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Ref: 11-813-V6
Date: 25th August 2020

Steve Weir
Rowlinson Construction
London House
London Road South
Poynton
Stockport
SK12 1YP

BY Email

Dear Sir

GARDEN VALIDATION – BOWES STREET

An E3P engineer attended the above site to validate the thickness of the cover system that had been placed within the rear gardens of Plots 32-33 35-36 & 36-39 at Bowes street, Manchester.

In total 7No. 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 600mm (600mm topsoil).

E3P can confirm that our independent validation demonstrates that all gardens 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 27th July 2020 to obtain three 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 and soft landscaping areas.

Chemical analysis results are included within lab report - 20-21973 (attached to 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



Rob Horseman
Associate Director



Site: Bowes Street

Date: 24-08-2020	Project Number: 11-813
Project Manager: R. Horseman	E3P Engineer: V Wilkinson
Plot Numbers Validated: 32-33 35-36 & 38-39	

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.

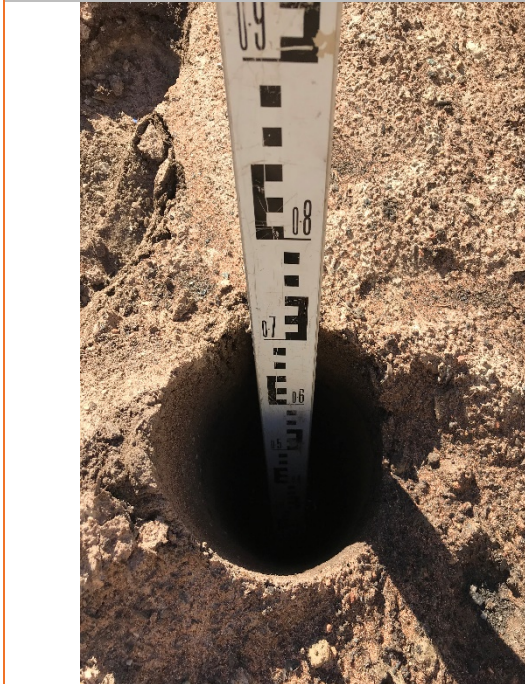
	Topsoil	Subsoil
<i>Chemical analysis confirmed materials suitable?</i>	Pass	Pass
<i>Further Comments</i>	N/A	N/A



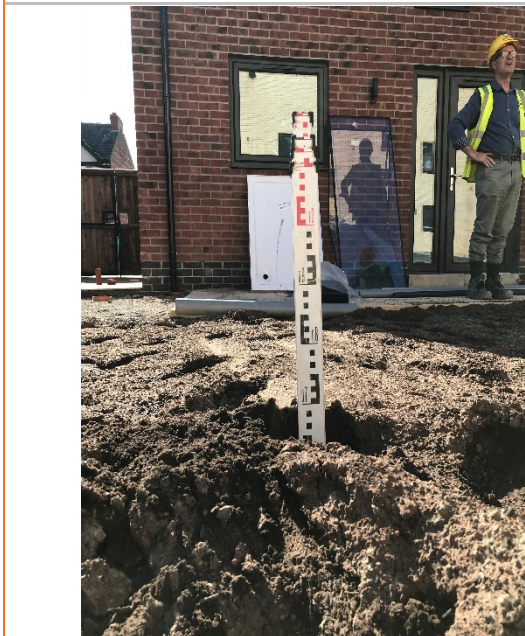
Plot No: 32

Depth of Strata (m bgl)	0.60	Validated TOPSOIL
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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: 33

Depth of Strata (m bgl)	0.60	Validated TOPSOIL
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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: 35

Depth of Strata (m bgl)	0.60	Validated TOPSOIL
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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: 36

Depth of Strata (m bgl)	0.60	Validated TOPSOIL
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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: 37

Depth of Strata (m bgl)	0.60	Validated TOPSOIL
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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: 38

Depth of Strata (m bgl)	0.60	Validated TOPSOIL
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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: 39

Depth of Strata (m bgl)	0.60	Validated TOPSOIL
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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





Rob Horseman

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e: reception@i2analytical.com

Analytical Report Number : 20-84975

Project / Site name: Bow St

Samples received on: 04/02/2020

Your job number: 11813

Samples instructed on: 04/02/2020

Your order number:

Analysis completed by: 11/02/2020

Report Issue Number: 1

Report issued on: 11/02/2020

Samples Analysed: 3 soil samples

Signed: *Karolina Marek*

Karolina Marek
Technical Reviewer (Reporting Team)

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.

Iss No 20-84975-1 Bow St 11813

Analytical Report Number: 20-84975

Project / Site name: Bow St

Lab Sample Number				1432702	1432703	1432704		
Sample Reference				TS101	TS102	TS103		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				03/02/2020	03/02/2020	03/02/2020		
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
Moisture Content				%	N/A	NONE	10	14
Total mass of sample received				kg	0.001	NONE	0.48	0.54

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

pH - Automated	pH Units	N/A	MCERTS	7.7	7.8	7.9		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Sulphate as SO ₄	mg/kg	50	MCERTS	400	490	540		
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	63	59	120		
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.032	0.029	0.061		
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	31.6	29.4	60.5		
Sulphide	mg/kg	1	MCERTS	< 1.0	1.0	< 1.0		
Total Sulphur	mg/kg	50	MCERTS	320	340	390		

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	1.1		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.25		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.31	0.97		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.31	0.95		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.65		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.63		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.66		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.28		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.58		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.27		
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	0.35		

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	6.66		
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.3	6.2	6.2		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	18	16		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	16	16	17		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	30	29	33		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	13	13		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	57	55	72		

Analytical Report Number: 20-84975

Project / Site name: Bow St

Lab Sample Number	1432702	1432703	1432704		
Sample Reference	TS101	TS102	TS103		
Sample Number	None Supplied	None Supplied	None Supplied		
Depth (m)	None Supplied	None Supplied	None Supplied		
Date Sampled	03/02/2020	03/02/2020	03/02/2020		
Time Taken	None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0		
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	9.3		
TPH (C16 - C21)	mg/kg	1	MCERTS	6.7	< 1.0	18		
TPH (C21 - C35)	mg/kg	1	MCERTS	50	< 1.0	21		
TPH (C35 - C40)	mg/kg	10	MCERTS	24	< 10	< 10		
TPH Total C5 - C40	mg/kg	10	MCERTS	83	< 10	50		



Analytical Report Number : 20-84975

Project / Site name: Bow St

* 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 *
1432702	TS101	None Supplied	None Supplied	Brown clay and loam with gravel and vegetation.
1432703	TS102	None Supplied	None Supplied	Brown clay and sand with gravel.
1432704	TS103	None Supplied	None Supplied	Brown clay and sand with gravel.

Analytical Report Number : 20-84975

Project / Site name: Bow St

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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-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. (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
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
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.	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 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
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
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

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.