Appendix C

Ashton Bennett

Borehole Log

Borehole No.
WS1
Sheet 1 of 1

Project Name: 4 Vane Close	Project No. 3288	Co-ords: -	Hole Type WLS
Location: LONDON, NW3 5UN		Level:	Scale 1:50
Client: MR J Patel		Dates: 31-01-2017 - 17-03-2017	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								TRAIL PIT - Paving slabs overlying grey black gravel and stones with crushed red brick and sandstone and occasional reworked clay
					1.50			
					1.60			Gravel of stones and crush with occasional brown grey clay and sandstone with red brick fragments
					1.90			Concrete pad
					2.10			
					2.20			Concrete gravel with stones and red brick with reworked brown grey clay.
					2.45			Wet brown orange sandy gravelly clay with gravel
								Moist orange brown sandy silty clay
		3.00		N=19 (3,2/4,4,5,6)				Laminated grey brown occasionally orange, occasionally blue silty clay
					3.70			Dry orange brown very sandy clay with occasional lamination.
		4.00		N=11 (2,2/3,3,2,3)				
					4.60			Wet brown orange silty clay
		5.00		N=11 (2,2/2,3,3,3)				
					5.40			Moist brown orange occasional blue silty sandy partially laminated clay with thin orange sand bands.
					6.00			

Remarks

AGS

Ashton Bennett

Borehole Log

Borehole No.
WS2
Sheet 1 of 1

Project Name: 4 Vane Close	Project No. 3288	Co-ords: -	Hole Type WLS
Location: LONDON, NW3 5UN		Level:	Scale 1:50
Client: MR J Patel		Dates: 31-01-2017 - 17-03-2017	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.35			Astroturf overlying concrete conglomerate.
					0.75			Gravel of stones and red brick and occasional clay with uniform red brick and mortar.
					1.30			Weathered red brick with gravel and stones and sandstone gravel
					1.65			Brown silty clay with red brick and gravel of red brick and stones
		2.00		N=8 (1,2/2,2,2,2)				Moist brown orange silty sandy clay, possibly reworked
					2.25			Gravel of red brick and stone and sandstone
					2.35			Moist orange brown very silty clay
		2.80		N=16 (2,3/3,3,5,5)	2.80			Brown orange grey silty sandy clay with evidence of lamination
		3.80		N=20 (4,5/4,4,5,7)	3.80			

Remarks

AGS

View and location of WS2 and TP2 through astroturf in northern corner of site

Location and view of WS1 and TP1 through patio with use of supporting boards

View of TP3 through the patio along the south east wall of 4 Vane Close

STRUCTURAL SOILS LTD

TEST REPORT

Report No. 782522 R2 1774

Date 15-May-2017 Contract 4 Vane Close

Client Ashton Bennett Consultancy
Address Unit K
Bridge Mills
Huddersfield Road
Holmfirth HD9 3TW

For the Attention of Tristan Bennett

Samples submitted by client	30/03/17 & 21/04/17	Client Reference	
Testing Started	04/04/17 & 21/04/17	Client Order No.	
Testing Completed	19/04/17 & 03/05/17	Instruction Type	Written

UKAS Accredited Tests Undertaken

Moisture Content (oven drying method) BS1377:Part 2:1990,clause 3.2 (superseded) **
Liquid Limit (definitive method) BS1377:Part 2:1990,clause 4.3
Plastic Limit BS1377:Part 2:1990,clause 5.3
Plasticity Index Derivation BS1377:Part 2:1990,clause 5.4

* This clause of BS1377 is no longer the most up to date method due to the publication of ISO17892

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of.
Test were undertaken on samples 'as received' unless otherwise stated.
Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.

Structural Soils Ltd, The Potteries, Pottery Street, Castleford, WF10 1NJ Tel.01977 552255. E-mail mark.athorne@soils.co.uk

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
WS1	1	D	2.35	30	51	24	27	100	Light brown slightly sandy slightly silty CLAY
WS1	2	D	3.30	31	68	23	45	100	Brown CLAY
WS2	1	D	2.00	28	53	26	27	100	Light brown slightly sandy slightly silty CLAY
WS2	2	D	3.80	29	62	25	37	92	Brown slightly gravelly CLAY

STRUCTURAL SOILS LTD

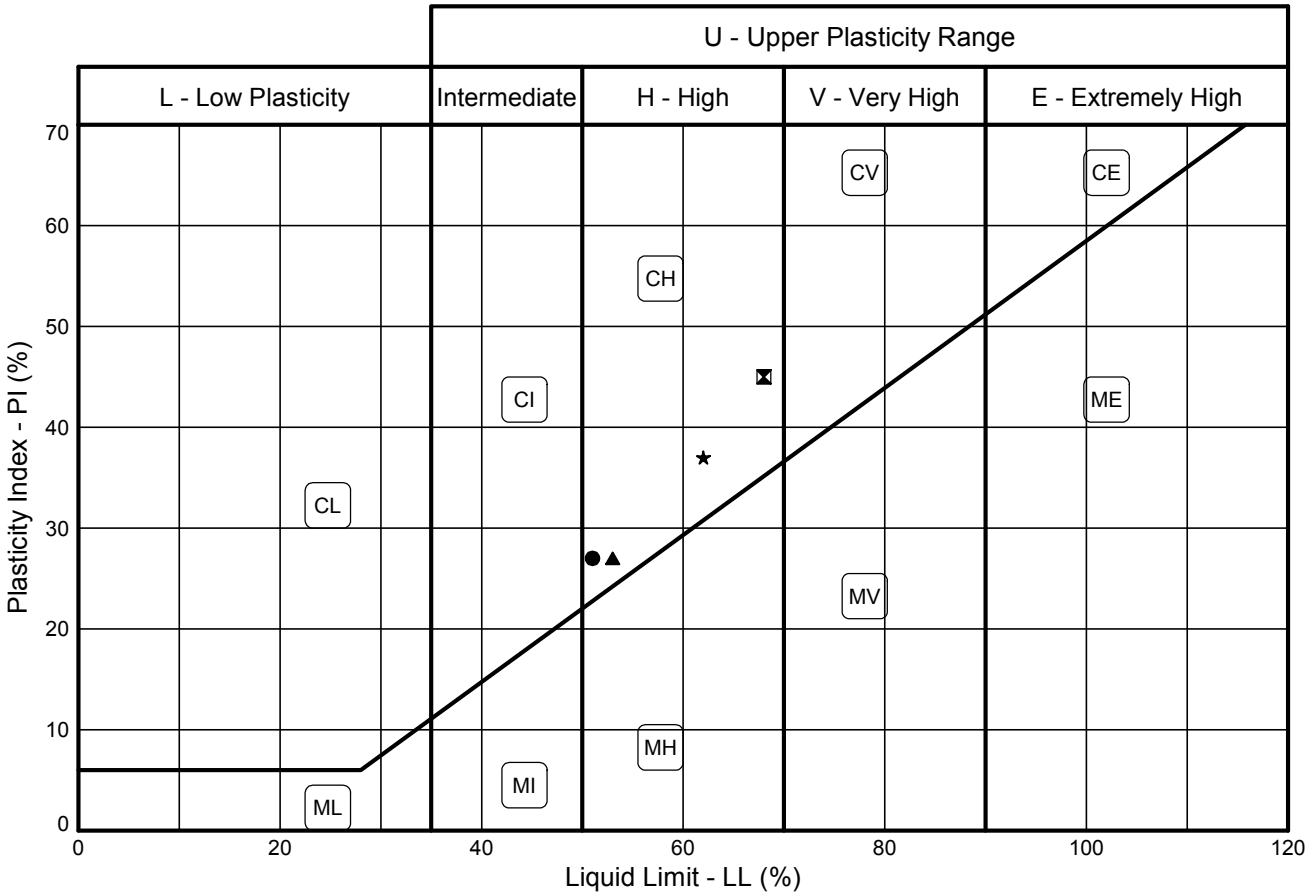
Contract: **4VC**

Contract Ref: **782522**

AGS

PLASTICITY CHART - PI Vs LL

In accordance with clause 42.3 of BS5930:1999
Testing in accordance with BS1377-2:1990



Sample Identification				BS Test Method #	Preparation Method +	MC %	LL %	PL %	PI %	<425um %	Lab location	
	Exploratory Position ID	Sample	Depth (m)									
●	WS1	1D	2.35	3.2/4.3/5.3/5.4	4.2.3	30	51	24	27	100	C	
⊠	WS1	2D	3.30	3.2/4.3/5.3/5.4	4.2.3	31	68	23	45	100	C	
▲	WS2	1D	2.00	3.2/4.3/5.3/5.4	4.2.3	28	53	26	27	100	C	
★	WS2	2D	3.80	3.2/4.3/5.3/5.4	4.2.4	29	62	25	37	92	C	

Tested in accordance with the following clauses of BS1377-2:1990.

3.2 - Moisture Content
4.3 - Cone Penetrometer Method
4.4 - One Point Cone Penetrometer Method
4.6 - One Point Casagrande Method
5.3 - Plastic Limit Method
5.4 - Plasticity Index

+ Tested in accordance with the following clauses of BS1377-2:1990.

4.2.3 - Natural State
4.2.4 - Wet Sieved

Key: * = Non-standard test, NP = Non plastic.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

Compiled By		Date
M. Athorne	MARK ATHORNE	15/05/17

Contract	Contract Ref:
4VC	782522

AGS

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenviromental.co.uk

Ashton Bennett Consultancy
Unit K Bridge Mills
Huddersfield Road
Holmfirth
HD9 3TW

Attention: Frances Bennett

CERTIFICATE OF ANALYSIS

Date:	14 February 2017
Customer:	H_ABCON_HMF
Sample Delivery Group (SDG):	170202-79
Your Reference:	3279
Location:	4 Vane Close
Report No:	397329

We received 8 samples on Thursday February 02, 2017 and 8 of these samples were scheduled for analysis which was completed on Tuesday February 14, 2017. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	170202-79	**Client Reference:**	3279	**Report Number:**	397329
Location:	4 Vane Close	**Order Number:**	3279	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14936221	TP1		1.50	31/01/2017
14936213	WS1		0.30	31/01/2017
14936214	WS1		0.75	31/01/2017
14936215	WS1		1.35	
14936217	WS1		1.50	31/01/2017
14936218	WS2		0.35	31/01/2017
14936219	WS2		0.55	31/01/2017
14936220	WS2		0.70	31/01/2017

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG:	170202-79	**Client Reference:**	3279	**Report Number:**	397329
Location:	4 Vane Close	**Order Number:**	3279	**Superseded Report:**	

Soil/Solid (S)

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	14936221	14936213	14936214	14936215	14936217	14936218	14936219	14936220
			Customer Sample Reference	TP1	WS1	WS1	WS1	WS1	WS2	WS2	WS2
			AGS Reference								
			Depth (m)	1.50	0.30	0.75	1.35	1.50	0.35	0.55	0.70
			Container	1kg TUB	60g VOC (ALE215)	1kg TUB	1kg TUB	1kg TUB	60g VOC (ALE215)	250g Amber Jar (ALE21	1kg TUB
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 2		X							X
Anions by Kone (w)	All	NDPs: 0 Tests: 2		X							X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3				X	X	X			
CEN Readings	All	NDPs: 0 Tests: 2		X							X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2		X							X
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2		X							X
EPH	All	NDPs: 0 Tests: 1							X		
EPH by FID	All	NDPs: 0 Tests: 1							X		
Fluoride	All	NDPs: 0 Tests: 2		X							X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3		X					X		X
Loss on Ignition in soils	All	NDPs: 1 Tests: 1		X							N
Mercury Dissolved	All	NDPs: 0 Tests: 2		X							X
Metals in solid samples by OES	All	NDPs: 0 Tests: 1								X	
Mineral Oil	All	NDPs: 0 Tests: 2		X							X
PAH by GCMS	All	NDPs: 0 Tests: 3		X	X						X

Validated

CERTIFICATE OF ANALYSIS

SDG:	170202-79	**Client Reference:**	3279	**Report Number:**	397329
Location:	4 Vane Close	**Order Number:**	3279	**Superseded Report:**	

Soil/Solid (S)

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	14936221	14936213	14936214	14936215	14936217	14936218	14936219	14936220
			Customer Sample Reference	TP1	WS1	WS1	WS1	WS1	WS2	WS2	WS2
			AGS Reference								
			Depth (m)	1.50	0.30	0.75	1.35	1.50	0.35	0.55	0.70
			Container	1kg TUB	60g VOC (ALE215)	1kg TUB	1kg TUB	1kg TUB	60g VOC (ALE215)	250g Amber Jar (ALE21	1kg TUB
PCBs by GCMS	All	NDPs: 0 Tests: 2		X							X
pH	All	NDPs: 0 Tests: 2		X							X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2		X							X
Sample description	All	NDPs: 0 Tests: 5		X	X				X	X	X
Total Dissolved Solids	All	NDPs: 0 Tests: 2		X							X
Total Organic Carbon	All	NDPs: 0 Tests: 2		X							X

CERTIFICATE OF ANALYSIS

SDG:	170202-79	**Client Reference:**	3279	**Report Number:**	397329
Location:	4 Vane Close	**Order Number:**	3279	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
14936221	TP1	1.50	Light Brown	Sandy Clay Loam	0.063 - 2.00 mm	Stones	Vegetation
14936213	WS1	0.30	Dark Brown	Sandy Clay Loam	0.063 - 2.00 mm	Stones	N/A
14936218	WS2	0.35	Dark Brown	Silt Loam	0.063 - 2.00 mm	Stones	N/A
14936219	WS2	0.55	Dark Brown	Sandy Clay Loam	0.063 - 2.00 mm	Crushed Brick	Stones
14936220	WS2	0.70	Dark Brown	Sandy Clay Loam	0.063 - 2.00 mm	Stones	Brick

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

CERTIFICATE OF ANALYSIS

SDG:	170202-79	**Client Reference:**	3279	**Report Number:**	397329
Location:	4 Vane Close	**Order Number:**	3279	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP1	WS1	WS2	WS2	WS2	
			Depth (m)	1.50	0.30	0.35	0.55	0.70	
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	
			Date Sampled	31/01/2017	31/01/2017	31/01/2017	31/01/2017	31/01/2017	
			Sample Time	-	-	-	-	-	
			Date Received	02/02/2017	02/02/2017	02/02/2017	02/02/2017	02/02/2017	
			SDG Ref	170202-79	170202-79	170202-79	170202-79	170202-79	
			Lab Sample No.(s)	14936221	14936213	14936218	14936219	14936220	
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		22	22	17	13	14	
Loss on ignition	<0.7 %	TM018		5.81 M					
Mineral oil >C10-C40	<1 mg/kg	TM061		12.5				27.9	
EPH (C5-C40)	<35 mg/kg	TM061				991			
Mineral Oil Surrogate % recovery**	%	TM061		84.7				79.7	
EPH Range >C10 - C40	<35 mg/kg	TM061				991 M			
Organic Carbon, Total	<0.2 %	TM132		2.68 M				7.57 M	
pH	1 pH Units	TM133		8.71 M				8.8 M	
PCB congener 28	<3 µg/kg	TM168		<3 M				<3 M	
PCB congener 52	<3 µg/kg	TM168		<3 M				<3 M	
PCB congener 101	<3 µg/kg	TM168		<3 M				<3 M	
PCB congener 118	<3 µg/kg	TM168		<3 M				<3 M	
PCB congener 138	<3 µg/kg	TM168		<3 M				3.67 M	
PCB congener 153	<3 µg/kg	TM168		<3 M				<3 M	
PCB congener 180	<3 µg/kg	TM168		<3 M				<3 M	
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168		<21				<21	
Arsenic	<0.6 mg/kg	TM181					18.9 M		
Cadmium	<0.02 mg/kg	TM181					0.221 M		
Chromium	<0.9 mg/kg	TM181					15.8 M		
Copper	<1.4 mg/kg	TM181					20.5 M		
Lead	<0.7 mg/kg	TM181					349 M		
Mercury	<0.14 mg/kg	TM181					<0.14 M		
Nickel	<0.2 mg/kg	TM181					11.4 M		
Selenium	<1 mg/kg	TM181					<1 #		
Zinc	<1.9 mg/kg	TM181					125 M		
ANC @ pH 4	<0.03 mol/kg	TM182		0.338				0.324	
ANC @ pH 6	<0.03 mol/kg	TM182		0.155				0.101	

Validated

CERTIFICATE OF ANALYSIS

SDG:	170202-79	**Client Reference:**	3279	**Report Number:**	397329
Location:	4 Vane Close	**Order Number:**	3279	**Superseded Report:**	

GRO by GC-FID (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP1	WS2	WS2			
			Depth (m)	1.50	0.35	0.70			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	31/01/2017	31/01/2017	31/01/2017			
			Sample Time	-	-	-			
			Date Received	02/02/2017	02/02/2017	02/02/2017			
			SDG Ref	170202-79	170202-79	170202-79			
			Lab Sample No.(s)	14936221	14936218	14936220			
			AGS Reference						
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089		<5 2 #	<5 #	<5 2 #			
Benzene	<10 µg/kg	TM089		<10 2 M	<10 M	<10 2 M			
Toluene	<2 µg/kg	TM089		<2 2 M	<2 M	<2 2 M			
Ethylbenzene	<3 µg/kg	TM089		<3 2 M	<3 M	<3 2 M			
m,p-Xylene	<6 µg/kg	TM089		<6 2 M	<6 M	<6 2 M			
o-Xylene	<3 µg/kg	TM089		<3 2 M	<3 M	<3 2 M			
sum of detected mpo xylene by GC	<9 µg/kg	TM089		<9 2	<9	<9 2			
sum of detected BTEX by GC	<24 µg/kg	TM089		<24 2	<24	<24 2			
GRO >C5-C10	<10 µg/kg	TM089			<10				

Validated

CERTIFICATE OF ANALYSIS

SDG:	170202-79	**Client Reference:**	3279	**Report Number:**	397329
Location:	4 Vane Close	**Order Number:**	3279	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP1	WS1	WS2			
			Depth (m)	1.50	0.30	0.70			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	31/01/2017	31/01/2017	31/01/2017			
			Sample Time	-	-	-			
			Date Received	02/02/2017	02/02/2017	02/02/2017			
			SDG Ref	170202-79	170202-79	170202-79			
			Lab Sample No.(s)	14936221	14936213	14936220			
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218			103				
Acenaphthene-d10 % recovery**	%	TM218			103				
Phenanthrene-d10 % recovery**	%	TM218			99				
Chrysene-d12 % recovery**	%	TM218			89.6				
Perylene-d12 % recovery**	%	TM218			88.2				
Naphthalene	<9 µg/kg	TM218			17.3 M				
Acenaphthylene	<12 µg/kg	TM218			<12 M				
Acenaphthene	<8 µg/kg	TM218			<8 M				
Fluorene	<10 µg/kg	TM218			<10 M				
Phenanthrene	<15 µg/kg	TM218			133 M				
Anthracene	<16 µg/kg	TM218			24.2 M				
Fluoranthene	<17 µg/kg	TM218			242 M				
Pyrene	<15 µg/kg	TM218			216 M				
Benz(a)anthracene	<14 µg/kg	TM218			152 M				
Chrysene	<10 µg/kg	TM218			140 M				
Benzo(b)fluoranthene	<15 µg/kg	TM218			216 M				
Benzo(k)fluoranthene	<14 µg/kg	TM218			88.6 M				
Benzo(a)pyrene	<15 µg/kg	TM218			156 M				
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218			106 M				
Dibenzo(a,h)anthracene	<23 µg/kg	TM218			30 M				
Benzo(g,h,i)perylene	<24 µg/kg	TM218			142 M				
PAH, Total Detected USEPA 16	<118 µg/kg	TM218			1660				
PAH total 17 (inclusive of Coronene)	<10 mg/kg	TM218		<10		125			

Validated

CERTIFICATE OF ANALYSIS

SDG:	170202-79	**Client Reference:**	3279	**Report Number:**	397329
Location:	4 Vane Close	**Order Number:**	3279	**Superseded Report:**	

Asbestos Identification - Solid Samples

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS1 0.75 SOLID 31/01/2017 00:00:00 09/02/2017 18:33:42 170202-79 14936214 TM048	14/2/17	Martin Cotterell	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS1 1.35 SOLID 08/02/2017 10:00:22 170202-79 14936215 TM048	14/2/17	Martin Cotterell	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS1 1.50 SOLID 31/01/2017 00:00:00 08/02/2017 09:58:28 170202-79 14936217 TM048	14/2/17	Martin Cotterell	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

Validated

CERTIFICATE OF ANALYSIS

SDG:	170202-79	**Client Reference:**	3279	**Report Number:**	397329
Location:	4 Vane Close	**Order Number:**	3279	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	4 Vane Close
Mass Sample taken (kg)	0.107	**Natural Moisture Content (%)**	19
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	84
Particle Size <4mm	>95%		

Case	
SDG	170202-79
Lab Sample Number(s)	14936220
Sampled Date	31-Jan-2017
Customer Sample Ref.	WS2
Depth (m)	0.70

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	7.57	3	5	6
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	<0.024	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg)	27.9	500	-	-
PAH Sum of 17 (mg/kg)	125	100	-	-
pH (pH Units)	8.8	-	>6	-
ANC to pH 6 (mol/kg)	0.101	-	-	-
ANC to pH 4 (mol/kg)	0.324	-	-	-

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	0.0086	<0.00051	0.086	<0.0051	0.5	2	25
Barium	0.0208	<0.0002	0.208	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00227	<0.0012	0.0227	<0.012	0.5	10	70
Copper	<0.00085	<0.00085	<0.0085	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.000846	<0.00062	0.00846	<0.0062	0.5	10	30
Nickel	<0.00044	<0.00044	<0.0044	<0.0044	0.4	10	40
Lead	0.00241	<0.0001	0.0241	<0.001	0.5	10	50
Antimony	0.00566	<0.00016	0.0566	<0.0016	0.06	0.7	5
Selenium	<0.00081	<0.00081	<0.0081	<0.0081	0.1	0.5	7
Zinc	0.00193	<0.0013	0.0193	<0.013	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	60.4	<5	604	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	<3	<3	<30	<30	500	800	1000

Leach Test Information

Date Prepared	09-Feb-2017
pH (pH Units)	8.87
Conductivity (µS/cm)	79.80
Temperature (°C)	19.50
Volume Leachant (Litres)	0.883

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
14/02/2017 16:27:41

16:27:34 14/02/2017

Validated

CERTIFICATE OF ANALYSIS

SDG:	170202-79	**Client Reference:**	3279	**Report Number:**	397329
Location:	4 Vane Close	**Order Number:**	3279	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	4 Vane Close
Mass Sample taken (kg)	0.117	**Natural Moisture Content (%)**	29.9
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	77
Particle Size <4mm	>95%		

Case	
SDG	170202-79
Lab Sample Number(s)	14936221
Sampled Date	31-Jan-2017
Customer Sample Ref.	TP1
Depth (m)	1.50

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	2.68	3	5	6
Loss on Ignition (%)	5.81	-	-	10
Sum of BTEX (mg/kg)	<0.024	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg)	12.5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.71	-	>6	-
ANC to pH 6 (mol/kg)	0.155	-	-	-
ANC to pH 4 (mol/kg)	0.338	-	-	-

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	0.00574	<0.00051	0.0574	<0.0051	0.5	2	25
Barium	0.00951	<0.0002	0.0951	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.0012	<0.0012	<0.012	<0.012	0.5	10	70
Copper	<0.00085	<0.00085	<0.0085	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00164	<0.00062	0.0164	<0.0062	0.5	10	30
Nickel	<0.00044	<0.00044	<0.0044	<0.0044	0.4	10	40
Lead	0.00116	<0.0001	0.0116	<0.001	0.5	10	50
Antimony	0.00381	<0.00016	0.0381	<0.0016	0.06	0.7	5
Selenium	<0.00081	<0.00081	<0.0081	<0.0081	0.1	0.5	7
Zinc	<0.0013	<0.0013	<0.013	<0.013	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	69.1	<5	691	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	<3	<3	<30	<30	500	800	1000

Leach Test Information

Date Prepared	09-Feb-2017
pH (pH Units)	8.16
Conductivity (µS/cm)	87.20
Temperature (°C)	19.60
Volume Leachant (Litres)	0.873

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
14/02/2017 16:27:41

16:27:34 14/02/2017

Validated

CERTIFICATE OF ANALYSIS

SDG:	170202-79	**Client Reference:**	3279	**Report Number:**	397329
Location:	4 Vane Close	**Order Number:**	3279	**Superseded Report:**	

Notification of NDPs (No determination possible)

Date Received : 02/02/2017 13:22:52

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
14936220	WS2	0.70	Loss on Ignition in soils	Unsuitable sample for analysis

CERTIFICATE OF ANALYSIS

SDG:	170202-79	**Client Reference:**	3279	**Report Number:**	397329
Location:	4 Vane Close	**Order Number:**	3279	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
ASB_PREP				
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition		
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material		
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM218	Determination of PAH by GCMS Microwave extraction	The determination of PAH in soil samples by microwave extraction and GC-MS		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	170202-79	**Client Reference:**	3279	**Report Number:**	397329
Location:	4 Vane Close	**Order Number:**	3279	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	14936221	14936213	14936214	14936215	14936217	14936218	14936219	14936220
Customer Sample Ref.	TP1	WS1	WS1	WS1	WS1	WS2	WS2	WS2
AGS Ref.								
Depth	1.50	0.30	0.75	1.35	1.50	0.35	0.55	0.70
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
ANC at pH4 and ANC at pH 6	14-Feb-2017							14-Feb-2017
Anions by Kone (w)	11-Feb-2017							11-Feb-2017
Asbestos ID in Solid Samples			14-Feb-2017	14-Feb-2017	14-Feb-2017			
CEN 10:1 Leachate (1 Stage)	09-Feb-2017							09-Feb-2017
CEN Readings	13-Feb-2017							13-Feb-2017
Dissolved Metals by ICP-MS	14-Feb-2017							13-Feb-2017
Dissolved Organic/Inorganic Carbon	11-Feb-2017							11-Feb-2017
EPH						14-Feb-2017		
EPH by FID						10-Feb-2017		
Fluoride	13-Feb-2017							13-Feb-2017
GRO by GC-FID (S)	14-Feb-2017					14-Feb-2017		14-Feb-2017
Loss on Ignition in soils	13-Feb-2017							
Mercury Dissolved	13-Feb-2017							14-Feb-2017
Metals in solid samples by OES							14-Feb-2017	
Mineral Oil	14-Feb-2017							13-Feb-2017
PAH by GCMS	14-Feb-2017	14-Feb-2017						14-Feb-2017
PCBs by GCMS	14-Feb-2017							13-Feb-2017
pH	13-Feb-2017							13-Feb-2017
Phenols by HPLC (W)	14-Feb-2017							14-Feb-2017
Sample description	08-Feb-2017	08-Feb-2017				08-Feb-2017	10-Feb-2017	08-Feb-2017
Total Dissolved Solids	13-Feb-2017							13-Feb-2017
Total Organic Carbon	14-Feb-2017							14-Feb-2017

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment . Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect .

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than : - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.