



E3P
Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Manchester | London | Edinburgh

info@E3P.co.uk
www.E3P.co.uk

Ref: 12-312 V1
Date: 12th July 2022

Property Alliance Group
Alliance House
Westpoint Enterprise Park,
Clarence Ave,
Manchester
M17 1QS

BY email

Dear Sirs,

COVER SYSTEM VALIDATION – THE LIMES

An E3P engineer attended the above site to validate the thickness of the cover system that had been placed within the public open space and garden areas across the site at The Limes, Didsbury.

In total 12No. hand excavated trial pits were advanced with the resulting strata detailed to the rear of this letter.

All trial pits were completed to highlight the required cover system of 300mm on this occasion, the full cover system comprised 300mm topsoil.

E3P can confirm that our independent validation demonstrates that all POS and garden areas have been installed with 300mm of certified topsoil in accordance with the NHBC requirements for a site of this nature.

TOPSOIL

E3P attended site on 6th July 2022 to collect 6 samples of the stockpiled topsoil deposits which were analysed in accordance with the E3P Remediation Strategy. Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed garden areas.

Chemical analysis results are included within lab reports 22-71541 and 22-71543 - TS201-TS203- SS201-SS203(attached to this letter).

A total of 655m³ of topsoil has been utilised.



Cover system validation photographs are enclosed within this letter.

I trust this information is satisfactory to your requirements, and should I be able to be of any further assistance, please do not hesitate to contact me.

Yours sincerely,

For and on behalf of E3P Ltd

Stuart Ellis
Principal Geoenvironmental Consultant



Site: The Limes

Date: 06-07-2022	Project Number: 12-312
Project Manager: S. Ellis	E3P Engineer: J. James
Plot Numbers Validated: POS and plots 1 to 4	

Chemical Laboratory Analysis

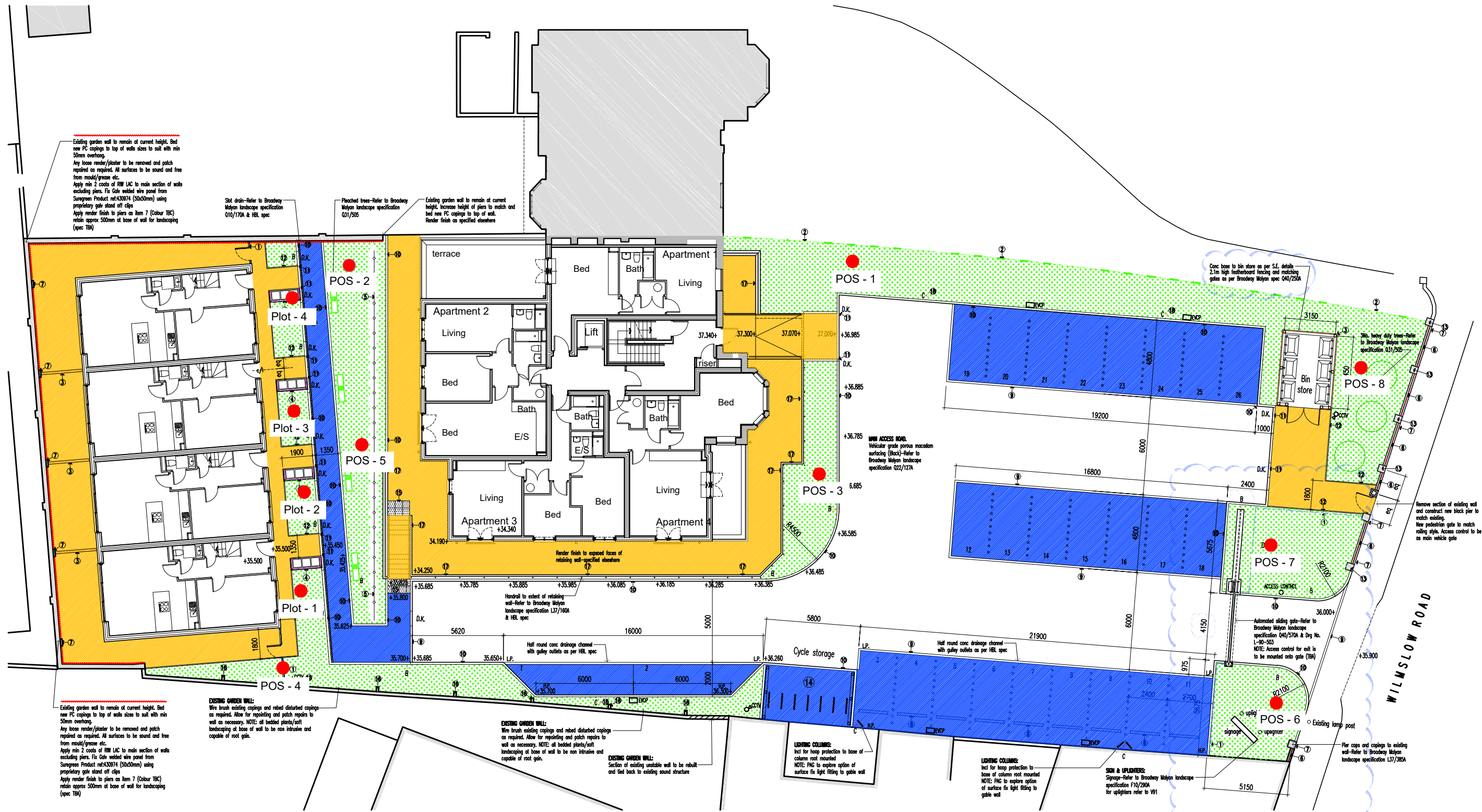
Analysis for topsoil and subsoil undertaken by I2 Analytical Laboratory using UKAS accredited methods where applicable.

Chemical analysis suite comprises heavy metals, sulphates, phenols, speciated Polycyclic Aromatic Hydrocarbons (PAHs), speciated and total Petroleum Hydrocarbons (TPH) and asbestos.

Sampling frequency in accordance with the agreed Remediation Strategy. Laboratory analysis certificates attached to this validation certificate.

	Topsoil	Subsoil
<i>Chemical analysis confirmed materials suitable?</i>	Pass	Pass
<i>Further Comments</i>	N/A	N/A





Existing garden wall to remain of current height. Bed new PC copings to top of walls sizes to suit with min 50mm overhang.
Any loose render/plaster to be removed and patch repaired as required. All surfaces to be sound and free from mould/grease etc.
Apply min 2 coats of RW LAC to main section of walls excluding piers. Fix Galv welded wire panel from Suregreen Product ref:430874 (50x50mm) using proprietary galv stand off clips.
Apply render finish to piers as item 7 (Colour TBC) retain approx 500mm at base of wall for landscaping (spec TBA)

Set drain-Refer to Broadway Mayan landscape specification Q10/170A & HBL spec

Planted trees-Refer to Broadway Mayan landscape specification Q31/505

Existing garden wall to remain of current height. Increase height of piers to match and bed new PC copings to top of wall.
Render finish as specified elsewhere

Conc base to bin store as per S.E. details
2.1m high featherboard fencing and matching gates as per Broadway Mayan spec Q40/250A

Remove section of existing wall and construct new block pier to match existing.
New pedestrian gate to match rolling style. Access control to be as main vehicle gate

Existing garden wall to remain of current height. Bed new PC copings to top of walls sizes to suit with min 50mm overhang.
Any loose render/plaster to be removed and patch repaired as required. All surfaces to be sound and free from mould/grease etc.
Apply min 2 coats of RW LAC to main section of walls excluding piers. Fix Galv welded wire panel from Suregreen Product ref:430874 (50x50mm) using proprietary galv stand off clips.
Apply render finish to piers as item 7 (Colour TBC) retain approx 500mm at base of wall for landscaping (spec TBA)

EXISTING GARDEN WALL:
Wire brush existing copings and rebed disturbed copings as required. Allow for repointing and patch repairs to wall as necessary. NOTE: all bedded plants/soil landscaping at base of wall to be non intrusive and capable of root gain.

EXISTING GARDEN WALL:
Wire brush existing copings and rebed disturbed copings as required. Allow for repointing and patch repairs to wall as necessary. NOTE: all bedded plants/soil landscaping at base of wall to be non intrusive and capable of root gain.

EXISTING GARDEN WALL:
Section of existing unstable wall to be rebuilt and tied back to existing sound structure

LIGHTING COLUMNS:
Incl for hoop protection to base of column root mounted
NOTE: PAG to explore option of surface fix light fitting to gable wall

LIGHTING COLUMNS:
Incl for hoop protection to base of column root mounted
NOTE: PAG to explore option of surface fix light fitting to gable wall

SIGN & UP LIGHTERS:
Signage-Refer to Broadway Mayan landscape specification F10/290A for uplighters refer to V91

Pier caps and copings to existing wall-Refer to Broadway Mayan landscape specification L37/385A

Validation Pit Location

Notes:

Client:

Property Alliance Group LTD

Job No:

12-312

Date:

09.02.2023

Drawing No:

023

Scale:

NTS



Environmental Engineering Partnership Ltd
Taylor Road, Trafford Park
Urmston, Manchester, M41 7JQ
Tel: 0161 707 9612
E-mail: info@e3p.co.uk
Website: www.e3p.co.uk

Job Title:

The Limes, Didsbury

Validation Location Plan

P1	REVA	09.02.2023	OW	SE
Phase	Issue	Date	Drawn	Checked

Drawing Title:

The client must not amend any drawing, design or other intellectual property produced by E3P Ltd without permission in writing from E3P Ltd in advance of any amendments being made. In the event that such written permission is not obtained in advance of the amendments being made, E3P Ltd shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or intellectual property.

Plot No: POS - 1

Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.30	Validated SUBSOIL

Depth of Cover System Materials



Depth of Cover System Materials



Depth of Cover System at Ground Level



Depth of Cover System in Relation to Plot



Plot No: POS 2

Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.30	Validated SUBSOIL

Depth of Cover System Materials



Depth of Cover System Materials



Depth of Cover System at Ground Level



Depth of Cover System in Relation to Plot



Plot No: POS 3

Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.30	Validated SUBSOIL

Depth of Cover System Materials



Depth of Cover System Materials



Depth of Cover System at Ground Level



Depth of Cover System in Relation to Plot



Plot No: POS 4

Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.30	Validated SUBSOIL

Depth of Cover System Materials



Depth of Cover System at Ground Level



Depth of Cover System Materials



Depth of Cover System in Relation to Plot



Plot No: POS 5

Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.30	Validated SUBSOIL

Depth of Cover System Materials



Depth of Cover System at Ground Level



Depth of Cover System in Relation to Plot



Plot No: POS 6

Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.30	Validated SUBSOIL

Depth of Cover System Materials



Depth of Cover System Materials



Depth of Cover System at Ground Level



Depth of Cover System in Relation to Plot



Plot No: POS 7

Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.30	Validated SUBSOIL

Depth of Cover System Materials



Depth of Cover System at Ground Level



Depth of Cover System in Relation to Plot



Plot No: POS 8

Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.30	Validated SUBSOIL

Depth of Cover System Materials



Depth of Cover System at Ground Level



Depth of Cover System in Relation to Plot



Plot No: 4

Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.30	Validated SUBSOIL

Depth of Cover System Materials



Depth of Cover System at Ground Level



Depth of Cover System in Relation to Plot



Plot No: 3

Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.30	Validated SUBSOIL

Depth of Cover System Materials



Depth of Cover System Materials



Depth of Cover System in Relation to Plot



Plot No: 2		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.30	Validated SUBSOIL
Depth of Cover System Materials		Depth of Cover System Materials
		
Depth of Cover System in Relation to Plot		
		

Plot No: 1

Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.30	Validated SUBSOIL

Depth of Cover System Materials



Depth of Cover System Materials



Depth of Cover System in Relation to Plot



Henry Morgan
e3p
Taylor Road
Urmston
Manchester
M41 7JQ

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

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

e:

Analytical Report Number : 22-71541

Project / Site name:	The Lime	Samples received on:	14/07/2022
Your job number:	12-312	Samples instructed on/ Analysis started on:	14/07/2022
Your order number:	002231	Analysis completed by:	21/07/2022
Report Issue Number:	1	Report issued on:	21/07/2022
Samples Analysed:	3 soil samples		

Martyna Langer
Signed:
Martyna Langer
Junior Reporting Specialist
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

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 22-71541
Project / Site name: The Lime
Your Order No: 002231

Lab Sample Number				2351247	2351248	2351249
Sample Reference				TS201	TS202	TS203
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				14/07/2022	14/07/2022	14/07/2022
Time Taken				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
Moisture Content	%	0.01	NONE	11	11	12
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN	MJN

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.9	7.8	7.8
Total Cyanide	mg/kg	1	MCERTS	1.5	1.4	1.6
Total Sulphate as SO ₄	mg/kg	50	MCERTS	440	520	480
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.063	0.068	0.069
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	130	140	140
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	63.3	67.9	69
Sulphide	mg/kg	1	MCERTS	13	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	350	370	360
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.7	1.9	1.9

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.37	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.22	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	2.7	0.51	0.23
Anthracene	mg/kg	0.05	MCERTS	0.42	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	3	0.82	0.44
Pyrene	mg/kg	0.05	MCERTS	2.6	0.8	0.42
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.3	0.46	0.26
Chrysene	mg/kg	0.05	MCERTS	1.1	0.45	0.25
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.4	0.24	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.67	0.24	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.48	0.22	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.26	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.37	0.24	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	13.9	3.98	1.6
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Analytical Report Number: 22-71541
Project / Site name: The Lime
Your Order No: 002231

Lab Sample Number				2351247	2351248	2351249
Sample Reference				TS201	TS202	TS203
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				14/07/2022	14/07/2022	14/07/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	13	13
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	23	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	27	25	24
Lead (aqua regia extractable)	mg/kg	1	MCERTS	70	65	86
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21	20	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	110	110

Petroleum Hydrocarbons

TPH (C5 - C6) HS_ID_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0
TPH (C6 - C8) HS_ID_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_ID_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_ID_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_ID_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_ID_TOTAL	mg/kg	1	MCERTS	9	< 1.0	< 1.0
TPH (C21 - C35) EH_CU_ID_TOTAL	mg/kg	1	MCERTS	18	< 1.0	< 1.0
TPH (C35 - C40) EH_CU_ID_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_ID_TOTAL	mg/kg	10	MCERTS	27	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-71541

Project / Site name: The Lime

* 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 *
2351247	TS201	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
2351248	TS202	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
2351249	TS203	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.

Analytical Report Number : 22-71541
Project / Site name: The Lime

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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
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.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	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
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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-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
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-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.	L009-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

Analytical Report Number : 22-71541
Project / Site name: The Lime

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Henry Morgan
e3p
Taylor Road
Urmston
Manchester
M41 7JQ

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

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

e:

Analytical Report Number : 22-71543

Project / Site name:	The Lime	Samples received on:	14/07/2022
Your job number:	12-312	Samples instructed on/ Analysis started on:	14/07/2022
Your order number:	002232	Analysis completed by:	21/07/2022
Report Issue Number:	1	Report issued on:	21/07/2022
Samples Analysed:	3 soil samples		

Martyna Langer
Signed:
Martyna Langer
Junior Reporting Specialist
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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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 22-71543
Project / Site name: The Lime
Your Order No: 002232

Lab Sample Number				2351254	2351255	2351256
Sample Reference				SS201	SS202	SS203
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				14/07/2022	14/07/2022	14/07/2022
Time Taken				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
Moisture Content	%	0.01	NONE	11	11	11
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN	MJN

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8	7.8	7.8
Total Cyanide	mg/kg	1	MCERTS	1.7	1.4	1.6
Total Sulphate as SO ₄	mg/kg	50	MCERTS	420	550	470
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.058	0.056	0.06
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	120	110	120
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	58.4	55.7	59.7
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	3.3
Total Sulphur	mg/kg	50	MCERTS	350	330	320
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.7	1.6	1.7

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.22
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.54	0.49	0.39
Pyrene	mg/kg	0.05	MCERTS	0.57	0.52	0.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.34	0.21	0.2
Chrysene	mg/kg	0.05	MCERTS	0.28	0.29	0.19
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.32	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.18	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	2.23	1.51	1.4
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Analytical Report Number: 22-71543
Project / Site name: The Lime
Your Order No: 002232

Lab Sample Number	2351254	2351255	2351256
Sample Reference	SS201	SS202	SS203
Sample Number	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied
Date Sampled	14/07/2022	14/07/2022	14/07/2022
Time Taken	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	14	15
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	24	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31	24	37
Lead (aqua regia extractable)	mg/kg	1	MCERTS	71	68	70
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	21	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	110	120

Petroleum Hydrocarbons

TPH (C5 - C6) HS_ID_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0
TPH (C6 - C8) HS_ID_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_ID_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_ID_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_ID_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_ID_TOTAL	mg/kg	1	MCERTS	< 1.0	5.6	6.8
TPH (C21 - C35) EH_CU_ID_TOTAL	mg/kg	1	MCERTS	< 1.0	15	26
TPH (C35 - C40) EH_CU_ID_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_ID_TOTAL	mg/kg	10	MCERTS	< 10	21	33

U/S = Unsuitable Sample I/S = Insufficient Sample

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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 *
2351254	SS201	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
2351255	SS202	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
2351256	SS203	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.

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Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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.	L038-PL	D	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
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	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
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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-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
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-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.	L009-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

Analytical Report Number : 22-71543
Project / Site name: The Lime

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total