



CARDIFF ARENA

FACTUAL GROUND INVESTIGATION REPORT

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A. INTRODUCTION

1. Terms of Reference

Envirotreast Technologies Ltd (hereinafter referred to as Envirotreast) was appointed by Cardiff Council (hereinafter referred to as 'the client') to undertake intrusive site investigation at the site of the proposed Cardiff Arena, located on land located between Hemingway Road and Schooner Way, Cardiff ('the site'). The site investigation was specified and supervised by Mott MacDonald on behalf of the client.

2. Scope of Work

The scope of work produced by Mott MacDonald can be summarised as follows:

- 7no cable percussion boreholes to 20m bgl (meters below ground level), or 5m below rock head, with in-situ testing and soil sample collection.
- Installation of 4no groundwater and ground gas monitoring wells.
- 5no rotary probe holes to a maximum depth of 10m bgl.
- 1no trial trench to a maximum depth of 5m bgl to identify a former dock wall.
- 2no trial pits to 4.5m bgl.
- 2no BD365 soakage tests.
- 1no round of groundwater monitoring.
- 4no rounds of ground gas monitoring.
- Geotechnical and geoenvironmental laboratory testing of soils and groundwater.
- Factual presentations of findings.

In order to facilitate the safe completion of the above scope of works, the following tasks were also undertaken:

- In-situ UXO (unexploded ordnance) clearance using a downhole magnetometer.
- HPS (health protection surveyor) attendance.

Study limitations are provided in Appendix A.

3. Previous Reports

Envirotreast has been provided with the following previous reports pertaining to the site:

- Cardiff Arena desk study. Produced for Cardiff Council by Mott MacDonald, 2019.

The above report includes a Detailed UXO Desk Study. This report should be read in conjunction with the desk study report.

B. INTRUSIVE INVESTIGATION

4. Date and Weather

Intrusive works were undertaken in one phase between Monday 7th September and Monday 28th September 2020. During the field works, the weather was predominantly dry and sunny, with only short periods of wet weather at either end of the programme.

5. Fieldwork Scope

The initial scope of works was amended during the fieldworks, with a list of completed field tasks included below.

Table 1 – Completed scope of work

Task	Number	Comment
Cable percussion boreholes	7	BH101 to BH107
Rotary probe holes	4	RO101 to RO104
Trial trench	1	TT101
Trial pits	2	TP101 and TP102
Soakage tests	1	TP101
Groundwater and ground gas well installation	7	BH101, BH103, BH105 (dual installation), BH106 (dual installation), BH107
Undisturbed sample collection	21	
In-situ penetration tests	80	
Groundwater monitoring visits	1	
Ground gas monitoring visits	3	

The positions of completed investigation positions are shown on Figure 1, included in Appendix B. Photographs taken during the fieldwork are presented in Appendix C.

The fieldworks were supervised by an experienced engineering geologist. Exploratory holes were logged in accordance with BS5930:2015¹. Exploratory hole records, including details of the ground conditions encountered and the testing and sampling completed, are included in Appendix D.

Only 1no soakage test was attempted. This was undertaken in TP101 but was abandoned due to perched groundwater influx. The second soakage test was scheduled to be completed in TP02 but was abandoned due to trial pit instability and the presence of perched groundwater.

An additional monitoring well was added to the specification by the investigation supervisor. The affected borehole was BH106.

¹ BS5930:2015+A1:2020. Code of practice for ground investigation. 202. The British Standards Institute.

6. Investigation Tasks

6.1 Investigation Methods

Borehole drilling

An inspection pit was excavated to 1.2m by hand at each position to ensure the position was free of services. The boreholes were then advanced using a cable percussion drilling rig. Boreholes were initially cased at 250mm diameter. Typically, three strings of casing were used to reach the termination depth. The second string of casing measured 200mm in diameter and was used either at the base of the Made Ground or if the larger diameter casing refused in the Made Ground. The third string was then used either at the base of the Made ground, or after refusal of the 200mm diameter casing at depth within natural soils. Boreholes were terminated either at the target depth or due to refusal.

A bentonite seal was set at the base of the Made Ground. This was accompanied by a reduction in casing size to minimise potential for cross-contamination deeper strata.

Small volumes of potable water were added when drilling through granular strata to aid progress.

In-situ penetration testing

SPTs (standard penetrations tests) were completed using split-spoon or solid cone in cohesive and granular soils at 1m intervals from ground level to 5m bgl, and at 1.5m intervals thereafter. They were interspersed with undisturbed sample collection in cohesive strata. Tests were completed to refusal at 50 blows in superficial soils and 100 blows in bedrock. The uncorrected blow counts are presented on the borehole logs, along with SPT hammer efficiency ratings.

Groundwater and ground gas monitoring point installation

Monitoring wells were installed in 5no of the 7no boreholes. Boreholes were backfilled to the base of the well with bentonite pellets. Wells were constructed from either 63mm outer diameter (OD) HDPE (high-density polyethylene) or 19mm OD PVC (polyvinyl chloride). The response zones were covered with filter fabric and surrounded with well graded gravel. The granular filter pack extended 0.2m above the response zone. The plain section was surrounded with extruded bentonite pellets. Each well was finished with a rubber bung and gas tap. Boreholes were reinstated with flush-mounted steel covers set in concrete and blacktop (BH103 and BH105 to BH107), or concrete and turf (BH101) to match the surrounding ground.

Details on monitoring well design are summarised in Table 2 and presented on the borehole logs in Appendix D.

Table 2 – Well installation summary

Exploratory hole	Response zone	Diameter	Response zone stratum
BH101	3.5-7.0m	63mm OD	Made Ground
BH103	2.5-6.5m	63mm OD	Made Ground
BH105	2.0-5.0m	19mm OD	Made Ground
	14.0-17.0m	63mm OD	Glaciofluvial Sheet Deposits (GSD)
BH106	2.5-4.0m	19mm OD	Made Ground
	14.0-15.0m	63mm OD	GSD
BH107	10.0-15.8m	63mm OD	GSD/ Mercia Mudstone

Groundwater monitoring point development

The newly installed groundwater monitoring wells were purged during the intrusive phase of works. This was completed using a disposable HDPE high flow inertial tubing and a surge block. Purged water was transferred to an on-site IBC (intermediate bulk container) pending off-site disposal.

Wells were purged until turbidity reduced to low levels or until three saturated well volumes had been removed.

Rotary probe boreholes

4no rotary probes were completed on 17th and 18th September 2020 using a tracked Commachio 602 drilling rig. Boreholes were positioned such that they traversed the section of dock wall identified in trial trench TT101.

The rotary holes were drilled at 148mm diameter using air and air/ mist flush. The upper sections of each borehole were cased due to instability in the Made Ground. The general geological sequence was recorded based on progress and arisings. The target depth for each borehole was 10m, although RO103 was extended to prove natural soils.

Upon completion of borehole RO103, efforts were made to rotary core through the underlying bedrock. The borehole was cased at 148mm diameter to 12m, where the casing refused on a layer of dense granular soil. The borehole was terminated at this depth. Upon completion, each borehole was backfilled with extruded bentonite pellets.

Details of ground conditions encountered, and the drilling equipment used are included on the borehole logs in Appendix D.

Trial pit / trench excavations

Trial pit TP101 and trial trench TT101 were excavated using a 6-tonne tracked excavator. The excavations were advanced using a combination of a 1m wide bladed bucket and 600mm wide toother and bladed buckets. Trial trench TT101 was extended until the former dock wall was identified. The excavation was then extended down the front and back of the structure to a termination depth of 3.8m.

Trial pit TP101 was excavated to a final depth of 4.8m using the same plant as trial trench TT101. The trial pit was initially extended to 4.5m whilst the soakage test was set up. It was then extended to 4.8m immediately prior to filling.

The hardstanding in trial pit TP102 was cut using a floor saw. It was then removed using a 14-tonne excavator on rubber wheels. The trial pit was extended using the same plant with a combination of 1m wide bladed bucket and 450mm wide toother and bladed buckets to the termination depth. Excavation works were terminated due to instability in the trial pit and undermining of the surrounding hardstanding.

Upon completion the excavations were photographed, with photos included in Appendix C. They were backfilled with spoil in reverse order and compacted in stages. Trial pit TP102 was further reinstated with 1 tonne of imported subbase material. Excavations were reinstated to original condition.

Further details on the excavations, including dimensions, are shown on the logs, included as Appendix D.

In-situ permeability tests

A large-scale soakage test was undertaken in trial pit TP101 on 15th September 2020. The weather during the test was fine and dry.

Immediately prior to the test, the trial pit was extended to 4.8m bgl. The trial pit was filled with potable water to the top of the natural soils at 4.0m. Water levels were measured using an electronic dipmeter every two minutes for 10 minutes, then every five minutes for 20 minutes and then every ten minutes for 60 minutes. The test was abandoned after 1.5 hours as groundwater levels were rising.

Results of the soakage test are included in Appendix E.

A second test, scheduled for trial pit TP102, was abandoned due to unstable ground conditions.

Soil sampling and logging

Soils were recovered from each exploratory position for logging, field screening and sampling.

Each position was logged by an experienced engineer in general accordance with BS5930:2015². Field evidence of contamination was noted, and geoenvironmental soil samples subjected to headspace screening using a PID (photo ionising detector).

Geoenvironmental soil samples were placed into laboratory prepared plastic and glass containers. Each was labelled with the sample hole identity, depth and date. Disposable nitrile gloves were worn during sampling to prevent cross-contamination. Samples were kept cool pending collection and transport to the laboratory. Soil samples were sent to The Environmental Laboratory.

Bulk and disturbed geotechnical samples were collected at 1m intervals. They were placed into plastic tubs and bags and labelled with the borehole reference, sample depth, number and date. Thin walled undisturbed samples were collected where ground conditions allowed. These samples were sealed with wax and plastic end caps were fitted for protection. The location of these samples, along with the number of blows required to collect the sample, are provided on the borehole logs. Geotechnical samples were stored in the site compound and collected by the laboratory, GSTL.

Sample depths, types and number are shown on the exploratory hole logs, included in Appendix D.

Groundwater sampling

One round of groundwater monitoring was undertaken on 7th October 2020. Groundwater depths were gauged using an electronic dipmeter.

Groundwater was pumped using a peristaltic pump through disposable nylon and silicone tubing. Pumped groundwater was run through a flow-cell containing a YSI multimeter and well-head parameters recorded. Samples were collected in laboratory prepared glass and plastic containers once the well-head parameters had stabilised.

Each sample container was labelled with the sampling location and date and stored in cool boxes until collected for transport to the laboratory. Groundwater samples were sent to The Environmental Laboratory.

² BS5930:2015. Code of practise for ground investigation. BSI 2015.

Field monitoring records are included in Appendix F.

Ground gas monitoring

3no monitoring rounds have been completed during this phase of work.

7no wells were monitored for bulk ground gases and VOCs (volatile organic compounds). The wells were monitored for flow rate. Methane, carbon dioxide, carbon monoxide, oxygen and hydrogen sulphide using a GA5000 infra-red gas analyser. The wells were also monitored for VOCs using a Phocheck+ PID (photo-ionising detector) with 10.6eV bulb.

Topographic surveying

Exploratory holes were surveyed on two occasions. An initial round of surveying was completed on 23rd September to pick up the rotary holes prior to re-excavation of trial trench.

Coordinates and ground level were surveyed to National Grid and Ordnance Datum. The level and location data are included on the exploratory hole logs and summarised below.

Table 3 – Summary of coordinates and elevations

Exploratory hole	Easting	Northing	Elevation (m AOD)
BH101	319127.760	175129.841	10.904
BH102	319157.381	175071.679	10.424
BH103	319166.896	175024.193	10.180
BH104	319218.782	175065.971	10.602
BH105	319231.075	175001.739	10.120
BH106	319333.172	175078.977	11.208
BH107	319197.831	175127.485	10.499
RO101	319137.149	175147.760	10.857
RO102	319135.602	175147.178	10.891
RO103	319134.521	175146.663	10.961
RO104	319134.942	175146.838	10.925
TT101	319136.440	175147.452	10.933
TP101	319149.232	175153.632	11.216
TP102	319291.722	175033.489	10.128

Notes

m AOD = metres above ordnance datum.

7. Laboratory Analyses

7.1 Geotechnical Analyses

Selected soil samples have been scheduled for geotechnical testing. The testing will be carried out by GSTL at their laboratory in Llanelli in accordance with BS1377³ and BS EN ISO17892⁴. The sampling technique, type, storage and transport has been completed in accordance with BS EN 1997-2:2007⁵ and BS EN ISO22475⁶.

A summary of the geotechnical testing completed is included in Table 4. Laboratory test certificates are included in Appendix G.

Table 4 – Geotechnical soil analysis summary

Test	Number of tests completed			
	Made Ground	TFD	GSD	MMG
Moisture content	-	13	1	8
4-point Atterberg limit	-	13	1	7
Particle size distribution wet sieve	7	4	4	3
Organic content	2	8	-	-
Loss on ignition	3	2	-	-
BRE SD1	7	6	3	5
1-dimensional consolidation	-	4	-	-
Triaxial (effective stress)	-	2*	-	1
Triaxial (total stress)	-	3	1	-
Particle density	-	-	1	-
Peak/ residual shear	-	1	-	1*

Notes

TFD = Tidal Flat Deposits

GSD = Glaciofluvial Sheet Deposit

MMG = Mercia Mudstone Group

* 1 additional sample scheduled but confirmed unsuitable for analysis by lab (BH103 13-13.45m, BH106 17.3-18.7m).

³ BS1377-1: 2016. Methods of test for soils for civil engineering purposes. General requirements and sample preparation. 2016. The British Standards Institute.

⁴ BS EN ISO17892 parts 1-12. Geotechnical investigation and testing. Laboratory testing of soils. The British Standards Institute.

⁵ BS EN 1997-2:2007. Eurocode 7. Geotechnical design. Ground investigation and testing. 2007. The British Standards Institute.

⁶ BS EN ISO22475 parts 1-3. Geotechnical investigation and testing. Sampling methods and measuring groundwater. 2011. The British Standards Institute.

7.2 Geoenvironmental Analyses

All soil and groundwater samples were submitted to The Environmental Laboratory for analysis. Sampling was undertaken in accordance with BS10175:2011+A1:2017⁷. Where available, laboratory analysis was undertaken using UKAS and MCERTS accredited methods.

Table 5 – Geoenvironmental soil analysis summary

Analytical suite	Number of tests completed	
	Made Ground	Tidal Flat Deposits
MM comprehensive soil suite	11	7
MM comprehensive leachate suite	5	4

Notes

MM comprehensive soil suite comprises metals, metalloids, boron, free cyanide, fraction organic carbon, pH, speciated phenols, speciated polyaromatic hydrocarbons, petroleum hydrocarbons (TPH CWG method), water soluble sulphate, total sulphur and volatile organic compounds.

MM comprehensive leachate suite comprises metals, metalloids, boron, free and complex cyanide, fluoride, ammoniacal nitrogen, pH, speciated phenols and sulphate.

Laboratory test certificates are included in Appendix H.

The following groundwater analyses have been scheduled.

Table 6 – Geoenvironmental groundwater analysis summary

Analytical suite	Number of tests completed
MM comprehensive water suite	5

Notes

MM water soil suite comprises metals, metalloids, boron, ammoniacal nitrogen, free and total cyanide, hardness as CaCO₃, nitrate, sulphate, sulphur, pH, speciated phenols, speciated polyaromatic hydrocarbons, petroleum hydrocarbons (TPH CWG method) and volatile organic compounds.

Laboratory test certificates are included in Appendix H.

7.2 Deviating Samples

The following analyses were listed as deviating due to excessive holding times.

Table 7 – Deviating analyses

Sample	Affected analyses
BH101 1m	Aliphatic hydrocarbons >C5-C6 and >C6-C8, aromatic hydrocarbons >EC5-EC7 and >EC7-Ec8, benzene, toluene, ethylbenzene and total xylenes.
BH101 7m	
BH101 9m	

⁷ BS 10175:2011+A2:2017. Investigation of potentially contaminated sites. Code of practice. 2011. The British Standards Institute.

C. SITE INVESTIGATION RESULTS

8. Ground Conditions

Ground conditions identified during this phase of work are detailed on the exploratory hole logs, with the general geological succession summarised in the following table.

8.1 Geological Sequence

The general geological sequence identified beneath the site is summarised as follows.

Table 8 – Ground model

Depth from (m)	Depth to (m)	Max thickness (m)	Soil type	Description
0.0	1.1/10	10	Made Ground	Variable. Generally angular granular subbase over generally black clayey gravelly SAND with fragments of brick, coal waste and sandstone.
1.1/10	7.3/14.5	9.9	Tidal Flat Deposits	Typically soft grey silty CLAY with occasional lenses of peat.
7.3/14.5	11.3/17.4	0.6/ 4.7	Glaciofluvial Sheet Deposit	Typically Dense to very dense angular to coarse sandstone GRAVEL with cobbles.
11.3/17.4	>20.45	>8.65	Mercia Mudstone	Variably weathered MUDSTONE, typically recovered as a clay matrix with fine lithorelics.

8.2 Obstructions

Man-made obstructions encountered are summarised below.

Table 9 – Obstructions encountered

Exploratory Hole	Depth	Observation
TT101	3.0*	Obstruction anticipated to be former dock wall. Structure had flat top and front, extended to 1.2m and orientated at 164 degrees.
RO102	2.8	Obstruction encountered from 2.8m to 8.0m, consistent with section of dock wall identified in TT01.

Note

* Depth estimated by measuring from long side of trial pit. Depth from rotary borehole considered more accurate.

Additionally, the Made Ground within the infilled wharf structures contained frequent oversize material.

8.3 Contamination

Field observations of contamination are summarised in the following table.

Table 10 – Field observations of contamination

Exploratory Hole	Depth (m)	Observation
BH101	6.5-8.2	Slight hydrocarbon odour, possibly coal ash suspended in groundwater.

A summary of the maximum PID results from each borehole is provided in the following table.

Table 11 – Measureable PID results

Exploratory Hole	Depth (m bgl)	Reading (ppmV)
BH101	3.0	3.4
BH102	1.0	8.2
BH103	1.0	3.0
BH104	0.3	2.3
BH105	1.0	5.2
BH106	0.3	2.4
BH107	0.3	3.1
TT101	-	0.0
TP101	-	0.0
TP102	-	0.0

9. Hydrogeological Observations

9.1 Groundwater Strikes

Groundwater strikes were noted in numerous trial pits and boreholes. A summary of observed groundwater strikes is presented in the following table.

Table 12 – Groundwater strikes

Exploratory Hole	Strike (m bl)	After 20 minutes (m bgl)	Strata
BH101	4.5	4.5	Made Ground
BH102	4.5	4.3	Made Ground
	7.5	7.3	Made Ground
BH103	3.5	3.3	Made Ground
	14.6	6.4	Glaciofluvial Sheet Deposit
BH104	3.3	2.4	Tidal Flat Deposit
	8.0	3.1	Tidal Flat Deposit
	11.4	10.4	Glaciofluvial Sheet Deposit
BH105	2.9	2.8	Made Ground
	13.5	6.2	Glaciofluvial Sheet Deposit
BH106	4.8	4.45	Made Ground

Table 12 – Groundwater strikes (continued)

Exploratory Hole	Strike (m bl)	After 20 minutes (m bgl)	Strata
BH107	2.5	2.3	Tidal Flat Deposit
	13.2	12.6	Mercia Mudstone
RO103	9.5	8.0	Made Ground
RO104	7.0	7.0	Made Ground
TP101	3.9	3.8	Made Ground
TP102	3.1	3.1	Made Ground

9.2 Groundwater Monitoring Results

One round of groundwater monitoring has been completed during this phase of work. A summary of the groundwater rest levels and field observations is included in the following table.

Table 13 – Groundwater monitoring observations

Exploratory Hole	Depth (m)	Elevation (mADO)	Observations
BH101	4.03	6.87	No sheen/ odour.
BH103	3.10	7.08	No sheen/ odour.
BH105 (s)	2.89	7.23	-
BH105 (d)	5.90	4.22	No sheen/ odour.
BH106 (s)	Dry	<7.18	-
BH106 (d)	4.85	6.36	Slight landfill/ hydrocarbon odour
BH107	6.35	4.15	Sulphurous odour

Groundwater observations from the monitoring round are included on the field record sheets, included in Appendix F.

9.3 Ground Gas Monitoring Results

Three rounds of ground gas monitoring have been completed. A summary of the findings is presented in the following table.

Table 14 – Maximum ground gas monitoring summary

Exploratory Hole	Flow (l/hr)	Peak CO2 (%)	Peak CH4 (%)	Min O2 (%)	PID (ppm)	H2S (ppm)	CO (ppm)
BH101	1.6	4.0	3.8	8.1	17.6	NR	7
BH103	1.3	8.4	6.5	0.5	18.3	NR	1
BH105 (s)	1.0	8.5	0.1	5.1	12.6	NR	3
BH105 (d)	0.2	1.9	0.1	14.3	016.4	NR	6
BH106 (s)	0.6	4.6	NR	19.9	NR	NR	1
BH106 (d)	0.6	0.5	0.1	20.7	NR	NR	5
BH107	1.5	5.6	78.5	ND	46.6	87	NR

Notes:

CO2 = carbon dioxide

CH4 = methane

O2 = oxygen

H2S = hydrogen sulphide

CO = carbon monoxide

NR = none recorded

Ground gas monitoring records are included on the field record sheets, included in Appendix F.

APPENDIX A

LIMITATIONS

This report is confidential to the Client, and Envirotrete Technologies Ltd accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by Envirotrete Technologies Ltd beforehand. Any such party relies upon the report at their own risk.

This report has been prepared by Envirotrete Technologies Ltd on the basis of information received from a variety of sources which Envirotrete Technologies Ltd believes to be accurate. Nevertheless, Envirotrete Technologies Ltd cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

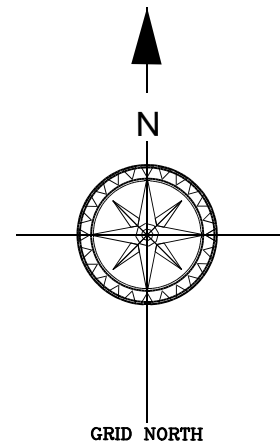
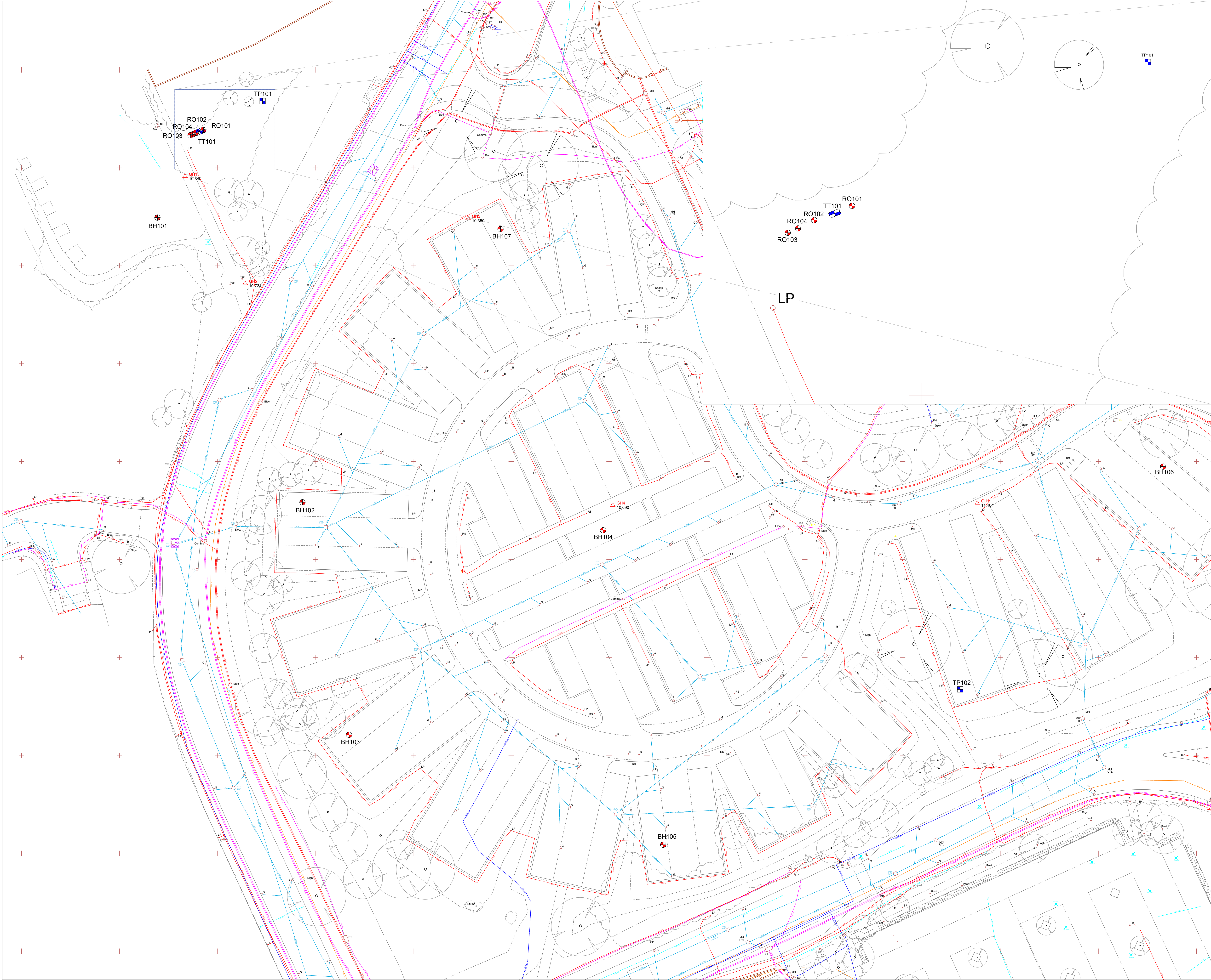
Envirotrete Technologies Ltd has used all reasonable skill, care and diligence in the execution of this report, taking into account the manpower and resources devoted to it in agreement with the Client. Although every reasonable effort has been made to obtain all relevant information, all potential contamination, environmental constraints or liabilities associated with the site may not necessarily have been revealed. Envirotrete Technologies Ltd cannot be held responsible for any disclosures or changes in regulation that are provided post-production of this report, and will not automatically update the report.

The extent of the exploratory holes, laboratory testing and monitoring undertaken may have been restricted due to a number of factors including accessibility, the presence of buried or overhead services, current development and site usage, timescales or client's specification. The exploratory holes only assess a small proportion of the site area with respect to the site as a whole, and as such may only provide an overall assessment of ground conditions on site. The presence of hotspots of undisclosed contamination site, and unexpected/ exceptional ground conditions cannot be discounted.

This report does not constitute an asbestos survey. The presence of asbestos cannot be discounted.

APPENDIX B

FIGURES



THIS DRAWING IS THE PROPERTY OF
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IT IS CONFIDENTIAL AND MUST NOT BE USED IN
ANY WAY DETRIMENTAL TO THEIR INTERESTS.

	E	N	Z
RO101	319137.149	175147.760	10.857
RO102	319135.602	175147.178	10.891
RO103	319134.521	175146.663	10.961
RO104	319134.942	175146.838	10.925
BH101	319127.760	175129.841	10.904
BH102	319157.381	175071.679	10.424
BH103	319166.896	175024.193	10.180
BH104	319218.782	175065.971	10.602
BH105	319231.075	175001.739	10.120
BH106	319333.172	175078.977	11.208
BH107	319197.831	175127.485	10.499
TP101	319149.232	175153.632	11.216
TP102	319291.722	175033.459	10.128
TT101	319136.440	175147.452	10.933

Legend

- Borehole** — 
- Trial Pit** — 
- Trial Trench** — 



envirotreat[®]

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CLIENT

CARDIFF COUNCIL

FIGURE TITLE

EXPLORATORY HOLE LOCATIONS

FIGURE NUMBER

1

FIGURE TITLE

EXPLORATORY HOLE LOCATIONS

DRAWN BY

L.Worth

DRAWN DATE

07-10-2020

CHECKED BY

A.Norman

CHECKED DATE

08-10-2020

DRAWING NUMBER:

RD117-001-01

REV.

0

APPENDIX C

PHOTOGRAPHS

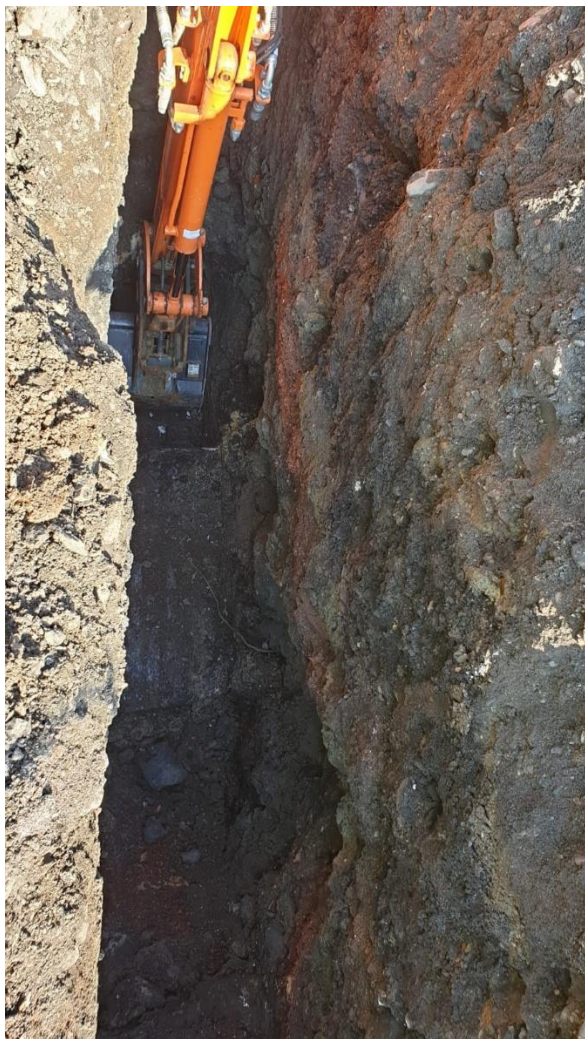


Plate 1: TT101 from west showing southern face



Plate 2: TT101 from west showing suspected former dock wall



Plate 3: TT101 shallow arisings



Plate 4: TT101 deep arisings



Plate 5: TP101 from north showing southern face



Plate 6: TP101 from north showing western face



Plate 7: TP101 from west showing eastern face.



Plate 8: TP101 arisings



Plate 9: TP102 from south showing western face

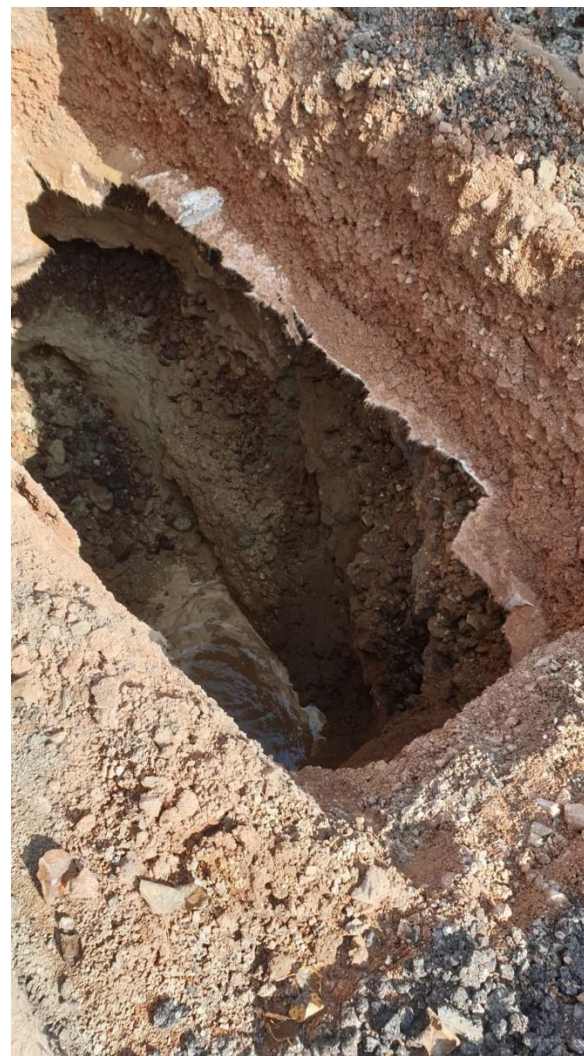


Plate 10: TP102 from north showing eastern face



Plate 11: TP102 from the south showing the northern face



Plate 12: TP102 spoil

APPENDIX D

EXPLORATORY HOLE LOGS

		Contract Name: Atlantic Wharf, Cardiff			Client: Envirotreat Technologies Limited			Borehole ID: BH101	
		Contract Number: G203312	Date Started: 23/09/2020	Date Completed: 28/09/2020	Logged: JH	Checked: AN	Status: FINAL		
Cable Percussion Borehole Log		Easting: 319127.8	Northing: 175129.8	Ground Level: 10.90m (OD)	Plant Used: Dando 2000	Print Date: 28/10/2020	Sheet 1 of 2 Scale: 1:50		
Weather: Fine		Rig Crew: ST & KM		Termination: Reached target depth			SPT Hammer: AR366 Energy Ratio: 65%		
Samples & In Situ Testing				Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation	
0.30	ES1	PID 0.30m, 0.0ppm	10.70	0.20		Grass overlying TOPSOIL: Soft brown silty slightly sandy slightly organic CLAY with frequent rootlets (<2mm). Sand is fine to coarse.	1		
0.50 - 1.00	B1			(0.90)		[Topsoil]			
0.70	D2					MADE GROUND: Blackish dark brown clayey ashy gravelly fine to coarse SAND. Gravel is angular to sub-angular fine to coarse sandstone, slag, red brick fragments, limestone and occasional coal.			
1.00	ES2	PID 1.00m, 2.1ppm	9.80	1.10		0.80 - 1.10: From 0.8m to 1.1m, Frequent cobbles red brick and concrete (65mm – 400mm)	2		
1.00 - 1.50	B3					MADE GROUND: Soft to firm black mottled grey and brown ashy slightly sandy slightly gravelly organic CLAY with occasional pockets (<50mm) orangish brown coarse sand. Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse sandstone, red brick fragments, mudstone, slag and occasional coal.			
1.50	D4	SPT(S) 1.50m, N=43		(1.10)					
1.50 - 1.95	SD5	(7,8/10,10,9,14)				MADE GROUND: Soft to firm black mottled grey and brown ashy slightly sandy slightly gravelly organic CLAY with occasional pockets (<50mm) orangish brown coarse sand. Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse sandstone, red brick fragments, mudstone, slag and occasional coal.	3		
2.00 - 2.50	B6		8.70	2.20					
2.30	D7					MADE GROUND: Dark brown mottled bluish grey clayey gravelly fine to coarse SAND. Gravel is angular to sub-angular fine to coarse sandstone, concrete, slag, limestone, red brick fragments and coal. N.B variable density.			
2.50 - 3.00	B8	SPT(S) 2.50m, 50				2.60 - 8.20: From 2.6m to 8.2m, contains cobble (<200mm) granite, strong sandstone and metal fragments / pipes.	4		
2.70	D9	(8,9/50 for 120mm)							
3.00	ES3	PID 3.00m, 3.4ppm				3.10 - 8.20: From 3.1m to 8.2m, sand becomes black organic and peaty with degraded wood fragments (<100mm)			
3.00 - 3.50	B10						5		
3.30	D11								
3.50 - 3.95	SD12	SPT(S) 3.50m, N=21							
		(6,6/6,7,4,4)					6		
4.00 - 4.50	B13								
4.20	D14								
4.50 - 4.95	SD15	SPT(S) 4.50m, N=3					7		
		(1,2/1,0,1,1)							
5.00	ES4	PID 5.00m, 0.0ppm							
5.00 - 5.50	B16						8		
5.70	D17								
6.00 - 6.45	SD18	SPT(S) 6.00m, N=25							
		(3,4/4,4,8,9)					9		
6.50 - 6.80	B19								
6.90	D20	PID 7.00m, 0.0ppm							
7.00 - 7.50	ES5						10		
7.00 - 7.50	B21								
7.50 - 7.95	SD22	SPT(S) 7.50m, N=8							
		(4,3/1,2,3,2)					11		
8.00 - 8.50	B23		2.70	8.20					
8.70	D24					Soft black fibrous silty organic PEAT with frequent degraded wood fragments (<30mm) and strong organic odour.			
9.00	ES6	SPT(S) 9.00m, N=12				[TIDAL FLAT DEPOSITS]	12		
9.00 - 9.45	SD25	(2,1/2,2,3,5)	1.60	9.30		8.60 - 9.30: From 8.6m to 9.3m, peat becomes firm and slightly sandy. Sand is fine to medium.			
		PID 9.00m, 0.0ppm				Soft to firm bluish dark grey mottled black silty sandy organic CLAY. Sand is fine to medium.			
					[TIDAL FLAT DEPOSITS]				
Start & End of Shift Observations				Borehole Diameter		Casing Diameter		Remarks:	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	
23-09-2020	07:30	0.00			2.60	230	2.80	250	Inspection pit hand dug to 1.2m. Groundwater encountered at 4.5m. Borehole terminated at 19.95m. Borehole installed with 50mm ground gas monitoring pipe. Response Zone 3.5m to 7.0m. Backfilled with bentonite pellets and gravel on completion.
23-09-2020	18:00	6.80	6.80	4.50	8.60	190	8.60	200	
24-09-2020	07:30	6.80	6.80	4.50	16.00	140	16.00	150	
24-09-2020	18:00	12.00	12.00	4.50					
25-09-2020	07:30	12.00	12.00	4.50					
25-09-2020	13:00	15.30	15.50	4.50					
Chiselling				Installation				Water Strikes	
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)
1.50	4.00	05:00		0.00	3.50	PLAIN	50	4.50	4.50
10.80	12.00	05:00		3.50	7.00	SLOTTED	50		
12.00	12.40	01:00						Sealed (m)	Time (mins)
								15.50	20
								Rose to (m)	Remarks
								4.50	Slow ingress

[illegible]



Contract Name:

Atlantic Wharf, Cardiff

Contract Number:

G203312

Client:

Envirotreant Technologies Limited

Contract Number:

G203312

Date Started:

24/09/2020

Date Completed:

25/09/2020

Logged:

PB

Checked:

AN

Status:

FINAL

Borehole ID:

BH102

Sheet 1 of 2

Cable Percussion Borehole Log

Easting:

319157.4

Northing:

175071.7

Ground Level:

10.42m (OD)

Plant Used:

Dando 2000

Print Date:

28/10/2020

Scale:

1:50

Weather: Fine

Rig Crew: DG & CC

Termination: Refusal

SPT Hammer: AR1826 Energy Ratio: 58%

Start & End of Shift Observations

Borehole Diameter

Casing Diameter

Remarks:

Chiselling

Installation

Water Strikes



Contract Name:

Atlantic Wharf, Cardiff

Contract Number:

G203312

Client:

Envirotreat Technologies Limited

Borehole ID:

BH102

Date Started:

24/09/2020

Date Completed:

25/09/2020

Logged:

PB

Checked:

AN

Status:

FINAL

Cable Percussion Borehole Log

Easting:

319157.4

Northing:

175071.7

Ground Level:

10.42m (OD)

Plant Used:

Dando 2000

Print Date:

28/10/2020

Scale:

1:50

Weather: Fine

Rig Crew: DG & CC

Termination: Refusal

SPT Hammer: AR1826 Energy Ratio: 58%

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
10.00 - 10.30	U22	Ublows = 100 Recovery = 0%	-0.08	10.50		Soft to firm bluish grey silty organic CLAY. [TIDAL FLAT DEPOSITS]	11	
10.50 - 10.91	D23	SPT(S) 10.50m, 100 (10,17/100 for 255mm)				Very dense dark grey slightly sandy cobbly fine to coarse sub-angular to rounded GRAVEL of sandstone. Sand is coarse. Cobbles are strong sandstone. [GLACIOFLUVIAL SHEET DEPOSITS]		
10.50 - 11.50	B24	PID 10.60m, 0.0ppm						
11.00 - 11.10	D25		-1.38	11.80		Extremely weak reddish brown highly weathered MUDSTONE, arising as; very stiff closely fissured reddish brown sandy CLAY with light blue reduction spots. Sand is fine to coarse. [MERCIA MUDSTONE GROUP, WEATHERING GRADE IVb]	12	
11.80 - 11.90	D26	SPT(S) 12.00m, N=36 (4,5/7,7,11,11)						
12.00 - 12.45	D27							
12.00 - 13.00	B28							
12.50 - 12.60	D29		-3.08	13.50		Extremely weak reddish brown highly weathered MUDSTONE, arising as; Dense reddish brown gravelly coarse SAND. Gravel is fine to medium sub-rounded to rounded quartz and sandstone. [MERCIA MUDSTONE GROUP, WEATHERING GRADE IVa]	14	
13.50 - 13.95	U30	Ublows = 100 Recovery = 0%						
13.50 - 14.00	B31							
15.00 - 15.45	D32	SPT(S) 15.00m, N=72 (7,10/13,17,22,20)	-6.38	16.80		15.00 - 16.80: From 15.0m to 16.8m, sand becomes clayey and very dense.	15	
15.20 - 16.20	B33							
16.00 - 16.10	D34							
16.50 - 16.80	D35	SPT(S) 16.50m, 100 (13,14/100 for 150mm)	-6.38	16.80		End of Borehole at 16.800m	17	
							18	
							19	
							20	

Start & End of Shift Observations

Borehole Diameter

Casing Diameter

Remarks:

Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)
					7.50	230	7.50	250
					12.00	190	12.00	200

Chiselling

Installation

Water Strikes

From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Inspection pit hand dug to 1.2m. Groundwater encountered at 4.6m and 7.5m rising to 4.4m and 7.3m respectively after 20 minutes. Borehole terminated at 16.8m. Backfilled with bentonite pellets on completion.



Contract Name:

Atlantic Wharf, Cardiff

Contract Number:

G203312

Client:

Envirotrat Technologies Limited

Contract Number:

G203312

Date Started:

14/09/2020

Date Completed:

16/09/2020

Logged:

PB

Checked:

AN

Status:

FINAL

Borehole ID:

BH103

Sheet 1 of 2

Cable Percussion Borehole Log

Easting:

319166.9

Northing:

175024.2

Ground Level:

10.18m (OD)

Plant Used:

Dando 2000

Print Date:

28/10/2020

Scale:

1:50

Weather: Fine

Rig Crew: DG & CC

Termination: Refusal

SPT Hammer: AR1826 Energy Ratio: 58%

Start & End of Shift Observations

Borehole Diameter

Casing Diameter

Remarks:

Chiselling

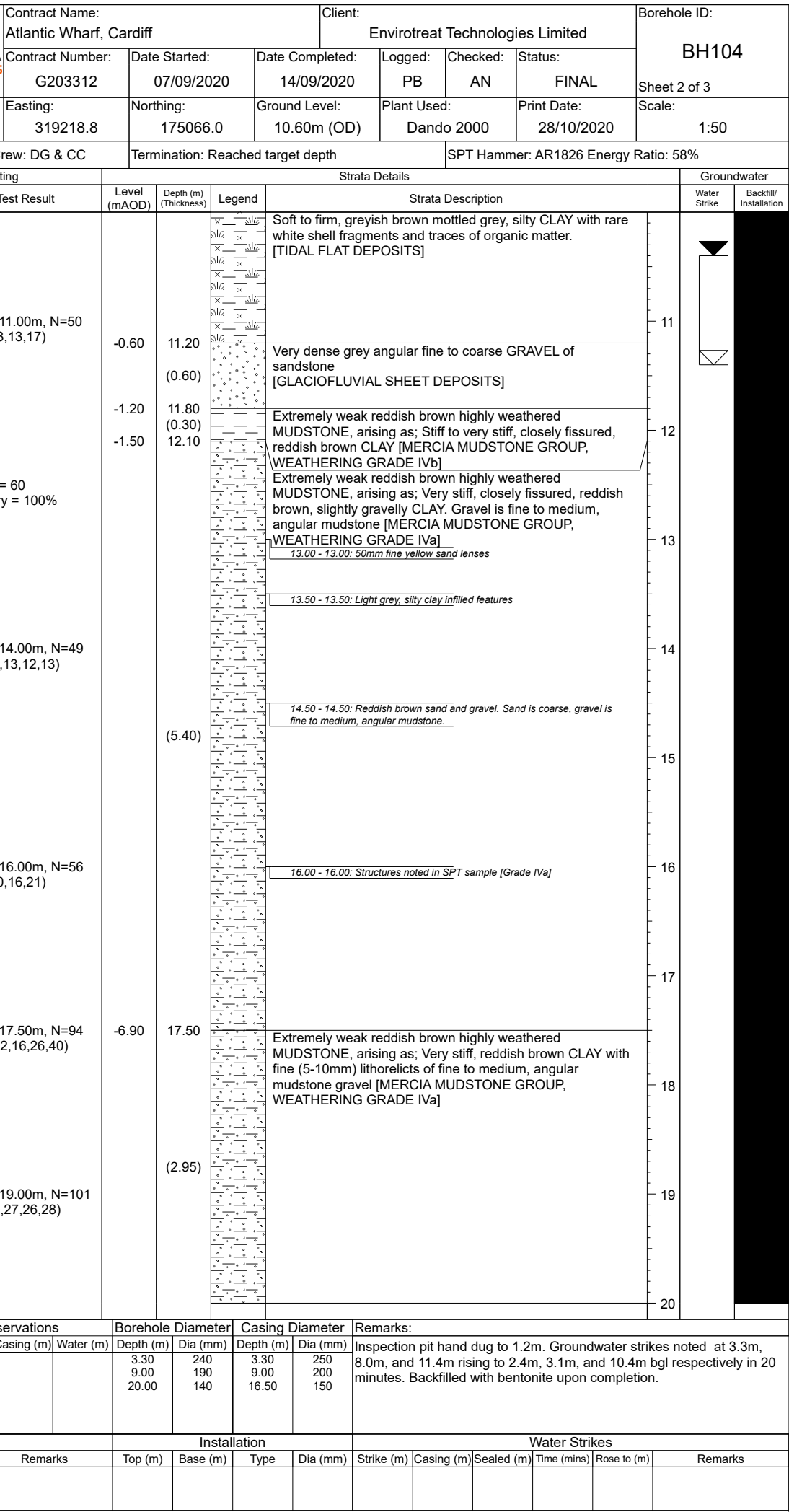
Installation

Water Strikes

Inspection pit hand dug to 1.2m. Groundwater encountered at 3.50m bgl, rising to 3.30m bgl after 20mins, and at 14.60m bgl, rising to 6.40m bgl after 20mins. Backfilled with bentonite and gravel upon completion.

Chiselling				Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

		Contract Name: Atlantic Wharf, Cardiff			Client: Envirotreat Technologies Limited			Borehole ID: BH104					
		Contract Number: G203312	Date Started: 07/09/2020	Date Completed: 14/09/2020	Logged: PB	Checked: AN	Status: FINAL						
Cable Percussion Borehole Log		Easting: 319218.8	Northing: 175066.0	Ground Level: 10.60m (OD)	Plant Used: Dando 2000	Print Date: 28/10/2020	Sheet 1 of 3 Scale: 1:50						
Weather: Fine		Rig Crew: DG & CC		Termination: Reached target depth			SPT Hammer: AR1826 Energy Ratio: 58%						
Samples & In Situ Testing				Strata Details				Groundwater					
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation					
0.30	ES1A	PID 0.30m, 2.3ppm	10.45	0.15		MADE GROUND: Blacktop, ASPHALT.							
0.30 - 0.70	B01					MADE GROUND: Type 1 roadstone comprised of sandy angular, coarse GRAVEL and COBBLES of limestone							
0.70 - 1.20	B02			(1.15)		0.70 - 1.30: Strong grey limestone cobbles and boulders, recovered as angular coarse gravel to cobbles in type 1 matrix.	1						
1.00	ES2A	PID 1.00m, 2.0ppm											
1.20 - 1.70	B03	SPT(C) 1.20m, N=7 (2,3/2,1,2,2)	9.30	1.30		MADE GROUND: Loose, orangish brown, slightly gravelly fine to coarse SAND. Gravel is fine, angular mudstone.	2						
2.10 - 2.55	SD04	SPT(S) 2.10m, N=7 (1,1/1,2,2,2)											
2.40 - 3.00	B05		8.20	2.40		Firm, grey mottled orangish brown, silty CLAY with fine (<10mm) rootlets and white shell fragments. [TIDAL FLAT DEPOSITS]	3						
2.50	ES3A	PID 2.50m, 1.0ppm											
3.30 - 3.75	SD06	SPT(S) 3.30m, N=4 (1,0/1,1,1,1)	7.30	3.30		Loose, dark grey, fine to coarse angular to subangular GRAVEL of mudstone. [TIDAL FLAT DEPOSITS]	4						
3.30 - 4.50	B07												
4.50 - 5.20	B08	SPT(C) 4.00m, N=4 (1,1/1,1,1,1)	6.10	4.50		Soft to firm, greyish brown mottled grey, silty CLAY with rare white shell fragments and traces of organic matter. [TIDAL FLAT DEPOSITS]	5						
6.00 - 6.45	UT09	Ublows = 40 Recovery = 100%											
7.00 - 7.10	D10			(6.70)			7						
8.00 - 8.45	SD11	SPT(S) 8.00m, N=11 (1,2/2,3,3,3)											
9.00	D12					8.40 - 8.50: Black to brown fibrous peat. 8.50 - 11.20: Increased organic material content.	9						
9.50 - 9.95	UT13	Ublows = 30 Recovery = 100%											
							10						
Start & End of Shift Observations			Borehole Diameter		Casing Diameter		Remarks:						
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)					
					3.30	240	3.30	250					
					9.00	190	9.00	200					
					20.00	140	16.50	150					
Chiselling			Installation				Water Strikes						
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
								3.30	3.20		20	2.40	
								8.00	7.00		60	3.10	
								11.40	10.50		20	10.40	





Contract Name:
Atlantic Wharf, Cardiff

Client:
Envirotreat Technologies Limited

Contract Number:
G203312

Date Started:
07/09/2020

Date Completed:
14/09/2020

Logged:
PB

Checked:
AN

Status:
FINAL

Borehole ID:
BH104

Sheet 3 of 3

Cable Percussion
Borehole Log

Easting:
319218.8

Northing:
175066.0

Ground Level:
10.60m (OD)

Plant Used:
Dando 2000

Print Date:
28/10/2020

Scale:
1:50

Weather: Fine

Rig Crew: DG & CC

Termination: Reached target depth

SPT Hammer: AR1826 Energy Ratio: 58%

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
20.00 - 20.10 20.00 - 20.45	D27 SD28	SPT(S) 20.00m, N=105 (6,12/15,24,28,38)	-9.85	20.45		Extremely weak reddish brown highly weathered MUDSTONE, arising as; Very stiff, reddish brown CLAY with fine (5-10mm) lithorelicts of fine to medium, angular mudstone gravel [MERCIA MUDSTONE GROUP, WEATHERING GRADE IVa] End of Borehole at 20.450m	21 22 23 24 25 26 27 28 29 30	

Start & End of Shift Observations

Borehole Diameter

Casing Diameter

Remarks:

Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)
					3.30	240	3.30	250
					9.00	190	9.00	200
					20.00	140	16.50	150

Chiselling

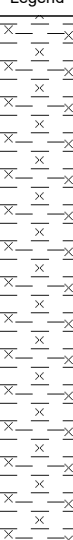
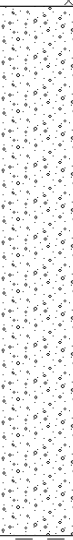
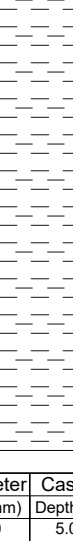
Installation

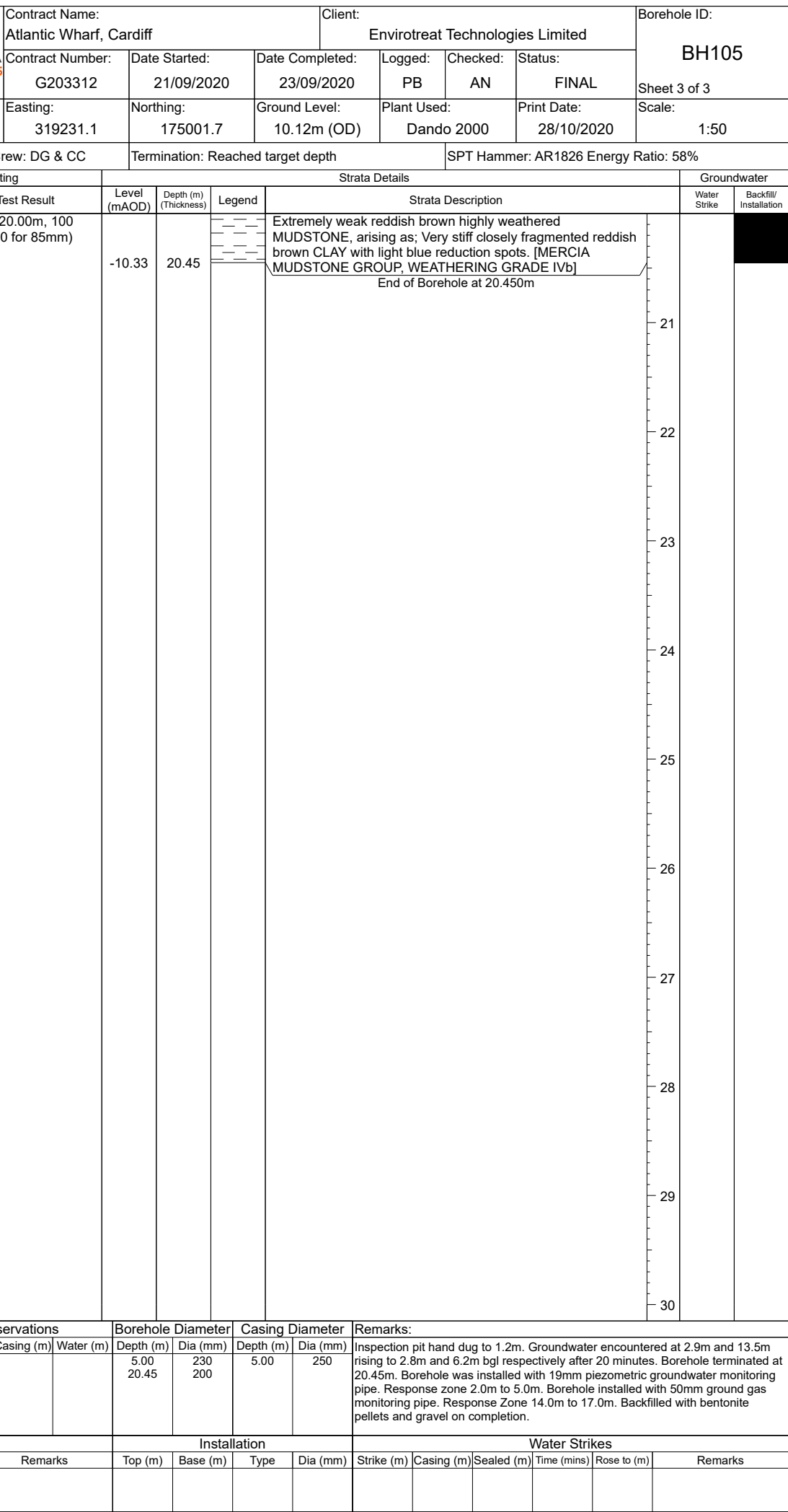
Water Strikes

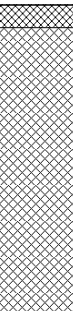
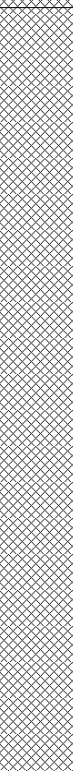
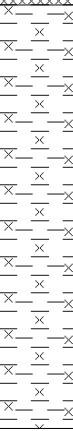
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Inspection pit hand dug to 1.2m. Groundwater strikes noted at 3.3m, 8.0m, and 11.4m rising to 2.4m, 3.1m, and 10.4m bgl respectively in 20 minutes. Backfilled with bentonite upon completion.

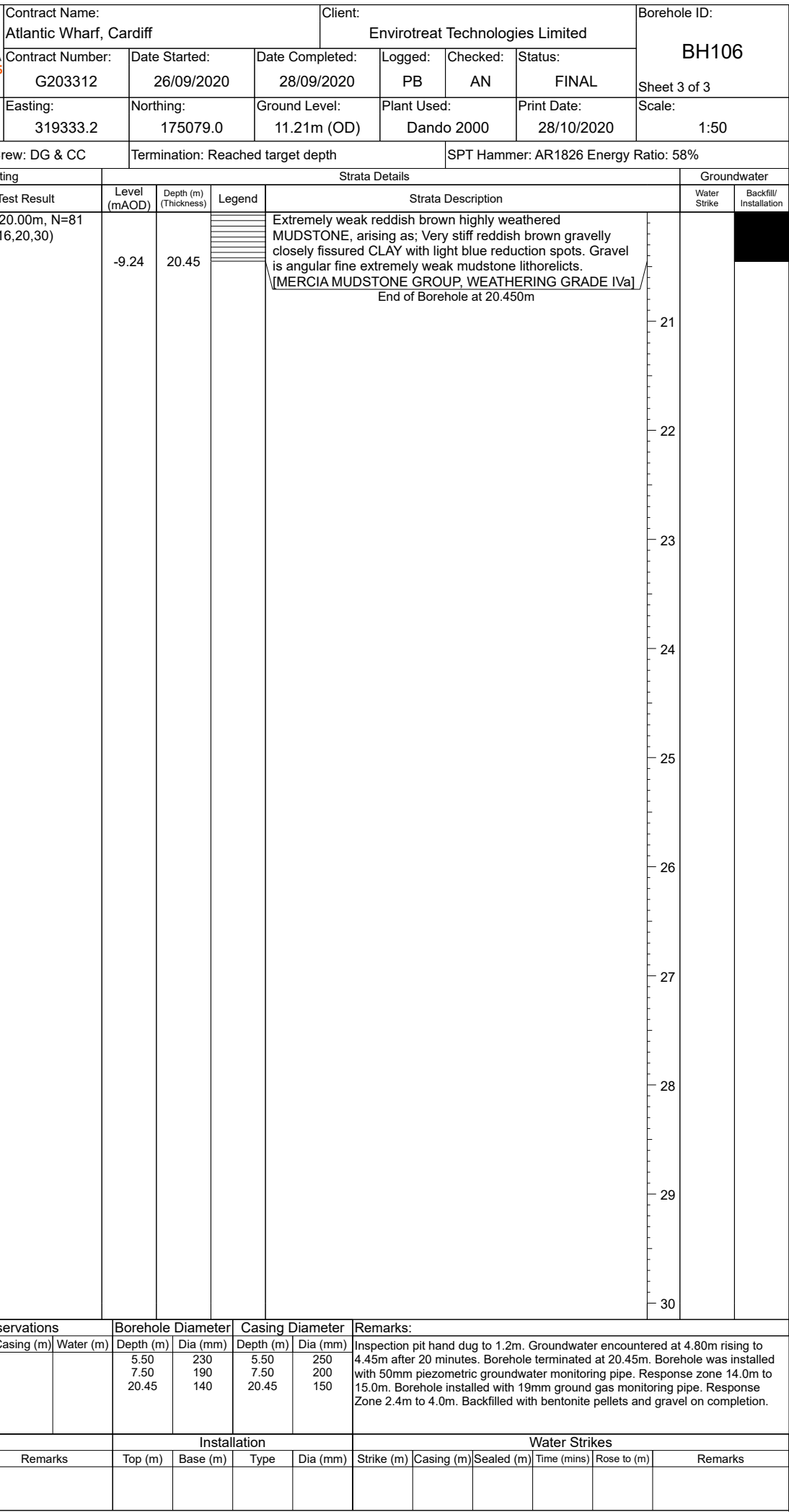
		Contract Name: Atlantic Wharf, Cardiff			Client: Envirotreat Technologies Limited			Borehole ID: BH105						
		Contract Number: G203312	Date Started: 21/09/2020	Date Completed: 23/09/2020	Logged: PB	Checked: AN	Status: FINAL							
Cable Percussion Borehole Log		Easting: 319231.1	Northing: 175001.7	Ground Level: 10.12m (OD)	Plant Used: Dando 2000	Print Date: 28/10/2020	Sheet 1 of 3 Scale: 1:50							
Weather: Fine		Rig Crew: DG & CC		Termination: Reached target depth			SPT Hammer: AR1826 Energy Ratio: 58%							
Samples & In Situ Testing				Strata Details				Groundwater						
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation						
0.15 - 0.80 0.30 0.40 - 0.50	B1 ES1 D2	PID 0.30m, 4.0ppm	9.97	0.15		MADE GROUND: Blacktop, ASPHALT.	1							
0.80 - 1.10 1.00 1.00 - 1.10 1.20 - 2.20 1.30 - 1.40	B3 ES2 D4 B5 D6	PID 1.00m, 5.2ppm	8.92	1.20		MADE GROUND: Type 1 roadstone comprised of sandy angular, coarse GRAVEL and COBBLES of limestone								
2.20 - 3.20 2.30 - 2.40 2.50 - 3.50	B7 D8 B9	SPT(C) 1.50m, N=16 (3,3/5,4,3,4)	(4.50)		MADE GROUND: Medium to dense black slightly clayey sandy GRAVEL. Sand is coarse. Gravel is fine to cobble size colliery spoil, ash, coal, sandstone, whole red bricks.	2								
3.00 3.00 - 3.10	ES3 D10	PID 3.00m, 4.1ppm			2.70 - 5.70: From 2.7m to 5.7m, contains frequent wood fragments and angular fine to cobble sized strong sandstone.	3								
3.50 - 4.50 4.00 - 4.10	B11 D12	SPT(C) 3.50m, 100 (50 for 30mm/100 for 25mm)			4.00 - 5.70: From 4.0m to 5.7m, encountered frequent cobbles and boulders of strong sandstone.	4								
4.50 - 5.50 5.00 5.00 - 5.10	B13 ES4 D14	SPT(C) 4.50m, 0 (125 for 75mm/0 for 10mm)				5								
5.70 - 6.00 5.80 - 5.90 6.00 - 6.10 6.00 - 6.45	B15 D16 D18 UT17	SPT(C) 5.50m, N=9 (1,1/2,2,2,3) Ublows = 30 Recovery = 100%	4.42	5.70	Soft brownish grey silty CLAY with occasional blue streaks. [TIDAL FLAT DEPOSITS]	6								
6.60 - 7.50 7.00 7.00 - 7.10	B19 ES5 D20	PID 7.00m, 2.1ppm	(7.80)			7								
7.50 - 7.95 7.50 - 8.50	D21 B22	SPT(S) 7.50m, N=6 (1,1/1,1,2,2)				8								
8.00 - 8.10	D23					9								
9.00 - 9.45 9.50 - 9.60	UT24 D25	Ublows = 30 Recovery = 100%			9.00 - 9.10: From 9.0m to 9.1m, encountered band of black fibrous peat. 9.10 - 13.50: From 9.1m to 13.5m, contains black organic trace with strong organic odour.	10								
Start & End of Shift Observations			Borehole Diameter		Casing Diameter		Remarks:							
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	Inspection pit hand dug to 1.2m. Groundwater encountered at 2.9m and 13.5m rising to 2.8m and 6.2m bgl respectively after 20 minutes. Borehole terminated at 20.45m. Borehole was installed with 19mm piezometric groundwater monitoring pipe. Response zone 2.0m to 5.0m. Borehole installed with 50mm ground gas monitoring pipe. Response Zone 14.0m to 17.0m. Backfilled with bentonite pellets and gravel on completion.					
21-09-2020	03:00	0.00	0.00		5.00	230	5.00	250						
21-09-2020	17:40	3.50	3.40	3.40	20.45	200								
22-09-2020	07:30	3.50	3.50	3.30										
22-09-2020	18:10	11.95	11.00											
23-09-2020	06:55	11.95	11.00	9.50										
23-09-2020	18:00	20.45	11.00	9.50										
Chiselling			Installation				Water Strikes							
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
3.50	5.50	04:00			0.00	2.00	PLAIN	19	2.90	2.70		20	2.80	Seepage
					2.00	5.00	PIEZO	19	13.50	13.00		20	6.20	Fast
					0.00	14.00	PLAIN	50						

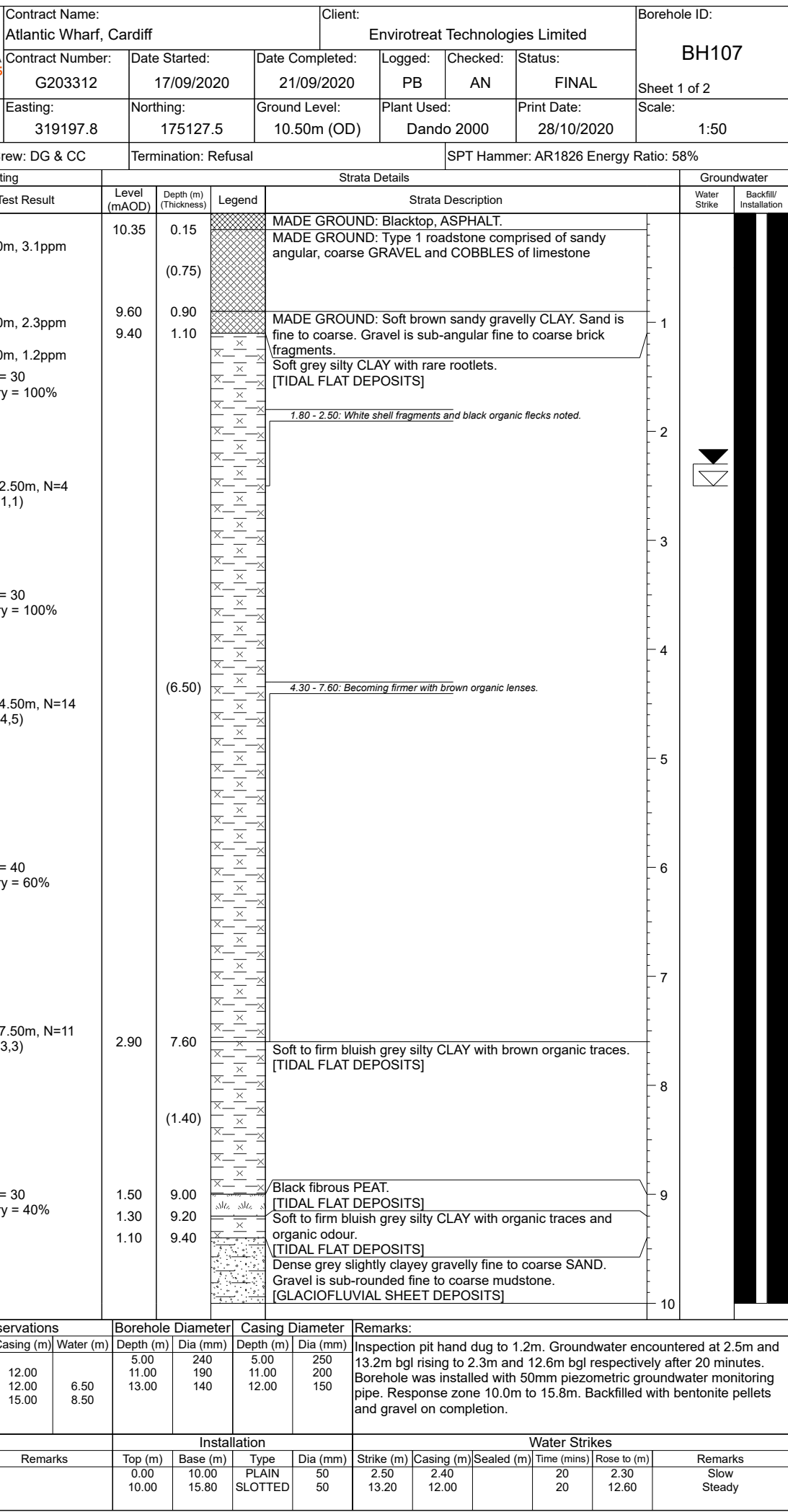
	Contract Name: Atlantic Wharf, Cardiff			Client: Envirotreat Technologies Limited			Borehole ID: BH105							
	Contract Number: G203312	Date Started: 21/09/2020	Date Completed: 23/09/2020	Logged: PB	Checked: AN	Status: FINAL	Sheet 2 of 3							
	Cable Percussion Borehole Log			Easting: 319231.1	Northing: 175001.7	Ground Level: 10.12m (OD)	Plant Used: Dando 2000	Print Date: 28/10/2020	Scale: 1:50					
Weather: Fine		Rig Crew: DG & CC		Termination: Reached target depth			SPT Hammer: AR1826 Energy Ratio: 58%							
Samples & In Situ Testing			Strata Details						Groundwater					
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description			Water Strike	Backfill/Installation				
10.00 - 11.00	B26					Soft brownish grey silty CLAY with occasional blue streaks. [TIDAL FLAT DEPOSITS]								
10.50 - 10.60	D27													
11.50 - 11.95	D28	SPT(S) 11.50m, N=5 (1,1/1,1,1,2)												
12.00 - 13.00	B29													
12.50 - 12.60	D30													
13.00 - 13.45	U31	Ublows = 30 Recovery = 100%												
13.50 - 14.50	B32		-3.38	13.50		Dense sub-sounded to rounded medium to coarse GRAVEL with occasional cobbles of sandstone. Sand is fine to coarse. [GLACIOFLUVIAL SHEET DEPOSITS] <i>13.50 - 17.00: From 13.5m to 17.0m, sand and gravel become coarser with increasing depth.</i>								
14.00 - 14.10	D33													
14.50 - 15.50	B34	SPT(C) 14.50m, N=33 (7,14/7,10,9,7)												
15.00 - 15.10	D35			(3.50)										
15.70 - 16.00	B36					15.70 - 16.00: Wood encountered.								
15.80 - 15.90	D37	SPT(S) 16.00m, N=34 (5,6/7,10,7,10)												
16.00 - 16.45	D38													
16.00 - 17.00	B39													
16.50 - 16.60	D40													
17.00 - 17.45	U41	Ublows = 100 Recovery = 0%	-6.88	17.00		Extremely weak reddish brown highly weathered MUDSTONE, arising as; Very stiff closely fragmented reddish brown CLAY with light blue reduction spots. [MERCIA MUDSTONE GROUP, WEATHERING GRADE IVb] <i>18.00 - 20.45: From 18.0m to 20.45m, mudstone arises as angular fine to medium gravel.</i>								
17.00 - 17.50	B42													
17.50 - 17.70	D43													
18.50 - 18.75	D44	SPT(S) 18.50m, 100 (11,18/100 for 95mm)		(3.45)										
19.00 - 20.00	B45													
Start & End of Shift Observations			Borehole Diameter		Casing Diameter		Remarks:							
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	Inspection pit hand dug to 1.2m. Groundwater encountered at 2.9m and 13.5m rising to 2.8m and 6.2m bgl respectively after 20 minutes. Borehole terminated at 20.45m. Borehole was installed with 19mm piezometric groundwater monitoring pipe. Response zone 2.0m to 5.0m. Borehole installed with 50mm ground gas monitoring pipe. Response Zone 14.0m to 17.0m. Backfilled with bentonite pellets and gravel on completion.					
					5.00 20.45	230 200	5.00	250						
Chiselling			Installation				Water Strikes							
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					14.00	17.00	SLOTTED	50						

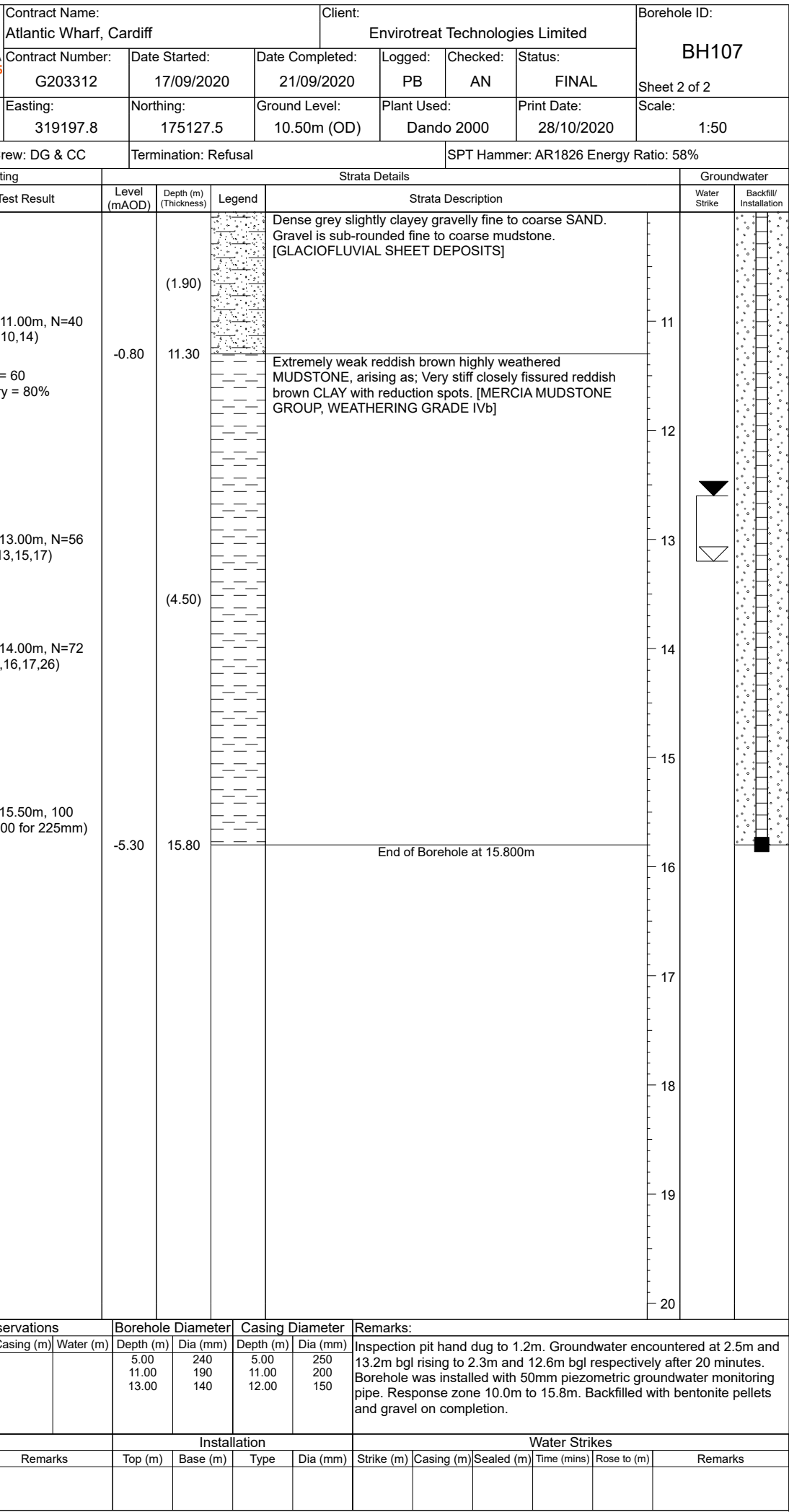


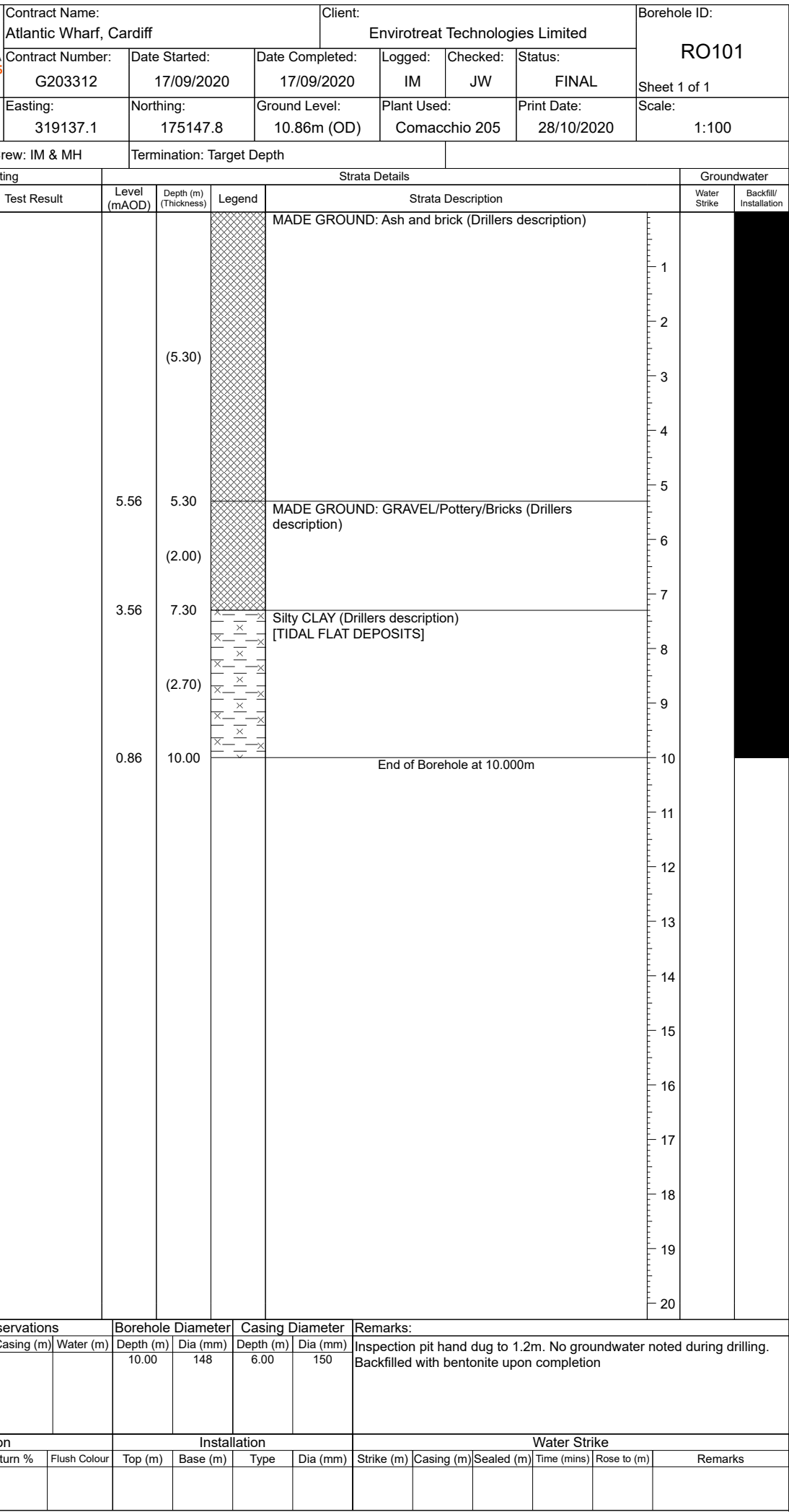
		Contract Name: Atlantic Wharf, Cardiff			Client: Envirotrat Technologies Limited			Borehole ID: BH106						
		Contract Number: G203312	Date Started: 26/09/2020	Date Completed: 28/09/2020	Logged: PB	Checked: AN	Status: FINAL							
Cable Percussion Borehole Log		Easting: 319333.2	Northing: 175079.0	Ground Level: 11.21m (OD)	Plant Used: Dando 2000	Print Date: 28/10/2020	Sheet 1 of 3							
					Scale: 1:50									
Weather: Fine		Rig Crew: DG & CC		Termination: Reached target depth			SPT Hammer: AR1826 Energy Ratio: 58%							
Samples & In Situ Testing				Strata Details				Groundwater						
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		Water Strike	Backfill/ Installation					
0.20 - 1.20 0.30 0.30 - 0.40	B1 ES1 D2	PID 0.30m, 2.4ppm	11.06	0.15		MADE GROUND: Blacktop, ASPHALT.								
1.00 1.20 - 2.20 1.30 - 1.40	ES2 B3 D4	PID 1.00m, 2.0ppm SPT(C) 1.20m, N=60 (9,14/11,17,18,14)		(1.95)		MADE GROUND: Type 1 roadstone comprised of sandy angular, coarse GRAVEL and COBBLES of limestone								
2.20 - 3.20 2.30 - 2.40	B5 D6	SPT(C) 2.20m, N=14 (7,3/3,5,3,3)	9.11	2.10		MADE GROUND: Medium dense blackish grey clayey gravelly fine to coarse SAND. Gravel is angular to rounded fine to cobble sized red brick, coal, wood fragments, sandstone and limestone.								
3.00 3.20 - 4.20 3.30 - 3.40	ES3 B7 D8	PID 3.00m, 1.2ppm SPT(C) 3.20m, N=11 (2,4/3,3,2,3)												
4.00 - 5.00 4.20 - 4.30	B9 D10	SPT(C) 4.00m, N=10 (2,2/2,2,3,3)				MADE GROUND: Medium dense blackish grey clayey gravelly fine to coarse SAND. Gravel is angular to rounded fine to cobble sized red brick, coal, wood fragments, sandstone and limestone.								
5.00 5.00 - 5.45 5.00 - 6.00	ES4 D11 B12	SPT(S) 5.00m, N=16 (1,1/3,3,5,5) PID 5.00m, 2.1ppm				4.80 - 7.20: From 4.8m to 7.2m, sand contains frequent gravel of fine to coarse angular black coal.								
5.50 - 5.60	D13					5.70 - 5.90: From 5.7m to 5.9m, full glass bottles and whole red bricks encountered.								
6.00 - 7.00	B14													
6.50 - 6.60	D15													
7.00 7.00 - 7.45 7.20 - 7.30 7.20 - 7.50	ES5 D16 D18 B17	SPT(S) 7.00m, N=2 (1,0/0,0,1,1) PID 7.00m, 1.5ppm	4.01	7.20		Soft to firm bluish grey silty organic CLAY with black and brown organic streaks. [TIDAL FLAT DEPOSITS]								
8.00 - 8.45 8.00 - 9.00 8.00 - 9.00	U19 B21 B22	Ublows = 35 Recovery = 100%												
8.50 8.50 - 8.60	EW1 D20													
9.50 9.50 - 10.50 9.50 - 9.95	ES6 B24 D23	SPT(S) 9.50m, N=6 (1,2/1,2,1,2) PID 9.50m, 2.1ppm												
Start & End of Shift Observations			Borehole Diameter		Casing Diameter		Remarks:							
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	Inspection pit hand dug to 1.2m. Groundwater encountered at 4.80m rising to 4.45m after 20 minutes. Borehole terminated at 20.45m. Borehole was installed with 50mm piezometric groundwater monitoring pipe. Response zone 14.0m to 15.0m. Borehole installed with 19mm ground gas monitoring pipe. Response Zone 2.4m to 4.0m. Backfilled with bentonite pellets and gravel on completion.					
26-09-2020	07:30	0.00			5.50	230	5.50	250						
26-09-2020	18:00	7.50	7.50	6.50	7.50	190	7.50	200						
27-09-2020	07:30	7.50	7.50	5.00	20.45	140	20.45	150						
27-09-2020	18:00	17.75	17.00	12.00										
28-09-2020	07:30	20.45	17.00	4.60										
Chiselling				Installation				Water Strikes						
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					0.00	2.40	PLAIN	19	4.80	4.60	7.30	20	4.45	Medium
					2.40	4.00	SLOTTED	19						
					0.00	14.00	PLAIN	50						

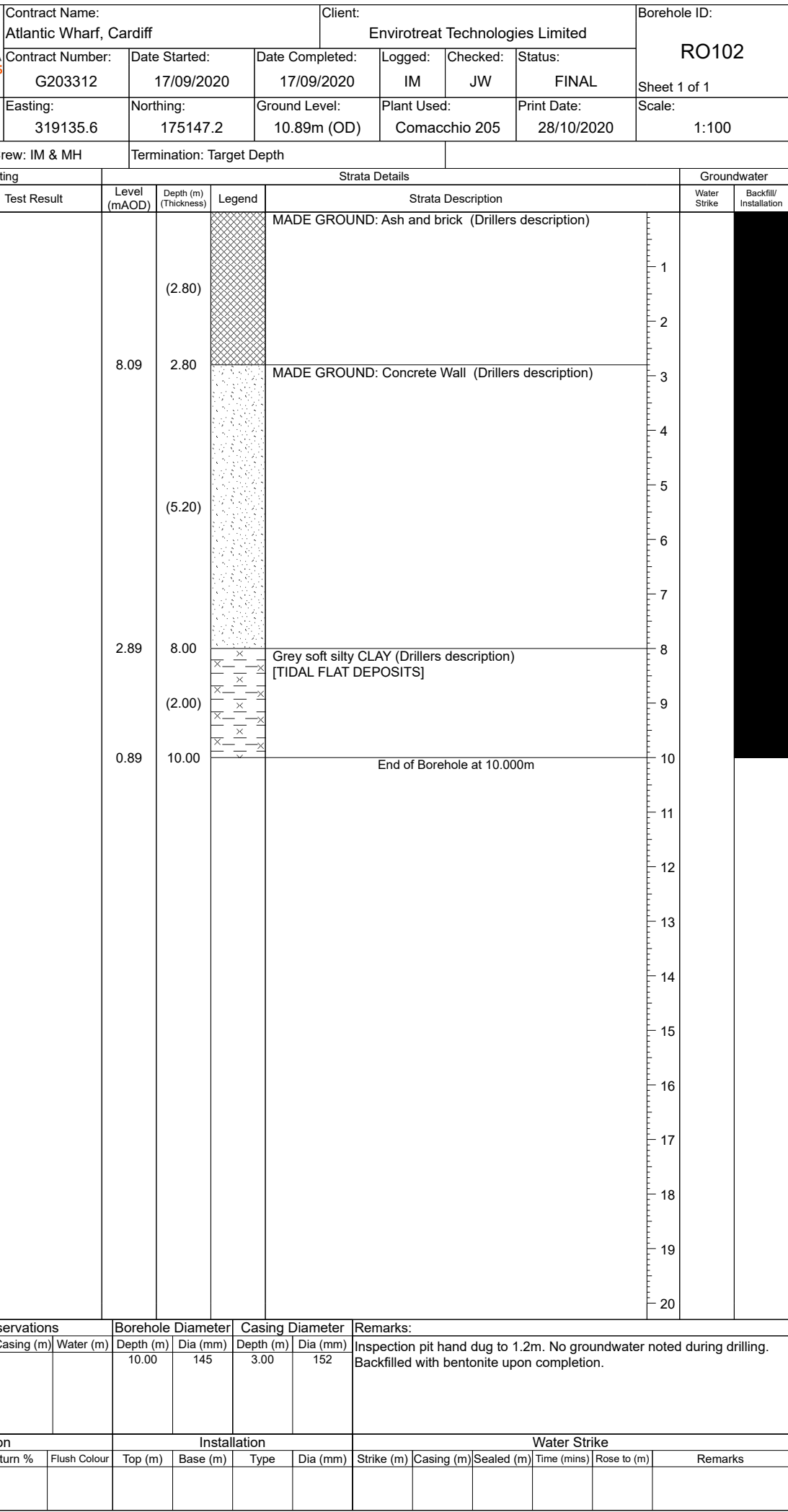
	Contract Name: Atlantic Wharf, Cardiff			Client: Envirotreat Technologies Limited			Borehole ID: BH106							
	Contract Number: G203312	Date Started: 26/09/2020	Date Completed: 28/09/2020	Logged: PB	Checked: AN	Status: FINAL								
	Cable Percussion Borehole Log			Easting: 319333.2	Northing: 175079.0	Ground Level: 11.21m (OD)	Plant Used: Dando 2000	Print Date: 28/10/2020	Scale: 1:50					
Weather: Fine		Rig Crew: DG & CC		Termination: Reached target depth			SPT Hammer: AR1826 Energy Ratio: 58%							
Samples & In Situ Testing				Strata Details					Groundwater					
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description			Water Strike	Backfill/Installation				
10.00 - 10.10	D25					Soft to firm bluish grey silty organic CLAY with black and brown organic streaks. [TIDAL FLAT DEPOSITS]								
11.00 - 11.45	U26	Ublows = 30 Recovery = 100%							11					
11.50 - 11.60	D27													
11.50 - 12.50	B28								12					
12.50 - 12.95	D29	SPT(S) 12.50m, N=8 (2,2/1,2,2,3)				12.30 - 14.20: From 12.3m to 14.2m, clay contains frequent horizons of fibrous black peat bands with strong organic odour.								
13.00 - 13.10	D30								13					
14.00 - 14.45	D31	SPT(S) 14.00m, N=41 (2,1/3,5,13,20)	-2.99	14.20		Dense dark grey sandy medium angular to rounded GRAVEL of strong sandstone. Sand is fine to coarse. [GLACIOFLUVIAL SHEET DEPOSITS]			14					
14.20 - 14.80	B32													
15.00 - 15.45	D33	SPT(S) 15.00m, N=27 (4,4/5,8,7,7)	-3.59	14.80		Extremely weak reddish brown highly weathered MUDSTONE, arising as; Stiff to very stiff reddish brown slightly silty CLAY. [MERCIA MUDSTONE GROUP, WEATHERING GRADE IVb]			15					
15.00 - 16.00	B34													
15.50 - 15.60	D35		-4.29	15.50		Extremely weak reddish brown highly weathered MUDSTONE, arising as; Very stiff reddish brown gravelly closely fissured CLAY with light blue reduction spots. Gravel is angular fine extremely weak mudstone lithorelicts. [MERCIA MUDSTONE GROUP, WEATHERING GRADE IVa]			16					
16.50 - 16.80	U36	Ublows = 100 Recovery = 0%							17					
16.50 - 17.30	B37													
17.30 - 17.75	D38	SPT(S) 17.30m, N=62 (4,5/11,15,16,20)				17.40 - 20.45: From 17.4m to 20.45m, mudstone contains gravel of possible halite and anhydride. Mudstone weathering condition becomes grade III.			18					
17.30 - 18.70	B39													
18.70 - 19.15	D40	SPT(S) 18.70m, N=56 (5,7/8,11,16,21)							19					
18.70 - 19.70	B41													
									20					
Start & End of Shift Observations			Borehole Diameter		Casing Diameter		Remarks:							
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)						
					5.50	230	5.50	250	Inspection pit hand dug to 1.2m. Groundwater encountered at 4.80m rising to 4.45m after 20 minutes. Borehole terminated at 20.45m. Borehole was installed with 50mm piezometric groundwater monitoring pipe. Response zone 14.0m to 15.0m. Borehole installed with 19mm ground gas monitoring pipe. Response Zone 2.4m to 4.0m. Backfilled with bentonite pellets and gravel on completion.					
					7.50	190	7.50	200						
					20.45	140	20.45	150						
Chiselling			Installation				Water Strikes							
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					14.00	15.00	SLOTTED	50						













Contract Name:
Atlantic Wharf, Cardiff

Client:
Envirotreat Technologies Limited

Contract Number:
G203312

Date Started:
18/09/2020

Date Completed:
18/09/2020

Logged:
IM

Checked:
JW

Status:
FINAL

Borehole ID:
RO103

Sheet 1 of 1

Rotary Open Hole
Borehole Log

Easting:
319134.5

Northing:
175146.7

Ground Level:
10.96m (OD)

Plant Used:
Comacchio 205

Print Date:
28/10/2020

Scale:
1:100

Weather: Sunny

Rig Crew: IM & MH

Termination: Target Depth

Samples & In Situ Testing			Strata Details					Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation	
						MADE GROUND: Ash and brick (Drillers description)			
							1		
							2		
							3		
							4		
							5		
							6		
							7		
							8		
							9		
							10		
			0.96	10.00		MADE GROUND: Very dense SAND AND GRAVEL/FILL (Drillers description)			
							11		
							12		
							13		
			-2.04	13.00		Soft grey silty CLAY (Drillers description) [TIDAL FLAT DEPOSITS]			
							14		
							15		
			-4.04	15.00		End of Borehole at 15.000m			
							16		
							17		
							18		
							19		
							20		

Start & End of Shift Observations

Borehole Diameter

Casing Diameter

Remarks:

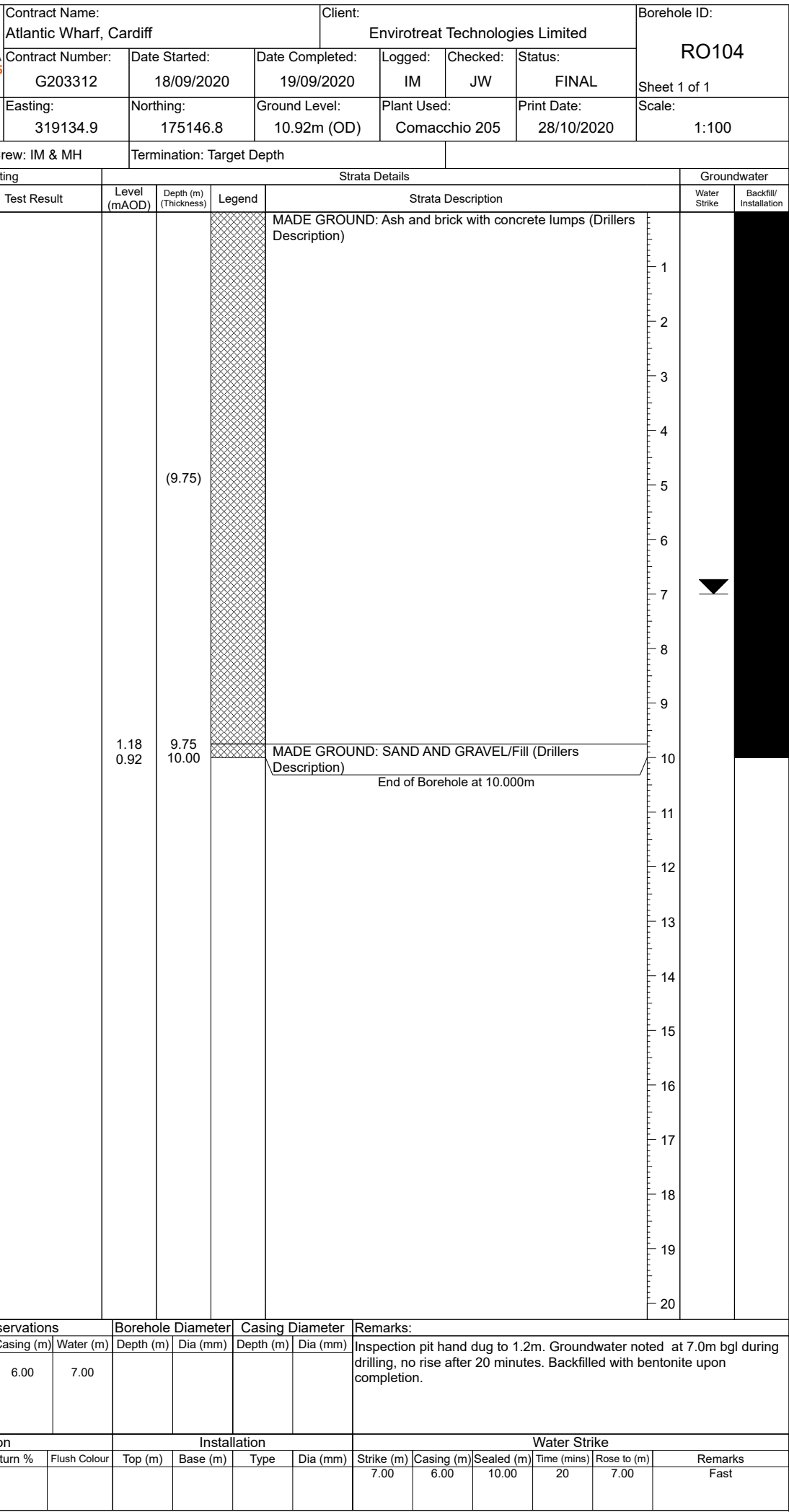
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)
18-09-2020	07:30				15.00	145	12.00	152
18-09-2020	13:55	0.00						

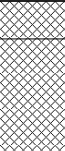
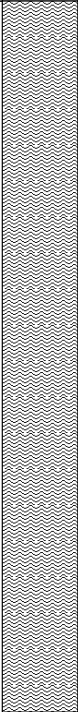
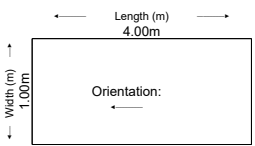
Flush Information

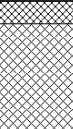
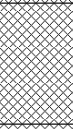
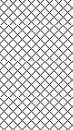
Installation

Water Strike

Top (m)	Base (m)	Flush Type	Return %	Flush Colour	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
									9.50	9.00	15.00	20	8.00	Very fast



	Contract Name: Atlantic Wharf, Cardiff		Client: Envirotreat Technologies Limited			Trial Pit ID: TP101		
	Contract Number: G203312	Date Started: 15/09/2020	Logged By: AN	Checked By: JW	Status: FINAL	Sheet 1 of 1		
Trial Pit Log		Easting: 319149.2	Northing: 175153.6	Ground Level: 11.22mOD	Plant Used: 6T Excavator	Date Printed: 28/10/2020	Scale: 1:51	
Weather: Fine		Stability: Stable		Services Encountered: Encountered adjacent to pavement		Hole Termination: Scheduled Depth		
Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.30	ES1	PID 0.30m, 0.0ppm	10.97	0.25		MADE GROUND: Light brown slightly clayey silty fine to medium SAND.	1	
1.00 1.00 1.00	B3 D4 ES2	PID 1.00m, 0.0ppm		(1.80)		MADE GROUND: Dark grey and black slightly clayey gravelly fine to coarse SAND with low cobble and boulder content. Gravel is angular to sub-angular fine to coarse coal, brick, concrete and mudstone. Cobbles are sub-angular brick and concrete. Boulders are sub-angular concrete.		
2.00 2.00	B5 D6		9.17	2.05		MADE GROUND: Black slightly clayey gravelly fine to coarse SAND. Gravel is angular to sub-rounded fine to coarse brick, concrete and chalk.		
3.00 3.00 3.00	B8 D9 ES7	PID 3.00m, 0.0ppm		8.42	2.80	MADE GROUND: Black slightly silty sandy GRAVEL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse mudstone, brick and concrete.	3	
4.00 4.00	B10 D11		7.72	3.50	MADE GROUND: Light grey silty sandy GRAVEL. Sand is fine to coarse. Gravel is sub-rounded to angular fine to coarse chalk.	4		
4.50	ES12	PID 4.50m, 0.0ppm	7.32	3.90	Soft to firm dark grey silty CLAY. [TIDAL FLAT DEPOSITS]			
				(0.80)				
			6.52	4.70		End of Trial Pit at 4.700m	5	
Trial Pit Photographs/Sketches								
Dimensions of Trial Pit: Final Depth: 4.70m  Inclination: °								
Remarks: Trial pit excavated to 4.7m bgl. Groundwater noted during excavation at 3.9m, rising to 3.8m after 20mins. Trial pit backfilled with arisings upon completion. Failed soakaway test due to water rising during test period.								
Water Strike								
Strike	Time (mins)	Rose to (m)	Remarks					
3.90	20	3.80						

	Contract Name: Atlantic Wharf, Cardiff		Client: Envirotrete Technologies Limited			Trial Pit ID: TP102										
	Contract Number: G203312	Date Started: 17/09/2020	Logged By: AN	Checked By: AN	Status: FINAL	Sheet 1 of 1										
Trial Pit Log		Easting: 319291.7	Northing: 175033.5	Ground Level: 10.13mOD	Plant Used: 14T Excavator	Date Printed: 28/10/2020	Scale: 1:51									
Weather: Fine		Stability: Unstable		Services Encountered: None		Hole Termination: Pit wall instability										
Samples & In Situ Testing			Strata Details				Water	Backfill								
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description										
0.30	ES1	PID 0.30m, 0.0ppm	9.98	0.15 (0.75)		MADE GROUND: Blacktop, ASPHALT. MADE GROUND: Orangish brown sightly silty sandy angular to sub-angular fine to coarse GRAVEL. Sand is fine to coarse.	1									
1.00	ES2	PID 1.00m, 0.0ppm	9.23	0.90 (0.80)		MADE GROUND: Light grey slightly sandy slightly gravelly COBBLE with rare boulders. Gravel is sub-angular to sub-rounded fine to coarse. Cobble is sub-rounded to rounded fine to coarse. At 0.90m bgl, geo-textile layer encountered.										
3.00	ES3	PID 3.00m, 0.0ppm	8.43	1.70 (0.50)		MADE GROUND: Grey mottled brown silty CLAY.			2							
			7.93	2.20 (1.30)		MADE GROUND: Light grey slightly sandy slightly gravelly COBBLE with rare boulders. Gravel is sub-angular to sub-rounded fine to coarse. Cobble is sub-rounded to rounded fine to coarse. 2.40m to 2.70m bgl, cobble contains lenses of light brown sand at the north end of the pit. 2.70m to 3.00m bgl, contains layer of orangish brown cobbles at northern end of pit.			3							
			6.63	3.50	End of Trial Pit at 3.500m				4							
							5									
Trial Pit Photographs/Sketches																
Dimensions of Trial Pit: Final Depth: 3.50m ← Length (m) → 3.40m ↑ Width (m) ↓ 1.90m Orientation: ← Inclination: 90°																
Remarks: Trial pit excavated to 3.5m bgl. Groundwater encountered at 3.1m. Side walls observed to be unstable. Trial pit backfilled with arisings upon completion.																
Water Strike																
<table><tr><td>Strike</td><td>Time (mins)</td><td>Rose to (m)</td><td>Remarks</td></tr><tr><td>3.10</td><td>20</td><td>3.10</td><td></td></tr></table>									Strike	Time (mins)	Rose to (m)	Remarks	3.10	20	3.10	
Strike	Time (mins)	Rose to (m)	Remarks													
3.10	20	3.10														



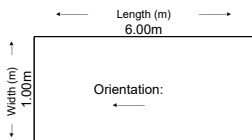
Contract Name: Atlantic Wharf, Cardiff		Client: Envirotrat Technologies Limited			Trial Pit ID: TT101
Contract Number: G203312	Date Started: 14/09/2020	Logged By: AN	Checked By: JW	Status: FINAL	
Easting: 319136.4		Northing: 175147.5	Ground Level: 10.93mOD	Plant Used: 6T Excavator	Date Printed: 28/10/2020
Weather: Fine		Stability: Stable	Services Encountered: None		Hole Termination: Refusal/Obstruction

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.30	ES1	PID 0.30m, 0.0ppm	10.68	0.25		MADE GROUND: Light brown silty fine to coarse SAND.		
1.00	ES2	PID 1.00m, 0.0ppm				MADE GROUND: Black slightly silty sandy GRAVEL with low cobble and boulder content. Sand is fine to coarse. Gravel is angular to sub-rounded coal, brick, concrete and clinker. Cobbles are sub-rounded coal and concrete. Boulders are sub-angular concrete with rebar.	1	
3.00	ES3	PID 3.00m, 0.0ppm		(3.55)			2	
						Concrete structure, assumed to be dock wall.	3	
			7.13	3.80		End of Trial Pit at 3.800m	4	
							5	

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 3.80m



Inclination: °

Remarks:

Trial pit excavated to 3.8m bgl. No groundwater noted during excavation. Trial pit backfilled with arisings upon completion

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks



Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Dynamic sampling uk ltd
5-8 victory parkway
victory road
Derby
DE24 8ZF

Hammer Ref: AR1826
Test Date: 04/09/2020
Report Date: 04/09/2020
File Name: AR1826.spt
Test Operator: AP

Instrumented Rod Data

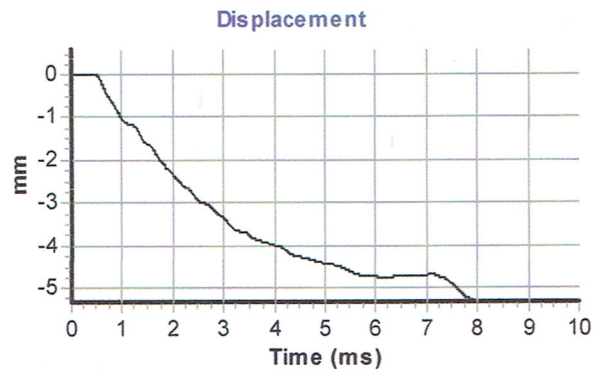
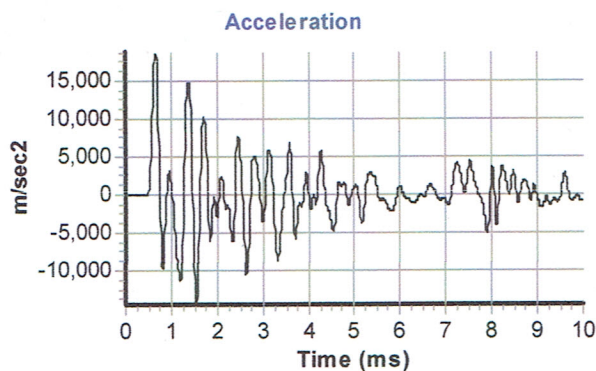
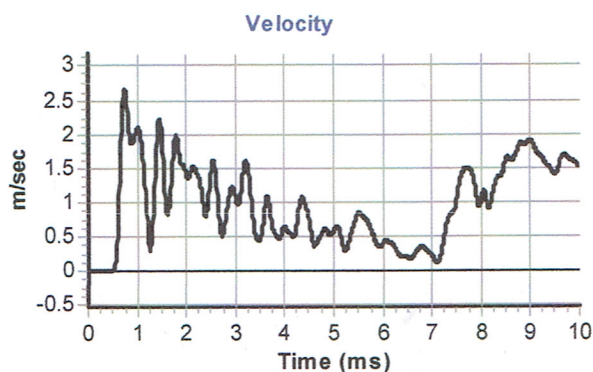
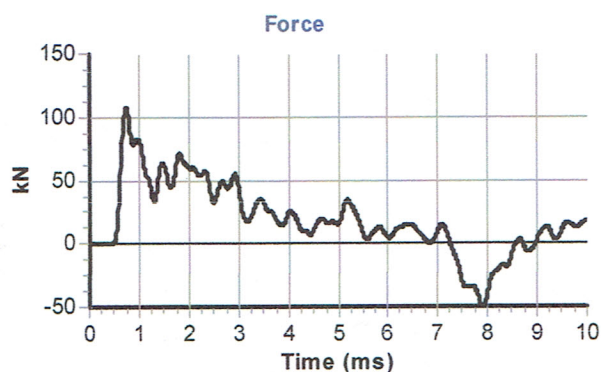
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.0
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 62901
Accelerometer No.2: 62902

Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
String Length L (m): 15.0

Comments / Location

Strata rig tested at Dynamic samplings yard.



Calculations

Area of Rod A (mm²): 905
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 273

Energy Ratio E_r (%): **58**

Signed: A.parker.

Title: Associate Director.

The recommended calibration interval is 12 months



Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Dynamic sampling uk ltd
5-8 victory parkway
victory road
Derby
DE24 8ZF

Hammer Ref: AR366
Test Date: 04/09/2020
Report Date: 04/09/2020
File Name: AR366.spt
Test Operator: AP

Instrumented Rod Data

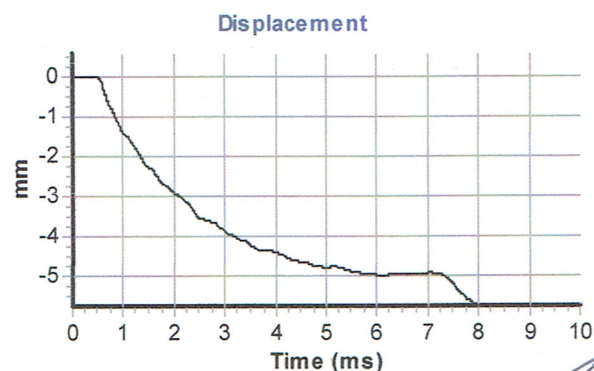
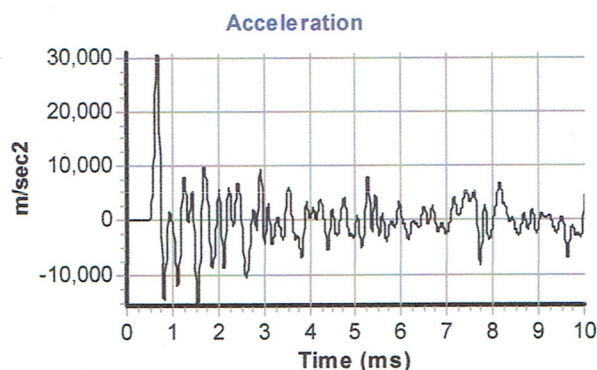
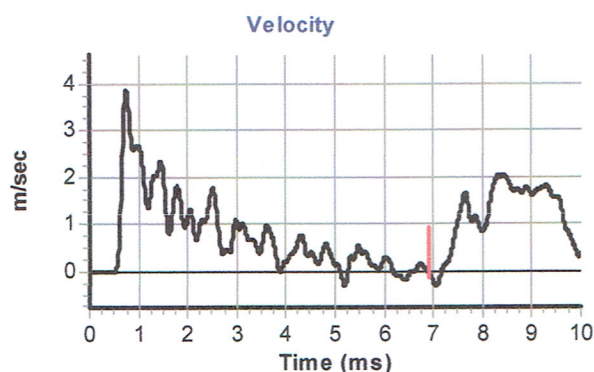
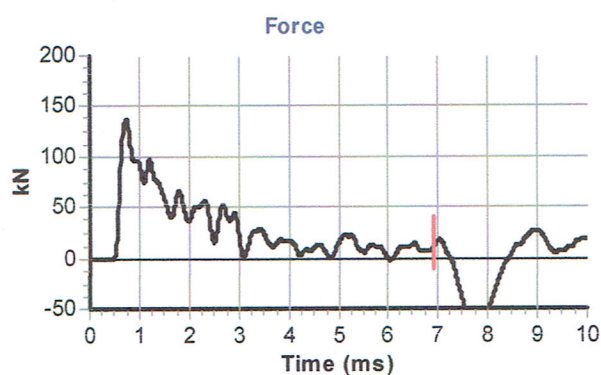
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.0
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 62901
Accelerometer No.2: 62902

Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
String Length L (m): 15.0

Comments / Location

Strata hammer tested at Dynamic samplings yard.



Calculations

Area of Rod A (mm^2): 905
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 307

Energy Ratio E_r (%): **65**

Signed: A.parker.

Title: Associate Director.

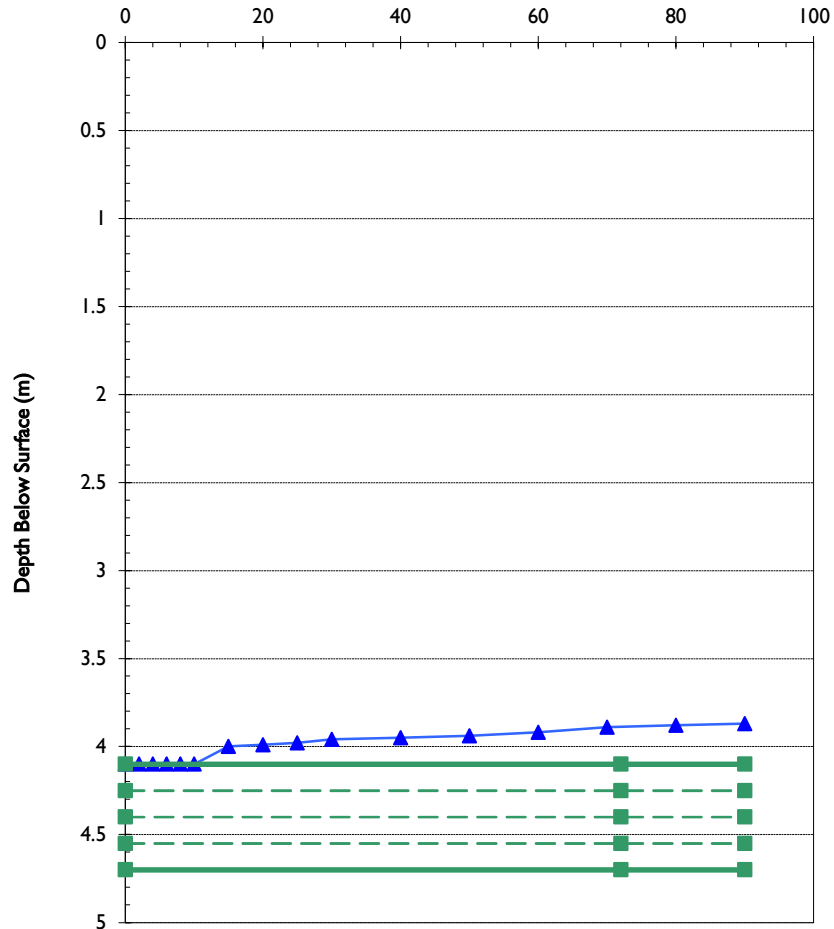
The recommended calibration interval is 12 months

APPENDIX E

SOAKAGE TEST RESULTS

BRE Digest 365 - Soakage Test

Filling to Max Water Depth (min)



initial)

Test Hole No: TP101
Test No: Test No 1



Pit Length (m)	4
Pit Width (m)	1
Depth to Pit Base (m)	4.7
Depth to Top of Permeable Soils (m)	
Depth to Groundwater Surface (m)	3.8
Depth to Top of Granular Fill (m)	
Voids Assumed for Granular Fill (%)	
Depth of Water at Start of Test (m)	4.1
Max Water Dropdown during Test (m)	0
Total Soakage Test Time (min)	90
Mean Internal Discharge Area (m2)	11.5
Discharge Rate (litre/min)	
Soakage Rate (litre/m2/min)	N/A
BRE Soil Infiltration Rate (m/sec)	N/A

Comments:

Water level arose during the test, soakage rate calculation is not applicable.

Client: Cardiff Council
Site: Atlantic Wharf
Tested By: AN
Test Date: 16/10/20

APPENDIX F

FIELD MONITORING SHEETS

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: Envirotreat
Site: Atlantic Wharf
Date: 07/10/2020

Quote No:
Visit No: 1 of 3
Operator: W.M

Project Manager: Dan Stodgell



	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				WELL AND WATER DATA		Comments
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady					
BH101	3.8	3.8	76.0	76.0	1.4	1.4	7	7	ND	ND	10.6	10.6	ND	NA	ND	ND	-0.10	30	4.03	6.95	
BH103	5.8	5.8	>>>	>>>	1.6	1.6	ND	ND	ND	ND	0.5	0.5	ND	NA	-0.1	-0.1	-0.17	30	3.10	6.16	
BH105	0.1	0.1	2.0	2.0	1.9	1.9	6	6	ND	ND	14.3	14.3	0.6	NA	0.1	0.1	0.22	30	5.90	15.68	
BH105 Peizo	ND	ND	ND	ND	0.1	0.1	3	3	ND	ND	5.1	5.1	ND	NA	-0.1	-0.1	-0.12	30	2.89	4.07	
BH106	0.1	0.1	2.0	2.0	0.5	0.4	5	5	ND	ND	20.7	20.7	ND	NA	ND	ND	13.94	30	4.85	14.62	
BH106 Peizo	ND	ND	ND	ND	0.1	ND	1	1	ND	ND	20.9	20.9	ND	NA	ND	ND	-0.05	0	DRY	4.03	
BH107	76.2	49.0	>>>	>>>	5.5	3.9	ND	ND	41	41	2.3	7.0	0.1	NA	ND	ND	0.05	30	6.35	15.56	
Max	76.2	49.0	76.0	76.0	5.5	3.9	7	7	41	41	20.9	20.9	NR	ND	0.1	0.1	14	30	6.35	15.68	
Min	ND	ND	ND	ND	0.1	ND	ND	ND	ND	ND	0.5	0.5	NR	0.0	ND	ND	-0.2	0	DRY	4.03	

ND - Not detected
NR - Not recorded
NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: ☐ Dry ☐ Moist ☒ Wet ☐ Snow ☐ Frozen
Wind: ☒ Calm ☐ Light ☐ Moderate ☐ Strong
Cloud cover: ☐ None ☐ Slight ☒ Cloudy ☐ Overcast
Precipitation: ☒ None ☐ Slight ☐ Moderate ☐ Heavy
Time monitoring performed: 07:30 Start 13:00 End
Barometric pressure (mbar): 1013 Start 1013 End
Pressure trend (Daily): Falling ☐ Steady Rising
Source:
Air Temperature (Deg. C): 10 Before 15 After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA5000;G505312
Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%
Gas Flow range: +100/-50 l/hour
Differential Pressure: (+/-) 1000 Pa
Date of last calibration: 05/05/2020
Date of next calibration: 05/11/2020

Ambient air check: CH₄ 0.0 CO₂ 0.1 O₂ 20.9

JOB DETAILS:

Client: Envirotreat
 Site: Atlantic Wharf
 Date: 15/10/2020

Quote No:
 Visit No: 2 of 3
 Operator: M.C

Project Manager: Dan Stodgell



	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				WELL AND WATER DATA		Comments
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady					
BH101	1.3	1.0	26.0	20.0	4.0	1.6	2	2	ND	ND	8.1	10.9	8.9	NA	0.9	0.6	-0.43	30	3.99	6.95	
BH103	6.4	6.4	>>>	>>>	8.4	1.6	1	1	ND	ND	0.9	0.9	ND	NA	-0.4	-0.2	-0.05	30	3.12	6.16	
BH105	0.1	0.1	2.0	2.0	0.3	0.0	3	3	ND	ND	17.9	19.1	ND	NA	0.3	0.3	0.26	30	5.98	15.68	
BH105 Peizo	0.1	0.1	2.0	2.0	8.5	8.4	ND	ND	ND	ND	6.9	6.7	ND	NA	-0.1	-0.1	2.16	30	2.89	4.07	
BH106	ND	ND	ND	ND	0.1	0.0	ND	ND	ND	ND	20.7	20.8	ND	NA	0.0	0.0	13.21	30	5.15	14.62	
BH106 Peizo	ND	ND	ND	ND	0.9	0.8	1	1	ND	ND	15.5	15.5	ND	NA	0.0	0.0	-0.10	0	DRY	4.03	
BH107	76.8	61.8	>>>	>>>	5.6	4.6	ND	ND	31	31	5.2	0.5	21.9	NA	0.9	0.7	8.59	30	6.44	15.56	
Max	76.8	61.8	26.0	20.0	8.5	8.4	3	3	31	31	20.7	20.8	NR	ND	0.9	0.7	13	30	6.44	15.68	
Min	ND	ND	ND	ND	0.1	0.0	ND	ND	ND	ND	0.9	0.5	NR	0.0	-0.4	-0.2	-0.4	0	DRY	4.03	

ND - Not detected
 NR - Not recorded
 NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: ☒ Dry ☐ Moist ☐ Wet ☐ Snow ☐ Frozen
 Wind: ☒ Calm ☐ Light ☐ Moderate ☐ Strong
 Cloud cover: ☐ None ☒ Slight ☐ Cloudy ☐ Overcast
 Precipitation: ☒ None ☐ Slight ☐ Moderate ☐ Heavy
 Time monitoring performed: 14:00 Start 07:12 End
 Barometric pressure (mbar): 1027 Start 1025 End
 Pressure trend (Daily): Falling ☐ Steady Rising
 Source:
 Air Temperature (Deg. C): 11 Before 10 After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA12359
 Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%
 Gas Flow range: +100/-50 l/hour
 Differential Pressure: (+/-) 1000 Pa
 Date of last calibration: 08/07/2020
 Date of next calibration: 08/01/2021

Ambient air check: CH₄ 0.0 CO₂ 0.1 O₂ 20.9

JOB DETAILS:

Client: Envirotreat
 Site: Atlantic Wharf
 Date: 19/10/2020

Quote No:
 Visit No: 3 of 3
 Operator: M.C

Project Manager: Dan Stodgell



	GAS CONCENTRATIONS												VOLATILES		FLOW DATA			WELL AND WATER DATA		Comments	
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)		Depth of well (m)
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady					
BH101	0.8	0.8	16.0	16.0	1.8	1.8	1	1	ND	ND	10.7	10.7	17.6	NA	1.6	1.5	-0.70	60	3.98		6.85
BH103	6.5	6.5	>>>>	>>>>	1.4	1.4	1	1	ND	ND	0.5	0.5	18.3	NA	1.3	1.3	-0.39	60	3.00	6.08	
BH105	ND	ND	ND	ND	0.2	0.2	5	5	ND	ND	17.2	17.2	16.4	NA	1.0	1.0	0.65	60	5.86	15.58	
BH105 Peizo	0.1	ND	2.0	ND	8.1	8.1	ND	ND	ND	ND	6.9	6.9	12.6	NA	0.2	0.1	0.00	60	2.93	4.87	
BH106	ND	ND	ND	ND	0.2	0.1	ND	ND	ND	ND	20.8	20.8	ND	NA	0.6	0.6	-0.26	60	5.03	14.63	
BH106 Peizo	ND	ND	ND	ND	4.6	4.4	1	1	ND	ND	14.9	15.4	ND	NA	0.6	0.4	0.00	60	dry	3.93	
BH107	78.5	78.5	>>>	>>>	5.6	5.6	ND	ND	87	87	ND	ND	46.6	NA	1.5	1.3	1.42	60	6.33	15.58	
Max	78.5	78.5	16.0	16.0	8.1	8.1	5	5	87	87	20.8	20.8	NR	ND	1.6	1.5	1	60	6.33	15.58	
Min	ND	ND	ND	ND	0.2	0.1	ND	ND	ND	ND	ND	ND	NR	0.0	0.2	0.1	-0.7	60	DRY	3.93	

ND - Not detected
 NR - Not recorded
 NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: ☒ Dry ☐ Moist ☐ Wet ☐ Snow ☐ Frozen
 Wind: ☐ Calm ☒ Light ☐ Moderate ☐ Strong
 Cloud cover: ☐ None ☒ Slight ☒ Cloudy ☐ Overcast
 Precipitation: ☒ None ☐ Slight ☐ Moderate ☐ Heavy
 Time monitoring performed: 13:35 Start 15:15 End
 Barometric pressure (mbar): 1012 Start 1010 End
 Pressure trend (Daily): ☒ Falling ☐ Steady ☐ Rising
 Source: met office
 Air Temperature (Deg. C): 14 Before ☐ After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA12359
 Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%
 Gas Flow range: +100/-50 l/hour
 Differential Pressure: (+/-) 1000 Pa
 Date of last calibration: 08/07/2020
 Date of next calibration: 08/01/2021

Ambient air check: CH₄ 0.0 CO₂ 0.1 O₂ 20.8

Test Properties

Test Type = Low-Flow Test

Test Date / Time = 2020-10-07 12:12:39

Time Offset = 01:00:00

Initial Depth to Water = 4.03 m

Flow Cell Volume = 130 ml

Final Draw Down = 0 m

Location Properties

Location Name = BH101

Location ID = c2e2e9e3-8b21-4b14-8174-c9495f7597bf

Well Properties

Well Diameter = 5 cm

Total Depth = 6.95 m

Instrument Properties

Device Model = Aqua TROLL 500

Device SN = 678014

Date Time	Elapsed Time	Depth To	Actual Conc	Specific Co	Salinity (PSU)	Total Dissc	Resistivity	Density (g/cm³)	RDO Conc	RDO Satur	Oxygen Pa	pH (pH)	pH (mV)	ORP (mV)	Turbidity (NTU)	Total Susp	Temperature	External Voltage (V) (678014)
07/10/2020 12:12	00:00:00	403	1298.589	1644.93	0.83502	1.069205	770.0664	0.999898	8.844946	86.30166	318.947	8.397866	-89.9935	66.18861	555.9167	0	13.97641	9.281
07/10/2020 12:15	00:03:00	403	1124.516	1426.874	0.719537	0.927468	889.2716	0.999818	3.855273	37.5315	138.7162	7.898636	-61.5358	62.81499	190.6891	0	13.90562	9.29
07/10/2020 12:18	00:06:00	403	1062.862	1329.146	0.668677	0.863945	940.8557	0.999693	2.675341	26.38317	97.44984	7.626695	-46.1435	45.93972	228.435	0	14.5109	9.272
07/10/2020 12:21	00:09:00	403	1016.495	1271.937	0.638645	0.826759	983.7723	0.999673	2.101466	20.70855	76.49194	7.507043	-39.3105	26.35363	328.717	0	14.48541	9.281
07/10/2020 12:24	00:12:00	403	983.856	1233.813	0.618618	0.801979	1016.409	0.999671	1.853856	18.22964	67.34215	7.427241	-34.7447	11.17829	317.9261	0	14.39323	9.281
07/10/2020 12:27	00:15:00	403	961.8135	1205.368	0.603774	0.783489	1039.703	0.999655	1.713781	16.86093	62.28415	7.378212	-31.9505	-4.39521	284.1263	0	14.42105	9.29
07/10/2020 12:30	00:18:00	403	947.8816	1181.709	0.591584	0.768111	1054.984	0.999614	1.59445	15.76058	58.20576	7.359541	-30.9086	-20.6625	311.2692	0	14.6402	9.29
07/10/2020 12:33	00:21:00	403	933.5765	1159.922	0.58032	0.75395	1071.149	0.999584	1.529306	15.16256	55.98849	7.327306	-29.0823	-33.2629	368.1833	0	14.78331	9.29

Samples

BH101: Cloudy fine sediment low turbidity No odour

Test Properties

Test Type = Low-Flow Test

Test Date / Time = 2020-10-07 10:56:15

Time Offset = 01:00:00

Initial Depth to Water = 3.1 m

Flow Cell Volume = 130 ml

Final Draw Down = 0 m

Location Properties

Location Name = BH103

Location ID = 33e39368-3bf1-43b2-9e18-9f8dd14b8ae7

Well Properties

Well Diameter = 5 cm

Total Depth = 6.16 m

Instrument Properties

Device Model = Aqua TROLL 500

Device SN = 678014

Date Time	Elapsed Time	Depth To Water (m)	Actual Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Salinity (PSU)	Total Dissolved Solids (mg/L)	Resistivity (kΩ·cm)	Density (g/cm³)	RDO Concentration (mg/L)	RDO Saturation (%)	Oxygen Partial Pressure (kPa)	pH (pH)	6-pH mV (mV)	ORP (mV)	Turbidity (NTU)	Total Suspended Solids (mg/L)	Temperature (°C)	External Voltage (V) (678014)
07/10/2020 10:56	00:00:00	310	2916.678	3663.965	1.941049	2.381577	342.8558	1.000703	5.65751	55.99957	206.8839	8.04186	-69.7947	61.18897	1282.004	0	14.32169	9.29
07/10/2020 10:59	00:03:00	310	2843.74	3580.344	1.893934	2.327223	351.6496	1.000681	4.949696	48.87999	180.5992	7.903109	-61.8601	22.44357	869.2803	0	14.22851	9.272
07/10/2020 11:02	00:06:00	310	1194.837	1467.482	0.74223	0.953863	836.9346	0.999634	2.529737	25.37247	93.63849	8.140059	-75.6455	-44.7046	4623.99	0	15.27271	9.281
07/10/2020 11:05	00:09:00	310	965.021	1188.204	0.595336	0.772332	1036.247	0.999537	1.944129	19.43689	71.74144	7.812647	-56.8867	-52.7608	1386.839	0	15.16586	9.281
07/10/2020 11:08	00:12:00	310	938.6588	1155.464	0.578255	0.751052	1065.35	0.999523	1.714026	17.1384	63.25702	7.566278	-42.7938	-53.7789	948.611	0	15.17619	9.272
07/10/2020 11:11	00:15:00	310	915.334	1126.678	0.563254	0.732341	1092.497	0.999511	1.614645	16.14418	59.58719	7.450002	-36.1419	-52.6678	875.1081	0	15.17896	9.272
07/10/2020 11:14	00:18:00	310	871.3854	1063.977	0.530843	0.691585	1147.598	0.999432	1.54271	15.53602	57.32032	7.386647	-32.5561	-52.1528	752.6556	0	15.523	9.281
07/10/2020 11:17	00:21:00	310	848.7388	1040.876	0.518751	0.676569	1178.219	0.999452	1.495085	14.99497	55.33584	7.325249	-29.0203	-53.6358	480.7268	0	15.33551	9.281

Samples

BH103: Slightly brown fine sediment moderate turbidity No odour

Test Properties

Test Type = Low-Flow Test

Test Date / Time = 2020-10-07 10:17:19

Time Offset = 01:00:00

Initial Depth to Water = 5.90 m

Flow Cell Volume = 130 ml

Final Draw Down = 0 m

Location Properties

Location Name = Bh105

Location ID = 7f252612-ab23-49d2-b7c5-a267f472457b

Well Properties

Well Diameter = 5 cm

Total Depth = 15.68 m

Instrument Properties

Device Model = Aqua TROLL 500

Device SN = 678014

Date Time	Elapsed Time	Depth (m)	Temperature (°C)	Actual Salinity (PSU)	Specific Conductivity (µS/cm)	Salinity (PSU)	Total Dissolved Solids (mg/L)	Resistivity (kΩ/cm)	Density (g/cm³)	RDO Concentration (mg/L)	RDO Saturation (%)	Oxygen (mg/L)	pH (pH)	pH (mV)	ORP (mV)	Turbidity (NTU)	Total Suspended Solids (mg/L)	Temperature (°C)	External Voltage (V)
07/10/2020 10:17	00:00:00	590	4057.442	5248.958	2.836538	3.411823	246.4607	1.001565	7.118136	68.99691	255.2162	7.083257	-15.0514	119.4084	266.5818	0	13.11516	9.281	
07/10/2020 10:20	00:03:00	590	4717.672	6105.874	3.331858	3.968818	211.9689	1.001951	3.850515	37.42328	138.4295	7.370687	-31.3759	104.6718	220.4422	0	13.09659	9.281	
07/10/2020 10:23	00:06:00	590	5043.361	6533.255	3.58082	4.246616	198.2805	1.002148	2.629535	25.57557	94.60794	7.502874	-38.8789	92.30498	212.3169	0	13.06033	9.281	
07/10/2020 10:26	00:09:00	590	5259.156	6815.882	3.746208	4.430324	190.1446	1.002278	2.128459	20.71491	76.62898	7.592093	-43.9429	82.30571	205.2144	0	13.04205	9.29	
07/10/2020 10:29	00:12:00	590	5412.142	7013.717	3.86242	4.558916	184.7697	1.002367	1.890136	18.40978	68.10162	7.654055	-47.462	73.56051	207.2629	0	13.04456	9.281	
07/10/2020 10:32	00:15:00	590	5540.456	7183.281	3.962081	4.669133	180.4906	1.002447	1.752483	17.07266	63.15652	7.701092	-50.1299	65.07043	206.9679	0	13.02611	9.29	
07/10/2020 10:35	00:18:00	590	5628.818	7300.258	4.030937	4.745168	177.6572	1.002502	1.667395	16.24589	60.09884	7.737663	-52.2041	56.49451	200.4959	0	13.01276	9.272	
07/10/2020 10:38	00:21:00	590	5699.784	7396.9	4.087776	4.807985	175.4453	1.002549	1.610075	15.68422	58.02246	7.766803	-53.854	48.10218	193.449	0	12.98764	9.281	

Samples

Bh105: Clear odourless fine sediment low turbidity No odour

Test Properties

Test Type = Low-Flow Test

Test Date / Time = 2020-10-07 09:28:13

Time Offset = 01:00:00

Initial Depth to Water = 4.85 m

Flow Cell Volume = 130 ml

Final Draw Down = 0 m

Estimated Total Volume Pumped = 2 liter

Location Properties

Location Name = BH106

Location ID = f9478512-efc0-497c-ba3d-70f7d94cf591

Well Properties

Well Diameter = 5 cm

Total Depth = 14.62 m

Instrument Properties

Device Model = Aqua TROLL 500

Device SN = 678014

Date Time	Elapsed Time	Depth To Water (m)	Actual Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Salinity (PSU)	Total Dissolved Solids (mg/L)	Resistivity (kΩ·cm)	Density (g/cm³)	RDO Concentration (mg/L)	RDO Saturation (%)	Oxygen Partial Pressure (kPa)	pH (pH)	6-pH mV (mV)	ORP (mV)	Turbidity (NTU)	Total Suspended Solids (mg/L)	Temperature (°C)	External Voltage (V) (678014)
07/10/2020 09:28	00:00:00	485	2546.909	3258.992	1.712875	2.118345	392.6327	1.000635	8.387061	81.5302	301.4419	7.300686	-27.4444	182.9708	241.8884	0	13.56032	9.29
07/10/2020 09:31	00:03:00	485	2084.15	2642.575	1.373757	1.717674	479.8118	1.000321	3.989663	39.02314	144.2247	7.192867	-21.3385	100.2705	66.88424	0	13.93621	9.272
07/10/2020 09:34	00:06:00	485	1903.68	2410.816	1.247287	1.56703	525.2983	1.000216	2.731025	26.72087	98.7519	7.174222	-20.2799	24.83252	51.10775	0	13.98646	9.29
07/10/2020 09:37	00:09:00	485	1793.436	2265.609	1.16856	1.472646	557.5889	1.00014	2.234835	21.90434	80.94291	7.157907	-19.3572	-11.6431	43.35642	0	14.08855	9.281
07/10/2020 09:40	00:12:00	485	1717.409	2169.938	1.116733	1.41046	582.2726	1.000101	1.998176	19.57546	72.33754	7.149799	-18.8947	-26.8852	39.28833	0	14.08142	9.272
07/10/2020 09:43	00:15:00	485	1664.244	2102.403	1.080256	1.366562	600.8735	1.000072	1.878559	18.40236	68.00207	7.142136	-18.4584	-35.9642	37.81078	0	14.08855	9.263
07/10/2020 09:46	00:18:00	485	1618.207	2045.046	1.0493	1.32928	617.968	1.00005	1.782573	17.45255	64.49334	7.152027	-19.021	-40.4036	45.63794	0	14.07232	9.29
07/10/2020 09:49	00:21:00	485	1585.816	2003.088	1.02674	1.302007	630.59	1.00003	1.701129	16.66055	61.56524	7.137654	-18.2033	-40.4012	52.66693	0	14.09349	9.263

Samples

BH106: Slight landfill/hydrocarbon odour clear no sediment low turbidity

Test Properties

Test Type = Low-Flow Test

Test Date / Time = 2020-10-07 11:32:31

Time Offset = 01:00:00

Initial Depth to Water = 6.35 m

Flow Cell Volume = 130 ml

Final Draw Down = 0 m

Location Properties

Location Name = Bh107

Location ID = 53d159b0-0018-43ed-8c89-2f306cbc7d65

Well Properties

Well Diameter = 5 cm

Total Depth = 15.56 m

Instrument Properties

Device Model = Aqua TROLL 500

Device SN = 678014

Date Time	Elapsed Tir	Depth To \	Actual Con	Specific Co	Salinity (P	Total Dissc	Resistivity	Density (g/	RDO Conc	RDO Satur	Oxygen Pa	pH (pH) (6-	pH mV (m\	ORP (mV)	Turbidity (	Total Susp	Temperatu	External Voltage (V) (678014)
07/10/2020 11:32	00:00:00	635	3383.688	4309.33	2.303028	2.801064	295.5355	1.001065	7.713878	75.58169	279.3932	6.62638	10.92434	109.9766	276.8698	0	13.75396	9.29
07/10/2020 11:35	00:03:00	635	4341.278	5502.197	2.986761	3.576428	230.3469	1.001564	4.179967	41.30919	152.6709	6.990703	-9.82285	88.31147	97.24062	0	13.95331	9.281
07/10/2020 11:38	00:06:00	635	4774.01	6066.204	3.313292	3.943033	209.4675	1.001831	2.767282	27.34	101.0546	7.108956	-16.5534	65.18487	93.47817	0	13.84737	9.29
07/10/2020 11:41	00:09:00	635	5078.929	6466.193	3.546237	4.203026	196.8919	1.002022	2.156037	21.29452	78.71564	7.178555	-20.5112	45.11002	89.49807	0	13.76749	9.263
07/10/2020 11:44	00:12:00	635	5393.985	6820.976	3.756073	4.433634	185.3917	1.002143	1.820307	18.11197	66.93192	7.223474	-23.0908	27.24532	77.40948	0	14.04679	9.272
07/10/2020 11:47	00:15:00	635	5715.096	7195.226	3.977823	4.676897	174.9752	1.002287	1.671332	16.71873	61.77138	7.2501	-24.6239	14.39933	75.84798	0	14.22985	9.272
07/10/2020 11:50	00:18:00	635	5935.726	7489.281	4.151171	4.868032	168.4714	1.002433	1.587308	15.86405	58.61915	7.272988	-25.9209	3.100669	75.1343	0	14.13942	9.272
07/10/2020 11:53	00:21:00	635	6135.749	7764.434	4.313551	5.046882	162.9793	1.002577	1.541237	15.37833	56.83158	7.287951	-26.7625	-6.01169	101.6025	0	14.01768	9.29

Samples

BH107: Cloudy fine sediment moderate turbidity sulphurous odour

APPENDIX G

GEOTECHNICAL LABORATORY TEST CERTIFICATES



Contract Number: 50473

Client Ref:

Report Date: **16-10-2020**

Client PO: **AW/AN/007**

Client **Envirotrat Technologies Ltd**
Envirotrat Technologies Ltd
LCP House,
The Pensnett Estate,
Kingswinford,
West Midlands.
DY6 7NA
Tel: 01384 288876

Contract Title: **Atlantic Wharf, Cardiff (BH102)**
For the attention of: **Andy Norman**

Date Received: **29-09-2020**
Date Completed: **16-10-2020**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	2
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	1
Particle Density (Gas Jar) BS 1377:1990 - Part 2 : 8.2 - * UKAS	1
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	4
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) BS 1377:1990 - Part 2 : 9.4 - * UKAS	1
Organic Matter Content-dichromate method BS 1377:1990 - Part 3 : 3 - @ Non Accredited Test	1

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

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Emma Sharp (Office Manager/Director) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)
Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)



Laboratory Report



GEO Site & Testing Services Ltd

Contract Number: 50473

Test Description	Qty
BRE Reduced Suite includes pH, water & acid soluble sulphate and total sulphur BRE - BR279 - @ Non Accredited Test	4
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation

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- denotes test carried out by approved contractor

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Approved Signatories:

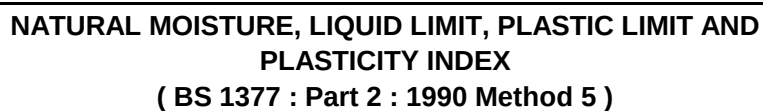
Emma Sharp (Office Manager/Director) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)

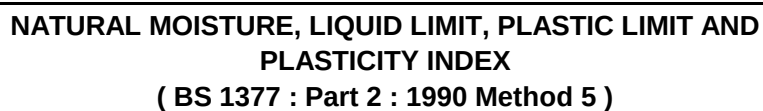
Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)

GEO Site & Testing Services Ltd

Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN

Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

[illegible]



Test Operator	Checked and Authorised by		Paul Evans	
Darren Bourne	Date	16-10-20		

Test Operator	Checked and Authorised by		Paul Evans	
Darren Bourne	Date	16-10-20		



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **50473**

Borehole/Pit No. **BH102**

Site Name **Atlantic Wharf, Cardiff (BH102)**

Sample No.

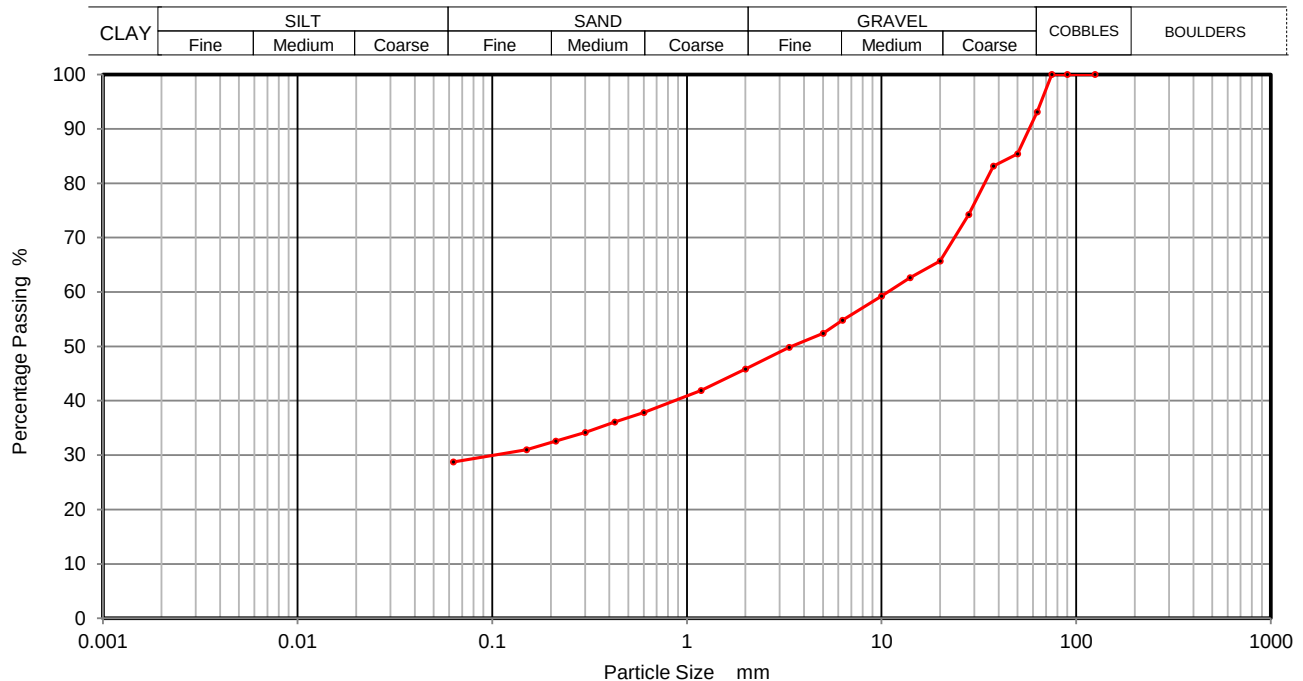
Soil Description Grey slightly sandy silty/clayey fine to coarse GRAVEL. Contains some cobbles

Depth Top **2.00**

Depth Base **3.00**

Date Tested **15-10-20**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	93		
50	85		
37.5	83		
28	74		
20	66		
14	63		
10	59		
6.3	55		
5	52		
3.35	50		
2	46		
1.18	42		
0.6	38		
0.425	36		
0.3	34		
0.212	33		
0.15	31		
0.063	29		

Sample Proportions	% dry mass
Cobbles	7
Gravel	47
Sand	17
Silt and Clay	29

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	15-10-20	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	16-10-20	Paul Evans	<i>P. Evans</i>



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number

50473

Borehole/Pit No.

BH102

Site Name

Atlantic Wharf, Cardiff (BH102)

Sample No.

Soil Description

Grey slightly sandy silty/clayey fine to coarse GRAVEL. Contains some cobbles

Depth Top

7.00

Depth Base

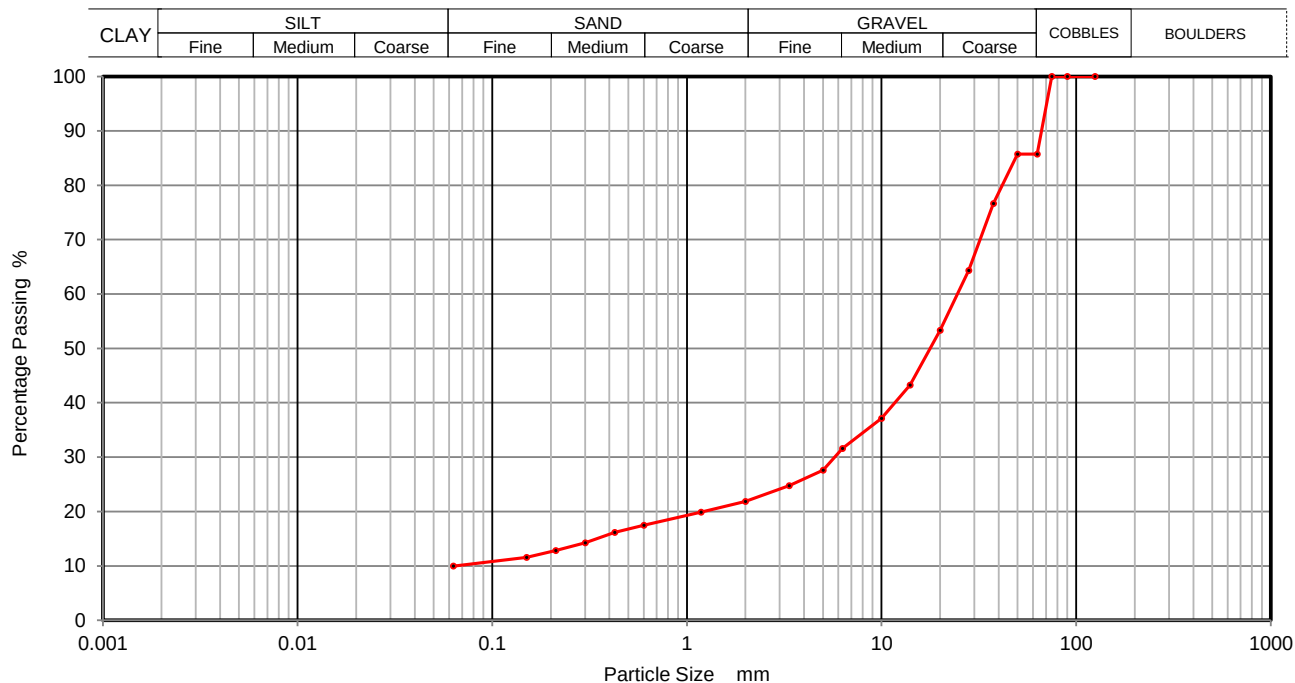
8.00

Date Tested

15-10-20

Sample Type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	86		
50	86		
37.5	77		
28	64		
20	53		
14	43		
10	37		
6.3	32		
5	28		
3.35	25		
2	22		
1.18	20		
0.6	17		
0.425	16		
0.3	14		
0.212	13		
0.15	12		
0.063	10		

Sample Proportions	% dry mass
Cobbles	14
Gravel	64
Sand	12
Silt and Clay	10

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	15-10-20	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	16-10-20	Paul Evans	<i>P. Evans</i>



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **50473**

Borehole/Pit No. **BH102**

Site Name **Atlantic Wharf, Cardiff (BH102)**

Sample No.

Soil Description

Grey slightly sandy slightly silty/clayey fine to coarse GRAVEL.
Contains some cobbles

Depth Top

10.50

Depth Base

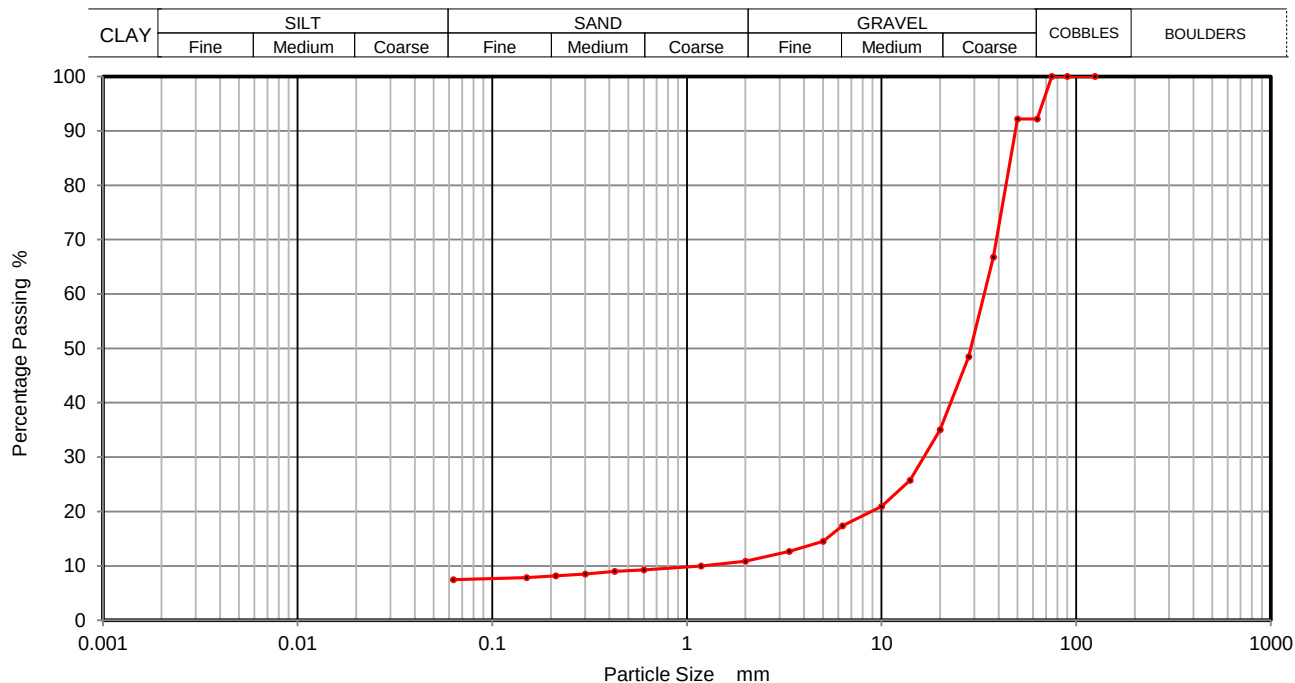
11.50

Date Tested

15-10-20

Sample Type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	92		
50	92		
37.5	67		
28	48		
20	35		
14	26		
10	21		
6.3	17		
5	14		
3.35	13		
2	11		
1.18	10		
0.6	9		
0.425	9		
0.3	9		
0.212	8		
0.15	8		
0.063	7		

Sample Proportions	% dry mass
Cobbles	8
Gravel	81
Sand	4
Silt and Clay	7

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	15-10-20	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	16-10-20	Paul Evans	<i>P. Evans</i>



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number **50473**

Borehole/Pit No. **BH102**

Site Name **Atlantic Wharf, Cardiff (BH102)**

Sample No.

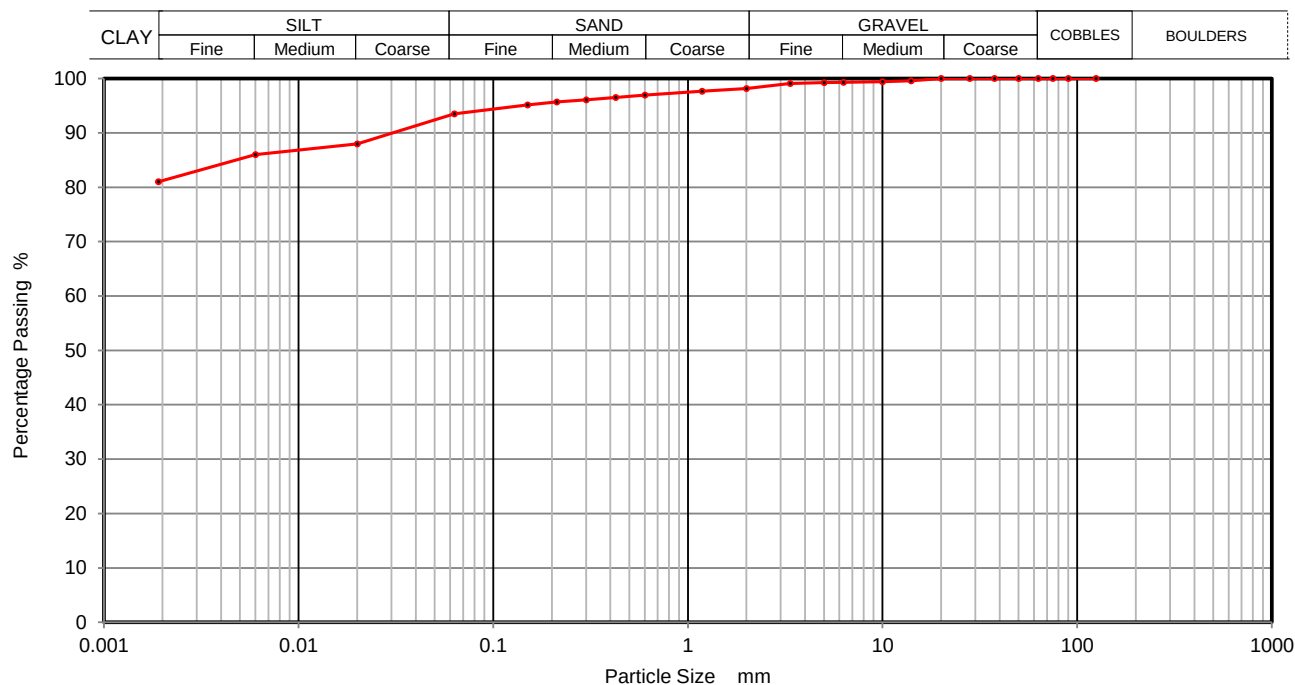
Soil Description **Brown slightly sandy slightly silty CLAY**

Depth Top **15.20**

Depth Base **16.70**

Date Tested **15-10-20**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	88
90	100	0.0060	86
75	100	0.0020	81
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	99		
5	99		
3.35	99		
2	98		
1.18	98		
0.6	97		
0.425	97		
0.3	96		
0.212	96		
0.15	95		
0.063	93		

Sample Proportions	% dry mass
Cobbles	0
Gravel	2
Sand	5
Silt	12
Clay	81

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	15-10-20	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	16-10-20	Paul Evans	<i>P. Evans</i>



2788



Contract Number

50473

Project Location

Atlantic Wharf, Cardiff (BH102)

Date Tested

15-10-20





Contract Number: 50521

Client Ref:

Report Date: **27-10-2020**

Client PO: **AW/AN/007**

Client **Envirotrat Technologies Ltd**
Envirotrat Technologies Ltd
LCP House,
The Pensnett Estate,
Kingswinford,
West Midlands.
DY6 7NA
Tel: 01384 288876

Contract Title: **Atlantic Wharf, Cardiff (BH106)**
For the attention of: **Andy Norman**

Date Received: **02-10-2020**
Date Completed: **27-10-2020**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	4
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	4
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	1
Organic Matter Content-dichromate method BS 1377:1990 - Part 3 : 3 - @ Non Accredited Test	2
Loss on Ignition BS 1377:1990 - Part 3 : 4 - @ Non Accredited Test	3
BRE Suite D Brownfield Site (pyrite present) includes pH, water & acid soluble sulphate, total sulphur, magnesium, chloride and nitrate BRE - BR279 - @ Non Accredited Test	2

Notes: ~~Observations and Interpretations are outside the UKAS Accreditation~~
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Approved Signatories:

Emma Sharp (Office Manager/Director) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)
Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)



Laboratory Report



GEO Site & Testing Services Ltd

Contract Number: 50521

Test Description	Qty
CD 100mm Consolidated drained Triaxial compression test on a single 100 mm diameter specimens Multistage loading with the measurement of volume change and pore water pressure including saturation and consolidation, test duration FOUR days. PLEASE NOTE IT IS LIKELY THIS TEST WILL INCUR EXTRA OVER DAY CHARGES. BS 1377:1990 - Part 8 : 7	1
Quick Undrained Triaxial Compression test - set of 3 - 38mm diameter specimens BS 1377:1990 - Part 7 : 8 - * UKAS	1
Extra over items for test duration in excess of four days.	5
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation

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@ - denotes non accredited tests

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Approved Signatories:

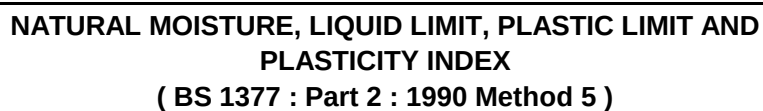
Emma Sharp (Office Manager/Director) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)

Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)

GEO Site & Testing Services Ltd

Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN

Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

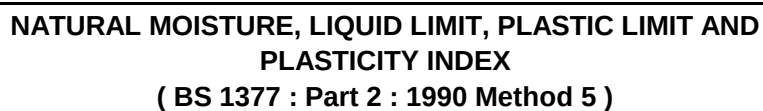


Contract Number	50521	
Site Name	Atlantic Wharf, Cardiff (BH106)	
Date Tested	22-10-20	
	DESCRIPTIONS	

[illegible]

Operators	Checked	27-10-20	Richard John (Advanced Testing Manager)
Daniel Bassett	Approved	27-10-20	Paul Evans (Quality/Technical Manager)







PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number

50521

Borehole/Pit No.

BH106

Site Name

Atlantic Wharf, Cardiff (BH106)

Sample No.

Soil Description

Grey slightly sandy fine to coarse GRAVEL. Coal

Depth Top

5.00

Depth Base

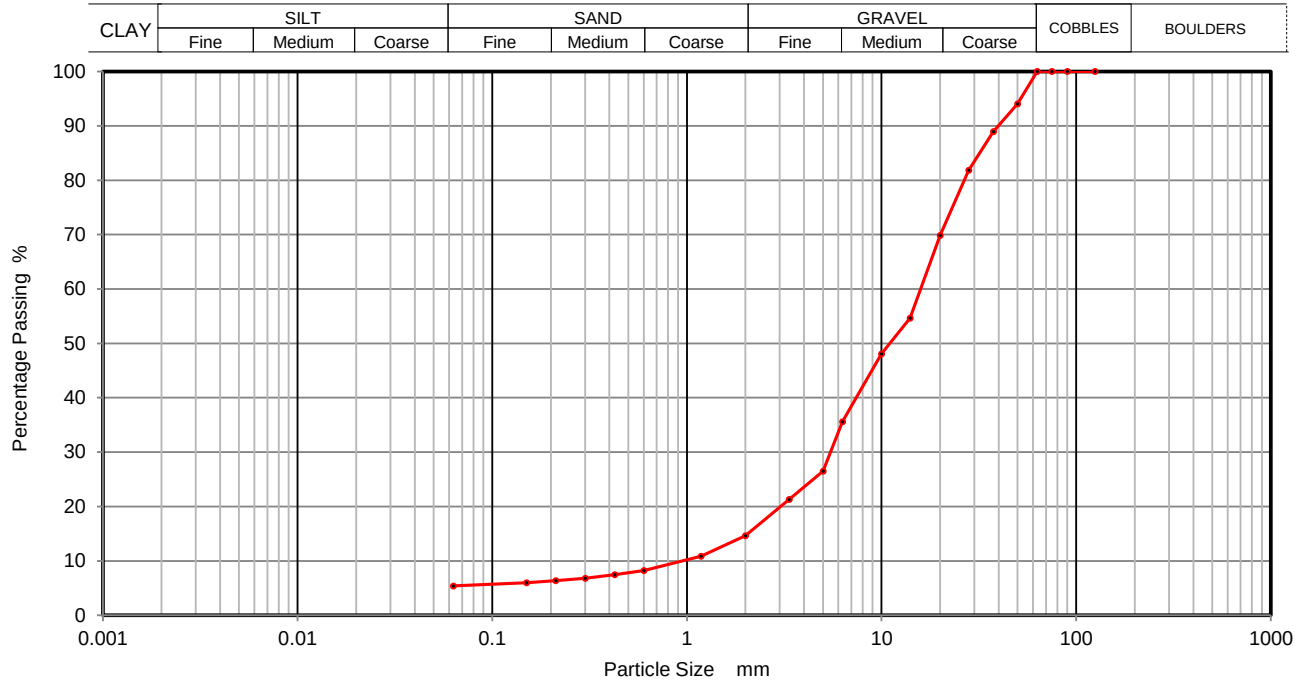
6.00

Date Tested

26-10-20

Sample Type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	94		
37.5	89		
28	82		
20	70		
14	55		
10	48		
6.3	36		
5	26		
3.35	21		
2	15		
1.18	11		
0.6	8		
0.425	7		
0.3	7		
0.212	6		
0.15	6		
0.063	5		

Sample Proportions	% dry mass
Cobbles	0
Gravel	85
Sand	10
Silt and Clay	5

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-10-20	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	27-10-20	Paul Evans	<i>P. Evans</i>



2788

Test Operator	Checked and Authorised by		Paul Evans	
Darren Bourne	Date	27-10-20		

Certificate of Chemical Analysis
BS1377 Part 3 1990

<u>Key</u>	<u>Reported As</u>	<u>Clause</u>
Acid Soluble Sulphate	% SO ₃	Clause 5.2 & 5.5
Aqueous Extract Sulphate	g/l SO ₃	Clause 5.3 & 5.5
Water Soluble Chloride	%	Clause 7.2
pH Value	@ 25°	Clause 9.5
Organic	%	Clause 3
Acid Soluble Chloride	%	Clause 7.3
LOI	%	Clause 4

Remarks
NCP = No Chloride Present

DP Wang



Undrained Shear Strength in Triaxial Compression
BS1377 : Part 7 : Clause 8 : 1991 Set of Three 38 mm
without the measurement of Pore Pressure

Contract Number

50521

Borehole/Pit No.

BH106

Site Name

Atlantic Wharf, Cardiff (BH106)

Sample No.

Soil Description

Greyish brown silty CLAY

Depth Top

8.00

Depth Base

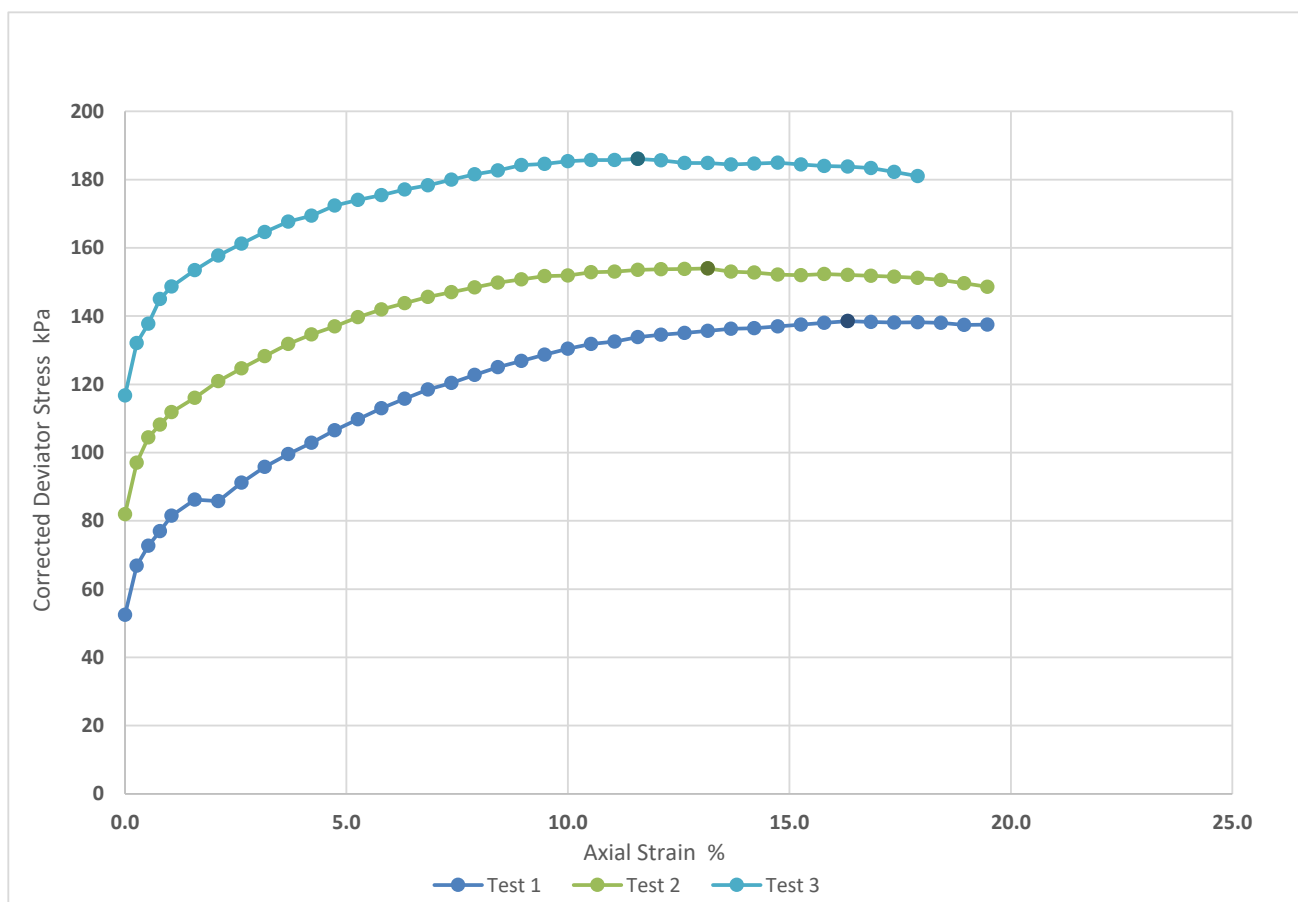
8.45

Date Tested

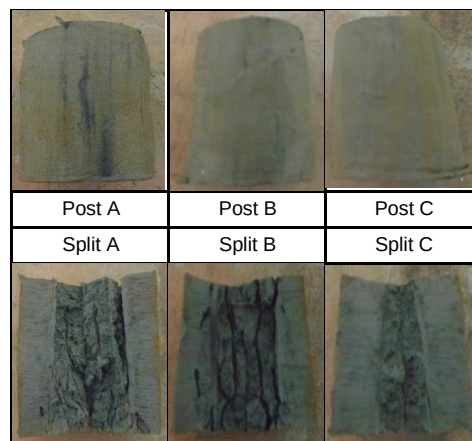
26-10-20

Sample Type

U



	Specimen 1	Specimen 2	Specimen 3
Moisture Content (%)	47	47	47
Bulk Density (Mg/m ³)	1.82	1.79	1.81
Dry Density (Mg/m ³)	1.24	1.22	1.23
Specimen Length (mm)	76	76	76
Specimen Diameter (mm)	38	38	38
Cell Pressures (kPa)	160	320	480
Deviator Stress (kPa)	139	154	186
Undrained Shear Strength (kPa)	69	77	93
Failure Strain (%)	16	13	12
Mode Of Failure	Plastic	Plastic	Plastic
Membrane Used/Thickness	Rubber/0.3mm	Rubber/0.3mm	Rubber/0.3mm
Rate of Strain (%/min)	1.97	1.97	1.97



Checked	26-10-20	Emma Sharp	
Approved	27-10-20	Paul Evans	



Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH106
Sample No.		
Depth	from(m)	11.00
Depth	to(m)	11.45
Date		27/10/2020
Disturbed / Undisturbed		Undisturbed

Description of Specimen

Grey silty CLAY

Initial Specimen Conditions

Height	mm	210.00
Diameter	mm	104.00
Area	mm ²	8494.87
Volume	cm ³	1783.92
Mass	g	3075.37
Dry Mass	g	2350.00
Density	Mg/m ³	1.72
Dry Density	Mg/m ³	1.32
Moisture Content	%	31
Specific Gravity	kN/m ³	2.65
(assumed/measured)		assumed

Final Specimen Conditions

Moisture Content	%	24
Density	Mg/m ³	1.70
Dry Density	Mg/m ³	1.37


Checked and Approved By

27/10/20
Date

Client Ref

Atlantic Wharf, Cardiff

Contract No

Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH106
Sample No.		
Depth	from(m)	11.00
Depth	to(m)	11.45

Test Setup

Date started	17/10/2020
Date Finished	26/10/2020
Top Drain Used	y
Base Drain Used	y
Side Drains Used	y
Pressure System Number	P3
Cell Number	C3

Saturation

Cell Pressure Incr.	kPa	100.00
Back Pressure Incr.	kPa	95.00
Differential Pressure	kPa	5.00
Final Cell Pressure	kPa	700.00
Final Pore Pressure	kPa	600.00
Final B Value		1.00

Consolidation

Effective Pressure	kPa	220.00	440.00	660.00
Cell Pressure	kPa	700.00	700.00	700.00
Back Pressure	kPa	480.00	260.00	40.00
Excess Pore Pressure	kPa	220.00	240.00	260.00
Pore Pressure at End	kPa	580.00	260.00	40.00
Consolidated Volume	cm ³	1745.62	1725.92	1715.42
Consolidated Height	mm	208.50	199.46	190.55
Consolidated Area	mm ²	8373.28	8653.36	9002.57
Vol. Compressibility	m ² /MN	0.03702	0.04341	0.15209
Consolidation Coef.	m ² /yr.	97.17365	0.31371	0.18914


Checked and Approved By

27/10/20
Date

Client Ref

Atlantic Wharf, Cardiff

Contract No

50521

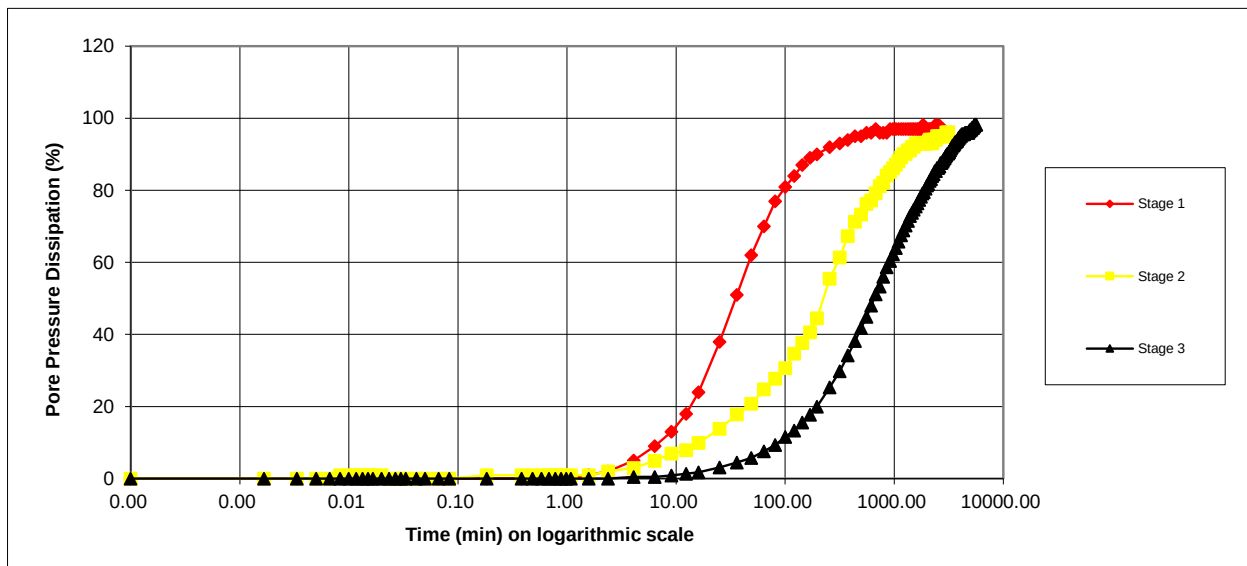
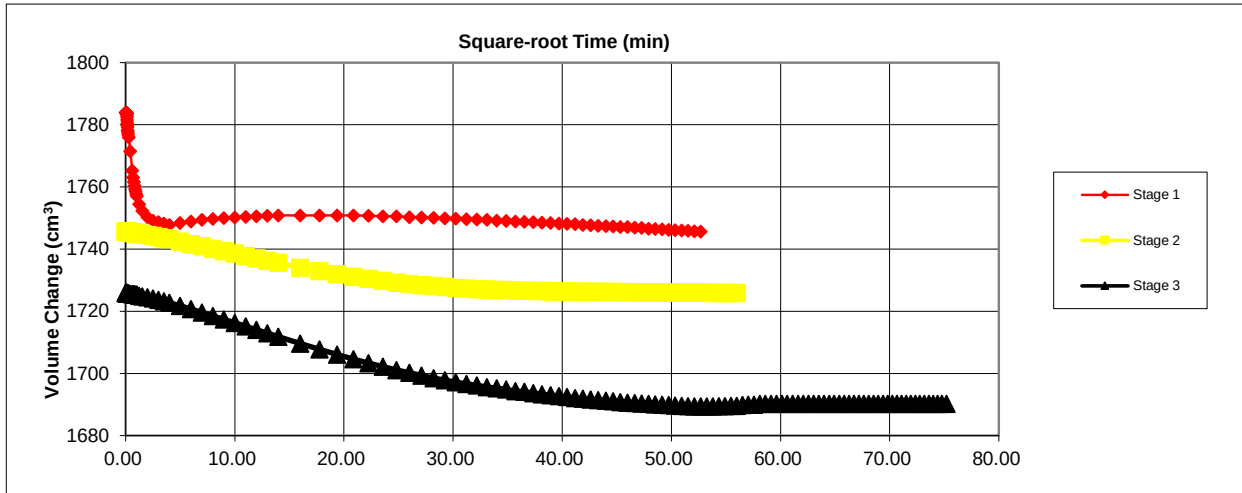
Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH106
Sample No.		
Depth	from(m)	11.00
Depth	to(m)	11.45

Consolidation Stage



D P Gnan
Checked and Approved By

27/10/20
Date

Client Ref

Atlantic Wharf, Cardiff

Contract No

GSTL
GEO SITE & TESTING SERVICES LTD

50521

Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH106
Sample No.		
Depth	from(m)	11.00
Depth	to(m)	11.45

Shearing

Initial Cell Pressure	kPa	700	700	700
Initial Pore Pressure	kPa	480	260	40
Rate of Strain	mm/min	1.9744	0.0061	0.0035
Max Deviator Stress				
Axial Strain		4.748	7.468	14.021
Axial Stress	kPa	250.492	377.24	495.00
Cor. Deviator stress	kPa	247.490	372.96	490.36
Effective Major Stress	kPa	456.490	771.96	1045.36
Effective Minor Stress	kPa	210.000	399.00	555.00
Effective Stress Ratio		2.174	1.935	1.88
s'	kPa	333.245	585.48	800.18
t'	kPa	123.245	186.48	245.18
Max Effective Principle Stress Ratio				
Axial Strain		1.612	7.087	13.176
Axial Stress	kPa	212.387	370.859	494.460
Cor. Deviator stress	kPa	212.119	366.621	489.871
Effective Major Stress	kPa	393.119	762.621	1044.871
Effective Minor Stress	kPa	181.000	396.000	555.000
Effective Stress Ratio		2.172	1.926	1.883
s'	kPa	287.060	579.310	799.936
t'	kPa	106.060	183.310	244.936
Shear Resistance Angle	deg	15.9		
Cohesion c'	kPa	28		

D P Gons

Checked and Approved By

27/10/20

Date

Client Ref

Atlantic Wharf, Cardiff

Contract No

50521

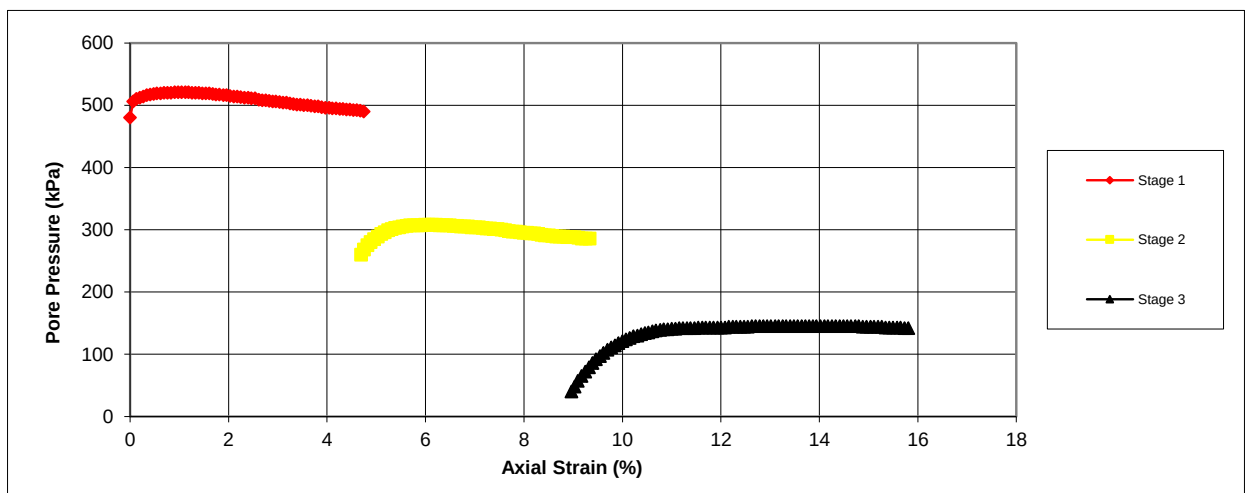
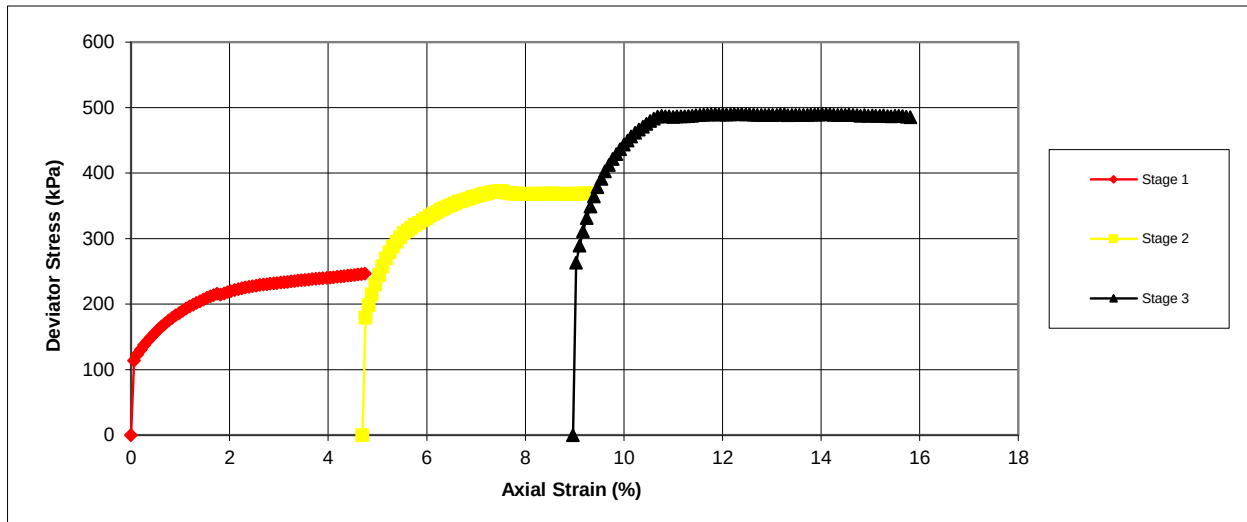
Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH106
Sample No.		
Depth	from(m)	11.00
Depth	to(m)	11.45

Shearing Stage



D P Gans
Checked and Approved By

27/10/20
Date

Client Ref

Atlantic Wharf, Cardiff

Contract No

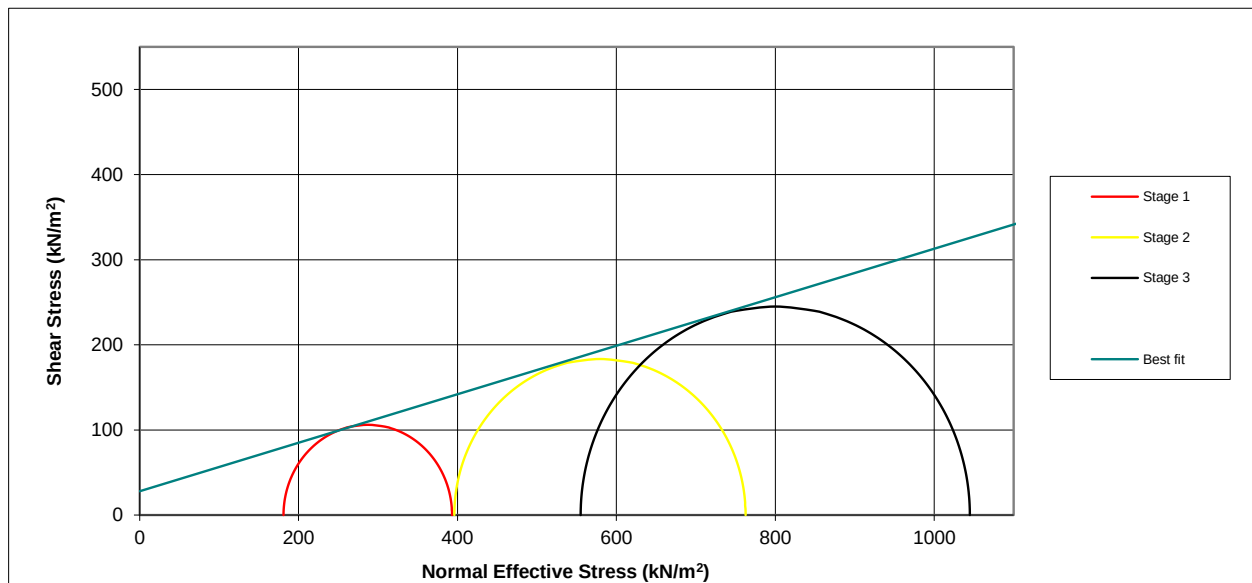
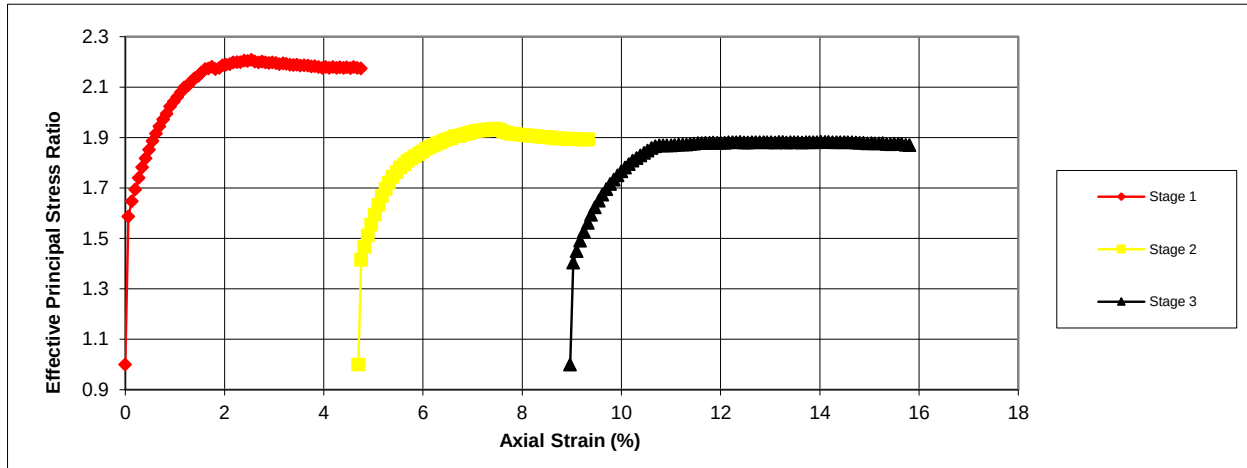
Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH106
Sample No.		
Depth	from(m)	11.00
Depth	to(m)	11.45

Shearing Stage



D P Gons

Checked and Approved By

27/10/20

Date

Client Ref

Atlantic Wharf, Cardiff

Contract No

50521

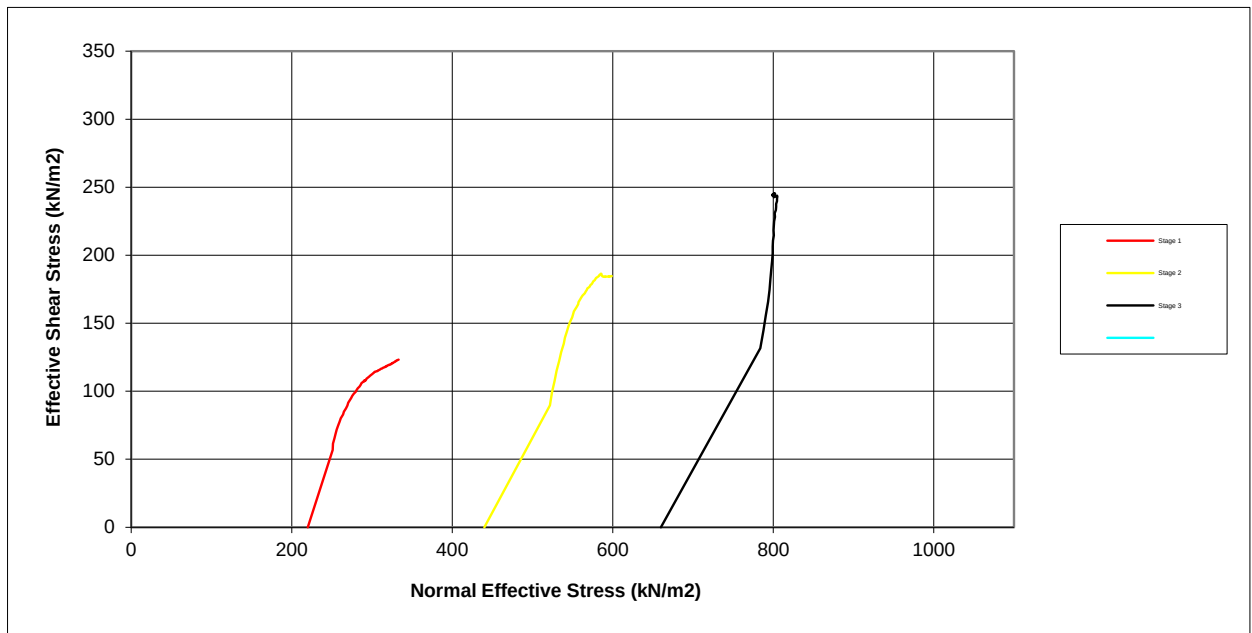
Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH106
Sample No.		
Depth	from(m)	11.00
Depth	to(m)	11.45

Shearing Stage



D P Gans
Checked and Approved By

27/10/20
Date

Client Ref

Atlantic Wharf, Cardiff

Contract No

50521



Contract Number: 50424

Client Ref: **G203312**
Client PO: **AW/AN/007**

Report Date: **26-10-2020**

Client **Envirotrete Technologies Ltd**
Envirotrete Technologies Ltd
LCP House,
The Pensnett Estate,
Kingswinford,
West Midlands.
DY6 7NA
Tel: 01384 288876

Contract Title: **Atlantic Wharf (BH105)**
For the attention of: **Andy Norman**

Date Received: **30-09-2020**
Date Completed: **26-10-2020**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	1
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	1
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	2
Organic Matter Content-dichromate method BS 1377:1990 - Part 3 : 3 - @ Non Accredited Test	1
BRE Reduced Suite includes pH, water & acid soluble sulphate and total sulphur BRE - BR279 - @ Non Accredited Test	4
One-dimensional Consolidation 75mm or 50mm diameter specimens (5 days) BS 1377:1990 - Part 5 : 3 - * UKAS	1

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

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Emma Sharp (Office Manager/Director) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)
Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)



Laboratory Report



Contract Number: 50424

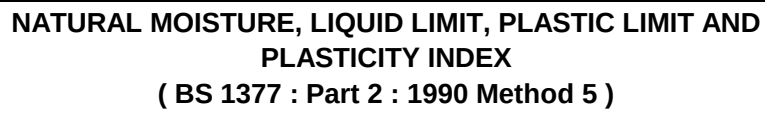
Test Description	Qty
Quick Undrained Triaxial Compression test - set of 3 - 38mm diameter specimens BS 1377:1990 - Part 7 : 8 - * UKAS	1
Disposal of samples for job	1

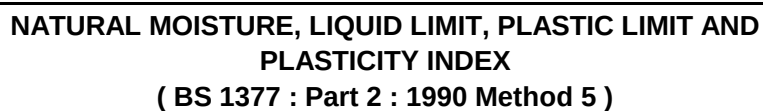
Notes: Observations and Interpretations are outside the UKAS Accreditation
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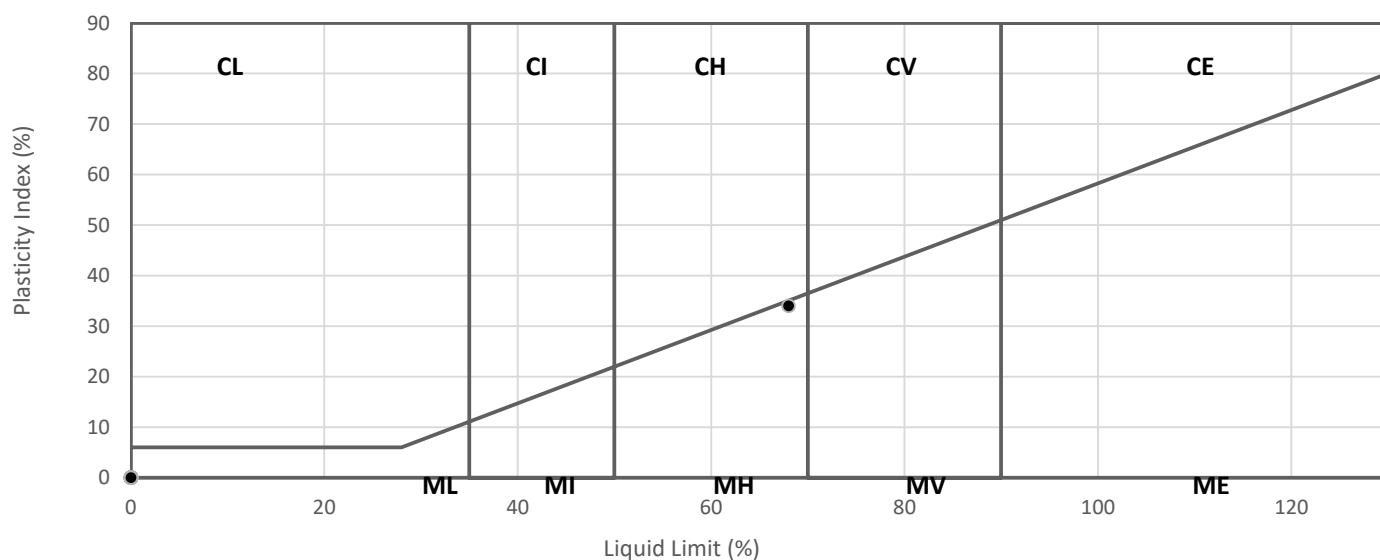
Approved Signatories:

Emma Sharp (Office Manager/Director) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)
Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)

[illegible]

[illegible]

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION BS 5930:1999+A2:2010



Operators	Checked	26-10-20	Richard John (Advanced Testing Manager)
Darren Bourne	Approved	26-10-20	Paul Evans (Quality/Technical Manager)





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **50424**

Borehole/Pit No. **BH105**

Site Name **Atlantic Wharf (BH105)**

Sample No.

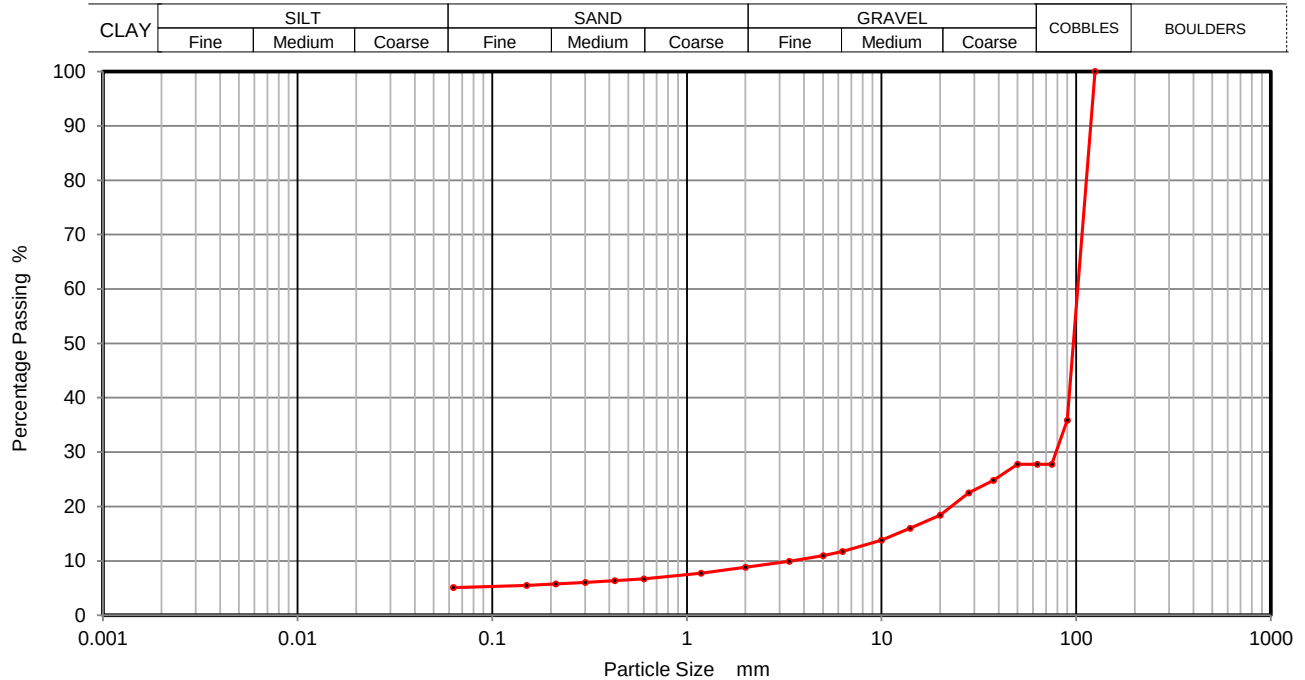
Soil Description **Dark brown fine to coarse GRAVEL. Cobbles**

Depth Top **2.50**

Depth Base **3.50**

Date Tested **17-10-20**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	36		
75	28		
63	28		
50	28		
37.5	25		
28	23		
20	18		
14	16		
10	14		
6.3	12		
5	11		
3.35	10		
2	9		
1.18	8		
0.6	7		
0.425	6		
0.3	6		
0.212	6		
0.15	5		
0.063	5		

Sample Proportions	% dry mass
Cobbles	72
Gravel	19
Sand	4
Silt and Clay	5

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	25-10-20	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	26-10-20	Paul Evans	<i>P. Evans</i>



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **50424**

Borehole/Pit No. **BH105**

Site Name **Atlantic Wharf (BH105)**

Sample No.

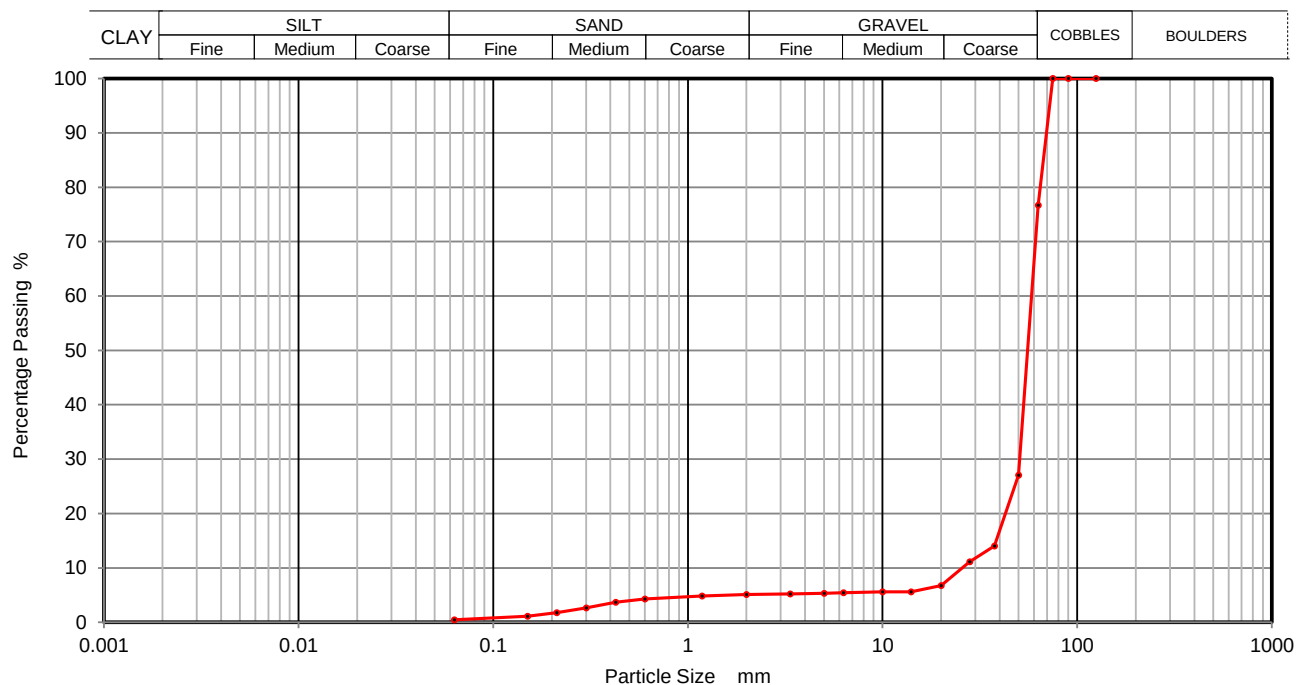
Soil Description **Wood fibres (Organic)**

Depth Top **15.70**

Depth Base **16.00**

Date Tested **17-10-20**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	77		
50	27		
37.5	14		
28	11		
20	7		
14	6		
10	6		
6.3	5		
5	5		
3.35	5		
2	5		
1.18	5		
0.6	4		
0.425	4		
0.3	3		
0.212	2		
0.15	1		
0.063	0		

Sample Proportions	% dry mass
Cobbles	23
Gravel	72
Sand	5
Silt and Clay	0

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	25-10-20	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	26-10-20	Paul Evans	<i>P. Evans</i>



2788

Certificate of Chemical Analysis
BS1377 Part 3 1990



ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

Contract Number

50424

Borehole/Trialpit No.

BH105

Site Name

Atlantic Wharf (BH105)

Sample No.

Soil Description

Grey silty CLAY

Depth Top (m)

6.00

Depth Base (m)

6.45

Lab Temperature

20°C

Sample Location

Top

Remarks

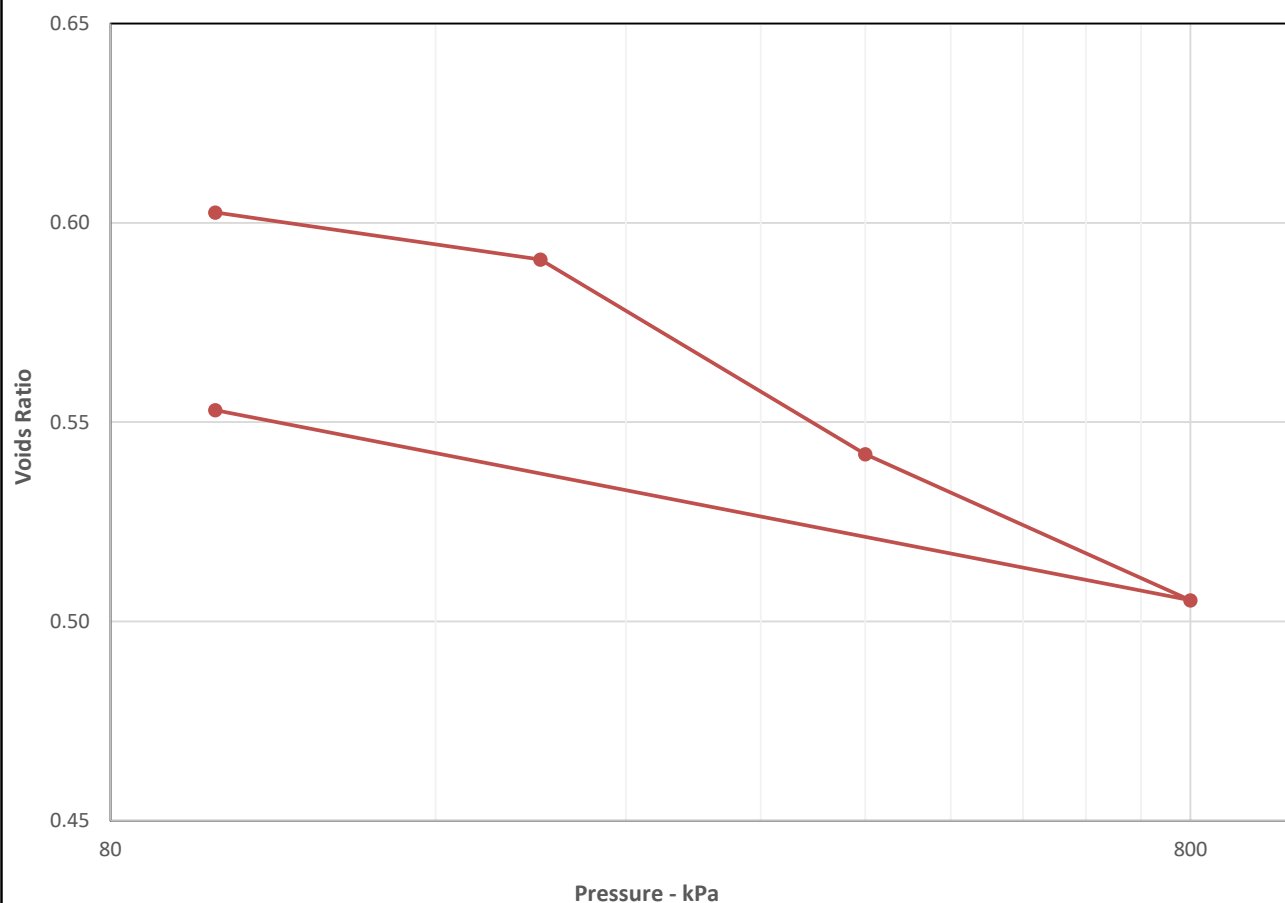
Cv Calculated Using T90
Particle Density Assumed Unless Stated Otherwise

Sample Type

UT

Date Tested

21-05-20



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	26	0	-	100	0.6	0.44		-			
Bulk Density (Mg/m3)	1.96	100	-	200	0.074	2		-			
Dry Density (Mg/m3)	1.56	200	-	400	0.15	1.3		-			
Voids Ratio	0.7027	400	-	800	0.06	1.1		-			
Degree of saturation	98.2	800	-	100	0.045	9.5		-			
Height (mm)	18.64		-					-			
Diameter (mm)	74.63		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operators	Checked	25-10-20	Emma Sharp	
LG	Approved	26-10-20	Paul Evans	





Undrained Shear Strength in Triaxial Compression
BS1377 : Part 7 : Clause 8 : 1991 Set of Three 38 mm
without the measurement of Pore Pressure

Contract Number

50424

Borehole/Pit No.

BH105

Site Name

Atlantic Wharf (BH105)

Sample No.

Soil Description

Brown silty CLAY

Depth Top

6.00

Depth Base

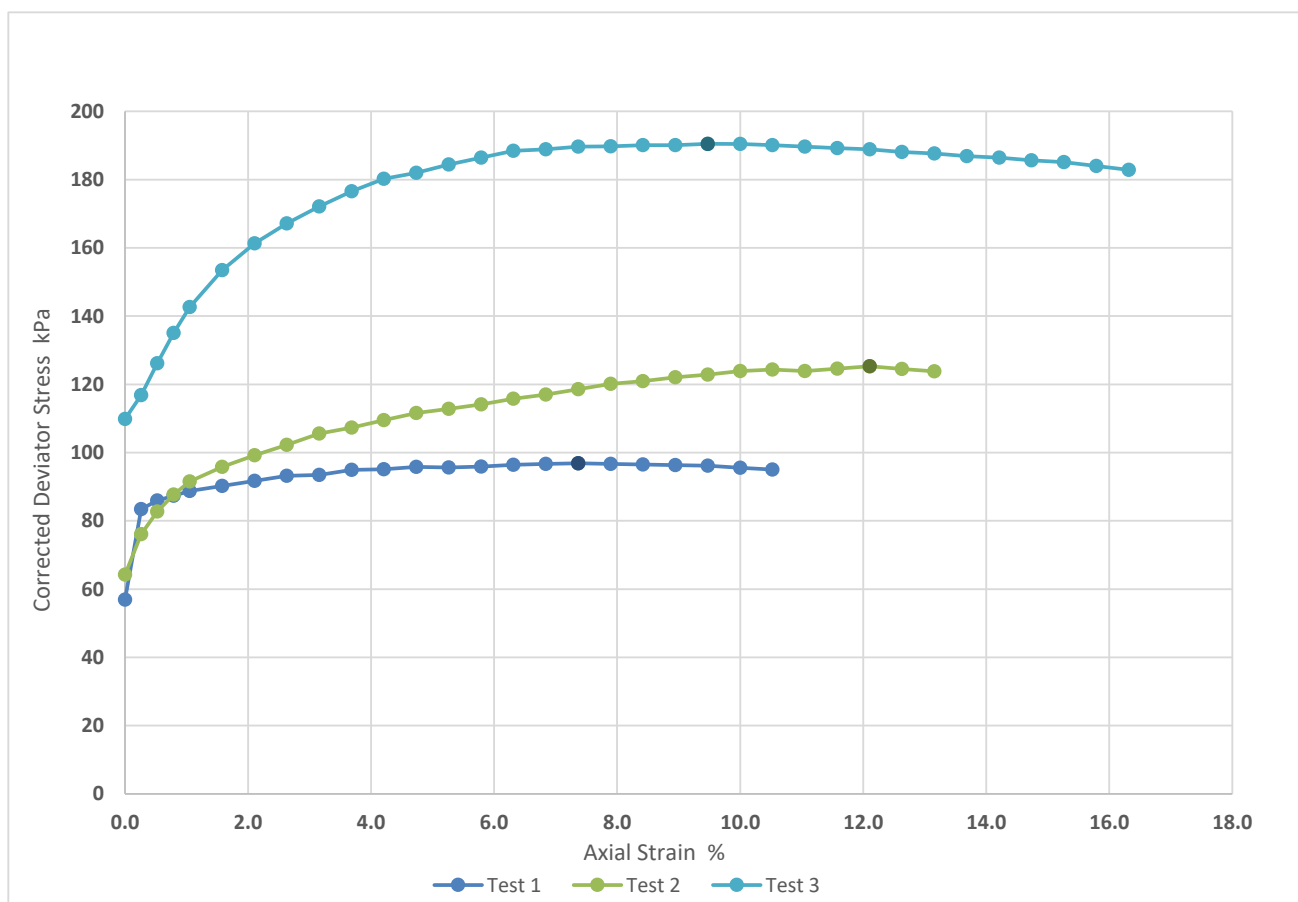
6.45

Date Tested

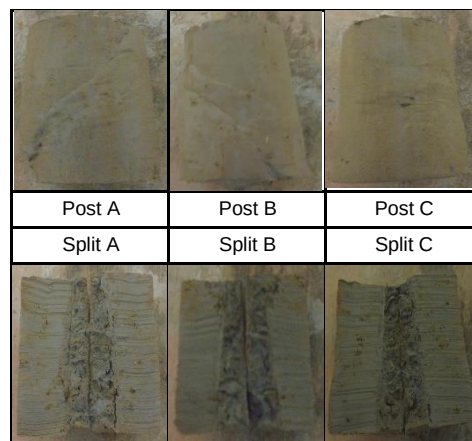
26-10-20

Sample Type

UT



	Specimen 1	Specimen 2	Specimen 3
Moisture Content (%)	38	38	38
Bulk Density (Mg/m ³)	1.78	1.82	1.80
Dry Density (Mg/m ³)	1.29	1.33	1.31
Specimen Length (mm)	76	76	76
Specimen Diameter (mm)	38	38	38
Cell Pressures (kPa)	120	240	480
Deviator Stress (kPa)	97	125	190
Undrained Shear Strength (kPa)	48	63	95
Failure Strain (%)	7.4	12	9.5
Mode Of Failure	Brittle	Brittle	Brittle
Membrane Used/Thickness	Rubber/0.3mm	Rubber/0.3mm	Rubber/0.3mm
Rate of Strain (%/min)	1.97	1.97	1.97



Checked	25-10-20	Emma Sharp	
Approved	26-10-20	Paul Evans	





Contract Number: 50187

Client Ref: **G203312**
Client PO: **AW/AN/007**

Report Date: **21-10-2020**

Client **Envirotrat Technologies Ltd**
Envirotrat Technologies Ltd
LCP House,
The Pensnett Estate,
Kingswinford,
West Midlands.
DY6 7NA
Tel: 01384 288876

Contract Title: **Atlantic Wharf, Cardiff**
For the attention of: **Andy Norman**

Date Received: **21-09-2020**
Date Completed: **21-10-2020**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	9
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	9
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	7
Organic Matter Content-dichromate method BS 1377:1990 - Part 3 : 3 - @ Non Accredited Test	3
Loss on Ignition BS 1377:1990 - Part 3 : 4 - @ Non Accredited Test	1
BRE Suite D Brownfield Site (pyrite present) includes pH, water & acid soluble sulphate, total sulphur, magnesium, chloride and nitrate BRE - BR279 - @ Non Accredited Test	5

Notes: ~~Observations and Interpretations are outside the UKAS Accreditation~~
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@ - denotes non accredited tests

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Emma Sharp (Office Manager/Director) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)
Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)



Laboratory Report



Contract Number: 50187

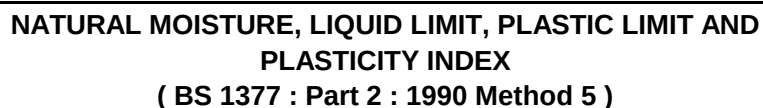
Test Description	Qty
One-dimensional Consolidation 75mm or 50mm diameter specimens (5 days) BS 1377:1990 - Part 5 : 3 - * UKAS	2
Consolidated Drained Peak and Residual Shear Strength - set of 3 60 x 60mm Shear Box Specimens (5 days) BS 1377:1990 - Part 7 : 4 - * UKAS	1
CD 100mm Consolidated drained Triaxial compression test on a single 100 mm diameter specimens Multistage loading with the measurement of volume change and pore water pressure including saturation and consolidation, test duration FOUR days. PLEASE NOTE IT IS LIKELY THIS TEST WILL INCUR EXTRA OVER DAY CHARGES. BS 1377:1990 - Part 8 : 7	2
Extra over items for test duration in excess of four days.	18
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation
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@ - denotes non accredited tests

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Approved Signatories:

Emma Sharp (Office Manager/Director) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)
Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)

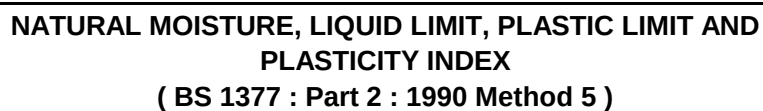


Contract Number	50187	
Site Name	Atlantic Wharf, Cardiff	
Date Tested	07/10/2020	
	DESCRIPTIONS	

[illegible]

Operators	Checked	16/10/2020	Wayne Honey (Administrative/Quality Assistant)
Clayton Jenkins	Approved	16/10/2020	Paul Evans (Quality/Technical Manager)







**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number **50187**

Borehole/Pit No. **BH103**

Site Name **Atlantic Wharf, Cardiff**

Sample No.

Soil Description

Dark greyish brown fine slightly sandy silty clayey fine to coarse GRAVEL.

Depth Top

3.00

Depth Base

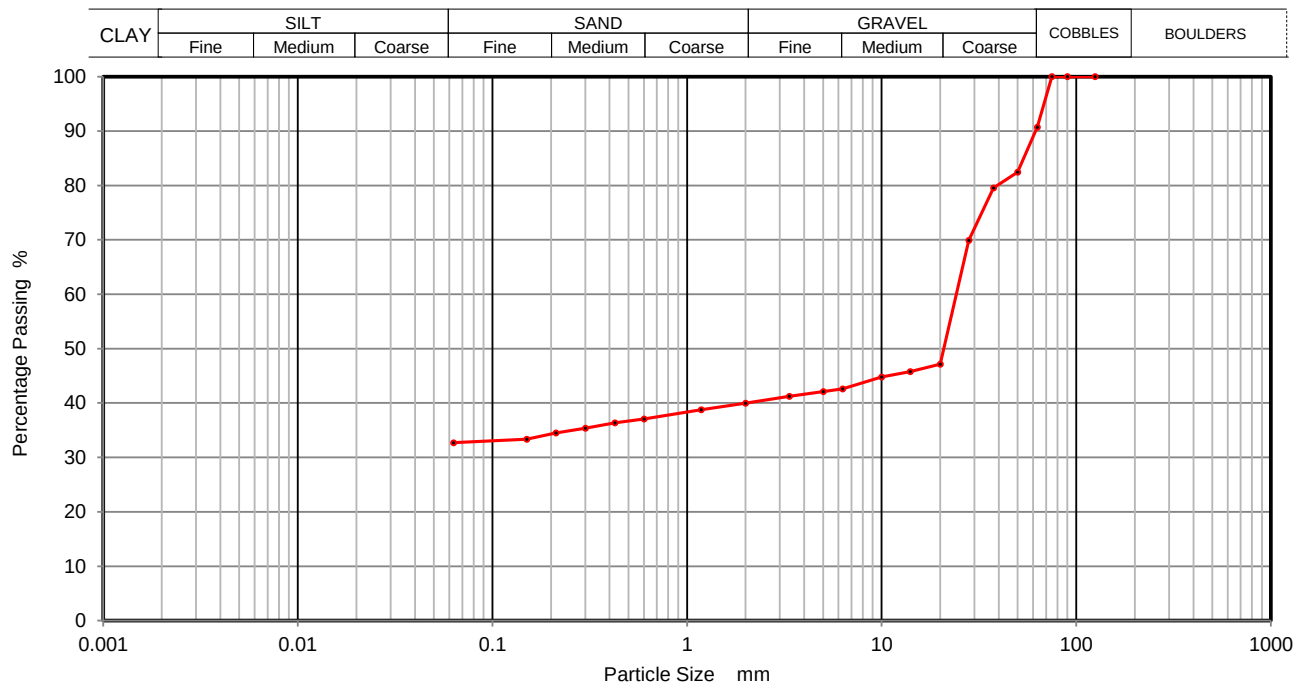
3.50

Date Tested

07/10/2020

Sample Type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	91		
50	82		
37.5	80		
28	70		
20	47		
14	46		
10	45		
6.3	43		
5	42		
3.35	41		
2	40		
1.18	39		
0.6	37		
0.425	36		
0.3	35		
0.212	34		
0.15	33		
0.063	33		

Sample Proportions	% dry mass
Cobbles	9
Gravel	51
Sand	7
Silt and Clay	33

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	15/10/2020	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	16/10/2020	Paul Evans	<i>P. Evans</i>



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **50187**

Borehole/Pit No. **BH103**

Site Name **Atlantic Wharf, Cardiff**

Sample No.

Soil Description

Dark greyish brown fine slightly sandy fine to coarse gravelly silty CLAY.

Depth Top

7.00

Depth Base

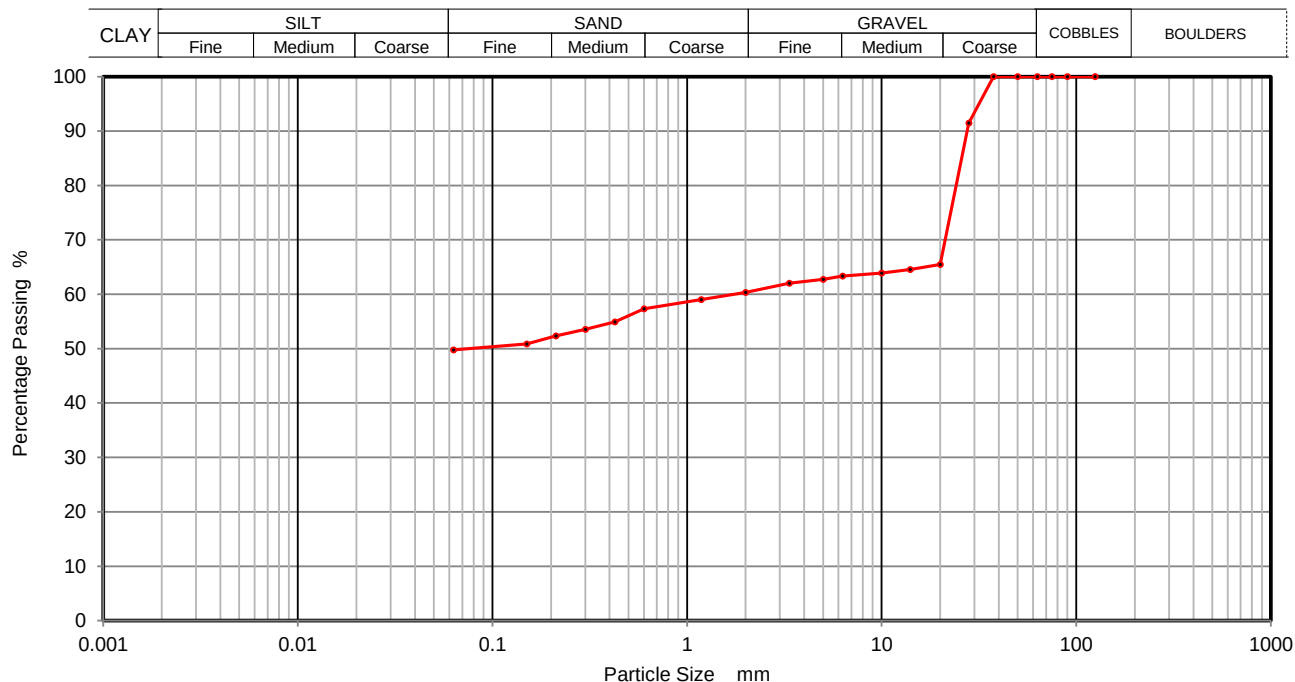
8.00

Date Tested

07/10/2020

Sample Type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	91		
20	65		
14	65		
10	64		
6.3	63		
5	63		
3.35	62		
2	60		
1.18	59		
0.6	57		
0.425	55		
0.3	54		
0.212	52		
0.15	51		
0.063	50		

Sample Proportions	% dry mass
Cobbles	0
Gravel	40
Sand	10
Silt and Clay	50

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	15/10/2020	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	16/10/2020	Paul Evans	<i>P. Evans</i>



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **50187**

Borehole/Pit No. **BH103**

Site Name **Atlantic Wharf, Cardiff**

Sample No.

Soil Description

Dark greyish brown fine slightly sandy silty clayey fine to coarse GRAVEL.

Depth Top

9.80

Depth Base

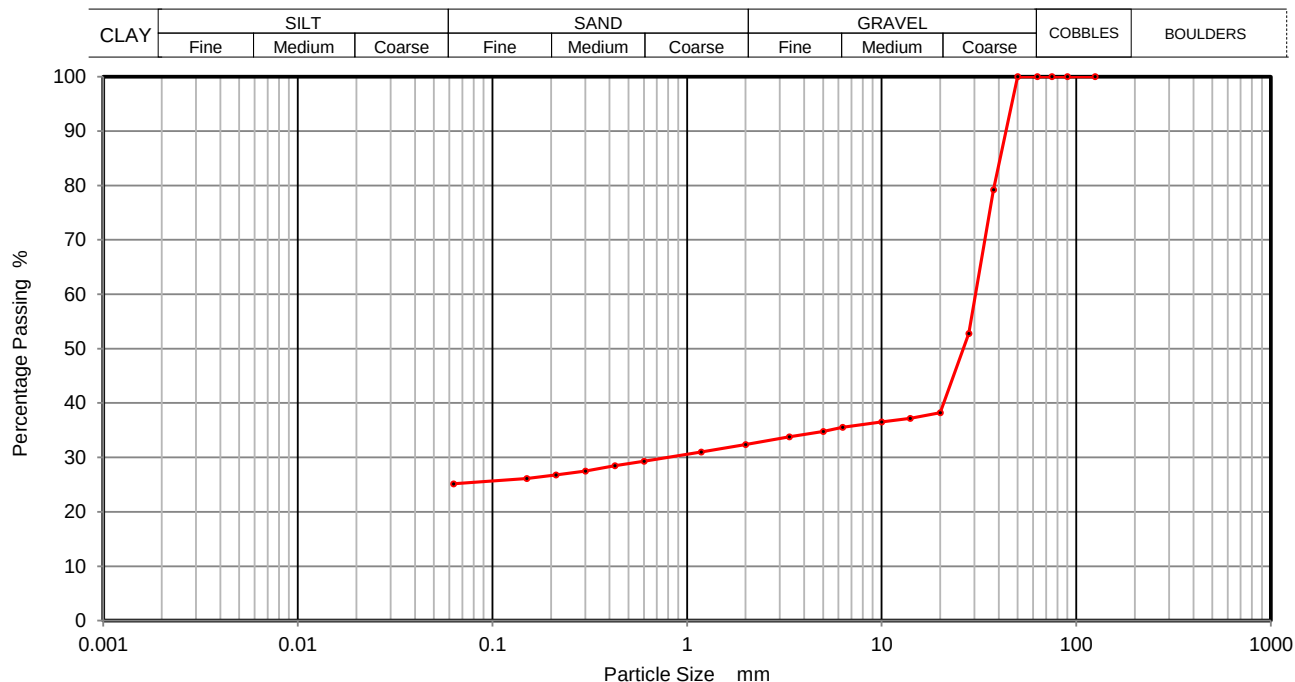
10.50

Date Tested

07/10/2020

Sample Type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	79		
28	53		
20	38		
14	37		
10	37		
6.3	36		
5	35		
3.35	34		
2	32		
1.18	31		
0.6	29		
0.425	28		
0.3	28		
0.212	27		
0.15	26		
0.063	25		

Sample Proportions	% dry mass
Cobbles	0
Gravel	68
Sand	7
Silt and Clay	25

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	15/10/2020	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	16/10/2020	Paul Evans	<i>P. Evans</i>



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **50187**

Borehole/Pit No. **BH103**

Site Name **Atlantic Wharf, Cardiff**

Sample No.

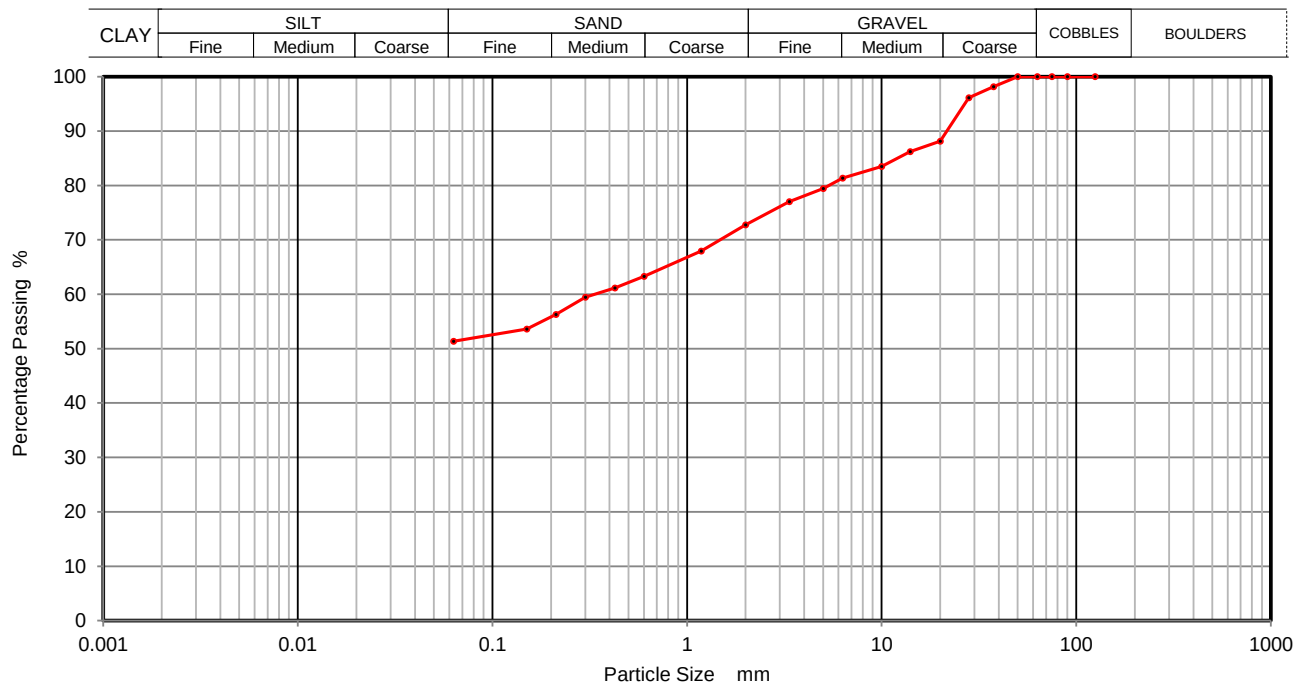
Soil Description **Dark greyish brown fine slightly sandy fine to coarse gravelly silty CLAY.**

Depth Top **17.40**

Depth Base **18.00**

Date Tested **07/10/2020**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	96		
20	88		
14	86		
10	83		
6.3	81		
5	79		
3.35	77		
2	73		
1.18	68		
0.6	63		
0.425	61		
0.3	59		
0.212	56		
0.15	54		
0.063	51		

Sample Proportions	% dry mass
Cobbles	0
Gravel	27
Sand	22
Silt and Clay	51

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	15/10/2020	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	16/10/2020	Paul Evans	<i>P. Evans</i>



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **50187**

Borehole/Pit No. **BH103**

Site Name **Atlantic Wharf, Cardiff**

Sample No.

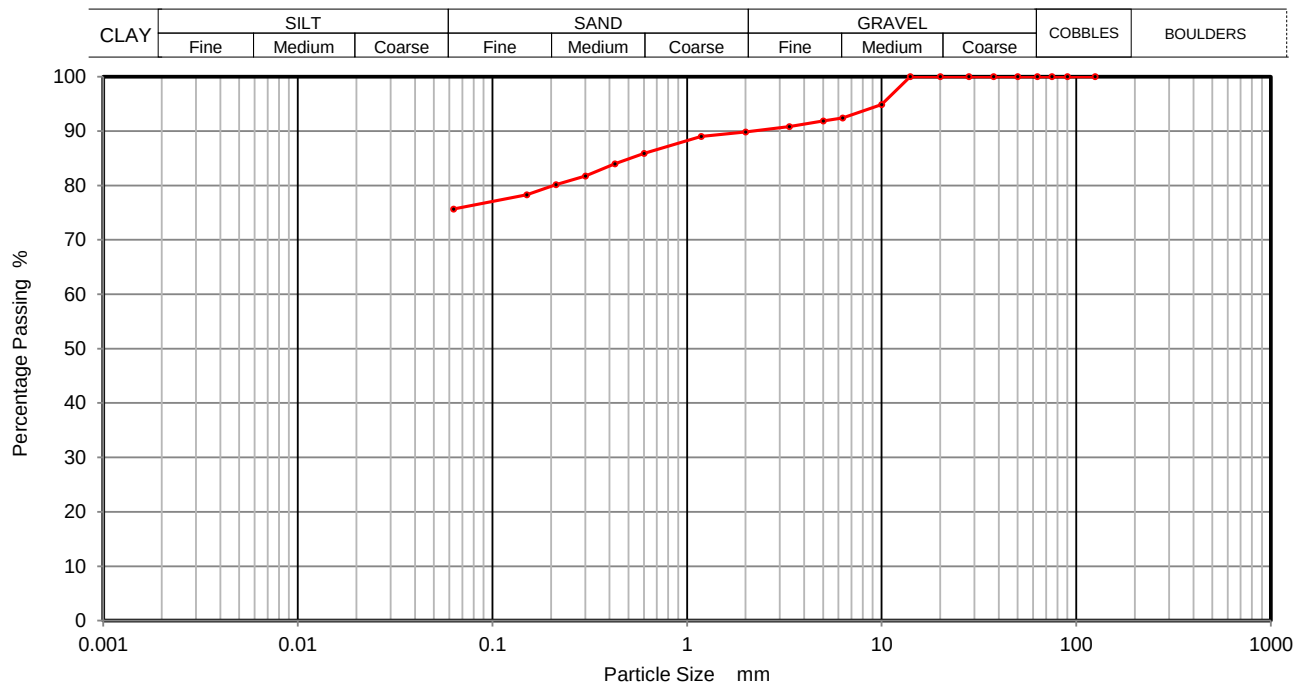
Soil Description **Dark greyish brown fine slightly gravelly sandy silty CLAY.**

Depth Top **17.50**

Depth Base **17.60**

Date Tested **07/10/2020**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	95		
6.3	92		
5	92		
3.35	91		
2	90		
1.18	89		
0.6	86		
0.425	84		
0.3	82		
0.212	80		
0.15	78		
0.063	76		

Sample Proportions	% dry mass
Cobbles	0
Gravel	10
Sand	14
Silt and Clay	76

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	15/10/2020	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	16/10/2020	Paul Evans	<i>P. Evans</i>



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number

50187

Borehole/Pit No.

BH104

Site Name

Atlantic Wharf, Cardiff

Sample No.

Soil Description

Dark greyish brown fine slightly gravelly sandy silty CLAY.

Depth Top

2.45

Depth Base

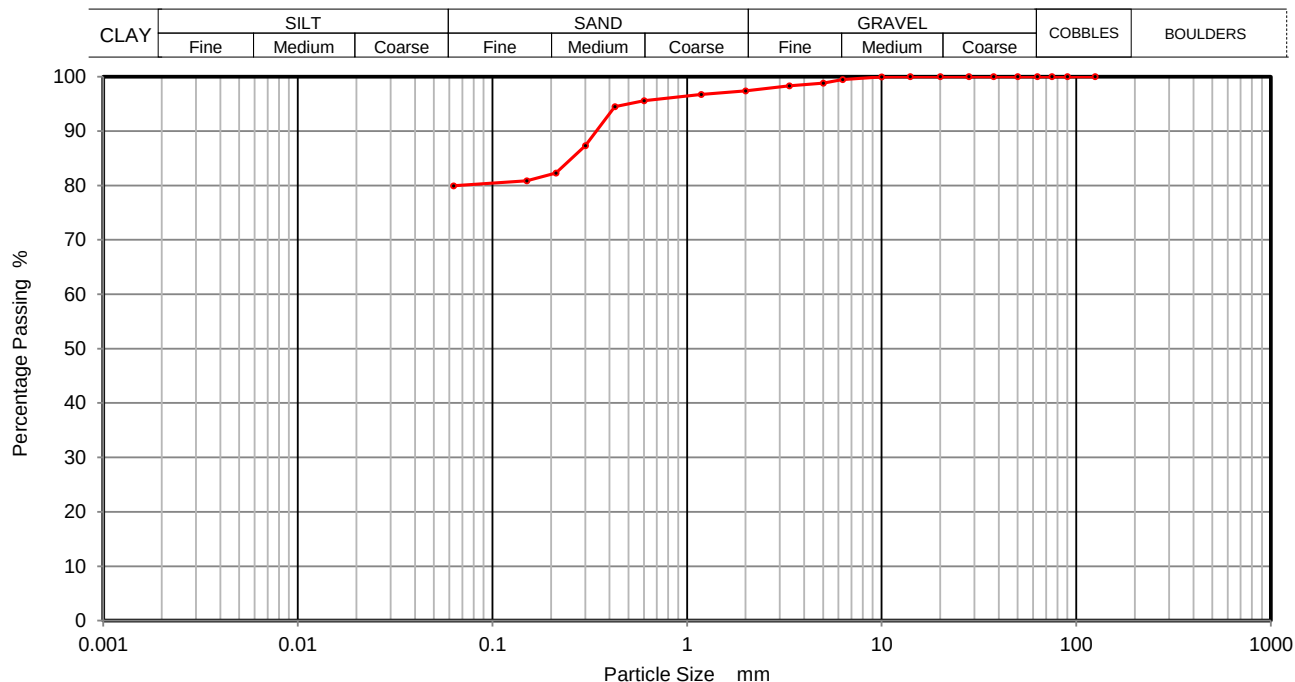
3.00

Date Tested

07/10/2020

Sample Type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	98		
2	97		
1.18	97		
0.6	96		
0.425	95		
0.3	87		
0.212	82		
0.15	81		
0.063	80		

Sample Proportions

% dry mass

Cobbles	0
Gravel	3
Sand	17
Silt and Clay	80

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators

Checked

15/10/2020

Wayne Honey

W. Honey

RO/MH

Approved

16/10/2020

Paul Evans

P. Evans



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **50187**

Borehole/Pit No. **BH104**

Site Name **Atlantic Wharf, Cardiff**

Sample No.

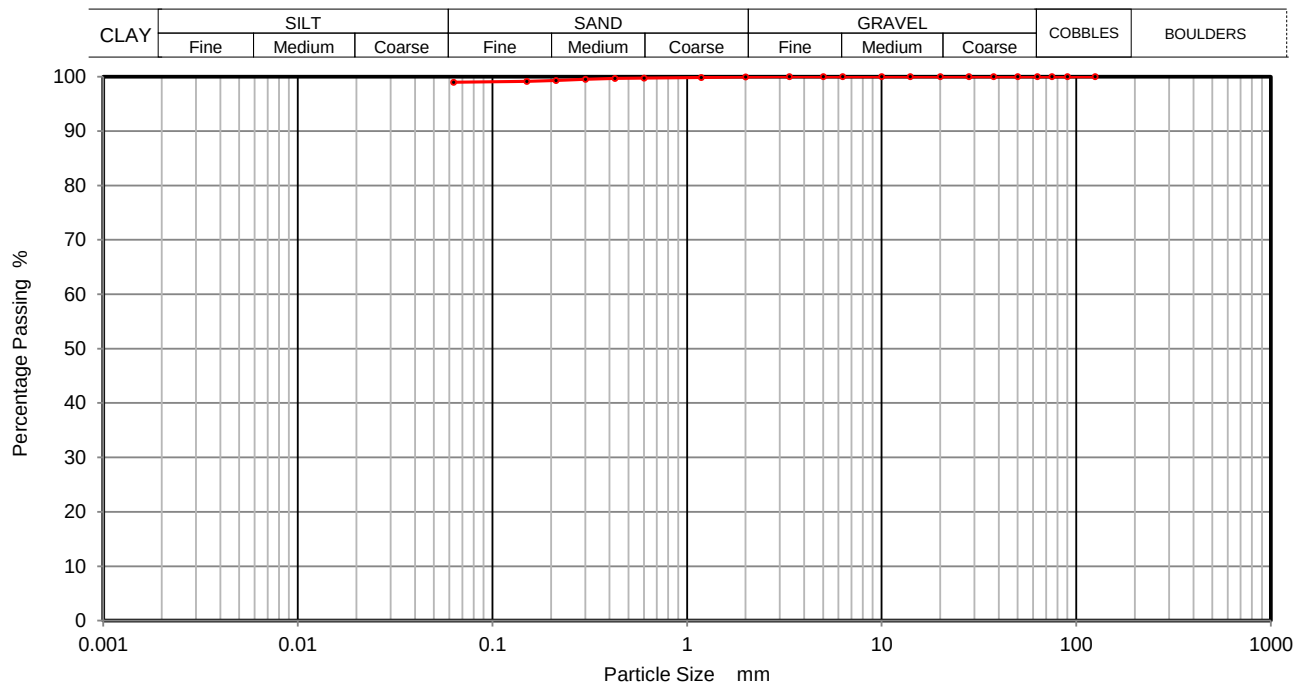
Soil Description **Dark greyish brown fine slightly sandy silty CLAY.**

Depth Top **4.50**

Depth Base **5.20**

Date Tested **07/10/2020**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	99		
0.063	99		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	1
Silt and Clay	99

Remarks
 Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	15/10/2020	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	16/10/2020	Paul Evans	<i>P. Evans</i>



Test Operator	Checked and Authorised by		Paul Evans	
Darren Bourne	Date	16/10/2020		

Certificate of Chemical Analysis
BS1377 Part 3 1990

[illegible]



ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

Contract Number 50187

Borehole/Trialpit No. BH103

Site Name Atlantic Wharf, Cardiff

Sample No.

Soil Description Greyish brown silty CLAY

Depth Top (m) 13.00

Depth Base (m) 13.45

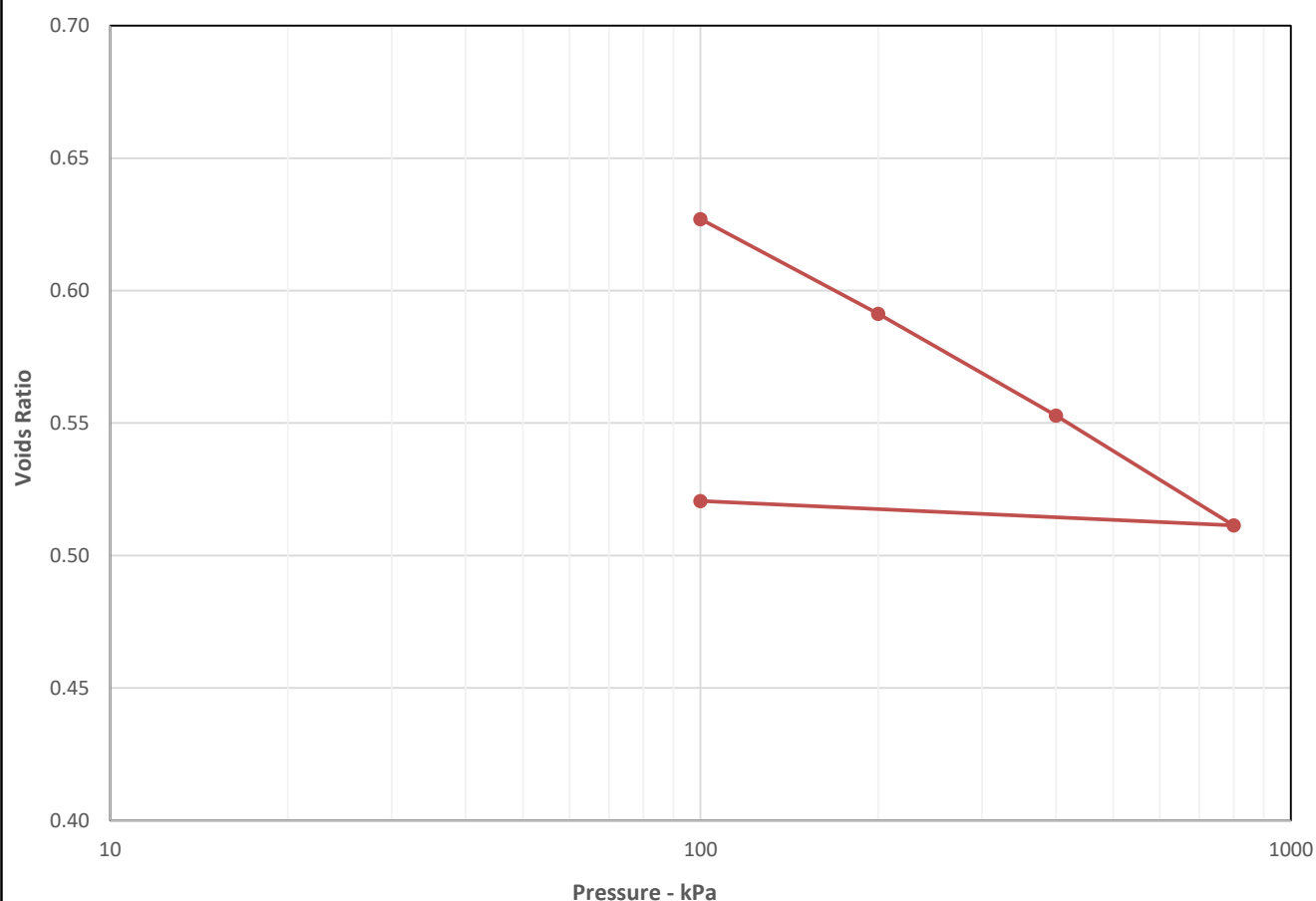
Lab Temperature 20°C

Sample Location Middle

Remarks Cv Calculated Using T90
Particle Density Assumed Unless Stated Otherwise

Sample Type UT

Date Tested 29/09/2020



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	25	0	-	100	0.7	4.5		-			
Bulk Density (Mg/m3)	2.04	100	-	200	0.22	9.3		-			
Dry Density (Mg/m3)	1.63	200	-	400	0.12	14		-			
Voids Ratio	0.7479	400	-	800	0.07	7.6		-			
Degree of saturation	95.9	800	-	100	0.0087	5.4		-			
Height (mm)	19.65		-					-			
Diameter (mm)	74.99		-					-			
Particle Density (Mg/m3)	2.85		-					-			

Operators	Checked	15/10/2020	Emma Sharp	
LG	Approved	16/10/2020	Paul Evans	





ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

Contract Number

50187

Borehole/Trialpit No.

BH104

Site Name

Atlantic Wharf, Cardiff

Sample No.

Soil Description

Greyish brown silty CLAY

Depth Top (m)

9.50

Depth Base (m)

9.95

Lab Temperature

20°C

Sample Location

Middle

Remarks

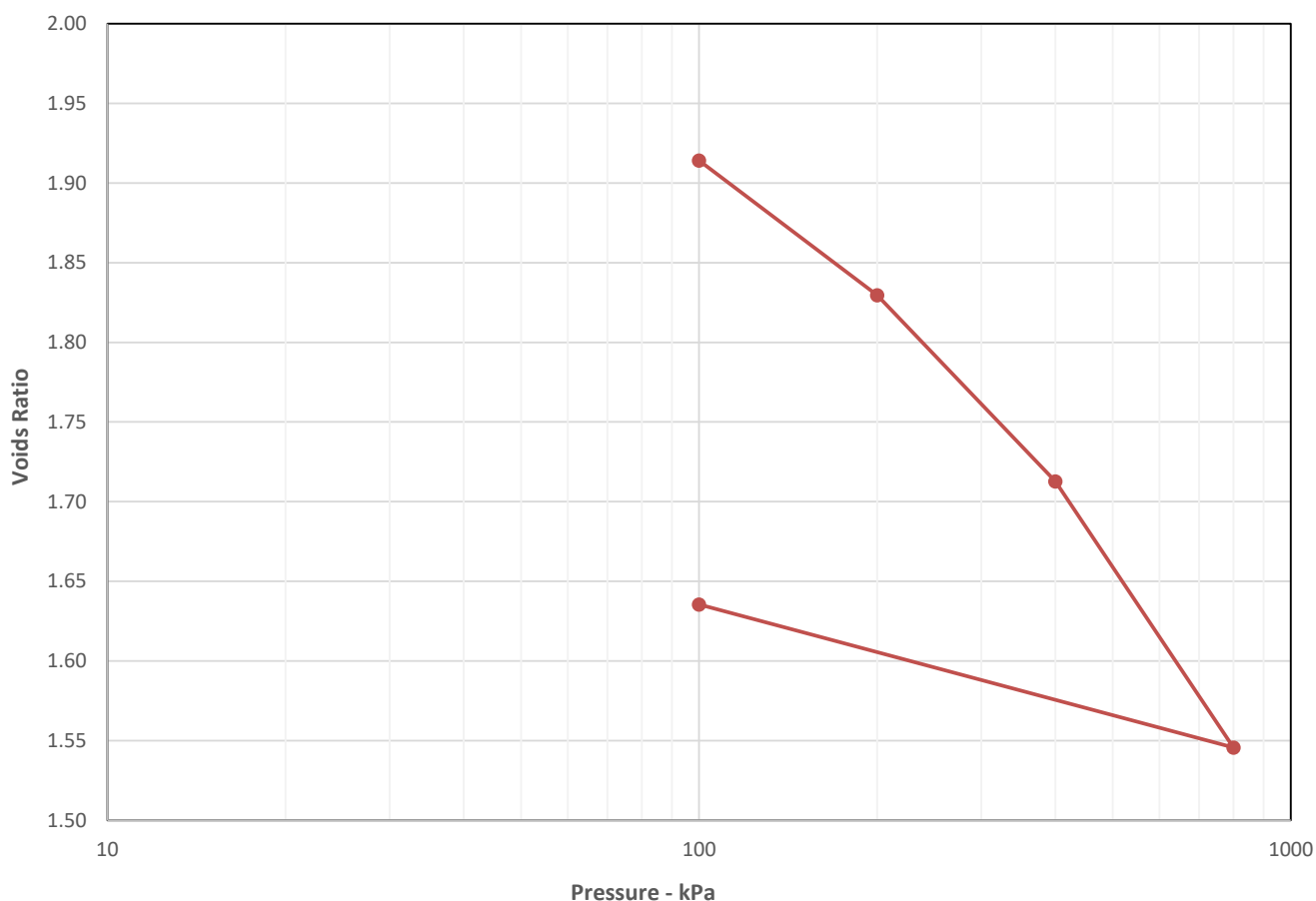
Cv Calculated Using T90
Particle Density Assumed Unless Stated Otherwise

Sample Type

UT

Date Tested

29/09/2020



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	66	0	-	100	0.4	18		-			
Bulk Density (Mg/m3)	1.68	100	-	200	0.29	6.2		-			
Dry Density (Mg/m3)	1.01	200	-	400	0.21	0.59		-			
Voids Ratio	2.0283	400	-	800	0.15	0.5		-			
Degree of saturation	100.0	800	-	100	0.05	0.41		-			
Height (mm)	19.86		-					-			
Diameter (mm)	74.98		-					-			
Particle Density (Mg/m3)	3.05		-					-			

Operators	Checked	15/10/2020	Emma Sharp	
LG	Approved	16/10/2020	Paul Evans	



Test Report: CONSOLIDATED DRAINED PEAK AND RESIDUAL SHEARBOX TEST.

BS1377:Part 7.4.5.5 Shearing: multi-reversal test :1990

Borehole Number: TP01 Depth from (m): 4.00

Sample Type: B	Remoulded (Light Tamping) material above 2.5mm removed
Particle Density - Mg/m ³ :	2.65 (Assumed)
Specimen Tested:	Submerged

Sample Description:

Brown CLAY

STAGE	1	2	3
Initial Conditions			
Height - mm:	23.98	23.98	23.98
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	36	36	36
Bulk Density - Mg/m ³ :	1.83	1.83	1.83
Dry Density - Mg/m ³ :	1.34	1.34	1.34
Voids Ratio:	0.9734	0.9749	0.9766
Normal Pressure- kPa	80	160	240
Consolidation			
Consolidated Height - mm:	23.34	22.49	21.64
Shear			
Rate of Strain (mm/min)	0.010	0.010	0.010
Strain at peak shear stress (mm)	3.54	4.86	5.43
Peak shear Stress - kPa:	47	73	99

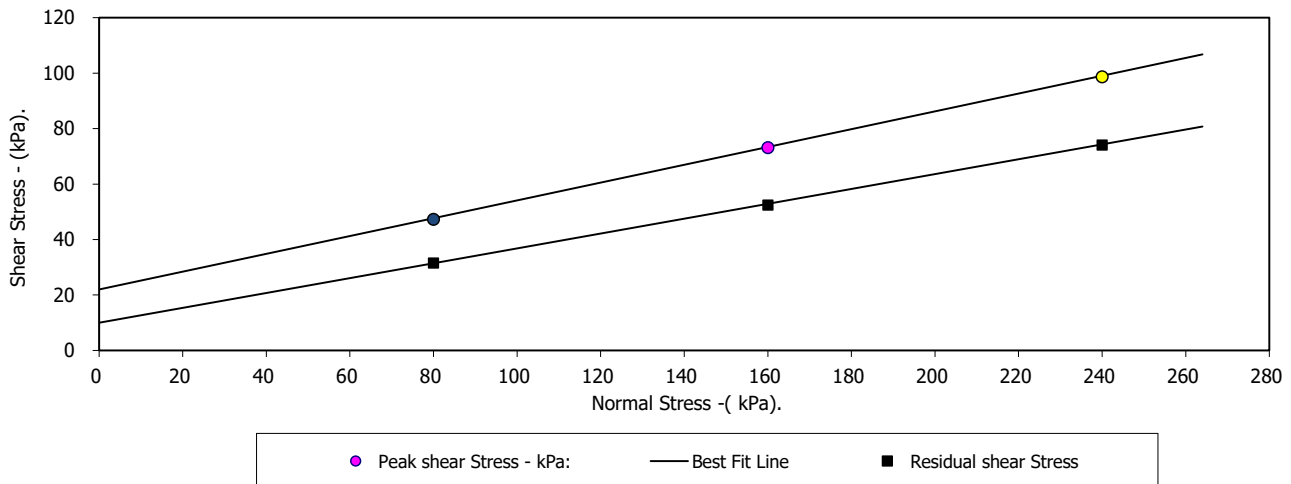
PEAK

Angle of Shearing Resistance:(θ)	17.8
Effective Cohesion - kPa:	22

RESIDUAL

Angle of Shearing Resistance:(θ)	15.0
Effective Cohesion - kPa:	10

Failure Conditions



D P Gans 08-10-20

Checked Pages 1-4 by: Date

D P Gans

Approved Pages 1-4 by: 08-10-20



Contract No.:
50187

Client Ref Number:
AW/AN/007

Atlantic Wharf

Test Report: CONSOLIDATED DRAINED PEAK AND RESIDUAL SHEARBOX TEST.

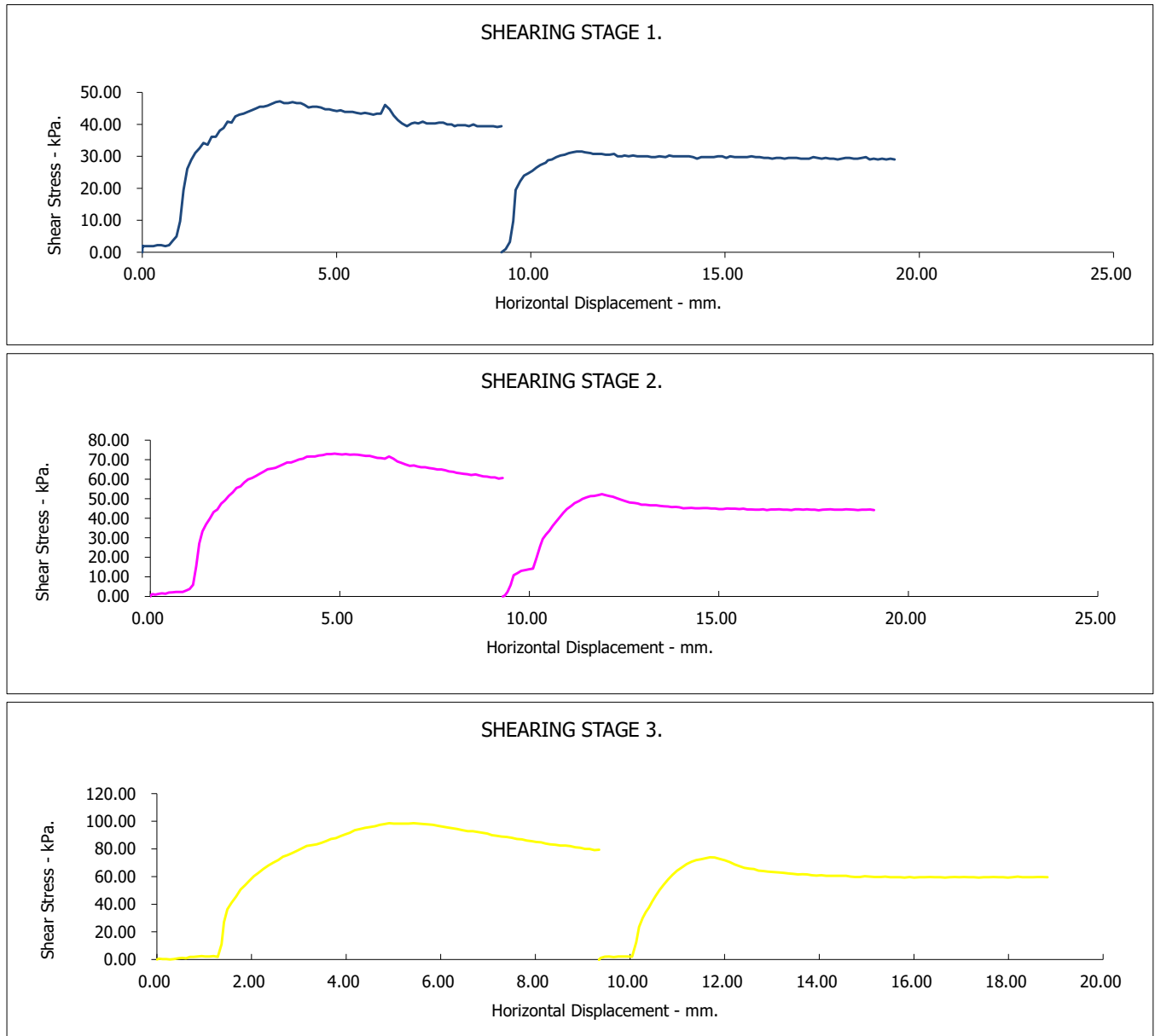
BS1377:Part 7.4.5.5 Shearing: multi-reversal test :1990

Borehole/Sample Number:

TP01

Depth (m):

4.00



Atlantic Wharf

Contract No.:
50187

Client Ref Number:
AW/AN/007

Test Report: CONSOLIDATED DRAINED PEAK AND RESIDUAL SHEARBOX TEST.

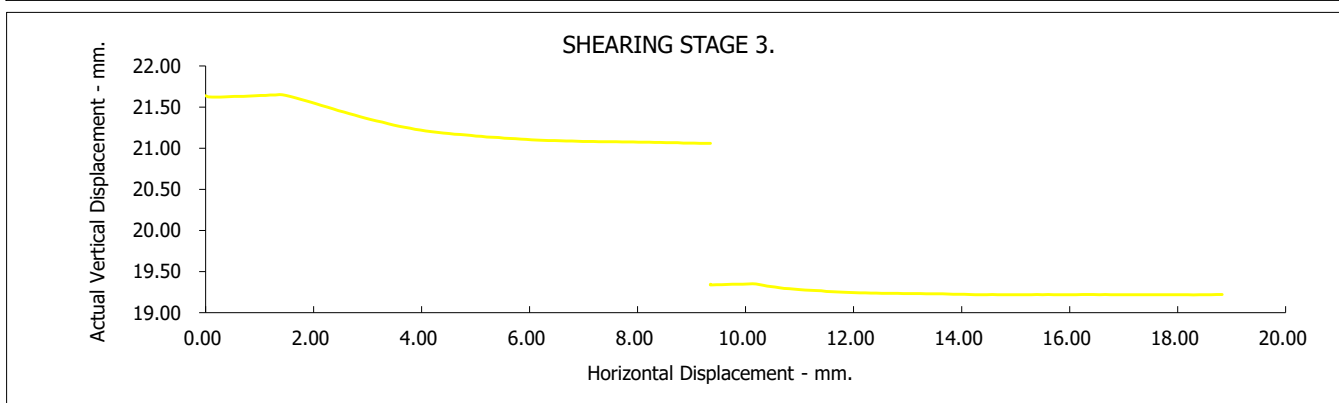
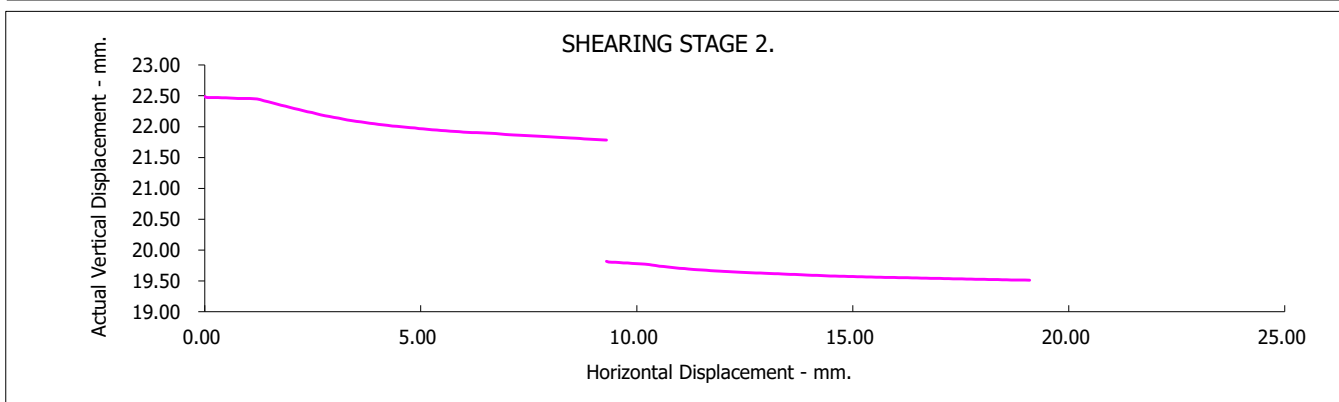
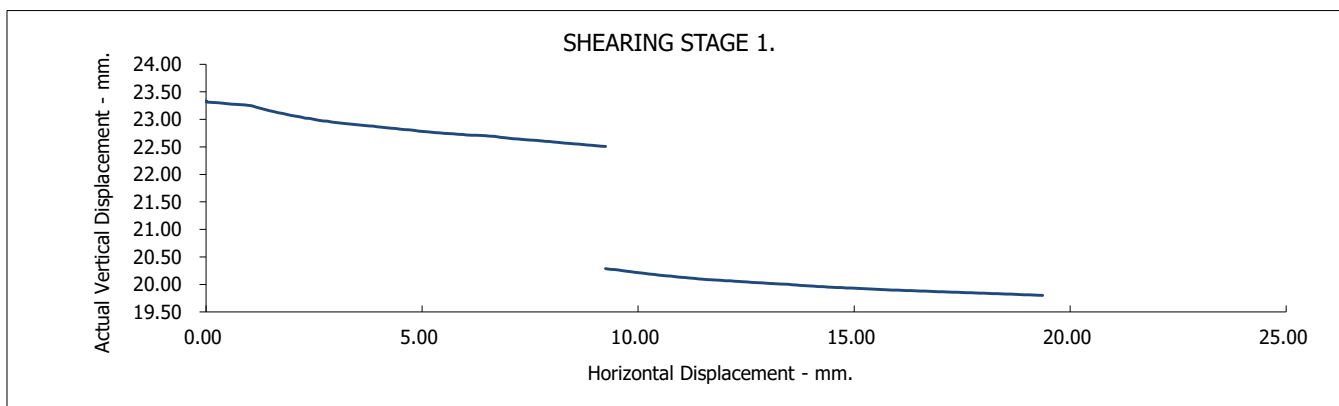
BS1377:Part 7.4.5.5 Shearing: multi-reversal test :1990

Borehole/Sample Number:

TP01

Depth (m):

4.00



Atlantic Wharf

Contract No.:
50187

Client Ref Number:
AW/AN/007

Test Report: CONSOLIDATED DRAINED PEAK AND RESIDUAL SHEARBOX TEST.

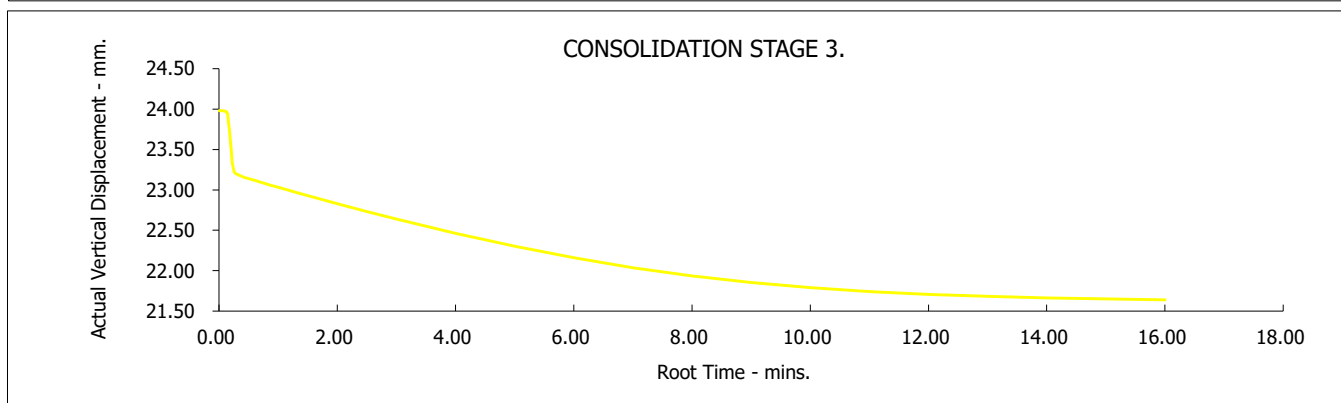
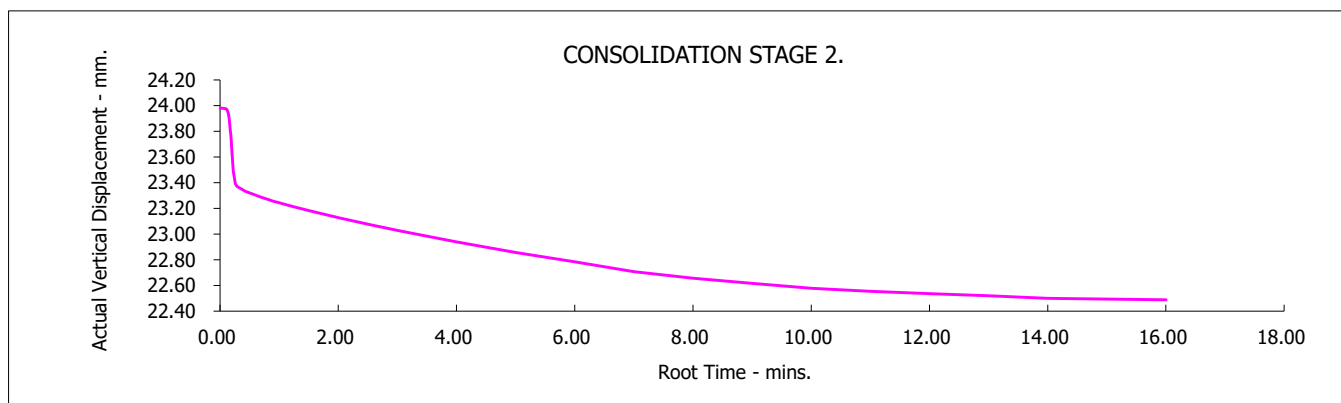
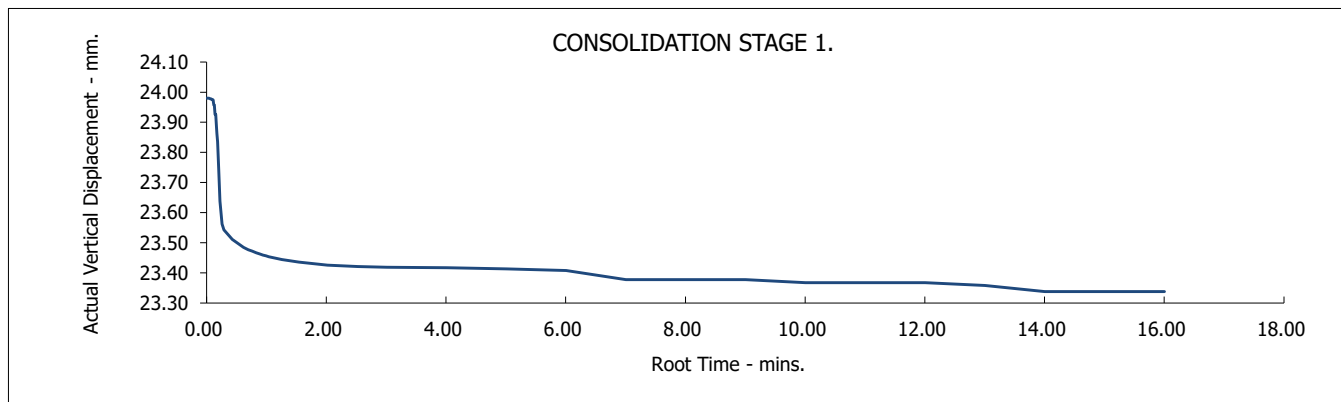
BS1377:Part 7.4.5.5 Shearing: multi-reversal test :1990

Borehole/Sample Number:

TP01

Depth (m):

4.00



Atlantic Wharf

Contract No.:
50187

Client Ref Number:
AW/AN/007

Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	6.00
Depth	to(m)	6.45
Date		21-10-20
Disturbed / Undisturbed		U

Description of Specimen

Grey silty CLAY

Initial Specimen Conditions

Height	mm	210.00
Diameter	mm	103.00
Area	mm ²	8332.29
Volume	cm ³	1749.78
Mass	g	3249.75
Dry Mass	g	2348.91
Density	Mg/m ³	1.86
Dry Density	Mg/m ³	1.34
Moisture Content	%	38
Specific Gravity	kN/m ³	2.65
(assumed/measured)		assumed

Final Specimen Conditions

Moisture Content	%	32
Density	Mg/m ³	1.89
Dry Density	Mg/m ³	1.43


Checked and Approved By

21-10-20
Date

Client Ref

G203312

Contract No

50187

Atlantic Wharf, Cardiff

Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	6.00
Depth	to(m)	6.45

Test Setup

Date started	30-09-20
Date Finished	20-10-20
Top Drain Used	y
Base Drain Used	y
Side Drains Used	y
Pressure System Number	P3
Cell Number	C3

Saturation

Cell Pressure Incr.	kPa	100.00
Back Pressure Incr.	kPa	95.00
Differential Pressure	kPa	5.00
Final Cell Pressure	kPa	700.00
Final Pore Pressure	kPa	693.00
Final B Value		0.96

Consolidation

Effective Pressure	kPa	120.00	240.00	480.00
Cell Pressure	kPa	700.00	700.00	700.00
Back Pressure	kPa	580.00	460.00	220.00
Excess Pore Pressure	kPa	113.00	131.00	255.00
Pore Pressure at End	kPa	580.00	460.00	220.00
Consolidated Volume	cm ³	1703.78	1676.38	1641.78
Consolidated Height	mm	208.16	199.46	190.61
Consolidated Area	mm ²	8186.26	8405.30	8613.93
Vol. Compressibility	m ² /MN	0.04533	0.03496	0.09382
Consolidation Coef.	m ² /yr.	0.16548	0.03128	0.01722


Checked and Approved By

21-10-20
Date

Client Ref
G203312

Atlantic Wharf, Cardiff

Contract No

50187

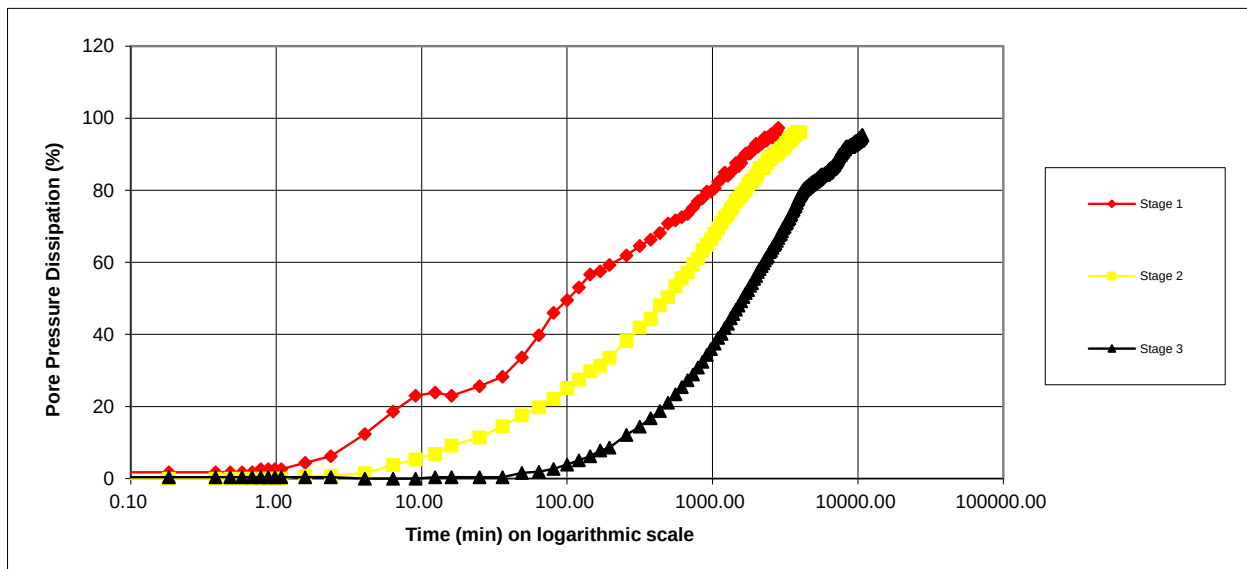
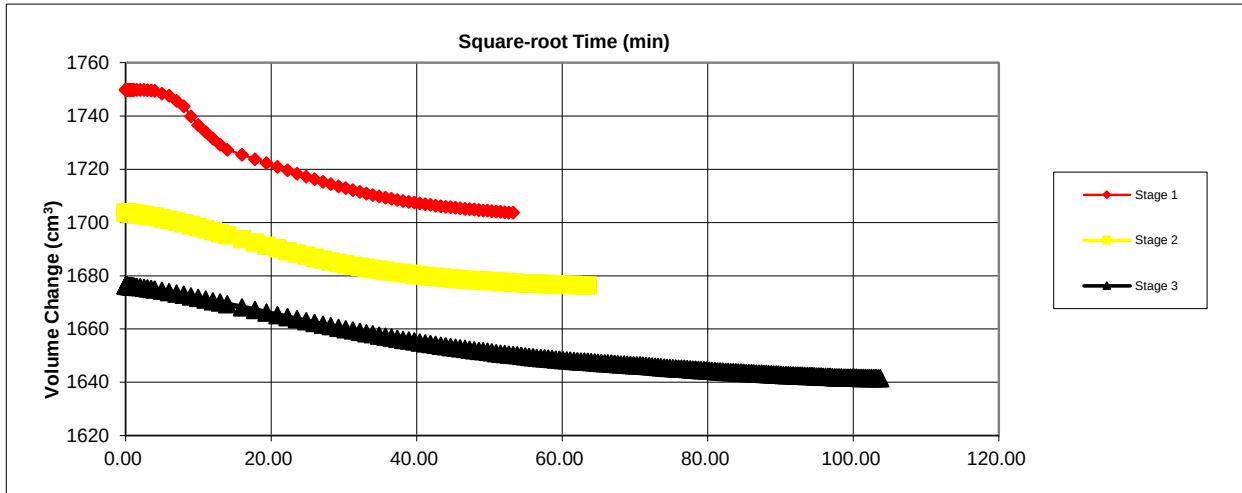
Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	6.00
Depth	to(m)	6.45

Consolidation Stage



D P Gnan
Checked and Approved By

21-10-20
Date

Client Ref
G203312

Atlantic Wharf, Cardiff

Contract No

50187

Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	6.00
Depth	to(m)	6.45

Shearing

Initial Cell Pressure	kPa	700	700	700
Initial Pore Pressure	kPa	580	460	220
Rate of Strain	mm/min	0.0034	0.0006	0.0003
Max Deviator Stress				
Axial Strain		4.458	7.462	10.429
Axial Stress	kPa	201.465	281.10	428.26
Cor. Deviator stress	kPa	195.480	276.81	423.82
Effective Major Stress	kPa	284.480	462.81	794.82
Effective Minor Stress	kPa	90.000	186.00	371.00
Effective Stress Ratio		3.161	2.488	2.14
s'	kPa	187.240	324.41	582.91
t'	kPa	97.240	138.41	211.91
Max Effective Principle Stress Ratio				
Axial Strain		4.247	7.021	10.355
Axial Stress	kPa	196.963	270.679	426.668
Cor. Deviator stress	kPa	192.994	266.441	422.235
Effective Major Stress	kPa	282.994	445.441	795.235
Effective Minor Stress	kPa	90.000	179.000	373.000
Effective Stress Ratio		3.144	2.488	2.132
s'	kPa	186.497	312.220	584.118
t'	kPa	96.497	133.220	211.118
Shear Resistance Angle	degs	17.0		
Cohesion c'	kPa	42		

D P Gons
Checked and Approved By

21-10-20
Date

Client Ref

G203312

Atlantic Wharf, Cardiff

Contract No

50187

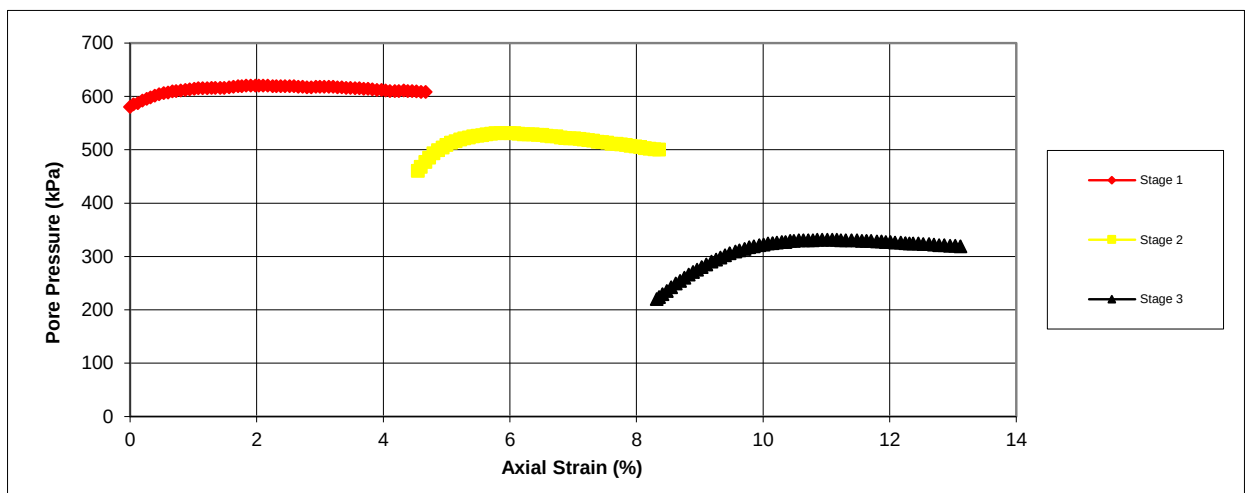
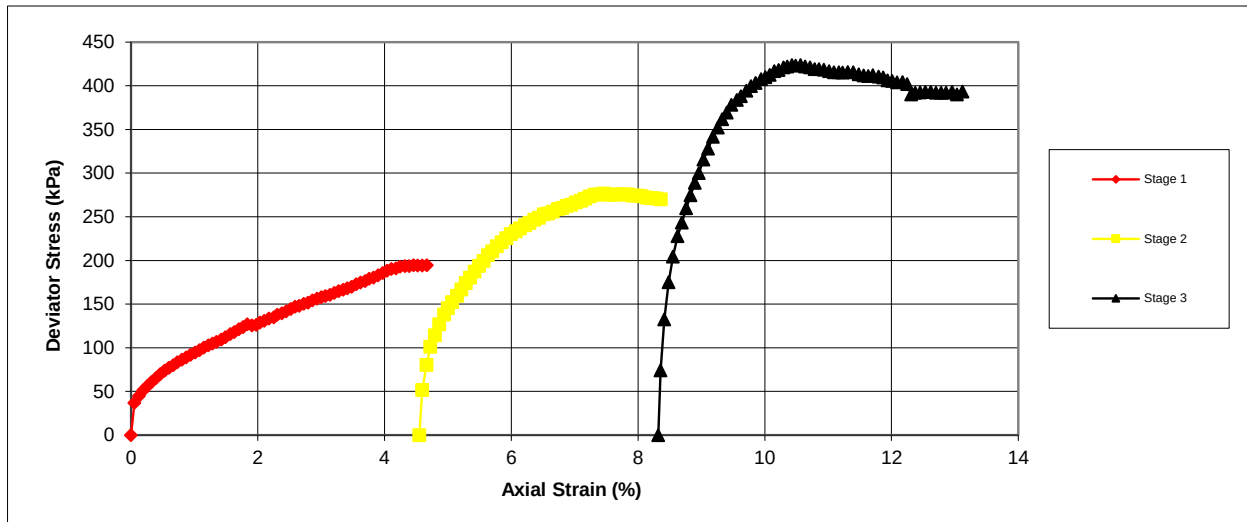
Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	6.00
Depth	to(m)	6.45

Shearing Stage



D P Gans
Checked and Approved By

21-10-20
Date

Client Ref
G203312

Contract No

50187

Atlantic Wharf, Cardiff

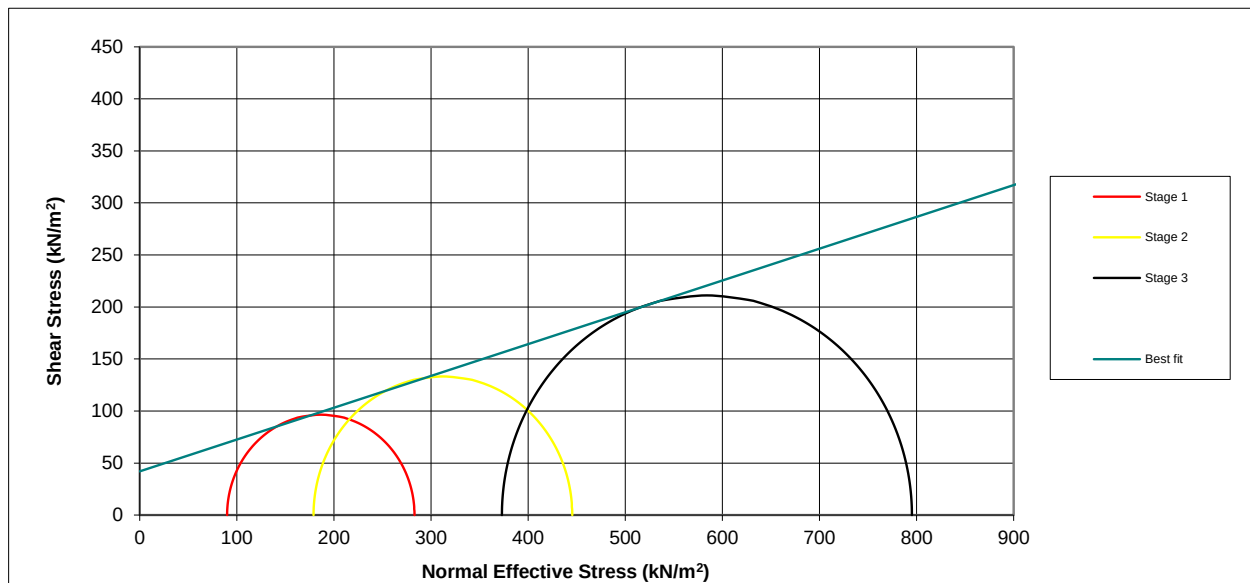
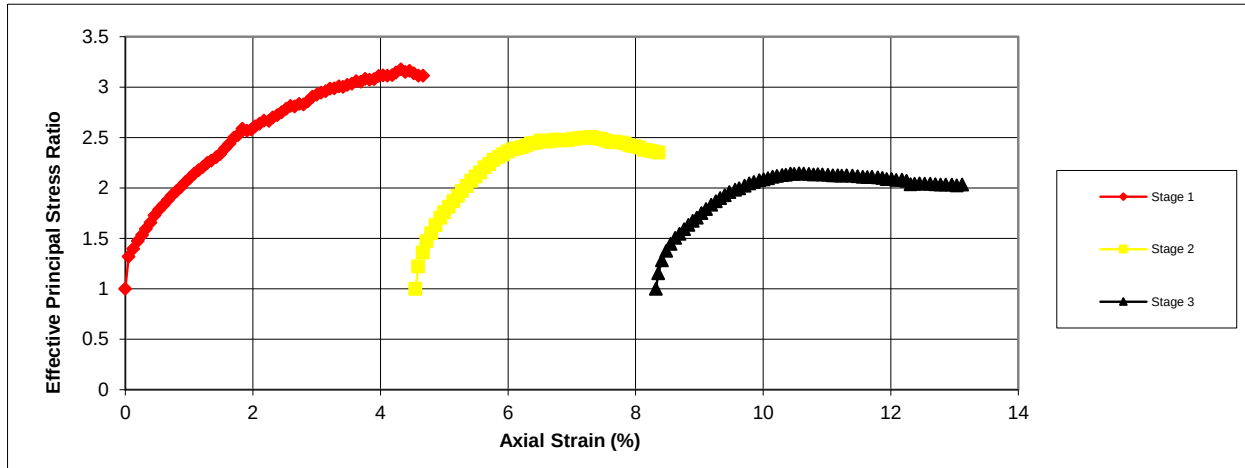
Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	6.00
Depth	to(m)	6.45

Shearing Stage



D P Gans

Checked and Approved By

21-10-20

Date

Client Ref

G203312

Contract No

50187

Atlantic Wharf, Cardiff

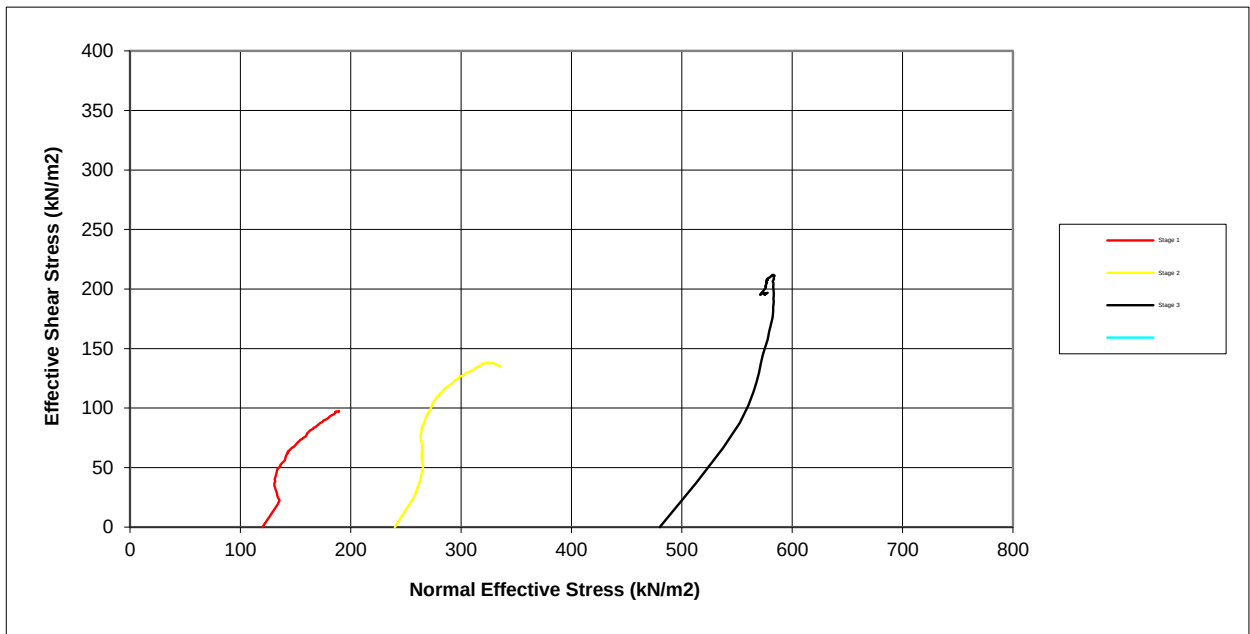
Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	6.00
Depth	to(m)	6.45

Shearing Stage



D P Gans
Checked and Approved By

21-10-20
Date

Client Ref

G203312

Contract No

50187

Atlantic Wharf, Cardiff

Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	6.00
Depth	to(m)	6.45

D P Gans

Checked and Approved By

21-10-20

Date

Client Ref

G203312

Atlantic Wharf, Cardiff

Contract No

50187

Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	12.50
Depth	to(m)	12.95
Date		17-10-20
Disturbed / Undisturbed		U

Description of Specimen

Brown silty CLAY

Initial Specimen Conditions

Height	mm	210.00
Diameter	mm	104.00
Area	mm ²	8494.87
Volume	cm ³	1783.92
Mass	g	3399.29
Dry Mass	g	2701.49
Density	Mg/m ³	1.91
Dry Density	Mg/m ³	1.51
Moisture Content	%	26
Specific Gravity	kN/m ³	2.65
(assumed/measured)		assumed

Final Specimen Conditions

Moisture Content	%	21
Density	Mg/m ³	1.99
Dry Density	Mg/m ³	1.65


Checked and Approved By

21-10-20
Date

Client Ref
G203312

Atlantic Wharf, Cardiff

Contract No

50187

Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	12.50
Depth	to(m)	12.95

Test Setup

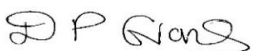
Date started	30-09-20
Date Finished	16-10-20
Top Drain Used	y
Base Drain Used	y
Side Drains Used	y
Pressure System Number	P8
Cell Number	C8

Saturation

Cell Pressure Incr.	kPa	100.00
Back Pressure Incr.	kPa	95.00
Differential Pressure	kPa	5.00
Final Cell Pressure	kPa	800.00
Final Pore Pressure	kPa	600.00
Final B Value		1.00

Consolidation

Effective Pressure	kPa	250.00	500.00	750.00
Cell Pressure	kPa	800.00	800.00	800.00
Back Pressure	kPa	550.00	300.00	50.00
Excess Pore Pressure	kPa	250.00	250.00	250.00
Pore Pressure at End	kPa	550.00	300.00	50.00
Consolidated Volume	cm ³	1717.92	1673.72	1639.22
Consolidated Height	mm	207.41	197.16	186.61
Consolidated Area	mm ²	8285.34	8490.25	8784.90
Vol. Compressibility	m ² /MN	0.06727	0.08576	0.41225
Consolidation Coef.	m ² /yr.	2.88863	1.08814	2.18641


Checked and Approved By

21-10-20
Date

Client Ref

G203312

Atlantic Wharf, Cardiff

Contract No

50187

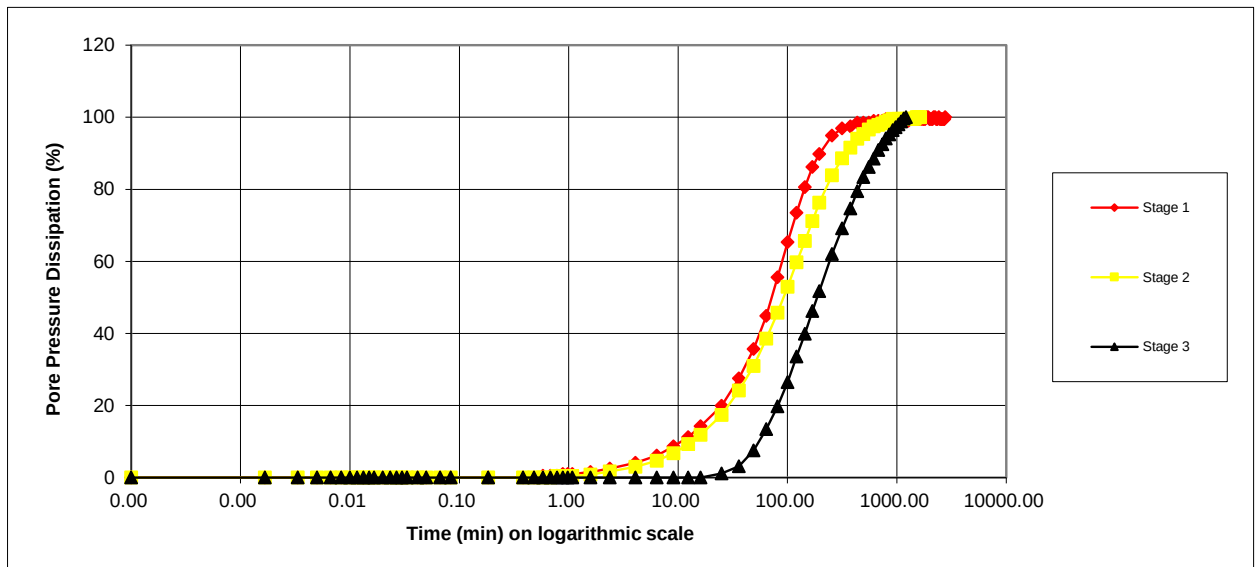
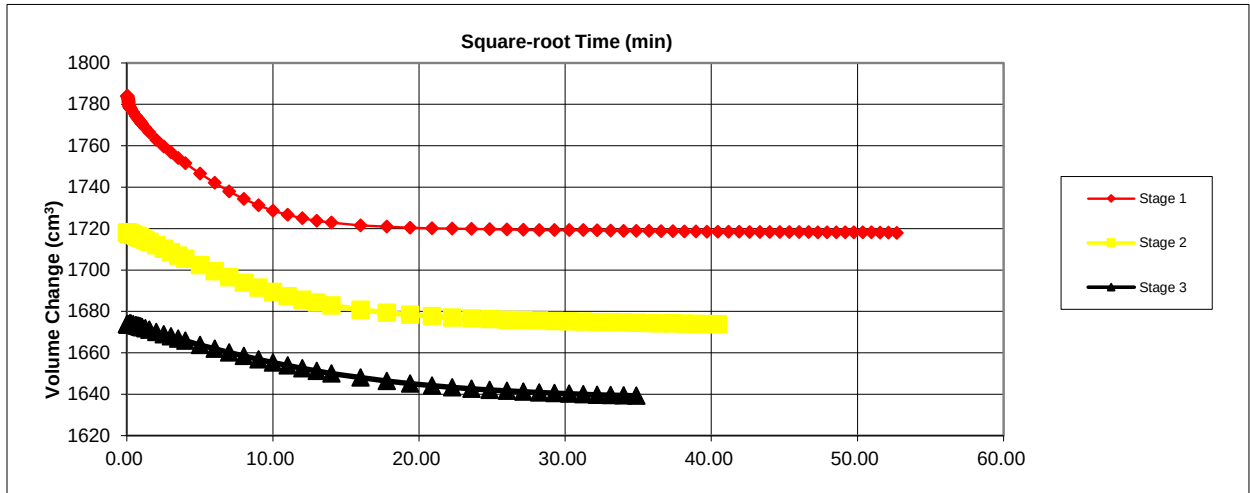
Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	12.50
Depth	to(m)	12.95

Consolidation Stage



D P Gans
Checked and Approved By

21-10-20
Date

Client Ref

G203312

Atlantic Wharf, Cardiff

Contract No

50187

Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	12.50
Depth	to(m)	12.95

Shearing

Initial Cell Pressure	kPa	800	800	800
Initial Pore Pressure	kPa	550	300	50
Rate of Strain	mm/min	0.0584	0.0209	0.0398
Max Deviator Stress				
Axial Strain		5.935	7.009	11.210
Axial Stress	kPa	199.589	333.41	540.12
Cor. Deviator stress	kPa	196.498	329.18	535.65
Effective Major Stress	kPa	375.498	673.18	1149.65
Effective Minor Stress	kPa	180.000	344.00	614.00
Effective Stress Ratio		2.086	1.957	1.87
s'	kPa	277.749	508.59	881.82
t'	kPa	97.749	164.59	267.82
Max Effective Principle Stress Ratio				
Axial Strain		4.383	6.933	11.606
Axial Stress	kPa	197.228	333.201	531.249
Cor. Deviator stress	kPa	193.253	328.979	526.751
Effective Major Stress	kPa	365.253	671.979	1122.751
Effective Minor Stress	kPa	172.000	343.000	596.000
Effective Stress Ratio		2.124	1.959	1.884
s'	kPa	268.627	507.489	859.376
t'	kPa	96.627	164.489	263.376
Shear Resistance Angle	degs	16.5		
Cohesion c'	kPa	20		

D P Gons

Checked and Approved By

21-10-20

Date

Client Ref

G203312

Atlantic Wharf, Cardiff

Contract No

50187

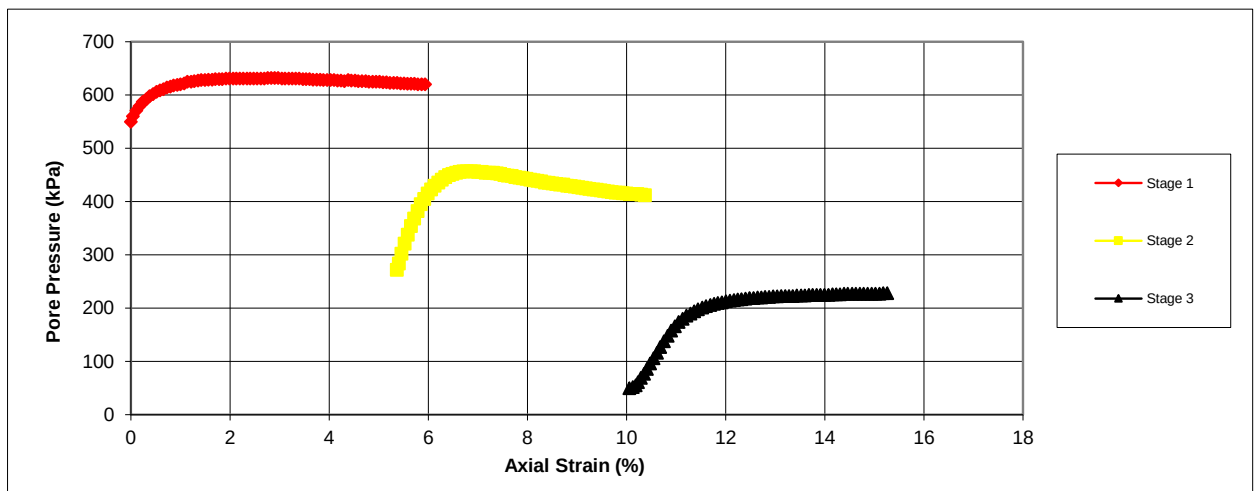
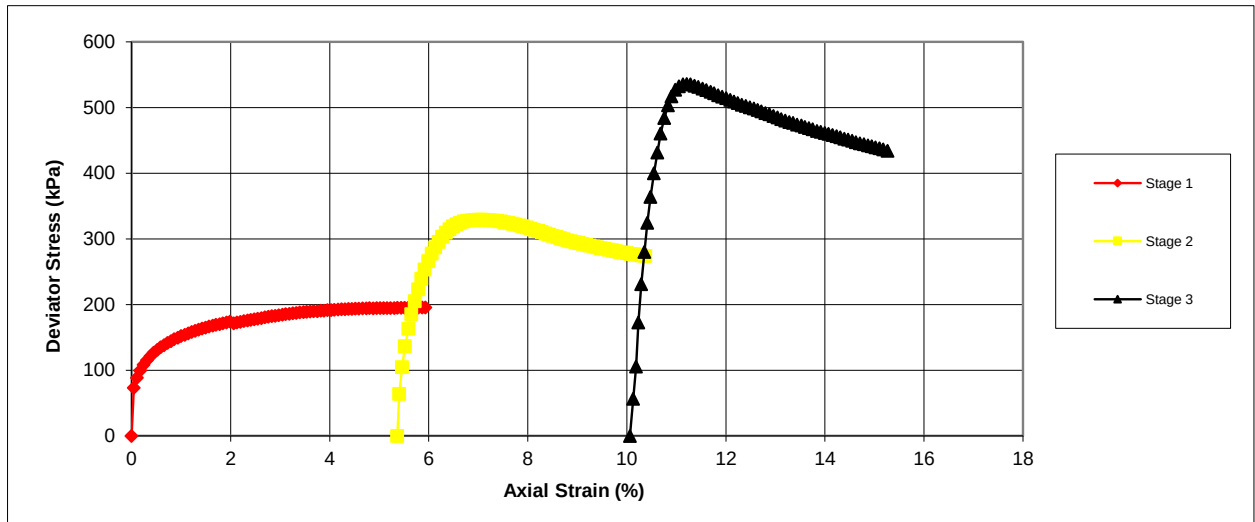
Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	12.50
Depth	to(m)	12.95

Shearing Stage



D P Gnan
Checked and Approved By

21-10-20
Date

Client Ref
G203312

Atlantic Wharf, Cardiff

Contract No

50187

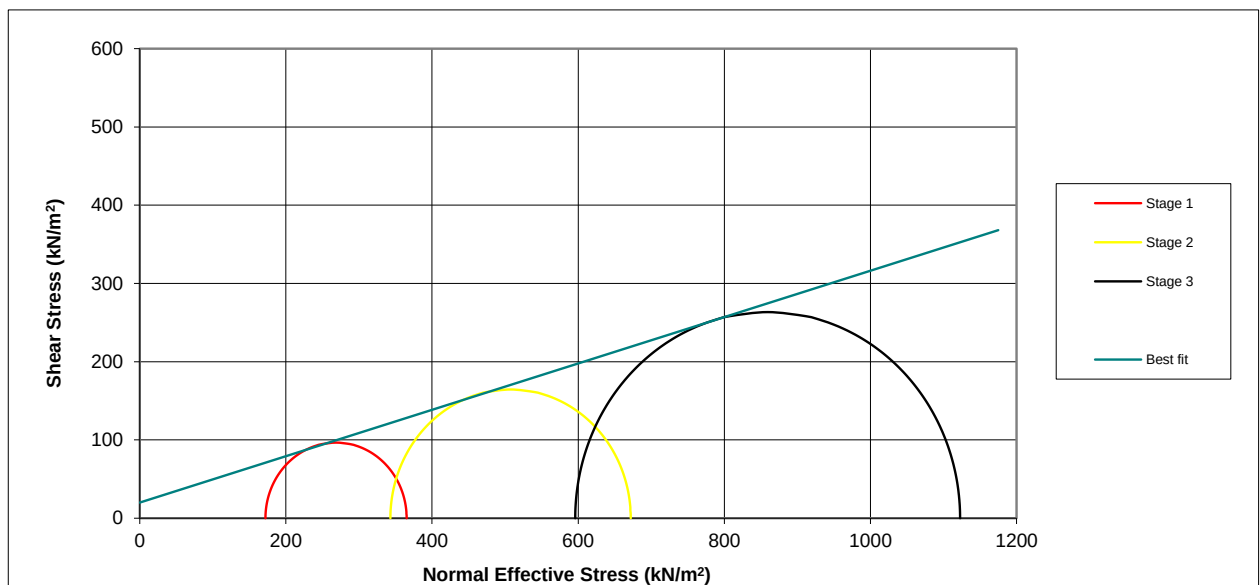
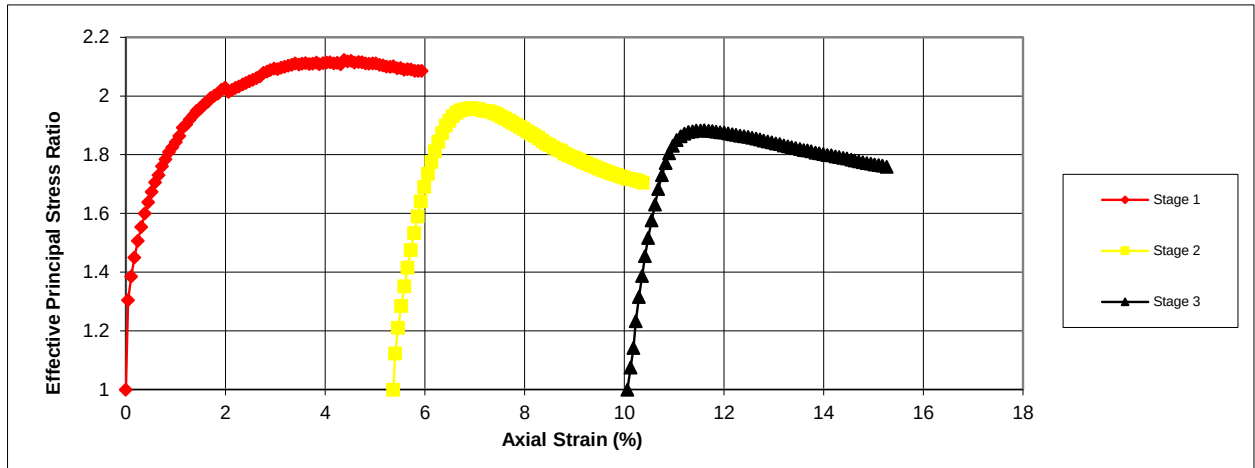
Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	12.50
Depth	to(m)	12.95

Shearing Stage



D P Gans

Checked and Approved By

21-10-20
Date

Client Ref

G203312

Atlantic Wharf, Cardiff

Contract No

50187

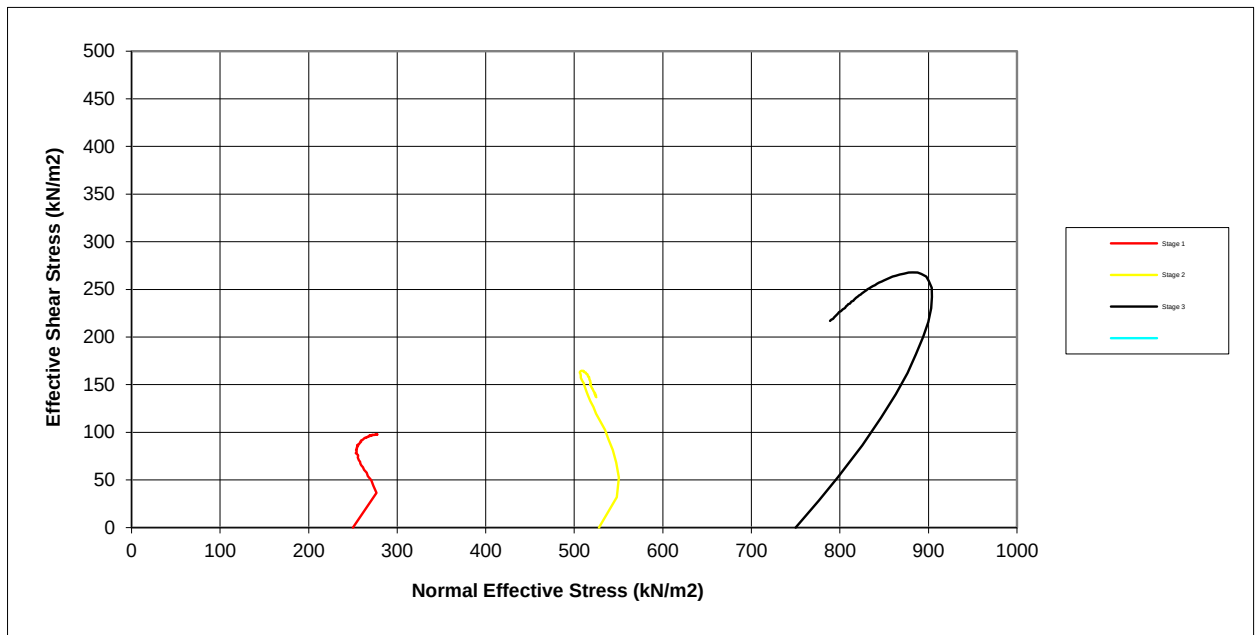
Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	12.50
Depth	to(m)	12.95

Shearing Stage



D P Gnan
Checked and Approved By

21-10-20
Date

Atlantic Wharf, Cardiff

Client Ref

G203312

Contract No

50187

Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990

Specimen Details

Borehole		BH104
Sample No.		
Depth	from(m)	12.50
Depth	to(m)	12.95

DP Gans

Checked and Approved By

21-10-20

Date

Client Ref

G203312

Atlantic Wharf, Cardiff

Contract No

50187



Contract Number: 50481

Client Ref: **AW/AN/007**

Report Date: **19-10-2020**

Client PO: **AW/AN/007**

Client **Envirotrat Technologies Ltd**
Envirotrat Technologies Ltd
LCP House,
The Pensnett Estate,
Kingswinford,
West Midlands.
DY6 7NA
Tel: 01384 288876

Contract Title: **Atlantic Wharf, Cardiff (BH101)**
For the attention of: **Andy Norman**

Date Received: **30-09-2020**
Date Completed: **19-10-2020**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	3
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	3
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	2
Organic Matter Content-dichromate method BS 1377:1990 - Part 3 : 3 - @ Non Accredited Test	1
Loss on Ignition BS 1377:1990 - Part 3 : 4 - @ Non Accredited Test	1
BRE Suite D Brownfield Site (pyrite present) includes pH, water & acid soluble sulphate, total sulphur, magnesium, chloride and nitrate BRE - BR279 - @ Non Accredited Test	3

Notes: ~~Observations and Interpretations are outside the UKAS Accreditation~~
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- denotes test carried out by approved contractor
@ - denotes non accredited tests

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Approved Signatories:

Emma Sharp (Office Manager/Director) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)
Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)



Laboratory Report



Contract Number: 50481

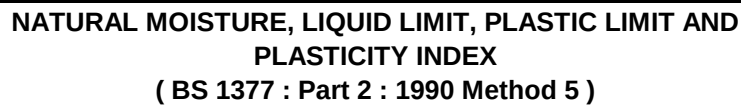
Test Description	Qty
Consolidated Drained Peak and Residual Shear Strength - set of 3 60 x 60mm Shear Box Specimens (5 days) BS 1377:1990 - Part 7 : 4 - * UKAS	1
Disposal of samples for job	1

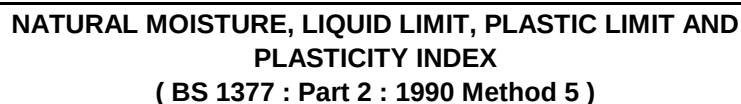
Notes: Observations and Interpretations are outside the UKAS Accreditation
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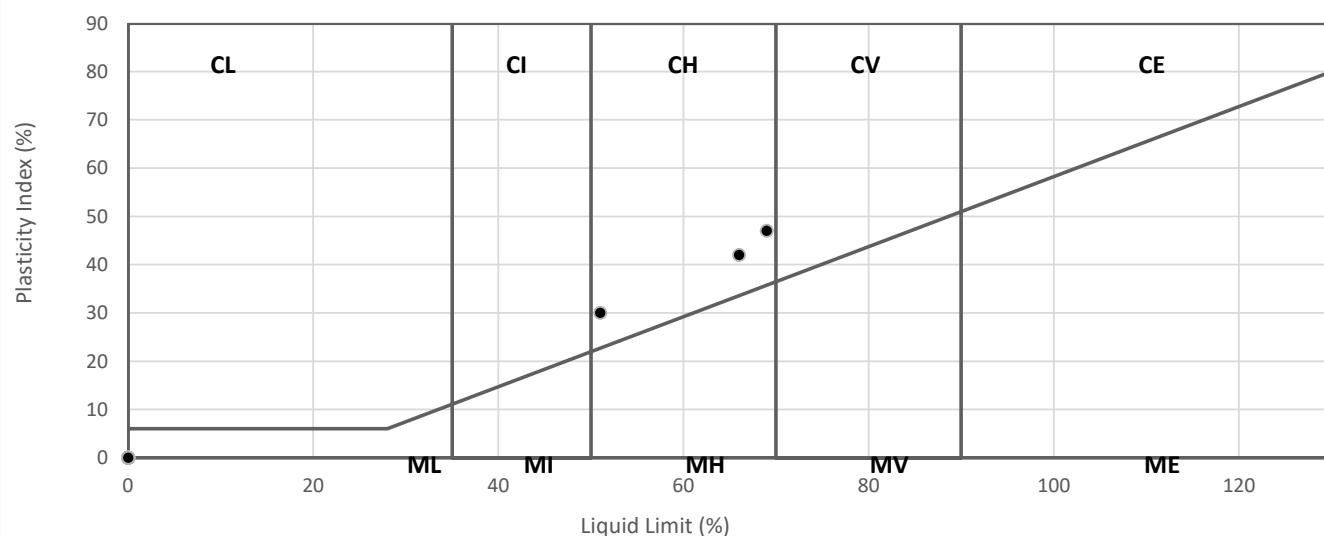
Approved Signatories:

Emma Sharp (Office Manager/Director) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)
Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)

[illegible]

[illegible]

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION BS 5930:1999+A2:2010





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number **50481**

Borehole/Pit No. **BH101**

Site Name **Atlantic Wharf, Cardiff (BH101)**

Sample No.

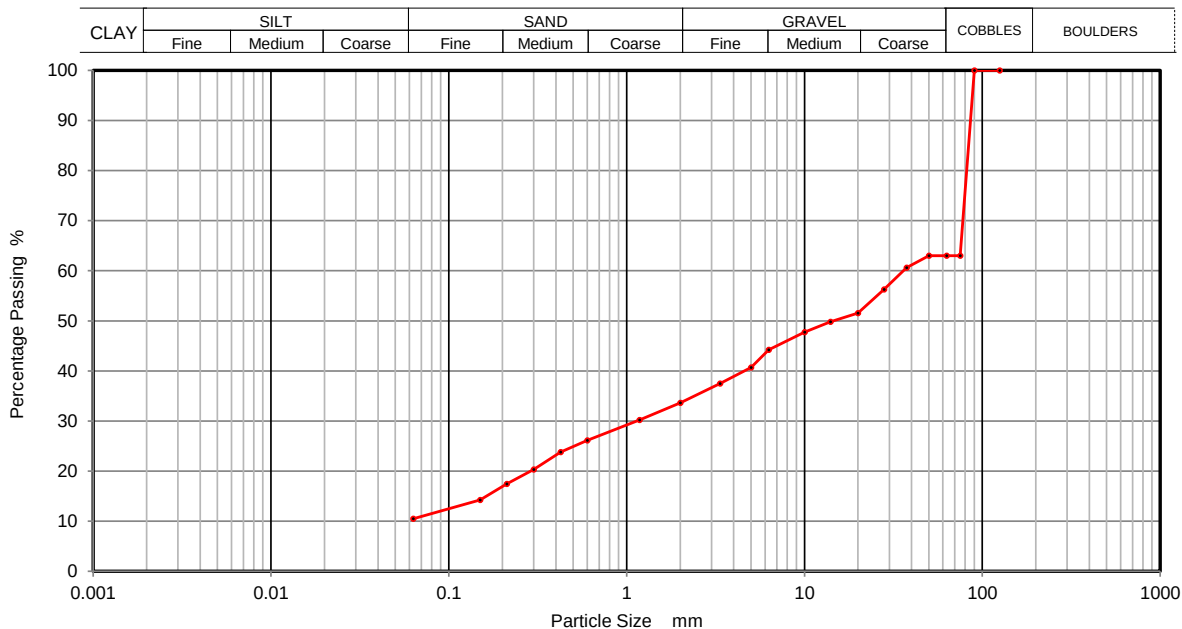
Soil Description **Grey clayey/silty fine to coarse sandy fine to coarse GRAVEL (with cobbles)**

Depth Top **2.50**

Depth Base **3.00**

Date Tested **17/10/2020**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	63		
63	63		
50	63		
37.5	61		
28	56		
20	52		
14	50		
10	48		
6.3	44		
5	41		
3.35	37		
2	34		
1.18	30		
0.6	26		
0.425	24		
0.3	20		
0.212	17		
0.15	14		
0.063	10		

Sample Proportions	% dry mass
Cobbles	37
Gravel	29
Sand	24
Silt and Clay	10

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	18/10/2020	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	19/10/2020	Paul Evans	<i>P. Evans</i>





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number **50481**

Borehole/Pit No. **BH101**

Site Name **Atlantic Wharf, Cardiff (BH101)**

Sample No.

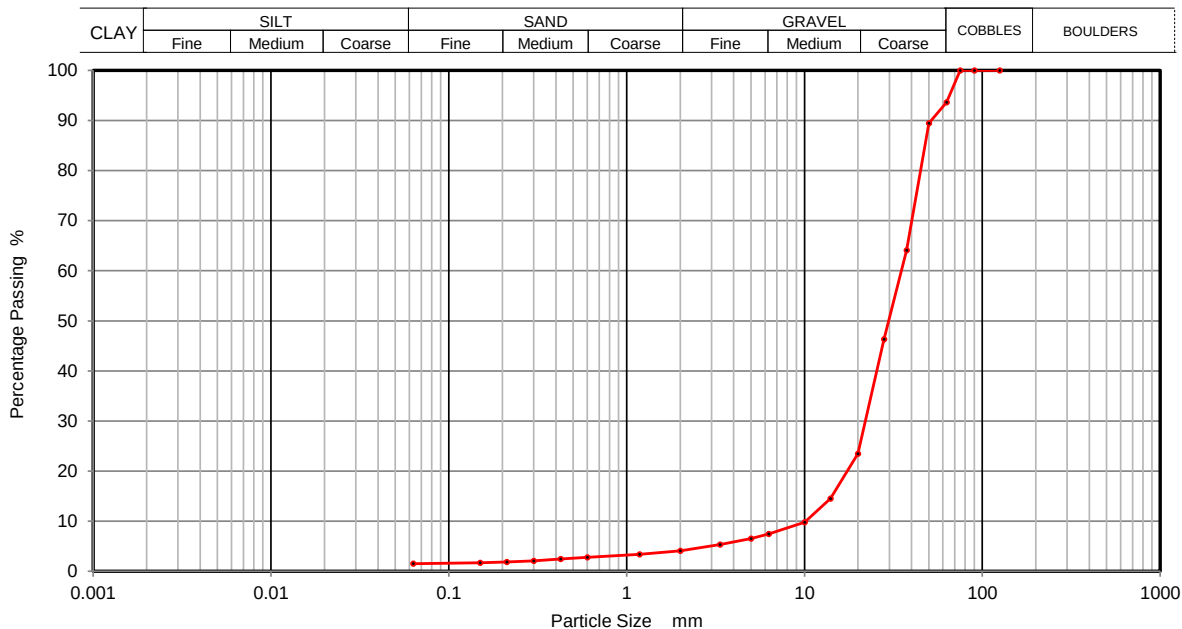
Soil Description **Brown slightly clayey/silty slightly sandy fine to coarse GRAVEL (with cobbles)**

Depth Top **13.00**

Depth Base **13.50**

Date Tested **17/10/2020**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	94		
50	89		
37.5	64		
28	46		
20	23		
14	14		
10	10		
6.3	7		
5	7		
3.35	5		
2	4		
1.18	3		
0.6	3		
0.425	2		
0.3	2		
0.212	2		
0.15	2		
0.063	2		

Sample Proportions	% dry mass
Cobbles	6
Gravel	90
Sand	2
Silt and Clay	2

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	18/10/2020	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	19/10/2020	Paul Evans	<i>P. Evans</i>

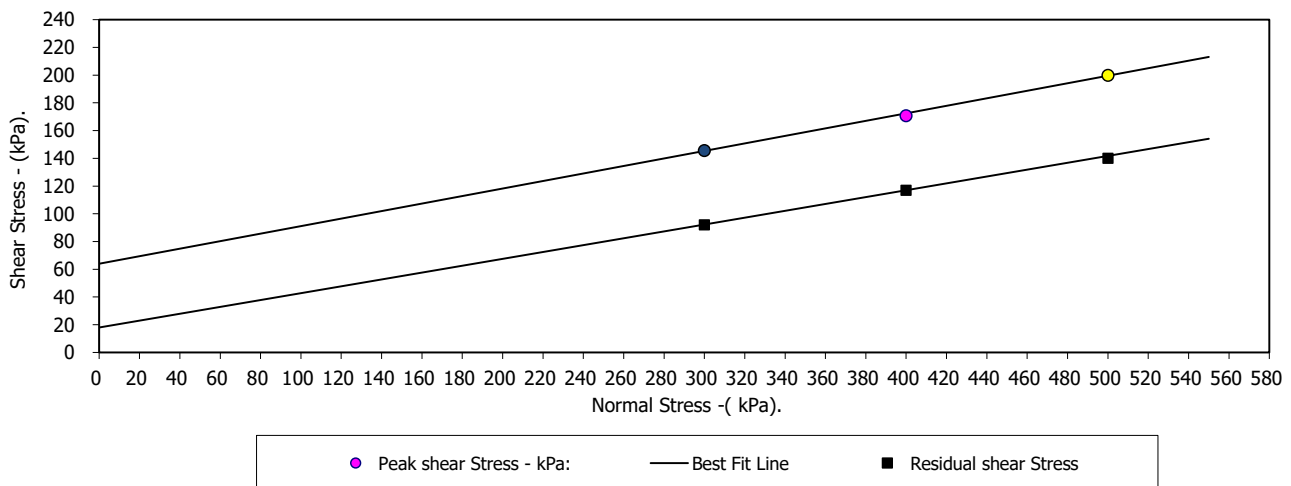


Test Report: CONSOLIDATED DRAINED PEAK AND RESIDUAL SHEARBOX TEST.

BS1377:Part 7.4.5.5 Shearing: multi-reversal test :1990

Borehole Number:	BH101	Depth from (m):	16.00
		Depth to (m):	16.50
Sample Type:	B	Remoulded (Light Tamping) material above 2.5mm removed	
Particle Density - Mg/m3:	2.65	(Assumed)	
Specimen Tested:	Submerged		
Sample Description:			
Brown slightly sandy silty CLAY fine to coarse GRAVEL			
STAGE	1	2	3
Initial Conditions			
Height - mm:	23.98	23.98	23.98
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	32	32	32
Bulk Density - Mg/m3:	1.84	1.84	1.84
Dry Density - Mg/m3:	1.39	1.39	1.40
Voids Ratio:	0.9031	0.9016	0.8991
Normal Pressure- kPa	300	400	500
Consolidation			
Consolidated Height - mm:	22.10	21.80	21.50
Shear			
Rate of Strain (mm/min)	0.010	0.010	0.010
Strain at peak shear stress (mm)	3.65	5.48	5.26
Peak shear Stress - kPa:	146	171	200
PEAK			
Angle of Shearing Resistance:(θ)	15.2		
Effective Cohesion - kPa:	64		
RESIDUAL			
Angle of Shearing Resistance:(θ)	13.9		
Effective Cohesion - kPa:	18		

Failure Conditions



D P Gnan 16-10-20

Checked Pages 1-4 by: Date

D P Gnan

Approved Pages 1-4 by: 16-10-20



Contract No.:
50481

Client Ref Number:
AW/AN/007

Atlantic Wharf

Test Report: CONSOLIDATED DRAINED PEAK AND RESIDUAL SHEARBOX TEST.

BS1377:Part 7.4.5.5 Shearing: multi-reversal test :1990

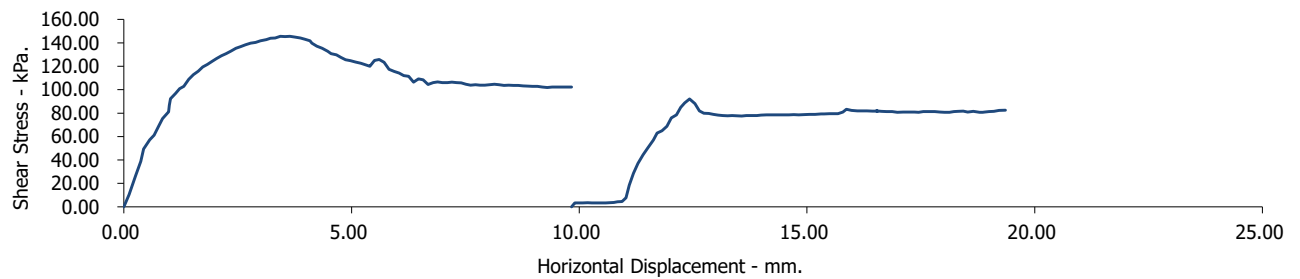
Borehole/Sample Number:

BH101

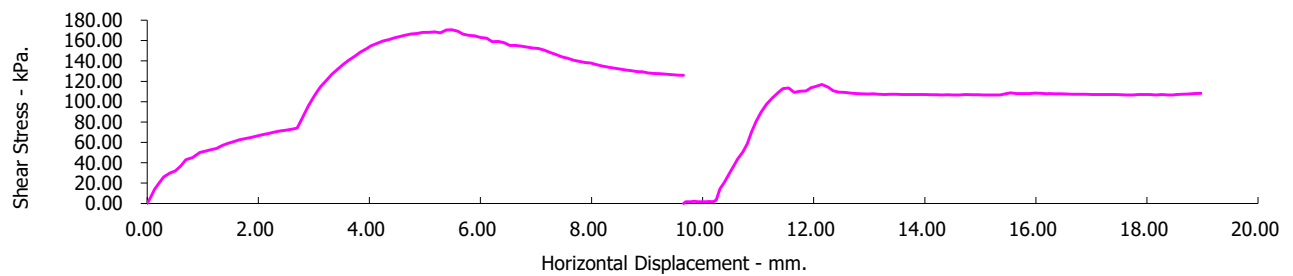
Depth (m):

16.00

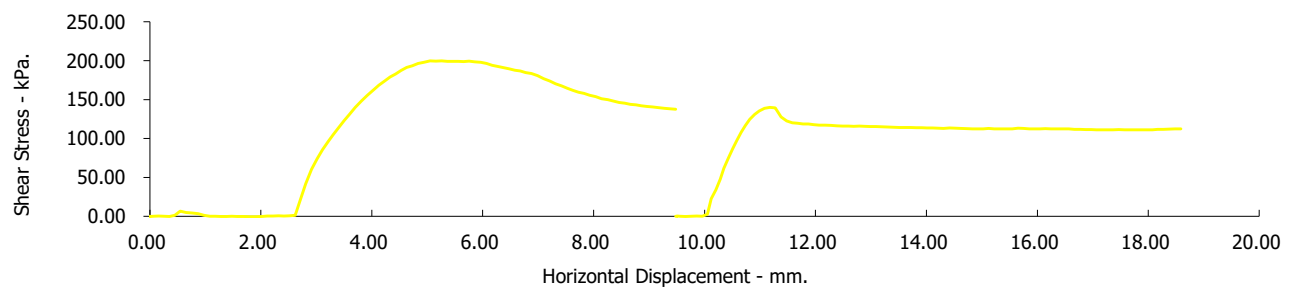
SHEARING STAGE 1.



SHEARING STAGE 2.



SHEARING STAGE 3.



Atlantic Wharf

Contract No.:
50481

Client Ref Number:
AW/AN/007

Test Report: CONSOLIDATED DRAINED PEAK AND RESIDUAL SHEARBOX TEST.

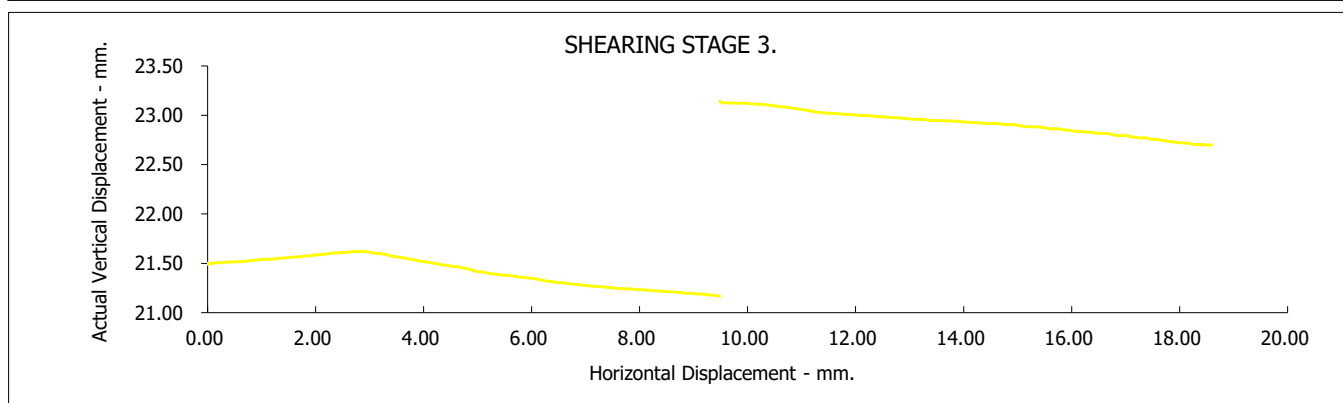
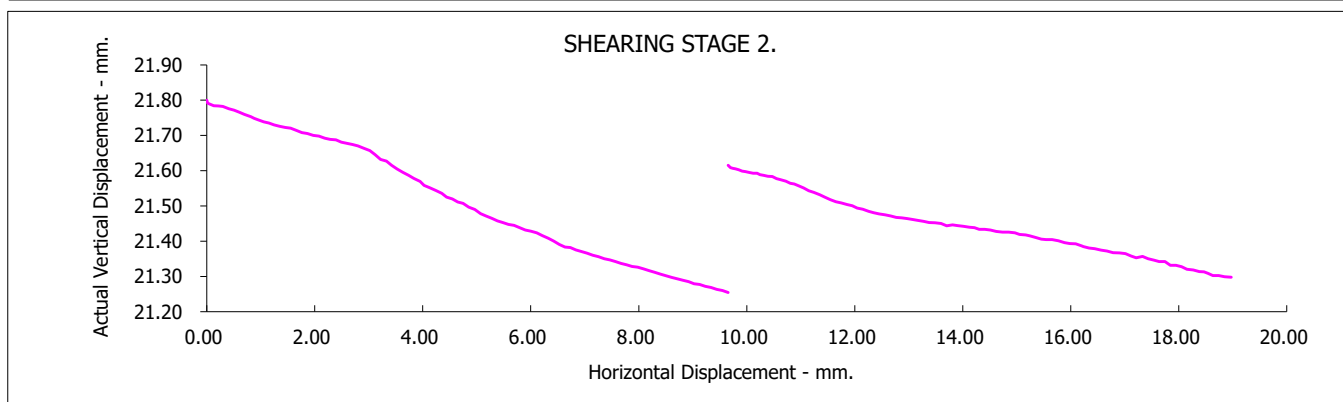
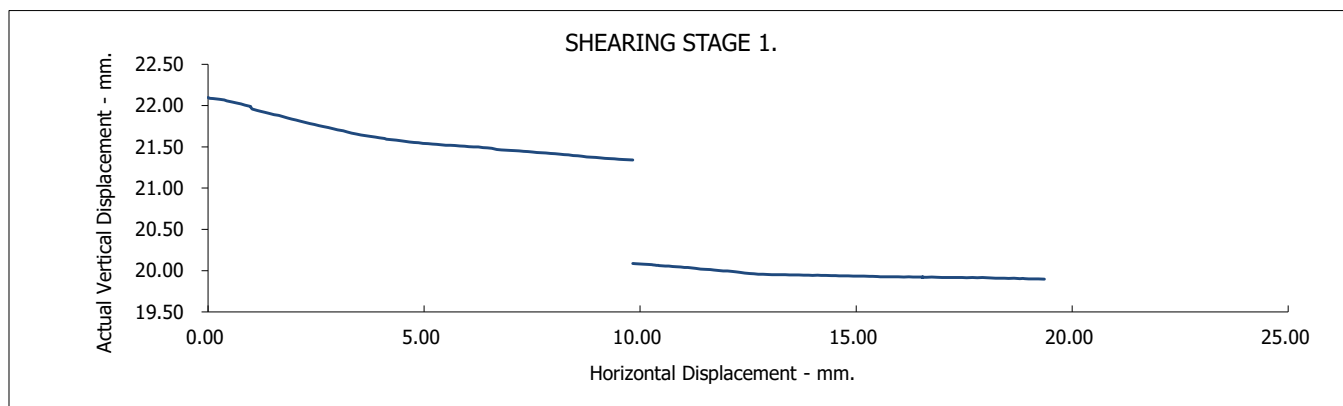
BS1377:Part 7.4.5.5 Shearing: multi-reversal test :1990

Borehole/Sample Number:

BH101

Depth (m):

16.00



Atlantic Wharf

Contract No.:
50481

Client Ref Number:
AW/AN/007

Test Report: CONSOLIDATED DRAINED PEAK AND RESIDUAL SHEARBOX TEST.

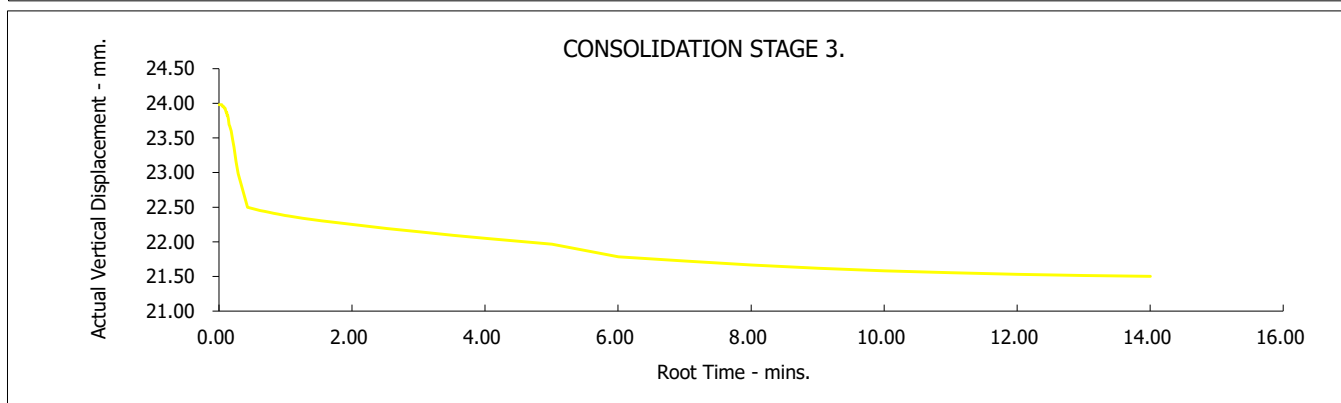
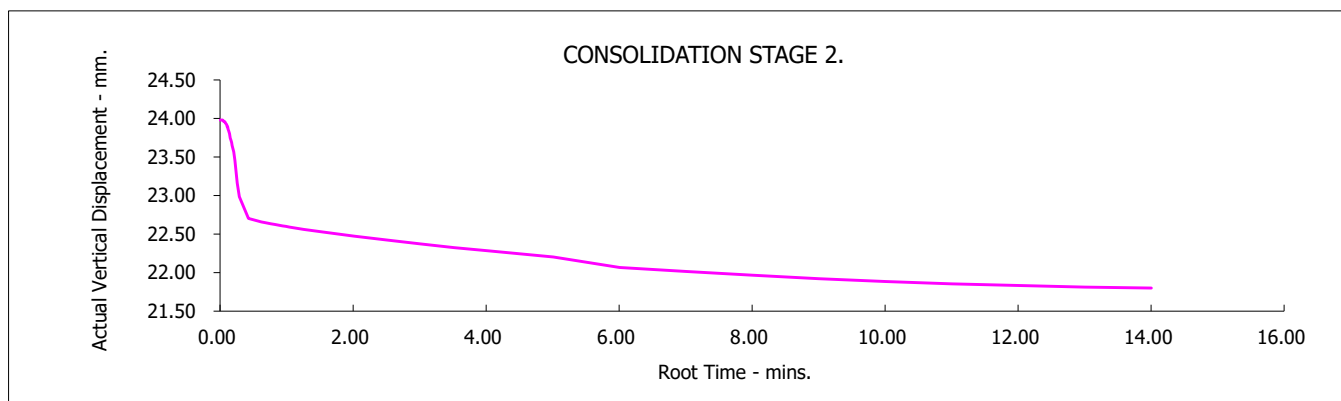
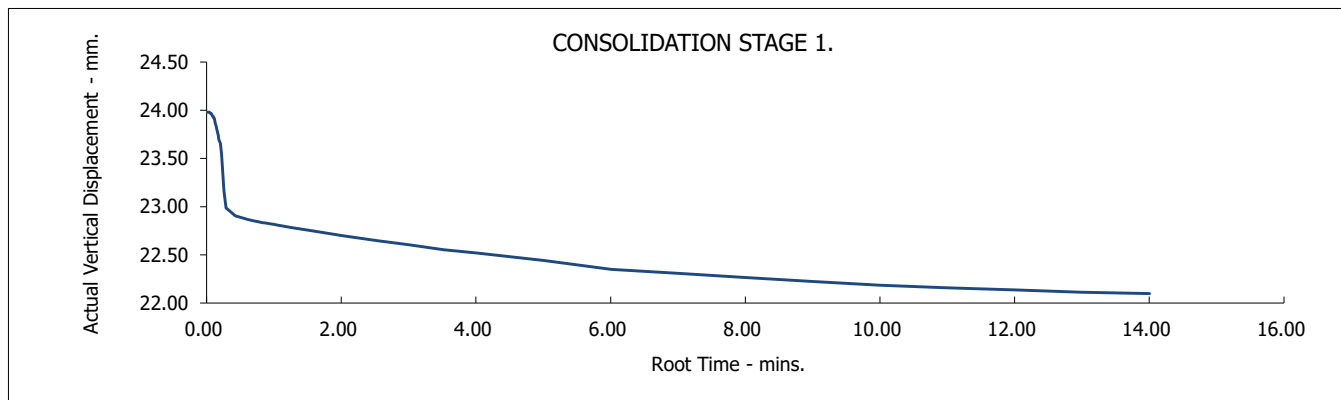
BS1377:Part 7.4.5.5 Shearing: multi-reversal test :1990

Borehole/Sample Number:

BH101

Depth (m):

16.00



Atlantic Wharf

Contract No.:
50481

Client Ref Number:
AW/AN/007



Contract Number: 50357

Client Ref: **G203312**
Client PO: **AW/AN/007**

Report Date: **16-10-2020**

Client **Envirotrat Technologies Ltd**
Envirotrat Technologies Ltd
LCP House,
The Pensnett Estate,
Kingswinford,
West Midlands.
DY6 7NA
Tel: 01384 288876

Contract Title: **Atlantic Wharf, Cardiff**
For the attention of: **Andy Norman**

Date Received: **24-09-2020**
Date Completed: **16-10-2020**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	3
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	3
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	2
Organic Matter Content-dichromate method BS 1377:1990 - Part 3 : 3 - @ Non Accredited Test	2
BRE Reduced Suite includes pH, water & acid soluble sulphate and total sulphur BRE - BR279 - @ Non Accredited Test	3
One-dimensional Consolidation 75mm or 50mm diameter specimens (5 days) BS 1377:1990 - Part 5 : 3 - * UKAS	1

Notes: ~~Observations and Interpretations are outside the UKAS Accreditation~~
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Approved Signatories:

Emma Sharp (Office Manager/Director) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)
Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)



Laboratory Report



Contract Number: 50357

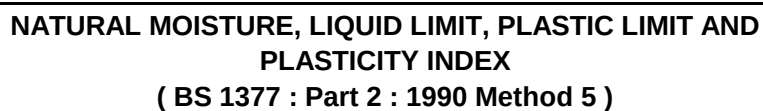
Test Description	Qty
Quick Undrained Triaxial Compression test - set of 3 - 38mm diameter specimens BS 1377:1990 - Part 7 : 8 - * UKAS	2
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation
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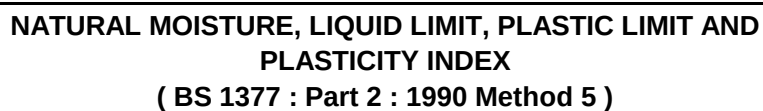


Contract Number	50357	
Site Name	Atlantic Wharf, Cardiff	
Date Tested	09-10-20	
	DESCRIPTIONS	

[illegible]

Operators	Checked	16-10-20	Wayne Honey (Administrative/Quality Assistant)
Clayton Jenkins	Approved	16-10-20	Paul Evans (Quality/Technical Manager)





Test Operator	Checked and Authorised by		Paul Evans	
Darren Bourne	Date	16-10-20		



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **50357**

Borehole/Pit No. **BH107**

Site Name **Atlantic Wharf, Cardiff**

Sample No.

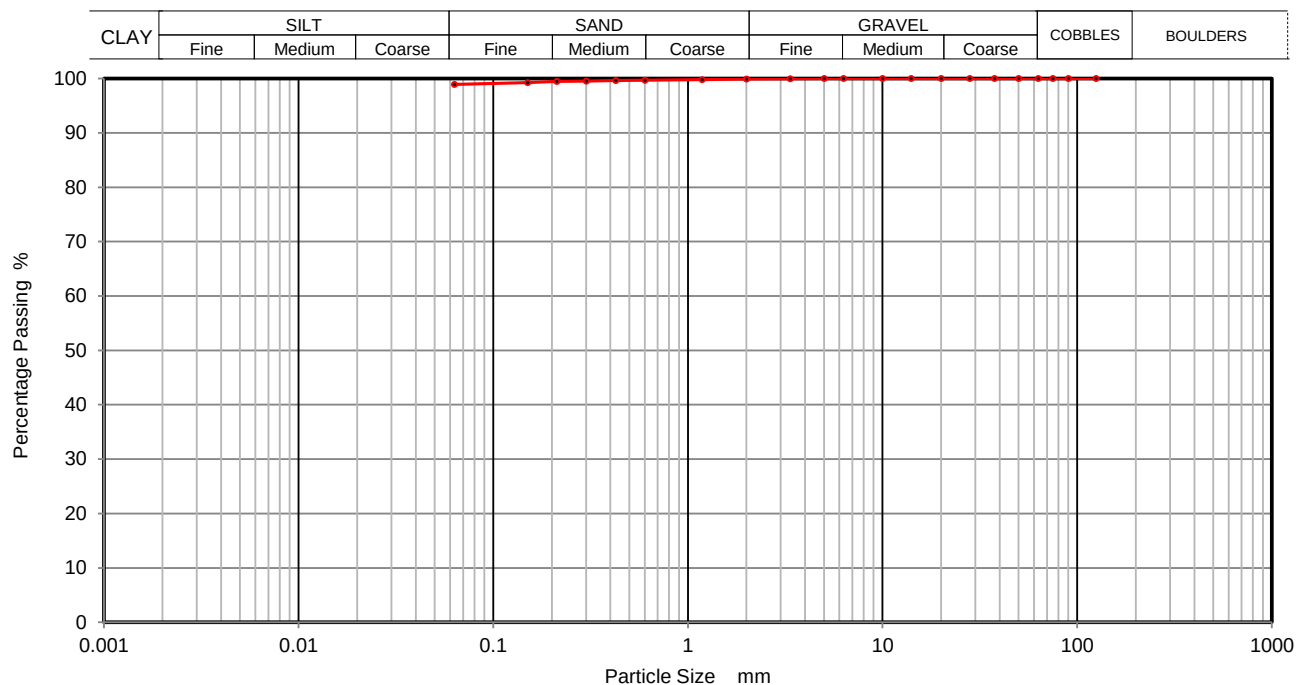
Soil Description **Grey silty CLAY**

Depth Top **2.00**

Depth Base **2.10**

Date Tested **02-10-20**

Sample Type **D**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	99		
0.063	99		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	1
Silt and Clay	99

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	15-10-20	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	16-10-20	Paul Evans	<i>P. Evans</i>





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **50357**

Borehole/Pit No. **BH107**

Site Name **Atlantic Wharf, Cardiff**

Sample No.

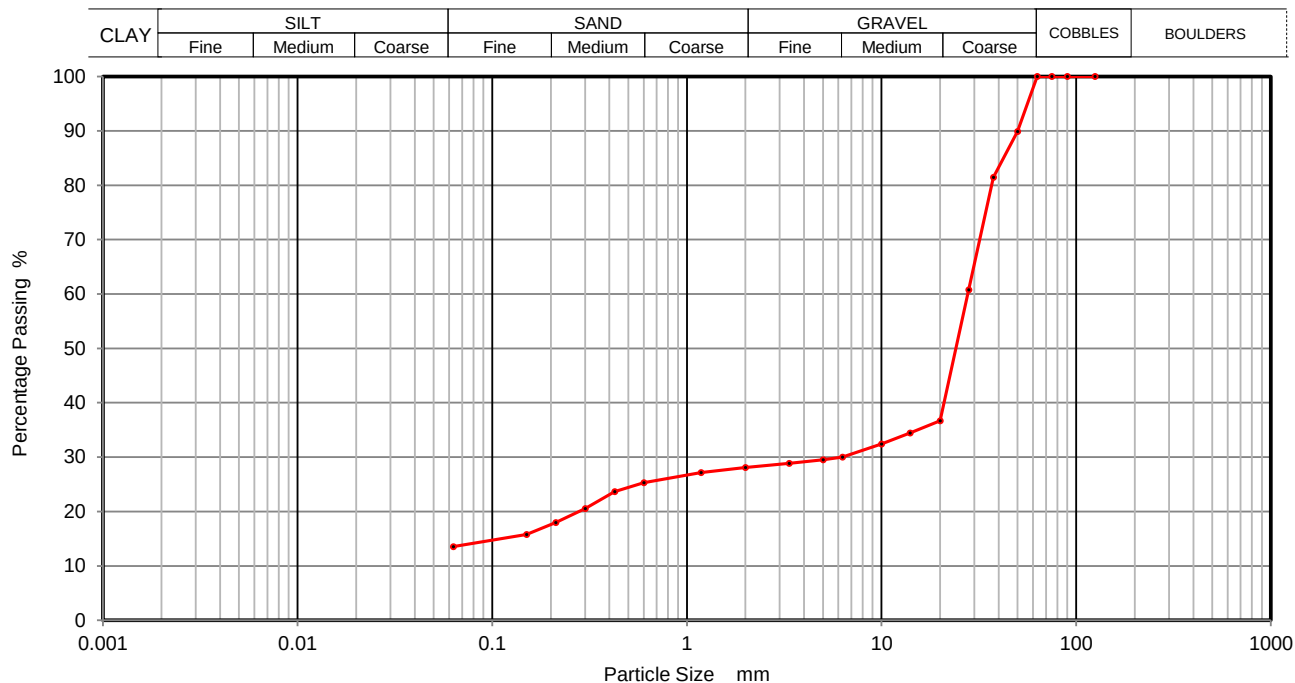
Soil Description **Grey slightly sandy silty/clayey fine to coarse GRAVEL**

Depth Top **9.50**

Depth Base **10.50**

Date Tested **02-10-20**

Sample Type **D**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	90		
37.5	81		
28	61		
20	37		
14	34		
10	32		
6.3	30		
5	30		
3.35	29		
2	28		
1.18	27		
0.6	25		
0.425	24		
0.3	21		
0.212	18		
0.15	16		
0.063	14		

Sample Proportions	% dry mass
Cobbles	0
Gravel	72
Sand	14
Silt and Clay	14

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	15-10-20	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	16-10-20	Paul Evans	<i>P. Evans</i>



2788



ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

Contract Number

50357

Borehole/Trialpit No.

BH107

Site Name

Atlantic Wharf, Cardiff

Sample No.

Soil Description

Grey silty CLAY

Depth Top (m)

3.50

Depth Base (m)

3.95

Lab Temperature

20°C

Sample Location

Top

Remarks

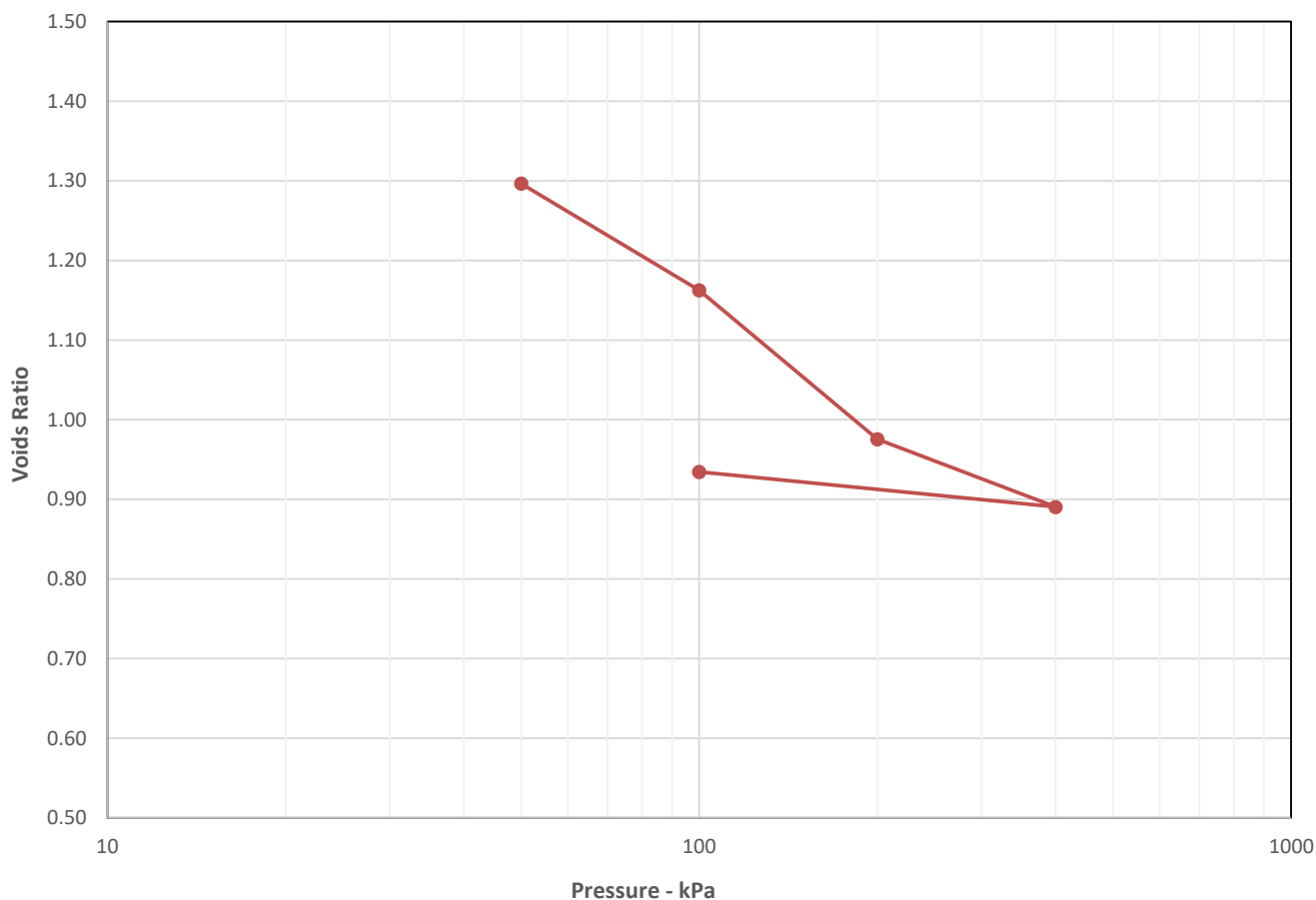
Cv Calculated Using T90
Particle Density Assumed Unless Stated Otherwise

Sample Type

UT

Date Tested

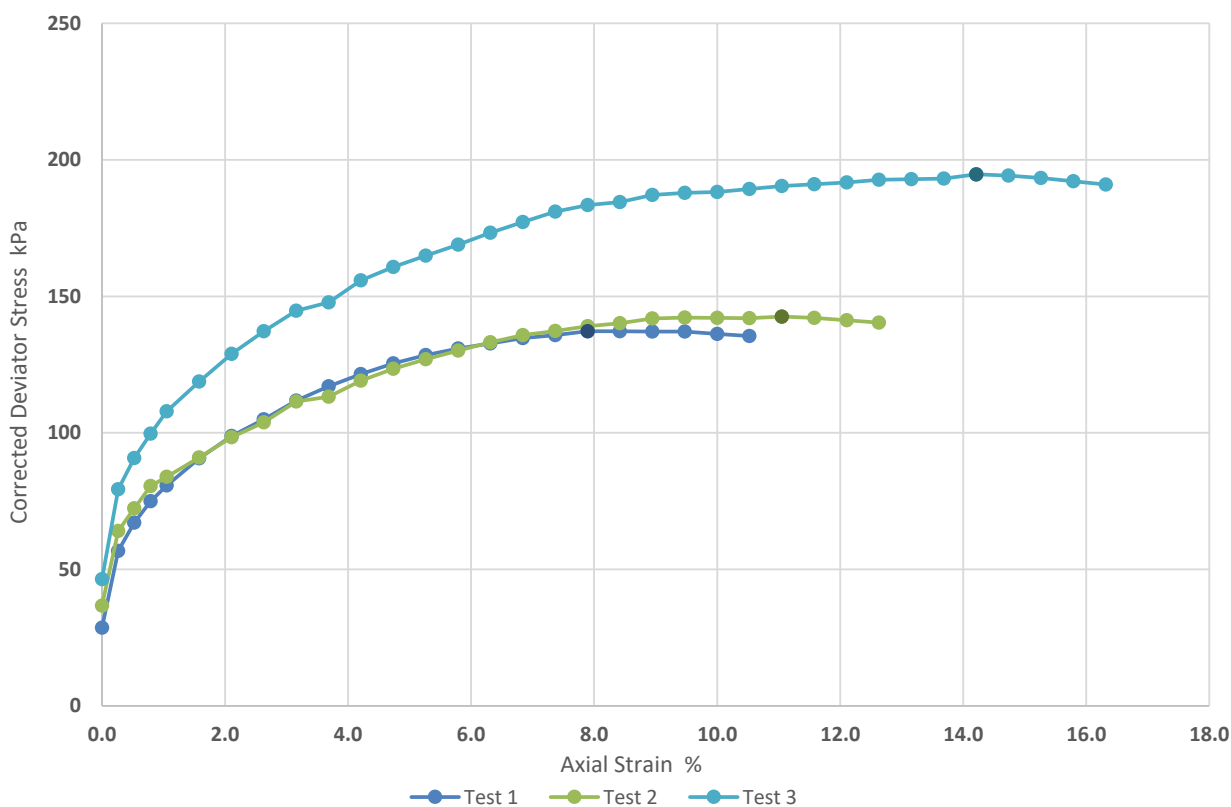
25-09-20



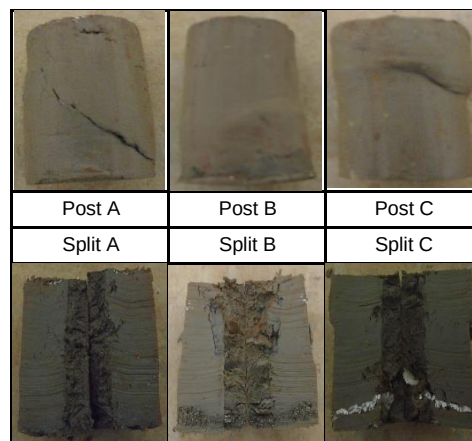
Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	44	0	-	50	0.4	0.12		-			
Bulk Density (Mg/m3)	1.88	50	-	100	1.2	1.4		-			
Dry Density (Mg/m3)	1.31	100	-	200	0.87	9.4		-			
Voids Ratio	1.3460	200	-	400	0.21	14.0		-			
Degree of saturation	99.6	400	-	100	0.077	1.6		-			
Height (mm)	18.77		-					-			
Diameter (mm)	74.96		-					-			
Particle Density (Mg/m3)			-					-			

Operators	Checked	15-10-20	Emma Sharp	
LG	Approved	16-10-20	Paul Evans	





	Specimen 1	Specimen 2	Specimen 3
Moisture Content (%)	36	36	36
Bulk Density (Mg/m ³)	1.82	1.83	1.83
Dry Density (Mg/m ³)	1.34	1.35	1.35
Specimen Length (mm)	76	76	76
Specimen Diameter (mm)	38	38	38
Cell Pressures (kPa)	40	80	160
Deviator Stress (kPa)	137	143	195
Undrained Shear Strength (kPa)	69	71	97
Failure Strain (%)	7.9	11	14
Mode Of Failure	Brittle	Brittle	Brittle
Membrane Used/Thickness	Rubber/0.3mm	Rubber/0.3mm	Rubber/0.3mm
Rate of Strain (%/min)	1.97	1.97	1.97



Checked	15-10-20	Emma Sharp	
Approved	16-10-20	Paul Evans	



Undrained Shear Strength in Triaxial Compression
BS1377 : Part 7 : Clause 8 : 1991 Set of Three 38 mm
without the measurement of Pore Pressure

Contract Number

50357

Borehole/Pit No.

BH107

Site Name

Atlantic Wharf, Cardiff

Sample No.

Soil Description

Brown/grey silty CLAY

Depth Top

11.00

Depth Base

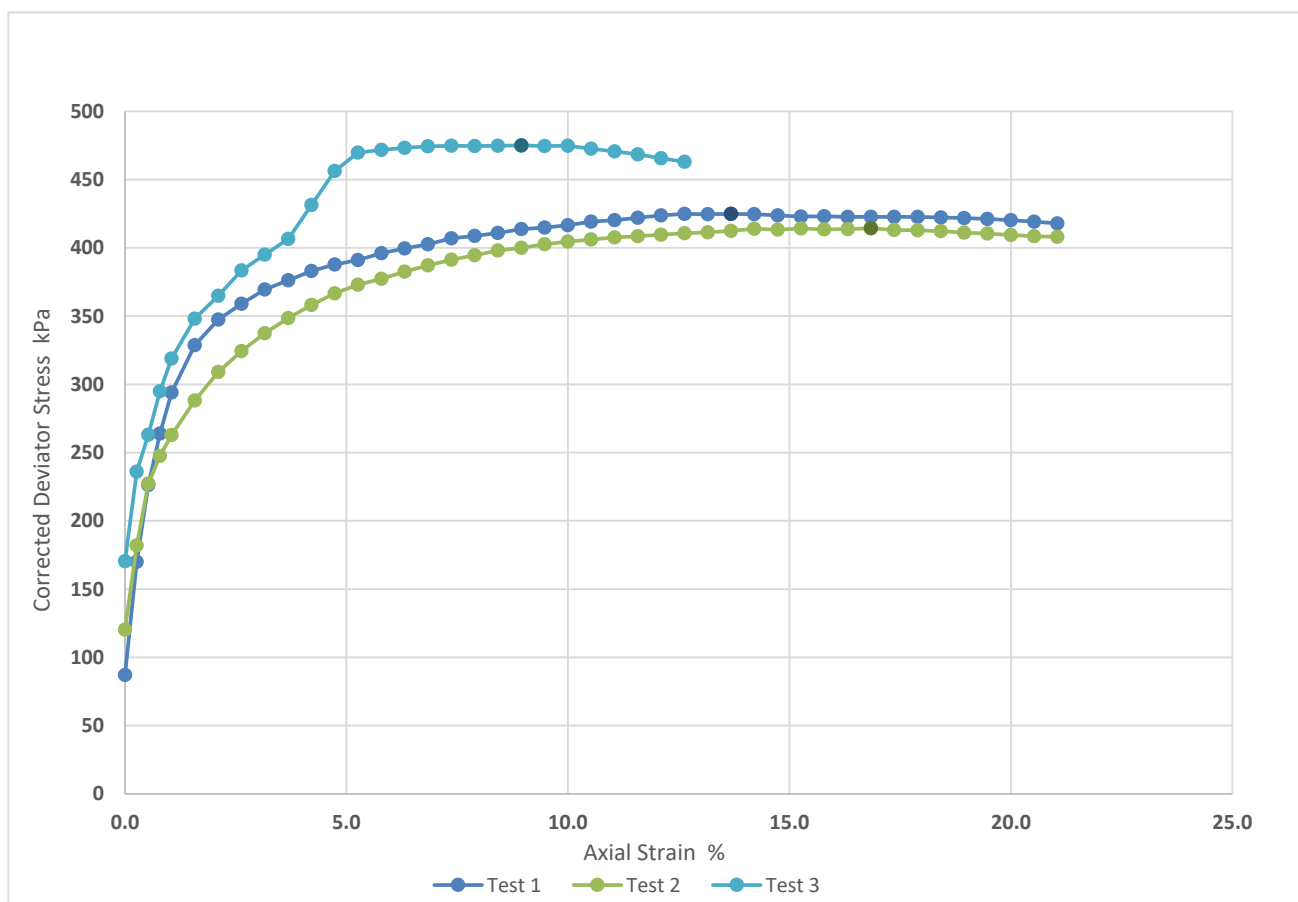
11.45

Date Tested

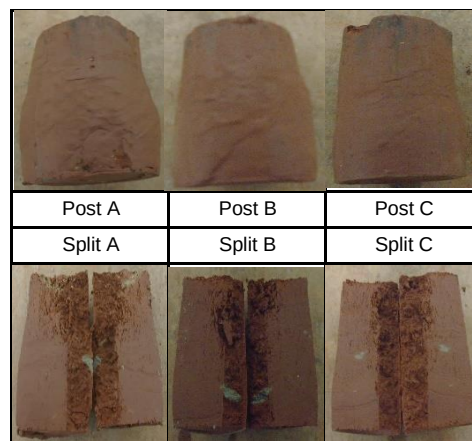
15-10-20

Sample Type

UT



	Specimen 1	Specimen 2	Specimen 3
Moisture Content (%)	25	25	25
Bulk Density (Mg/m ³)	2.00	2.00	2.00
Dry Density (Mg/m ³)	1.59	1.59	1.59
Specimen Length (mm)	76	76	76
Specimen Diameter (mm)	38	38	38
Cell Pressures (kPa)	250	500	750
Deviator Stress (kPa)	425	414	475
Undrained Shear Strength (kPa)	212	207	238
Failure Strain (%)	14	17	8.9
Mode Of Failure	Plastic	Plastic	Plastic
Membrane Used/Thickness	Rubber/0.3mm	Rubber/0.3mm	Rubber/0.3mm
Rate of Strain (%/min)	1.97	1.97	1.97



Checked	15-10-20	Emma Sharp	
Approved	16-10-20	Paul Evans	



APPENDIX H

GEOENVIRONMENTAL LABORATORY TEST CERTIFICATES



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 20-29777

Issue: 1

Date of Issue: 16/09/2020

Contact: Andy Norman

Customer Details: Envirotreat Technologies Ltd
LCP House
The Pensnett Estate

West MidlandsDY6 7NA

Quotation No: Q20-01871

Order No: Not Supplied

Customer Reference: Not Supplied

Date Received: 09/09/2020

Date Approved: 16/09/2020

Details: Atlantic Wharf

Approved by: 

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

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Sample Summary

Report No.: 20-29777, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
213542	BH104 0.30	07/09/2020	09/09/2020		
213543	BH104 1.00	07/09/2020	09/09/2020	Sand + stones	
213544	BH104 2.50	07/09/2020	09/09/2020	Clay	
213545	BH104 3.20	08/09/2020	09/09/2020		
213546	BH104 8.40	08/09/2020	09/09/2020		



Results Summary

2683

Report No.: 20-29777, issue number 1

ELAB Reference	213543	213544
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	BH104	BH104
Sample Depth (m)	1.00	2.50
Sampling Date	07/09/2020	07/09/2020

Determinand	Codes	Units	LOD		
Soil sample preparation parameters					
Material removed	N	%	0.1	< 0.1	< 0.1
Description of Inert material removed	N		0	None	None
Metals					
Antimony	N	mg/kg	2.5	< 2.5	< 2.5
Arsenic	M	mg/kg	1	^ 7.3	7.3
Barium	U	mg/kg	10	3290	132
Beryllium	U	mg/kg	1	< 1.0	1.2
Cadmium	M	mg/kg	0.5	^ < 0.5	< 0.5
Chromium	M	mg/kg	5	^ 36.5	39.3
Chromium (III)	N	mg/kg	5	36.5	39.3
Copper	M	mg/kg	5	^ 10.0	13.4
Iron	N	mg/kg	35	21000	32700
Lead	M	mg/kg	5	^ 29.5	25.2
Manganese	U	mg/kg	30	1340	461
Mercury	M	mg/kg	0.5	^ < 0.5	< 0.5
Molybdenum	N	mg/kg	0.5	4.1	< 0.5
Nickel	M	mg/kg	5	^ 23.7	34.6
Selenium	M	mg/kg	1	^ < 1.0	< 1.0
Vanadium	M	mg/kg	5	^ 13.3	48.6
Zinc	M	mg/kg	5	^ 32.3	104
Anions					
Water Soluble Sulphate	M	mg/l	20	^ 34	24
Water Soluble Sulphate	M	mg/kg	40	^ 69	48
Inorganics					
Free Cyanide	N	mg/kg	1	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	^ < 1.0	< 1.0
Total Sulphur	N	%	0.01	0.07	0.03
Water Soluble Boron	N	mg/kg	0.5	2.9	< 0.5
Miscellaneous					
Fraction of Organic Carbon	N		0.0001	0.0031	0.0056
pH	M	pH units	0.1	^ 8.6	8.9
Phenols					
Phenol	M	mg/kg	1	^ < 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	^ < 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	^ < 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5



Results Summary

2683

Report No.: 20-29777, issue number 1

ELAB Reference	213543	213544
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	BH104	BH104
Sample Depth (m)	1.00	2.50
Sampling Date	07/09/2020	07/09/2020

Determinand	Codes	Units	LOD		
Polyaromatic hydrocarbons					
Naphthalene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Acenaphthylene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Acenaphthene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Fluorene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Phenanthrene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Anthracene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Fluoranthene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Pyrene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Benzo(a)anthracene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Chrysene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Benzo(b)fluoranthene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Benzo(k)fluoranthene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Benzo(a)pyrene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene GCMS	N	mg/kg	0.01	< 0.01	< 0.01
Total PAH(16) GCMS	N	mg/kg	0.04	< 0.04	< 0.04
BTEX					
Benzene	M	ug/kg	10	^ < 10.0	< 10.0
Toluene	M	ug/kg	10	^ < 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	^ < 10.0	< 10.0
Xylenes	M	ug/kg	10	^ < 10.0	< 10.0
MTBE	N	ug/kg	10	< 10.0	< 10.0
TPH CWG					
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aliphatic	M	mg/kg	1	^ < 1.0	< 1.0
>C12-C16 Aliphatic	M	mg/kg	1	^ < 1.0	< 1.0
>C16-C21 Aliphatic	M	mg/kg	1	^ < 1.0	< 1.0
>C21-C35 Aliphatic	M	mg/kg	1	^ < 1.0	< 1.0
>C35-C40 Aliphatic	M	mg/kg	1	^ < 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aromatic	M	mg/kg	1	^ < 1.0	< 1.0
>C12-C16 Aromatic	M	mg/kg	1	^ < 1.0	< 1.0
>C16-C21 Aromatic	M	mg/kg	1	^ < 1.0	< 1.0
>C21-C35 Aromatic	M	mg/kg	1	^ 1.1	< 1.0
>C35-C40 Aromatic	M	mg/kg	1	^ < 1.0	< 1.0
Total aromatic hydrocarbons (>C5 - C40)	N	mg/kg	1	1.8	< 1.0
Total petroleum hydrocarbons (>C5 - C40)	N	mg/kg	1	2.6	< 1.0

Results Summary

Report No.: 20-29777, issue number 1

ELAB Reference	213543	213544
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	BH104	BH104
Sample Depth (m)	1.00	2.50
Sampling Date	07/09/2020	07/09/2020

Determinand	Codes	Units	LOD		
VOC					
Heptane	N	ug/kg	10	< 10.0	< 10.0
Octane	N	ug/kg	10	< 10.0	< 10.0
Nonane	N	ug/kg	10	< 10.0	< 10.0
Benzene	M	ug/kg	10	^ < 10.0	< 10.0
Toluene	M	ug/kg	10	^ < 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	^ < 10.0	< 10.0
m+p-xylene	M	ug/kg	10	^ < 10.0	< 10.0
o-xylene	M	ug/kg	10	^ < 10.0	< 10.0
cis-1,2-dichloroethane	N	ug/kg	10	< 10.0	< 10.0
1,1-Dichloroethane	M	ug/kg	10	^ < 10.0	< 10.0
Chloroform	M	ug/kg	10	^ < 10.0	< 10.0
Tetrachloromethane	M	ug/kg	10	^ < 10.0	< 10.0
1,1,1-Trichloroethane	M	ug/kg	10	^ < 10.0	< 10.0
Trichloroethylene	M	ug/kg	10	^ < 10.0	< 10.0
Tetrachloroethylene	M	ug/kg	10	^ < 10.0	< 10.0
1,1,1,2-Tetrachloroethane	M	ug/kg	10	^ < 10.0	< 10.0
1,1,2,2-Tetrachloroethane	M	ug/kg	10	^ < 10.0	< 10.0
Chlorobenzene	M	ug/kg	10	^ < 10.0	< 10.0
Bromobenzene	M	ug/kg	10	^ < 10.0	< 10.0
Bromodichloromethane	M	ug/kg	10	^ < 10.0	< 10.0
Methylethylbenzene	M	ug/kg	10	^ < 10.0	< 10.0
1,1-Dichloro-1-propene	M	ug/kg	10	^ < 10.0	< 10.0
Trans - 1-2 -dichloroethylene	N	ug/kg	10	< 10.0	< 10.0
2,2-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0
Bromochloromethane	N	ug/kg	10	< 10.0	< 10.0
1,2-Dichloroethane	M	ug/kg	10	^ < 10.0	^ < 10.0
Dibromomethane	M	ug/kg	10	^ < 10.0	< 10.0
1,2-Dichloropropane	M	ug/kg	10	^ < 10.0	< 10.0
cis-1,3-Dichloro-1-propene	M	ug/kg	10	^ < 10.0	< 10.0
trans-1,3-Dichloro-1-propene	M	ug/kg	10	^ < 10.0	< 10.0
1,1,2-Trichloroethane	N	ug/kg	10	< 10.0	< 10.0
Dibromochloromethane	N	ug/kg	10	< 10.0	< 10.0
1,3-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0
1,2-dibromoethane	N	ug/kg	10	< 10.0	< 10.0
Styrene	N	ug/kg	10	< 10.0	< 10.0
Propylbenzene	N	ug/kg	10	< 10.0	< 10.0
2-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0
1,2,4-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0
4-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0
t-butylbenzene	N	ug/kg	10	< 10.0	< 10.0
1,3,5-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0
1-methylpropylbenzene	N	ug/kg	10	< 10.0	< 10.0
p-cymene	N	ug/kg	10	< 10.0	< 10.0
1,3-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Butylbenzene	N	ug/kg	10	< 10.0	< 10.0
1,2-Dibromo-3-chloropropane	N	ug/kg	10	< 10.0	< 10.0
Hexachlorobutadiene	N	ug/kg	10	< 10.0	< 10.0
1-2-3 - Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Naphthalene	N	ug/kg	10	< 10.0	< 10.0
1-2-4 - Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
1,4-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
1,2-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Bromoform	N	ug/kg	10	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

The Environmental Laboratory Ltd. Reg. No. 3882193

Results Summary

2683

Report No.: 20-29777, issue number 1

ELAB Reference	213543
Customer Reference	
Sample ID	
Sample Type	SOIL
Sample Location	BH104
Sample Depth (m)	1.00
Sampling Date	07/09/2020

Determinand	Codes	Units	LOD	
Metals				
Chromium (III)	N	ug/l	5	< 5
Antimony 10:1 extract	N	ug/l	5	< 5
Arsenic 10:1 extract	N	ug/l	5	< 5
Barium 10:1 extract	N	ug/l	5	45
Beryllium 10:1 extract	N	ug/l	5	< 5
Boron 10:1 extract	N	ug/l	5	9
Cadmium 10:1 extract	N	ug/l	1	< 1
Calcium 10:1 extract	N	ug/l	100	10300
Chromium 10:1 extract	N	ug/l	5	< 5
Copper 10:1 extract	N	ug/l	5	< 5
Iron 10:1 extract	N	ug/l	140	< 140
Lead 10:1 extract	N	ug/l	5	< 5
Magnesium 10:1 extract	N	ug/l	100	4010
Manganese 10:1 extract	N	ug/l	5	< 5
Mercury 10:1 extract	N	ug/l	0.1	< 0.1
Molybdenum 10:1 extract	N	ug/l	5	12
Nickel 10:1 extract	N	ug/l	5	< 5
Selenium 10:1 extract	N	ug/l	5	< 5
Vanadium 10:1 extract	N	ug/l	5	< 5
Zinc 10:1 extract	N	ug/l	5	< 5
Anions				
Chloride	N	mg/l	1	4
Fluoride	N	mg/l	1	< 1
Inorganics				
Complex cyanide	N	ug/l	5	< 5
Hexavalent chromium	N	ug/l	100	< 100
Free Cyanide	N	ug/l	5	< 5
Ammoniacal Nitrogen as N	N	mg/l	0.1	0.1
Total Cyanide	N	ug/l	5	< 5
Miscellaneous				
pH (10:1 extract)	N	pH units	0.1	7.9
Phenols				
Phenol	N	ug/l	1	< 1
M,P-Cresol	N	ug/l	1	< 1
O-Cresol	N	ug/l	1	< 1
3,4-Dimethylphenol	N	ug/l	1	< 1
2,3-Dimethylphenol	N	ug/l	1	< 1
Trimethylphenol	N	ug/l	1	< 1
Total Monohydric Phenols 10:1 extract	N	ug/l	5	< 5



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Results Summary

Report No.: 20-29777, issue number 1

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
213543	1.00	BH104	Red-brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
213544	2.50	BH104	Brown soil, (clay)	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 20-29777, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Leachate cyanide 10:1 extract	N		14/09/2020		Colorimetry
Leachate phenols 10:1 extract	N		14/09/2020		HPLC
PAH (GC-MS)	N	As submitted sample	10/09/2020		GC-MS
pH of leachates	N		14/09/2020		Electromeric
Free cyanide	N	As submitted sample	10/09/2020	107	Colorimetry
Hexavalent chromium	N	As submitted sample	10/09/2020	110	Colorimetry
pH	M	Air dried sample	14/09/2020	113	Electromeric
Phenols in solids	M	As submitted sample	10/09/2020	121	HPLC
Ammonia in leachates	N		14/09/2020	151	Colorimetry
Water soluble anions	M	Air dried sample	10/09/2020	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	10/09/2020	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	10/09/2020	181	GC-MS
VOC in solids	M	As submitted sample	10/09/2020	181	GC-MS
BTEX in solids	M	As submitted sample	10/09/2020	181A	GC-MS
Water soluble boron	N	Air dried sample	10/09/2020	202	Colorimetry
Total cyanide	M	As submitted sample	10/09/2020	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	11/09/2020	210	IR
Anions in leachates	N		14/09/2020	270	Ion Chromatography
TPH CWG soil by gc-gc	M	As submitted sample	10/09/2020	271	
Asbestos identification	U	Air dried sample	11/09/2020	280	Microscopy
Aqua regia extractable metals	M	Air dried sample	10/09/2020	300	ICPMS
Leachate metals 10:1 extract	N		14/09/2020	301	ICPMS

Tests marked N are not UKAS accredited

Report Information

Report No.: 20-29777, issue number 1

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.

ELAB are unable to provide an interpretation or opinion on the content of this report.

The results relate only to the sample received.

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

-
- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 20-29932

Issue: 1

Date of Issue: 25/09/2020

Contact: Andy Norman

Customer Details: Envirotreat Technologies Ltd
LCP House
The Pensnett Estate

West MidlandsDY6 7NA

Quotation No: Q20-01871

Order No: Not Supplied

Customer Reference: Not Supplied

Date Received: 17/09/2020

Date Approved: 25/09/2020

Details: Atlantic Wharf

Approved by: 

Mike Varley, Technical Manager

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Sample Summary

Report No.: 20-29932, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
214411	BH103 Made Ground 0.30	15/09/2020	18/09/2020		
214412	BH103 Made Ground 1.00	15/09/2020	18/09/2020	Sandy loam	
214413	BH103 Made Ground 3.00	15/09/2020	18/09/2020	Sandy loam	
214414	BH103 Made Ground 5.00	15/09/2020	18/09/2020		
214415	BH103 Made Ground 7.00	15/09/2020	18/09/2020		
214416	BH103 Natural Soil 10.30	15/09/2020	18/09/2020	Clayey loam	
214417	TT101 Made Ground 0.30	15/09/2020	18/09/2020		
214418	TT101 Made Ground 1.00	15/09/2020	18/09/2020	Sandy loam	
214419	TT101 Made Ground 3.00	15/09/2020	18/09/2020	Sandy loam	
214420	TP101 Made Ground 0.30	15/09/2020	18/09/2020		
214421	TP101 Made Ground 1.00	15/09/2020	18/09/2020	Silty loam	
214422	TP101 Made Ground 3.00	15/09/2020	18/09/2020		
214423	TP101 Natural Soil 4.50	15/09/2020	18/09/2020	Sandy clay	
214424	W1 3.40	15/09/2020	18/09/2020		
214425	W2 14.50	15/09/2020	18/09/2020		



Results Summary

2683

Report No.: 20-29932, issue number 1

ELAB Reference	214412	214413	214416	214418
Customer Reference	Made Ground	Made Ground	Natural Soil	Made Ground
Sample ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sample Location	BH103	BH103	BH103	TT101
Sample Depth (m)	1.00	3.00	10.30	1.00
Sampling Date	15/09/2020	15/09/2020	15/09/2020	15/09/2020

Determinand	Codes	Units	LOD				
Soil sample preparation parameters							
Material removed	N	%	0.1	43.2	32.2	< 0.1	51.0
Description of Inert material removed	N		0	Stones	Stones	None	Stones,brick,clinker
Metals							
Antimony	N	mg/kg	2.5	< 2.5	3.5	< 2.5	4.2
Arsenic	M	mg/kg	1	8.1	31.5	12.0	36.8
Barium	U	mg/kg	10	6480	562	66.3	273
Beryllium	U	mg/kg	1	< 1.0	1.1	1.3	1.4
Cadmium	M	mg/kg	0.5	< 0.5	0.6	< 0.5	< 0.5
Chromium	M	mg/kg	5	26.3	52.7	37.8	22.7
Chromium (III)	N	mg/kg	5	26.3	52.7	37.8	22.7
Copper	M	mg/kg	5	15.3	100	17.8	118
Iron	N	mg/kg	35	22100	34800	36400	35600
Lead	M	mg/kg	5	18.2	152	28.7	213
Manganese	U	mg/kg	30	1480	791	907	1240
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Molybdenum	N	mg/kg	0.5	3.0	5.3	0.8	2.3
Nickel	M	mg/kg	5	21.9	47.8	32.3	39.8
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5	20.2	37.4	41.3	29.9
Zinc	M	mg/kg	5	38.9	200	97.6	216
Anions							
Water Soluble Sulphate	M	mg/l	20	212	81	269	139
Water Soluble Sulphate	M	mg/kg	40	424	163	539	278
Inorganics							
Free Cyanide	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphur	N	%	0.01	0.18	0.11	1.7	0.23
Water Soluble Boron	N	mg/kg	0.5	0.8	1.3	4.2	1.1
Miscellaneous							
Fraction of Organic Carbon	N		0.0001	0.0055	0.0350	0.0157	0.117
pH	M	pH units	0.1	9.1	9.6	8.9	8.4
Phenols							
Phenol	M	mg/kg	1	< 1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5	< 5



Results Summary

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Report No.: 20-29932, issue number 1

ELAB Reference	214412	214413	214416	214418
Customer Reference	Made Ground	Made Ground	Natural Soil	Made Ground
Sample ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sample Location	BH103	BH103	BH103	TT101
Sample Depth (m)	1.00	3.00	10.30	1.00
Sampling Date	15/09/2020	15/09/2020	15/09/2020	15/09/2020

Determinand	Codes	Units	LOD				
Polyaromatic hydrocarbons							
Naphthalene GCMS	N	mg/kg	0.01	0.01	0.08	0.03	0.40
Acenaphthylene GCMS	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	0.03
Acenaphthene GCMS	N	mg/kg	0.01	< 0.01	0.03	< 0.01	0.05
Fluorene GCMS	N	mg/kg	0.01	< 0.01	0.03	< 0.01	0.13
Phenanthrene GCMS	N	mg/kg	0.01	< 0.01	0.15	0.01	1.05
Anthracene GCMS	N	mg/kg	0.01	< 0.01	0.04	< 0.01	0.13
Fluoranthene GCMS	N	mg/kg	0.01	0.01	0.20	0.02	0.80
Pyrene GCMS	N	mg/kg	0.01	0.01	0.16	0.01	0.76
Benzo(a)anthracene GCMS	N	mg/kg	0.01	< 0.01	0.12	< 0.01	0.44
Chrysene GCMS	N	mg/kg	0.01	< 0.01	0.16	0.01	0.62
Benzo(b)fluoranthene GCMS	N	mg/kg	0.01	< 0.01	0.11	< 0.01	0.45
Benzo(k)fluoranthene GCMS	N	mg/kg	0.01	< 0.01	0.13	< 0.01	0.40
Benzo(a)pyrene GCMS	N	mg/kg	0.01	< 0.01	0.12	< 0.01	0.43
Indeno(1,2,3-cd)pyrene GCMS	N	mg/kg	0.01	< 0.01	0.06	< 0.01	0.23
Dibenzo(a,h)anthracene GCMS	N	mg/kg	0.01	< 0.01	0.02	< 0.01	0.10
Benzo(g,h,i)perylene GCMS	N	mg/kg	0.01	< 0.01	0.07	< 0.01	0.30
Total PAH(16) GCMS	N	mg/kg	0.04	0.10	1.47	0.14	6.30
BTEX							
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0
MTBE	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0
TPH CWG							
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	M	mg/kg	1	1.8	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	M	mg/kg	1	1.1	< 1.0	< 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40)	N	mg/kg	1	3.1	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	M	mg/kg	1	14.4	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	M	mg/kg	1	4.5	< 1.0	< 1.0	< 1.0
Total aromatic hydrocarbons (>C5 - C40)	N	mg/kg	1	20.3	< 1.0	< 1.0	< 1.0
Total petroleum hydrocarbons (>C5 - C40)	N	mg/kg	1	23.4	< 1.0	< 1.0	< 1.0

Results Summary

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Report No.: 20-29932, issue number 1

ELAB Reference	214419	214421	214423
Customer Reference	Made Ground	Made Ground	Natural Soil
Sample ID			
Sample Type	SOIL	SOIL	SOIL
Sample Location	TT101	TP101	TP101
Sample Depth (m)	3.00	1.00	4.50
Sampling Date	15/09/2020	15/09/2020	15/09/2020

Determinand	Codes	Units	LOD			
Soil sample preparation parameters						
Material removed	N	%	0.1	47.9	49.2	< 0.1
Description of Inert material removed	N		0	Stones,brick,clinker	Stones,brick,clinker	None
Metals						
Antimony	N	mg/kg	2.5	4.4	3.2	< 2.5
Arsenic	M	mg/kg	1	56.9	47.9	12.6
Barium	U	mg/kg	10	267	303	42.9
Beryllium	U	mg/kg	1	1.3	1.2	1.4
Cadmium	M	mg/kg	0.5	0.5	0.5	< 0.5
Chromium	M	mg/kg	5	24.0	25.9	44.5
Chromium (III)	N	mg/kg	5	24.0	25.9	44.5
Copper	M	mg/kg	5	123	155	19.1
Iron	N	mg/kg	35	31600	32700	37600
Lead	M	mg/kg	5	172	197	29.8
Manganese	U	mg/kg	30	661	1190	514
Mercury	M	mg/kg	0.5	0.6	1.4	< 0.5
Molybdenum	N	mg/kg	0.5	3.3	2.2	0.6
Nickel	M	mg/kg	5	41.2	39.8	37.3
Selenium	M	mg/kg	1	1.1	1.2	< 1.0
Vanadium	M	mg/kg	5	32.7	36.1	50.3
Zinc	M	mg/kg	5	164	239	111
Anions						
Water Soluble Sulphate	M	mg/l	20	215	26	28
Water Soluble Sulphate	M	mg/kg	40	431	52	56
Inorganics						
Free Cyanide	N	mg/kg	1	< 1.0	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0
Total Sulphur	N	%	0.01	0.16	0.16	0.05
Water Soluble Boron	N	mg/kg	0.5	1.8	< 0.5	2.0
Miscellaneous						
Fraction of Organic Carbon	N		0.0001	0.0579	0.109	0.0071
pH	M	pH units	0.1	8.2	8.4	8.6
Phenols						
Phenol	M	mg/kg	1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5

Results Summary

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Report No.: 20-29932, issue number 1

ELAB Reference	214419	214421	214423
Customer Reference	Made Ground	Made Ground	Natural Soil
Sample ID			
Sample Type	SOIL	SOIL	SOIL
Sample Location	TT101	TP101	TP101
Sample Depth (m)	3.00	1.00	4.50
Sampling Date	15/09/2020	15/09/2020	15/09/2020

Determinand	Codes	Units	LOD			
Polyaromatic hydrocarbons						
Naphthalene GCMS	N	mg/kg	0.01	0.17	0.21	0.01
Acenaphthylene GCMS	N	mg/kg	0.01	0.04	0.02	< 0.01
Acenaphthene GCMS	N	mg/kg	0.01	0.03	0.02	< 0.01
Fluorene GCMS	N	mg/kg	0.01	0.06	0.04	< 0.01
Phenanthrene GCMS	N	mg/kg	0.01	0.34	0.54	< 0.01
Anthracene GCMS	N	mg/kg	0.01	0.07	0.09	< 0.01
Fluoranthene GCMS	N	mg/kg	0.01	0.45	0.59	< 0.01
Pyrene GCMS	N	mg/kg	0.01	0.38	0.48	< 0.01
Benzo(a)anthracene GCMS	N	mg/kg	0.01	0.18	0.36	< 0.01
Chrysene GCMS	N	mg/kg	0.01	0.25	0.56	< 0.01
Benzo(b)fluoranthene GCMS	N	mg/kg	0.01	0.17	0.41	< 0.01
Benzo(k)fluoranthene GCMS	N	mg/kg	0.01	0.20	0.40	< 0.01
Benzo(a)pyrene GCMS	N	mg/kg	0.01	0.20	0.34	< 0.01
Indeno(1,2,3-cd)pyrene GCMS	N	mg/kg	0.01	0.11	0.21	< 0.01
Dibenzo(a,h)anthracene GCMS	N	mg/kg	0.01	0.04	0.09	< 0.01
Benzo(g,h,i)perylene GCMS	N	mg/kg	0.01	0.15	0.24	< 0.01
Total PAH(16) GCMS	N	mg/kg	0.04	2.85	4.60	0.07
BTEX						
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0
MTBE	N	ug/kg	10	< 10.0	< 10.0	< 10.0
TPH CWG						
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	1.2	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	M	mg/kg	1	< 1.0	2.6	< 1.0
>C21-C35 Aromatic	M	mg/kg	1	< 1.0	6.9	< 1.0
>C35-C40 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0
Total aromatic hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	10.8	< 1.0
Total petroleum hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	12.0	< 1.0

Results Summary

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Report No.: 20-29932, issue number 1

ELAB Reference				214412	214413	214416	214418	214419
Customer Reference				Made Ground	Made Ground	Natural Soil	Made Ground	Made Ground
Sample ID								
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				BH103	BH103	BH103	TT101	TT101
Sample Depth (m)				1.00	3.00	10.30	1.00	3.00
Sampling Date				15/09/2020	15/09/2020	15/09/2020	15/09/2020	15/09/2020
Determinand	Codes	Units	LOD					
VOC								
Heptane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Octane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Nonane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
m+p-xylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
o-xylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
cis-1,2-dichloroethene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1-Dichloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Chloroform	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Tetrachloromethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1,1-Trichloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Trichloroethylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Tetrachloroethylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1,1,2-Tetrachloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1,2,2-Tetrachloroetha	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Chlorobenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bromobenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bromodichloromethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Methylethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Trans - 1-2 -dichloroethylene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
2,2-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bromochloromethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-Dichloroethane	M	ug/kg	10	^ < 10.0	^ < 10.0	^ < 10.0	^ < 10.0	^ < 10.0
Dibromomethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-Dichloropropane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
cis-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
trans-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1,2-Trichloroethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Dibromochloromethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,3-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-dibromoethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Styrene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Propylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
2-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2,4-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
4-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
t-butylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,3,5-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1-methylpropylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
p-cymene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,3-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Butylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-Dibromo-3-chloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Hexachlorobutadiene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1-2-3 - Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Naphthalene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1-2-4 - Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,4-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bromoform	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

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Results Summary

Report No.: 20-29932, issue number 1

ELAB Reference	214421	214423
Customer Reference	Made Ground	Natural Soil
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	TP101	TP101
Sample Depth (m)	1.00	4.50
Sampling Date	15/09/2020	15/09/2020

Determinand	Codes	Units	LOD		
VOC					
Heptane	N	ug/kg	10	< 10.0	< 10.0
Octane	N	ug/kg	10	< 10.0	< 10.0
Nonane	N	ug/kg	10	< 10.0	< 10.0
Benzene	M	ug/kg	10	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0
m+p-xylene	M	ug/kg	10	< 10.0	< 10.0
o-xylene	M	ug/kg	10	< 10.0	< 10.0
cis-1,2-dichloroethane	N	ug/kg	10	< 10.0	< 10.0
1,1-Dichloroethane	M	ug/kg	10	< 10.0	< 10.0
Chloroform	M	ug/kg	10	< 10.0	< 10.0
Tetrachloromethane	M	ug/kg	10	< 10.0	< 10.0
1,1,1-Trichloroethane	M	ug/kg	10	< 10.0	< 10.0
Trichloroethylene	M	ug/kg	10	< 10.0	< 10.0
Tetrachloroethylene	M	ug/kg	10	< 10.0	< 10.0
1,1,1,2-Tetrachloroethane	M	ug/kg	10	< 10.0	< 10.0
1,1,2,2-Tetrachloroethane	M	ug/kg	10	< 10.0	< 10.0
Chlorobenzene	M	ug/kg	10	< 10.0	< 10.0
Bromobenzene	M	ug/kg	10	< 10.0	< 10.0
Bromodichloromethane	M	ug/kg	10	< 10.0	< 10.0
Methylethylbenzene	M	ug/kg	10	< 10.0	< 10.0
1,1-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
Trans - 1-2 -dichloroethylene	N	ug/kg	10	< 10.0	< 10.0
2,2-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0
Bromochloromethane	N	ug/kg	10	< 10.0	< 10.0
1,2-Dichloroethane	M	ug/kg	10	^ < 10.0	^ < 10.0
Dibromomethane	M	ug/kg	10	< 10.0	< 10.0
1,2-Dichloropropane	M	ug/kg	10	< 10.0	< 10.0
cis-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
trans-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
1,1,2-Trichloroethane	N	ug/kg	10	< 10.0	< 10.0
Dibromochloromethane	N	ug/kg	10	< 10.0	< 10.0
1,3-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0
1,2-dibromoethane	N	ug/kg	10	< 10.0	< 10.0
Styrene	N	ug/kg	10	< 10.0	< 10.0
Propylbenzene	N	ug/kg	10	< 10.0	< 10.0
2-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0
1,2,4-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0
4-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0
t-butylbenzene	N	ug/kg	10	< 10.0	< 10.0
1,3,5-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0
1-methylpropylbenzene	N	ug/kg	10	< 10.0	< 10.0
p-cymene	N	ug/kg	10	< 10.0	< 10.0
1,3-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Butylbenzene	N	ug/kg	10	< 10.0	< 10.0
1,2-Dibromo-3-chloropropane	N	ug/kg	10	< 10.0	< 10.0
Hexachlorobutadiene	N	ug/kg	10	< 10.0	< 10.0
1-2-3 - Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Naphthalene	N	ug/kg	10	< 10.0	< 10.0
1-2-4 - Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
1,4-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
1,2-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Bromoform	N	ug/kg	10	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 20-29932, issue number 1

ELAB Reference	214416	214419	214423
Customer Reference	Natural Soil	Made Ground	Natural Soil
Sample ID			
Sample Type	SOIL	SOIL	SOIL
Sample Location	BH103	TT101	TP101
Sample Depth (m)	10.30	3.00	4.50
Sampling Date	15/09/2020	15/09/2020	15/09/2020

Determinand	Codes	Units	LOD			
Metals						
Chromium (III)	N	ug/l	5	< 5	< 5	< 5
Antimony 10:1 extract	N	ug/l	5	< 5	7	< 5
Arsenic 10:1 extract	N	ug/l	5	16	11	6
Barium 10:1 extract	N	ug/l	5	11	14	< 5
Beryllium 10:1 extract	N	ug/l	5	< 5	< 5	< 5
Boron 10:1 extract	N	ug/l	5	204	75	105
Cadmium 10:1 extract	N	ug/l	1	< 1	< 1	< 1
Calcium 10:1 extract	N	ug/l	100	11200	13900	2630
Chromium 10:1 extract	N	ug/l	5	< 5	< 5	< 5
Copper 10:1 extract	N	ug/l	5	105	18	30
Iron 10:1 extract	N	ug/l	140	184	< 140	< 140
Lead 10:1 extract	N	ug/l	5	< 5	< 5	< 5
Magnesium 10:1 extract	N	ug/l	100	3130	2370	675
Manganese 10:1 extract	N	ug/l	5	35	26	7
Mercury 10:1 extract	N	ug/l	0.1	< 0.1	< 0.1	< 0.1
Molybdenum 10:1 extract	N	ug/l	5	< 5	9	18
Nickel 10:1 extract	N	ug/l	5	< 5	< 5	< 5
Selenium 10:1 extract	N	ug/l	5	< 5	< 5	< 5
Vanadium 10:1 extract	N	ug/l	5	22	< 5	6
Zinc 10:1 extract	N	ug/l	5	44	7	10
Anions						
Chloride	N	mg/l	1	44	1	5
Fluoride	N	mg/l	1	< 1	< 1	< 1
Inorganics						
Complex cyanide	N	ug/l	5	< 5	< 5	< 5
Hexavalent chromium	N	ug/l	100	< 100	< 100	< 100
Free Cyanide	N	ug/l	5	< 5	< 5	< 5
Ammoniacal Nitrogen as N	N	mg/l	0.1	2.0	< 0.1	1.5
Total Cyanide	N	ug/l	5	< 5	< 5	< 5
Miscellaneous						
pH (10:1 extract)	N	pH units	0.1	7.3	7.2	7.4
Phenols						
Phenol	N	ug/l	1	< 1	< 1	< 1
M,P-Cresol	N	ug/l	1	< 1	< 1	< 1
O-Cresol	N	ug/l	1	< 1	< 1	< 1
3,4-Dimethylphenol	N	ug/l	1	< 1	< 1	< 1
2,3-Dimethylphenol	N	ug/l	1	< 1	< 1	< 1
Trimethylphenol	N	ug/l	1	< 1	< 1	< 1
Total Monohydric Phenols 10:1 extract	N	ug/l	5	< 5	< 5	< 5



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Results Summary

Report No.: 20-29932, issue number 1

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix	Asbestos	Gravimetric Analysis Total	Gravimetric Analysis by ACM Type	Free Fibre Analysis	Total Asbestos
214412	1.00	BH103 Made Ground	Brown soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
214413	3.00	BH103 Made Ground	Brown soil, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
214416	10.30	BH103 Natural Soil	Grey-brown soil (clay), stones	No asbestos detected	n/t	n/t	n/t	n/t
214418	1.00	TT101 Made Ground	Brown sandy soil, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
214419	3.00	TT101 Made Ground	Brown sandy soil, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
214421	1.00	TP101 Made Ground	Brown sandy soil, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
214423	4.50	TP101 Natural Soil	Brown soil (clay), stones	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 20-29932, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Leachate cyanide 10:1 extract	N		23/09/2020		Colorimetry
Leachate phenols 10:1 extract	N		23/09/2020		HPLC
PAH (GC-MS)	N	As submitted sample	22/09/2020		GC-MS
pH of leachates	N		24/09/2020		Electromeric
Free cyanide	N	As submitted sample	22/09/2020	107	Colorimetry
Hexavalent chromium	N	As submitted sample	22/09/2020	110	Colorimetry
pH	M	Air dried sample	23/09/2020	113	Electromeric
Phenols in solids	M	As submitted sample	22/09/2020	121	HPLC
Ammonia in leachates	N		25/09/2020	151	Colorimetry
Water soluble anions	M	Air dried sample	22/09/2020	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	22/09/2020	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	22/09/2020	181	GC-MS
VOC in solids	M	As submitted sample	22/09/2020	181	GC-MS
BTEX in solids	M	As submitted sample	22/09/2020	181A	GC-MS
Water soluble boron	N	Air dried sample	22/09/2020	202	Colorimetry
Total cyanide	M	As submitted sample	22/09/2020	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	23/09/2020	210	IR
Anions in leachates	N		23/09/2020	270	Ion Chromatography
TPH CWG soil by gc-gc	M	As submitted sample	22/09/2020	271	
Asbestos identification	U	Air dried sample	24/09/2020	280	Microscopy
Aqua regia extractable metals	M	Air dried sample	22/09/2020	300	ICPMS
Leachate metals 10:1 extract	N		23/09/2020	301	ICPMS

Tests marked N are not UKAS accredited

Report Information

Report No.: 20-29932, issue number 1

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

LOD LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.
Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.
ELAB are unable to provide an interpretation or opinion on the content of this report.
The results relate only to the sample received.
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request
Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

-
- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 20-30010

Issue: 1

Date of Issue: 01/10/2020

Contact: Andy Norman

Customer Details: Envirotreat Technologies Ltd
LCP House
The Pensnett Estate

West Midlands DY6 7NA

Quotation No: Q20-01871

Order No: Not Supplied

Customer Reference: Not Supplied

Date Received: 24/09/2020

Date Approved: 01/10/2020

Details: Atlantic Wharf

Approved by: 

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

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Sample Summary

Report No.: 20-30010, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
214861	BH107 0.30	17/09/2020	24/09/2020		
214862	BH107 1.00	17/09/2020	24/09/2020	Sandy clayey loam	
214863	BH107 1.30	17/09/2020	24/09/2020	Clay	
214864	BH105 0.30	21/09/2020	24/09/2020		
214865	BH105 1.00	21/09/2020	24/09/2020	Sandy clayey loam	
214866	BH105 3.00	21/09/2020	24/09/2020	Sandy clayey loam	
214867	BH105 5.00	22/09/2020	24/09/2020		
214868	BH105 6.00	22/09/2020	24/09/2020	Clay	
214869	TP102 0.30	17/09/2020	24/09/2020		
214870	TP102 1.00	17/09/2020	24/09/2020		
214871	TP102 3.00	17/09/2020	24/09/2020	Loamy sand	
214872	BH105 13.50	23/09/2020	24/09/2020		
214873	BH107 13.20	18/09/2020	24/09/2020		

Results Summary

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Report No.: 20-30010, issue number 1

ELAB Reference	214862	214863	214865	214866	214868
Customer Reference					
Sample ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	BH107	BH107	BH105	BH105	BH105
Sample Depth (m)	1.00	1.30	1.00	3.00	6.00
Sampling Date	17/09/2020	17/09/2020	21/09/2020	21/09/2020	22/09/2020

Determinand	Codes	Units	LOD					
Soil sample preparation parameters								
Material removed	N	%	0.1	< 0.1	< 0.1	48.2	55.2	< 0.1
Description of Inert material removed	N		0	None	None	Stones	Clinker	None
Metals								
Antimony	N	mg/kg	2.5	< 2.5	< 2.5	< 2.5	3.5	< 2.5
Arsenic	M	mg/kg	1	46.5	7.9	3.5	47.3	13.1
Barium	U	mg/kg	10	3560	163	3130	407	58.8
Beryllium	U	mg/kg	1	< 1.0	3.0	2.5	1.8	2.1
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	1.2	< 0.5
Chromium	M	mg/kg	5	33.0	35.7	18.4	34.2	39.7
Chromium (III)	N	mg/kg	5	33.0	35.7	18.4	34.2	39.7
Copper	M	mg/kg	5	16.6	8.5	< 5.0	149	53.6
Iron	N	mg/kg	35	40300	29300	26000	44800	35500
Lead	M	mg/kg	5	45.1	30.3	19.2	140	26.4
Manganese	U	mg/kg	30	3560	506	1870	1230	746
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	0.9	< 0.5
Molybdenum	N	mg/kg	0.5	3.9	1.1	2.0	4.1	< 0.5
Nickel	M	mg/kg	5	38.4	32.0	14.6	62.1	35.8
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	4.3	< 1.0
Vanadium	M	mg/kg	5	48.1	38.7	12.4	28.2	43.6
Zinc	M	mg/kg	5	69.5	128	76.5	450	154
Anions								
Water Soluble Sulphate	M	mg/l	20	44	51	40	220	46
Water Soluble Sulphate	M	mg/kg	40	89	103	80	439	92
Inorganics								
Free Cyanide	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphur	N	%	0.01	0.09	0.08	0.10	1.2	0.03
Water Soluble Boron	N	mg/kg	0.5	1.0	2.7	< 0.5	1.2	2.4
Miscellaneous								
Fraction of Organic Carbon	N		0.0001	0.0069	0.0086	0.0156	0.222	0.0079
pH	M	pH units	0.1	8.6	9.0	9.0	8.4	9.7
Phenols								
Phenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	3	< 1	< 1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5	< 5	< 5

Results Summary

Report No.: 20-30010, issue number 1

ELAB Reference	214862	214863	214865	214866	214868
Customer Reference					
Sample ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	BH107	BH107	BH105	BH105	BH105
Sample Depth (m)	1.00	1.30	1.00	3.00	6.00
Sampling Date	17/09/2020	17/09/2020	21/09/2020	21/09/2020	22/09/2020

Determinand	Codes	Units	LOD					
Polyaromatic hydrocarbons								
Naphthalene GCMS	N	mg/kg	0.01	0.02	< 0.01	< 0.01	0.47	< 0.01
Acenaphthylene GCMS	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.01
Acenaphthene GCMS	N	mg/kg	0.01	0.01	< 0.01	< 0.01	0.08	< 0.01
Fluorene GCMS	N	mg/kg	0.01	0.01	< 0.01	< 0.01	0.22	< 0.01
Phenanthrene GCMS	N	mg/kg	0.01	0.06	< 0.01	0.01	0.83	< 0.01
Anthracene GCMS	N	mg/kg	0.01	0.02	< 0.01	< 0.01	0.28	< 0.01
Fluoranthene GCMS	N	mg/kg	0.01	0.07	< 0.01	0.01	1.03	< 0.01
Pyrene GCMS	N	mg/kg	0.01	0.05	< 0.01	0.01	0.72	< 0.01
Benzo(a)anthracene GCMS	N	mg/kg	0.01	0.04	< 0.01	0.01	0.54	< 0.01
Chrysene GCMS	N	mg/kg	0.01	0.05	< 0.01	< 0.01	0.56	< 0.01
Benzo(b)fluoranthene GCMS	N	mg/kg	0.01	0.04	< 0.01	< 0.01	0.51	< 0.01
Benzo(k)fluoranthene GCMS	N	mg/kg	0.01	0.02	< 0.01	< 0.01	0.43	< 0.01
Benzo(a)pyrene GCMS	N	mg/kg	0.01	0.03	< 0.01	< 0.01	0.45	< 0.01
Indeno(1,2,3-cd)pyrene GCMS	N	mg/kg	0.01	0.02	< 0.01	< 0.01	0.31	< 0.01
Dibenzo(a,h)anthracene GCMS	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	0.13	< 0.01
Benzo(g,h,i)perylene GCMS	N	mg/kg	0.01	0.03	< 0.01	< 0.01	0.30	< 0.01
Total PAH(16) GCMS	N	mg/kg	0.04	0.49	0.05	0.10	6.90	0.06
BTEX								
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
MTBE	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
TPH CWG								
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	M	mg/kg	1	2.4	1.5	1.8	1.3	< 1.0
>C35-C40 Aliphatic	M	mg/kg	1	1.7	< 1.0	< 1.0	< 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40)	N	mg/kg	1	4.6	2.8	2.6	2.4	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	M	mg/kg	1	< 1.0	3.5	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	M	mg/kg	1	12.0	6.4	3.4	3.6	< 1.0
>C35-C40 Aromatic	M	mg/kg	1	6.3	1.7	< 1.0	< 1.0	< 1.0
Total aromatic hydrocarbons (>C5 - C40)	N	mg/kg	1	20.9	12.9	5.3	6.2	< 1.0
Total petroleum hydrocarbons (>C5 - C40)	N	mg/kg	1	25.5	15.8	8.0	8.6	< 1.0

Results Summary

2683

Report No.: 20-30010, issue number 1

ELAB Reference	214871
Customer Reference	
Sample ID	
Sample Type	SOIL
Sample Location	TP102
Sample Depth (m)	3.00
Sampling Date	17/09/2020

Determinand	Codes	Units	LOD	
Soil sample preparation parameters				
Material removed	N	%	0.1	55.3
Description of Inert material removed	N		0	Stones
Metals				
Antimony	N	mg/kg	2.5	< 2.5
Arsenic	M	mg/kg	1	105
Barium	U	mg/kg	10	5470
Beryllium	U	mg/kg	1	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5
Chromium	M	mg/kg	5	34.8
Chromium (III)	N	mg/kg	5	34.8
Copper	M	mg/kg	5	230
Iron	N	mg/kg	35	21700
Lead	M	mg/kg	5	5720
Manganese	U	mg/kg	30	638
Mercury	M	mg/kg	0.5	< 0.5
Molybdenum	N	mg/kg	0.5	< 0.5
Nickel	M	mg/kg	5	20.6
Selenium	M	mg/kg	1	< 1.0
Vanadium	M	mg/kg	5	19.7
Zinc	M	mg/kg	5	137
Anions				
Water Soluble Sulphate	M	mg/l	20	< 20
Water Soluble Sulphate	M	mg/kg	40	< 40
Inorganics				
Free Cyanide	N	mg/kg	1	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0
Total Sulphur	N	%	0.01	0.18
Water Soluble Boron	N	mg/kg	0.5	< 0.5
Miscellaneous				
Fraction of Organic Carbon	N		0.0001	0.0075
pH	M	pH units	0.1	8.8
Phenols				
Phenol	M	mg/kg	1	< 1
M,P-Cresol	N	mg/kg	1	< 1
O-Cresol	N	mg/kg	1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5



Results Summary

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Report No.: 20-30010, issue number 1

ELAB Reference	214871
Customer Reference	
Sample ID	
Sample Type	SOIL
Sample Location	TP102
Sample Depth (m)	3.00
Sampling Date	17/09/2020

Determinand	Codes	Units	LOD	
Polyaromatic hydrocarbons				
Naphthalene GCMS	N	mg/kg	0.01	0.02
Acenaphthylene GCMS	N	mg/kg	0.01	0.03
Acenaphthene GCMS	N	mg/kg	0.01	< 0.01
Fluorene GCMS	N	mg/kg	0.01	< 0.01
Phenanthrene GCMS	N	mg/kg	0.01	0.08
Anthracene GCMS	N	mg/kg	0.01	0.04
Fluoranthene GCMS	N	mg/kg	0.01	0.34
Pyrene GCMS	N	mg/kg	0.01	0.27
Benzo(a)anthracene GCMS	N	mg/kg	0.01	0.56
Chrysene GCMS	N	mg/kg	0.01	0.53
Benzo(b)fluoranthene GCMS	N	mg/kg	0.01	0.41
Benzo(k)fluoranthene GCMS	N	mg/kg	0.01	0.56
Benzo(a)pyrene GCMS	N	mg/kg	0.01	0.54
Indeno(1,2,3-cd)pyrene GCMS	N	mg/kg	0.01	0.41
Dibenzo(a,h)anthracene GCMS	N	mg/kg	0.01	0.21
Benzo(g,h,i)perylene GCMS	N	mg/kg	0.01	0.35
Total PAH(16) GCMS	N	mg/kg	0.04	4.38
BTEX				
Benzene	M	ug/kg	10	< 10.0
Toluene	M	ug/kg	10	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0
Xylenes	M	ug/kg	10	< 10.0
MTBE	N	ug/kg	10	< 10.0
TPH CWG				
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0
>C10-C12 Aliphatic	M	mg/kg	1	< 1.0
>C12-C16 Aliphatic	M	mg/kg	1	< 1.0
>C16-C21 Aliphatic	M	mg/kg	1	< 1.0
>C21-C35 Aliphatic	M	mg/kg	1	< 1.0
>C35-C40 Aliphatic	M	mg/kg	1	< 1.0
Total aliphatic hydrocarbons (>C5 - C40)	N	mg/kg	1	1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0
>C10-C12 Aromatic	M	mg/kg	1	< 1.0
>C12-C16 Aromatic	M	mg/kg	1	< 1.0
>C16-C21 Aromatic	M	mg/kg	1	< 1.0
>C21-C35 Aromatic	M	mg/kg	1	1.0
>C35-C40 Aromatic	M	mg/kg	1	< 1.0
Total aromatic hydrocarbons (>C5 - C40)	N	mg/kg	1	2.4
Total petroleum hydrocarbons (>C5 - C40)	N	mg/kg	1	3.4

Results Summary

Report No.: 20-30010, issue number 1

ELAB Reference				214862	214863	214865	214866	214868	214871
Customer Reference									
Sample ID									
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				BH107	BH107	BH105	BH105	BH105	TP102
Sample Depth (m)				1.00	1.30	1.00	3.00	6.00	3.00
Sampling Date				17/09/2020	17/09/2020	21/09/2020	21/09/2020	22/09/2020	17/09/2020
Determinand	Codes	Units	LOD						
VOC									
Heptane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Octane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Nonane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
m+p-xylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
o-xylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
cis-1,2-dichloroethene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1-Dichloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Chloroform	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Tetrachloromethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1,1-Trichloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Trichloroethylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Tetrachloroethylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1,1,2-Tetrachloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1,2,2-Tetrachloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Chlorobenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bromobenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bromodichloromethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Methylethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Trans - 1-2 -dichloroethylene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
2,2-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bromochloromethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-Dichloroethane	M	ug/kg	10	^ < 10.0	^ < 10.0	^ < 10.0	^ < 10.0	^ < 10.0	^ < 10.0
Dibromomethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-Dichloropropane	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
cis-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
trans-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1,2-Trichloroethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Dibromochloromethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,3-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-dibromoethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Styrene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Propylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
2-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2,4-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
4-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
t-butylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,3,5-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1-methylpropylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
p-cymene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,3-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Butylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-Dibromo-3-chloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Hexachlorobutadiene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1-2-3 - Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Naphthalene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1-2-4 - Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,4-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bromoform	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

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Results Summary

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Report No.: 20-30010, issue number 1

ELAB Reference	214862	214866	214868	214871
Customer Reference				
Sample ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sample Location	BH107	BH105	BH105	TP102
Sample Depth (m)	1.00	3.00	6.00	3.00
Sampling Date	17/09/2020	21/09/2020	22/09/2020	17/09/2020

Determinand	Codes	Units	LOD				
Metals							
Chromium (III)	N	ug/l	5	< 5	< 5	< 5	< 5
Antimony 10:1 extract	N	ug/l	5	< 5	< 5	< 5	< 5
Arsenic 10:1 extract	N	ug/l	5	< 5	< 5	70	24
Barium 10:1 extract	N	ug/l	5	110	27	< 5	25
Beryllium 10:1 extract	N	ug/l	5	< 5	< 5	< 5	< 5
Boron 10:1 extract	N	ug/l	5	22	31	142	11
Cadmium 10:1 extract	N	ug/l	1	< 1	< 1	< 1	< 1
Calcium 10:1 extract	N	ug/l	100	11300	31400	5970	7890
Chromium 10:1 extract	N	ug/l	5	< 5	< 5	< 5	< 5
Copper 10:1 extract	N	ug/l	5	< 5	7	6	8
Iron 10:1 extract	N	ug/l	140	< 140	< 140	< 140	< 140
Lead 10:1 extract	N	ug/l	5	< 5	< 5	< 5	< 5
Magnesium 10:1 extract	N	ug/l	100	2390	3730	1030	1100
Manganese 10:1 extract	N	ug/l	5	< 5	237	13	< 5
Mercury 10:1 extract	N	ug/l	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum 10:1 extract	N	ug/l	5	6	9	10	< 5
Nickel 10:1 extract	N	ug/l	5	< 5	< 5	< 5	< 5
Selenium 10:1 extract	N	ug/l	5	< 5	< 5	< 5	< 5
Vanadium 10:1 extract	N	ug/l	5	< 5	< 5	111	< 5
Zinc 10:1 extract	N	ug/l	5	< 5	6	< 5	< 5
Anions							
Chloride	N	mg/l	1	2	2	5	< 1
Fluoride	N	mg/l	1	< 1	< 1	< 1	< 1
Inorganics							
Complex cyanide	N	ug/l	5	< 5	< 5	< 5	< 5
Hexavalent chromium	N	ug/l	100	< 100	< 100	< 100	< 100
Free Cyanide	N	ug/l	5	< 5	< 5	< 5	< 5
Ammoniacal Nitrogen as N	N	mg/l	0.1	0.1	0.2	1.0	0.5
Total Cyanide	N	ug/l	5	< 5	< 5	< 5	< 5
Miscellaneous							
pH (10:1 extract)	N	pH units	0.1	8.3	7.7	8.8	8.4
Phenols							
Phenol	N	ug/l	1	< 1	< 1	< 1	< 1
M,P-Cresol	N	ug/l	1	< 1	< 1	< 1	< 1
O-Cresol	N	ug/l	1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	ug/l	1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	N	ug/l	1	< 1	< 1	< 1	< 1
Trimethylphenol	N	ug/l	1	< 1	< 1	< 1	< 1
Total Monohydric Phenols 10:1 extract	N	ug/l	5	< 5	< 5	< 5	< 5



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Results Summary

Report No.: 20-30010, issue number 1

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos	Gravimetric Analysis Total	Gravimetric Analysis by ACM Type	Free Fibre Analysis	Total Asbestos
214862	1.00	BH107	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
214863	1.30	BH107	Grey clay	No asbestos detected	n/t	n/t	n/t	n/t
214865	1.00	BH105	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
214866	3.00	BH105	Brown sandy soil, stones, brick, clinker, slate,	No asbestos detected	n/t	n/t	n/t	n/t
214868	6.00	BH105	Brown/Grey clay, stones	No asbestos detected	n/t	n/t	n/t	n/t
214871	3.00	TP102	Brown sandy soil, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 20-30010, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Leachate cyanide 10:1 extract	N		29/09/2020		Colorimetry
Leachate phenols 10:1 extract	N		30/09/2020		HPLC
PAH (GC-MS)	N	As submitted sample	25/09/2020		GC-MS
pH of leachates	N		30/09/2020		Electromeric
Free cyanide	N	As submitted sample	29/09/2020	107	Colorimetry
Hexavalent chromium	N	As submitted sample	28/09/2020	110	Colorimetry
pH	M	Air dried sample	25/09/2020	113	Electromeric
Phenols in solids	M	As submitted sample	28/09/2020	121	HPLC
Ammonia in leachates	N		30/09/2020	151	Colorimetry
Water soluble anions	M	Air dried sample	25/09/2020	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	28/09/2020	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	28/09/2020	181	GC-MS
VOC in solids	M	As submitted sample	28/09/2020	181	GC-MS
BTEX in solids	M	As submitted sample	28/09/2020	181A	GC-MS
Water soluble boron	N	Air dried sample	25/09/2020	202	Colorimetry
Total cyanide	M	As submitted sample	29/09/2020	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	28/09/2020	210	IR
Anions in leachates	N		30/09/2020	270	Ion Chromatography
TPH CWG soil by gc-gc	M	As submitted sample	24/09/2020	271	
Asbestos identification	U	Air dried sample	29/09/2020	280	Microscopy
Aqua regia extractable metals	M	Air dried sample	25/09/2020	300	ICPMS
Leachate metals 10:1 extract	N		30/09/2020	301	ICPMS

Tests marked N are not UKAS accredited

Report Information

Report No.: 20-30010, issue number 1

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

LOD LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.
Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.
ELAB are unable to provide an interpretation or opinion on the content of this report.
The results relate only to the sample received.
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request
Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

-
- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage



2683



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 20-30074

Issue: 2. Replaces Analytical Report number 20-30074; issue no.1

Date of Issue: 15/10/2020

Contact: Andy Norman

Customer Details: Envirotreat Technologies Ltd
LCP House
The Pensnett Estate

West Midlands DY6 7NA

Quotation No: Q20-01871

Order No: Not Supplied

Customer Reference: Not Supplied

Date Received: 28/09/2020

Date Approved: 15/10/2020

Details: Atlantic Wharf

Approved by:

Tim Reeve, Quality Officer

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

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Sample Summary

Report No.: 20-30074, issue number 2

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
215191	BH102 0.30	24/09/2020	28/09/2020		
215192	BH102 1.00	24/09/2020	28/09/2020		
215193	BH102 3.00	24/09/2020	28/09/2020	Sandy silty loam	
215194	BH102 5.00	24/09/2020	28/09/2020		
215195	BH102 7.00	24/09/2020	28/09/2020		
215196	BH102 9.60	25/09/2020	28/09/2020	Clayey loam	
215197	BH101 0.30	23/09/2020	28/09/2020		
215198	BH101 1.00	23/09/2020	28/09/2020	Silty loam	g
215199	BH101 3.00	23/09/2020	28/09/2020		
215200	BH101 5.00	23/09/2020	28/09/2020		
215201	BH101 7.00	23/09/2020	28/09/2020	Sand	g
215202	BH101 9.00	24/09/2020	28/09/2020	Silty loam	g

Results Summary

Report No.: 20-30074, issue number 2

ELAB Reference	215193	215196	215198	215201
Customer Reference				
Sample ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sample Location	BH102	BH102	BH101	BH101
Sample Depth (m)	3.00	9.60	1.00	7.00
Sampling Date	24/09/2020	25/09/2020	23/09/2020	23/09/2020

Determinand	Codes	Units	LOD				
Soil sample preparation parameters							
Material removed	N	%	0.1	38.8	< 0.1	37.9	28.9
Description of Inert material removed	N		0	Stones,clinker	None	Stones,clinker	Stones,brick
Metals							
Antimony	N	mg/kg	2.5	< 2.5	< 2.5	3.3	6.2
Arsenic	M	mg/kg	1	29.8	10.5	33.1	18.8
Barium	U	mg/kg	10	160	43.2	191	631
Beryllium	U	mg/kg	1	< 1.0	1.3	1.3	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	24.0	39.2	39.0	19.6
Chromium (III)	N	mg/kg	5	24.0	39.2	39.0	19.6
Copper	M	mg/kg	5	128	16.5	117	53.3
Iron	N	mg/kg	35	29200	32400	37800	20500
Lead	M	mg/kg	5	212	50.0	135	412
Manganese	U	mg/kg	30	544	685	857	404
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	0.9	1.9
Molybdenum	N	mg/kg	0.5	1.5	< 0.5	2.9	1.2
Nickel	M	mg/kg	5	33.0	33.1	46.8	18.1
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5	29.7	47.4	40.9	21.5
Zinc	M	mg/kg	5	147	101	240	207
Anions							
Water Soluble Sulphate	M	mg/l	20	30	52	53	67
Water Soluble Sulphate	M	mg/kg	40	60	104	105	135
Inorganics							
Free Cyanide	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphur	N	%	0.01	0.17	0.29	0.13	0.25
Water Soluble Boron	N	mg/kg	0.5	1.3	2.9	1.0	1.2
Miscellaneous							
Fraction of Organic Carbon	N		0.0001	0.132	0.0113	0.0886	0.0241
pH	M	pH units	0.1	8.5	9.0	8.4	8.8
Phenols							
Phenol	M	mg/kg	1	< 1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5	< 5
Polyaromatic hydrocarbons							
Naphthalene GCMS	N	mg/kg	0.01	0.14	< 0.01	0.22	0.51
Acenaphthylene GCMS	N	mg/kg	0.01	0.02	< 0.01	0.02	0.42
Acenaphthene GCMS	N	mg/kg	0.01	0.02	< 0.01	0.03	0.91
Fluorene GCMS	N	mg/kg	0.01	0.06	< 0.01	0.04	1.62
Phenanthrene GCMS	N	mg/kg	0.01	0.43	< 0.01	0.58	8.78
Anthracene GCMS	N	mg/kg	0.01	0.15	< 0.01	0.11	2.09
Fluoranthene GCMS	N	mg/kg	0.01	0.85	< 0.01	0.58	9.42
Pyrene GCMS	N	mg/kg	0.01	0.54	< 0.01	0.52	6.68
Benzo(a)anthracene GCMS	N	mg/kg	0.01	0.50	< 0.01	0.36	4.01
Chrysene GCMS	N	mg/kg	0.01	0.68	< 0.01	0.59	3.57

Tests marked N are not UKAS accredited.



Results Summary

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Report No.: 20-30074, issue number 2

ELAB Reference	215193	215196	215198	215201
Customer Reference				
Sample ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sample Location	BH102	BH102	BH101	BH101
Sample Depth (m)	3.00	9.60	1.00	7.00
Sampling Date	24/09/2020	25/09/2020	23/09/2020	23/09/2020
Determinand	Codes	Units	LOD	
Benzo(b)fluoranthene GCMS	N	mg/kg	0.01	0.31
Benzo(k)fluoranthene GCMS	N	mg/kg	0.01	0.47
Benzo(a)pyrene GCMS	N	mg/kg	0.01	0.36
Indeno(1,2,3-cd)pyrene GCMS	N	mg/kg	0.01	0.12
Dibenzo(a,h)anthracene GCMS	N	mg/kg	0.01	0.05
Benzo(g,h,i)perylene GCMS	N	mg/kg	0.01	0.12
Total PAH(16) GCMS	N	mg/kg	0.04	4.84
BTEX				
Benzene	M	ug/kg	10	< 10.0
Toluene	M	ug/kg	10	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0
Xylenes	M	ug/kg	10	< 10.0
MTBE	N	ug/kg	10	< 10.0
TPH CWG				
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0
>C10-C12 Aliphatic	M	mg/kg	1	< 1.0
>C12-C16 Aliphatic	M	mg/kg	1	< 1.0
>C16-C21 Aliphatic	M	mg/kg	1	< 1.0
>C21-C35 Aliphatic	M	mg/kg	1	< 1.0
>C35-C40 Aliphatic	M	mg/kg	1	< 1.0
Total aliphatic hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0
>C10-C12 Aromatic	M	mg/kg	1	< 1.0
>C12-C16 Aromatic	M	mg/kg	1	< 1.0
>C16-C21 Aromatic	M	mg/kg	1	< 1.0
>C21-C35 Aromatic	M	mg/kg	1	< 1.0
>C35-C40 Aromatic	M	mg/kg	1	< 1.0
Total aromatic hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0
Total petroleum hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0

Results Summary

Report No.: 20-30074, issue number 2

ELAB Reference	215202
Customer Reference	
Sample ID	
Sample Type	SOIL
Sample Location	BH101
Sample Depth (m)	9.00
Sampling Date	24/09/2020

Determinand	Codes	Units	LOD	
Soil sample preparation parameters				
Material removed	N	%	0.1	< 0.1
Description of Inert material removed	N		0	None
Metals				
Antimony	N	mg/kg	2.5	< 2.5
Arsenic	M	mg/kg	1	28.9
Barium	U	mg/kg	10	335
Beryllium	U	mg/kg	1	1.2
Cadmium	M	mg/kg	0.5	4.2
Chromium	M	mg/kg	5	92.2
Chromium (III)	N	mg/kg	5	92.2
Copper	M	mg/kg	5	264
Iron	N	mg/kg	35	19700
Lead	M	mg/kg	5	229
Manganese	U	mg/kg	30	405
Mercury	M	mg/kg	0.5	2.3
Molybdenum	N	mg/kg	0.5	1.7
Nickel	M	mg/kg	5	45.8
Selenium	M	mg/kg	1	3.1
Vanadium	M	mg/kg	5	30.8
Zinc	M	mg/kg	5	525
Anions				
Water Soluble Sulphate	M	mg/l	20	240
Water Soluble Sulphate	M	mg/kg	40	480
Inorganics				
Free Cyanide	N	mg/kg	1	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8
Total Cyanide	M	mg/kg	1	2.9
Total Sulphur	N	%	0.01	0.61
Water Soluble Boron	N	mg/kg	0.5	2.0
Miscellaneous				
Fraction of Organic Carbon	N		0.0001	0.339
pH	M	pH units	0.1	8.1
Phenols				
Phenol	M	mg/kg	1	< 1
M,P-Cresol	N	mg/kg	1	< 1
O-Cresol	N	mg/kg	1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5
Polyaromatic hydrocarbons				
Naphthalene GCMS	N	mg/kg	0.01	13.4
Acenaphthylene GCMS	N	mg/kg	0.01	0.59
Acenaphthene GCMS	N	mg/kg	0.01	3.26
Fluorene GCMS	N	mg/kg	0.01	7.24
Phenanthrene GCMS	N	mg/kg	0.01	15.7
Anthracene GCMS	N	mg/kg	0.01	3.60
Fluoranthene GCMS	N	mg/kg	0.01	13.7
Pyrene GCMS	N	mg/kg	0.01	9.45
Benzo(a)anthracene GCMS	N	mg/kg	0.01	8.37
Chrysene GCMS	N	mg/kg	0.01	9.48

Tests marked N are not UKAS accredited.



Results Summary

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Report No.: 20-30074, issue number 2

ELAB Reference	215202
Customer Reference	
Sample ID	
Sample Type	SOIL
Sample Location	BH101
Sample Depth (m)	9.00
Sampling Date	24/09/2020

Determinand	Codes	Units	LOD	
Benzo(b)fluoranthene GCMS	N	mg/kg	0.01	9.47
Benzo(k)fluoranthene GCMS	N	mg/kg	0.01	6.36
Benzo(a)pyrene GCMS	N	mg/kg	0.01	7.59
Indeno(1,2,3-cd)pyrene GCMS	N	mg/kg	0.01	4.55
Dibenzo(a,h)anthracene GCMS	N	mg/kg	0.01	2.37
Benzo(g,h,i)perylene GCMS	N	mg/kg	0.01	4.41
Total PAH(16) GCMS	N	mg/kg	0.04	120
BTEX				
Benzene	M	ug/kg	10	g < 10.0
Toluene	M	ug/kg	10	g < 10.0
Ethylbenzene	M	ug/kg	10	g < 10.0
Xylenes	M	ug/kg	10	g < 10.0
MTBE	N	ug/kg	10	g < 10.0
TPH CWG				
>C5-C6 Aliphatic	N	mg/kg	0.01	g < 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	g < 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0
>C10-C12 Aliphatic	M	mg/kg	1	< 1.0
>C12-C16 Aliphatic	M	mg/kg	1	1.4
>C16-C21 Aliphatic	M	mg/kg	1	2.5
>C21-C35 Aliphatic	M	mg/kg	1	6.8
>C35-C40 Aliphatic	M	mg/kg	1	< 1.0
Total aliphatic hydrocarbons (>C5 - C40)	N	mg/kg	1	11.0
>C5-C7 Aromatic	N	mg/kg	0.01	g < 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	g < 0.01
>C8-C10 Aromatic	N	mg/kg	1	3.1
>C10-C12 Aromatic	M	mg/kg	1	1.6
>C12-C16 Aromatic	M	mg/kg	1	3.7
>C16-C21 Aromatic	M	mg/kg	1	3.0
>C21-C35 Aromatic	M	mg/kg	1	6.0
>C35-C40 Aromatic	M	mg/kg	1	< 1.0
Total aromatic hydrocarbons (>C5 - C40)	N	mg/kg	1	17.9
Total petroleum hydrocarbons (>C5 - C40)	N	mg/kg	1	28.9

Results Summary

Report No.: 20-30074, issue number 2

ELAB Reference	215193	215196	215198	215201	215202
Customer Reference					
Sample ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	BH102	BH102	BH101	BH101	BH101
Sample Depth (m)	3.00	9.60	1.00	7.00	9.00
Sampling Date	24/09/2020	25/09/2020	23/09/2020	23/09/2020	24/09/2020
Determinand	Codes	Units	LOD		
VOC					
Heptane	N	ug/kg	10	< 10.0	< 10.0
Octane	N	ug/kg	10	< 10.0	< 10.0
Nonane	N	ug/kg	10	< 10.0	< 10.0
Benzene	M	ug/kg	10	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0
m+p-xylene	M	ug/kg	10	< 10.0	< 10.0
o-xylene	M	ug/kg	10	< 10.0	< 10.0
cis-1,2-dichloroethene	N	ug/kg	10	< 10.0	< 10.0
1,1-Dichloroethane	M	ug/kg	10	< 10.0	< 10.0
Chloroform	M	ug/kg	10	< 10.0	< 10.0
Tetrachloromethane	M	ug/kg	10	< 10.0	< 10.0
1,1,1-Trichloroethane	M	ug/kg	10	< 10.0	< 10.0
Trichloroethylene	M	ug/kg	10	< 10.0	< 10.0
Tetrachloroethylene	M	ug/kg	10	< 10.0	< 10.0
1,1,1,2-Tetrachloroethane	M	ug/kg	10	< 10.0	< 10.0
1,1,2,2-Tetrachloroetha	M	ug/kg	10	< 10.0	< 10.0
Chlorobenzene	M	ug/kg	10	< 10.0	< 10.0
Bromobenzene	M	ug/kg	10	< 10.0	< 10.0
Bromodichloromethane	M	ug/kg	10	< 10.0	< 10.0
Methylethylbenzene	M	ug/kg	10	< 10.0	< 10.0
1,1-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
Trans - 1-2 -dichloroethylene	N	ug/kg	10	< 10.0	< 10.0
2,2-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0
Bromochloromethane	N	ug/kg	10	< 10.0	< 10.0
1,2-Dichloroethane	M	ug/kg	10	^ < 10.0	^ < 10.0
Dibromomethane	M	ug/kg	10	< 10.0	< 10.0
1,2-Dichloropropane	M	ug/kg	10	< 10.0	< 10.0
cis-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
trans-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
1,1,2-Trichloroethane	N	ug/kg	10	< 10.0	< 10.0
Dibromochloromethane	N	ug/kg	10	< 10.0	< 10.0
1,3-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0
1,2-dibromoethane	N	ug/kg	10	< 10.0	< 10.0
Styrene	N	ug/kg	10	< 10.0	< 10.0
Propylbenzene	N	ug/kg	10	< 10.0	< 10.0
2-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0
1,2,4-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0
4-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0
t-butylbenzene	N	ug/kg	10	< 10.0	< 10.0
1,3,5-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0
1-methylpropylbenzene	N	ug/kg	10	< 10.0	< 10.0
p-cymene	N	ug/kg	10	< 10.0	< 10.0
1,3-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Butylbenzene	N	ug/kg	10	< 10.0	< 10.0
1,2-Dibromo-3-chloropropane	N	ug/kg	10	< 10.0	< 10.0
Hexachlorobutadiene	N	ug/kg	10	< 10.0	< 10.0
1-2-3 - Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Naphthalene	N	ug/kg	10	< 10.0	< 10.0
1-2-4 - Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
1,4-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
1,2-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Bromoform	N	ug/kg	10	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

The Environmental Laboratory Ltd. Reg. No. 3882193

Results Summary

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Report No.: 20-30074, issue number 2

ELAB Reference	215201
Customer Reference	
Sample ID	
Sample Type	SOIL
Sample Location	BH101
Sample Depth (m)	7.00
Sampling Date	23/09/2020

Determinand	Codes	Units	LOD	
Metals				
Chromium (III)	N	ug/l	5	< 5
Antimony 10:1 extract	N	ug/l	5	5
Arsenic 10:1 extract	N	ug/l	5	7
Barium 10:1 extract	N	ug/l	5	14
Beryllium 10:1 extract	N	ug/l	5	< 5
Boron 10:1 extract	N	ug/l	5	50
Cadmium 10:1 extract	N	ug/l	1	< 1
Calcium 10:1 extract	N	ug/l	100	18000
Chromium 10:1 extract	N	ug/l	5	< 5
Copper 10:1 extract	N	ug/l	5	< 5
Iron 10:1 extract	N	ug/l	140	< 140
Lead 10:1 extract	N	ug/l	5	< 5
Magnesium 10:1 extract	N	ug/l	100	1630
Manganese 10:1 extract	N	ug/l	5	8
Mercury 10:1 extract	N	ug/l	0.1	< 0.1
Molybdenum 10:1 extract	N	ug/l	5	8
Nickel 10:1 extract	N	ug/l	5	< 5
Selenium 10:1 extract	N	ug/l	5	< 5
Vanadium 10:1 extract	N	ug/l	5	< 5
Zinc 10:1 extract	N	ug/l	5	< 5
Anions				
Chloride	N	mg/l	1	< 1
Fluoride	N	mg/l	1	< 1
Inorganics				
Complex cyanide	N	ug/l	5	< 5
Hexavalent chromium	N	ug/l	100	< 100
Free Cyanide	N	ug/l	5	< 5
Ammoniacal Nitrogen as N	N	mg/l	0.1	0.2
Total Cyanide	N	ug/l	5	< 5
Miscellaneous				
pH (10:1 extract)	N	pH units	0.1	7.7
Phenols				
Phenol	N	ug/l	1	< 1
M,P-Cresol	N	ug/l	1	< 1
O-Cresol	N	ug/l	1	< 1
3,4-Dimethylphenol	N	ug/l	1	< 1
2,3-Dimethylphenol	N	ug/l	1	< 1
Trimethylphenol	N	ug/l	1	< 1
Total Monohydric Phenols 10:1 extract	N	ug/l	5	< 5



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Results Summary
Report No.: 20-30074, issue number 2

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
215193	3.00	BH102	Brown Soil, Stones, Clinker, Brick	No asbestos detected	n/t	n/t	n/t	n/t
215196	9.60	BH102	Grey Soil (Clay), Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t
215198	1.00	BH101	Brown soil, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
215201	7.00	BH101	Brown sandy soil, stones, brick, plant-material	Amosite (fibre bundles and board fragments)	n/t	n/t	n/t	n/t
215202	9.00	BH101	Dark-brown soil, stones	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 20-30074, issue number 2

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Leachate cyanide 10:1 extract	N		13/10/2020		Colorimetry
Leachate phenols 10:1 extract	N		13/10/2020		HPLC
PAH (GC-MS)	N	As submitted sample	30/09/2020		GC-MS
pH of leachates	N		14/10/2020		Electromeric
Free cyanide	N	As submitted sample	01/10/2020	107	Colorimetry
Hexavalent chromium	N	As submitted sample	30/09/2020	110	Colorimetry
pH	M	Air dried sample	02/10/2020	113	Electromeric
Phenols in solids	M	As submitted sample	30/09/2020	121	HPLC
Ammonia in leachates	N		14/10/2020	151	Colorimetry
Water soluble anions	M	Air dried sample	30/09/2020	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	30/09/2020	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	30/09/2020	181	GC-MS
VOC in solids	M	As submitted sample	30/09/2020	181	GC-MS
BTEX in solids	M	As submitted sample	30/09/2020	181A	GC-MS
Water soluble boron	N	Air dried sample	30/09/2020	202	Colorimetry
Total cyanide	M	As submitted sample	01/10/2020	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	01/10/2020	210	IR
Anions in leachates	N		13/10/2020	270	Ion Chromatography
TPH CWG soil by gc-gc	M	As submitted sample	29/09/2020	271	
Asbestos identification	U	Air dried sample	01/10/2020	280	Microscopy
Aqua regia extractable metals	M	Air dried sample	30/09/2020	300	ICPMS
Leachate metals 10:1 extract	N		14/10/2020	301	ICPMS

Tests marked N are not UKAS accredited

Report Information

Report No.: 20-30074, issue number 2

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

LOD LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.
Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.
ELAB are unable to provide an interpretation or opinion on the content of this report.
The results relate only to the sample received.
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request
Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

-
- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 20-30251

Issue: 1

Date of Issue: 15/10/2020

Contact: Andy Norman

Customer Details: Envirotreat Technologies Ltd
LCP House
The Pensnett Estate

West Midlands DY6 7NA

Quotation No: Q20-01871

Order No: Not Supplied

Customer Reference: Not Supplied

Date Received: 30/09/2020

Date Approved: 15/10/2020

Details: Atlantic Wharf

Approved by:

Tim Reeve, Quality Officer

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

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Sample Summary

Report No.: 20-30251, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
216306	BH106 0.30	26/09/2020	08/10/2020		
216307	BH106 1.00	26/09/2020	08/10/2020		
216308	BH106 3.00	26/09/2020	08/10/2020	Sandy silty loam	
216309	BH106 5.00	26/09/2020	08/10/2020		
216310	BH106 7.00	26/09/2020	08/10/2020	Clay	
216311	BH106 8.50	26/09/2020	08/10/2020		



Results Summary

2683

Report No.: 20-30251, issue number 1

ELAB Reference	216308	216310
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	BH106	BH106
Sample Depth (m)	3.00	7.00
Sampling Date	26/09/2020	26/09/2020

Determinand	Codes	Units	LOD		
Soil sample preparation parameters					
Material removed	N	%	0.1	55.6	< 0.1
Description of Inert material removed	N		0	Stones,brick,clinker	None
Metals					
Antimony	N	mg/kg	2.5	6.7	< 2.5
Arsenic	M	mg/kg	1	32.1	11.4
Barium	U	mg/kg	10	1460	74.6
Beryllium	U	mg/kg	1	1.0	1.3
Cadmium	M	mg/kg	0.5	0.6	< 0.5
Chromium	M	mg/kg	5	36.6	39.5
Chromium (III)	N	mg/kg	5	36.6	39.5
Copper	M	mg/kg	5	262	20.9
Iron	N	mg/kg	35	52900	38500
Lead	M	mg/kg	5	362	35.6
Manganese	U	mg/kg	30	1820	282
Mercury	M	mg/kg	0.5	1.8	< 0.5
Molybdenum	N	mg/kg	0.5	3.8	0.6
Nickel	M	mg/kg	5	45.8	35.0
Selenium	M	mg/kg	1	< 1.0	< 1.0
Vanadium	M	mg/kg	5	36.7	46.0
Zinc	M	mg/kg	5	273	116
Anions					
Water Soluble Sulphate	M	mg/l	20	25	42
Water Soluble Sulphate	M	mg/kg	40	< 40	< 40
Inorganics					
Free Cyanide	N	mg/kg	1	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	1.4
Total Sulphur	N	%	0.01	0.13	0.03
Water Soluble Boron	N	mg/kg	0.5	< 0.5	3.2
Miscellaneous					
Fraction of Organic Carbon	N		0.0001	0.0989	0.0074
pH	M	pH units	0.1	8.3	8.1
Phenols					
Phenol	M	mg/kg	1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5



Results Summary

2683

Report No.: 20-30251, issue number 1

ELAB Reference	216308	216310
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	BH106	BH106
Sample Depth (m)	3.00	7.00
Sampling Date	26/09/2020	26/09/2020

Determinand	Codes	Units	LOD		
Polyaromatic hydrocarbons					
Naphthalene GCMS	N	mg/kg	0.01	0.14	0.02
Acenaphthylene GCMS	N	mg/kg	0.01	0.02	< 0.01
Acenaphthene GCMS	N	mg/kg	0.01	0.04	0.01
Fluorene GCMS	N	mg/kg	0.01	0.05	< 0.01
Phenanthrene GCMS	N	mg/kg	0.01	0.51	0.05
Anthracene GCMS	N	mg/kg	0.01	0.14	0.05
Fluoranthene GCMS	N	mg/kg	0.01	0.69	0.07
Pyrene GCMS	N	mg/kg	0.01	0.57	0.05
Benzo(a)anthracene GCMS	N	mg/kg	0.01	0.38	0.03
Chrysene GCMS	N	mg/kg	0.01	0.50	0.04
Benzo(b)fluoranthene GCMS	N	mg/kg	0.01	0.42	0.04
Benzo(k)fluoranthene GCMS	N	mg/kg	0.01	0.41	0.04
Benzo(a)pyrene GCMS	N	mg/kg	0.01	0.48	0.03
Indeno(1,2,3-cd)pyrene GCMS	N	mg/kg	0.01	0.21	0.01
Dibenzo(a,h)anthracene GCMS	N	mg/kg	0.01	0.08	< 0.01
Benzo(g,h,i)perylene GCMS	N	mg/kg	0.01	0.20	0.01
Total PAH(16) GCMS	N	mg/kg	0.04	4.82	0.46
BTEX					
Benzene	M	ug/kg	10	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0
MTBE	N	ug/kg	10	< 10.0	< 10.0
TPH CWG					
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aliphatic	M	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aliphatic	M	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aliphatic	M	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aliphatic	M	mg/kg	1	< 1.0	< 1.0
>C35-C40 Aliphatic	M	mg/kg	1	< 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aromatic	M	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aromatic	M	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aromatic	M	mg/kg	1	1.4	< 1.0
>C21-C35 Aromatic	M	mg/kg	1	2.2	< 1.0
>C35-C40 Aromatic	M	mg/kg	1	< 1.0	< 1.0
Total aromatic hydrocarbons (>C5 - C40)	N	mg/kg	1	3.8	< 1.0
Total petroleum hydrocarbons (>C5 - C40)	N	mg/kg	1	4.4	< 1.0

Results Summary

2683

Report No.: 20-30251, issue number 1

ELAB Reference	216308	216310
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	BH106	BH106
Sample Depth (m)	3.00	7.00
Sampling Date	26/09/2020	26/09/2020

Determinand	Codes	Units	LOD		
VOC					
Heptane	N	ug/kg	10	< 10.0	< 10.0
Octane	N	ug/kg	10	< 10.0	< 10.0
Nonane	N	ug/kg	10	< 10.0	< 10.0
Benzene	M	ug/kg	10	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0
m+p-xylene	M	ug/kg	10	< 10.0	< 10.0
o-xylene	M	ug/kg	10	< 10.0	< 10.0
cis-1,2-dichloroethane	N	ug/kg	10	< 10.0	< 10.0
1,1-Dichloroethane	M	ug/kg	10	< 10.0	< 10.0
Chloroform	M	ug/kg	10	< 10.0	< 10.0
Tetrachloromethane	M	ug/kg	10	< 10.0	< 10.0
1,1,1-Trichloroethane	M	ug/kg	10	< 10.0	< 10.0
Trichloroethylene	M	ug/kg	10	< 10.0	< 10.0
Tetrachloroethylene	M	ug/kg	10	< 10.0	< 10.0
1,1,1,2-Tetrachloroethane	M	ug/kg	10	< 10.0	< 10.0
1,1,2,2-Tetrachloroethane	M	ug/kg	10	< 10.0	< 10.0
Chlorobenzene	M	ug/kg	10	< 10.0	< 10.0
Bromobenzene	M	ug/kg	10	< 10.0	< 10.0
Bromodichloromethane	M	ug/kg	10	< 10.0	< 10.0
Methylethylbenzene	M	ug/kg	10	< 10.0	< 10.0
1,1-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
Trans - 1-2 -dichloroethylene	N	ug/kg	10	< 10.0	< 10.0
2,2-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0
Bromochloromethane	N	ug/kg	10	< 10.0	< 10.0
1,2-Dichloroethane	M	ug/kg	10	^ < 10.0	^ < 10.0
Dibromomethane	M	ug/kg	10	< 10.0	< 10.0
1,2-Dichloropropane	M	ug/kg	10	< 10.0	< 10.0
cis-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
trans-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
1,1,2-Trichloroethane	N	ug/kg	10	< 10.0	< 10.0
Dibromochloromethane	N	ug/kg	10	< 10.0	< 10.0
1,3-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0
1,2-dibromoethane	N	ug/kg	10	< 10.0	< 10.0
Styrene	N	ug/kg	10	< 10.0	< 10.0
Propylbenzene	N	ug/kg	10	< 10.0	< 10.0
2-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0
1,2,4-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0
4-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0
t-butylbenzene	N	ug/kg	10	< 10.0	< 10.0
1,3,5-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0
1-methylpropylbenzene	N	ug/kg	10	< 10.0	< 10.0
p-cymene	N	ug/kg	10	< 10.0	< 10.0
1,3-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Butylbenzene	N	ug/kg	10	< 10.0	< 10.0
1,2-Dibromo-3-chloropropane	N	ug/kg	10	< 10.0	< 10.0
Hexachlorobutadiene	N	ug/kg	10	< 10.0	< 10.0
1-2-3 - Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Naphthalene	N	ug/kg	10	< 10.0	< 10.0
1-2-4 - Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
1,4-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
1,2-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Bromoform	N	ug/kg	10	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

The Environmental Laboratory Ltd. Reg. No. 3882193



Results Summary

2683

Report No.: 20-30251, issue number 1

ELAB Reference	216308
Customer Reference	
Sample ID	
Sample Type	SOIL
Sample Location	BH106
Sample Depth (m)	3.00
Sampling Date	26/09/2020

Determinand	Codes	Units	LOD	
Metals				
Chromium (III)	N	ug/l	5	< 5
Antimony 10:1 extract	N	ug/l	5	< 5
Arsenic 10:1 extract	N	ug/l	5	< 5
Barium 10:1 extract	N	ug/l	5	19
Beryllium 10:1 extract	N	ug/l	5	< 5
Boron 10:1 extract	N	ug/l	5	13
Cadmium 10:1 extract	N	ug/l	1	< 1
Calcium 10:1 extract	N	ug/l	100	6610
Chromium 10:1 extract	N	ug/l	5	< 5
Copper 10:1 extract	N	ug/l	5	< 5
Iron 10:1 extract	N	ug/l	140	< 140
Lead 10:1 extract	N	ug/l	5	< 5
Magnesium 10:1 extract	N	ug/l	100	1580
Manganese 10:1 extract	N	ug/l	5	< 5
Mercury 10:1 extract	N	ug/l	0.1	< 0.1
Molybdenum 10:1 extract	N	ug/l	5	< 5
Nickel 10:1 extract	N	ug/l	5	< 5
Selenium 10:1 extract	N	ug/l	5	< 5
Vanadium 10:1 extract	N	ug/l	5	< 5
Zinc 10:1 extract	N	ug/l	5	< 5
Anions				
Chloride	N	mg/l	1	1
Fluoride	N	mg/l	1	< 1
Inorganics				
Complex cyanide	N	ug/l	5	< 5
Hexavalent chromium	N	ug/l	100	< 100
Free Cyanide	N	ug/l	5	< 5
Ammoniacal Nitrogen as N	N	mg/l	0.1	< 0.1
Total Cyanide	N	ug/l	5	< 5
Miscellaneous				
pH (10:1 extract)	N	pH units	0.1	7.7
Phenols				
Phenol	N	ug/l	1	< 1
M,P-Cresol	N	ug/l	1	< 1
O-Cresol	N	ug/l	1	< 1
3,4-Dimethylphenol	N	ug/l	1	< 1
2,3-Dimethylphenol	N	ug/l	1	< 1
Trimethylphenol	N	ug/l	1	< 1
Total Monohydric Phenols 10:1 extract	N	ug/l	5	< 5



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Results Summary

Report No.: 20-30251, issue number 1

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
216308	3.00	BH106	Brown soil, stones, slate, clinker	No asbestos detected	n/t	n/t	n/t	n/t
216310	7.00	BH106	Brown soil (clay)	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 20-30251, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Leachate cyanide 10:1 extract	N		13/10/2020		Colorimetry
Leachate phenols 10:1 extract	N		13/10/2020		HPLC
PAH (GC-MS)	N	As submitted sample	09/10/2020		GC-MS
pH of leachates	N		14/10/2020		Electromeric
Free cyanide	N	As submitted sample	13/10/2020	107	Colorimetry
Hexavalent chromium	N	As submitted sample	14/10/2020	110	Colorimetry
pH	M	Air dried sample	12/10/2020	113	Electromeric
Phenols in solids	M	As submitted sample	12/10/2020	121	HPLC
Ammonia in leachates	N		14/10/2020	151	Colorimetry
Water soluble anions	M	Air dried sample	09/10/2020	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	12/10/2020	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	12/10/2020	181	GC-MS
VOC in solids	M	As submitted sample	12/10/2020	181	GC-MS
BTEX in solids	M	As submitted sample	12/10/2020	181A	GC-MS
Water soluble boron	N	Air dried sample	09/10/2020	202	Colorimetry
Total cyanide	M	As submitted sample	13/10/2020	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	09/10/2020	210	IR
Anions in leachates	N		13/10/2020	270	Ion Chromatography
TPH CWG soil by gc-gc	M	As submitted sample	09/10/2020	271	
Asbestos identification	U	Air dried sample	13/10/2020	280	Microscopy
Aqua regia extractable metals	M	Air dried sample	09/10/2020	300	ICPMS
Leachate metals 10:1 extract	N		14/10/2020	301	ICPMS

Tests marked N are not UKAS accredited

Report Information

Report No.: 20-30251, issue number 1

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

LOD LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.
Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.
ELAB are unable to provide an interpretation or opinion on the content of this report.
The results relate only to the sample received.
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request
Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

-
- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage



2683

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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 20-30312

Issue: 1

Date of Issue: 19/10/2020

Contact: Andy Norman

Customer Details: Envirotreat Technologies Ltd
LCP House
The Pensnett Estate

West Midlands DY6 7NA

Quotation No: Q20-01871

Order No: Not Supplied

Customer Reference: Not Supplied

Date Received: 09/10/2020

Date Approved: 19/10/2020

Details: Atlantic Wharf

Approved by:

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

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Sample Summary

Report No.: 20-30312, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
216766	BH101	07/10/2020	12/10/2020		
216767	BH103	07/10/2020	12/10/2020		
216768	BH105	07/10/2020	12/10/2020		
216769	BH106	07/10/2020	12/10/2020		
216770	BH107	07/10/2020	12/10/2020		

Results Summary

Report No.: 20-30312, issue number 1

ELAB Reference	216766	216767	216768	216769	216770
Customer Reference					
Sample ID					
Sample Type	WATER	WATER	WATER	WATER	WATER
Sample Location	BH101	BH103	BH105	BH106	BH107
Sample Depth (m)					
Sampling Date	07/10/2020	07/10/2020	07/10/2020	07/10/2020	07/10/2020

Determinand	Codes	Units	LOD					
Dissolved Metals								
Arsenic	U	ug/l	5	55	16	32	< 5	13
Boron	N	ug/l	5	428	331	1780	661	1650
Barium	U	ug/l	5	102	128	151	108	159
Beryllium	U	ug/l	5	< 5	< 5	< 5	< 5	< 5
Calcium	U	ug/l	100	91500	90300	195000	148000	211000
Cadmium	U	ug/l	1	< 1	< 1	< 1	< 1	< 1
Chromium	U	ug/l	5	< 5	< 5	< 5	< 5	< 5
Chromium (III)	N	ug/l	5	< 5	< 5	< 5	< 5	< 5
Copper	U	ug/l	5	< 5	< 5	< 5	< 5	< 5
Mercury	U	ug/l	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Magnesium	U	ug/l	100	27500	20900	232000	63800	276000
Manganese	U	ug/l	5	757	708	356	586	1190
Molybdenum	U	ug/l	5	7	21	19	< 5	12
Sodium	U	ug/l	100	49700	29400	2150000	211000	2730000
Nickel	U	ug/l	5	< 5	< 5	< 5	< 5	< 5
Lead	U	ug/l	1	< 1	< 1	< 1	< 1	< 1
Antimony	N	ug/l	5	< 5	< 5	< 5	< 5	< 5
Selenium	U	ug/l	5	< 5	< 5	7	< 5	< 5
Vanadium	N	ug/l	5	< 5	< 5	< 5	< 5	8
Zinc	U	ug/l	5	< 5	< 5	< 5	< 5	< 5
Anions								
Chloride	U	mg/l	0.5	34.4	31.3	3270	306	4610
Fluoride	U	mg/l	0.5	0.6	< 0.5	< 0.5	1.0	< 0.5
Nitrate	U	mg/l	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Sulphate	U	mg/l	0.5	20.1	46.7	177	112	292
Inorganics								
Elemental Sulphur	N	mg/l	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Free Cyanide	N	ug/l	5	< 5	< 5	< 5	< 5	< 5
Ammoniacal Nitrogen as N	N	mg/l	0.1	2.9	1.2	2.9	1.2	1.2
Hexavalent Chromium	U	ug/l	100	< 100	< 100	< 100	< 100	< 100
Total Cyanide	U	ug/l	5	< 5	< 5	< 5	< 5	< 5
Miscellaneous								
Total Alkalinity (CaCO3)	N	mg/l	5	360	320	740	460	950
Bicarbonate alkalinity (CaCO3)	N	mg/l CaCO3	5	359	319	736	459	948
Hardness (CaCO3)	N	mg/l CaCO3	0.1	342	311	1440	633	1660
pH	U	pH units	0.1	7.5	7.4	7.8	7.5	7.4
Total Dissolved Solids	N	mg/l	100	592	524	8410	1290	10300
Phenols								
Phenol	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
M,P-Cresol	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
O-Cresol	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
2,3,5-trimethylphenol	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	ug/l	1	< 1	< 1	< 1	< 1	< 1

Results Summary

Report No.: 20-30312, issue number 1

ELAB Reference	216766	216767	216768	216769	216770
Customer Reference					
Sample ID					
Sample Type	WATER	WATER	WATER	WATER	WATER
Sample Location	BH101	BH103	BH105	BH106	BH107
Sample Depth (m)					
Sampling Date	07/10/2020	07/10/2020	07/10/2020	07/10/2020	07/10/2020

Determinand	Codes	Units	LOD					
Polyaromatic hydrocarbons								
Naphthalene GCMS	N	ug/l	0.01	0.25	0.19	0.10	0.09	0.03
Acenaphthylene GCMS	N	ug/l	0.01	0.05	0.05	0.03	0.02	< 0.01
Acenaphthene GCMS	N	ug/l	0.01	0.80	0.10	0.04	0.04	0.01
Fluorene GCMS	N	ug/l	0.01	0.16	0.16	0.04	0.04	< 0.01
Phenanthrene GCMS	N	ug/l	0.01	0.40	0.43	0.10	0.09	0.04
Anthracene GCMS	N	ug/l	0.01	0.11	0.11	0.02	0.02	< 0.01
Fluoranthene GCMS	N	ug/l	0.01	0.38	0.40	0.03	0.06	0.02
Pyrene GCMS	N	ug/l	0.01	0.26	0.28	0.02	0.05	0.02
Benzo (a) anthracene GCMS	N	ug/l	0.01	0.22	0.25	0.01	0.02	< 0.01
Chrysene GCMS	N	ug/l	0.01	0.17	0.19	0.01	0.01	< 0.01
Benzo (b) fluoranthene GCMS	N	ug/l	0.01	0.20	0.21	0.01	< 0.01	< 0.01
Benzo (k) fluoranthene GCMS	N	ug/l	0.01	0.15	0.16	< 0.01	< 0.01	< 0.01
Benzo (a) pyrene GCMS	N	ug/l	0.01	0.19	0.20	< 0.01	< 0.01	< 0.01
Indeno (1,2,3-cd) pyrene GCMS	N	ug/l	0.01	0.10	0.10	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene GCMS	N	ug/l	0.01	0.05	0.05	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene GCMS	N	ug/l	0.01	0.09	0.09	< 0.01	< 0.01	< 0.01
Total PAH(16) GCMS	N	ug/l	0.01	3.56	2.96	0.43	0.45	0.19
TPH CWG								
>C5-C6 Aliphatic	N	ug/l	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C6-C8 Aliphatic	N	ug/l	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C8-C10 Aliphatic	N	ug/l	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
>C10-C12 Aliphatic	N	ug/l	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
>C12-C16 Aliphatic	N	ug/l	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
>C16-C21 Aliphatic	N	ug/l	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
>C21-C35 Aliphatic	N	ug/l	5	< 5.0	< 5.0	22.7	< 5.0	< 5.0
>C35-C40 Aliphatic	N	ug/l	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total (>C5-C40) Aliphatic	N	ug/l	5	< 5.0	< 5.0	22.7	< 5.0	< 5.0
>C5-C7 Aromatic	N	ug/l	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C7-C8 Aromatic	N	ug/l	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C8-C10 Aromatic	N	ug/l	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
>C10-C12 Aromatic	N	ug/l	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
>C12-C16 Aromatic	N	ug/l	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
>C16-C21 Aromatic	N	ug/l	5	5.6	< 5.0	< 5.0	< 5.0	< 5.0
>C21-C35 Aromatic	N	ug/l	5	< 5.0	< 5.0	20.6	< 5.0	< 5.0
>C35-C40 Aromatic	N	ug/l	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total (>C5-C40) Aromatic	N	ug/l	5	5.6	< 5.0	20.6	< 5.0	< 5.0
Total (>C5-C40) Ali/Aro	N	ug/l	5	5.6	< 5.0	43.3	< 5.0	< 5.0

Results Summary

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ELAB Reference				216766	216767	216768	216769	216770
Customer Reference								
Sample ID								
Sample Type				WATER	WATER	WATER	WATER	WATER
Sample Location				BH101	BH103	BH105	BH106	BH107
Sample Depth (m)								
Sampling Date				07/10/2020	07/10/2020	07/10/2020	07/10/2020	07/10/2020
Determinand	Codes	Units	LOD					
VOC								
MTBE	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Heptane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Octane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Nonane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Benzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Toluene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
m+p-xylene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
o-xylene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
cis-1,2-dichloroethene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,1-Dichloroethane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Chloroform	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Tetrachloromethane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,1,1-Trichloroethane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,1,1,2-Tetrachloroethane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-Tetrachloroethane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Bromobenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Methylethylbenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,1-Dichloro-1-propene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Trans - 1-2 - dichloroethylene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
2,2-Dichloropropane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Bromochloromethane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloroethane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Dibromomethane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloropropane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
cis-1,3-Dichloro-1-propene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
trans-1,3-Dichloro-1-propene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,1,2-Trichloroethane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,3-Dichloropropane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Dibromoethane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Styrene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Propylbenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
2-Chlorotoluene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,2,4-Trimethylbenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
4-Chlorotoluene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
t-butylbenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,3,5-Trimethylbenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1-methylpropylbenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
p-cymene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,3-Dichlorobenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Butylbenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,2-Dibromo-3-chloropropane	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1-2-3 - Trichlorobenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Naphthalene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1-2-4 - Trichlorobenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,4-Dichlorobenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
1,2-Dichlorobenzene	N	ug/l	1	< 1	< 1	< 1	< 1	< 1
Bromoform	N	ug/l	1	< 1	< 1	< 1	< 1	< 1

Method Summary

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Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Water					
Aliphatic/Aromatic hydrocarbons in water	N		15/10/2020		GC-FID
Aromatic hydrocarbons in water	N		15/10/2020		GC-FID
Phenols in waters	N		15/10/2020		HPLC
Alkalinity in waters	N		15/10/2020	100	Titrimetry
pH of waters	U		14/10/2020	113	Electromeric
Chromium Hexavalent in waters	U		15/10/2020	123	Colorimetry
Cyanide in waters	U		14/10/2020	132	Colorimetry
PAHs and/or PCBs in waters	N		15/10/2020	135	GC-MS
Total Dissolved Solids	N		19/10/2020	144	Gravimetry
Ammonia in waters	N		19/10/2020	151	Colorimetry
Low range Aliphatic hydrocarbons water	N		15/10/2020	200	GC-MS
Low range Aromatic hydrocarbons water	N		15/10/2020	200	GC-MS
VOC in waters	N		14/10/2020	200	GC-MS
Cyanide in waters	U		14/10/2020	205	Colorimetry
Elemental Sulphur by HPLC in waters	N		16/10/2020	206	HPLC
Aliphatic hydrocarbons in water	N		15/10/2020	215	GC-FID
Aromatic hydrocarbons in water	N		15/10/2020	215	GC-FID
Anions	U		15/10/2020	270	Ion Chromatography
Dissolved metals by ICP in waters	U		15/10/2020	301	ICPMS
Hardness in waters	N		16/10/2020	APHA	ICPMS

Tests marked N are not UKAS accredited

Report Information

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Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

LOD LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.
Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.
ELAB are unable to provide an interpretation or opinion on the content of this report.
The results relate only to the sample received.
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request
Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

-
- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage