Date: 4th March 2024
Reference: 17-440 V1

GARDEN VALIDATION – DOWNLEY DRIVE

Project Name:	Downley Drive, Manchester
Project Number:	17-440
Client:	Rowlinson Construction Ltd
Date:	22-02-2024
Project Manager:	N. Sellars
E3P Engineer:	T. Preston
Plots:	15-16 & 18-23

OVERVIEW

An E3P engineer attended the above site to validate the thickness of the cover system placed within the rear garden of plots 15-16 and 18-23 at the site located off Downley Drive, Manchester.

In total 8 No. hand excavated trial pits were advanced, with the resulting strata detailed at the rear of this letter.

All trial pits were completed to highlight the required cover system of 600 mm (600mm topsoil) underlain by a suitable geotextile.

E3P can confirm that our independent validation demonstrates that all gardens have been installed with 600 mm of certified topsoil under the NHBC requirements for a site of this nature.

A list of plots requiring validation and their associated validation letters is presented in Table 1 for reference.

TOPSOIL

E3P attended site on the 22nd of February 2024 to obtain three samples of the imported topsoil. The topsoil was sourced from Baldwin's Landscape Supplies, Landgate Farm, Wigan. Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed garden areas.

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

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

Sampling frequency following the agreed Remediation Strategy at 1 sample per 50 m3. Approximately 130 m3 of topsoil has been imported to date.

Chemical analysis results are included within lab report 24-005186 (attached to this letter).

CHEMICAL ANALYSIS

TOPSOIL	SOURCE	LAB REFERENCE	SAMPLE REFERENCE	PASS/FAIL
Topsoil	Landgate Farm	24-005186	TS101-TS103	Pass

The cover system validation photographs are enclosed within this letter. For information, Table 1 includes references and validation dates of previously validated plots.

Table 1 – Validation Letter Reference

PLOT NUMBER	DATE	REPORT REFERENCE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15	22nd February 2024	V1
16	22nd February 2024	V1
17		
18	22nd February 2024	V1
19	22nd February 2024	V1
20	22nd February 2024	V1

PLOT NUMBER	DATE	REPORT REFERENCE
21	22nd February 2024	V1
22	22nd February 2024	V1
23	22nd February 2024	V1

Garden Cover System Validation

Complete

Score	(100%)
Site Name	Downley Drive
Location	16 Downley Dr Manchester England M4 7JU United Kingdom (53.48526317337557, -2.2219348879199616)
Project Number	17440
Developer	Rowlinson
Project Manager	Rob Horseman
Conducted By	Tom Preston
Date of visit	22 Feb 2024 10:11 AM GMT

Plot Validation 1	6 / 6 (100%)
Plot Number	23
Is Plot Ready	Yes
Installation Standard	Pass
Depth of Cover System Materials (record the depth and support with Photo down the hole)	600


Photo 1


Photo 2

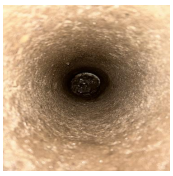
Depth of Topsoil (mm)	600
Depth of Subsoil (mm)	0
Depth of Cover System at Ground Level (Photo)	☒


Photo 3

Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)	☒


Photo 4

Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.	Yes
Geotextile membrane present	Yes


Photo 5

Plot Validation 2	6 / 6 (100%)
Plot Number	22
Is Plot Ready	Yes
Installation Standard	Pass
Depth of Cover System Materials (record the depth and support with Photo down the hole)	600


Photo 6


Photo 7

Depth of Topsoil (mm)	600
Depth of Subsoil (mm)	0
Depth of Cover System at Ground Level (Photo)	☒


Photo 8

Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)	☒


Photo 9

Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.	Yes
Geotextile membrane present	Yes


Photo 10

Plot Validation 3	6 / 6 (100%)
Plot Number	21
Is Plot Ready	Yes
Installation Standard	Pass
Depth of Cover System Materials (record the depth and support with Photo down the hole)	600


Photo 11


Photo 12

Depth of Topsoil (mm)	600
Depth of Subsoil (mm)	0
Depth of Cover System at Ground Level (Photo)	☒


Photo 13

Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)	☒


Photo 14

Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.	Yes
Geotextile membrane present	Yes



Photo 15

Plot Validation 4	6 / 6 (100%)
Plot Number	20
Is Plot Ready	Yes
Installation Standard	Pass
Depth of Cover System Materials (record the depth and support with Photo down the hole)	600


Photo 16


Photo 17

Depth of Topsoil (mm)	600
Depth of Subsoil (mm)	0
Depth of Cover System at Ground Level (Photo)	☒


Photo 18

Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)	☒


Photo 19

Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.	Yes
Geotextile membrane present	Yes


Photo 20

Plot Validation 5	6 / 6 (100%)
Plot Number	19
Is Plot Ready	Yes
Installation Standard	Pass
Depth of Cover System Materials (record the depth and support with Photo down the hole)	600

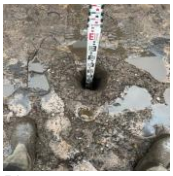

Photo 21


Photo 22

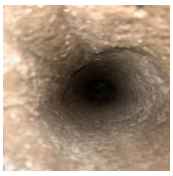
Depth of Topsoil (mm)	600
Depth of Subsoil (mm)	0
Depth of Cover System at Ground Level (Photo)	☒


Photo 23

Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)	☒


Photo 24

Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.	Yes
Geotextile membrane present	Yes


Photo 25

Plot Validation 6	6 / 6 (100%)
Plot Number	18
Is Plot Ready	Yes
Installation Standard	Pass
Depth of Cover System Materials (record the depth and support with Photo down the hole)	600


Photo 26


Photo 27

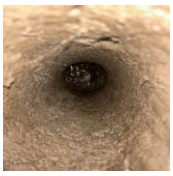
Depth of Topsoil (mm)	600
Depth of Subsoil (mm)	0
Depth of Cover System at Ground Level (Photo)	☒


Photo 28

Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)	☒


Photo 29

Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.	Yes
Geotextile membrane present	Yes


Photo 30

Plot Validation 7	6 / 6 (100%)
Plot Number	16
Is Plot Ready	Yes
Installation Standard	Pass
Depth of Cover System Materials (record the depth and support with Photo down the hole)	600


Photo 31


Photo 32

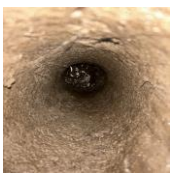
Depth of Topsoil (mm)	600
Depth of Subsoil (mm)	0
Depth of Cover System at Ground Level (Photo)	☒


Photo 33

Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)	☒


Photo 34

Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.	Yes


Photo 35

Geotextile membrane present	Yes

Plot Validation 8	6 / 6 (100%)
Plot Number	15
Is Plot Ready	Yes
Installation Standard	Pass
Depth of Cover System Materials (record the depth and support with Photo down the hole)	600


Photo 36


Photo 37

Depth of Topsoil (mm)	600
Depth of Subsoil (mm)	0
Depth of Cover System at Ground Level (Photo)	☒


Photo 38

Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)	☒


Photo 39

Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.	Yes
Geotextile membrane present	Yes


Photo 40

Site Manager or Representative

Name	Mark Frain
Signature	

22 Feb 2024 10:40 AM GMT

Media summary



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12



Photo 13



Photo 14



Photo 15



Photo 16



Photo 17



Photo 18



Photo 19



Photo 20



Photo 21



Photo 22



Photo 23



Photo 24



Photo 25



Photo 26



Photo 27



Photo 28



Photo 29



Photo 30



Photo 31



Photo 32



Photo 33



Photo 34



Photo 35



Photo 36



Photo 37



Photo 38



Photo 39



Photo 40

Geotextile Placement



e3p☐
Taylor Road
Urmston
Manchester

e: Rhorseman@e3p.co.uk; nsellars@e3p.co.uk

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

t: 01923 225404
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e: reception@i2analytical.com

Analytical Report Number : 24-005186

Project / Site name:	Downley Drive	**Samples received on:**	23/02/2024
Your job number:	17440	**Samples instructed on/ Analysis started on:**	23/02/2024
Your order number:		**Analysis completed by:**	29/02/2024
Report Issue Number:	1	**Report issued on:**	01/03/2024
Samples Analysed:	3 soil samples		

Signed:

Joanna Szwagrzak
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.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 24-005186
Project / Site name: Downley Drive

Lab Sample Number				126748	126749	126750
Sample Reference				Plot 23 TS101	Plot 19 TS102	Plot 15 TS103
Sample Number				TS	TS	TS
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				22/02/2024	22/02/2024	22/02/2024
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	25	26	28
Total mass of sample received	kg	0.1	NONE	0.4	0.5	0.4
Asbestos						
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	PDO	PDO	PDO
General Inorganics						
pH (L099)	pH Units	N/A	MCERTS	7.8	7.9	7.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	270	250	260
Water Soluble SO4 1hr extraction	mg/kg	2.5	MCERTS	42	42	48
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	20.9	21.1	24.1
Sulphide	mg/kg	1	MCERTS	2.4	2.1	1.4
Total Sulphur	mg/kg	50	MCERTS	310	340	500
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	3.4	3.4	2.8
Total Phenols						
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
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	0.17	0.1	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.4	0.35	0.24
Pyrene	mg/kg	0.05	MCERTS	0.35	0.35	0.22
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.16	0.12	0.1
Chrysene	mg/kg	0.05	MCERTS	0.22	0.19	0.14
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.21	0.21	0.14
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.11	0.07	0.06
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.16	0.16	0.11
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.1	< 0.05	< 0.05
Dibenzo(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.14	< 0.05	< 0.05
Total PAH						
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	2.02	1.55	1.01

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 24-005186
Project / Site name: Downley Drive

Lab Sample Number				126748	126749	126750
Sample Reference				Plot 23 TS101	Plot 19 TS102	Plot 15 TS103
Sample Number				TS	TS	TS
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				22/02/2024	22/02/2024	22/02/2024
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	3.3	4	2.9
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	8.8	7.8	11
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	16	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	31	32	27
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	6.3	5.9	10
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	47	47	39
Petroleum Hydrocarbons						
TPH (>C5 - C10) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0
TPH (>C5 - C6) HS_1D_TOTAL	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1
TPH (>C6 - C8) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0###	< 1.0###	< 1.0
TPH (>C8 - C10) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0###	< 1.0###	< 1.0
TPH (>C10 - C12) EH_CU_1D_TOTAL_#1_#2	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH (>C12 - C16) EH_CU_1D_TOTAL_#1_#2	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0
TPH (>C16 - C21) EH_CU_1D_TOTAL_#1_#2	mg/kg	10	MCERTS	< 10	< 10	< 10
TPH (>C21 - C35) EH_CU_1D_TOTAL_#1_#2	mg/kg	10	MCERTS	52	56	33
TPH (>C35 - C40) EH_CU_1D_TOTAL_#1_#2	mg/kg	10	MCERTS	27	18	< 10
TPH Total >C5 - C40 EH_CU+HS_1D_TOTAL_#1_#2	mg/kg	10	NONE	89###	85###	43
TPH (C10 - C40) EH_CU_1D_TOTAL_#1_#2	mg/kg	10	MCERTS	89	85	43

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number : 24-005186
Project / Site name: Downley Drive

* 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 *
126748	Plot 23 TS101	TS	None Supplied	Brown loam and sand with gravel and vegetation
126749	Plot 19 TS102	TS	None Supplied	Brown loam and sand with gravel and vegetation
126750	Plot 15 TS103	TS	None Supplied	Brown loam and sand with gravel and vegetation

Analytical Report Number : 24-005186
Project / Site name: Downley Drive

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
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, 2021	A001B	D	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 (Walkley Black Method)	In-house method	L009B	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	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
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.	L019B	D	NONE
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	L038B	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	L038B	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	L038B	D	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS	In-house method	L076B/L088	D/W	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	W	MCERTS
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	L080	W	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	L080	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' 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.

Analytical Report Number : 24-005186
Project / Site name: Downley Drive

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

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.

- Quality control parameter failure associated with this result; other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.