Analytical Report Number : 18-91646

Project / Site name: Castlewood House

* 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 *
996266	TP105	(Medius)	0.40	Brown clay and sand with gravel.

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

Analytical Report Number : 18-91646

Project / Site name: Castlewood House

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
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-UK	W	NONE
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
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 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	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 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
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

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.

Philip Lewis
LMB Geosolutions Ltd
28 Dresden Road
London
N19 3BD

e: philip@lmbgeosolutions.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-91904

Project / Site name:	Castlewood House	**Samples received on:**	09/07/2018
Your job number:		**Samples instructed on:**	09/07/2018
Your order number:		**Analysis completed by:**	16/07/2018
Report Issue Number:	1	**Report issued on:**	16/07/2018
Samples Analysed:	5 leachate samples		

Signed:

Jordan Hill
Reporting 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: 18-91904

Project / Site name: Castlewood House

Lab Sample Number				997622	997709	997710	997711	997712
Sample Reference				TP107	TP109	TP110	BH102	BH104
Sample Number				None Supplied	None Supplied	(Medius)	None Supplied	None Supplied
Depth (m)				0.40	0.60	1.90	0.50	1.20
Date Sampled				22/06/2018	22/06/2018	04/07/2018	21/06/2018	21/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	-	-	< 0.01	< 0.01	-
Acenaphthylene	µg/l	0.01	ISO 17025	-	-	< 0.01	< 0.01	-
Acenaphthene	µg/l	0.01	ISO 17025	-	-	< 0.01	< 0.01	-
Fluorene	µg/l	0.01	ISO 17025	-	-	< 0.01	< 0.01	-
Phenanthrene	µg/l	0.01	ISO 17025	-	-	< 0.01	< 0.01	-
Anthracene	µg/l	0.01	ISO 17025	-	-	< 0.01	< 0.01	-
Fluoranthene	µg/l	0.01	ISO 17025	-	-	< 0.01	< 0.01	-
Pyrene	µg/l	0.01	ISO 17025	-	-	< 0.01	< 0.01	-
Benzo(a)anthracene	µg/l	0.01	ISO 17025	-	-	< 0.01	< 0.01	-
Chrysene	µg/l	0.01	ISO 17025	-	-	< 0.01	< 0.01	-
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	-	-	< 0.01	< 0.01	-
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	-	-	< 0.01	< 0.01	-
Benzo(a)pyrene	µg/l	0.01	ISO 17025	-	-	< 0.01	< 0.01	-
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	-	-	< 0.01	< 0.01	-
Dibenz(a,h)anthracene	µg/l	0.01	NONE	-	-	< 0.01	< 0.01	-
Benzo(ghi)perylene	µg/l	0.01	NONE	-	-	< 0.01	< 0.01	-
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	-	-	< 0.2	< 0.2	-
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	20	2.8	-	6.0	5.6
Boron (dissolved)	µg/l	10	ISO 17025	16	< 10	-	26	22
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	-	< 0.08	< 0.08
Chromium (dissolved)	µg/l	0.4	ISO 17025	2.6	4.5	-	5.8	4.6
Copper (dissolved)	µg/l	0.7	ISO 17025	7.6	11	-	9.7	9.3
Lead (dissolved)	µg/l	1	ISO 17025	4.3	5.4	-	4.5	4.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	-	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	2.0	4.3	-	1.8	2.4
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	-	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	7.6	10	-	4.4	9.4

Analytical Report Number: 18-91904

Project / Site name: Castlewood House

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Depth (m)				0.40	0.60	1.90	0.50	1.20
Date Sampled				22/06/2018	22/06/2018	04/07/2018	21/06/2018	21/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	-	-	-	-	< 1.0
Toluene	µg/l	1	ISO 17025	-	-	-	-	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	-	-	-	-	< 1.0
p & m-xylene	µg/l	1	ISO 17025	-	-	-	-	< 1.0
o-xylene	µg/l	1	ISO 17025	-	-	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	-	-	-	-	< 10
Petroleum Hydrocarbons								
TPH1 (C10 - C40)	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	-	-	-	-	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	-	-	-	-	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	-	-	-	-	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	-	-	-	-	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	-	-	-	-	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	-	-	-	-	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	-	-	-	-	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	-	-	-	-	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	-	-	-	-	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	-	-	-	-	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	-	-	-	-	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	-	-	-	-	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	-	-	-	-	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	-	-	-	-	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	-	-	-	-	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	-	-	-	-	< 10

Analytical Report Number: 18-91904

Project / Site name: Castlewood House

Lab Sample Number				997622	997709	997710	997711	997712
Sample Reference				TP107	TP109	TP110	BH102	BH104
Sample Number				None Supplied	None Supplied	(Medius)	None Supplied	None Supplied
Depth (m)				0.40	0.60	1.90	0.50	1.20
Date Sampled				22/06/2018	22/06/2018	04/07/2018	21/06/2018	21/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Naphthalene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Acenaphthylene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
Acenaphthene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Fluorene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	-	-	-	< 0.02
Phenanthrene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
Anthracene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Fluoranthene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
Pyrene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	-	-	-	< 0.05
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
Chrysene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	-	-	-	< 0.01

Analytical Report Number : 18-91904

Project / Site name: Castlewood House

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
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
Semi-volatile organic compounds in leachate	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L070-PL	W	NONE
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

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.

APPENDICES

APPENDIX C GEOTECHNICAL LABORATORY RESULTS

TEST CERTIFICATE

Determination of Liquid and Plastic Limits

Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

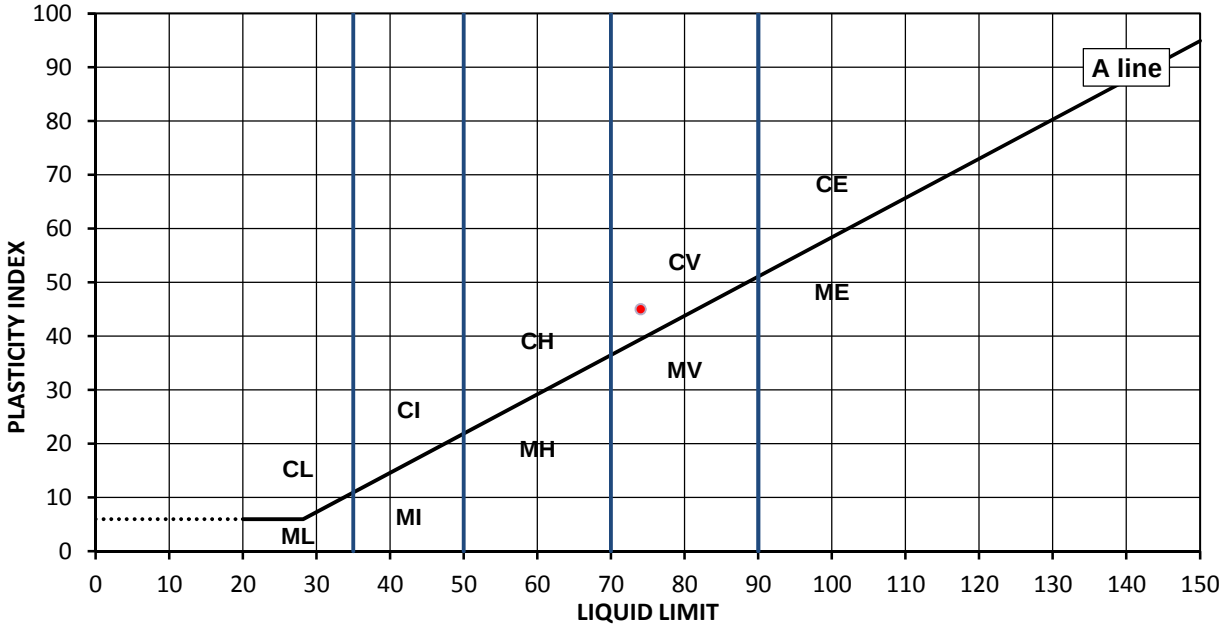
4041

Client:	LMB Geosolutions Ltd	Client Reference:	LMB-CASTLEWOOD
Client Address:	28 Dresden Road London N19 3BD	Job Number:	18-92021
		Date Sampled:	27/06/2018
		Date Received:	20/06/2018
Contact:	Philip Lewis	Date Tested:	16/07/2018
Site Name:	Castlewood House	Sampled By:	PIL/DN
Site Address:	Not Given		

Test Results

Laboratory Reference:	998169	Depth Top [m]:	6.50
Hole No.:	BHDA101	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Soil Description:	Dark grey CLAY		
Sample Preparation:	Tested in natural condition		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
25	74	29	45	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Date Reported: 20/07/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Determination of Liquid and Plastic Limits

Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

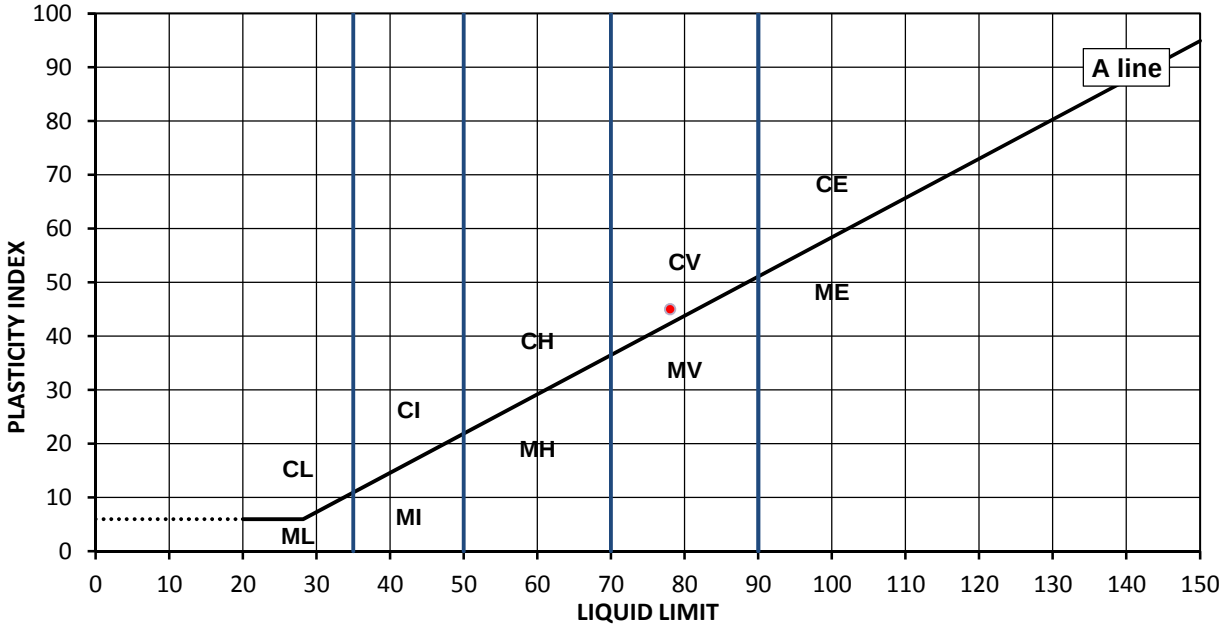
4041

Client:	LMB Geosolutions Ltd	Client Reference:	LMB-CASTLEWOOD
Client Address:	28 Dresden Road London N19 3BD	Job Number:	18-92021
		Date Sampled:	27/06/2018
		Date Received:	20/06/2018
Contact:	Philip Lewis	Date Tested:	17/07/2018
Site Name:	Castlewood House	Sampled By:	PIL/DN
Site Address:	Not Given		

Test Results

Laboratory Reference:	998172	Depth Top [m]:	11.00
Hole No.:	BHDA101	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	U
Soil Description:	Brown CLAY		
Sample Preparation:	Tested in natural condition		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
27	78	33	45	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
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		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Date Reported: 20/07/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd