

Technical Note

Project:	Phase 2, Clarendon Road, Hornsey		
Subject:	Blocks B3 and B4 Verification Report		
Date:	28 September 2022	Project No.:	5192204
Distribution:	Tim Collinson Edward Friel Ranjeet Dhanjal	Representing:	St William Homes LLP St William Homes LLP St William Homes LLP

Notice

This document and its contents have been prepared and are intended solely as information for St William Homes LLP and use in relation to the Block B3 and Block B4 soft landscaping areas in Phase 2 of the former Hornsey Gasworks at Mary Neuner Road, Hornsey, N22 6UG.

Atkins Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
1.0	Draft	JR	AA	NK	AN	28/09/2022
2.0	Final	JR	AA	NK	AN	28/09/2022

1. Introduction

1.1. General

Atkins Limited (Atkins) was commissioned by St William Homes LLP (St William) to produce a Verification Report to assess soft landscaping cover systems installed in Phase 2 – Blocks B3 and B4 of the Clarendon Road, Hornsey development. The site is located to the west of Mary Neuner Road, Hornsey, N22 6UG. The Phase 2 – Blocks B3 and B4 soft landscaping comprises a number of small rectangular and triangular shaped areas around the residential blocks which total approximately 95 m².

A site location plan is presented as Figure 1 and a general arrangement plan illustrating the soft landscaped areas to be installed and detailed in this report (green shading) within Blocks B3 and B4, as provided by St William, is presented in Appendix A.

1.2. Background and Objectives

In 2022, Keltbray Ltd (Keltbray) produced a Verification Report [1] detailing the earthworks and remediation completed within Phase 2.

Keltbray's works were undertaken in accordance with the Atkins Remediation Strategy [2] in support of the partial discharge of Condition 31: Land Contamination attached to planning permission HGY/2017/3117.

The remediation works undertaken by Keltbray excluded the placement of cover systems in areas of soft landscaping. The objective of this technical note is to demonstrate the compliance of the cover system being installed within Blocks B3 and B4 in September 2022 with the approved Atkins Remediation Strategy [2] to support the discharge of Condition 31.

1.3. Assumptions and Limitations

The report has been produced subject to the following assumptions and limitations:

- The Blocks B3 and B4 soft landscaping primarily comprised tree pits, raised planter beds and hedges located around each Block. However, the outside wider landscaped areas will be used by future residents as a communal open space and will be centrally managed and maintained.
- Atkins did not oversee the placement of the cover system. Statements relating to the build-up of the cover system and sources of imported material are based on information provided by St William. The data have been assumed to be correct for the purposes of this assessment. Atkins does not accept liability for the validity of reports by or on behalf of third parties.
- The Blocks B3 and B4 landscaping was in progress when verification sampling was undertaken. Samples and photographs have been obtained from accessible areas of the site where subsoil and top soil had been placed and are representative of completed soil profiles. Subsoil and topsoil continued to be imported and placed following this sampling exercise, with materials confirmed as from the same sources and batches as those sampled. Planting had not been completed at the time of sampling.

2. Cover System Requirements

The approved Atkins Remediation Strategy [2] requires all areas of soft landscaping within Phase 2 to be completed with cover systems comprising a Human Health Separation Layer (HHSL) of not less than 600 mm in thickness, unless otherwise agreed with the Planning Authority.

In tree pits, the placement of a Marker Layer at the base and the sides linking to the surrounding Marker Layer is specified. The HHSL is required to include a capillary break layer (CBL) comprising a minimum of 100 mm thickness of Class 6C Starter Layer overlaying the Marker Layer.

HHSL materials are required to meet the *residential without private gardens* generic assessment criteria (GAC) as detailed in the Atkins Remediation Strategy [2]. In response to comments from the Environment Agency in June 2018, a revised set of chemical targets for imported soils were developed and detailed in a technical note addendum to the National Grid Property Controlled Waters DQRA¹ [3]. These values were developed to be protective of the culverted Moselle Brook and are more conservative than the human health *residential without private gardens* GAC detailed in the Atkins Remediation Strategy [2]. The human health criteria and the revised import target criteria are presented in Appendix B.

The strategy specifies typical validation sampling at a minimum frequency of one sample per 200 m³ for HHSL materials, with a minimum of three samples per source.

¹ DQRA = Detailed Quantitative Risk Assessment

3. Cover System Installation Details

The cover system within Blocks B3 and B4 was installed by Elite Landscapes Ltd, who were appointed by St William and commenced work in August 2022. A summary of the cross section of soft landscaping is presented as follows:

Soft landscaping / planting areas build-up (top – down)

- 400mm topsoil;
- 200mm subsoil; and
- Geotextile filter membrane, placed above gravel filter layer.

CBL comprising a minimum of 100mm thickness of Class C Starter Layer with a maximum particle size of 75mm was installed below the Marker Layer and has therefore not been tested as part of this verification Technical Note.

3.1. Imported Topsoil and Subsoil Details

Both topsoil and subsoil used across the Phase 2 soft landscaped areas were from Charlton (Charlton subsoil and Charlton Trugrow topsoil) which was supplied by H Sivyer Transport Ltd.

A summary of the topsoil and subsoil imported to the site is provided in Table 3-1 and the chemical certificates provided by the suppliers are presented in Appendix C. Photographs showing the imported material are presented in Appendix D.

Table 3-1 – Phase 2 – Blocks B3 and B4 topsoil and subsoil import details

Material Type	Supplier	Source Analysis Date	Approximate Volume (m ³)	Area used	Description based on supplier reports
Charlton subsoil	H Sivyer Transport Ltd	06/06/2022	20	Subsoil surrounding Blocks B3 and B4	Strong brown, slightly moist, friable, very slightly calcerous SAND.
Charlton Trugrow Topsoil		06/06/2022	35	Topsoil surrounding Blocks B3 and B4	Dark greyish brown, dry, friable, very slightly calcerous SANDY LOAM.

3.2. Source Certification Results

The chemical data provided by the material suppliers (one sample per type) were reviewed during the current assessment, and are enclosed in Appendix C. Chemical analytical data were screened against the target criteria for imported soils developed in Atkins' June 2018 technical note [3] and enclosed in Appendix B. Chemical concentrations recorded in samples from the Charlton subsoil and Charlton Trugrow topsoil were all recorded below the relevant import criteria and therefore chemically compliant.

4. Verification of Cover System

4.1. Scope of Work

In order to confirm the compliance of the cover system installed within Phase 2 – Blocks B3 and B4 with the design documents and associated revised import target criteria [2] [3], the following scope of works was undertaken by Atkins:

- Screening of the soil arisings for volatile organic compounds (VOCs) using a photo-ionisation detector (PID);
- Logging of the soil profile;
- Collection of six representative soil samples for chemical analysis (from imported topsoil and subsoil material to supplement the source data provided by the suppliers); and
- Laboratory chemical analysis as per the list of analytes included in the import criteria.

At the time of sampling, topsoil and subsoil had already been placed in some areas of the site, whilst both soil types continued to be imported for use within remaining areas of soft landscaping, under the management of St William and the soft landscaping contractor. Three hand pits were undertaken and a total of six soil samples were obtained from placed material in Blocks B3 and B4. Samples locations are presented in Appendix A and photographs of the handpits are provided in Appendix D.

UKAS and MCERTS accredited laboratory testing (where applicable) was scheduled on all samples by Atkins for the suite detailed in Table 4-1. The geo-environmental laboratory analysis was undertaken by Chemtest and the chemical certificates are presented in Appendix E.

Table 4-1 – Soil chemical testing suite

Analyte
Inorganics: pH, fraction of organic carbon (FOC) and free cyanide
Asbestos screen
Metals: arsenic, cadmium, chromium III and VI, lead, mercury, nickel, selenium and zinc
Total Petroleum Hydrocarbon (TPH) Criteria Working Group (CWG)
Benzene, toluene, ethylbenzene, xylene (BTEX)
Polyaromatic hydrocarbons (PAHs) - 16 speciated
Total phenol
VOCs: 1,1-dichloroethane, 1,2-dichloroethane (1,2-DCA), cis-1,2-dichloroethene, trans-1,2-dichloroethene, 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichloroethane (1,1,2-TCA), 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, trichloroethene (TCE), tetrachloroethene (PCE), trichloromethane (chloroform), carbon tetrachloride /tetrachloromethane

4.2. Field Observations

Verification samples B3-B4 HP1 SS, B3-B4 HP2 SS and B3-B4 HP3 SS were obtained via hand pits from imported and placed subsoil. Verification samples B3-B4 HP1 TS, B3-B4 HP2 TS and B3-B4 HP3 TS were obtained via hand pits from imported and placed topsoil.

Placed materials were compliant with the depths detailed in Section 3 and marker layer was present at a minimum depth of 600 mm bgl. No PID readings were reported above the instrument detection limit (0.1 parts per million) and no visual or olfactory evidence of contamination were observed.

As all areas of soft landscaping had not been fully completed when the sampling took place, confirmation of the cover system installation, including the placement of CBL, marker layer and subsoil and topsoil from the same source as existing soils is required from St William.

Photographs of the installation of subsoil and marker layer and the three hand pits are presented in Appendix D.

4.3. Chemical Verification

Chemical analytical data from the six soil samples collected on 14 September 2022 were screened against the target criteria for imported soils (Appendix B). The results showed concentrations of all analytes were recorded below the relevant human health and controlled waters soil criteria approved in the Phase 2 remediation documentation and/or below the limit of detection.

5. Conclusions

Six verification samples were collected from in-situ topsoil and subsoil during the site visit on 14 September 2022. Chemical analytical data from these samples, as well as two source samples, were screened against the target criteria for imported soils developed in Atkins' June 2018 technical note [3]. The chemical analysis completed on the imported topsoil and subsoil samples confirmed no exceedances in any of the samples.

No field evidence of potential contamination was observed during the hand pits, or in general site observations and PID concentrations were below the instrument detection limit (0.1 parts per million). The thickness of the cover system and presence of marker layer were compliant with the Phase 2 Remediation Strategy [2] and in line with the soil profiles set out in Section 3.

As all areas of soft landscaping had not been fully completed when the sampling took place, confirmation of the cover system installation, including the placement of CBL, marker layer and subsoil and topsoil from the same source as existing soils is required from St William.

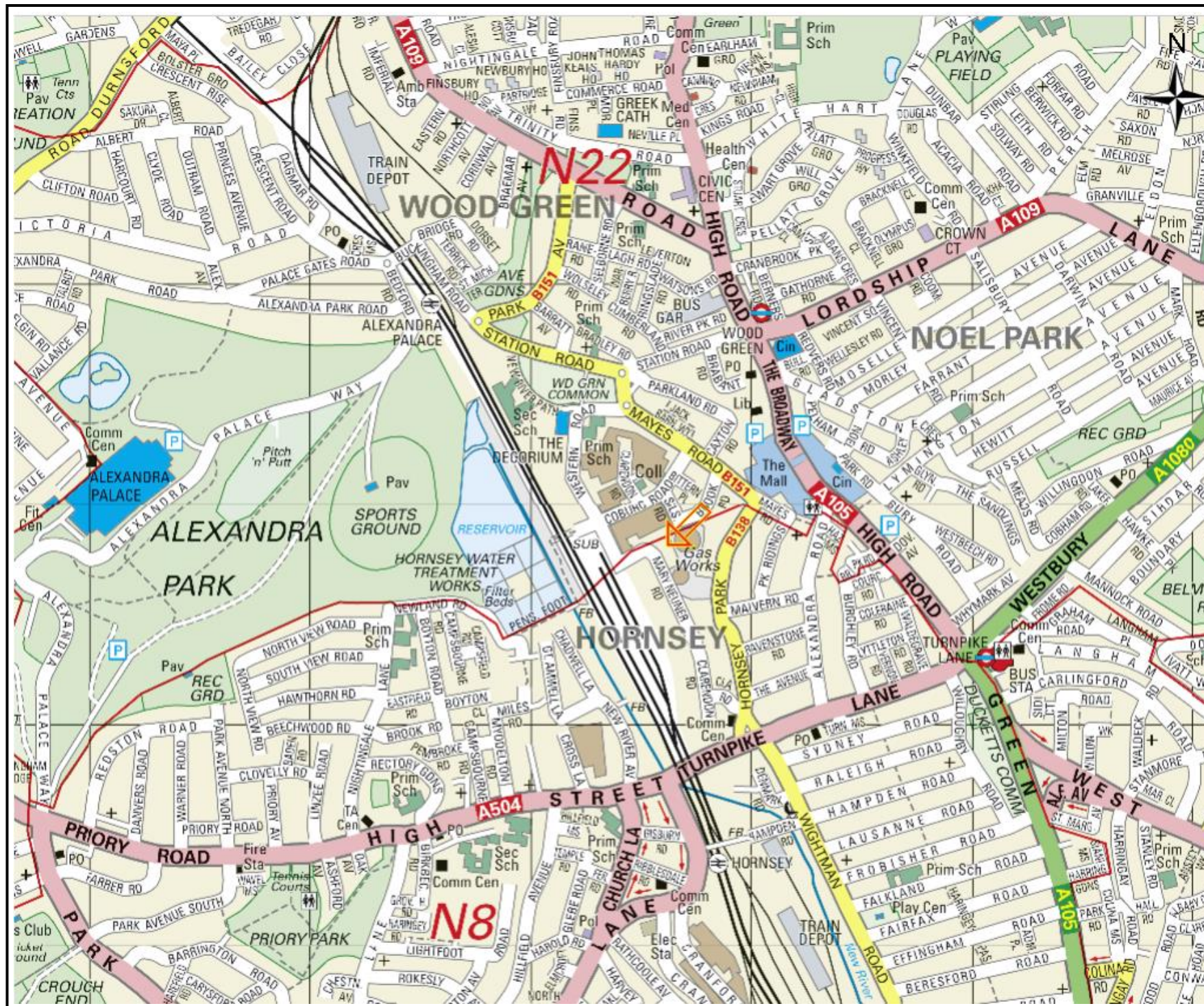
In summary, the verification works undertaken by Atkins confirm that the cover system to be installed within Phase 2 – Blocks B3 and B4 meets the requirement of the approved Remediation Strategy [2] to mitigate potential risks to human health.

6. References

- [1] Keltbray Ltd, "P296/RE6066-VR-DV-November2020-03-A_Plot B," March 2022.
- [2] Atkins Ltd, "Phase 2, Clarendon Road, Hornsey: Remediation Method Statement, Rev 2.0," April 2019.
- [3] Atkins Limited, "Clarendon Road, Hornsey: Addendum to the National Grid Controlled Waters DQRA," June 2018.
- [4] St William, "Clarendon Road Phase 2 - B1 / B2 Soil Verification Memo," July 2022.

Figures





Legend

ATKINS

Member of the SNC-Lavalin Group

Client

St William

Designed for life

Project

Clarendon Road - Hornsey

Drawing Title

Figure 1: Site Location

Author

J Moreno

Date & Revision

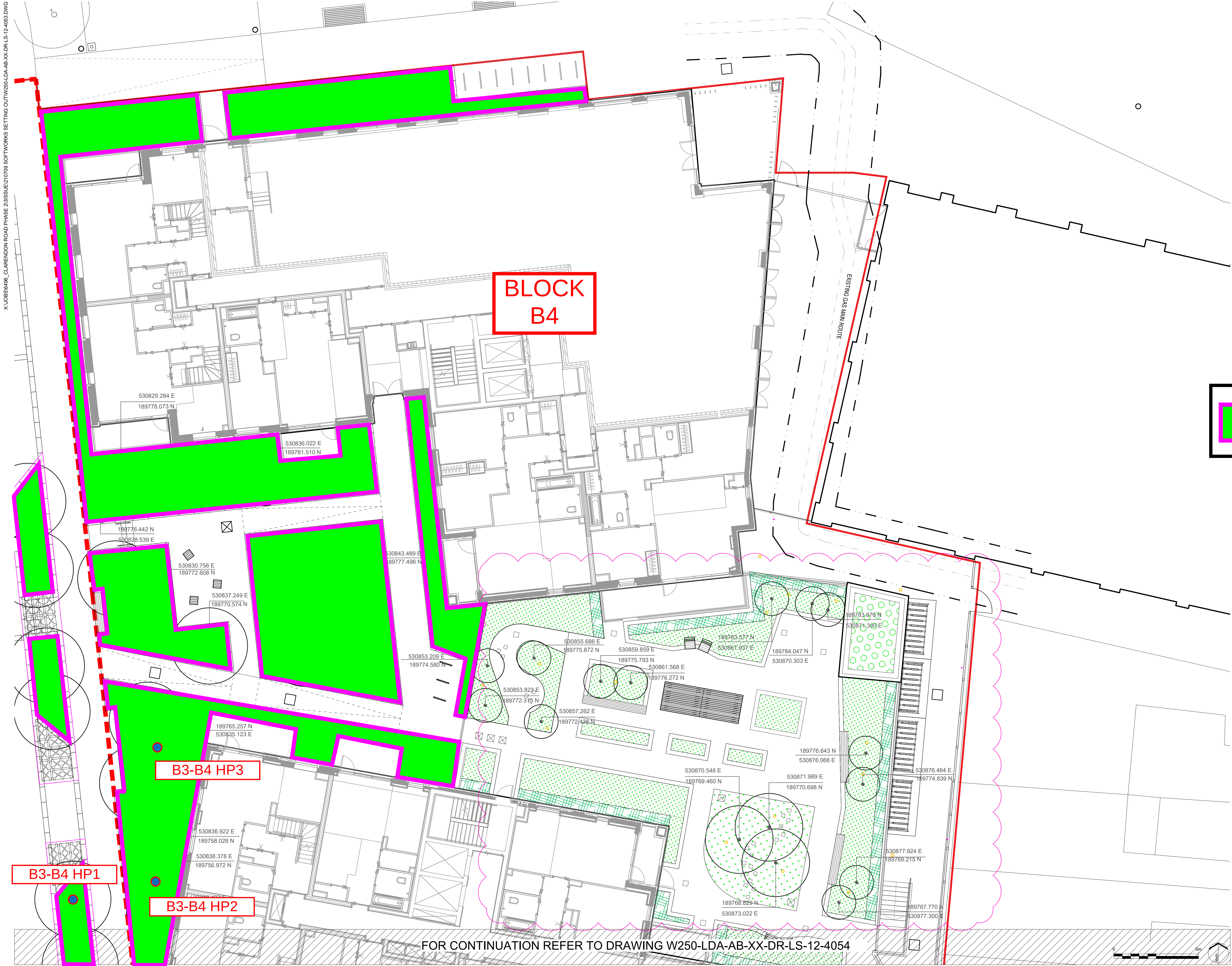
31/05/22- Rev 0

Appendices



Appendix A. General Arrangement

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LEGEND

- HEDGE
FOR SOIL BUILD UP REFER TO DRAWING
W250-LDA-AB-XX-DR-LS-90-6021
- TREE PIT IN LAWN
FOR SOIL BUILD UP REFER TO DRAWINGS
W250-LDA-AB-XX-DR-LS-90-6001-6006 AND 6014
- TREE PIT ON SLOPE
FOR SOIL BUILD UP REFER TO DRAWINGS
W250-LDA-AB-XX-DR-LS-90-6011-6012 AND 6015
- HERBACEOUS PLANTING IN RAISED PLANTER
FOR SOIL BUILD UP REFER TO DRAWINGS
W250-LDA-AB-XX-DR-LS-90-6007-6008

NOTE:FOR LIGHTING LAYOUT & TYPES PLEASE
REFER TO CHAPMAN DRAWING
W250-CHA-AB-00-DR-E-63-2250

B4 Soil locations

READ THIS FIRST

Note for Contractors
This drawing should be considered along with the risk information contained in the CDM Pre Construction Information. This information will include details of the SIGNIFICANT risks which LDA Design has identified which may arise from constructing their designs shown on this drawing. A Competent Contractor should be aware of the typical risks associated with doing this work.

Note for Workers
DO NOT START YOUR WORK unless you know the Risks and Controls relating to the work on this drawing (including SAFE SEQUENCES OF WORK AND EQUIPMENT).

Do not issue copies of parts of this drawing without the above Note for Workers (unless you are sure that the Workers can undertake the work safely).

C1 Issues for Construction AH 08/07/21
REV. DESCRIPTION APP. DATE

LDA DESIGN

PROJECT TITLE
CLARENDON ROAD PHASE 2

DRAWING TITLE
SOFTWARES SETTING OUT
SHEET 4 OF 6

ISSUED BY: London T: 020 7467 1470
DATE: FEB 19 DRAWN: AN
SCALE: A1 1:100 CHECKED: JT
STATUS: Construction APPROVED: AH

DWG. NO W250-LDA-AB-XX-DR-LS-12-4053

No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.

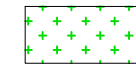
© LDA Design Consulting Ltd. Quality Assured to BS EN ISO 9001: 2008
Sources: Ordnance Survey

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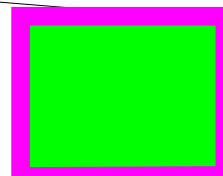
FOR CONTINUATION REFER TO DRAWING W250-LDA-AB-XX-DR-LS-12-4053

BLOCK
B3

LEGEND

-  HEDGE
FOR SOIL BUILD UP REFER TO DRAWING
W250-LDA-AB-XX-DR-LS-90-6021
-  TREE PIT IN LAWN
FOR SOIL BUILD UP REFER TO DRAWINGS
W250-LDA-AB-XX-DR-LS-90-6001-6006 AND 6014
-  TREE PIT ON SLOPE
FOR SOIL BUILD UP REFER TO DRAWINGS
W250-LDA-AB-XX-DR-LS-90-6011-6012 AND 6015
-  HERBACEOUS PLANTING IN RAISED PLANTER
FOR SOIL BUILD UP REFER TO DRAWINGS
W250-LDA-AB-XX-DR-LS-90-6007-6008

NOTE:FOR LIGHTING LAYOUT & TYPES PLEASE
REFER TO CHAPMAN DRAWING
W250-CHA-AB-00-DR-E-63-2250

 B3 Soil
locations

B2 Soil Verification
Approved
Haringey Ref
HGY/2022/1834

READ THIS FIRST

-  **Note for Contractors**
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contained in the CDM Pre Construction Information. This information
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work safely).

C1	Issue for Construction	AM	08/07/21
REV.	DESCRIPTION	APP.	DATE

LDA DESIGN

PROJECT TITLE
CLARENDON ROAD PHASE 2

DRAWING TITLE
SOFTWORKS SETTING OUT
SHEET 5 OF 6

ISSUED BY	London	T: 020 7467 1470
DATE	FEB 19	DRAWN AN
SCALE	1:100	CHECKED JT
STATUS	Construction	APPROVED AH

DWG. NO W250-LDA-AB-XX-DR-LS-12-4054

No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.

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Sources Ordnance Survey



FOR CONTINUATION REFER TO DRAWING W250-LDA-AB-XX-DR-LS-12-4055

TP3

Appendix B. Assessment Criteria

Table A Target Criteria for Imported Soils (mg/kg unless stated otherwise)

Contaminant of Concern	Import Target	Source of Risk-based Target
General Inorganics		
Asbestos	No detection	
Free Cyanide	3.40E+01	Human Health Residential with Plant Uptake
Heavy Metals/Metalloids		
Arsenic	3.70E+01	Human Health Residential with Plant Uptake
Cadmium (lifetime exposure)	2.21E+01	Human Health Residential with Plant Uptake
Chromium III	1.43E+04	Human Health Residential with Plant Uptake
Chromium VI	2.05E+01	Human Health Residential with Plant Uptake
Lead	2.00E+02	Human Health Residential with Plant Uptake
Mercury	1.80E+02	Human Health Residential with Plant Uptake
Nickel	1.36E+02	Human Health Residential with Plant Uptake
Selenium	3.75E+02	Human Health Residential with Plant Uptake
Zinc	2.00E+04	Human Health Residential with Plant Uptake
BTEX		
Benzene	1.00E-01	Controlled Waters SSAC Zone B
Toluene	1.00E+01	Not risk based
Ethylbenzene	5.07E+01	Human Health Residential with Plant Uptake
Total Xylenes,	2.40E+01	Human Health Residential with Plant Uptake
TPH Bands		
TPH Aliphatic > C ₅ -C ₆	1.00E+01	Not risk based
TPH Aliphatic > C ₆ -C ₈	1.00E+01	Not risk based
TPH Aliphatic > C ₈ -C ₁₀	1.00E+01	Not risk based
TPH Aliphatic > C ₁₀ -C ₁₂	1.00E+01	Not risk based
TPH Aliphatic > C ₁₂ -C ₁₆	1.00E+01	Not risk based
TPH Aliphatic > C ₁₆ -C ₃₅	1.00E+01	Not risk based
TPH Aromatic > C ₅ -C ₇	1.37E-01	Human Health Residential with Plant Uptake
TPH Aromatic > C ₇ -C ₈	1.00E+01	Not risk based
TPH Aromatic > C ₈ -C ₁₀	6.28E-01	Controlled Waters SSAC Zone B
TPH Aromatic > C ₁₀ -C ₁₂	7.28E-01	Controlled Waters SSAC Zone B
TPH Aromatic > C ₁₂ -C ₁₆	1.45+00	Controlled Waters SSAC Zone B
TPH Aromatic > C ₁₆ -C ₂₁	1.00E+01	Not risk based
TPH Aromatic > C ₂₁ -C ₃₅	1.00E+01	Not risk based
PAHs		
Acenaphthene	5.00E+01	Not risk based
Acenaphthylene	5.00E+01	Not risk based
Anthracene	5.00E+01	Not risk based
Benzo(a)anthracene	5.00E+01	Not risk based
Benzo(a)pyrene	4.95E+00	Human Health Residential with Plant Uptake
Benzo(b)fluoranthene	5.00E+01	Not risk based
Benzo(g,h,i)perylene	5.00E+01	Not risk based
Benzo(k)fluoranthene	5.00E+01	Not risk based
Chrysene	5.00E+01	Not risk based
Dibenz(a,h)anthracene	5.00E+01	Not risk based
Fluoranthene	5.00E+01	Not risk based
Fluorene	5.00E+01	Not risk based
Indeno(1,2,3-c,d)pyrene	5.00E+01	Not risk based

Contaminant of Concern	Import Target	Source of Risk-based Target
Naphthalene	6.76E-01	Controlled Waters SSAC Zone B
Phenanthrene	5.00E+01	Not risk based
Pyrene	5.00E+01	Not risk based
Other Organics		
1,1-Dichloroethane	1.17E+00	Human Health Residential with Plant Uptake
1,2-Dichloroethane (1,2-DCA)	8.19E-03	Human Health Residential with Plant Uptake
cis-1,2-Dichloroethene	5.56E-02	Human Health Residential with Plant Uptake
trans-1,2-Dichloroethene	9.52E-02	Human Health Residential with Plant Uptake
1,1,1-Trichloroethane (1,1,1-TCA)	3.19E+00	Human Health Residential with Plant Uptake
1,1,2-Trichloroethane (1,1,2-TCA)	3.58E-01	Human Health Residential with Plant Uptake
1,1,1,2-Tetrachloroethane	1.73E+00	Human Health Residential with Plant Uptake
1,1,2,2-Tetrachloroethane	3.29E+00	Human Health Residential with Plant Uptake
Trichloroethene (TCE)	1.56E-03	Human Health Residential with Plant Uptake
Tetrachloroethene (PCE)	6.43E-01	Human Health Residential with Plant Uptake
Trichloromethane (Chloroform)	4.29E-01	Human Health Residential with Plant Uptake
Carbon Tetrachloride / Tetrachloromethane	1.41E-01	Human Health Residential with Plant Uptake
Phenol	2.67E+02	Human Health Residential with Plant Uptake
Notes All values in mg/kg, unless otherwise stated. No material containing free-phase product is permitted. The human health risk-based criteria are generic and do not relate to the proposed development. Any exceedances of the criteria will be assessed on a contaminant by contaminant basis to assess the suitability of the material for use on the site.		

Table A-3 GACS for Human Health – Soils from 0.0 to 1.0 m bgl (mg/kg unless stated otherwise)

Contaminant of Concern	Residential with Private Gardens*	Residential without Private Gardens
General Inorganics		
Asbestos	No detection ^(a)	No detection ^(a)
Free Cyanide	3.40E+01	3.40E+01
Heavy Metals/Metalloids		
Arsenic	3.70E+01	3.99E+01
Cadmium (lifetime exposure)	2.21E+01	1.49E+02
Chromium III	1.43E+04	1.67E+04
Chromium VI	2.05E+01	2.05E+01
Lead	2.00E+02	3.13E+02
Mercury	1.80E+02	2.44E+02
Nickel	1.36E+02	1.88E+02
Selenium	3.75E+02	5.95E+02
Zinc	2.00E+04	4.70E+04
BTEX		
Benzene	1.37E-01	0.31E-01
Toluene	1.13E+02	3.12E+02
Ethylbenzene	5.07E+01	8.50E+01
Total Xylenes,	2.40E+01	2.68E+01
TPH Bands		
TPH Aliphatic > C ₅ -C ₆	4.27E+01	4.29E+01
TPH Aliphatic > C ₆ -C ₈	9.93E+01	9.96E+01
TPH Aliphatic > C ₈ -C ₁₀	1.39E+01	1.39E+01
TPH Aliphatic > C ₁₀ -C ₁₂	8.17E+01	8.18E+01
TPH Aliphatic > C ₁₂ -C ₁₆	3.85E+02	3.85E+02
TPH Aliphatic > C ₁₆ -C ₃₅	2.10E+05	2.12E+05
TPH Aromatic > C ₅ -C ₇	1.37E-01	0.31E-01
TPH Aromatic > C ₇ -C ₈	1.13E+02	3.12E+02
TPH Aromatic > C ₈ -C ₁₀	2.05E+01	2.27E+01
TPH Aromatic > C ₁₀ -C ₁₂	7.04E+02	1.39E+02
TPH Aromatic > C ₁₂ -C ₁₆	1.65E+02	7.03E+02
TPH Aromatic > C ₁₆ -C ₂₁	3.19E+02	1.93E+03
TPH Aromatic > C ₂₁ -C ₃₅	1.12E+03	1.93E+03
PAHs		
Acenaphthene	6.08E+02	2.68E+03
Anthracene	1.02E+04	3.43E+04
Benzo(a)pyrene	4.95E+00	5.34E+00
Fluoranthene	9.83E+03	4.88E+03
Fluorene	7.53E+03	3.26E+03
Naphthalene	8.29E-01	8.52E-01
Pyrene	6.68E+02	3.65E+03
Other Organics		
1,1-Dichloroethane	1.17E+00	1.19E+00
1,2-Dichloroethane (1,2-DCA)	8.19E-03	8.94E-03
cis-1,2-Dichloroethene	5.56E-02	5.74E-02
trans-1,2-Dichloroethene	9.52E-02	9.66E-02
1,1,1-Trichloroethane (1,1,1-TCA)	3.19E+00	3.20E+00

Contaminant of Concern	Residential with Private Gardens*	Residential without Private Gardens
1,1,2-Trichloroethane (1,1,2-TCA)	3.58E-01	4.30E-01
1,1,1,2-Tetrachloroethane	1.73E+00	1.89E+00
1,1,2,2-Tetrachloroethane	3.29E+00	4.74E+00
Trichloroethene (TCE)	1.56E-03	1.59E-03
Tetrachloroethene (PCE)	6.43E-01	6.78E-01
Trichloromethane (Chloroform)	4.29E-01	4.72E-01
Carbon Tetrachloride / Tetrachloromethane	1.41E-01	1.47E-01
Vinyl Chloride (VC)	3.00E-04	3.00E-04
Phenol	2.67E+02	5.70E+02

Notes

* Private gardens assumes that people may consume home grown produce.

All values in mg/kg, unless otherwise stated.

No material containing free-phase product is permitted.

^(a): applies to the full thickness of the cover system (1000 mm or 600 mm depending on purpose/location)

Appendix C. Source Certificates



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Simon Sivyver
H. Sivyver Transport Ltd
160 Sydenham Road
London
SE26 5JZ

6th June 2022
Our Ref: TOHA/22/7509/1/SS
Your Ref: PO 179613

Dear Sirs

Topsoil Analysis Report: Charlton - Trugrow Topsoil

We have completed the analysis of the soil sample recently submitted, referenced *Trugrow Topsoil*, and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes. In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the topsoil source. The report and results should therefore not be used by third parties as a means of verification or validation testing or waste designation purposes, especially after the topsoil has left the H Sivyver Transport Ltd site.

SAMPLE EXAMINATION

The sample was described as a dark greyish brown (Munsell Colour 10YR 4/2), dry, friable, very slightly calcareous SANDY LOAM with a single grain structure*. The stone content of the sample was low and contained a moderate proportion of organic fines and occasional woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

* This appraisal of soil structure was made from examination of a disturbed sample(s). Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

Tim O'Hare Associates LLP
Howbery Park Wallingford Oxfordshire OX10 8BA
T:01491 822653 E:info@toha.co.uk
www.toha.co.uk



Plate 1: Trugrow topsoil sample

ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- detailed particle size analysis (% 5 sands, silt, clay);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX).

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

RESULTS OF ANALYSIS

Particle Size Analysis and Stone Content

The sample fell into the *sandy loam* texture class. Further detailed particle size analysis found the sample to have a sufficiently narrow particle size distribution and a predominance of *medium sand* (0.25-0.50mm) and *fine sand* (0.15-0.25mm) and a relatively small proportion of *very fine sand* (0.05-0.15mm). This is usually ideal for topsoil in general landscape applications as reasonable porosity levels are generally maintained in a consolidated state and the risk of particle interpacking is reduced. The sample should therefore provide adequate drainage and aeration properties for general landscape applications.

The stone content of the sample was low and, as such, stones should not restrict the use of the soil for general landscape purposes.

pH and Electrical Conductivity Values

The sample was alkaline in reaction (pH 7.7). This pH value would be considered suitable for general landscape purposes providing species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was moderate, which indicates that soluble salts should not be present at levels that would be harmful to plants.

The electrical conductivity value by CaSO₄ extract (*BS3882* requirement) fell below the maximum specified value (3300 µS/cm) given in *BS3882:2015 – Table 1*.

Organic Matter and Fertility Status

The sample was adequately supplied with organic matter and all major plant nutrients.

The C:N ratio of the sample was acceptable for general landscape purposes.

Potential Contaminants

With reference to *BS3882:2015 – Table 1*: Notes 3 and 4, there is a requirement to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific criteria, the concentrations that affect human health have been assessed against the most sensitive end use (*residential*), against the Suitable For Use Levels (S4ULs) presented in the LQM/CIEH S4ULs for Human Health Risk Assessment (2015) and the DEFRA SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document (2014).

Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in *BS3882:2015 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil sample for general landscape purposes. The analysis has also been undertaken to determine the sample's compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

From the soil examination and subsequent laboratory analysis, the sample was described as an alkaline, non-saline, very slightly calcareous sandy loam with a weakly developed structure and low stone content. The sample was adequately supplied with organic matter and major plant nutrients. Of the potential contaminants determined, none exceeded their respective guideline values.

Based on our findings, the topsoil represented by this sample would be considered suitable for general landscape purposes provided species with a wide pH tolerance or those known to prefer alkaline soils are selected and the soil's physical condition is satisfactory.

The topsoil was also fully compliant with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

RECOMMENDATIONS

Soil Handling Recommendations

It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, resspreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is reasonably dry and non-plastic (friable) in consistency.

It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the soil is friable in consistency. If the soil is structurally damaged and compacted at any stage during the course of soiling or landscaping works, it should be cultivated appropriately to relieve the compaction and to restore the soil's structure prior to any planting, turfing or seeding.

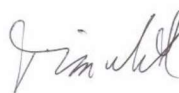
Further details on soil handling are provided in Annex A of *BS3882:2015*.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully



Aaron Cross
BSc MSc
Soil Scientist



Tim White
BSc MSc MScilSci CSci
Senior Associate

For and on behalf of Tim O'Hare Associates LLP



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	H Sivyver Transport Ltd
Project:	Charlton - Trugrow Topsoil
Job:	Topsoil Analysis (BS3882:2015)
Date:	06/06/2022
Job Ref No:	TOHA/22/7509/1/SS

Sample Reference		
		Accreditation
Clay (<0.002mm)	%	UKAS
Silt (0.002-0.05mm)	%	UKAS
Very Fine Sand (0.05-0.15mm)	%	UKAS
Fine Sand (0.15-0.25mm)	%	UKAS
Medium Sand (0.25-0.50mm)	%	UKAS
Coarse Sand (0.50-1.0mm)	%	UKAS
Very Coarse Sand (1.0-2.0mm)	%	UKAS
Total Sand (0.05-2.0mm)	%	UKAS
Texture Class (UK Classification)	—	UKAS
Stones (2-20mm)	% DW	GLP
Stones (20-50mm)	% DW	GLP
Stones (>50mm)	% DW	GLP

Trugrow Topsoil	
	13
	7
	19
	13
	36
	8
	4
	80
	SL
	13
	0
	0

pH Value (1:2.5 water extract)	units	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Electrical Conductivity (1:2 CaSO ₄ extract)	uS/cm	UKAS
Exchangeable Sodium Percentage	%	UKAS
Organic Matter (LOI)	%	UKAS
Total Nitrogen (Dumas)	%	UKAS
C : N Ratio	ratio	UKAS
Extractable Phosphorus	mg/l	UKAS
Extractable Potassium	mg/l	UKAS
Extractable Magnesium	mg/l	UKAS

	7.7
	706
	2675
	3.3
	3.9
	0.18
	13
	53
	808
	127

Total Arsenic (As)	mg/kg	MCERTS
Total Cadmium (Cd)	mg/kg	MCERTS
Total Chromium (Cr)	mg/kg	MCERTS
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS
Total Copper (Cu)	mg/kg	MCERTS
Total Lead (Pb)	mg/kg	MCERTS
Total Mercury (Hg)	mg/kg	MCERTS
Total Nickel (Ni)	mg/kg	MCERTS
Total Selenium (Se)	mg/kg	MCERTS
Total Zinc (Zn)	mg/kg	MCERTS
Water Soluble Boron (B)	mg/kg	MCERTS
Total Cyanide (CN)	mg/kg	MCERTS
Total (mono) Phenols	mg/kg	MCERTS

	11
	< 0.2
	20
	< 1.8
	22
	45
	< 0.3
	17
	< 1.0
	48
	1.4
	< 1.0
	< 1.0

Naphthalene	mg/kg	MCERTS
Acenaphthylene	mg/kg	MCERTS
Acenaphthene	mg/kg	MCERTS
Fluorene	mg/kg	MCERTS
Phenanthrene	mg/kg	MCERTS
Anthracene	mg/kg	MCERTS
Fluoranthene	mg/kg	MCERTS
Pyrene	mg/kg	MCERTS
Benzo(a)anthracene	mg/kg	MCERTS
Chrysene	mg/kg	MCERTS
Benzo(b)fluoranthene	mg/kg	MCERTS
Benzo(k)fluoranthene	mg/kg	MCERTS
Benzo(a)pyrene	mg/kg	MCERTS
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS
Dibenzo(a,h)anthracene	mg/kg	MCERTS
Benzo(g,h,i)perylene	mg/kg	MCERTS
Total PAHs (sum USEPA16)	mg/kg	MCERTS

	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.80

Aliphatic TPH >C5 - C6	mg/kg	MCERTS
Aliphatic TPH >C6 - C8	mg/kg	MCERTS
Aliphatic TPH >C8 - C10	mg/kg	MCERTS
Aliphatic TPH >C10 - C12	mg/kg	MCERTS
Aliphatic TPH >C12 - C16	mg/kg	MCERTS
Aliphatic TPH >C16 - C21	mg/kg	MCERTS
Aliphatic TPH >C21 - C35	mg/kg	MCERTS
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS
Aromatic TPH >C5 - C7	mg/kg	MCERTS
Aromatic TPH >C7 - C8	mg/kg	MCERTS
Aromatic TPH >C8 - C10	mg/kg	MCERTS
Aromatic TPH >C10 - C12	mg/kg	MCERTS
Aromatic TPH >C12 - C16	mg/kg	MCERTS
Aromatic TPH >C16 - C21	mg/kg	MCERTS
Aromatic TPH >C21 - C35	mg/kg	MCERTS
Aromatic TPH (C5 - C35)	mg/kg	MCERTS

	< 0.001
	< 0.001
	< 0.001
	< 1.0
	< 2.0
	< 8.0
	< 8.0
	< 10
	< 0.001
	< 0.001
	< 0.001
	< 1.0
	< 2.0
	< 10
	< 10
	< 10

Benzene	mg/kg	MCERTS
Toluene	mg/kg	MCERTS
Ethylbenzene	mg/kg	MCERTS
p & m-xylene	mg/kg	MCERTS
o-xylene	mg/kg	MCERTS
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS

	< 0.001
	< 0.001
	< 0.001
	< 0.001
	< 0.001
	< 0.001

SL = SANDY LOAM

Visual Examination

The sample was described as a dark greyish brown (Munsell Colour 10YR 4/2), dry, friable, very slightly calcareous SANDY LOAM with a single grain structure. The stone content of the sample was low and contained a moderate proportion of organic fines and occasional woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Aaron Cross

Aaron Cross
BSc MSc
Soil Scientist

Results of analysis should be read in conjunction with the report they were issued with.

The contents of this certificate shall not be reproduced without the express written permission of Tim O'Hare Associates LLP.



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Simon Sivyver
H. Sivyver Transport Ltd
160 Sydenham Road
London
SE26 5JZ

6th June 2022
Our Ref: TOHA/22/7509/2/SS
Your Ref: PO 179613

Dear Sirs

Soil Analysis Report: Subsoil

We have completed the analysis of the sample recently submitted, referenced *Subsoil*, and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the subsoil sample for use in general landscape applications (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Subsoil (*BS8601:2013 – Specification for subsoil and requirements for use – Table 1, Multipurpose Subsoil*), including analysis of potential contaminants.

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the soil source. The report and results should therefore not be used by third parties as a means of verification or validation testing or waste designation purposes, especially after the soil has left the H Sivyver Transport Ltd site.

SAMPLE EXAMINATION

The sample was described as a strong brown (Munsell Colour 7.5YR 5/6), slightly moist, friable, very slightly calcareous SAND with a single grain structure. The sample was moderately stony and no unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Tim O'Hare Associates LLP
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Plate 1: Subsoil sample

ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition, drainage rate and fertility of the rootzone, and the concentration of selected potential contaminants. The following parameters were determined:

- detailed particle size analysis (5 sands, silt, clay);
- stone content (2-20mm, 20-75mm, >75mm);
- saturated hydraulic conductivity;
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- organic matter content;
- heavy metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX).

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

RESULTS OF ANALYSIS

Particle Size Analysis and Stone Content

The sample fell into the *sand* texture class. Further detailed particle size analysis revealed the sample to have a narrow particle size distribution with a large proportion of sand falling into the *medium sand* (0.25-0.50mm) class, with smaller proportions falling into the *fine sand* (0.15-0.25mm) and *coarse sand* (0.50-1.0mm) classes. This would be considered suitable for subsoil in general landscape applications.

The stone content of the sample was moderate and, as such, stones are unlikely to constitute a limitation for use as subsoil for general landscape purposes.

Saturated Hydraulic Permeability

The sample displayed a moderately high permeability rate (50mm/hour), which would be suitable for general landscape purposes.

pH and Electrical Conductivity Values

The sample was alkaline in reaction (pH 7.6). This pH value would be considered suitable as subsoil for general landscape purposes providing species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was low, which indicates that soluble salts were not present at levels that would be harmful to plants.

The electrical conductivity value by CaSO₄ extract (*BS8601* requirement) fell below the maximum specified value (2800 µS/cm) given in *BS8601:2013 – Table 1*.

Organic Matter and Fertility Status

The organic matter content was low (0.7%) and compliant with *BS8601:2013 – Table 1*.

Potential Contaminants

With reference to *BS3882:2015 - Table 1*: Notes 3 and 4, there is a requirement to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific criteria, the concentrations that affect human health have been assessed against the most sensitive end use (*residential*), against the Suitable For Use Levels (S4ULs) presented in the LQM/CIEH S4ULs for Human Health Risk Assessment (2015) and the DEFRA SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document (2014).

Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in *BS3882:2015 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the sample for use as subsoil in general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Subsoil (*BS8601:2013 – Specification for subsoil and requirements for use – Table 1, Multipurpose Subsoil*), including analysis of potential contaminants.

From the soil examination and subsequent laboratory analysis, the sample was described as an alkaline, non-saline, very slightly calcareous sand, with a single grain structure and moderate stone content. The sample displayed a moderately high saturated hydraulic conductivity rate (permeability). The organic matter content was low and consistent with subsoil. Of the potential contaminants determined, none exceeded their respective SGV or GAC values.

Based on our findings, the soil represented by this sample would be considered suitable for use as subsoil for general landscape purposes provided species with a wide pH tolerance or those known to prefer alkaline soils are selected and the soil's physical condition is satisfactory.

The sample was also fully compliant with the requirements of the British Standard for Subsoil (*BS8601:2013 – Specification for subsoil and requirements for use – Table 1, Multipurpose Subsoil*).

Soil Handling Recommendations

Reference should be made to Section 6.0 of *BS8601:2013* with regard to the handling and management of the subsoil:

"Soils generally lose strength and become less resistant to damage as they become wetter; therefore, it is essential that they are stripped, handled and trafficked only in the appropriate conditions of weather and soil moisture, and with suitable machinery. If sustained heavy rainfall (e.g. >10 mm in 24 h) occurs during soil stripping operations, work should be suspended and not restarted until the ground has had at least one dry day or until a suitable moisture content has been reached. A soil can be considered to have a suitable moisture content for stripping and handling if the whole thickness of the subsoil layer being stripped and/or handled is at a moisture content below the plastic limit as determined in accordance with BS 1377-2:1990 (incorporating Amendment No. 1).

Machinery should be selected and routed to minimise soil compaction."

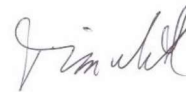
Further guidance is provided in Clauses 6.1–6.5.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully



Aaron Cross
BSc MSc
Soil Scientist



Tim White
BSc MSc MSc SoilSci CSci
Senior Associate

For & on behalf of Tim O'Hare Associates LLP



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	H Sivyver Transport Ltd
Project:	Charlton - Subsoil
Job:	Subsoil Analysis (BS8601:2013)
Date:	06/06/2022
Job Ref No:	TOHA/22/7509/2/SS

Sample Reference		Accreditation
Clay (<0.002mm)	%	UKAS
Silt (0.002-0.05mm)	%	UKAS
Very Fine Sand (0.05-0.15mm)	%	UKAS
Fine Sand (0.15-0.25mm)	%	UKAS
Medium Sand (0.25-0.50mm)	%	UKAS
Coarse Sand (0.50-1.0mm)	%	UKAS
Very Coarse Sand (1.0-2.0mm)	%	UKAS
Total Sand (0.05-2.0mm)	%	UKAS
Texture Class (UK Classification)	--	UKAS
Stones (2-20mm)	% DW	GLP
Stones (20-75mm)	% DW	GLP
Stones (>75mm)	% DW	GLP

Subsoil
7
4
10
14
41
19
5
89
5
25
7
0

Saturated Hydraulic Conductivity	mm/hr	A2LA
----------------------------------	-------	------

50

pH Value (1:2.5 water extract)	units	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Electrical Conductivity (1:2 CaSO ₄ extract)	uS/cm	UKAS
Exchangeable Sodium Percentage	%	UKAS
Organic Matter (LOI)	%	UKAS

7.6
153
2041
1.1
0.7

Total Arsenic (As)	mg/kg	MCERTS
Total Cadmium (Cd)	mg/kg	MCERTS
Total Chromium (Cr)	mg/kg	MCERTS
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS
Total Copper (Cu)	mg/kg	MCERTS
Total Lead (Pb)	mg/kg	MCERTS
Total Mercury (Hg)	mg/kg	MCERTS
Total Nickel (Ni)	mg/kg	MCERTS
Total Selenium (Se)	mg/kg	MCERTS
Total Zinc (Zn)	mg/kg	MCERTS
Water Soluble Boron (B)	mg/kg	MCERTS
Total Cyanide (CN)	mg/kg	MCERTS
Total (mono) Phenols	mg/kg	MCERTS

12
< 0.2
19
< 1.8
12
9
< 0.3
18
< 1.0
25
0.3
< 1.0
< 1.0

Naphthalene	mg/kg	MCERTS
Acenaphthylene	mg/kg	MCERTS
Acenaphthene	mg/kg	MCERTS
Fluorene	mg/kg	MCERTS
Phenanthrene	mg/kg	MCERTS
Anthracene	mg/kg	MCERTS
Fluoranthene	mg/kg	MCERTS
Pyrene	mg/kg	MCERTS
Benzo(a)anthracene	mg/kg	MCERTS
Chrysene	mg/kg	MCERTS
Benzo(b)fluoranthene	mg/kg	MCERTS
Benzo(k)fluoranthene	mg/kg	MCERTS
Benzo(a)pyrene	mg/kg	MCERTS
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS
Dibenzo(a,h)anthracene	mg/kg	MCERTS
Benzo(g,h,i)perylene	mg/kg	MCERTS
Total PAHs (sum USEPA16)	mg/kg	MCERTS

< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.05
< 0.80

Aliphatic TPH >C5 - C6	mg/kg	MCERTS
Aliphatic TPH >C6 - C8	mg/kg	MCERTS
Aliphatic TPH >C8 - C10	mg/kg	MCERTS
Aliphatic TPH >C10 - C12	mg/kg	MCERTS
Aliphatic TPH >C12 - C16	mg/kg	MCERTS
Aliphatic TPH >C16 - C21	mg/kg	MCERTS
Aliphatic TPH >C21 - C35	mg/kg	MCERTS
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS
Aromatic TPH >C5 - C7	mg/kg	MCERTS
Aromatic TPH >C7 - C8	mg/kg	MCERTS
Aromatic TPH >C8 - C10	mg/kg	MCERTS
Aromatic TPH >C10 - C12	mg/kg	MCERTS
Aromatic TPH >C12 - C16	mg/kg	MCERTS
Aromatic TPH >C16 - C21	mg/kg	MCERTS
Aromatic TPH >C21 - C35	mg/kg	MCERTS
Aromatic TPH (C5 - C35)	mg/kg	MCERTS

< 0.001
< 0.001
< 0.001
< 1.0
< 2.0
< 8.0
< 8.0
< 10
< 0.001
< 0.001
< 0.001
< 1.0
< 2.0
< 10
< 10
< 10

Benzene	mg/kg	MCERTS
Toluene	mg/kg	MCERTS
Ethylbenzene	mg/kg	MCERTS
p & m-xylene	mg/kg	MCERTS
o-xylene	mg/kg	MCERTS
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS

< 0.001
< 0.001
< 0.001
< 0.001
< 0.001
< 0.001

S = SAND

Visual Examination

The sample was described as a strong brown (Munsell Colour 7.5YR 5/6), slightly moist, friable, very slightly calcareous SAND with a single grain structure. The sample was moderately stony and no unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Results of analysis should be read in conjunction with the report they were issued with

The contents of this certificate shall not be reproduced without the express written permission of Tim O'Hare Associates LLP.

Aaron Cross

Aaron Cross
BSc MSc
Soil Scientist

Appendix D. Photographs

 ATKINS Member of the SNC-Lavalin Group PHOTOGRAPHS		
Client Name: St William Homes LLP	Site Location: Clarendon Road, Hornsey – Phase 2 Blocks B3 & B4	Project No. 5192204

Photo No. 1	Date: 14/09/22	
Description: Installation of Marker Layer		

Photo No. 2	Date: 14/09/22
Description: Placed subsoil prior to installation of topsoil	



Photo No. 3	Date: 14/09/22	
Description: B3-B4 HP1 including arisings (topsoil and subsoil) and Marker Layer at base of hole		

Photo No. 4	Date: 14/09/22	
Description: B3-B4 HP2 including arisings (topsoil and subsoil) and Marker Layer at base of hole		

Photo No. 5	Date: 14/09/22	
Description: B3-B4 HP3 including arisings (topsoil and subsoil) and Marker Layer at base of hole		

Appendix E. Laboratory Certificates



2183

Final Report

Report No.:	22-35567-1		
Initial Date of Issue:	23-Sep-2022		
Client	Atkins Ltd		
Client Address:	24th Floor East Euston Tower 286 Euston Road London London NW1 3AT		
Contact(s):	Nick Ketchell		
Project	Phase B Clarendon Road		
Quotation No.:	Q19-17666	Date Received:	16-Sep-2022
Order No.:	12190092	Date Instructed:	16-Sep-2022
No. of Samples:	6		
Turnaround (Wkdays):	5	Results Due:	23-Sep-2022
Date Approved:	23-Sep-2022		
Approved By:			



Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: Phase B Clarendon Road

Client: Atkins Ltd	Chemtest Job No.:				22-35567	22-35567	22-35567	22-35567	22-35567	22-35567
Quotation No.: Q19-17666	Chemtest Sample ID.:				1507992	1507993	1507994	1507995	1507996	1507997
Order No.: 12190092	Client Sample Ref.:				B3-B4 HP1 TS	B3-B4 HP1 SS	B3-B4 HP2 TS	B3-B4 HP2 SS	B3-B4 HP3 TS	B3-B4 HP3 SS
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Date Sampled:				14-Sep-2022	14-Sep-2022	14-Sep-2022	14-Sep-2022	14-Sep-2022	14-Sep-2022
	Asbestos Lab:				NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	Accred.	SOP	Units	LOD						
ACM Type	U	2192		N/A	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	13	11	14	11	12	10
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand	Sand
pH	U	2010		4.0	8.4	8.4	8.3	8.4	8.2	8.4
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	1.2	0.67	1.2	0.73	1.3	0.64
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.19	0.23	0.22	0.17	0.13	0.17
Sulphur (Elemental)	U	2180	mg/kg	1.0	5.3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloride (Water Soluble)	U	2220	g/l	0.010	0.12	0.047	0.13	0.040	0.14	0.029
Cyanide (Complex)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Thiocyanate	U	2300	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ammonium (Extractable)	U	2425	mg/kg	0.50	9.8	2.4	9.8	2.4	12	2.1
Arsenic	U	2455	mg/kg	0.5	7.2	6.0	5.6	8.2	9.3	8.1
Cadmium	U	2455	mg/kg	0.10	0.13	< 0.10	< 0.10	< 0.10	0.22	< 0.10
Chromium	U	2455	mg/kg	0.5	11	11	9.4	17	16	19
Copper	U	2455	mg/kg	0.50	24	11	18	14	29	13
Mercury	U	2455	mg/kg	0.05	0.30	0.11	0.33	0.13	0.38	0.11
Nickel	U	2455	mg/kg	0.50	9.4	30	60	13	15	14
Lead	U	2455	mg/kg	0.50	70	30	56	37	94	29
Selenium	U	2455	mg/kg	0.25	0.36	0.34	0.28	0.44	0.53	0.48
Zinc	U	2455	mg/kg	0.50	41	29	47	30	48	27
LOI	U	2610	%	0.10	9.4	3.0	4.0	1.9	4.0	1.8
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Quotation No.: Q19-17666	Chemtest Sample ID.:				1507992	1507993	1507994	1507995	1507996	1507997
Order No.: 12190092	Client Sample Ref.:				B3-B4 HP1 TS	B3-B4 HP1 SS	B3-B4 HP2 TS	B3-B4 HP2 SS	B3-B4 HP3 TS	B3-B4 HP3 SS
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Date Sampled:				14-Sep-2022	14-Sep-2022	14-Sep-2022	14-Sep-2022	14-Sep-2022	14-Sep-2022
	Asbestos Lab:				NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	Accred.	SOP	Units	LOD						
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	U	2760	µg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20
Chloroethane	U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	U	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloromethane	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Client: Atkins Ltd	Chemtest Job No.:				22-35567	22-35567	22-35567	22-35567	22-35567	22-35567
Quotation No.: Q19-17666	Chemtest Sample ID.:				1507992	1507993	1507994	1507995	1507996	1507997
Order No.: 12190092	Client Sample Ref.:				B3-B4 HP1 TS	B3-B4 HP1 SS	B3-B4 HP2 TS	B3-B4 HP2 SS	B3-B4 HP3 TS	B3-B4 HP3 SS
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Date Sampled:				14-Sep-2022	14-Sep-2022	14-Sep-2022	14-Sep-2022	14-Sep-2022	14-Sep-2022
	Asbestos Lab:				NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	Accred.	SOP	Units	LOD						
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	U	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	U	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	U	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Quotation No.: Q19-17666	Chemtest Sample ID.:				1507992	1507993	1507994	1507995	1507996	1507997
Order No.: 12190092	Client Sample Ref.:				B3-B4 HP1 TS	B3-B4 HP1 SS	B3-B4 HP2 TS	B3-B4 HP2 SS	B3-B4 HP3 TS	B3-B4 HP3 SS
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Date Sampled:				14-Sep-2022	14-Sep-2022	14-Sep-2022	14-Sep-2022	14-Sep-2022	14-Sep-2022
	Asbestos Lab:				NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	Accred.	SOP	Units	LOD						
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Resorcinol	U	2920	mg/kg	0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Phenol	U	2920	mg/kg	0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Cresols	U	2920	mg/kg	0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Xylenols	U	2920	mg/kg	0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
1-Naphthol	N	2920	mg/kg	0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Trimethylphenols	U	2920	mg/kg	0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurement by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2425	Extractable Ammonium in soils	Ammonium	Extraction with potassium chloride solution / analysis by 'Aquakem 600' Discrete Analyser using sodium salicylate and sodium dichloroisocyanurate.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Appendix F. Screened Chemical Analytical Data

Assessment Criteria :		Residential With Plant Uptake - 1% SOM Sand																			
Use MRL Values?																					
Constituent	Unit	Limit of Detection	Generic Assessment Criteria	Number of Samples	Minimum Value	Maximum Value	Number of Exceedances	Locations of Exceedances	Location		1507992	1507993	1507994	1507995	1507996	1507997	Tim o'hare	Tim o'hare			
									Sample ID	B3-B4 HP1 TS	B3-B4 HP1 SS	B3-B4 HP2 TS	B3-B4 HP2 SS	B3-B4 HP3 TS	B3-B4 HP3 SS	Imported subsoil	Imported Topsoil				
									Depth	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL				
									Date	14/09/2022	44818	44818	44818	44818	44818						
									Strata	Zone	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB					
ACM Type		N/A	No SSV	0	-	-	0			-	-	-	-	-	-	-	-	-			
Asbestos Identification		N/A	No SSV	6	-	-	0			No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected						
Moisture	%	0.020	No SSV	6	10	14	0			13	11	14	11	12	10						
Soil Colour		N/A	No SSV	6	-	-	0			Brown	Brown	Brown	Brown	Brown	Brown						
Other Material		N/A	No SSV	6	-	-	0			Stones	Stones	Stones	Stones	Stones	Stones						
Soil Texture		N/A	No SSV	6	-	-	0			Sand	Sand	Sand	Sand	Sand	Sand						
pH		4.0	No SSV	8	7.6	8.4	0			8.4	8.4	8.3	8.4	8.2	8.4	7.6	7.7				
Boron (Hot Water Soluble)	mg/kg	0.40	No SSV	8	0.3	1.4	0			1.2	0.67	1.2	0.73	1.3	0.64	0.3	1.4				
Sulphate (2:1 Water Soluble) as SO4	g/l	0.010	No SSV	6	0.13	0.23	0			0.19	0.23	0.22	0.17	0.13	0.17						
Sulphur (Elemental)	mg/kg	1.0	No SSV	6	<1	5.3	0			5.3	<1	<1	<1	<1	<1						
Chloride (Water Soluble)	g/l	0.010	No SSV	6	0.029	0.14	0			0.12	0.047	0.13	0.04	0.14	0.029						
Cyanide (Complex)	mg/kg	0.50	No SSV	6	<0.5	<0.5	0			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5						
Cyanide (Free)	mg/kg	0.50	34	8	<0.5	<1	0			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1				
Cyanide (Total)	mg/kg	0.50	No SSV	6	<0.5	<0.5	0			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5						
Thiocyanate	mg/kg	5.0	No SSV	6	<5	<5	0			<5	<5	<5	<5	<5	<5						
Ammonium (Extractable)	mg/kg	0.50	No SSV	6	2.1	12	0			9.8	2.4	9.8	2.4	12	2.1						
Arsenic	mg/kg	0.5	37	8	5.6	12	0			7.2	6	5.6	8.2	9.3	8.1	12	11				
Cadmium	mg/kg	0.10	22.1	8	<0.1	0.22	0			0.13	<0.1	<0.1	<0.1	0.22	<0.1	<0.2	<0.2				
Chromium	mg/kg	0.5	14300	8	9.4	20	0			11	11	9.4	17	16	19	20	20				
Copper	mg/kg	0.50	4730	8	11	29	0			24	11	18	14	29	13	12	22				
Mercury	mg/kg	0.05	11	8	<0.11	0.38	0			0.3	0.11	0.33	0.13	0.38	0.11	<0.3	<0.3				
Nickel	mg/kg	0.50	136	8	9.4	60	0			9.4	30	60	13	15	14	18	17				
Lead	mg/kg	0.50	200	8	9	94	0			70	30	56	37	94	29	9	45				
Selenium	mg/kg	0.25	375	8	<0.28	<1	0			0.36	0.34	0.28	0.44	0.53	0.48	<1	<1				
Zinc	mg/kg	0.50	20000	8	25	48	0			41	29	47	30	48	27	25	48				
LOI	%	0.10	No SSV	6	1.8	9.4	0			9.4	3	4	1.9	4	1.8						
Aliphatic TPH >C5-C6	mg/kg	1.0	42.7	8	<0.001	<1	0			<1	<1	<1	<1	<1	<1	<0.001	<0.001				
Aliphatic TPH >C6-C8	mg/kg	1.0	99.3	8	<0.001	<1	0			<1	<1	<1	<1	<1	<1	<0.001	<0.001				
Aliphatic TPH >C8-C10	mg/kg	1.0	13.9	8	<0.001	<1	0			<1	<1	<1	<1	<1	<1	<0.001	<0.001				
Aliphatic TPH >C10-C12	mg/kg	1.0	81.7	8	<1	<1	0			<1	<1	<1	<1	<1	<1	<1	<1				
Aliphatic TPH >C12-C16	mg/kg	1.0	385	8	<1	<2	0			<1	<1	<1	<1	<1	<1	<2	<2				
Aliphatic TPH >C16-C21	mg/kg	1.0	210000	8	<1	<8	0			<1	<1	<1	<1	<1	<1	<8	<8				
Aliphatic TPH >C21-C35	mg/kg	1.0	210000	8	<1	<8	0			<1	<1	<1	<1	<1	<1	<8	<8				
Aliphatic TPH >C35-C44	mg/kg	1.0	No SSV	6	<1	<1	0			<1	<1	<1	<1	<1	<1						
Total Aliphatic Hydrocarbons	mg/kg	5.0	No SSV	8	<5	<10	0			<5	<5	<5	<5	<5	<5	<10	<10				
Aromatic TPH >C5-C7	mg/kg	1.0	0.137	8	<0.001	<1	0			<1	<1	<1	<1	<1	<1	<0.001	<0.001				
Aromatic TPH >C7-C8	mg/kg	1.0	113	8	<0.001	<1	0			<1	<1	<1	<1	<1	<1	<0.001	<0.001				
Aromatic TPH >C8-C10	mg/kg	1.0	20.5	8	<0.001	<1	0			<1	<1	<1	<1	<1	<1	<0.001	<0.001				
Aromatic TPH >C10-C12	mg/kg	1.0	70	8	<1	<1	0			<1	<1	<1	<1	<1	<1	<1	<1				
Aromatic TPH >C12-C16	mg/kg	1.0	165	8	<1	<2	0			<1	<1	<1	<1	<1	<1	<2	<2				
Aromatic TPH >C16-C21	mg/kg	1.0	No SSV	8	<1	<10	0			<1	<1	<1	<1	<1	<1	<10	<10				
Aromatic TPH >C21-C35	mg/kg	1.0	1120	8	<1	<10	0			<1	<1	<1	<1	<1	<1	<10	<10				
Aromatic TPH >C35-C44	mg/kg	1.0	No SSV	6	<1	<1	0			<1	<1	<1	<1	<1	<1						
Total Aromatic Hydrocarbons	mg/kg	5.0	No SSV	8	<5	<10	0			<5	<5	<5	<5	<5	<5	<10	<10				
Total Petroleum Hydrocarbons	mg/kg	10.0	No SSV	6	<10	<10	0			<10	<10	<10	<10	<10	<10	<10	<10				
Naphthalene	mg/kg	0.10	0.829	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Acenaphthylene	mg/kg	0.10	No SSV	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Acenaphthene	mg/kg	0.10	608	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Fluorene	mg/kg	0.10	735	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Phenanthrene	mg/kg	0.10	No SSV	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Anthracene	mg/kg	0.10	10200	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Fluoranthene	mg/kg	0.10	983	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Pyrene	mg/kg	0.10	668	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Benzo[a]anthracene	mg/kg	0.10	BaP Surrogate	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Chrysene	mg/kg	0.10	BaP Surrogate	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Benzo[b]fluoranthene	mg/kg	0.10	BaP Surrogate	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Benzo[k]fluoranthene	mg/kg	0.10	BaP Surrogate	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Benzo[a]pyrene	mg/kg	0.10	4.95	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Indeno(1,2,3-c,d)Pyrene	mg/kg	0.10	BaP Surrogate	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Dibenz(a,h)Anthracene	mg/kg	0.10	BaP Surrogate	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Benzo[g,h,i]perylene	mg/kg	0.10	BaP Surrogate	8	<0.05	<0.1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05				
Total Of 16 PAH's	mg/kg	2.0	No SSV	8	<0.8	<2	0			<2	<2	<2	<2	<2	<2	<0.8	<0.8				
Dichlorodifluoromethane	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001						
Chloromethane	mg/kg	0.001	0.00428	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001						
Vinyl Chloride	mg/kg	0.001	0.0064	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<								



Assessment Criteria :		Residential With Plant Uptake - 1% SOM Sand																	
Use MRL Values?																			
		Unit of Detection	Analytical Assessment Criteria	Number of Samples	Minimum Value	Maximum Value	Number of Exceedances		Location		1507992	1507993	1507994	1507995	1507996	1507997	Tim o'hare	Tim o'hare	
									Sample ID		B3-B4 HP1 TS	B3-B4 HP1 SS	B3-B4 HP2 TS	B3-B4 HP2 SS	B3-B4 HP3 TS	B3-B4 HP3 SS	Imported subsoil	Imported Topsoil	
									Depth		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
									Date		14/09/2022	44818	44818	44818	44818	44818			
									Strata		NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB			
Tribromomethane	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Isopropylbenzene	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Bromobenzene	mg/kg	0.001	0.452	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
1,2,3-Trichloropropane	mg/kg	0.05	No SSV	6	<0.05	<0.05	0			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			
N-Propylbenzene	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
2-Chlorotoluene	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
1,3,5-Trimethylbenzene	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
4-Chlorotoluene	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Tert-Butylbenzene	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
1,2,4-Trimethylbenzene	mg/kg	0.001	1.17	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Sec-Butylbenzene	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
1,3-Dichlorobenzene	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
4-Isopropyltoluene	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
1,4-Dichlorobenzene	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
N-Butylbenzene	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
1,2-Dichlorobenzene	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
1,2-Dibromo-3-Chloropropane	mg/kg	0.05	No SSV	6	<0.05	<0.05	0			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			
1,2,4-Trichlorobenzene	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Hexachlorobutadiene	mg/kg	0.001	No SSV	6	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
1,2,3-Trichlorobenzene	mg/kg	0.002	No SSV	6	<0.002	<0.002	0			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002			
Methyl Tert-Butyl Ether	mg/kg	0.001	27.6	8	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Resorcinol	mg/kg	0.020	No SSV	6	<0.02	<0.02	0			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02			
Phenol	mg/kg	0.020	267	6	<0.02	<0.02	0			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02			
Cresols	mg/kg	0.020	92.2	6	<0.02	<0.02	0			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02			
Xylenols	mg/kg	0.020	No SSV	6	<0.02	<0.02	0			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02			
1-Naphthol	mg/kg	0.020	No SSV	6	<0.02	<0.02	0			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02			
Trimethylphenols	mg/kg	0.020	No SSV	6	<0.02	<0.02	0			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02			
Total Phenols	mg/kg	0.10	No SSV	8	<0.1	<1	0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	

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