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Analytical Report Number : 17-67583

Project / Site name: Ickenham Constructions

Samples received on: 06/11/2017

Your job number:

Samples instructed on: 14/11/2017

Your order number:

Analysis completed by: 22/11/2017

Report Issue Number: 1

Report issued on: 22/11/2017

Samples Analysed: 4 soil samples

Signed:

Rexona Rahman
Customer Services Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-67583

Project / Site name: Ickenham Constructions

Lab Sample Number				857636	857637	857638	857639	
Sample Reference				1	2	3	4	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				Deviating	Deviating	Deviating	Deviating	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	16	11	15	14	
Total mass of sample received	kg	0.001	NONE	1.1	1.4	1.2	1.4	

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	7.3	6.8	7.2	
Total Cyanide	mg/kg	1	MCERTS	1	< 1	< 1	< 1	
Total Sulphate as SO ₄	mg/kg	50	MCERTS	810	920	880	900	
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.085	0.079	0.063	0.14	
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Total Organic Carbon (TOC)	%	0.1	MCERTS	3.1	3.5	1.7	2.3	

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.17	0.16	0.18	0.25	
Acenaphthylene	mg/kg	0.05	MCERTS	0.21	0.27	0.25	0.30	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.21	< 0.05	0.23	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.22	< 0.05	0.24	
Phenanthrene	mg/kg	0.05	MCERTS	1.0	3.3	1.9	3.9	
Anthracene	mg/kg	0.05	MCERTS	0.25	0.79	0.86	0.67	
Fluoranthene	mg/kg	0.05	MCERTS	3.3	13	8.3	10	
Pyrene	mg/kg	0.05	MCERTS	2.9	11	7.1	8.1	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.3	8.6	5.0	4.9	
Chrysene	mg/kg	0.05	MCERTS	1.6	7.8	4.6	5.0	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.7	11	7.6	6.8	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.4	4.8	2.9	3.3	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.5	8.5	6.3	6.1	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.5	4.9	3.9	3.5	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.26	1.1	0.74	0.57	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.7	5.2	4.2	3.8	

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	21.8	79.8	53.8	57.8	
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	21	25	16	16	
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	2.5	1.4	2.9	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	0.9	< 0.2	0.8	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	47	29	28	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	190	73	52	54	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	390	180	120	210	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	2.0	0.8	0.7	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21	24	23	22	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	530	310	130	300	

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Lab Sample Number				857636	857637	857638	857639	
Sample Reference				1	2	3	4	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				Deviating	Deviating	Deviating	Deviating	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
o-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	170	380	140	240	
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TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	2.1	< 1.0	< 1.0	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	11	< 2.0	< 2.0	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	13	< 8.0	< 8.0	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	13	49	< 8.0	24	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	13	74	< 10	30	

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	3.6	3.5	< 1.0	3.7	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	12	8.3	2.0	10	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	31	68	31	52	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	100	200	87	120	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	150	280	120	180	



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* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
857636	1	None Supplied	None Supplied	Brown loam with vegetation.
857637	2	None Supplied	None Supplied	Brown loam and clay with vegetation and gravel
857638	3	None Supplied	None Supplied	Brown loam and clay with vegetation.
857639	4	None Supplied	None Supplied	Brown loam and clay with vegetation.

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Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding.	L076-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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The results included within the report are representative of the samples submitted for analysis.

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Sample Deviation Report



Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
1		S	17-67583	857636	ab	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
1		S	17-67583	857636	ab	Monohydric phenols in soil	L080-PL	b
1		S	17-67583	857636	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
1		S	17-67583	857636	ab	TPHCWG (Soil)	L088/76-PL	b
2		S	17-67583	857637	ab	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
2		S	17-67583	857637	ab	Monohydric phenols in soil	L080-PL	b
2		S	17-67583	857637	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
2		S	17-67583	857637	ab	TPHCWG (Soil)	L088/76-PL	b
3		S	17-67583	857638	ab	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
3		S	17-67583	857638	ab	Monohydric phenols in soil	L080-PL	b
3		S	17-67583	857638	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
3		S	17-67583	857638	ab	TPHCWG (Soil)	L088/76-PL	b
4		S	17-67583	857639	ab	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
4		S	17-67583	857639	ab	Monohydric phenols in soil	L080-PL	b
4		S	17-67583	857639	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
4		S	17-67583	857639	ab	TPHCWG (Soil)	L088/76-PL	b