WHITECLIFF PAVILION, POOLE – BOROUGH OF POOLE

Factual Report

NOVEMBER 2018

Whitecliff Pavilion, Poole – Borough of Poole

Factual Report

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Report Ref	18-97497

Issue Number

Issue	Revision No.	Date Issued	Description of Revision	Reviewed by:
01		14/11/18		
02		04/12/18	Table Ref Updated	Anthony Elkins

Site Address
Whitecliff Pavilion
Whitecliff Road
Poole
BH14 8DU

Client Address
Borough of Poole
Unit 1 New Fields Bus. Park
Stinsford Road
Poole
Dorset
BH17 0NF

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1 INTRODUCTION

1.1 Terms of Reference

ACS Testing Ltd (ACS) were instructed by Joshua Chalke of Borough of Poole (the Client) in October 2018 to carry out a site investigation, laboratory testing and prepare a factual report for a site comprising Whitecliff Pavilion, Whitecliff Road, Poole, BH14 8DU.

1.2 Site Setting

The 'Site' comprises the existing pavilion building which is located at the northern extent of Whitecliff Harbourside Park, within the town of Poole, Dorset and is accessed via Whitecliff Road.

The Site is as defined on Figure 1 and Figure 2.

1.3 Objective and Scope

The objective of the investigation is to provide geotechnical parameters to enable the design of the proposed construction, including in relation to foundations and buried concrete specification, and geochemical information to inform waste soil disposal.

The scope of this study is as follows;

- Four windowless boreholes drilled to a maximum depth of 4.00mbgl
- In situ geotechnical Standard Penetration Tests (SPT) at 1m vertical intervals within the boreholes.
- Take and submit soil samples for geochemical laboratory testing.
- The preparation of a factual report.

The scope of the investigation and locations of the boreholes were agreed with the Client at a site meeting on 5th October 2018. The site investigation works were carried out on the 16thOctober 2018.

1.4 Proposed Development

It is understood the Client intends to redevelop the existing building including an extension.

1.5 Limitations

ACS carried out the site investigation, collection of samples and laboratory analysis. It should be appreciated that there may be areas of the Site that have not been investigated where ground conditions may vary from those encountered. The contaminant concentrations or sub-surface features revealed may be more widespread than identified by the investigation carried out by the Client.

This factual report has been produced by ACS in accordance with the instructions received from the Client. The information contained in this report is intended for the use of the Client pursuant to the development described above. The information contained herein may not be appropriate to other development proposals.

We confirm that in preparing this report we have exercised reasonable skill and care as would be expected of a suitably qualified and experienced geoscience consultant working within the limits of the Client's instructions.

No liability can be accepted for information in other data sources or conditions not revealed by the sampling or testing. Any comments made on the basis of information obtained from the Client or other third parties are given in good faith on the assumption that the information is accurate; no independent validation of such information has been made by ACS Testing Ltd.

2 INTRUSIVE INVESTIGATION

2.1 Ground Investigation

An intrusive investigation was undertaken by ACS on the 19th October 2018. Exploratory holes were undertaken in accessible locations around the existing pavillion. In total four windowless boreholes were drilled. The locations of the boreholes are shown on Figure 2. Logs of the material encountered are included within Appendix A.

A utility service drawing was provided by the Client and all locations were scanned with a Cable Avoidance Tool. All boreholes were hand dug to a depth of 1.0mbgl as a precautionary measure against unidentified buried services. No evidence of buried services was encountered. Boreholes were backfilled with bentonite on completion and reinstated with similar surfacing to reflect the surrounding materials.

2.2 Geotechnical and Geochemical Testing

The geotechnical and geochemical testing was specified by the Client's senior engineer. In situ standard penetration testing (SPT) was undertaken at 1m vertical intervals within all windowless boreholes.

The following samples, scheduled by the Client, were submitted for testing -

- 4 general chemical suite - metals, benzene/toluene/ethylbenzene/xylene (BTEX), soil organic matter, speciated polycyclic aromatic hydrocabons (PAH), polychlorinated biphenyls (PCB), speciated total petroleum hydrocarbons (TPH), pH.
- 4 Waste Acceptance Criteria (WAC)
- 7 pH and water soluble sulphate.

Geochemical laboratory test result certificates are included as Appendix B.

The investigation sampling and analysis plan are summarised in

Table 1: Summary of Sampling and Analysis Plan

Exploratory Hole	Depth of Sample (mbgl)	Testing
WS01	0.17-0.46	General chemical suite, WAC pH value, water soluble sulphate
WS01	0.46-1.00	pH and water soluble sulphate
WS02	0.09-0.42	pH and water soluble sulphate
WS02	0.42-1.00	General chemical suite, WAC pH value, water soluble sulphate
WS03	0.14-0.51	General chemical suite, WAC pH value, water soluble sulphate

Exploratory Hole	Depth of Sample (mbgl)	Testing
WS04	0.29-0.40	pH and water soluble sulphate
WS04	0.78-1.00	General chemical suite, WAC pH value, water soluble sulphate

3 GROUND CONDITIONS

3.1 Ground Conditions Encountered

The ground conditions encountered during the Site investigation are summarised in Table 2 below. Full details are provided in the exploratory hole logs included as Appendix A and a photographic record of the investigation is included as Appendix C.

Table 2: Summary of Ground Conditions Observed

Strata	Exploratory Holes	Depth to Base of Stratum (mbgl)
Hardstanding (Bound Macadam)	WS02, WS03 WS04	0.03-0.12
Made Ground (MG)	All Boreholes	1.53-1.76
Tidal Flat Deposits (TFD)	All Boreholes	2.16-2.64
Peat	WS04	2.61
Poole Formation (PF)	All Boreholes	Proven to 4.00

3.1.1 Hardstanding

Macadam surfacing was recorded in three of the exploratory holes; WS02, WS03 and WS04. The depth of the macadam was recorded betweem 0.03-0.12mbgl.

3.1.2 Made Ground

Made Ground was encountered in all exploratory holes. The majority of the made ground was revealed to comprise dark grey or dark brown gravelly silty fine to coarse sand. Gravel is fine to coarse angular to sub-rounded flint or brick. Within the made ground are layers with frequent glass and ceramic fragments. WS02 and WS04 had layers of slightly sandy to sandy fine to coarse angular to sub-rounded gravel of flint and limestone. Soft dark grey mottled dark brown slightly sandy gravelly clay was recorded within WS04.

3.1.3 Tidal Flat Deposits

Tidal Flat Deposits were encountered in all exploratory holes. The deposits comprised a unit of very loose light grey to dark grey organic silty to very silty fine to coarse sand. Within WS04 a dark brown mottled dark grey pseudo-fibrous peat layer was recorded at the base of the tidal flat deposits.

3.1.4 Poole Formation

The Poole formation was encountered in all windowless boreholes proven to a depth of 4.00mbgl. The Poole Formation was generally found to comprise either a very soft to firm light grey to dark grey mottled orange silty clay or a brownish yellow or brownish grey silty fine to coarse sand.

3.1.5 Groundwater

Table 3 summarises the groundwater encountered during the Site investigation. Full details are provided in the exploratory hole logs included as Appendix A.

Table 3: Summary of Groundwater Observations

Exploratory Hole Reference	Groundwater Strike (mbgl)	Geology of Strike	Rest Water Level After 20 Minutes (mbgl)
WS01	No water strike	n/a	n/a
WS02	No clear water strike. Ground saturated at 2.0-3.0m	Silty fine to coarse sand (TFD)	None measured
WS03	2.0	Silty fine to coarse sand (TFD)	1.36
WS04	3.0	Silty clay (PF)	2.96

4 GEOTECHNICAL TEST RESULTS

The results of the laboratory and in situ geotechnical testing are summarised in the section below. Full results can be found on the borehole logs and laboratory certificates included as Appendicies A and B.

4.1 Ground Corrosive to Concrete

The results from the pH and water soluble sulphate testing undertaken on soil samples are summarised in Table 4 below.

Table 4: Summary of pH and Water Soluble Sulphate Test Results

Borehole Reference (Depth mbgl)	Geology	pH	Water Soluble Sulphate (mg/l)
WS01 (0.17-0.46)	Brown gravelly silty sand (MG)	7.4	36.9
WS01 (0.46-1.00)	Grey brown and orange gravelly sand (MG)	7.5	43.7
WS02 (0.09-0.42)	Brown gravelly sand (MG)	7.7	10.4
WS02 (0.42-1.00)	Brown very gravelly sand (MG)	7.5	61.4
WS03 (0.14-0.51)	Brown gravelly sand (MG)	7.1	17.8
WS04 (0.29-0.40)	Grey sandy gravel (MG)	8.1	32.2
WS04 (0.78-1.00)	Brown and grey gravelly sand (MG)	8.0	86.3

4.2 Standard Penetration Testing

SPTs were undertaken at 1m vertical intervals to 4.00mbgl within each of the boreholes. All SPTs undertaken at 1.0mbgl were within Made Ground and ranged in value between N = 0 to N =10. All SPTs undertaken at 2.0mbgl were undertaken within the Tidal Flat Deposits and ranged in value from N=0 to N=1. The four SPTs carried out at 3.0mbgl were within the Poole Formation with a range of N values between N=0 and N=16. The four SPTs undertaken at 4.0mbgl were in the Poole Formation with N values varying from N=20 to N=29. The results of the tests are shown on the exploratory hole logs in Appendix A and graphically represented in Figure 3.

5 WASTE SOIL CLASSIFICATION

The following summarises the results of the soil chemical analysis, solely in relation to classification of waste soil arising from excavation at the Site. The results of the soil geochemical testing are includedin Appendix B.

5.1 Classification of Waste

Soil samples were tested to classify soil which may be required to remove from the Site as waste. To determine what type of landfill the soil can be disposed of there are two steps involved.

1) Testing of the solid fraction to determine if the sample has hazardous properties, enabling a waste code to be associated with the soil in accordance with Technical Guidance WM3. For waste soils there are two entries:
    - 17 05 03 – soil and stones containing hazardous substances
    - 17 05 04 – soil and stones other than those mentioned in 17 05 03

2) Preparation and testing of a leachate and solid component for comparison against published Waste Acceptance Criteria (WAC) to determine where the material can be disposed of in accordance with The Landfill Directive[1]. The soil must be classified as one of the following, or be subjected to further treatment:
    - A landfill for hazardous waste
    - A landfill for non-hazardous waste; or
    - A landfill for inert waste

5.2 Total Solids Testing

The results of the soil chemical analysis (total concentrations) were entered into waste soil characterisation assessment software (CAT Waste) in order to determine whether each sample has non-hazardous or hazardous properties. A summary of the recommended European Waste Catalogue code for each of the samples analysed is summarised in Table 5. The output from the CAT Waste software is included in Appendix D.

Table 5: Summary of Hazardous / Non-Hazardous Waste Assessment

Sample Reference	Hazardous Substances	European Waste Catalogue Code
WS01 (0.17-0.46)	Copper, Lead, Zinc	17 05 03
WS02 (0.42-1.00)	N / A	17 05 04
WS03 (0.14-0.51)	N / A	17 05 04
WS04 (0.78-1.00)	Copper, Lead, Zinc	17 05 03

[1] Department for Environment Food and Rural Affairs (2010). *Environmental Permitting Guidance The Landfill Directive*. Version 3.1.

5.3 Waste Acceptance Criteria Testing

Considering the materials waste code the results of the WAC testing have then been compared to landfill waste acceptance criteria. Table 6 below summarises the type of waste management facility which may be able to receive the soil represented by each sample.

Table 6: Summary of Waste Classification

Sample Reference	Landfill Waste Acceptance Criteria Specification – Exceedances	Disposal Facility
WS01 (0.17-0.46m)	Total Organic Carbon, Mineral Oil (C10-C40), PAH	Stable Non Reactive Hazardous Waste
WS02 (0.42-1.00m)	Total Organic Carbon	Non-Hazardous
WS03 (0.14-0.51m)	Total Organic Carbon, Mineral Oil (C10-C40), PAH	Non–Hazardous
WS04 (0.78-1.00m)	Total Organic Carbon, PAH	Stable Non Reactive Hazardous Waste

Figure 1 – Site Location Plan

Notes:

Key:

N

DO NOT SCALE

Drawing: Site Location Plan

Client: Borough of Poole

Project: Whitecliff Pavilion
Poole
Dorset
BH14 8DU

Project No: 18-97497

Figure No: 1

Revision:

Drawn By: DR

Date: 5.11.2018

Checked By: AJE

Date: 5.11.2018

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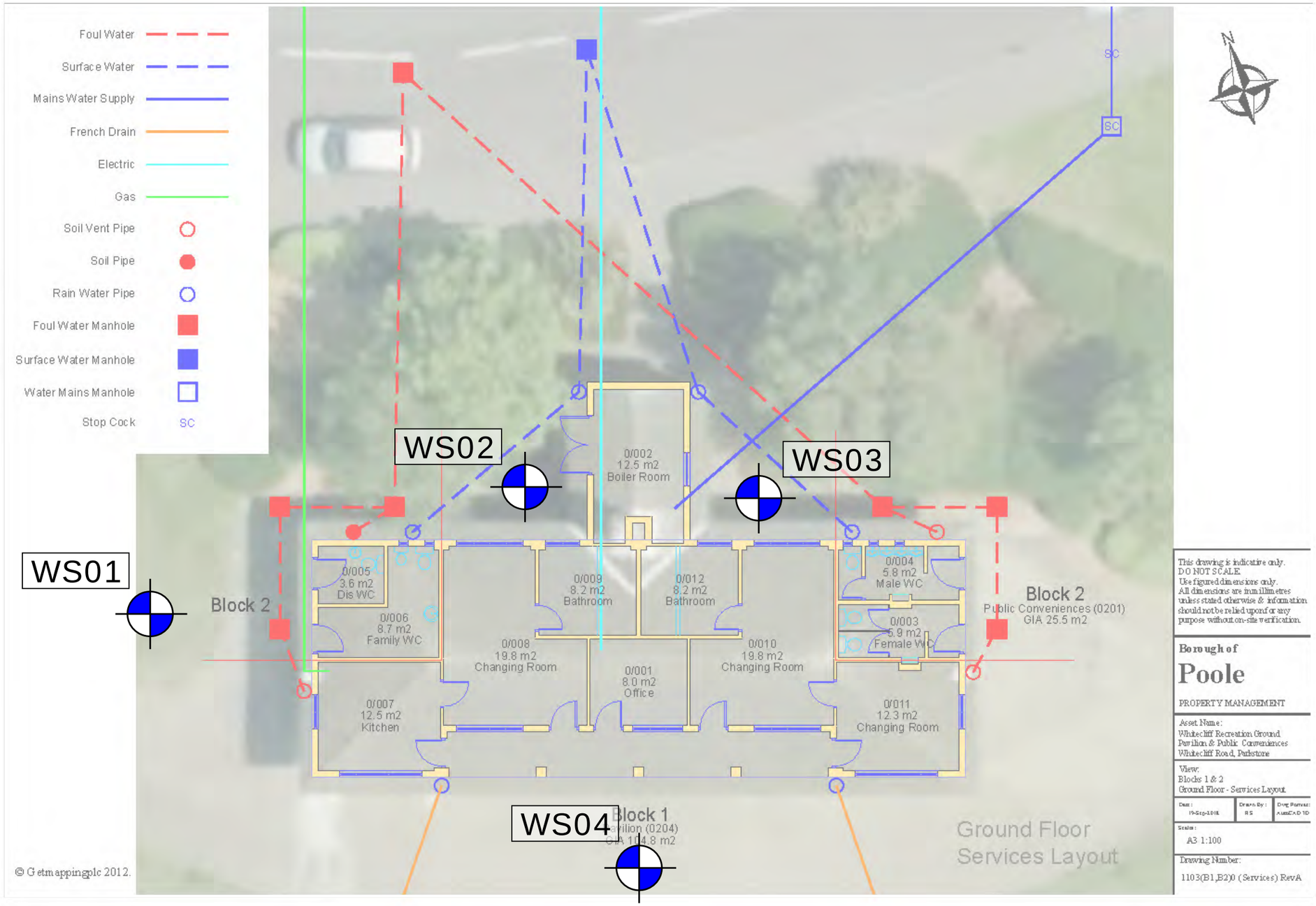
Figure 2 – Exploratory Hole Location Plan



Notes:

The services layout should not be relied upon and is for information only in relation to the exploratory hole locations.

Exploratory hole locations are approximate and have not been surveyed.

Key:

Borehole location

N

DO NOT SCALE

Drawing: Borehole Location Plan

Client: Borough of Poole

Project: Whitecliff Pavilion
Whitecliff Road
Poole
BH14 8DU

Project No: 18-97497

Figure No: 2

Revision: 1

Drawn By: AJE

Date: 19.10.18

Checked By: BG

Date: 19.10.18

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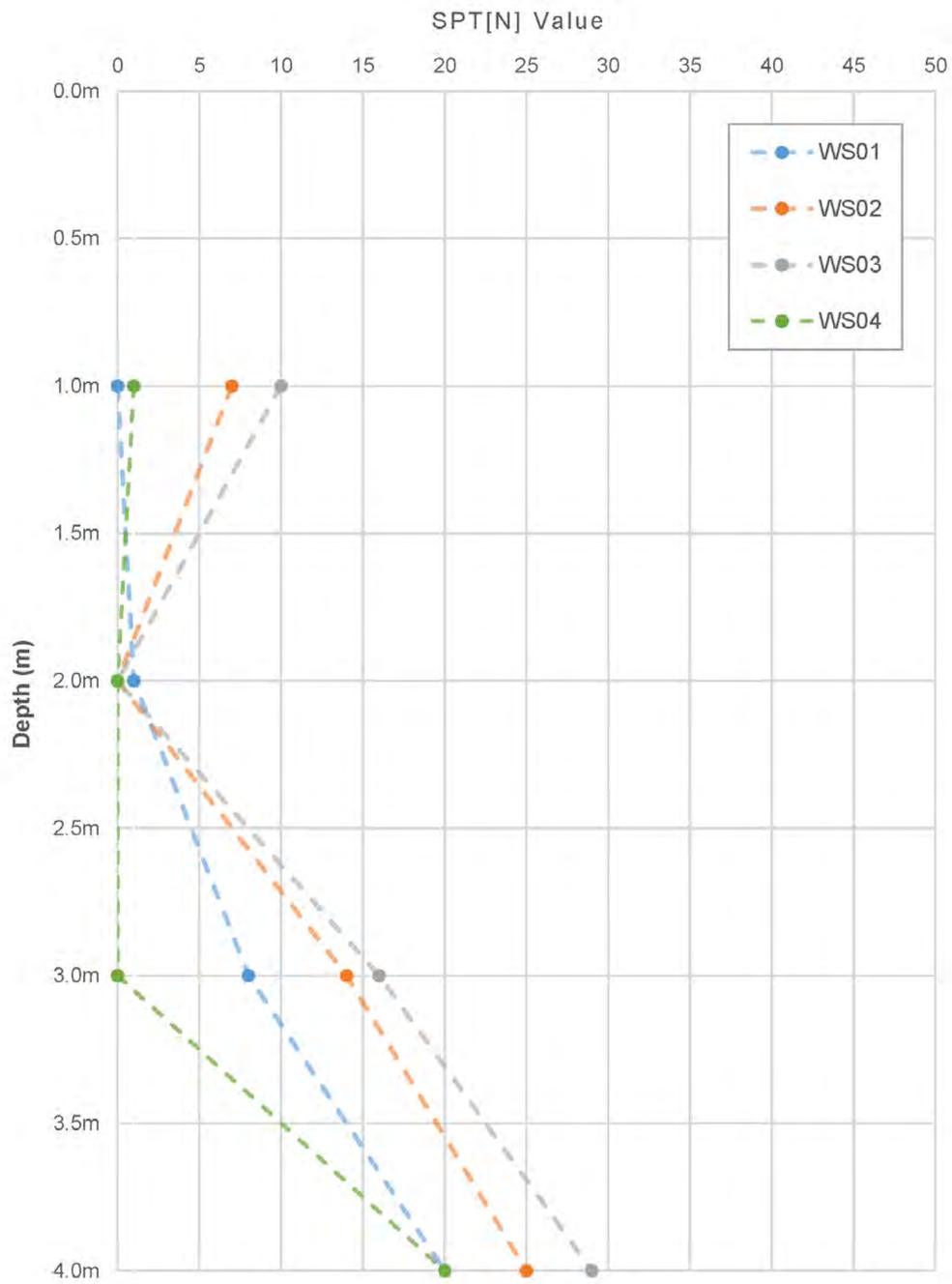
Figure 3 – Standard Penetration Results vs Depth



Notes:

Dashed lines are for ease of reading only

Key:

Drawing:
Standard Penetration Results vs Depth

Client:
Borough of Poole

Project:
Whitecliff Pavilion
Poole
Dorset
BH14 8DU

Project No:
18-97497

Figure No:
3

Revision:

Drawn By:
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APPENDIX A

Exploratory Hole Logs

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BOREHOLE LOG

WINDOWLESS SAMPLING

Borehole No.
WS01
Sheet 1 of 1

Client:	Borough of Poole	**Lab. Ref:**	**18-97298**
Contract:	Whitecliff Pavilion	**Drilling Equipment:**	Dando Terrier Mk1 Tracked Dynamic Percussion Rig
Location:	Whitecliff Road, Poole, BH14 8DU		
Ground Level (mAOD):	Not Surveyed	**Co-ords:**	Not Surveyed
Date(s):	16/10/2018		

Hole Type WLS
Scale 1:20
Logged By DW

All units = (m)	Stratum Description	Depth (Level)	Thickness	Legend	Water Strikes	Backfill	Sample (Type) Depth	In Situ Testing Depth	Type	Results	Drill Run
	MADE GROUND. Dark grey gravelly silty fine to coarse SAND. Gravel is fine to coarse angular to sub-rounded of flint, and brick. Frequent rootlets.	0.17									
	MADE GROUND. Dark brown gravelly silty fine to coarse SAND. Gravel is fine to coarse sub-angular to sub-rounded of flint, brick and slate. Rare rubber fragments.	0.46									
1	MADE GROUND. Multicoloured dark grey, dark brown and orange very gravelly fine to coarse SAND. Gravel is fine to coarse angular to sub-rounded of flint, brick and shell fragments. Frequent glass fragment and rare bone fragments.	1.53	(1.07)					1.00	SPT(C)	N=0 (1,1/0,0,0,0)	Hand Dug Pit (87mm dia) Rec=61%
2	Very loose grey silty organic fine to coarse SAND. (Tidal Flat Deposits)	2.64	(1.11)					2.00	SPT(C)	N=1 (1,1/0,1,0,0)	(87mm dia) Rec=94%
3	Soft to firm light grey mottled orange silty CLAY. (Poole Formation)	3.09	(0.45)					3.00	SPT(S)	N=8 (0,1/2,1,2,3)	(87mm dia) Rec=100%
	Firm light greyish brown silty CLAY. (Poole Formation)	3.61	(0.52)								
4	Firm light greyish brown slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular of mudstone. (Poole Formation) *Orange mottled greyish brown fine to medium angular to sub-angular GRAVEL of mudstone.*	4.00	(0.39)					4.00	SPT(S)	N=20 (2,3/3,4,5,8)	
	End of Borehole at 4.000m										

Remarks:

Groundwater not encountered. Ground becomes saturated between 2.00-3.00mbgl.

Groundwater Observations:

Date	Strike	Casing	Time Elapsed	Standing	Remarks

Technical Notes (where applicable):
Consistency of fine grained soil assessed by hand worked tests in accordance with BS5930. Densities of granular material based on in situ SPT N-values. Chalk descriptions in accordance with CIRIA C574'

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BOREHOLE LOG

WINDOWLESS SAMPLING

Borehole No.
WS02
Sheet 1 of 1

Client:	Borough of Poole	**Lab. Ref:**	**18-97298**
Contract:	Whitecliff Pavilion	**Drilling Equipment:**	Dando Terrier Mk1 Tracked Dynamic Percussion Rig
Location:	Whitecliff Road, Poole, BH14 8DU		
Ground Level (mAOD):	Not Surveyed	**Co-ords:**	Not Surveyed
Date(s):	16/10/2018		

Hole Type WLS
Scale 1:20
Logged By DW

All units = (m)	Stratum Description	Depth (Level)	Thickness	Legend	Water Strikes	Backfill	Sample (Type) Depth	In Situ Testing Depth	Type	Results	Drill Run
	BOUND MACADAM.	0.03									Core
	MADE GROUND. Greyish brown sandy fine to coarse angular to sub-rounded GRAVEL of flint.	0.09									
	MADE GROUND. Dark brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to sub-rounded of flint, brick and slate. Frequent glass and ceramic fragments.	0.42	(0.33)								
	MADE GROUND. Brown very gravelly fine to coarse SAND. Gravel is fine to coarse angular to sub-rounded of flint and brick. Frequent glass and ceramic fragments.	1.27	(0.85)								Hand Dug Pit
1								1.00	SPT(C)	N=7 (1,0/2,2,2,1)	
	MADE GROUND. Multicoloured dark grey, dark brown and orange slightly gravelly silty fine SAND. Gravel is fine to coarse sub-angular to sub-rounded of flint and brick.	1.54									(87mm dia) Rec=92%
	Very loose grey mottled dark grey silty organic fine to coarse SAND. (Tidal Flat Deposits)	2.16	(0.62)								
2								2.00	SPT(C)	N=0 (0,0/0,0,0,0)	
	Very soft to soft light grey mottled orange silty CLAY. (Poole Formation)	2.76	(0.60)								(87mm dia) Rec=81%
	Firm greyish brown mottled orange silty CLAY. (Poole Formation)	3.45	(0.69)								
3								3.00	SPT(S)	N=14 (1,1/2,3,4,5)	
	Firm dark grey silty CLAY. (Poole Formation)	4.00	(0.55)								(87mm dia) Rec=98%
4	End of Borehole at 4.000m							4.00	SPT(S)	N=25 (2,4/5,6,6,8)	

Remarks:

Groundwater not encountered.

Groundwater Observations:

Date	Strike	Casing	Time Elapsed	Standing	Remarks

Technical Notes (where applicable):
Consistency of fine grained soil assessed by hand worked tests in accordance with BS5930. Densities of granular material based on in situ SPT N-values. Chalk descriptions in accordance with CIRIA C574'

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BOREHOLE LOG

WINDOWLESS SAMPLING

Borehole No. **WS03**

Client: Borough of Poole		**Lab. Ref:** 18-97298	**Hole Type** WLS
Contract: Whitecliff Pavilion		**Drilling Equipment:** Dando Terrier Mk1 Tracked Dynamic Percussion Rig	**Scale** 1:20
Location: Whitecliff Road, Poole, BH14 8DU			**Logged By** DW
Ground Level (mAOD): Not Surveyed	**Co-ords:** Not Surveyed	**Date(s):** 16/10/2018	

All units = (m)	Stratum Description	Depth (Level)	Thickness	Legend	Water Strikes	Backfill	Sample (Type) Depth	In Situ Testing Depth	Type	Results	Drill Run
	BOUND MACADAM.	0.03									Core
	MADE GROUND. Dark brown very gravelly fine to coarse SAND. Gravel is fine to coarse sub-angular to sub-rounded of flint and brick. Occasional glass and ceramic fragments.	0.14									
	MADE GROUND. Brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to sub-rounded of flint and brick. Frequent glass and ceramic fragments.		(0.37)								
	MADE GROUND. Greyish brown very gravelly fine to coarse SAND. Gravel is fine to coarse angular to sub-rounded of flint and brick. Occasional glass, shell and ceramic fragments.	0.51	(0.61)								Hand Dug Pit
1								1.00	SPT(C)	N=10 (1,1/2,2,2,4)	
	MADE GROUND. Dark brownish grey slightly gravelly silty SAND. Gravel is fine to medium sub-angular to sub-rounded of flint and brick.	1.12	(0.48)								(87mm dia) Rec=92%
	Very loose dark grey becoming light grey mottled orange silty fine to coarse SAND. (Tidal Flat Deposits)	1.60	(0.87)								
2								2.00	SPT(C)	N=0 (0,1/0,0,0,0)	
	Brownish yellow silty fine to coarse SAND. (Poole Formation)	2.47									(87mm dia) Rec=79%
	Soft to firm light grey mottled orange silty CLAY. (Poole Formation)	2.66	(0.55)								
3								3.00	SPT(S)	N=16 (1,3/3,3,4,6)	
	Soft to firm brownish grey very sandy CLAY. (Poole Formation)	3.21									
	Brownish grey mottled orange silty fine to coarse SAND. (Poole Formation)	3.44									(87mm dia) Rec=97%
	Soft to firm brownish grey mottled orange very sandy CLAY. (Poole Formation)	3.59									
	Medium dense brownish grey mottled orange silty fine to coarse SAND. (Poole Formation)	3.79									
4	End of Borehole at 4.000m	4.00						4.00	SPT(C)	N=29 (2,2/5,4,9,11)	

Remarks:

Groundwater Observations:

Date	Strike	Casing	Time Elapsed	Standing	Remarks
16-10-2018	2.00m	2.00m	20mins	1.36m	

Technical Notes (where applicable):
Consistency of fine grained soil assessed by hand worked tests in accordance with BS5930. Densities of granular material based on in situ SPT N-values. Chalk descriptions in accordance with CIRIA C574'

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BOREHOLE LOG

WINDOWLESS SAMPLING

Borehole No.
WS04
Sheet 1 of 1

Client:	Borough of Poole	**Lab. Ref:**	**18-97298**
Contract:	Whitecliff Pavilion	**Drilling Equipment:**	Dando Terrier Mk1 Tracked Dynamic Percussion Rig
Location:	Whitecliff Road, Poole, BH14 8DU		
Ground Level (mAOD):	Not Surveyed	**Co-ords:**	Not Surveyed
Date(s):	16/10/2018		

Hole Type WLS
Scale 1:20
Logged By DW

All units = (m)	Stratum Description	Depth (Level)	Thickness	Legend	Water Strikes	Backfill	Sample (Type) Depth	In Situ Testing Depth	Type	Results	Drill Run
	BOUND MACADAM.	0.12									Core
	MADE GROUND. Light greyish brown slightly sandy fine to coarse angular to sub-rounded GRAVEL of flint and limestone.	0.23									
	MADE GROUND. Light greyish brown mottled dark grey slightly sandy fine to coarse sub-angular to sub-rounded GRAVEL of flint, limestone and clinker.	0.29									
	MADE GROUND. Light brownish grey slightly sandy fine to coarse angular to sub-rounded GRAVEL of flint and limestone.	0.40									
	MADE GROUND. Soft dark grey mottled dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to sub-rounded of flint and brock. Frequent ceramic fragments.	0.78	(0.38)								Hand Dug Pit
	MADE GROUND. Multicoloured greyish brown, dark grey and light brown very gravelly fine to coarse SAND. Gravel is fine to coarse angular to sub-rounded of flint and brick. Frequent glass fragments.		(0.98)								
1								1.00	SPT(C)	N=1 (1,0/0,0,0,1)	
											(87mm dia) Rec=77%
	Very loose dark grey silty organic fine to coarse SAND. (Tidal Flat Deposits)	1.76	(0.57)								
2								2.00	SPT(C)	N=0 (1,0/0,0,0,0)	
	Dark brown mottled dark grey pseudo-fibrous PEAT.	2.33									(87mm dia) Rec=92%
	Very soft bluish grey, light grey and dark brown organic silty CLAY. (Poole Formation)	2.61	(0.39)								
3	Very loose brownish grey becoming light grey mottled orange silty fine to coarse SAND. (Poole Formation)	3.00	(0.52)					3.00	SPT(S)	N=0 (2,1/0,0,0,0)	
	Firm light greyish brown mottled orange slightly sandy silty CLAY. (Poole Formation)	3.52	(0.48)								(87mm dia) Rec=91%
4	End of Borehole at 4.000m	4.00						4.00	SPT(S)	N=20 (3,2/4,4,6,6)	

Remarks:

Groundwater Observations:

Date	Strike	Casing	Time Elapsed	Standing	Remarks
16-10-2018	3.00m	3.00m	20mins	2.96m	

Technical Notes (where applicable):
Consistency of fine grained soil assessed by hand worked tests in accordance with BS5930. Densities of granular material based on in situ SPT N-values. Chalk descriptions in accordance with CIRIA C574'

APPENDIX B

Geochemical Test Results

ACS Testing Ltd
Unit 14
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Certificate of Analysis

Certificate Number : 18-09601-Issue 1-Page: 1

Report Fao:	Dan Paris
Site Address:	Whitecliff Pavilion
Client Order No:	18-97497
Date of Sampling:	16/10/2018
Date Received:	23/10/2018
Report Date:	31/10/2018

Please find your certificates of test attached for your samples received in the laboratory on 23/10/2018 under our laboratory reference 18-09601.

Remarks:

None

Results reviewed by:

Lisa McWean *Analyst*

Test Certificates approved by:

Eoin Byrne *Technical Supervisor*

Any opinions or interpretations indicated are outside the scope of our UKAS accreditation.
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.
Excel copies of reports are valid only when accompanied by this PDF certificate.
Client's Sample Description / ACS Material Description are noted for reference only.

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4150

ACSE Sample Number	38306	38307	38308
Sample ID	428213 - 18-97497	428214 - 18-97497	428215 - 18-97497
Clients Sample Ref.	WS01	WS01	WS02
Location / Sample Depth (m)	0.17-0.46m	0.46-1.00m	0.09-0.42m
Date Sampled	16/10/2018	16/10/2018	16/10/2018
Time Sampled			
Sample deviating codes	ef	f	f
Client's Sample Description			
ACS Testing Material Description	Brown gravelly silty SAND LOAM	Grey	Brown gravelly SAND
ACSE Material Description (Principal Matrix - As Received)		LOAM	LOAM

Determination	Units	Method	Prepared As	Result	AS	Result	AS	Result	AS
Anions									
Water Soluble Sulphate	mg/l	MT/ACSE/204	AD	**36.9**	*	**43.7**	*	**10.4**	*
BTEX									
Benzene	mg/kg	MT/ACSE/101	AR	**0.18**	*ef	-----		-----	
Ethylbenzene	mg/kg	MT/ACSE/101	AR	< 0.10	*ef	-----		-----	
m+p-xylene	mg/kg	MT/ACSE/101	AR	< 0.19	*ef	-----		-----	
o-xylene	mg/kg	MT/ACSE/101	AR	< 0.10	*ef	-----		-----	
Toluene	mg/kg	MT/ACSE/101	AR	**0.15**	*ef	-----		-----	
Total BTEX	mg/kg	MT/ACSE/101	AR	< 0.60	*ef	-----		-----	
Carbon									
Soil Organic Matter	%	MT/ACSE/102	AR	**8.21**		-----		-----	
FOC	%	MT/ACSE/102	AR	**0.0476**		-----		-----	
TOC (Total Organic Carbon)	%	MT/ACSE/102	AR	**4.72**	*	-----		-----	
Loss on Ignition									
Loss on Ignition (440 °C)	%	MT/ACSE/302	AD	**6.6**	*	-----		-----	
Metals (Soil)									
Arsenic	mg/kg	MT/ACSE/201	AD	**83.3**	*#	-----		-----	
Cadmium	mg/kg	MT/ACSE/201	AD	**1.66**	*#	-----		-----	
Chromium	mg/kg	MT/ACSE/201	AD	**79.4**	*#	-----		-----	
Copper	mg/kg	MT/ACSE/201	AD	**432**	*#	-----		-----	
Mercury	mg/kg	MT/ACSE/202	AD	**3.12**	*#	-----		-----	
Nickel	mg/kg	MT/ACSE/201	AD	**155**	*#	-----		-----	
Lead	mg/kg	MT/ACSE/201	AD	**2640**	*#	-----		-----	
Selenium	mg/kg	MT/ACSE/201	AD	< 6.00	*#	-----		-----	
Zinc	mg/kg	MT/ACSE/201	AD	**1410**	*#	-----		-----	
Chromium III	mg/kg	NAM/ACSE/X11	AD	**79.4**		-----		-----	
Chromium Hexavalent	mg/kg	NAM/ACSE/X11	AD	< 1.00		-----		-----	
Petroleum Hydrocarbons									
Total TPH (C10-C40)	mg/kg	MT/ACSE/105	AR	**667**	*#	-----		-----	
pH and Conductivity									
pH (@ 20°C)	units	MT/ACSE/301	AD	**7.4**	*f	**7.5**	*f	**7.7**	*f
Poly Aromatic Hydrocarbons									
Naphthalene	mg/kg	MT/ACSE/106	AD	**1.62**	*#	-----		-----	
Acenaphthylene	mg/kg	MT/ACSE/106	AD	**2.72**	*#	-----		-----	
Acenaphthene	mg/kg	MT/ACSE/106	AD	**0.79**	*#	-----		-----	
Fluorene	mg/kg	MT/ACSE/106	AD	**0.80**	*#	-----		-----	
Phenanthrene	mg/kg	MT/ACSE/106	AD	**5.94**	*#	-----		-----	
Anthracene	mg/kg	MT/ACSE/106	AD	**3.67**	*#	-----		-----	
Fluoranthene	mg/kg	MT/ACSE/106	AD	**13.9**	*#	-----		-----	
Pyrene	mg/kg	MT/ACSE/106	AD	**14.4**	*#	-----		-----	
Benzo (a) anthracene	mg/kg	MT/ACSE/106	AD	**7.99**	*#	-----		-----	
Chrysene	mg/kg	MT/ACSE/106	AD	**8.24**	*#	-----		-----	
Benzo (b) fluoranthene	mg/kg	MT/ACSE/106	AD	**16.9**	*#	-----		-----	
Benzo (k) fluoranthene	mg/kg	MT/ACSE/106	AD	**6.10**	*#	-----		-----	

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ACSE Sample Number	38306	38307	38308
Sample ID	428213 - 18-97497	428214 - 18-97497	428215 - 18-97497
Clients Sample Ref.	WS01	WS01	WS02
Location / Sample Depth (m)	0.17-0.46m	0.46-1.00m	0.09-0.42m
Date Sampled	16/10/2018	16/10/2018	16/10/2018
Time Sampled			
Sample deviating codes	ef	f	f
Client's Sample Description			
ACS Testing Material Description	Brown gravelly silty SAND LOAM	Grey	Brown gravelly SAND
ACSE Material Description (Principal Matrix - As Received)		LOAM	LOAM

Determination	Units	Method	Prepared As	Result	AS	Result	AS	Result	AS
Benzo (a) pyrene	mg/kg	MT/ACSE/106	AD	**13.1**	*#	-----		-----	
Indeno (1 2 3-CD) pyrene	mg/kg	MT/ACSE/106	AD	**7.70**	*#	-----		-----	
Dibenzo(a h)anthracene	mg/kg	MT/ACSE/106	AD	**2.33**	*#	-----		-----	
Benzo(g h i)perylene	mg/kg	MT/ACSE/106	AD	**9.94**	*#	-----		-----	
Total PAH	mg/kg	MT/ACSE/106	AD	**116**	*#	-----		-----	
Polychlorinated Biphenyls (PCBs)									
PCB (7 Congeners)	mg/kg	MT/ACSE/104	AD	< 1.00	*	-----		-----	
Speciated BTEX									
MTBE	mg/kg	NAM/ACSE/X12	AR	< 0.05		-----		-----	
Hexane	mg/kg	NAM/ACSE/X06	AR	< 0.05		-----		-----	
Heptane	mg/kg	NAM/ACSE/X06	AR	< 0.05		-----		-----	
Octane	mg/kg	NAM/ACSE/X06	AR	< 0.05		-----		-----	
Benzene	mg/kg	NAM/ACSE/X06	AR	< 0.05		-----		-----	
Toluene	mg/kg	NAM/ACSE/X06	AR	< 0.05		-----		-----	
Ethylbenzene	mg/kg	NAM/ACSE/X06	AR	< 0.05		-----		-----	
m+p-xylene	mg/kg	NAM/ACSE/X06	AR	< 0.05		-----		-----	
o-xylene	mg/kg	NAM/ACSE/X06	AR	< 0.05		-----		-----	
Total BTEX	mg/kg	NAM/ACSE/X06	AR	< 0.05		-----		-----	
Speciated Petroleum Hydrocarbons									
C5-C6 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 0.10		-----		-----	
>C6-C8 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 0.10		-----		-----	
>C8-C10 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		-----		-----	
>C10-C12 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		-----		-----	
>C12-C16 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		-----		-----	
>C16-C21 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		-----		-----	
>C21-C35 Aliphatic	mg/kg	NAM/ACSE/X07	AR	**79.6**		-----		-----	
C6-C7 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 0.10		-----		-----	
C7-C8 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 0.10		-----		-----	
>C8-C10 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		-----		-----	
>C10-C12 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		-----		-----	
>C12-C16 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		-----		-----	
>C16-C21 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		-----		-----	
>C21-C35 Aromatic	mg/kg	NAM/ACSE/X07	AR	**168**		-----		-----	
Total Speciated TPH	mg/kg	NAM/ACSE/X07	AR	**247**		-----		-----	

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ACSE Sample Number	38309	38310	38311
Sample ID	428216 - 18-97497	428217 - 18-97497	428218 - 18-97497
Clients Sample Ref.	WS02	WS03	WS04
Location / Sample Depth (m)	0.42-1.00m	0.14-0.51m	0.29-0.40m
Date Sampled	16/10/2018	16/10/2018	16/10/2018
Time Sampled			
Sample deviating codes	ef	ef	f
Client's Sample Description			
ACS Testing Material Description	Brown very gravelly SAND	Brown gravelly SAND	Grey sandy GRAVEL
ACSE Material Description (Principal Matrix - As Received)	LOAM	LOAM	Gravel

Determination	Units	Method	Prepared As	Result	AS	Result	AS	Result	AS
Anions									
Water Soluble Sulphate	mg/l	MT/ACSE/204	AD	**61.4**	*	**17.8**	*	**32.2**	*
BTEX									
Benzene	mg/kg	MT/ACSE/101	AR	**0.28**	*ef	**0.21**	*ef	-----	
Ethylbenzene	mg/kg	MT/ACSE/101	AR	< 0.10	*ef	< 0.10	*ef	-----	
m+p-xylene	mg/kg	MT/ACSE/101	AR	< 0.19	*ef	< 0.19	*ef	-----	
o-xylene	mg/kg	MT/ACSE/101	AR	< 0.10	*ef	< 0.10	*ef	-----	
Toluene	mg/kg	MT/ACSE/101	AR	< 0.10	*ef	**0.18**	*ef	-----	
Total BTEX	mg/kg	MT/ACSE/101	AR	< 0.60	*ef	< 0.60	*ef	-----	
Carbon									
Soil Organic Matter	%	MT/ACSE/102	AR	**16.6**		**20.7**		-----	
FOC	%	MT/ACSE/102	AR	**0.0961**		**0.120**		-----	
TOC (Total Organic Carbon)	%	MT/ACSE/102	AR	**9.52**	*	**11.9**	*	-----	
Loss on Ignition									
Loss on Ignition (440 °C)	%	MT/ACSE/302	AD	**13**	*	**7.2**	*	-----	
Metals (Soil)									
Arsenic	mg/kg	MT/ACSE/201	AD	**25.2**	*#	**49.4**	*#	-----	
Cadmium	mg/kg	MT/ACSE/201	AD	< 1.00	*#	< 1.00	*#	-----	
Chromium	mg/kg	MT/ACSE/201	AD	**53.8**	*#	**39.2**	*#	-----	
Copper	mg/kg	MT/ACSE/201	AD	**117**	*#	**193**	*#	-----	
Mercury	mg/kg	MT/ACSE/202	AD	**2.05**	*#	**1.52**	*#	-----	
Nickel	mg/kg	MT/ACSE/201	AD	**34.0**	*#	**68.7**	*#	-----	
Lead	mg/kg	MT/ACSE/201	AD	**844**	*#	**522**	*#	-----	
Selenium	mg/kg	MT/ACSE/201	AD	< 6.00	*#	< 6.00	*#	-----	
Zinc	mg/kg	MT/ACSE/201	AD	**542**	*#	**525**	*#	-----	
Chromium III	mg/kg	NAM/ACSE/X11	AD	**53.8**		**39.2**		-----	
Chromium Hexavalent	mg/kg	NAM/ACSE/X11	AD	< 1.00		< 1.00		-----	
Petroleum Hydrocarbons									
Total TPH (C10-C40)	mg/kg	MT/ACSE/105	AR	**269**	*#	**665**	*#	-----	
pH and Conductivity									
pH (@ 20°C)	units	MT/ACSE/301	AD	**7.5**	*f	**7.1**	*f	**8.1**	*f
Poly Aromatic Hydrocarbons									
Naphthalene	mg/kg	MT/ACSE/106	AD	**2.83**	*#	**2.22**	*#	-----	
Acenaphthylene	mg/kg	MT/ACSE/106	AD	**1.56**	*#	**5.06**	*#	-----	
Acenaphthene	mg/kg	MT/ACSE/106	AD	**0.71**	*#	**0.69**	*#	-----	
Fluorene	mg/kg	MT/ACSE/106	AD	**0.52**	*#	**0.76**	*#	-----	
Phenanthrene	mg/kg	MT/ACSE/106	AD	**4.06**	*#	**5.14**	*#	-----	
Anthracene	mg/kg	MT/ACSE/106	AD	**1.90**	*#	**5.09**	*#	-----	
Fluoranthene	mg/kg	MT/ACSE/106	AD	**7.40**	*#	**19.6**	*#	-----	
Pyrene	mg/kg	MT/ACSE/106	AD	**6.88**	*#	**21.7**	*#	-----	
Benzo (a) anthracene	mg/kg	MT/ACSE/106	AD	**4.82**	*#	**15.9**	*#	-----	
Chrysene	mg/kg	MT/ACSE/106	AD	**5.21**	*#	**15.3**	*#	-----	
Benzo (b) fluoranthene	mg/kg	MT/ACSE/106	AD	**7.73**	*#	**26.3**	*#	-----	

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Quality Testing & Materials Consultancy to the Construction Industry

ACSE Sample Number	38309	38310	38311
Sample ID	428216 - 18-97497	428217 - 18-97497	428218 - 18-97497
Clients Sample Ref.	WS02	WS03	WS04
Location / Sample Depth (m)	0.42-1.00m	0.14-0.51m	0.29-0.40m
Date Sampled	16/10/2018	16/10/2018	16/10/2018
Time Sampled			
Sample deviating codes	ef	ef	f
Client's Sample Description			
ACS Testing Material Description	Brown very gravelly SAND	Brown gravelly SAND	Grey sandy GRAVEL
ACSE Material Description (Principal Matrix - As Received)	LOAM	LOAM	Gravel

Determination	Units	Method	Prepared As	Result	AS	Result	AS	Result	AS
Benzo (k) fluoranthene	mg/kg	MT/ACSE/106	AD	**2.88**	*#	**6.76**	*#	-----	
Benzo (a) pyrene	mg/kg	MT/ACSE/106	AD	**6.18**	*#	**20.9**	*#	-----	
Indeno (1 2 3-CD) pyrene	mg/kg	MT/ACSE/106	AD	**4.41**	*#	**14.5**	*#	-----	
Dibenzo(a h)anthracene	mg/kg	MT/ACSE/106	AD	**1.16**	*#	**3.41**	*#	-----	
Benzo(g h i)perylene	mg/kg	MT/ACSE/106	AD	**5.66**	*#	**19.5**	*#	-----	
Total PAH	mg/kg	MT/ACSE/106	AD	**63.9**	*#	**183**	*#	-----	
Polychlorinated Biphenyls (PCBs)									
PCB (7 Congeners)	mg/kg	MT/ACSE/104	AD	< 1.00	*	< 1.00	*	-----	
Speciated BTEX									
MTBE	mg/kg	NAM/ACSE/X12	AR	< 0.05		< 0.05		-----	
Hexane	mg/kg	NAM/ACSE/X06	AR	< 0.05		< 0.05		-----	
Heptane	mg/kg	NAM/ACSE/X06	AR	< 0.05		< 0.05		-----	
Octane	mg/kg	NAM/ACSE/X06	AR	< 0.05		< 0.05		-----	
Benzene	mg/kg	NAM/ACSE/X06	AR	< 0.05		< 0.05		-----	
Toluene	mg/kg	NAM/ACSE/X06	AR	< 0.05		< 0.05		-----	
Ethylbenzene	mg/kg	NAM/ACSE/X06	AR	< 0.05		< 0.05		-----	
m+p-xylene	mg/kg	NAM/ACSE/X06	AR	< 0.05		< 0.05		-----	
o-xylene	mg/kg	NAM/ACSE/X06	AR	< 0.05		< 0.05		-----	
Total BTEX	mg/kg	NAM/ACSE/X06	AR	< 0.05		< 0.05		-----	
Speciated Petroleum Hydrocarbons									
C5-C6 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 0.10		< 0.10		-----	
>C6-C8 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 0.10		< 0.10		-----	
>C8-C10 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		< 10.0		-----	
>C10-C12 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		< 10.0		-----	
>C12-C16 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		< 10.0		-----	
>C16-C21 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		< 10.0		-----	
>C21-C35 Aliphatic	mg/kg	NAM/ACSE/X07	AR	**48.5**		**32.8**		-----	
C6-C7 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 0.10		< 0.10		-----	
C7-C8 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 0.10		< 0.10		-----	
>C8-C10 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		< 10.0		-----	
>C10-C12 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		< 10.0		-----	
>C12-C16 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		< 10.0		-----	
>C16-C21 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		< 10.0		-----	
>C21-C35 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 10.0		**72.7**		-----	
Total Speciated TPH	mg/kg	NAM/ACSE/X07	AR	**48.5**		**105**		-----	

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ACSE Sample Number	**38312**
Sample ID	**428219 - 18-97497**
Clients Sample Ref.	**WS04**
Location / Sample Depth (m)	**0.78-1.00m**
Date Sampled	**16/10/2018**
Time Sampled	
Sample deviating codes	**ef**
Client's Sample Description	----------
ACS Testing Material Description	**Brown and grey gravelly SAND**
ACSE Material Description (Principal Matrix - As Received)	**SAND**

Determination	Units	Method	Prepared As	Result	AS
Anions					
Water Soluble Sulphate	mg/l	MT/ACSE/204	AD	**86.3**	*
BTEX					
Benzene	mg/kg	MT/ACSE/101	AR	**0.16**	*ef
Ethylbenzene	mg/kg	MT/ACSE/101	AR	< 0.10	*ef
m+p-xylene	mg/kg	MT/ACSE/101	AR	< 0.19	*ef
o-xylene	mg/kg	MT/ACSE/101	AR	< 0.10	*ef
Toluene	mg/kg	MT/ACSE/101	AR	**0.15**	*ef
Total BTEX	mg/kg	MT/ACSE/101	AR	< 0.60	*ef
Carbon					
Soil Organic Matter	%	MT/ACSE/102	AR	**5.67**	
FOC	%	MT/ACSE/102	AR	**0.0329**	
TOC (Total Organic Carbon)	%	MT/ACSE/102	AR	**3.26**	*
Loss on Ignition					
Loss on Ignition (440 °C)	%	MT/ACSE/302	AD	**3.4**	*
Metals (Soil)					
Arsenic	mg/kg	MT/ACSE/201	AD	**80.1**	*#
Cadmium	mg/kg	MT/ACSE/201	AD	**2.34**	*#
Chromium	mg/kg	MT/ACSE/201	AD	**60.3**	*#
Copper	mg/kg	MT/ACSE/201	AD	**428**	*#
Mercury	mg/kg	MT/ACSE/202	AD	**2.54**	*#
Nickel	mg/kg	MT/ACSE/201	AD	**106**	*#
Lead	mg/kg	MT/ACSE/201	AD	**1090**	*#
Selenium	mg/kg	MT/ACSE/201	AD	< 6.00	*#
Zinc	mg/kg	MT/ACSE/201	AD	**1430**	*#
Chromium III	mg/kg	NAM/ACSE/X11	AD	**60.3**	
Chromium Hexavalent	mg/kg	NAM/ACSE/X11	AD	< 1.00	
Petroleum Hydrocarbons					
Total TPH (C10-C40)	mg/kg	MT/ACSE/105	AR	**51.4**	*#
pH and Conductivity					
pH (@ 20°C)	units	MT/ACSE/301	AD	**8.0**	*f
Poly Aromatic Hydrocarbons					
Naphthalene	mg/kg	MT/ACSE/106	AD	**1.84**	*#
Acenaphthylene	mg/kg	MT/ACSE/106	AD	**11.9**	*#
Acenaphthene	mg/kg	MT/ACSE/106	AD	**0.53**	*#
Fluorene	mg/kg	MT/ACSE/106	AD	**0.81**	*#
Phenanthrene	mg/kg	MT/ACSE/106	AD	**3.35**	*#
Anthracene	mg/kg	MT/ACSE/106	AD	**7.48**	*#
Fluoranthene	mg/kg	MT/ACSE/106	AD	**23.1**	*#
Pyrene	mg/kg	MT/ACSE/106	AD	**23.4**	*#
Benzo (a) anthracene	mg/kg	MT/ACSE/106	AD	**23.0**	*#
Chrysene	mg/kg	MT/ACSE/106	AD	**23.7**	*#
Benzo (b) fluoranthene	mg/kg	MT/ACSE/106	AD	**44.9**	*#

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Quality Testing & Materials Consultancy to the Construction Industry

ACSE Sample Number	**38312**
Sample ID	**428219 - 18-97497**
Clients Sample Ref.	**WS04**
Location / Sample Depth (m)	**0.78-1.00m**
Date Sampled	**16/10/2018**
Time Sampled	
Sample deviating codes	**ef**
Client's Sample Description	
ACS Testing Material Description	**Brown and grey gravelly SAND**
ACSE Material Description (Principal Matrix - As Received)	**SAND**

Determination	Units	Method	Prepared As	Result	AS
Benzo (k) fluoranthene	mg/kg	MT/ACSE/106	AD	**14.4**	*#
Benzo (a) pyrene	mg/kg	MT/ACSE/106	AD	**34.7**	*#
Indeno (1 2 3-CD) pyrene	mg/kg	MT/ACSE/106	AD	**25.0**	*#
Dibenzo(a h)anthracene	mg/kg	MT/ACSE/106	AD	**5.53**	*#
Benzo(g h i)perylene	mg/kg	MT/ACSE/106	AD	**32.4**	*#
Total PAH	mg/kg	MT/ACSE/106	AD	**276**	*#
Polychlorinated Biphenyls (PCBs)					
PCB (7 Congeners)	mg/kg	MT/ACSE/104	AD	< 1.00	*
Speciated BTEX					
MTBE	mg/kg	NAM/ACSE/X12	AR	< 0.05	
Hexane	mg/kg	NAM/ACSE/X06	AR	< 0.05	
Heptane	mg/kg	NAM/ACSE/X06	AR	< 0.05	
Octane	mg/kg	NAM/ACSE/X06	AR	< 0.05	
Benzene	mg/kg	NAM/ACSE/X06	AR	< 0.05	
Toluene	mg/kg	NAM/ACSE/X06	AR	< 0.05	
Ethylbenzene	mg/kg	NAM/ACSE/X06	AR	< 0.05	
m+p-xylene	mg/kg	NAM/ACSE/X06	AR	< 0.05	
o-xylene	mg/kg	NAM/ACSE/X06	AR	< 0.05	
Total BTEX	mg/kg	NAM/ACSE/X06	AR	< 0.05	
Speciated Petroleum Hydrocarbons					
C5-C6 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 0.10	
>C6-C8 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 0.10	
>C8-C10 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 10.0	
>C10-C12 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 10.0	
>C12-C16 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 10.0	
>C16-C21 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 10.0	
>C21-C35 Aliphatic	mg/kg	NAM/ACSE/X07	AR	< 10.0	
C6-C7 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 0.10	
C7-C8 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 0.10	
>C8-C10 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 10.0	
>C10-C12 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 10.0	
>C12-C16 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 10.0	
>C16-C21 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 10.0	
>C21-C35 Aromatic	mg/kg	NAM/ACSE/X07	AR	< 10.0	
Total Speciated TPH	mg/kg	NAM/ACSE/X07	AR	< 10.0	

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Technical Information for Analytical Results

Analysis

* - denotes analysis covered by our UKAS accreditation
# - denoted analysis covered by our MCERTS certification
AD = Sample tested in air dried condition.
AR = Sample tested in as-received condition.
D = Sample tested in dry condition.
L = Laboratory prepared leachate
SC = sub contracted
All MCERTS certified test values reported on a dry weight basis.
UKAS uncertainty available on request.
Where results are less than the limit of detection, the value of 0 is used in calculations.

Deviating Codes

Deviating Samples

The use of any of the following symbols indicates that the sample was deviating and it is possible therefore that the results provided may not be representative of the sample taken.

a – The date and /or time of sampling has not been provided, therefore it is not known if the time lapse between sampling and analysis has exceeded the acceptable holding time(s)*.
b – The test item was received in a container which has not been recommended*.
c – On receipt, the temperature of the sample received was found to fall outside the recommendations of BS ISO 18512:2007, Soil Quality. Guidance on long and short term storage of soil samples*.
d – The sample was received in a container that had not been filled as recommended*.
e – The delay between sampling and sample receipt is greater than the recommended holding time for the analyte of interest in this matrix*.
f – The delay between sampling and analysis is greater than the recommended holding time for the analyte of interest in this matrix*.

*In accordance with the requirements of Technical Policy Statement TPS 63; UKAS Policy on Deviating Samples, all UKAS accredited testing laboratories are required to notify their clients that calibration or test results may be invalid where samples are found to be deviating. It is the opinion of ACSE that the term invalid should be interpreted as 'not fully representative of the sample taken at source'.

The following Additional Deviating Sample Codes may also be used.

I/S – Insufficient sample mass/volume received for accurate quantification of this analyte.
U/S – The sample received was deemed unsuitable for accurate determination of this analyte using the Test Methods available.

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Certificate of Analysis
Landfill Waste Acceptance Criteria (WAC) (10:1)

Certificate Number : 18-09601-Issue 1-Page: 1

Report Fao:	Dan Paris
Site Address:	Whitecliff Pavilion
Customer Order No:	18-97497
Date of Sampling:	16/10/2018
Date Received:	23/10/2018
Report Date:	31/10/2018

Please find your certificates of test attached for your samples received in the laboratory on 23/10/2018 under our laboratory reference 18-09601.

Remarks:

None

Results reviewed by:

Lisa McWean *Analyst*

Results approved by:

Eoin Byrne *Technical Supervisor*

Any opinions or interpretations indicated are outside the scope of our UKAS accreditation.
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.
Excel copies of reports are valid only when accompanied by this PDF certificate.
Client's Sample Description / ACS Material Description are noted for reference only.

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Certificate No. 18-09601-Issue 1-Page: 2

Site Address Whitecliff Pavilion

ACSE Sample Number	38306
Sample ID	428213 - 18-97497
Clients Sample Ref.	WS01
Material Source	In Situ
Location / Sample Depth (m)	0.17-0.46m
Time Sampled	
Date Sampled	16/10/2018
Sample Deviating Codes	ef
Client's Sample Description	
ACS Testing Material Description	Brown gravelly silty SAND
Principal Matrix (as received)	LOAM

LANDFILL WASTE ACCEPTANCE CRITERIA (WAC)

TEST VALUES

Mass of Undried Test Portion (Mw)	101.4	g	Volume of Leachant Used (L10)	0.889	litres
Mass of Dried Test Portion (Mp)	90.0	g			
Moisture Content Ratio (MC)	12.6	%	Volume of Eluate (VE10)	0.860	litres
Dry Matter Content (DR)	88.8	%			

SOLIDS ANALYSIS

Analyte	Method	AS	Sample Condition for Analysis	**Results**	LANDFILL WASTE ACCEPTANCE CRITERIA SPECIFICATION		
					Inert Waste	Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste
Total Organic Carbon (%)	MT/ACSE/102	*	As received	**4.72**	3 %	5 %	6 %
Loss on ignition (%)	MT/ACSE/302	*	Air dried at 30℃	**6.6**	---	---	10 %
BTEX (mg/kg)	MT/ACSE/101	*ef	As received	**< 0.60**	6	---	---
PCBs (7 congeners) (mg/kg)	MT/ACSE/104	*	Air dried at 30℃	**< 1.00**	1	---	---
Mineral oil (C10 - C40) (mg/kg)	MT/ACSE/105	*#	As received	**667**	500	---	---
PAHs (mg/kg)	MT/ACSE/106	*#	Air dried at 30℃	**116**	100	---	---
pH (units)	MT/ACSE/301	*f	Air dried at 30℃	**7.4**	---	>6	---

ELUATE ANALYSIS

Analyte	Method	AS	Concentration in Eluate (mg/l)	Amount Leached (mg/kg)	LANDFILL WASTE ACCEPTANCE CRITERIA SPECIFICATION BS EN 12457-2-2002 LIMIT VALUES (mg/kg) at L/S 10		
					Inert Waste	Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste
Eluate Preparation	LP/ACSE/104						
Liquid : Solid Ratio (L/S)	LP/ACSE/101	*	**L/S 10**	**L/S 10**			
pH (units)	MT/ACSE/301	*	8.4				
Temperature (℃)	MT/ACSE/301		20				
Conductivity (mS/m)	MT/ACSE/303	*	28.30				
Arsenic	MT/ACSE/205	*	< 0.003	**< 0.0300**	0.5	2	25
Barium	MT/ACSE/205	*	0.168	**1.676**	20	100	300
Cadmium	MT/ACSE/205	*	< 0.0008	**< 0.008**	0.04	1	5
Chromium (total)	MT/ACSE/205	*	0.001	**0.014**	0.5	10	70
Copper	MT/ACSE/205	*	0.012	**0.118**	2	50	100
Mercury	MT/ACSE/202	*	< 0.0001	**< 0.0010**	0.01	0.2	2
Molybdenum	MT/ACSE/205	*	< 0.0010	**< 0.010**	0.5	10	30
Nickel	MT/ACSE/205	*	0.0015	**0.015**	0.4	10	40
Lead	MT/ACSE/205	*	0.004	**0.044**	0.5	10	50
Antimony	MT/ACSE/205	*	< 0.003	**< 0.030**	0.06	0.7	5
Selenium	MT/ACSE/205	*	< 0.006	**< 0.060**	0.1	0.5	7
Zinc	MT/ACSE/205	*	0.010	**0.099**	4	50	200
Chloride	MT/ACSE/204	*	< 3.00	**< 30.00**	800	15000	25000
Fluoride	MT/ACSE/204	*	< 0.01	**< 0.050**	10	150	500
Sulphate	MT/ACSE/204	*	92.65	**926.5**	1000	20000	50000
Total dissolved solids	MT/ACSE/304	*	235	**2350**	4000	60000	100000
Phenol index	MT/ACSE/107	*	< 0.05	**< 0.50**	1	---	---
Dissolved organic carbon	MT/ACSE/103	*	4.04	**40.40**	500	800	1000

Comments: (comments are beyond the scope of UKAS accreditation)

Key (at clients request):

Individual test result exceeds the landfill waste acceptance criteria limit for inert waste.

The landfill waste acceptance criteria limits are provided for guidance only.
Eluates prepared in accordance with BS EN 12457-3:2002*

Certificate No. 18-09601-Issue 1-Page: 3

Site Address Whitecliff Pavilion

ACSE Sample Number	38309
Sample ID	428216 - 18-97497
Clients Sample Ref.	WS02
Material Source	In Situ
Location / Sample Depth (m)	0.42-1.00m
Time Sampled	
Date Sampled	16/10/2018
Sample Deviating Codes	ef
Client's Sample Description	
ACS Testing Material Description	Brown very gravelly SAND
Principal Matrix (as received)	LOAM

LANDFILL WASTE ACCEPTANCE CRITERIA (WAC)

TEST VALUES

Mass of Undried Test Portion (Mw)	107.8	g	Volume of Leachant Used (L10)	0.882	litres
Mass of Dried Test Portion (Mp)	90.0	g			
Moisture Content Ratio (MC)	19.8	%	Volume of Eluate (VE10)	0.836	litres
Dry Matter Content (DR)	83.5	%			

SOLIDS ANALYSIS

Analyte	Method	AS	Sample Condition for Analysis	**Results**	LANDFILL WASTE ACCEPTANCE CRITERIA SPECIFICATION		
					Inert Waste	Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste
Total Organic Carbon (%)	MT/ACSE/102	*	As received	**9.52**	3 %	5 %	6 %
Loss on ignition (%)	MT/ACSE/302	*	Air dried at 30℃	**13**	---	---	10 %
BTEX (mg/kg)	MT/ACSE/101	*ef	As received	**< 0.60**	6	---	---
PCBs (7 congeners) (mg/kg)	MT/ACSE/104	*	Air dried at 30℃	**< 1.00**	1	---	---
Mineral oil (C10 - C40) (mg/kg)	MT/ACSE/105	*#	As received	**269**	500	---	---
PAHs (mg/kg)	MT/ACSE/106	*#	Air dried at 30℃	**63.9**	100	---	---
pH (units)	MT/ACSE/301	*f	Air dried at 30℃	**7.5**	---	>6	---

ELUATE ANALYSIS

Analyte	Method	AS	Concentration in Eluate (mg/l)	Amount Leached (mg/kg)	LANDFILL WASTE ACCEPTANCE CRITERIA SPECIFICATION BS EN 12457-2-2002 LIMIT VALUES (mg/kg) at L/S 10		
					Inert Waste	Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste
Eluate Preparation	LP/ACSE/104						
Liquid : Solid Ratio (L/S)	LP/ACSE/101	*	**L/S 10**	**L/S 10**			
pH (units)	MT/ACSE/301	*	7.4				
Temperature (℃)	MT/ACSE/301		20				
Conductivity (mS/m)	MT/ACSE/303	*	22.10				
Arsenic	MT/ACSE/205	*	< 0.003	**< 0.0300**	0.5	2	25
Barium	MT/ACSE/205	*	0.139	**1.392**	20	100	300
Cadmium	MT/ACSE/205	*	< 0.0008	**< 0.008**	0.04	1	5
Chromium (total)	MT/ACSE/205	*	0.002	**0.018**	0.5	10	70
Copper	MT/ACSE/205	*	< 0.008	**< 0.080**	2	50	100
Mercury	MT/ACSE/202	*	< 0.0001	**< 0.0010**	0.01	0.2	2
Molybdenum	MT/ACSE/205	*	0.0025	**0.025**	0.5	10	30
Nickel	MT/ACSE/205	*	0.0017	**0.017**	0.4	10	40
Lead	MT/ACSE/205	*	< 0.004	**< 0.040**	0.5	10	50
Antimony	MT/ACSE/205	*	< 0.003	**< 0.030**	0.06	0.7	5
Selenium	MT/ACSE/205	*	< 0.006	**< 0.060**	0.1	0.5	7
Zinc	MT/ACSE/205	*	0.011	**0.111**	4	50	200
Chloride	MT/ACSE/204	*	6.18	**61.80**	800	15000	25000
Fluoride	MT/ACSE/204	*	< 0.01	**< 0.050**	10	150	500
Sulphate	MT/ACSE/204	*	27.86	**278.6**	1000	20000	50000
Total dissolved solids	MT/ACSE/304	*	150	**1500**	4000	60000	100000
Phenol index	MT/ACSE/107	*	< 0.05	**< 0.50**	1	---	---
Dissolved organic carbon	MT/ACSE/103	*	3.34	**33.40**	500	800	1000

Comments: (comments are beyond the scope of UKAS accreditation)

Key (at clients request):

Individual test result exceeds the landfill waste acceptance criteria limit for inert waste.

The landfill waste acceptance criteria limits are provided for guidance only.
Eluates prepared in accordance with BS EN 12457-3:2002*

Certificate No. 18-09601-Issue 1-Page: 4

Site Address Whitecliff Pavilion

ACSE Sample Number	38310
Sample ID	428217 - 18-97497
Clients Sample Ref.	WS03
Material Source	In Situ
Location / Sample Depth (m)	0.14-0.51m
Time Sampled	
Date Sampled	16/10/2018
Sample Deviating Codes	ef
Client's Sample Description	
ACS Testing Material Description	Brown gravelly SAND
Principal Matrix (as received)	LOAM

LANDFILL WASTE ACCEPTANCE CRITERIA (WAC)

TEST VALUES

Mass of Undried Test Portion (Mw)	101.7	g	Volume of Leachant Used (L10)	0.888	litres
Mass of Dried Test Portion (Mp)	90.0	g			
Moisture Content Ratio (MC)	13.0	%	Volume of Eluate (VE10)	0.856	litres
Dry Matter Content (DR)	88.5	%			

SOLIDS ANALYSIS

Analyte	Method	AS	Sample Condition for Analysis	**Results**	LANDFILL WASTE ACCEPTANCE CRITERIA SPECIFICATION		
					Inert Waste	Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste
Total Organic Carbon (%)	MT/ACSE/102	*	As received	**11.9**	3 %	5 %	6 %
Loss on ignition (%)	MT/ACSE/302	*	Air dried at 30℃	**7.2**	---	---	10 %
BTEX (mg/kg)	MT/ACSE/101	*ef	As received	**< 0.60**	6	---	---
PCBs (7 congeners) (mg/kg)	MT/ACSE/104	*	Air dried at 30℃	**< 1.00**	1	---	---
Mineral oil (C10 - C40) (mg/kg)	MT/ACSE/105	*#	As received	**665**	500	---	---
PAHs (mg/kg)	MT/ACSE/106	*#	Air dried at 30℃	**183**	100	---	---
pH (units)	MT/ACSE/301	*f	Air dried at 30℃	**7.1**	---	>6	---

ELUATE ANALYSIS

Analyte	Method	AS	Concentration in Eluate (mg/l)	Amount Leached (mg/kg)	LANDFILL WASTE ACCEPTANCE CRITERIA SPECIFICATION BS EN 12457-2-2002 LIMIT VALUES (mg/kg) at L/S 10		
					Inert Waste	Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste
Eluate Preparation	LP/ACSE/104						
Liquid : Solid Ratio (L/S)	LP/ACSE/101	*	**L/S 10**	**L/S 10**			
pH (units)	MT/ACSE/301	*	7.7				
Temperature (℃)	MT/ACSE/301		20				
Conductivity (mS/m)	MT/ACSE/303	*	12.23				
Arsenic	MT/ACSE/205	*	< 0.003	**< 0.0300**	0.5	2	25
Barium	MT/ACSE/205	*	0.149	**1.494**	20	100	300
Cadmium	MT/ACSE/205	*	< 0.0008	**< 0.008**	0.04	1	5
Chromium (total)	MT/ACSE/205	*	0.002	**0.022**	0.5	10	70
Copper	MT/ACSE/205	*	< 0.008	**< 0.080**	2	50	100
Mercury	MT/ACSE/202	*	< 0.0001	**< 0.0010**	0.01	0.2	2
Molybdenum	MT/ACSE/205	*	0.0045	**0.045**	0.5	10	30
Nickel	MT/ACSE/205	*	0.0011	**0.011**	0.4	10	40
Lead	MT/ACSE/205	*	0.005	**0.047**	0.5	10	50
Antimony	MT/ACSE/205	*	< 0.003	**< 0.030**	0.06	0.7	5
Selenium	MT/ACSE/205	*	< 0.006	**< 0.060**	0.1	0.5	7
Zinc	MT/ACSE/205	*	0.011	**0.105**	4	50	200
Chloride	MT/ACSE/204	*	< 3.00	**< 30.00**	800	15000	25000
Fluoride	MT/ACSE/204	*	0.23	**2.347**	10	150	500
Sulphate	MT/ACSE/204	*	9.56	**95.63**	1000	20000	50000
Total dissolved solids	MT/ACSE/304	*	50	**500.0**	4000	60000	100000
Phenol index	MT/ACSE/107	*	< 0.05	**< 0.50**	1	---	---
Dissolved organic carbon	MT/ACSE/103	*	< 2.00	**< 20.00**	500	800	1000

Comments: (comments are beyond the scope of UKAS accreditation)

Key (at clients request):

Individual test result exceeds the landfill waste acceptance criteria limit for inert waste.

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Eluates prepared in accordance with BS EN 12457-3:2002*

Certificate No. 18-09601-Issue 1-Page: 5

Site Address Whitecliff Pavilion

ACSE Sample Number	38312
Sample ID	428219 - 18-97497
Clients Sample Ref.	WS04
Material Source	In Situ
Location / Sample Depth (m)	0.78-1.00m
Time Sampled	
Date Sampled	16/10/2018
Sample Deviating Codes	ef
Client's Sample Description	
ACS Testing Material Description	Brown and grey gravelly SAND
Principal Matrix (as received)	SAND

LANDFILL WASTE ACCEPTANCE CRITERIA (WAC)

TEST VALUES

Mass of Undried Test Portion (Mw)	109.5	g	Volume of Leachant Used (L10)	0.881	litres
Mass of Dried Test Portion (Mp)	90.0	g			
Moisture Content Ratio (MC)	21.6	%	Volume of Eluate (VE10)	0.843	litres
Dry Matter Content (DR)	82.2	%			

SOLIDS ANALYSIS

Analyte	Method	AS	Sample Condition for Analysis	**Results**	LANDFILL WASTE ACCEPTANCE CRITERIA SPECIFICATION		
					Inert Waste	Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste
Total Organic Carbon (%)	MT/ACSE/102	*	As received	**3.26**	3 %	5 %	6 %
Loss on ignition (%)	MT/ACSE/302	*	Air dried at 30℃	**3.4**	---	---	10 %
BTEX (mg/kg)	MT/ACSE/101	*ef	As received	**< 0.60**	6	---	---
PCBs (7 congeners) (mg/kg)	MT/ACSE/104	*	Air dried at 30℃	**< 1.00**	1	---	---
Mineral oil (C10 - C40) (mg/kg)	MT/ACSE/105	*#	As received	**51.4**	500	---	---
PAHs (mg/kg)	MT/ACSE/106	*#	Air dried at 30℃	**276**	100	---	---
pH (units)	MT/ACSE/301	*f	Air dried at 30℃	**8.0**	---	>6	---

ELUATE ANALYSIS

Analyte	Method	AS	Concentration in Eluate (mg/l)	Amount Leached (mg/kg)	LANDFILL WASTE ACCEPTANCE CRITERIA SPECIFICATION BS EN 12457-2-2002 LIMIT VALUES (mg/kg) at L/S 10		
					Inert Waste	Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste
Eluate Preparation	LP/ACSE/104						
Liquid : Solid Ratio (L/S)	LP/ACSE/101	*	**L/S 10**	**L/S 10**			
pH (units)	MT/ACSE/301	*	7.7				
Temperature (℃)	MT/ACSE/301		20				
Conductivity (mS/m)	MT/ACSE/303	*	12.74				
Arsenic	MT/ACSE/205	*	< 0.003	**< 0.0300**	0.5	2	25
Barium	MT/ACSE/205	*	0.139	**1.390**	20	100	300
Cadmium	MT/ACSE/205	*	< 0.0008	**< 0.008**	0.04	1	5
Chromium (total)	MT/ACSE/205	*	0.002	**0.023**	0.5	10	70
Copper	MT/ACSE/205	*	< 0.008	**< 0.080**	2	50	100
Mercury	MT/ACSE/202	*	< 0.0001	**< 0.0010**	0.01	0.2	2
Molybdenum	MT/ACSE/205	*	0.0039	**0.039**	0.5	10	30
Nickel	MT/ACSE/205	*	0.0013	**0.013**	0.4	10	40
Lead	MT/ACSE/205	*	< 0.004	**< 0.040**	0.5	10	50
Antimony	MT/ACSE/205	*	< 0.003	**< 0.030**	0.06	0.7	5
Selenium	MT/ACSE/205	*	< 0.006	**< 0.060**	0.1	0.5	7
Zinc	MT/ACSE/205	*	0.006	**0.060**	4	50	200
Chloride	MT/ACSE/204	*	< 3.00	**< 30.00**	800	15000	25000
Fluoride	MT/ACSE/204	*	< 0.01	**< 0.050**	10	150	500
Sulphate	MT/ACSE/204	*	14.47	**144.7**	1000	20000	50000
Total dissolved solids	MT/ACSE/304	*	55	**550.0**	4000	60000	100000
Phenol index	MT/ACSE/107	*	< 0.05	**< 0.50**	1	---	---
Dissolved organic carbon	MT/ACSE/103	*	< 2.00	**< 20.00**	500	800	1000

Comments: (comments are beyond the scope of UKAS accreditation)

Key (at clients request):

Individual test result exceeds the landfill waste acceptance criteria limit for inert waste.

The landfill waste acceptance criteria limits are provided for guidance only.
Eluates prepared in accordance with BS EN 12457-3:2002*

Technical Information for Analytical Results

Analysis

* - denotes analysis covered by our UKAS accreditation
# - denoted analysis covered by our MCERTS certification
AD = Sample tested in air dried condition.
AR = Sample tested in as-received condition.
D = Sample tested in dry condition.
L = Laboratory prepared leachate
SC = sub contracted
All MCERTS certified test values reported on a dry weight basis.
UKAS uncertainty available on request.
Where results are less than the limit of detection, the value of 0 is used in calculations.

For Phenol index, m- and p- cresol are reported as mixed isomers, calibrated with reference to a p-cresol reference solution.
The individual concentrations of m- and p- cresol cannot be quantified using this method, however, the result reported for the mixed isomers will be an over estimation of the true result in samples where m-cresol is present.

Deviating Codes

Deviating Samples

The use of any of the following symbols indicates that the sample was deviating and it is possible therefore that the results provided may not be representative of the sample taken.

a – The date and /or time of sampling has not been provided, therefore it is not known if the time lapse between sampling and analysis has exceeded the acceptable holding time(s)*.
b – The test item was received in a container which has not been recommended*.
c – On receipt, the temperature of the sample received was found to fall outside the recommendations of BS ISO 18512:2007, Soil Quality. Guidance on long and short term storage of soil samples*.
d – The sample was received in a container that had not been filled as recommended*.
e – The delay between sampling and sample receipt is greater than the recommended holding time for the analyte of interest in this matrix*.
f – The delay between sampling and analysis is greater than the recommended holding time for the analyte of interest in this matrix*.

*In accordance with the requirements of Technical Policy Statement TPS 63; UKAS Policy on Deviating Samples, all UKAS accredited testing laboratories are required to notify their clients that calibration or test results may be invalid where samples are found to be deviating. It is the opinion of ACSE that the term invalid should be interpreted as 'not fully representative of the sample taken at source'.

The following Additional Deviating Sample Codes may also be used.

I/S – Insufficient sample mass/volume received for accurate quantification of this analyte.
U/S – The sample received was deemed unsuitable for accurate determination of this analyte using the Test Methods available.

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Quality Testing & Materials Consultancy to the Construction Industry

APPENDIX C

Photographic Record

Photo 1; Looking South: Drilling of exploratory borehole.

Photo 2; Looking North West: Drilling of exploratory borehole.

APPENDIX D

CAT Waste Output

ATKINS CatWasteSoil

Classification Assessment Tool of Soil Wastes - Hazard Summary Sheet

Site Name	Whitecliff Pavilion
Location	Whitecliff Pavilion
Site ID	
Job Number	18-09601
Date	11/9/2018
User Name	edward.davies@acstesting.co.uk
Company Name	ACS Testing Ltd

Hole ID	Sample Depth	Hazardous Waste Y/N	HP1	HP2	HP3	HP4	HP5	HP6	HP7	HP8	HP9	HP10	HP11	HP12	HP13	HP14	HP15	HP16
WS01	0.17-0.46m	Y	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No
WS02	0.42-1.00m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS03	0.14-0.51m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS04	0.78-1.00m	Y	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No

This output data has been generated by the CAT-Waste Soil waste classification tool provided by Atkins Consultants Ltd and J.McArdle Contracts and should be read in conjuntion with the standard Terms and Conditions

17:16 14/11/2018

ATKINS CatWasteSoil

Classification Assessment Tool of Soil Wastes - Individual Compound Information

Site Name	Whitecliff Pavilion
Location	Whitecliff Pavilion
Site ID	
Job Number	18-09601
Date	11/9/2018
User Name	edward.davies@acstesting.co.uk
Company Name	ACS Testing Ltd

Hole ID	Sample Depth	Contaminant	Contaminant Concentration (%)	Hazardous Waste Y/N	Hazard Property	Individual Hazard Statements Exceeded	Cumulative Hazard Statements Exceeded	Additional Hazard Statements (see notes section)
38306	0m	pH	0.00000	N				
38306	0m	Benzene	0.00002	N				H225 test
38306	0m	Toluene	0.00002	N				H225 test
38306	0m	Naphthalenene	0.00016	N				H228 test
38306	0m	Acenaphthylene	0.00027	N				
38306	0m	Acenaphthene	0.00008	N				
38306	0m	Fluorene	0.00008	N				
38306	0m	Phenanthrene	0.00059	N				
38306	0m	Anthracene	0.00037	N				
38306	0m	Fluoranthene	0.00139	N				
38306	0m	Pyrene	0.00144	N				
38306	0m	Benzo(a)anthracene	0.00080	N				
38306	0m	Chrysene	0.00082	N				
38306	0m	Benzo(b)fluoranthene	0.00169	N				
38306	0m	Benzo(k)fluoranthene	0.00061	N				
38306	0m	Benzo(a)pyrene	0.00131	N				
38306	0m	Indeno(1,2,3-cd)pyrene	0.00077	N				
38306	0m	Di-benz(a,h,)anthracene	0.00023	N				
38306	0m	Benzo(g,h,i)perylene	0.00099	N				
38306	0m	hydrocarbon/oil with marker	0.06670	N				H225 test
38306	0m	Arsenic	0.01278	N				
38306	0m	Cadmium	0.00031	N				
38306	0m	Chromium (Total)	0.01160	N				
38306	0m	Copper	0.10852	Y	HP14		H410	
38306	0m	Lead	0.00000	N				
38306	0m	Leadx	0.26400	Y	HP14		H410	
38306	0m	Mercury	0.00031	N				
38306	0m	Nickel	0.04086	N				
38306	0m	Zinc	0.00000	N				
38306	0m	Zincx	0.34815	Y	HP14		H410	
38309	0m	pH	0.00000	N				
38309	0m	Benzene	0.00003	N				H225 test
38309	0m	Naphthalenene	0.00028	N				H228 test
38309	0m	Acenaphthylene	0.00016	N				
38309	0m	Acenaphthene	0.00007	N				
38309	0m	Fluorene	0.00005	N				
38309	0m	Phenanthrene	0.00041	N				
38309	0m	Anthracene	0.00019	N				

ATKINS CatWasteSoil

Classification Assessment Tool of Soil Wastes - Individual Compound Information

Site Name	Whitecliff Pavilion
Location	Whitecliff Pavilion
Site ID	
Job Number	18-09601
Date	11/9/2018
User Name	edward.davies@acstesting.co.uk
Company Name	ACS Testing Ltd

Hole ID	Sample Depth	Contaminant	Contaminant Concentration (%)	Hazardous Waste Y/N	Hazard Property	Individual Hazard Statements Exceeded	Cumulative Hazard Statements Exceeded	Additional Hazard Statements (see notes section)
38309	0m	Fluoranthene	0.00074	N				
38309	0m	Pyrene	0.00069	N				
38309	0m	Benzo(a)anthracene	0.00048	N				
38309	0m	Chrysene	0.00052	N				
38309	0m	Benzo(b)fluoranthene	0.00077	N				
38309	0m	Benzo(k)fluoranthene	0.00029	N				
38309	0m	Benzo(a)pyrene	0.00062	N				
38309	0m	Indeno(1,2,3-cd)pyrene	0.00044	N				
38309	0m	Di-benz(a,h,)anthracene	0.00012	N				
38309	0m	Benzo(g,h,i)perylene	0.00057	N				
38309	0m	hydrocarbon/oil with marker	0.02690	N				H225 test
38309	0m	Arsenic	0.00387	N				
38309	0m	Chromium (Total)	0.00786	N				
38309	0m	Copper	0.02939	N				
38309	0m	Lead	0.00000	N				
38309	0m	Leadx	0.08440	N				
38309	0m	Mercury	0.00021	N				
38309	0m	Nickel	0.00896	N				
38309	0m	Zinc	0.00000	N				
38309	0m	Zincx	0.13383	N				
38310	0m	pH	0.00000	N				
38310	0m	Benzene	0.00002	N				H225 test
38310	0m	Toluene	0.00002	N				H225 test
38310	0m	Naphthalenene	0.00022	N				H228 test
38310	0m	Acenaphthylene	0.00051	N				
38310	0m	Acenaphthene	0.00007	N				
38310	0m	Fluorene	0.00008	N				
38310	0m	Phenanthrene	0.00051	N				
38310	0m	Anthracene	0.00051	N				
38310	0m	Fluoranthene	0.00196	N				
38310	0m	Pyrene	0.00217	N				
38310	0m	Benzo(a)anthracene	0.00159	N				
38310	0m	Chrysene	0.00153	N				
38310	0m	Benzo(b)fluoranthene	0.00263	N				
38310	0m	Benzo(k)fluoranthene	0.00068	N				
38310	0m	Benzo(a)pyrene	0.00209	N				
38310	0m	Indeno(1,2,3-cd)pyrene	0.00145	N				
38310	0m	Di-benz(a,h,)anthracene	0.00034	N				

ATKINS CatWasteSoil

Classification Assessment Tool of Soil Wastes - Individual Compound Information

Site Name	Whitecliff Pavilion
Location	Whitecliff Pavilion
Site ID	
Job Number	18-09601
Date	11/9/2018
User Name	edward.davies@acstesting.co.uk
Company Name	ACS Testing Ltd

Hole ID	Sample Depth	Contaminant	Contaminant Concentration (%)	Hazardous Waste Y/N	Hazard Property	Individual Hazard Statements Exceeded	Cumulative Hazard Statements Exceeded	Additional Hazard Statements (see notes section)
38310	0m	Benzo(g,h,i)perylene	0.00195	N				
38310	0m	hydrocarbon/oil with marker	0.06650	N				H225 test
38310	0m	Arsenic	0.00758	N				
38310	0m	Chromium (Total)	0.00573	N				
38310	0m	Copper	0.04848	N				
38310	0m	Lead	0.00000	N				
38310	0m	Leadx	0.05220	N				
38310	0m	Mercury	0.00015	N				
38310	0m	Nickel	0.01811	N				
38310	0m	Zinc	0.00000	N				
38310	0m	Zincx	0.12963	N				
38312	0m	pH	0.00000	N				
38312	0m	Benzene	0.00002	N				H225 test
38312	0m	Toluene	0.00002	N				H225 test
38312	0m	Naphthalenene	0.00018	N				H228 test
38312	0m	Acenaphthylene	0.00119	N				
38312	0m	Acenaphthene	0.00005	N				
38312	0m	Fluorene	0.00008	N				
38312	0m	Phenanthrene	0.00034	N				
38312	0m	Anthracene	0.00075	N				
38312	0m	Fluoranthene	0.00231	N				
38312	0m	Pyrene	0.00234	N				
38312	0m	Benzo(a)anthracene	0.00230	N				
38312	0m	Chrysene	0.00237	N				
38312	0m	Benzo(b)fluoranthene	0.00449	N				
38312	0m	Benzo(k)fluoranthene	0.00144	N				
38312	0m	Benzo(a)pyrene	0.00347	N				
38312	0m	Indeno(1,2,3-cd)pyrene	0.00250	N				
38312	0m	Di-benz(a,h,)anthracene	0.00055	N				
38312	0m	Benzo(g,h,i)perylene	0.00324	N				
38312	0m	hydrocarbon/oil with marker	0.00514	N				H225 test
38312	0m	Arsenic	0.01229	N				
38312	0m	Cadmium	0.00043	N				
38312	0m	Chromium (Total)	0.00881	N				
38312	0m	Copper	0.10751	Y	HP14		H410	
38312	0m	Lead	0.00000	N				
38312	0m	Leadx	0.10900	Y	HP14		H410	
38312	0m	Mercury	0.00025	N				

ATKINS CatWasteSoil

Classification Assessment Tool of Soil Wastes - Individual Compound Information

Site Name	Whitecliff Pavilion
Location	Whitecliff Pavilion
Site ID	
Job Number	18-09601
Date	11/9/2018
User Name	edward.davies@acstesting.co.uk
Company Name	ACS Testing Ltd

Hole ID	Sample Depth	Contaminant	Contaminant Concentration (%)	Hazardous Waste Y/N	Hazard Property	Individual Hazard Statements Exceeded	Cumulative Hazard Statements Exceeded	Additional Hazard Statements (see notes section)
38312	0m	Nickel	0.02795	N				
38312	0m	Zinc	0.00000	N				
38312	0m	Zincx	0.35309	Y	HP14		H410	

Notes - Additional Information on Hazard Properties

Hazardous Property	Description	Hazard Statement	Note
HP1	Explosive	H200, H201, H202, H203, H204, H240 and H241	A waste is assessed for HP1 via test methods, rather than a concentration limit. If you have substances or a mixture containing explosive properties the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria.
HP2	Oxidising	H270, H271, H272	A waste is assessed for HP2 via test methods, rather than a concentration limit. If you have substances or a mixture containing oxidising properties the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria.
HP3	Flammable	H220 to H226, H228, H242, H250, H251m H252, H260, H261	A waste is assessed for HP3 via test methods, rather than a concentration limit. If you have substances or a mixture containing flammable properties the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria. If a waste contains either H220, H221, H260 or H261 a calculation can be performed to identify the minimum amount of that substance that will trigger HP3.
HP5	Specific Target Organ Toxicity (STOT)	H304	Should a waste contain two or more compounds displaying H304 (Asp. Tox 1) and equal or exceed its specific concentration limit of 10%, then a waste will be hazardous by HP5 if its kinematic viscosity exceeds 20.5 mm^2/s. Guidance should be sought from the CLP Criteria.
HP9	Infectious	N/A	A waste is assessed for HP9 via further testing, rather than a concentration limit. In cases where there is the potential for toxins to be present, further testing will be required. For healthcare waste reference should be made to the Department of health guidance: Safe management of healthcare waste.
HP12	Release of acute toxic gas	EUH029, EUH031, EUH032, H260 or H261	A waste is assessed for HP12 via test methods, rather than a concentration limit. If you have substances or a mixture that may release acute toxic gas the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria.
HP15	Explosive or explosive properties	H205, EUH001, EUH019 or EUH044	A waste is assessed for HP15 via test methods, rather than a concentration limit. If you have substances or a mixture that may exhibit explosive or explosive properties the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria.
HP16	Persistent organic pollutants	N/A	A waste is considered hazardous if the concentration of one or more compound (persistent organic pollutant) as listed in Appendix C of Environment Agency guidance WM3 is above its assigned concentration limit. For reference for dioxins and furans, this assessment incorporates the use of specific toxicity equivalent factors.