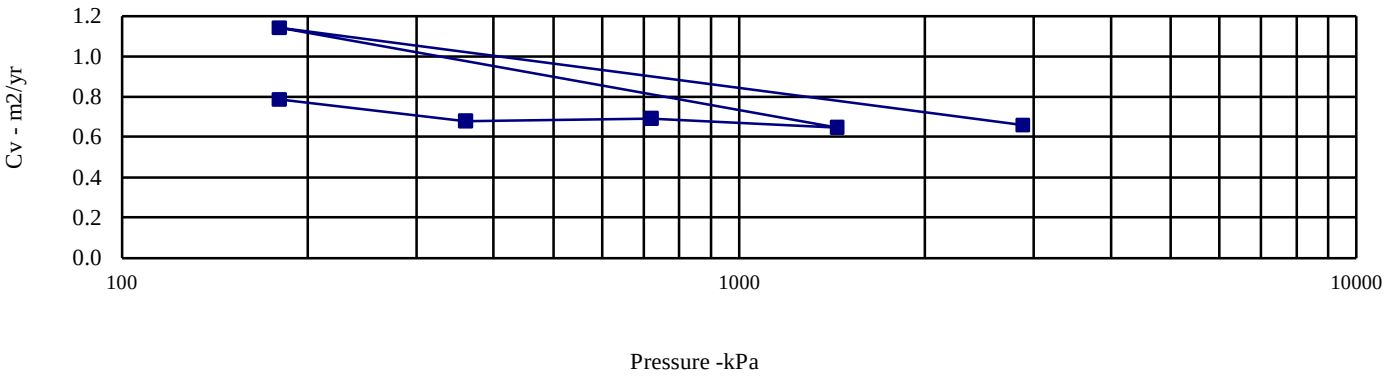
BS 1377: Part 5: 1990: Clause 3

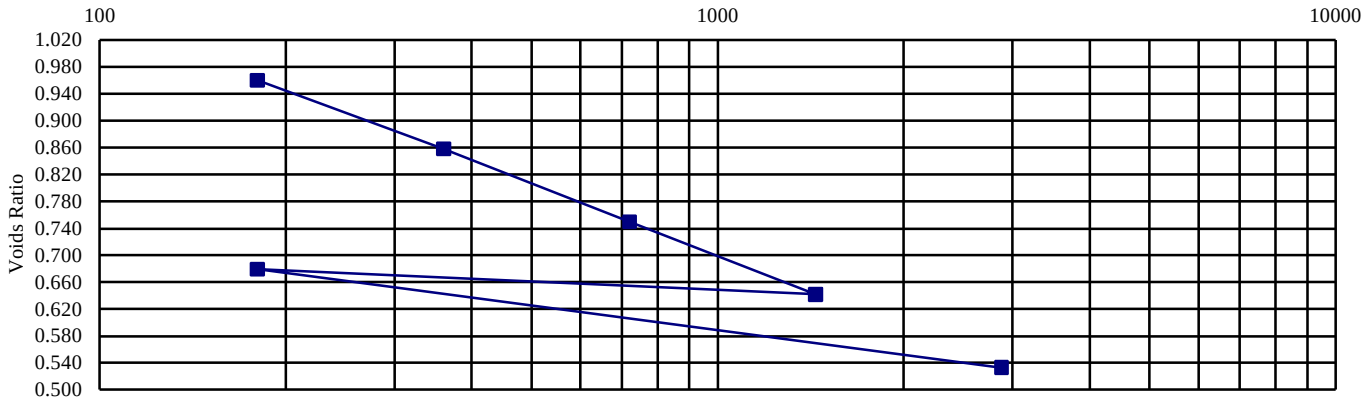
Hole Number: **BH102** **Top Depth (m):** **9.00**

Sample Number: **Base Depth (m) :** **9.45**

Sample Type: **U**

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	46						
Bulk Density (Mg/m3):	1.69	0	180	0.804	0.786	Method used to	
Dry Density (Mg/m3):	1.16	180	360	0.290	0.680	determine CV:	T90
Voids Ratio:	1.292	360	720	0.162	0.692	Nominal temperature	
Degree of saturation:	95.1	720	1440	0.086	0.648	during test ' C:	20
Height (mm):	20.016	1440	180	0.018	1.142	Remarks:	
Diameter (mm)	75.008	180	2880	0.032	0.660	See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Whitby**	**Contract No:** PSL23/9618 / **Client Ref:** S230311

ONE DIMENSIONAL CONSOLIDATION TEST

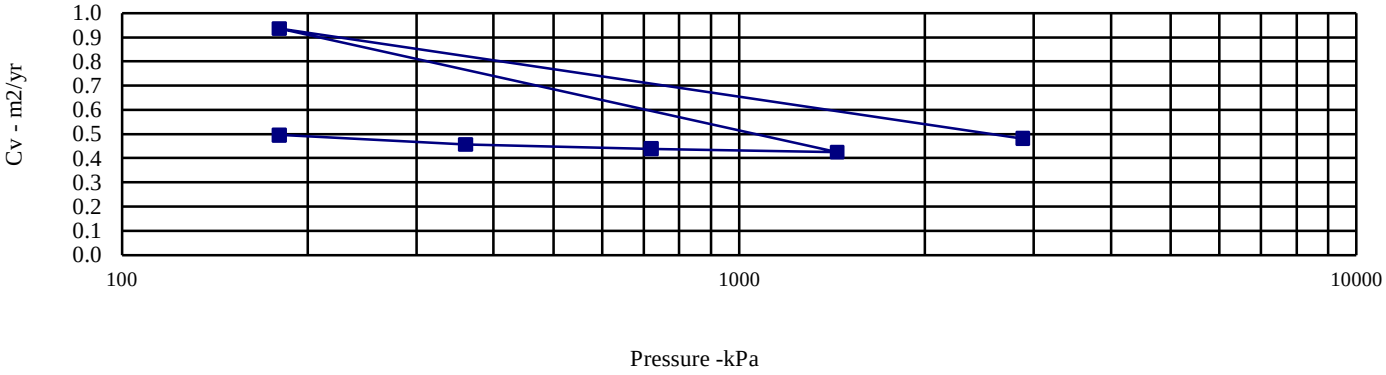
BS 1377: Part 5: 1990: Clause 3

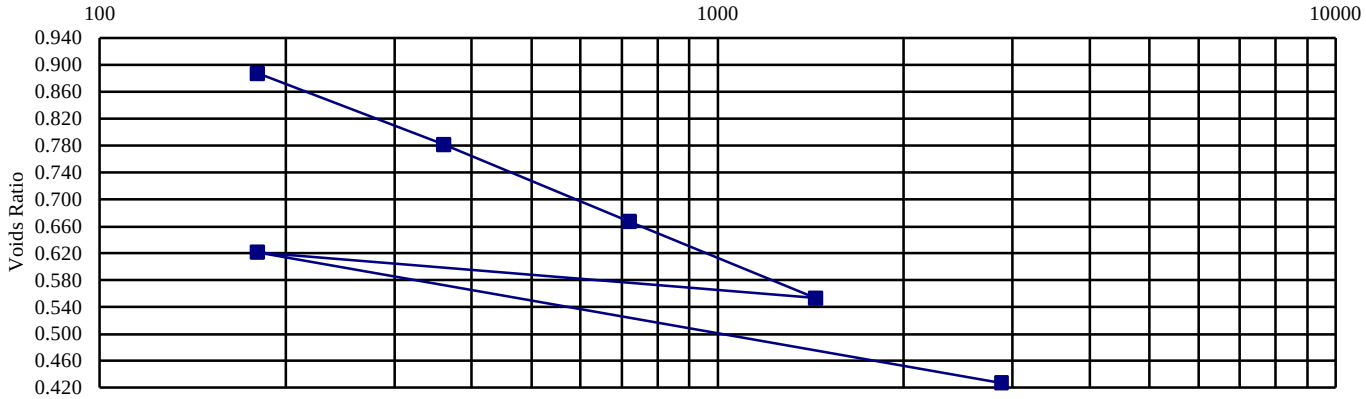
Hole Number: **BH105** **Top Depth (m):** **9.00**

Sample Number: **Base Depth (m) :** **9.45**

Sample Type: **U**

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	44						
Bulk Density (Mg/m3):	1.73	0	180	0.794	0.495	Method used to	
Dry Density (Mg/m3):	1.20	180	360	0.310	0.456	determine CV:	T90
Voids Ratio:	1.202	360	720	0.179	0.439	Nominal temperature	
Degree of saturation:	97.0	720	1440	0.095	0.425	during test ' C:	20
Height (mm):	20.018	1440	180	0.035	0.937	Remarks:	
Diameter (mm)	75.025	180	2880	0.044	0.481	See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Whitby**	**Contract No:** **PSL23/9618** **Client Ref:** **S230311**

Certificate of Analysis

Certificate Number 23-26611 *Issued:* 16-Nov-23

Client G2M Testing Ltd
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference 23-26611

Client Reference S230311

Order No LAB2042

Contract Title WHITBY

Description 7 Soil samples.

Date Received 13-Nov-23

Date Started 13-Nov-23

Date Completed 16-Nov-23

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

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

Approved By [redacted]

Kirk Bridgewood
General Manager

2139

Summary of Chemical Analysis
Soil Samples

Our Ref 23-26611
Client Ref S230311
Contract Title WHITBY

Test	Method	LOD	Units	Lab No	2261184	2261185	2261186	2261187	2261188	2261189
				.Sample ID	BH101	BH101	BH102	BH102	BH103	BH103
				Depth	5.00	13.50	7.50	10.50	7.50	10.50
				Other ID						
				Sample Type	D	D	D	D	D	D
				Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Inorganics										
pH	DETSC 2008#		pH		7.8	7.8	5.7	7.0	7.2	7.2
Organic matter	DETSC 2002#	0.1	%		3.4		8.4		7.0	7.4
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		830	41	1900	820	780	560

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

Summary of Chemical Analysis
Soil Samples

Our Ref 23-26611
Client Ref S230311
Contract Title WHITBY

Lab No	2261190
.Sample ID	BH105
Depth	7.10
Other ID	
Sample Type	D
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Inorganics				
pH	DETSC 2008#		pH	
Organic matter	DETSC 2002#	0.1	%	11
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	

Information in Support of the Analytical Results

Our Ref 23-26611
Client Ref S230311
Contract WHITBY

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2261184	BH101 5.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Organic Matter (Manual) (28 days), pH + Conductivity (7 days)	
2261185	BH101 13.50 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
2261186	BH102 7.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Organic Matter (Manual) (28 days), pH + Conductivity (7 days)	
2261187	BH102 10.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
2261188	BH103 7.50 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (30 days), Organic Matter (Manual) (28 days), pH + Conductivity (7 days)	
2261189	BH103 10.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Organic Matter (Manual) (28 days), pH + Conductivity (7 days)	
2261190	BH105 7.10 SOIL		PT 1L	Sample date not supplied, Organic Matter (Manual) (28 days)	

Key: P-Plastic T-Tub

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

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number 23-27587 *Issued:* 28-Nov-23

Client G2M Testing Ltd
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference 23-27587

Client Reference S230311

Order No LAB2042

Contract Title WHITBY

Description One Soil sample.

Date Received 23-Nov-23

Date Started 23-Nov-23

Date Completed 28-Nov-23

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

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

Approved By [redacted]

Kirk Bridgewood
General Manager

2139

Summary of Chemical Analysis
Soil Samples

Our Ref 23-27587
Client Ref S230311
Contract Title WHITBY

Lab No	2266640
.Sample ID	BH105
Depth	10.50
Other ID	
Sample Type	D
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Inorganics				
pH	DETSC 2008#		pH	9.4
Organic matter	DETSC 2002#	0.1	%	4.0
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	660

Information in Support of the Analytical Results

Our Ref 23-27587
Client Ref S230311
Contract WHITBY

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2266640	BH105 10.50 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (30 days), Organic Matter (Manual) (28 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

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Soil Analysis Notes

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

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

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

Disposal

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

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

End of Report

Certificate of Analysis

Certificate Number 23-28817 *Issued:* 12-Dec-23

Client G2M Testing Ltd
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference 23-28817

Client Reference S230311

Order No LAB2077

Contract Title WHITBY ROCK SCHEDULE

Description 5 Soil samples.

Date Received 07-Dec-23

Date Started 07-Dec-23

Date Completed 12-Dec-23

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

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

Approved By [redacted]

Kirk Bridgewood
General Manager

2139

Summary of Chemical Analysis
Soil Samples

Our Ref 23-28817
Client Ref S230311
Contract Title WHITBY ROCK SCHEDULE

			Lab No	2273501	2273502	2273503	2273504	2273505
			.Sample ID	BH101	BH101	BH102	BH103	BH105
			Depth	19.50	24.50	21.35	21.90	23.70
			Other ID					
			Sample Type	D	D	D	D	D
			Sampling Date	n/s	n/s	n/s	n/s	n/s
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units					
Inorganics								
pH	DETSC 2008#		pH	8.5	7.9	8.2	8.7	8.6
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	< 10	270	24	29	34

Information in Support of the Analytical Results

Our Ref 23-28817
Client Ref S230311
Contract WHITBY ROCK SCHEDULE

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2273501	BH101 19.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
2273502	BH101 24.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
2273503	BH102 21.35 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
2273504	BH103 21.90 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
2273505	BH105 23.70 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

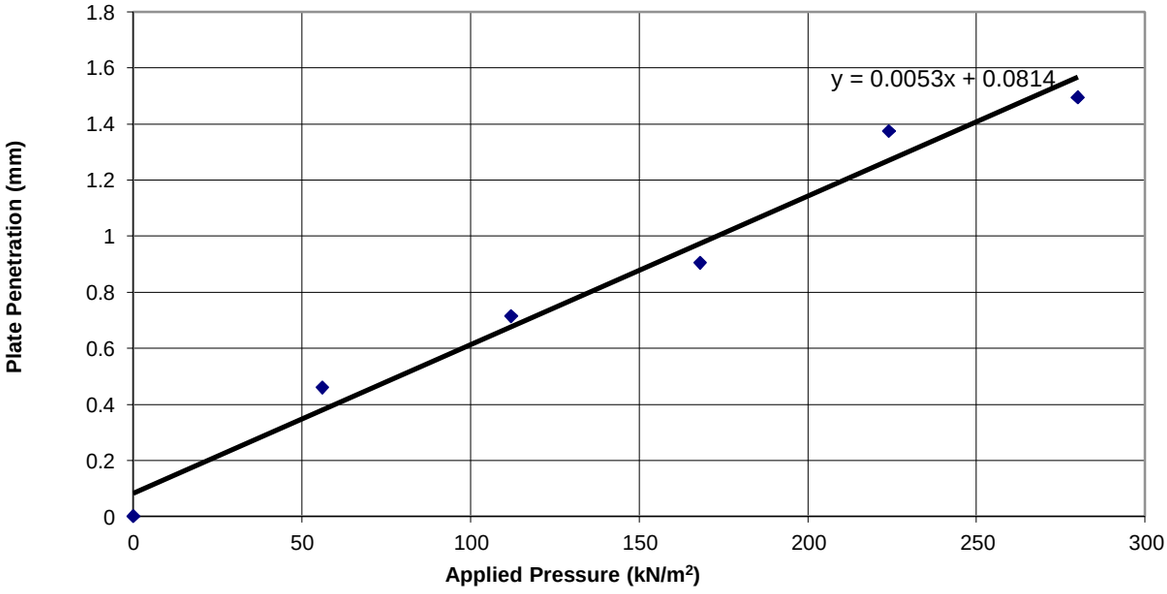
From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

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

End of Report

SOLMEK
GEOTECHNICAL TESTING LABORATORY

PLATE BEARING TEST			**Date:**	24/10/2023
Project Number:	S230311		**Test No:**	PLT01
Project Name:	Whitby Maritime Hub		**Test Level:**	0.7
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)			**Weather:**	Cold/overcast
Plate Diameter:	0.305 m		**Load Applied:**	280 kPa
Kentledge Type:	Tractor		**Remarks:**	Made Ground (Dolomite)



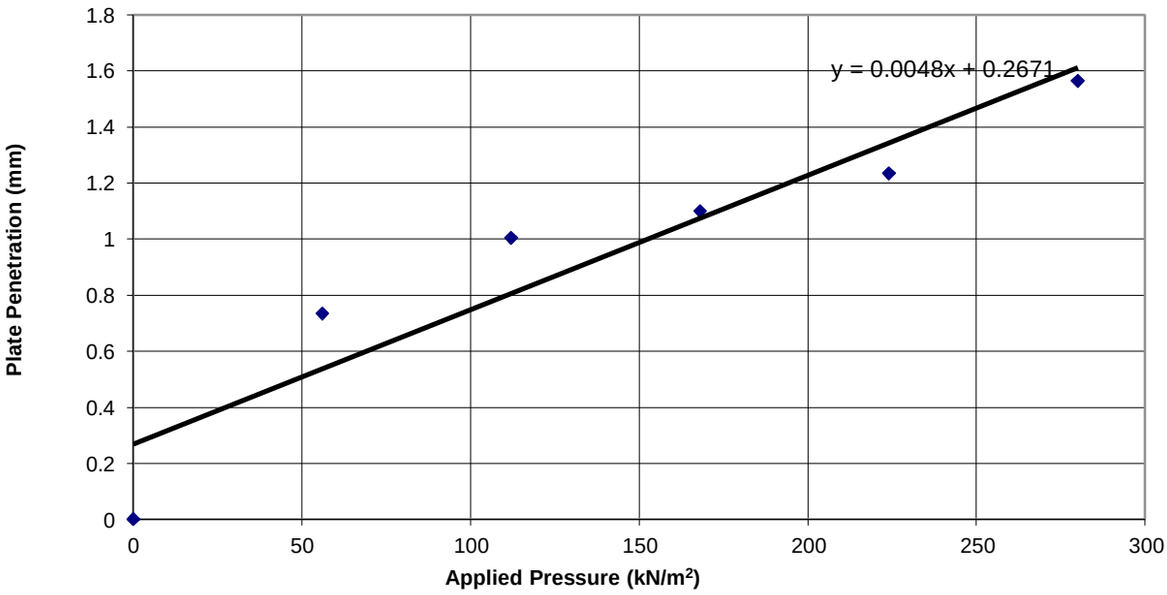
	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	56	0.46
Stage 2	112	0.72
Stage 3	168	0.91
Stage 4	224	1.38
Stage 5	280	1.50

Conversion Factor	0.45	Produced by:	E. Lupton
Stress Applied @ 1.25mm	220.02 kN/m^2		
Total Plate Deflection	1.50 mm	Checked by:	L. Cassidy
Plate Diameter	305 mm		
k305	176015		
k762	78810		
CBR	19 %		

SOLMEK

SOLMEK
GEOTECHNICAL TESTING LABORATORY

PLATE BEARING TEST			**Date:**	24/10/2023
Project Number:	S230311		**Test No:**	PLT02
Project Name:	Whitby Maritime Hub		**Test Level:**	0.3
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)			**Weather:**	Cold/overcast
Plate Diameter:	0.305 m		**Load Applied:**	280 kPa
Kentledge Type:	Tractor		**Remarks:**	Made Ground (Dolomite)



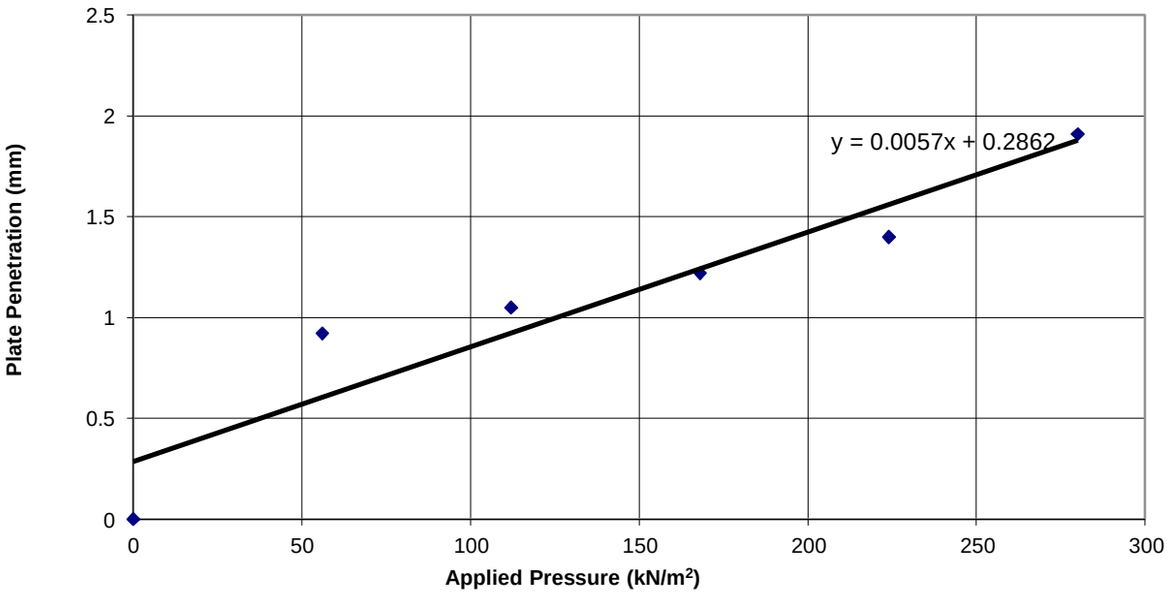
	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	56	0.74
Stage 2	112	1.01
Stage 3	168	1.10
Stage 4	224	1.24
Stage 5	280	1.57

Conversion Factor	0.45	Produced by:	E. Lupton
Stress Applied @ 1.25mm	204.50 kN/m^2		
Total Plate Deflection	1.57 mm	Checked by:	L. Cassidy
Plate Diameter	305 mm		
k305	163601		
k762	73251		
CBR	16 %		

SOLMEK

SOLMEK
GEOTECHNICAL TESTING LABORATORY

PLATE BEARING TEST			**Date:**	24/10/2023
Project Number:	S230311		**Test No:**	PLT03
Project Name:	Whitby Maritime Hub		**Test Level:**	0.3
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)			**Weather:**	Cold/overcast
Plate Diameter:	0.305 m		**Load Applied:**	280 kPa
Kentledge Type:	Tractor		**Remarks:**	Made Ground (Dolomite)



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	56	0.92
Stage 2	112	1.05
Stage 3	168	1.22
Stage 4	224	1.40
Stage 5	280	1.91

Conversion Factor	0.45	Produced by:	E. Lupton
Stress Applied @ 1.25mm	169.27 kN/m^2		
Total Plate Deflection	1.91 mm	Checked by:	L. Cassidy
Plate Diameter	305 mm		
k305	135417		
k762	60632		
CBR	12 %		

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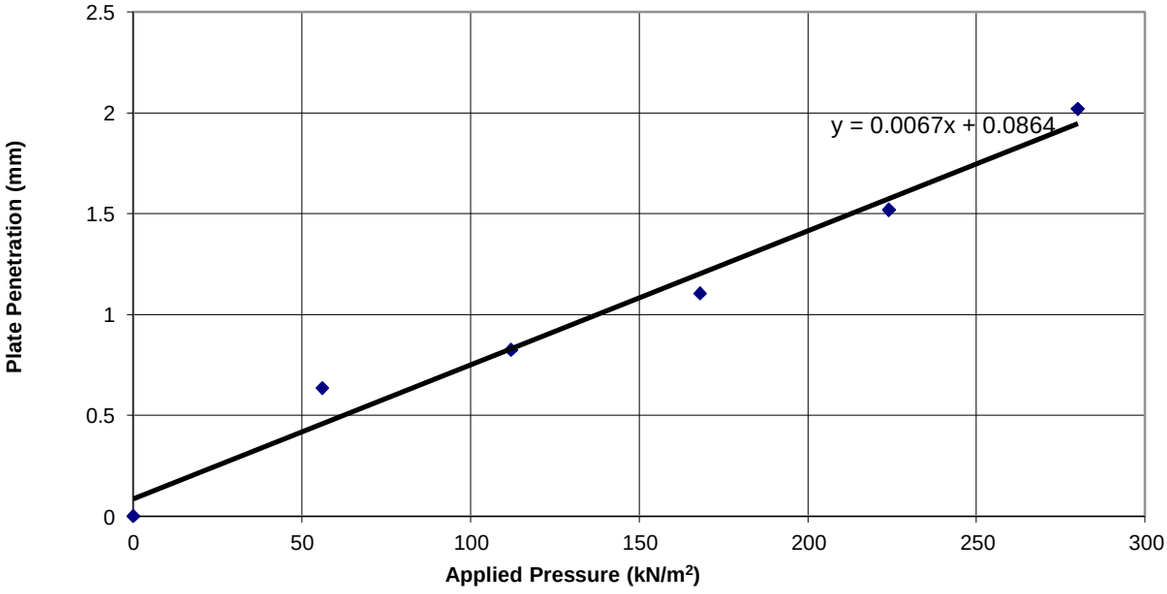
GEOTECHNICAL TESTING LABORATORY

PLATE BEARING TEST			**Date:**	24/10/2023
Project Number:	S230311		**Test No:**	PLT04
Project Name:	Whitby Maritime Hub		**Test Level:**	0.6
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)			**Weather:**	Cold/overcast
Plate Diameter:	0.305 m		**Load Applied:**	280 kPa
Kentledge Type:	Tractor		**Remarks:**	Made Ground (Dolomite)



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	56	0.64
Stage 2	112	0.83
Stage 3	168	1.11
Stage 4	224	1.52
Stage 5	280	2.02

Conversion Factor	0.45	Produced by:	E. Lupton
Stress Applied @ 1.25mm	174.96 kN/m^2		
Total Plate Deflection	2.02 mm	Checked by:	L. Cassidy
Plate Diameter	305 mm		
k305	139968		
k762	62670		
CBR	13 %		

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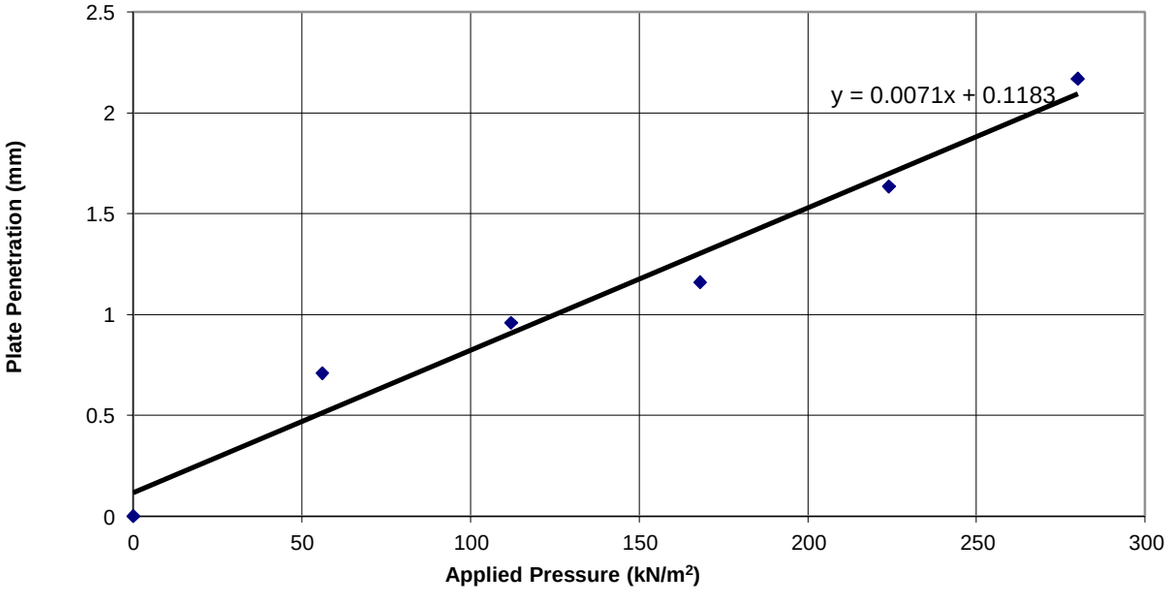
SOLMEK
GEOTECHNICAL TESTING LABORATORY

PLATE BEARING TEST			**Date:**	24/10/2023
Project Number:	S230311		**Test No:**	PLT05
Project Name:	Whitby Maritime Hub		**Test Level:**	0.25
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)			**Weather:**	Cold/overcast
Plate Diameter:	0.305 m		**Load Applied:**	280 kPa
Kentledge Type:	Tractor		**Remarks:**	Made Ground (Dolomite)



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	56	0.71
Stage 2	112	0.96
Stage 3	168	1.16
Stage 4	224	1.64
Stage 5	280	2.17

Conversion Factor	0.45	Produced by:	E. Lupton
Stress Applied @ 1.25mm	160.44 kN/m^2		
Total Plate Deflection	2.17 mm	Checked by:	L. Cassidy
Plate Diameter	305 mm		
k305	128351		
k762	57469		
CBR	11 %		

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APPENDIX E:
Gas Monitoring Results

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GAS MONITORING RESULTS

Project number	S230311
Project name	Whitby Maritime Hub, Whitby
Client	Fairhurst
Visit no	1
Date	20/11/2023
Equipment	GFM 435 Gas Analyser
Operator	LO

Weather Conditions	Cloudy
Ground Conditions	Wet
Ambient Atmospheric Pressure	1003
Regional Pressure Trend	Falling

Position	Flow	Pressure	CH4		CO2		O2 (% v/v)	PID (ppm)	CO (ppm)	H2S (ppm)	Groundwater Level (mbgl)	Depth to Base (mbgl)	Notes
			(% v/v)	GSV (l/hr)	(% v/v)	GSV (l/hr)							
BH101	0.1	1003	8.0	0.0080	0.3	0.0003	14.0	0.2	0.0	0.0	1.28	12.30	
BH102	0.1	1003	6.7	0.0067	0.3	0.0003	16.2	0.1	0.0	0.0	1.82	17.00	
BH103	0.1	1003	6.7	0.0067	0.2	0.0002	17.9	0.3	0.0	0.0	1.23	12.40	
BH105	0.1	1003	0.0	0.0000	0.2	0.0002	19.4	0.0	0.0	0.0	2.10	8.70	
WS101	0.1	1003	0.0	0.0000	2.2	0.0022	18.0	0.0	0.0	0.0	2.20	3.70	
WS104	0.1	1003	0.0	0.0000	0.0	0.0000	20.4	0.0	0.0	0.0	1.28	5.00	
WS105	0.1	1003	0.0	0.0000	0.8	0.0008	19.1	0.0	0.0	0.0	2.05	3.00	

KEY

CH_4 = Methane, **CO_2** = Carbon Dioxide, **O_2** = Oxygen, **CO** = Carbon Monoxide, **H_2S** = Hydrogen Sulphide, **GSV** = Gas Screening Value (If no flow is recorded a value of 0.1 is assumed), ND = Not Detected, * = not measured, N/A = Not applicable, % = % by volume, mbgl = m below ground level, ppm = parts per million.

GAS MONITORING RESULTS

Project number	S230311
Project name	Whitby Maritime Hub, Whitby
Client	Fairhurst
Visit no	2
Date	27/11/2023
Equipment	GFM 435 Gas Analyser
Operator	LO

Weather Conditions	Cloudy
Ground Conditions	Wet
Ambient Atmospheric Pressure	999
Regional Pressure Trend	Falling

Position	Flow	Pressure	CH4		CO2		O2 (% v/v)	PID (ppm)	CO (ppm)	H2S (ppm)	Groundwater Level (mbgl)	Depth to Base (mbgl)	Notes
			(% v/v)	GSV (l/hr)	(% v/v)	GSV (l/hr)							
BH101	0.1	999	3.0	0.0030	0.0	0.0000	18.4	0.4	0.0	0.0	3.07	12.30	Water sample retrieved
BH102	0.1	999	9.4	0.0094	0.5	0.0005	14.3	0.8	0.0	0.0	1.86	17.00	Water sample retrieved
BH103	0.1	999	7.3	0.0073	0.2	0.0002	18.0	0.6	0.0	0.0	1.45	12.40	Water sample retrieved
BH105	0.1	999	0.0	0.0000	0.2	0.0002	19.2	0.0	0.0	0.0	2.10	8.70	Water sample retrieved (partia
WS101	0.1	999	0.0	0.0000	4.9	0.0049	3.9	0.0	0.0	0.0	2.30	3.70	Water sample retrieved (partia
WS104	0.1	999	0.0	0.0000	0.0	0.0000	20.0	0.0	0.0	0.0	2.60	5.00	Insufficient water
WS105	0.1	999	0.0	0.0000	0.7	0.0007	19.4	0.0	0.0	0.0	2.00	3.00	Insufficient water

KEY

CH_4 = Methane, **CO_2** = Carbon Dioxide, **O_2** = Oxygen, **CO** = Carbon Monoxide, **H_2S** = Hydrogen Sulphide, **GSV** = Gas Screening Value (If no flow is recorded a value of 0.1 is assumed), ND = Not Detected, * = not measured, N/A = Not applicable, % = % by volume, mbgl = m below ground level, ppm = parts per million.

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GAS MONITORING RESULTS

Project number	S230311
Project name	Whitby Maritime Hub, Whitby
Client	Fairhurst
Visit no	3
Date	15/12/2023
Equipment	GFM 435 Gas Analyser
Operator	LO

Weather Conditions	Sunny
Ground Conditions	Damp
Ambient Atmospheric Pressure	1031
Regional Pressure Trend	Steady

Position	Flow	Pressure	CH4		CO2		O2 (% v/v)	PID (ppm)	CO (ppm)	H2S (ppm)	Groundwater Level (mbgl)	Depth to Base (mbgl)	Notes
			(% v/v)	GSV (l/hr)	(% v/v)	GSV (l/hr)							
BH101	0.1	1031	1.2	0.0012	0.0	0.0000	19.2	0.2	0.0	0.0	1.90	12.30	
BH102	0.1	1031	2.6	0.0026	0.5	0.0005	18.0	0.3	0.0	0.0	1.79	17.00	
BH103	0.1	1031	4.8	0.0048	0.2	0.0002	18.6	0.3	0.0	0.0	1.54	12.40	
BH105	0.1	1031	0.0	0.0000	0.3	0.0003	18.5	0.0	0.0	0.0	0.99	8.70	
WS101	0.1	1031	0.0	0.0000	3.0	0.0030	11.9	0.0	0.0	0.0	2.22	3.70	
WS104	0.1	1031	0.0	0.0000	0.0	0.0000	20.1	0.0	0.0	0.0	2.00	5.00	
WS105	0.1	1031	0.0	0.0000	0.7	0.0007	19.1	0.0	0.0	0.0	2.02	3.00	

KEY

CH_4 = Methane, **CO_2** = Carbon Dioxide, **O_2** = Oxygen, **CO** = Carbon Monoxide, **H_2S** = Hydrogen Sulphide, **GSV** = Gas Screening Value (If no flow is recorded a value of 0.1 is assumed), ND = Not Detected, * = not measured, N/A = Not applicable, % = % by volume, mbgl = m below ground level, ppm = parts per million.

APPENDIX F:
Notes on Limitations & Contamination Guidance

SOLMEK NOTES ON CONTAMINATION GUIDANCE (REF: VERSION 1/2023)

UK BACKGROUND

Environmental Protection Act 1990: Part 2A Revised Statutory Guidance (April 2012)

This revised document explains how the Local Authority should decide if land, based on a legal interpretation, is contaminated. The document replaces the previous guidance given in Annex 3 of DEFRA Circular 01/2006, issued in accordance with section 78YA of the 1990 Environmental Protection Act.

The main objectives of the Part 2A regime are to *"identify and remove unacceptable risks to human health and the environment" and* to *"seek to ensure that contaminated land is made suitable for its current use".*

Part 2A uses a risk based approach to defining contaminated land whereby the "risk" is interpreted as *"the likelihood that harm, or pollution of water, will occur as a result of contaminants in, on or under the land"* and by *"the scale and seriousness of such harm or pollution if it did occur".*

For a relevant risk to exist a contaminant, pathway and receptor linkage must be present before the land can be considered to be contaminated. The document explains that *"for a risk to exist there must be contaminants present in, on or under the land in a form and quantity that poses a hazard, and one or more pathways by which they might significantly harm people, the environment, or property; or significantly pollute controlled waters."*

A conceptual model is used to develop and communicate the risks associated with a particular site.

To determine if land is contaminated the local authority use various categories from 1 to 4. Categories 1 and 2 include *"land which is capable of being determined as contaminated land on grounds of significant possibility of significant harm to human health."*

Categories 3 and 4 *"encompass land which is not capable of being determined on such grounds".*

PRELIMINARY CONCEPTUAL MODEL

Preliminary Conceptual Models are undertaken in accordance with CIRIA C552. The Preliminary Conceptual Model assesses the consequence and the likelihood of a risk being realised to provide a risk classification, using the tables detailed below.

CONSEQUENCE OF RISK BEING REALISED (Based on C552 CIRIA, 2001)

Classification	Definition	Example
Severe	Short-term (acute) risk to human health, the environment, an element of the development or other aspect with is likely to result in *significant harm*, damage or both.	High concentrations of cyanide on the surface of an informal recreational area. Major spills of contaminants from site into controlled water. High concentrations of explosive gas in the subsurface environment that have a clear unobstructed pathway into buildings.
Moderate	Chronic damage to human health, a plausible chance that an event will occur, although the timeline is not immediate to be in the short-term.	Appreciable concentration of contamination that over the longer-term will cause significant harm i.e. high lead concentration in topsoil. Shallow mine workings that are potentially unstable but may remain in a satisfactory or stable conditions for a number of years.
Mild	Low level pollution of non-sensitive water, a feasible hazardous scenario although the timeline of such occurring can probably be considered in 10's of years.	The effect of high sulphate concentrations on structural concrete. Pollution of non-classified groundwater.
Minor	Harm, although not necessarily significant to human health, or with respect to other aspects of the development, which are considered implausible in terms of occurrence, or will have little consequential impact.	The presence of contaminants at such low concentrations that protective equipment is required during site works. Any damage to structures is minimal and will not be structural in characteristics.

PROBABILITY OF RISK BEING REALISED (C552 CIRIA, 2001)

Classification	Definition
High Likelihood	There is a viable pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence that the receptor has been harmed or polluted.
Likely	There is a viable pollutant linkage and all elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a viable pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a viable pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

RISK CLASSIFICATION MATRIX (C552 CIRIA, 2001)

Risk = Probability x Consequence		Consequence			
		Severe	Moderate	Mild	Minor
Probability	High likelihood	Very high risk	High risk	Moderate risk	Moderate/low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

HUMAN RECEPTORS

Human exposure to contaminants present in soils can occur via several pathways. Direct exposure pathways include dermal absorption after contact with contaminated ground, inhalation of soil or dust, inhalation of volatised compounds, and inadvertent soil ingestion (or deliberate soil ingestion in the case of some children). Other indirect pathways include human ingestion of plants grown in contaminated soil or contaminated ground or surface water. Contaminants associated with wind blown dust can affect humans on surrounding sites.

VEGETATION

Plants can be affected by soil contamination in a number of ways resulting in growth inhibition, nutrient deficiencies and yellowing of leaves. Contaminants are taken up by plants through the roots and through foliage. Contaminants identified as being highly phytotoxic include boron, cadmium, copper, lead, nickel, and zinc.

To establish if the levels of contaminants present on a site may pose a risk to vegetation the results of the contamination testing are compared to a series of threshold values published in 'Code of Good Agricultural Practice for the Protection of Soil'.

GROUNDWATER AND SURFACE WATER RECEPTORS

The principal pathway by which soil contamination may reach the water environment is through a slow seepage or leaching to groundwater or surface water. The potential for contaminants to migrate along such pathways is dependent on the chemical and physical characteristics of the contaminants and the local hydrogeology. Surface watercourses may also accumulate contamination as contaminated sediments are deposited within the water body.

Where the site investigated overlies major/principal aquifers (and in some cases minor/secondary aquifers depending on certain conditions), groundwater Source Protection Zones and areas in close proximity to groundwater abstractions, contamination test results have been compared with the Water Supply (Water Quality) Regulations 1989 and The Water Supply (Water Quality) Regulations 2000.

Should a surface water receptor, such as a fresh water environment (river, canal, stream, lake etc), or marine environment be considered sensitive in relation to a site, then test results are compared with DEFRA & SEPA Environmental Quality Standards (2004). Many of the Environmental Quality Standards are hardness ($CaCO_3$) depended. Where no hardness values are available, Solmek assume conservative values (of between 0 and 50mg/l).

In the absence of vulnerable ground and surface water environments, Solmek may compare any test results with the Environment Agency Leachate Quality Threshold Values.

DETAILED QUANTITATIVE RISK ASSESSMENT (DQRA)

In line with Environment Agency's guidance document Environment Agency *Land Contamination Risk Management*, which replaced the now-withdrawn *Contaminated Land Report 11 – Model Procedures for the Management of Land Contamination (2004)*, a DQRA for groundwater/human health may be required following a Phase 2 investigation and before the preparation of a Phase 3 Remediation Strategy. For human health DQRA, a site specific assessment criteria is undertaken using CLEA Software Version 1.06. For groundwater DQRA, the Environment Agency Remedial Targets Worksheet Version 3.1 is used.

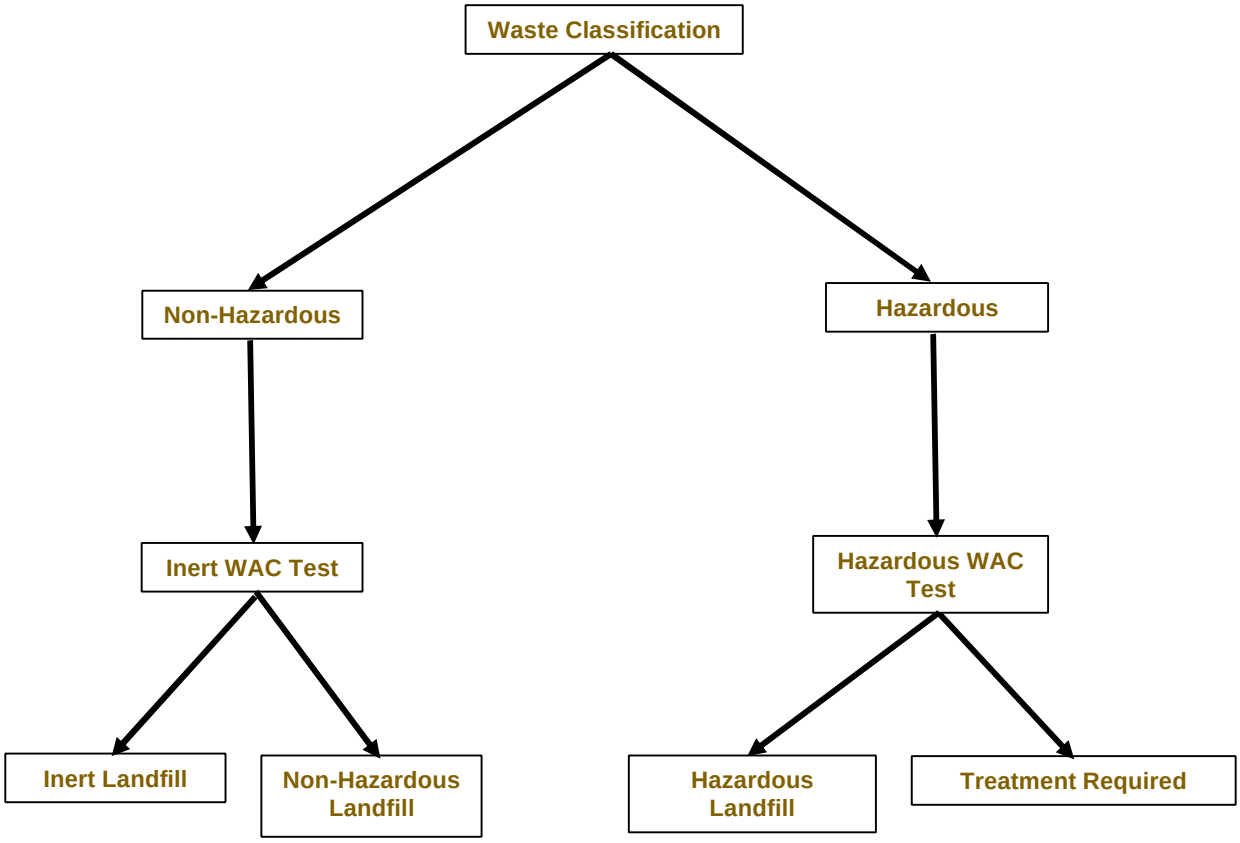
WASTE CLASSIFICATION AND WASTE ACCEPTANCE CRITERIA

During the site strip and construction activities, material may be required to be removed from site. Any such material would require classification, in line with Environment Agency Technical Guidance *Waste Classification: Guidance on the classification and assessment of waste (2015)*. This would classify the material as either Non-Hazardous or Hazardous Waste.

Once the material has been classified, determining the suitable landfill for disposal is governed by landfill directive Waste Acceptance Criteria (WAC) testing, with landfills categorized as Inert Waste, Stable Non-Reactive Hazardous Waste and Hazardous Waste. The WAC testing relates to materials that are to be exported from a site/development to landfill, and do not directly relate to human health specifically. The testing results are generally presented as certificates which can be used by site owners/contractors etc, which should be presented to the accepting waste facility or waste contractor.

If waste classification and/or WAC testing are not undertaken, material taken off site may be subject to WAC testing by the appropriate waste disposal company. The decision on whether or not to accept waste, or whether further testing is required, is at the discretion of the waste disposal company.

The below flow chart provides further information on the waste classification process.



CONSTRUCTION MATERIALS

Materials at risk from possible soil contaminants include inorganic matrices such as cement and concrete and also organic material such as plastics and rubbers. Acid ground conditions and high levels of sulphates can accelerate the corrosion of building materials. Where pH and soluble sulphate analysis has been undertaken, Solmek compare the test results with the guidelines presented within BRE Special Digest 1, 2005 (3rd Edition) 'Concrete in Aggressive Ground'. Plastics and rubbers are generally used for piping and service ducts and are potentially attacked by a range of chemicals, most of which are organic, particularly petroleum based substances. Drinking water supplies can be tainted by substances that can penetrate piping and water companies enforce stringent threshold values.

The levels of potential contaminants should be compared to thresholds supplied in the UK Water Industry Research (UKWIR) publication "Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites" (January 2011). A Brownfield Site is defined in the document as "Land or premises that have not previously been used or developed that may be vacant or derelict". It should be noted that Brownfield sites may not be contaminated. The guidance does not apply to Greenfield Sites however water companies may have their own assessment criteria which should be checked by the developer. The table below outlines the pipe material selection threshold concentrations.

	Pipe Material (Threshold concentrations in mg/kg)					
Parameter group	**PE**	**PVC**	**Barrier pipe (PE-AL-PE)**	**Wrapped Steel**	**Wrapped Ductile Iron**	**Copper**
Extended VOC suite by purge and trap or head space and GC-MS with TIC	0.5	0.125	Pass	Pass	Pass	Pass
+ BTEX + MTBE	0.1	0.03	Pass	Pass	Pass	Pass
SVOCs TIC by purge and trap or head space and GC-MS with TIC (aliphatic and aromatic C5-C10)	2	1.4	Pass	Pass	Pass	Pass
+ Phenols	2	0.4	Pass	Pass	Pass	Pass
+ Cresols and chlorinated phenols	2	0.04	Pass	Pass	Pass	Pass
Mineral oil C11-C20	10	Pass	Pass	Pass	Pass	Pass
Mineral oil C21-C40	500	Pass	Pass	Pass	Pass	Pass
Corrosive (Conductivity, Redox and pH)	Pass	Pass	Pass	Corrosive if pH <7 and conductivity >400µS/cm	Corrosive if pH <5, Eh not neutral and conductivity >400µS/cm	Corrosive if pH <5 or >8 and Eh positive
Specific suite identified as relevant following site investigation						
Ethers	0.5	1	Pass	Pass	Pass	Pass
Nitrobenzene	0.5	0.4	Pass	Pass	Pass	Pass
Ketones	0.5	0.02	Pass	Pass	Pass	Pass
Aldehydes	0.5	0.02	Pass	Pass	Pass	Pass
Amines	Fail	Pass	Pass	Pass	Pass	Pass

REQUIREMENTS OF PARTIES WITHIN THE DEVELOPMENT PROCESS

Interested parties involved in the development process may use the data in different ways and there may be varying views and interpretation of the factual data. Local Authority staff may have a view on contamination and human health and the wider environment. The Environment Agency are concerned principally with the protection of Controlled waters. Building insurers, funders and purchasers may be primarily concerned with issues of potential commercial blight. Purchasers are also not always fully informed, and perceptions on issues associated with risk can affect the decision to purchase. Developers and construction organisations will focus on financial aspects of dealing with the contamination in the context of the development and construction programme.

RISKS & LIABILITIES FROM CONTAMINATION

In simple terms, risks associated with contamination may be considered in terms of 1) statutory risks and 2) development related risks. If contamination is severe or forms a potential hazard based on its potential to affect groundwater, surface water or human health, a statutory risk may be present, and as such, if the risk is not reduced, criminal proceedings may be instigated by a government body or local authority.

If the contamination is less severe or not considered to be mobile, it may be considered a commercial liability which could, in theory remain untreated, but which may at a later date affect the value of the property, or, with changing legislation, become a statutory risk. Commercial liabilities could give rise to civil proceedings by third parties if there are grounds for action.

♣Solmek conditions of offer, notes on limitations & basis for contract (ref: version1/2023)

These conditions accompany our tender and supercede any previous conditions issued. Solmek will prepare a report solely for the use of the Client (the party invoiced) and its agent(s). No reliance should be placed on the contents of this report, in whole or in part by 3rd parties. The report, its content and format and associated data are copyright, and the property of Solmek. Photocopying of part or all of the contents, transfer or reproduction of any kind is forbidden without written permission from Solmek. A charge may be levied against such approval, the same to be made at the discretion of Solmek.

Solmek cannot be held liable and do not warrant, or otherwise guarantee the validity of information provided by third parties and subsequently used in our reports. Solmek are not responsible for the action negligent of otherwise of subcontractors or third parties.

Site investigation is a process of sampling. The scope and size of an investigation may be considered proportional to levels of confidence regarding the ground and groundwater conditions. The exploratory holes undertaken investigate only a small volume of the ground in relation to the overall size of the site, and can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions as encountered within each of the exploratory holes. There may be different ground conditions elsewhere on the site which have not been identified by this investigation and which therefore have not been taken into account in this report. Reports are generally subject to the comments of the local authority and Environment Agency. The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that mobile contamination, ground gas levels and groundwater levels may vary owing to seasonal, tidal and/or weather related effects. Solmek cannot be held liable for any unrecorded or unforeseen obstructions between exploratory boreholes and trial pits. This includes instances where previous structures on the site (buried man made structures) or the presence of boulder clay (cobbles and/or boulder obstructions) have been anticipated. All types of piling operations should make allowance for obstructions within the construction budget to accommodate this. Unrecorded ancient mining may occur anywhere where seams that have been worked and influence the rock and soil above. Dissolution cavities can occur where gypsum or chalk is present. Rotary drilling is the recommended technique to prove the integrity of the rock.

Where the scope of the investigation is limited via access to information, time constraints, equipment limitations, testing, interpretation or by the client or his agents budgetary constraints, elements not set out in the proposal and excluded from the report are deemed to be omitted from the scope of the investigation.

Desk studies are generally prepared in accordance with RICS guidelines. Environmental site investigations are generally undertaken as 'exploratory investigations' in accordance with the definitions provided in paragraph 5.4 of BS 10175:2011 in order to confirm the conceptual assumptions. You are advised to familiarize yourself with the typical scope of such an investigation. No pumping of water will be undertaken unless a licence or facilities/equipment have been arranged by others.

Where the type, number or/and depth of exploratory hole is specified by others, Solmek cannot and will not be responsible for any subsequent shortfall or inadequacy in data, and any consequent shortfall in interpretation of environmental and geotechnical aspects which may be required at a later date in order to facilitate the design of permanent or temporary works.

All information acquired by Solmek in the course of investigation is the property of Solmek, and, only also becomes the joint property of the Client only on the complete settlement of all invoices relating to the project. Solmek reserve the right to use the information in commercial tendering and marketing, unless the Client expressly wishes otherwise in writing. The quoted rates do not include VAT, and payment terms are 30 days from dispatch of invoice from our offices. Quotes are subject to a site visit.

We have allowed for 1 mobilisation and normal working hours unless otherwise stated. The scope of the investigation may be reviewed following the desk study and/or fieldwork. The presence or otherwise of Japanese Knotweed or other invasive plants can be difficult to identify especially during winter months. If Japanese Knotweed or other invasive species are suspect, it should be confirmed by an ecologist. We have not allowed for acquiring services information, and cannot be responsible for damage to underground services or pipes not shown to us or not clearly shown on plans. Costs incurred will be passed on to you, and in commissioning Solmek you understand and accept that you/your agent have a contractual relationship with Solmek & you accept this. Our rates assume unobstructed, reasonably level and firm access to the exploratory positions and adequate clear working areas and headroom. We have priced on the basis that you or your client have the necessary permissions, wayleaves and approvals to access land. All boreholes and pits are backfilled with arisings except where gas monitoring pipes are installed with stopcock covers. Solmek are not responsible for any uneven surfaces as a result of siteworks and rutting and backfilled excavations may require re-levelling and/or making good by others after fieldwork is complete, and Solmek has not allowed for this. No price has been provided or requested for a return visit to remove pipework and covers. Hourly rates apply to consultancy only and do not include expenses unless otherwise shown. If warranties are required, legal costs incurred will be passed on to you assuming Solmek agree to complete such warranties, modified or otherwise and you understand and agree to pay all costs.

We reserve the right to pursue full payment of the invoice prior to release of any information including reports. We advise you/your client that we may elect to pursue our statutory rights under late payment legislation, and will apply 8% to the base rate for unreasonably late payments. Solmek are exempt from the CIS Scheme. Solmek offer to undertake work only in strict accordance with conditions covered by our current insurances, which are available for inspection. Solmek are not responsible for acts, negligent or otherwise of subcontractors and as a matter of policy cannot indemnify any other parties. Professional indemnity Insurance is limited to ten times the invoice net total except where stated otherwise by Solmek. Solmek give notice that consequential loss as a direct or indirect result of Solmek's activities or omission of the same are excluded.