

TECHNICAL NOTE

TO: Chris Davis, St William Homes LLP

FROM

James Voysey

EMAIL

James.voysey@atkinsrealis.com

REF

5196431

DATE

14 December 2023

SUBJECT

Block D3 Verification Report

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 D3 soft landscaping areas in Phase 3 of the former Hornsey Gasworks at Mary Neuner Road, Hornsey, N22 6UG.

AtkinsRéalis UK 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
P1	Draft for comment	JV	AN	NK	AN	November 2023
P2	Updated with latest site information	JV/AA	NK	AN	NK	December 2023

TECHNICAL NOTE

1. Introduction

1.1 General

AtkinsRéalis UK Limited (AtkinsRéalis) was commissioned by St William Homes LLP (St William) to produce a Verification Report to assess soft landscaping cover systems installed in Phase 3 – Block D3 of the Clarendon Road, Hornsey development. The site is located to the west of Mary Neuner Road, Hornsey, N22 6UG. Block D3 soft landscaping comprises a number of small rectangular and polygonal shaped areas around the residential blocks which total approximately 786 m².

A site location plan is presented as Figure 1 and a general arrangement plan illustrating the soft landscaped areas within Block D3 detailed in this report, as provided by St William, is presented in Appendix A.

1.2 Background and Objectives

AtkinsRéalis produced a Remediation Strategy [1] and Remediation Method Statement [2] for development works within Phase 3. These documents set out remediation criteria for selected contaminants and qualitative descriptions of materials requiring removal or treatment prior to reuse.

Keltbray Ltd (Keltbray) produced the following verification reports detailing the earthworks and remediation completed within Phase 3 in support of the partial discharge of Condition 31: Land Contamination attached to planning permission HGY/2017/3117:

- Verification Report, Clarendon Road – Phase 3, Stage 1. May 2021 [3]

Verification of the Stage 1 earthworks and remediation to meet the requirements of the approved Remediation Strategy [1]. Works comprised the removal of contaminated Made Ground and London Clay in accordance with the criteria set out in Remediation Method Statement [2].

- Verification Report, Clarendon Road – Phase 3, Stage 2. June 2023 [4]

Verification of the Stage 2 earthworks including reduced level excavations to support construction of the proposed Phase 3 basement. Works were undertaken in accordance with Remediation Strategy [1] and Remediation Method Statement [2].

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 installed within Block D3 between October and December 2023 with the approved Remediation Strategy [1] 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 Block D3 soft landscaping primarily comprised lawns, tree pits, raised planter beds and hedges located around each Block. Landscaped areas will be used by future residents as a communal open space and will be centrally managed and maintained to ensure cover systems are not degraded.
- AtkinsRéalis did not oversee all of 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. AtkinsRéalis does not accept liability for the validity of reports by or on behalf of third parties.
- The Block D3 landscaping was in progress when verification sampling was undertaken. Samples and photographs have been obtained from accessible areas of the site where subsoil and topsoil had been placed and are representative of completed soil profiles. Subsoil and topsoil continued to be 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. St William provided photographic evidence of completion of all zones after the sampling exercise (Appendix G).

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2. Cover System Requirements

The approved Remediation Strategy [1] requires all areas of soft landscaping within Phase 3 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 overlying the Marker Layer.

HHSL materials are required to meet the *residential without private gardens* generic assessment criteria (GAC) as detailed in Appendix A of the Remediation Method Statement [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 250 m³ for HHSL materials, with a minimum of three samples per source.

3. Cover System Installation Details

The cover system within Block D3 was installed by Elite Landscapes Ltd, who were appointed by St William and commenced work in October 2023. A summary of the final soil profile in soft landscaping areas is as follows:

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

- 400 mm topsoil;
- 340-460 mm subsoil; and
- Geotextile filter membrane, placed above gravel/ shingle filter layer.

Shingle CBL comprising a minimum of 100 mm thickness of Class C Starter Layer with a maximum particle size of 20 mm was installed below the Marker Layer. Placement was specified as above Marker Layer in the Remediation Method Statement [2] but was amended to allow the full thickness of 600 mm topsoil and subsoil to be placed.

3.1 Imported Topsoil and Subsoil Details

Both topsoil and subsoil used in the Block D3 soft landscaped areas were supplied by H Sivyier Transport Ltd. They consist of Charlton Topsoil and Wennington Subsoil. The volumes in Table 3-1 are representative of the total amount of soils currently installed.

Shingle forming the CBL was supplied by H Sivyier Transport Ltd. The shingle is quarried aggregate sourced from South East Angerstien. It underlies the Marker Layer has not been sampled as part of this verification Technical Note. Source information is presented in Appendix C.

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

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Table 3-1: Phase 3 – Block D3 import details

Material Type	Detailed Information	Supplier	Source Analysis Date	Approximate Volume (m3)	Area used	Description based on supplier reports
Subsoil	Wennington Subsoil	H Sivyer Transport Ltd	19/10/2023	236	Subsoil surrounding Block D3	Yellowish brown, moist, friable, very slightly calcareous SAND with a single grain structure.
Topsoil	Charlton Topsoil		19/10/2023	236	Topsoil surrounding Block D3	Very dark brown, slightly moist, very slightly calcareous SANDY LOAM.
Shingle	Shingle		N/A	78.6	Used around Block D3 below the Marker Layer	Light brown coarse sub-angular to angular flint GRAVEL.

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 included in Appendix C. Chemical analytical data were screened against the chemical criteria for imported soils presented in Appendix B. Chemical concentrations recorded in samples from the topsoil and subsoil were all recorded below the relevant import criteria and therefore chemically compliant.

The shingle was not tested as it was not part of the verification requirements set out in the Remediation Method Statement [2] and Remediation Strategy [1]. This material has been placed below the Marker Layer and is from a quarried source and is therefore not required to be tested.

4. Verification of Cover System

4.1 Scope of Work

In order to confirm the compliance of the cover system installed within Block D3 with the design documents and associated verification criteria [2], the following scope of works was undertaken by AtkinsRéalis:

- Logging of the soil profile;
- Collection of six representative soil samples for chemical analysis (three samples from imported topsoil and three samples from imported subsoil material to supplement the source data provided by the suppliers); and
- Laboratory chemical analysis as per the list of analytes included in the verification 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. Two hand pits were undertaken and a total of four soil samples were obtained from placed material in Block D3. Two soil samples were collected from labelled bulk bags which confirmed where the soils would be placed. Sample locations are presented in Appendix A and photographs of the hand pits and bulk bags are provided in Appendix D. Further photographs of hand pits were provided to AtkinsRéalis following the completion of all areas in D3, which are included in Appendix G.

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UKAS and MCERTS accredited laboratory testing (where applicable) was scheduled on all samples by AtkinsRéalis for the suite detailed in Table 4-1. The geo-environmental laboratory analysis was undertaken by Chemtest and the chemical analysis 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 within D3 Zone 1 and Zone 3 were obtained via hand pits (HTP1 and HTP2 respectively) from imported and placed subsoil and topsoil. Verification samples for the remaining areas were taken from bulk bags of imported subsoil and topsoil pending placement. Based on the plan provided by St William it is assumed that these samples are representative of each of the sources of topsoil (TS) and subsoil (SS) outlined in Table 3-1. A plan provided by the Client showing Zones 1 to 6 is included as Figure 2.

Placed materials were compliant with the depths detailed in Section 3 and Marker Layer was present at a minimum depth of 750 m bgl. No visual or olfactory evidence of potential contamination were observed. CBL materials were provided by H Sivyer Transport Ltd and single sourced from South East Angerstein. Additionally it was noted that the shingle CBL layer was installed below the Marker Layer rather than above it, as detailed within the Remediation Method Statement [2]. This was to allow a full thickness of 600 mm of topsoil and subsoil to be placed and is not considered have any impact on potential risks to future users or the environment.

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 Marker Layer, subsoil and topsoil from the same source as existing imported soils was provided by St William upon completion of Block D3. Photographs of the soil profiles and imported materials are presented in Appendix D, with supplementary photographs provided by St William presented in Appendix G.

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4.3 Chemical Verification

Chemical analytical data from the six soil samples collected on 24 October 2023 were screened against the verification criteria for shallow soils (Appendix B). The results showed concentrations of all analytes were recorded below the relevant human health criteria approved in the Phase 3 remediation documentation and/or below the limit of detection. The full soil screening sheets are presented in Appendix F.

4.4 Sample Deviations

No analytes pertaining to any of the samples had deviated during the testing phase as confirmed by the laboratory report in Appendix B.

5. Conclusions

Two verification samples were collected each from in-situ topsoil and subsoil (four samples in total) during the site visit on 24 October 2023. An additional two samples were taken from bulk bags prior to placement. Chemical analytical data from these samples, as well as two source samples, were screened against the verification criteria for shallow soils as presented in the approved Phase 3 Remediation Strategy [1].

No visual or olfactory indicators of potential contamination were observed during the hand pits, or in general site observations. The thickness of the cover system and presence of Marker Layer were compliant with the Phase 3 Remediation Strategy [1] and the soil profiles set out in Section 3.

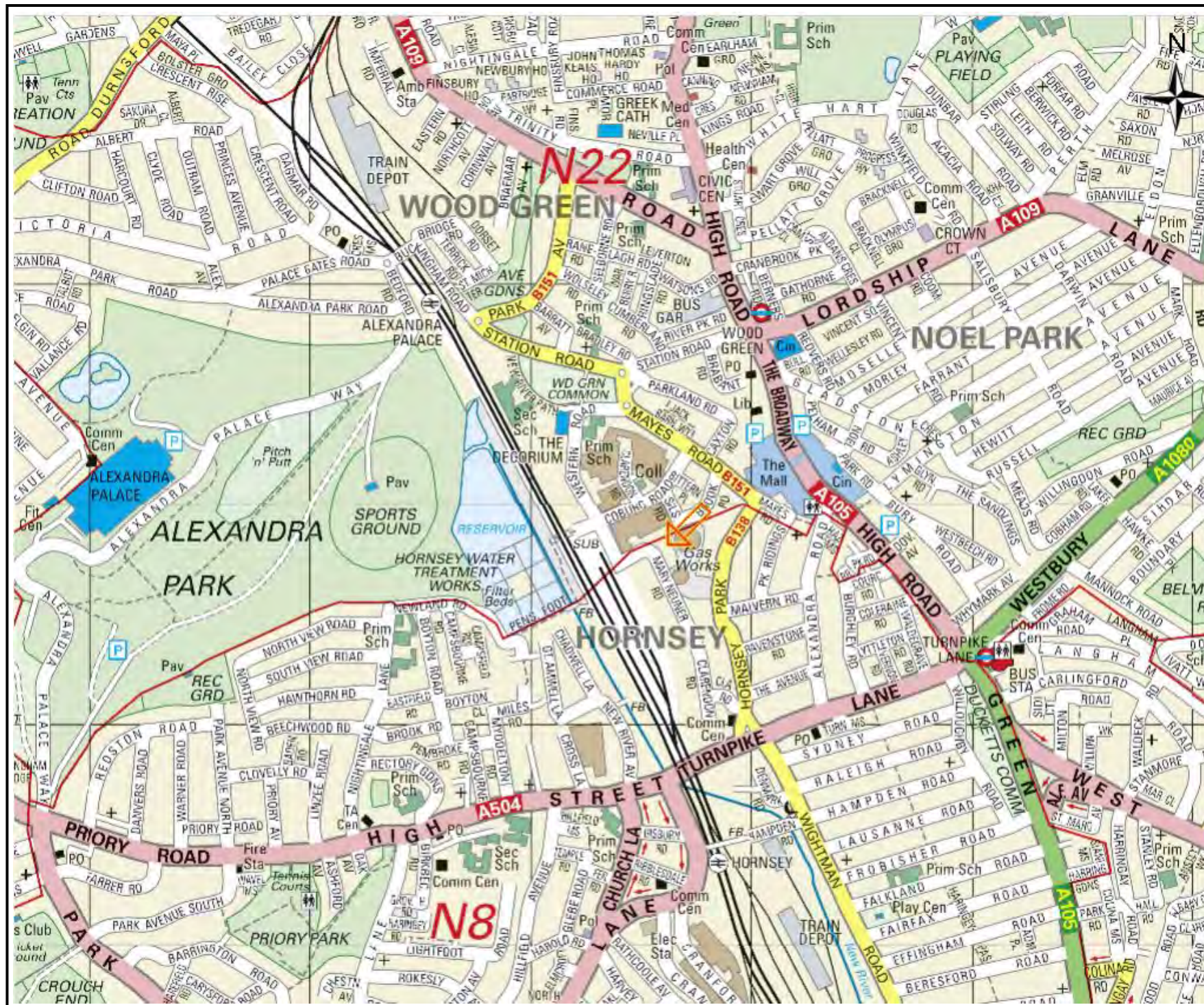
As all areas of soft landscaping had not been fully completed when the sampling took place, confirmation of the cover system installation, including the placement of Marker Layer, subsoil and topsoil from the same source as existing soils was provided by St William upon completion of D3.

In summary, the verification works undertaken by AtkinsRéalis confirm that the cover system within Block D3 meets the requirement of the approved Remediation Strategy [1] to mitigate potential risks to human health.

6. References

- [1] Atkins , "Phase 3, Clarendon Road, Hornsey, Remediation Strategy Rev 4.0," May 2020.
- [2] Atkins Ltd, "Phase 3, Clarendon Road, Hornsey: Remediation Method Statement, Rev 4.0," May 2020.
- [3] Keltbray Ltd, "Verification Report RE6067-VR-AH-November2020-03-Phase 3," May 2021.
- [4] Keltbray, "Verification Report RE6089-VR-GG-Phase 3B," 2023.

Figures



Legend

ATKINS

Member of the SNC-Lavalin Group

Client

St William

Designed for life

Project

Clarendon Road - Hornsey

Drawing Title

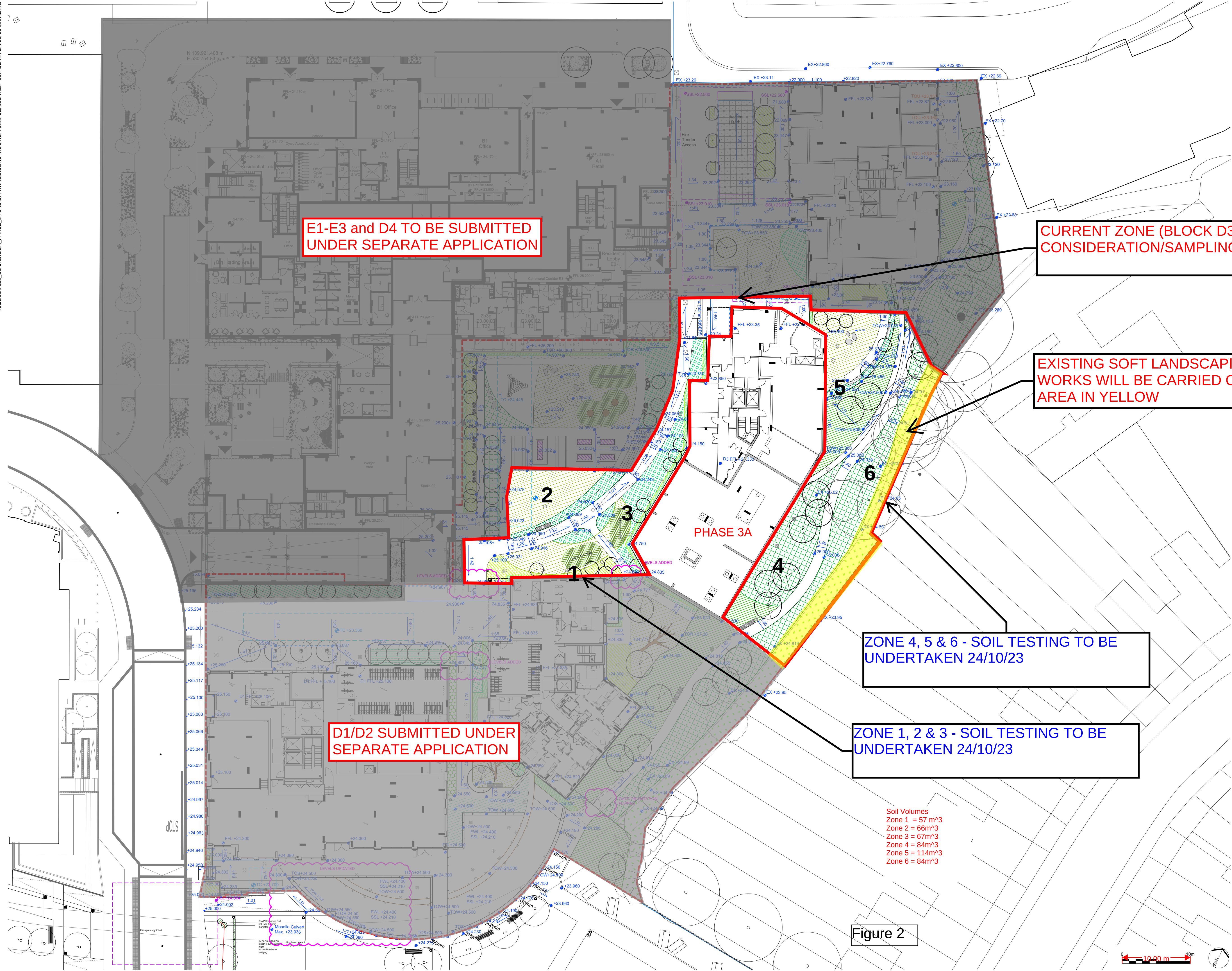
Figure 1: Site Location

Author

J Voysey

Date & Revision

07/11/23



E1-E3 and D4 TO BE SUBMITTED UNDER SEPARATE APPLICATION

CURRENT ZONE (BLOCK D3) UNDER CONSIDERATION/SAMPLING

EXISTING SOFT LANDSCAPING. NO WORKS WILL BE CARRIED OUT TO THIS AREA IN YELLOW

ZONE 4, 5 & 6 - SOIL TESTING TO BE UNDERTAKEN 24/10/23

ZONE 1, 2 & 3 - SOIL TESTING TO BE UNDERTAKEN 24/10/23

D1/D2 SUBMITTED UNDER SEPARATE APPLICATION

Soil Volumes
Zone 1 = 57 m³
Zone 2 = 66m³
Zone 3 = 67m³
Zone 4 = 84m³
Zone 5 = 114m³
Zone 6 = 84m³

Figure 2

- LEGEND
- RED LINE BOUNDARY
 - LEVELS
 - EXISTING LEVEL
 - FINISH FLOOR LEVEL (BY ARCHITECTS)
 - PROPOSED LEVEL
 - TOP OF WALL
 - TOP OF PLANTER
 - TOP OF RAILING
 - STRUCTURAL SLAB LEVEL (REFER ENGINEERS INFORMATION)
 - TOP OF CELL (ATTENUATION BY OTHERS)
 - ATTENUATION CELLS (BY OTHERS)
 - CONTOURS
 - SLOT DRAIN

- 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).

C17	Levels added to gates, PC levels updated	AH	16/05/23
C16	VE Updates	AH	03/02/23
C15	Architectural layouts updated	AH	20/05/22
C14	Levels and slot drain updates	AH	14/03/22
C13	Slot drains added	AH	11/02/22
C12	General updates	AH	11/11/21
C11	Updated for LABC	AH	15/07/21
C10	Updated to S278 and D4, steps removed, levels updated	AH	23/06/21
C9	Central courtyard amended to suit Block E and VE	AH	26/05/21
C8	Mary Neuner courtyard, D1 and Block E building updated	AH	10/05/21
C7	Levels updated to Moselle and Brooke Road courtyard	AH	07/05/21
C6	Issued for Construction	AH	08/12/20
C5	Issued for Construction	AH	27/07/20
C4	Additional levels added, slab levels updated	AH	17/07/20
C3	Updates to levels for D4 basement and Energy Room	AH	04/06/20
C2	Updates for drainage and architecture amendments	AH	21/04/20
C1	Issued for Construction	AH	17/04/20
REV.	DESCRIPTION	ATP	DATE

LDA DESIGN

PROJECT TITLE
CLARENDON ROAD PHASE 3

DRAWING TITLE
Phase 3 Sitewide Levels Plan

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

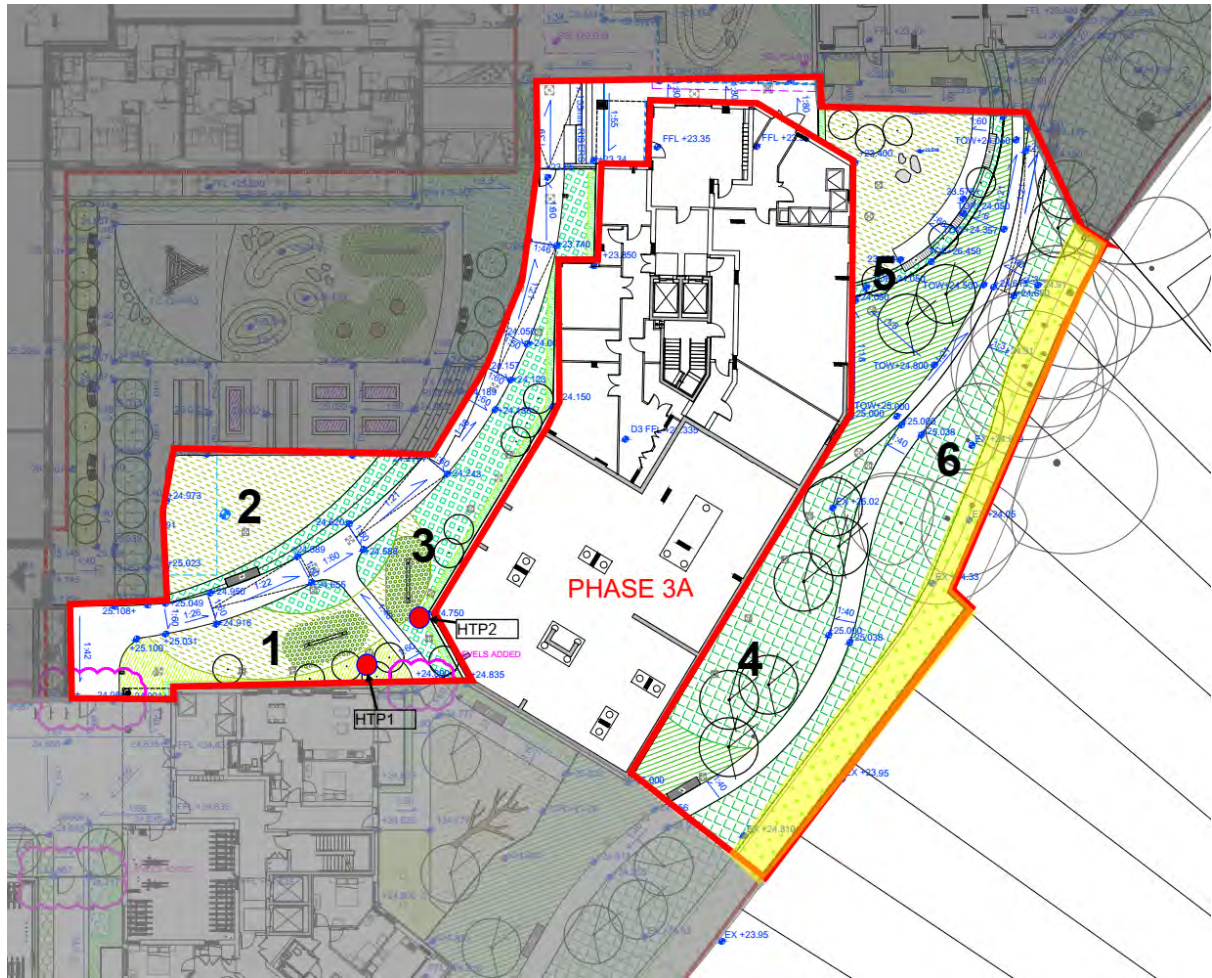
DWG. NO. W257-LDA-DD-XX-DR-LS-90-3007

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

Appendix A. General Arrangement



Appendix B. Assessment Criteria

Generic Assessment Criteria

The GACs for the identified contaminants of concern are provided in Table B-1 and Table B-2 for 0.0-1.0 m bgl and >1.0 m bgl, respectively.

Table B-1: GACS for Human Health – Soils from 0.0 to 1.0 m bgl (mg/kg unless stated otherwise)

Contaminant of Concern	Residential without Private Gardens
<i>General Inorganics</i>	
Asbestos	No detection
Free Cyanide	3.40E+01
<i>Heavy Metals/Metalloids</i>	
Arsenic	3.99E+01
Cadmium (lifetime exposure)	1.49E+02
Chromium III	1.67E+04
Chromium VI	2.05E+01
Lead	3.13E+02
Mercury	2.44E+02
Nickel	1.88E+02
Selenium	5.95E+02
Zinc	4.70E+04
<i>BTEX</i>	
Benzene	0.31E-01
Toluene	3.12E+02
Ethylbenzene	8.50E+01
Total Xylenes,	2.68E+01
<i>TPH Bands</i>	
TPH Aliphatic > C ₅ -C ₆	4.29E+01
TPH Aliphatic > C ₆ -C ₈	9.96E+01
TPH Aliphatic > C ₈ -C ₁₀	1.39E+01
TPH Aliphatic > C ₁₀ -C ₁₂	8.18E+01
TPH Aliphatic > C ₁₂ -C ₁₆	3.85E+02
TPH Aliphatic > C ₁₆ -C ₃₅	2.12E+05
TPH Aromatic > C ₅ -C ₇	0.31E-01
TPH Aromatic > C ₇ -C ₈	3.12E+02
TPH Aromatic > C ₈ -C ₁₀	2.27E+01
TPH Aromatic > C ₁₀ -C ₁₂	1.39E+02
TPH Aromatic > C ₁₂ -C ₁₆	7.03E+02
TPH Aromatic > C ₁₆ -C ₂₁	1.93E+03
TPH Aromatic > C ₂₁ -C ₃₅	1.93E+03
Acenaphthene	2.68E+03
Anthracene	3.43E+04
Benzo(a)pyrene	5.34E+00
Fluoranthene	4.88E+03
Fluorene	3.26E+03
Naphthalene	8.52E-01
Pyrene	3.65E+03
1,1-Dichloroethane	1.19E+00
1,2-Dichloroethane (1,2-DCA)	8.94E-03
cis-1,2-Dichloroethene	5.74E-02

Contaminant of Concern	Residential without Private Gardens
trans-1,2-Dichloroethene	9.66E-02
1,1,1-Trichloroethane (1,1,1-TCA)	3.20E+00
1,1,2-Trichloroethane (1,1,2-TCA)	4.30E-01
1,1,1,2-Tetrachloroethane	1.89E+00
1,1,2,2-Tetrachloroethane	4.74E+00
Trichloroethene (TCE)	1.59E-03
Tetrachloroethene (PCE)	6.78E-01
Trichloromethane (Chloroform)	4.72E-01
Carbon Tetrachloride / Tetrachloromethane	1.47E-01
Vinyl Chloride (VC)	3.00E-04
Phenol	5.70E+02
Notes All values in mg/kg, unless otherwise stated. No material containing visual/olfactory evidence of contamination is permitted. Material imported onto site produced under WRAP protocol should be sampled accordingly as per the source requirements. Material imported using DoWCoP should be assessed and adhere to the objective of DoWCoP alongside the site specific GAC criteria.	

Table B-2: GACS for Human Health – Soils > 1.0 m bgl (mg/kg unless stated otherwise)

Contaminant of Concern	Residential without Private Gardens
<i>General Inorganics</i>	
Asbestos	0.1% (a)
Free Cyanide	NO GAC
<i>Heavy Metals/Metalloids</i>	
Arsenic	NO GAC
Cadmium	NO GAC
Chromium III	NO GAC
Chromium VI	NO GAC
Lead	NO GAC
Mercury	NO GAC
Nickel	NO GAC
Selenium	NO GAC
Zinc	NO GAC
<i>BTEX</i>	
Benzene	2.51E+00
Toluene	3.15E+02
Ethylbenzene	8.56E+01
Xylenes	2.69E+01
<i>TPH Bands</i>	
TPH Aliphatic > C ₅ -C ₆	4.29E+01
TPH Aliphatic > C ₆ -C ₈	9.96E+01
TPH Aliphatic > C ₈ -C ₁₀	1.39E+01
TPH Aliphatic > C ₁₀ -C ₁₂	1.41E+02
TPH Aliphatic > C ₁₂ -C ₁₆	NO GAC

Contaminant of Concern	Residential without Private Gardens
TPH Aliphatic > C ₁₆ -C ₂₁	NO GAC
TPH Aliphatic > C ₂₁ -C ₃₅	NO GAC
TPH Aromatic > C ₅ -C ₇	2.51E+00
TPH Aromatic > C ₇ -C ₈	3.15E+02
TPH Aromatic > C ₈ -C ₁₀	2.28E+01
TPH Aromatic > C ₁₀ -C ₁₂	1.41E+02
TPH Aromatic > C ₁₂ -C ₁₆	NO GAC
TPH Aromatic > C ₁₆ -C ₂₁	NO GAC
TPH Aromatic > C ₂₁ -C ₃₅	NO GAC
<i>PAHs</i>	
Acenaphthene	NO GAC
Anthracene	NO GAC
Benzo(a)pyrene	NO GAC
Fluoranthene	NO GAC
Fluorene	NO GAC
Naphthalene	5.68E+00
Pyrene	NO GAC
<i>Other Organics</i>	
1,1-Dichloroethane	1.19E+00
1,2-Dichloroethane (1,2-DCA)	8.94E-03
cis-1,2-Dichloroethene	5.74E-02
trans-1,2-Dichloroethene	9.66E-02
1,1,1-Trichloroethane (1,1,1-TCA)	3.20E+00
1,1,2-Trichloroethane (1,1,2-TCA)	4.31E-01
1,1,1,2-Tetrachloroethane	1.89E+00
1,1,2,2-Tetrachloroethane	4.75E+00
Trichloroethene (TCE)	1.59E-03
Tetrachloroethene (PCE)	6.78E-01
Trichloromethane (Chloroform)	4.72E-01
Carbon Tetrachloride / Tetrachloromethane	1.47E-01
Vinyl Chloride (VC)	3.00E-04
Phenol	6.21E+02

Notes

All values in mg/kg, unless otherwise stated.

No material containing free-phase product is permitted.

Material imported onto site produced under WRAP protocol should be sampled accordingly as per the source requirements.

Material imported using DoWCoP should be assessed and adhere to the objective of DoWCoP alongside the site specific GAC criteria.

No GAC: modelled compound did not present an unacceptable risk to the applicable receptor along the modelled pathway.

(a): Asbestos criteria assumes the presence of the relevant thickness of Human Health Separation Layer is placed which meets the criteria presented in Table B-1, including areas of permanent hard standing/structures. In the event that this is not present, the criteria presented in Table B-1 will apply.

Appendix C. Source Certificates



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Dan Batinas
H. Sivyer Transport Ltd
160 Sydenham Road
London
SE26 5JZ

19th October 2023
Our Ref: TOHA/23/1130/1/SS
Your Ref: PO 184351

Dear Sirs

Topsoil Analysis: Charlton Topsoil

We have completed the analysis of the soil sample recently submitted, referenced *Charlton 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. Sivyer Transport Ltd site.

SAMPLE EXAMINATION

The sample was described as a very dark brown (Munsell Colour 10YR 2/2), slightly moist, friable, very slightly calcareous SANDY LOAM with a weakly developed, very fine to fine granular and subangular blocky structure*. The sample was moderately stony 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: Charlton 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. However, further detailed particle size analysis revealed the sample to have a high proportion of particles in the *very fine* (0.05-0.15mm), *fine* (0.15-0.25mm) and *medium* (0.25-0.50mm) fractions. Topsoils such as this are prone to self-compaction when initially placed in a landscape environment, which can lead to limited drainage and poor aeration, particularly if the soil does not display a well-defined structure. To reduce the risk of self-compaction, we recommend placing this soil to a maximum depth of 300mm, which is in line with *BS3882:2015*, section A.3.

The stone content of the sample was moderate comprising entirely of stones <20mm in size and, as such, stones are unlikely to constitute a limitation 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 provided 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 were not present at levels that would be harmful to plants.

The electrical conductivity value by CaSO₄ extract (3316 µS/cm - BS3882 requirement) slightly exceeded the maximum specified value (3300 µS/cm) given in BS3882:2015 – Table 1. Further testing of electrical conductivity by water extract indicates that excess soluble salts should not present a significant risk to plants.

Organic Matter and Fertility Status

The sample was well supplied with organic matter and all major plant nutrients. The level of extractable potassium (1621 mg/l) slightly exceeded the maximum permissible value (1500 mg/l) given in BS3882:2015 – Table 1.

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 recommendation 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 assessment criteria, the concentrations that affect human health have been compared with the *residential with homegrown produce* land use in 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 (C4SLs) for Assessment of Land Affected by Contamination – Policy Companion Document* (2014).

Of the potential contaminants determined, none was found at levels that exceed 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 moderate stone content. The sample was adequate to well supplied with organic matter and all major plant nutrients. Of the potential contaminants determined, none exceeded their guideline values.

To conclude, based on our findings, the topsoil represented by this sample would be considered suitable for general landscape purposes (trees, shrubs and amenity grass), provided species with a wide pH tolerance or those known to prefer alkaline soils are selected and the physical condition of the soil is satisfactory. The slightly elevated potassium and electrical conductivity levels should fall when the soil is wetted by rainfall or irrigation impacts.

To minimise the risk of self-compaction, we recommend placing this soil to a maximum depth of **300mm**.

The sample was largely compliant with the requirements of the British Standard for Topsoil (BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil) with the exception of a slightly elevated electrical conductivity value (CaSO₄ extract) and extractable potassium content.

On this occasion, these non-compliances are considered minor when reviewed in the context of all the other results and considering the proposed end-use of this soil.

Soil Handling Recommendations

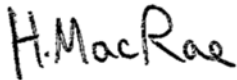
It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, resspreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is sufficiently dry to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



Harriet MacRae
BSc MSc
Graduate Soil Scientist



Aaron Cross
BSc MSc
Soil Scientist

For and on behalf of Tim O'Hare Associates LLP



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	H Sivyer Transport Ltd
Project:	Charlton Topsoil
Job:	Topsoil Analysis - BS3882:2015
Date:	19/10/2023
Job Ref No:	TOHA/23/1130/1/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	

Charlton Topsoil	
	15
	8
	19
	24
	25
	6
	3
	77
	SL
	19
	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
	1206
	3316
	4.8
	5.1
	0.24
	12
	89
	1621
	160

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

	7
	< 0.2
	12
	< 1.8
	20
	33
	< 0.3
	6.2
	< 1.0
	59
	2.2
	< 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
	0.15
	< 0.05
	0.16
	< 0.05
	0.29
	0.22
	0.1
	0.16
	0.21
	0.08
	0.12
	0.1
	< 0.05
	0.14
	1.7

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

	< 0.10
	< 0.10
	< 0.10
	< 1.0
	< 2.0
	< 8.0
	< 8.0
	< 10
	< 0.10
	< 0.10
	< 0.10
	< 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

	< 0.005
	< 0.005
	< 0.005
	< 0.005
	< 0.005
	< 0.005

SL = SANDY LOAM

Visual Examination

The sample was described as a very dark brown (Munsell Colour 10YR 2/2), slightly moist, friable, very slightly calcareous SANDY LOAM with a weakly developed, very fine to fine granular and subangular blocky structure. The sample was moderately stony 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.

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

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H. MacRae

Harriet MacRae
BSc MSc
Graduate Soil Scientist



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Dan Batinas
H. Sivyer Transport Ltd
160 Sydenham Road
London
SE26 5JZ

19th October 2023
Our Ref: TOHA/23/1130/2/SS
Your Ref: PO 184351

Dear Sirs

Soil Analysis Report: Wennington Subsoil

We have completed the analysis of the sample recently submitted, referenced *Wennington 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. Sivyer Transport Ltd site.

SAMPLE EXAMINATION

The sample was described as a yellowish brown (Munsell Colour 10YR 5/8), moist, friable, very slightly calcareous SAND with a single grain structure. The sample was moderately stony, comprising stones up to 30mm in size, and no unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

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: Wennington 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);
- 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 sufficiently narrow particle size distribution with a predominance of *medium sand* (0.25-0.50mm), *coarse sand* (0.50-1.0mm) and *very coarse sand* (1.0-2.0mm). This is acceptable for subsoil in general landscape applications as porosity levels are maintained in a compacted state and the risk of particle interpacking is minimised. The subsoil represented by this sample would be described as 'free-draining'.

The particle size distribution falls outside of the range indicated in *BS8601:2013 – Figure 1*, on account of the high sand content.

The stone content of the sample was moderately high and exceeded the limit given in *BS8601:2013 – Table 1*. Stones should not restrict the use of this soil where reasonable depths of topsoil (300mm+) are to be placed over the subsoil (eg. tree pits and shrub planting beds). However, the stones may have an impact where a thinner layer of topsoil is placed over this subsoil (i.e. less than 300mm), for example, in amenity grass lawn areas.

pH and Electrical Conductivity Values

The sample was strongly alkaline in reaction (pH 8.1). 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 (0.6%) and compliant with *BS8601:2013 – Table 1*.

Potential Contaminants

With reference to *BS8601:2013 – Section 4.2: Note 2*, there is a requirement to confirm levels of potential contaminants in relation to the subsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific assessment criteria, the concentrations of selected potential contaminants that affect human health have been assessed for the concentrations that affect human health have been assessed for *residential* end-use 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 *BS8601:2013 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the sample for use as a subsoil 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.

From the soil examination and subsequent laboratory analysis, the sample was described as a strongly alkaline, non-saline, very slightly calcareous sand, with a single grain structure and moderate stone content. The organic matter content was low and consistent with subsoil. Of the potential contaminants determined, none exceeded their respective guideline values.

To conclude, based on our findings, the subsoil represented by this sample would be considered suitable for landscape applications where a free-draining subsoil is required or where there will be a low drought risk provided species tolerant of alkaline soils are selected. Additional irrigation may need to be considered for plant species that demand moist conditions, depending on the composition of the overlying topsoil.

The sample was largely compliant with the requirements of the British Standard for Subsoil (*BS8601:2013 – Specification for subsoil and requirements for use – Table 1, Multipurpose Subsoil*) with the exception of the overall particle size distribution (high sand content). On this occasion, this non-compliance is considered minor when reviewed in the context of all the other results.

Soil Handling Recommendations

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

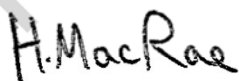
"Soils generally lose strength and become less resistant to damage as they become wetter; therefore, it is essential that they are stripped, handled and trafficked only in the appropriate conditions of weather and soil moisture, and with suitable machinery. If sustained heavy rainfall (e.g. >10 mm in 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



Harriet MacRae
BSc MSc
Graduate Soil Scientist



Aaron Cross
BSc MSc
Soil Scientist

For & on behalf of Tim O'Hare Associates LLP



Benzene	mg/kg	MCERTS
Toluene	mg/kg	MCERTS
Ethylbenzene	mg/kg	MCERTS
m-xylene	mg/kg	MCERTS
p-xylene	mg/kg	MCERTS
o-xylene	mg/kg	MCERTS

< 0.005
< 0.005
< 0.005
< 0.005
< 0.005
< 0.005

The sample was described as a yellowish brown (Munsell Colour 10YR 5/8), moist, friable, very slightly calcareous SAND with a single grain structure. The sample was moderately stony, comprising stones up to 30mm in size, and no unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

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Harriet MacRae
BSc MSc
Graduate Soil Scientist

TECHNICAL NOTE

Appendix D. Photographs

Photo No. 1	Date: 24/10/23	
Description: Installation of top soil in Zone 1 block D3.		

Photo No. 2	Date: 24/10/23
Description: Placed top soil sub soil Zone 1 and area awaiting installation.	

A photograph of a construction site. On the left, there is a brick building with a window. The ground in front of it is a large, muddy excavation area. A worker wearing a yellow safety vest and a white hard hat is standing in the background near a blue scaffolding structure. In the foreground, there is a large, flat, rusty metal plate. The ground is uneven and covered in mud and debris.

TECHNICAL NOTE

Photo No. 3	Date: 24/10/23
-----------------------	--------------------------

Description:
D3 Zone 2 still in work.



Photo No. 4	Date: 24/10/23
-----------------------	--------------------------

Description:
D3 Zone 3 work in progress top soil and sub soil installed right of photo. White Marker Layer present left of photo under sub soil. Shingle under lay present left of photo.



TECHNICAL NOTE

Photo No. 5	Date: 24/10/23
Description: D3 Zone 1 HTP1 top soil thickness.	



Photo No. 6	Date: 24/10/23
Description: Zone 1 HTP1 membrane proven.	



Shot on OnePlus
Greater London England - 24/10/23 09:52
Powered by OneCamera

TECHNICAL NOTE

Photo No. 7	Date: 24/10/23
Description: D3 HTP2 Zone 3 to sub soil.	



Photo No. 8	Date: 24/10/23
Description: D3 HTP2 membrane proven under sub soil.	



Shot on OnePlus
Greater London, England - 20231024 16:05:12
Powered by Triple Camera

TECHNICAL NOTE

Photo No. 9	Date: 24/10/23	
Description: Sub soil for Block D3 Zone 2, 4,5 and 6.		

Photo No. 10	Date: 24/10/23
Description:	
D3 top soil for Zone 2, 4, 5 and 6.	

Appendix E. Laboratory Certificates



Final Report

Report No.: 23-35853-1

Initial Date of Issue: 02-Nov-2023

Re-Issue Details:

Client AtkinsRealis UK Limited

Client Address: Woodcote Grove
Ashley Road
Epsom
KT18 5BW

Contact(s): Anna Nash
James Voysey
Nick Ketchell

Project 5202188 Hornsey

Quotation No.: Q23-31691

Date Received: 26-Oct-2023

Order No.: 5216033

Date Instructed: 26-Oct-2023

No. of Samples: 6

Turnaround (Wkdays): 5

Results Due: 01-Nov-2023

Date Approved: 02-Nov-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: 5202188 Hornsey

Client: AtkinsRealis UK Limited	Chemtest Job No.: 23-35853					23-35853	23-35853	23-35853	23-35853	23-35853	23-35853
Quotation No.: Q23-31691	Chemtest Sample ID.: 1722425					1722425	1722426	1722427	1722428	1722429	1722430
Order No.: 5216033	Client Sample Ref.:					TS1	TS2	TS3	SS1	SS2	SS3
	Sample Location:					HTP1	HTP2	BAG	HTP1	HTP2	BAG
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					0.20	0.20		0.60	0.60	0.60
	Date Sampled:					24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023
	Asbestos Lab:					DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
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	No Asbestos Detected
Moisture	N	2030	%	0.020	15	14	16		9.4	7.3	8.8
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones and Roots	Stones	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Loam	Sand	Loam	Sand	Sand	Sand	Sand
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	M	2455	mg/kg	0.5	5.2	4.6	6.6	7.3	8.9	8.5	
Cadmium	M	2455	mg/kg	0.10	0.10	< 0.10	0.16	0.30	< 0.10	< 0.10	
Chromium	M	2455	mg/kg	0.5	15	12	14	13	21	16	
Mercury	M	2455	mg/kg	0.05	0.11	0.10	0.11	< 0.05	< 0.05	< 0.05	
Nickel	M	2455	mg/kg	0.50	6.5	5.4	8.4	11	15	11	
Lead	M	2455	mg/kg	0.50	50	39	62	10	13	19	
Selenium	M	2455	mg/kg	0.25	0.41	0.31	0.41	0.40	0.43	0.42	
Zinc	M	2455	mg/kg	0.50	50	48	67	25	32	29	
Chromium (Trivalent)	N	2490	mg/kg	1.0	15	12	14	13	21	16	
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	2.1	< 2.0	2.0	< 2.0	< 2.0	< 2.0	
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	< 3.0	< 3.0	6.4	< 3.0	3.3	< 3.0	
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	< 10	
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	< 5.0	< 5.0	9.4	< 5.0	< 5.0	< 5.0	
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	< 10	
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	1.7	< 1.0	< 1.0	
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	

Results - Soil

Project: 5202188 Hornsey

Client: AtkinsRealis UK Limited	Chemtest Job No.:				23-35853	23-35853	23-35853	23-35853	23-35853	23-35853
Quotation No.: Q23-31691	Chemtest Sample ID.:				1722425	1722426	1722427	1722428	1722429	1722430
Order No.: 5216033	Client Sample Ref.:				TS1	TS2	TS3	SS1	SS2	SS3
	Sample Location:				HTP1	HTP2	BAG	HTP1	HTP2	BAG
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.20	0.20		0.60	0.60	0.60
	Date Sampled:				24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD						
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	4.8	< 2.0	< 2.0	11	10	16
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	20	27	77	3.9	13	< 2.0
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	33	3.8	13	1.5	11	< 1.0
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	25	29	79	16	24	18
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	57	33	92	18	35	18
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	28	32	88	17	28	18
Total EPH >C10-C40	N	2690	mg/kg	10.00	61	35	100	18	39	18
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10	0.14	< 0.10	< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	0.21	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	0.15	< 0.10	< 0.10	< 0.10
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10	0.24	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	0.29	4.6	< 0.10	< 0.10	< 0.10
Anthracene	M	2700	mg/kg	0.10	< 0.10	0.25	0.73	< 0.10	< 0.10	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	0.54	0.57	5.2	< 0.10	0.28	0.19
Pyrene	M	2700	mg/kg	0.10	0.76	0.66	4.6	< 0.10	0.67	0.21
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	0.24	1.1	< 0.10	< 0.10	< 0.10
Chrysene	M	2700	mg/kg	0.10	< 0.10	0.40	1.3	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	1.2	3.3	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	0.26	0.61	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	0.45	1.1	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	4.3	23	< 2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Chloromethane	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Vinyl Chloride	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Bromomethane	M	2760	mg/kg	0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Chloroethane	U	2760	mg/kg	0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Trichlorofluoromethane	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,1-Dichloroethene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Trans 1,2-Dichloroethene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,1-Dichloroethane	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
cis 1,2-Dichloroethene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Bromochloromethane	U	2760	mg/kg	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Trichloromethane	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,1,1-Trichloroethane	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Results - Soil

Project: 5202188 Hornsey

Client: AtkinsRealis UK Limited	Chemtest Job No.:		23-35853	23-35853	23-35853	23-35853	23-35853	23-35853
Quotation No.: Q23-31691	Chemtest Sample ID.:		1722425	1722426	1722427	1722428	1722429	1722430
Order No.: 5216033	Client Sample Ref.:		TS1	TS2	TS3	SS1	SS2	SS3
	Sample Location:		HTP1	HTP2	BAG	HTP1	HTP2	BAG
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):		0.20	0.20		0.60	0.60	0.60
	Date Sampled:		24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023
	Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD				
Tetrachloromethane	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,1-Dichloropropene	U	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Benzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,2-Dichloroethane	M	2760	mg/kg	0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Trichloroethene	N	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,2-Dichloropropane	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Dibromomethane	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Bromodichloromethane	M	2760	mg/kg	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
cis-1,3-Dichloropropene	N	2760	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
Toluene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Trans-1,3-Dichloropropene	N	2760	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
1,1,2-Trichloroethane	M	2760	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
Tetrachloroethene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,3-Dichloropropane	U	2760	mg/kg	0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Dibromochloromethane	U	2760	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
1,2-Dibromoethane	M	2760	mg/kg	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Chlorobenzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,1,1,2-Tetrachloroethane	M	2760	mg/kg	0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Ethylbenzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
m & p-Xylene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
o-Xylene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Styrene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Tribromomethane	U	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Isopropylbenzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Bromobenzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,2,3-Trichloropropane	N	2760	mg/kg	0.050	< 0.050	< 0.050	< 0.050	< 0.050
N-Propylbenzene	U	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
2-Chlorotoluene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,3,5-Trimethylbenzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
4-Chlorotoluene	U	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Tert-Butylbenzene	U	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,2,4-Trimethylbenzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Sec-Butylbenzene	U	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,3-Dichlorobenzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
4-Isopropyltoluene	N	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,4-Dichlorobenzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
N-Butylbenzene	U	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,2-Dichlorobenzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Results - Soil

Project: 5202188 Hornsey

Client: AtkinsRealis UK Limited	Chemtest Job No.:					23-35853	23-35853	23-35853	23-35853	23-35853	23-35853
Quotation No.: Q23-31691	Chemtest Sample ID.:					1722425	1722426	1722427	1722428	1722429	1722430
Order No.: 5216033	Client Sample Ref.:					TS1	TS2	TS3	SS1	SS2	SS3
	Sample Location:					HTP1	HTP2	BAG	HTP1	HTP2	BAG
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					0.20	0.20		0.60	0.60	0.60
	Date Sampled:					24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023
	Asbestos Lab:					DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD							
1,2-Dibromo-3-Chloropropane	U	2760	mg/kg	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,2,4-Trichlorobenzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Hexachlorobutadiene	U	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,2,3-Trichlorobenzene	U	2760	mg/kg	0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Methyl Tert-Butyl Ether	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Phenols	M	2920	mg/kg	0.10	0.21	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
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
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane 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.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
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 Without Plant Uptake - 1% SOM Sand																
Use MRL Values?																		
		Unit of Detection	Analytical Assessment Criteria	Number of samples	Minimum Value	Maximum Value	Number of exceedances	Locations of Strata	Location		HTP1	HTP2	Zone 2,4,5,6	HTP1	HTP2	Zone 2,4,5,6	Charlton Topsoil	Wennington Subsoil
									Sample ID		TS1	TS2	TS3	SS1	SS2	SS3	Topsoil Analysis	Subsoil Analysis
									Depth		0.20m	0.20m	n/a	0.60m	0.60m	n/a	n/a	n/a
									Date		24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023	24-Oct-2023	19-Oct-2023	19-Oct-2023
ACM Type		N/A	No SSV	0	-	-	0	N/A										
Asbestos Identification		N/A	No SSV	6	-	-	0	N/A			No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	-	-
Moisture	%	0.020	No SSV	6	7.3	16	0	N/A			15	14	16	9.4	7.3	8.8		
Soil Colour		N/A	No SSV	6	-	-	0	N/A			Brown	Brown	Brown	Brown	Brown	Brown		
Other Material		N/A	No SSV	6	-	-	0	N/A			Stones and Rocks	Stones	Stones	Stones	Stones	Stones		
Soil Texture		N/A	No SSV	6	-	-	0	N/A			Loam	Sand	Loam	Sand	Sand	Sand		
Cyanide (Free)	mg/kg	0.50	34	6	<0.5	<0.5	0	N/A			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Arsenic	mg/kg	0.5	39.9	8	4.6	9	0	N/A			5.2	4.6	6.6	7.3	8.9	8.5	7	9
Cadmium	mg/kg	0.10	149	8	<0.1	0.3	0	N/A			0.1	<0.1	0.16	0.3	<0.1	<0.1	<0.2	<0.2
Chromium	mg/kg	0.5	16700	8	11	21	0	N/A			15	12	14	13	21	16	12	11
Mercury	mg/kg	0.05	8	8	<0.05	<0.3	0	N/A			0.11	0.1	0.11	<0.05	<0.05	<0.05	<0.3	<0.3
Nickel	mg/kg	0.50	188	8	5.4	15	0	N/A			6.5	5.4	8.4	11	15	11	6.2	11
Lead	mg/kg	0.50	313	8	6	62	0	N/A			50	39	62	10	13	19	33	6
Selenium	mg/kg	0.25	595	8	<0.31	<1	0	N/A			0.41	0.31	0.41	0.4	0.43	0.42	<1	<1
Zinc	mg/kg	0.50	47000	8	18	67	0	N/A			50	48	67	25	32	29	59	18
Chromium (Trivalent)	mg/kg	1.0	No SSV	8	11	21	0	N/A			15	12	14	13	21	16	12	11
Chromium (Hexavalent)	mg/kg	0.50	20.5	8	<0.5	<1.8	0	N/A			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.8	<1.8
Aliphatic VPH >C5-C6	mg/kg	0.05	No SSV	7	<0.05	<1	0	N/A			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<1
Aliphatic VPH >C6-C7	mg/kg	0.05	No SSV	6	<0.05	<0.05	0	N/A			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
Aliphatic VPH >C7-C8	mg/kg	0.05	No SSV	6	<0.05	<0.05	0	N/A			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
Aliphatic VPH >C8-C10	mg/kg	0.10	No SSV	8	<0.1	<1	0	N/A			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1
Total Aliphatic VPH >C5-C10	mg/kg	0.25	No SSV	6	<0.05	<0.05	0	N/A			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
Aliphatic TPH >C10-C12	mg/kg	2.00	81.8	8	<0.25	<1	0	N/A			<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1	<1
Aliphatic TPH >C8-C10	mg/kg	0.05	13.9	8	<2	2.1	0	N/A			2.1	<2	2	<2	<2	<2	<2	<2
Aliphatic TPH >C12-C16	mg/kg	1.00	385	8	<1	<8	0	N/A			<1	<1	<1	<1	<1	<1	<8	<8
Aliphatic TPH >C16-C21	mg/kg	2.00	212000	8	<2	<8	0	N/A			<2	<2	<2	<2	<2	<2	<8	<8
TPH1 - Aliphatic >C12-C16	mg/kg	3.00	212000	8	<3	<8	0	N/A			<3	<3	6.4	<3	3.3	<3	<8	<8
Aliphatic EPH >C35-C40	mg/kg	10.00	No SSV	6	<10	<10	0	N/A			<10	<10	<10	<10	<10	<10		
Total Aliphatic EPH >C10-C35	mg/kg	5.00	No SSV	6	<5	9.4	0	N/A			<5	<5	9.4	<5	<5	<5		
Total Aliphatic EPH >C10-C40	mg/kg	10.00	No SSV	6	<10	<10	0	N/A			<10	<10	<10	<10	<10	<10		
Aromatic TPH >C5-C7	mg/kg	0.05	0.31	8	<0.05	<0.1	0	N/A			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1
Aromatic TPH >C7-C8	mg/kg	0.05	312	8	<0.05	<0.1	0	N/A			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1
Aromatic TPH >C8-C10	mg/kg	0.05	22.7	8	<0.05	<0.1	0	N/A			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1
Total Aromatic VPH >C5-C10	mg/kg	0.25	No SSV	8	<0.25	<1	0	N/A			<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1	<1
Aromatic TPH >C10-C12	mg/kg	1.00	139	8	<1	1.7	0	N/A			<1	<1	<1	1.7	<1	<1	<1	<1
Aromatic TPH >C12-C16	mg/kg	1.00	703	8	<1	<2	0	N/A			<1	<1	<1	<1	<1	<1	<2	<2
Aromatic TPH >C16-C21	mg/kg	2.00	No SSV	8	<2	16	0	N/A			4.8	<2	<2	11	10	16	<10	<10
Aromatic TPH >C21-C35	mg/kg	2.00	1930	8	<2	77	0	N/A			20	27	77	3.9	13	<2	<10	<10
Aromatic EPH >C35-C40	mg/kg	1.00	No SSV	8	<1	33	0	N/A			33	3.8	13	1.5	11	<1	<10	<10
Total Aromatic EPH >C10-C35	mg/kg	5.00	No SSV	6	16	79	0	N/A			25	29	79	16	24	18		
Total Aromatic EPH >C10-C40	mg/kg	10.00	No SSV	6	18	92	0	N/A			57	33	92	18	35	18		
Total VPH >C5-C10	mg/kg	0.50	No SSV	6	<0.5	<0.5	0	N/A			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Total EPH >C10-C35	mg/kg	10.00	No SSV	6	17	88	0	N/A			28	32	88	17	28	18		
Total EPH >C10-C40	mg/kg	10.00	No SSV	6	18	100	0	N/A			61	35	100	18	39	18		
Naphthalene	mg/kg	0.10	0.851	8	<0.05	0.14	0	N/A			<0.1	<0.1	0.14	<0.1	<0.1	<0.1	<0.05	<0.05
Acenaphthylene	mg/kg	0.10	No SSV	8	<0.05	0.21	0	N/A			<0.1	<0.1	0.21	<0.1	<0.1	<0.1	<0.05	<0.05
Acenaphthene	mg/kg	0.10	2680	8	<0.05	0.15	0	N/A			<0.1	<0.1	0.15	<0.1	<0.1	<0.1	0.15	<0.05
Fluorene	mg/kg	0.10	3260	8	<0.05	0.24	0	N/A			<0.1	<0.1	0.24	<0.1	<0.1	<0.1	<0.05	<0.05
Phenanthrene	mg/kg	0.10	No SSV	8	<0.05	4.6	0	N/A			<0.1	0.29	4.6	<0.1	<0.1	<0.1	0.16	<0.05
Anthracene	mg/kg	0.10	34300	8	<0.05	0.73	0	N/A			<0.1	0.25	0.73	<0.1	<0.1	<0.1	<0.05	<0.05
Fluoranthene	mg/kg	0.10	4880	8	<0.05	5.2	0	N/A			0.54	0.57	5.2	<0.1	0.28	0.19	0.29	<0.05
Pyrene	mg/kg	0.10	3650	8	<0.05	4.6	0	N/A			0.76	0.66	4.6	<0.1	0.67	0.21	0.22	<0.05
Benzo[a]anthracene	mg/kg	0.10	BaP Surrogate	8	<0.05	1.1	0	N/A			<0.1	0.24	1.1	<0.1	<0.1	<0.1	0.1	<0.05
Chrysene	mg/kg	0.10	BaP Surrogate	8	<0.05	1.3	0	N/A			<0.1	0.4	1.3	<0.1	<0.1	<0.1	0.16	<0.05
Benzo[b]fluoranthene	mg/kg	0.10	BaP Surrogate	8	<0.05	3.3	0	N/A			<0.1	1.2	3.3	<0.1	<0.1	<0.1	0.21	<0.05
Benzo[k]fluoranthene	mg/kg	0.10	BaP Surrogate	8	<0.05	0.81	0	N/A			<0.1	0.26	0.81	<0.1	<0.1	<0.1	0.08	<0.05
Benzo[a]pyrene	mg/kg	0.10	533	8	<0.05	1.1	0	N/A			<0.1	0.45	1.1	<0.1	<0.1	<0.1	0.12	<0.05
Indeno[1,2,3-c,d]Pyrene	mg/kg	0.10	BaP Surrogate	8	<0.05	0.1	0	N/A			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.05
Dibenzo[a,h]Anthracene	mg/kg	0.10	BaP Surrogate	8	<0.05	<0.1	0	N/A			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05
Benzo[ghi]perylene	mg/kg	0.10	BaP Surrogate	8	<0.05	0.14	0	N/A			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.14	<0.05
Total Of 16 PAH's	mg/kg	2.0	No SSV	8	<0.8	23	0	N/A			<2	4.3	23	<2	<2	<2	1.7	<0.8
Dichlorodifluoromethane	mg/kg	0.0010	No SSV	6	<0.001	<0.001	0	N/A			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Chloromethane	mg/kg	0.0010	0.00432	6	<0.001	<0.001	0	N/A			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vinyl Chloride	mg/kg	0.0010	0.015	6	<0.001	<0.001	0	N/A			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bromomethane	mg/kg	0.0020	No SSV	6	<0.002	<0.002	0	N/A			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		
Chloroethane	mg/kg	0.0020	4.36	6	<0.002	<0.002	0	N/A			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		
Trichlorofluoromethane	mg/kg	0.0010	No SSV	6	<0.001	<0.001	0	N/A			<0.001	<0.001	&					

TECHNICAL NOTE

Appendix G. Supplementary Photographs

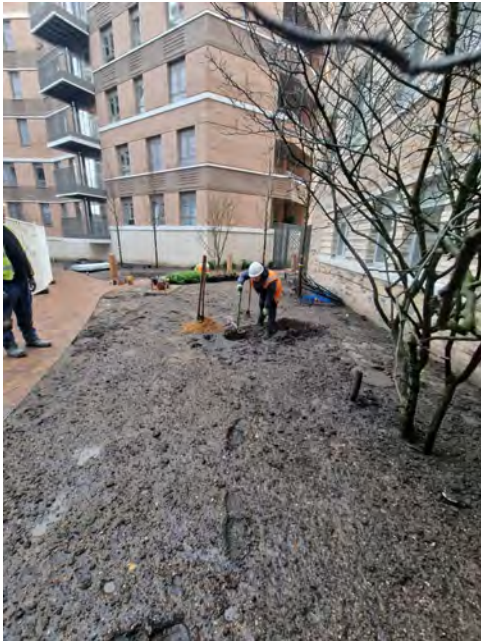
Photo No.	Date:	
1	12/12/23	
Description: Further photographs provided by St William after AtkinsRéalis' site visit to demonstrate completion of all zones. Zone 1		
		

Photo No.	Date:	
2	12/12/23	
Description: Zone 1 depth to sub soil.		
		

TECHNICAL NOTE

Photo No. 3	Date: 12/12/23	
Description: Zone 1 depth to sub soil.		

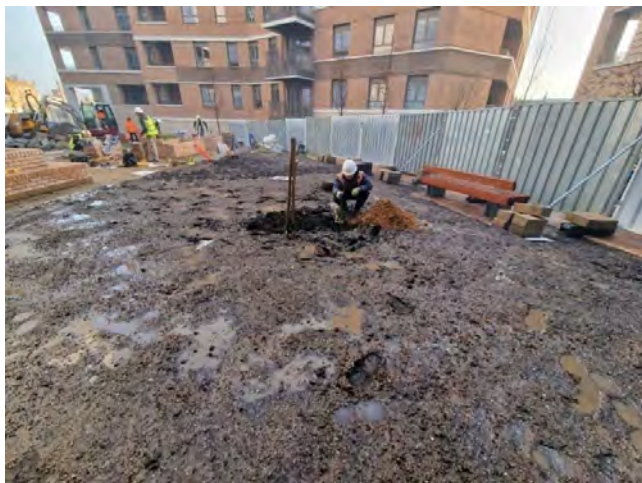
Photo No. 4	Date: 12/12/23	
Description: Zone 1 membrane proven under sub soil.		

TECHNICAL NOTE

Photo No. 5	Date: 12/12/23
Description: Zone 1 membrane proven under sub soil.	

A close-up photograph of a soil sample. The central part of the image shows a lighter, brownish-tan, crumbly material, which is the Zone 1 membrane. This material is surrounded by a darker, more granular and heterogeneous soil matrix. The texture of the membrane appears somewhat fibrous or clumpy, while the surrounding soil is more uniform in color but more varied in particle size and structure.

Photo No. 6	Date: 12/12/23
Description: Zone 2	



TECHNICAL NOTE

Photo No. 7	Date: 12/12/23	
Description: Zone 2 depth to sub soil.		

Photo No. 8	Date: 12/12/23	
Description: Zone 2 depth to subsoil.		

TECHNICAL NOTE

Photo No. 9	Date: 12/12/23
Description: Zone 2 membrane proven under sub soil.	



Photo No. 10	Date: 12/12/23	
Description: Zone 2 membrane proven under sub soil.		

TECHNICAL NOTE

Photo No. 11	Date: 12/12/23	
Description: Zone 3		

Photo No. 12	Date: 12/12/23	
Description: Zone 3 depth to sub soil.		

TECHNICAL NOTE

Photo No. 13	Date: 12/12/23
Description: Zone 3 membrane proven under sub soil.	



Photo No. 14	Date: 12/12/23
Description: Zone 3 membrane proven under sub soil.	

A photograph showing a green measuring tape held vertically against a dark, moist soil wall. The tape is positioned over a lighter, brownish, textured area that appears to be a membrane or a specific soil layer. A wooden stick is visible on the right side of the frame.

TECHNICAL NOTE

Photo No. 15	Date: 12/12/23	
Description: Zone 3 membrane proven under sub soil.		

TECHNICAL NOTE

Nick Ketchell

Woodcote Grove
Ashley Road
Epsom
KT18 5BW

nick.ketchell@atkinsrealis.com