VALIDATION REPORT

Site

63 SANDYCOMBE ROAD, RICHMOND, GREATER LONDON TW9 2EP

Client

WOODCROFT DEVELOPMENTS

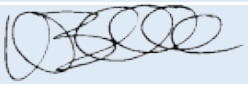
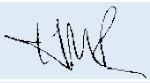
Report Ref
23/11527/B/KJC

Issued
MARCH 2023

ALBURY S.I. LTD

Geotechnical and Environmental Consultants
Miltons Yard, Petworth Road,
Witley, Surrey GU8 5LH

T: 01428 684 836
info@alburysi.co.uk
www.alburysi.co.uk

DOCUMENT CONTROL			
Report Title	Validation Report		
Contract	Sandycombe Road, Richmond		
Report Reference	23/11527/B/KJC		
Client	Woodcroft Developments		
Prepared by	**K J Clark** BSc Hons Director		
Reviewed by	**G C D Owens** BSc MSc FGS MIEnvSc Director		
Revision No.	Status	Date of Issue	Final Issue Check
0	Final	02/03/2023	

Albury S.I. Limited has prepared this Report with reasonable skill and care for the sole use of the Client in accordance with the terms and conditions of the contract under which our services were provided. No duty of care and no contractual obligation (whether expressed or implied) is owed to any third party. Should any third party rely on this Report then they do so at their own risk and Albury S.I. Limited shall have no liability whether in contract or in tort, in negligence, for breach of statutory duty or otherwise to any such party. No warranty, expressed or implied, is made as to the professional advice included in this Report or any services provided by Albury S.I. Limited.

This Report is prepared for the specific purpose stated and in relation to the development proposals or usage indicated to Albury S.I. Limited at the time of preparation. The recommendations should not be used for adjacent schemes and may not be appropriate for alternative proposals.

The recommendations made and opinions expressed in this Report are based on the strata conditions revealed by the fieldworks as indicated on the exploratory records, together with an assessment of the data from in situ and laboratory tests. No liability can be accepted for conditions which have not been revealed by the fieldworks, for example, between exploratory positions. While this Report may offer opinions on the possible configuration of strata, both between the excavations and below the maximum depth achieved by the investigation, these comments are for guidance only and no liability can be accepted for their accuracy. The data obtained relate to the conditions which are relevant at the time of the investigation.

The groundwater observations entered on exploratory records are those noted at the time of the investigation. The normal rate of progress does not usually permit the recording of any equilibrium water level for any one water strike. It should be noted that groundwater levels are prone to seasonal variation and to changes in local drainage conditions. The word 'none' indicates that groundwater was sealed off by the borehole casing or that no water was observed in the exploratory hole upon completion.

REPORT REF: 23/11527/B/KJC
CONTRACT: SANDYCOMBE ROAD, RICHMOND

TABLE OF CONTENTS

FIGURES

APPENDICES

1 INTRODUCTION

It was proposed to complete a residential redevelopment of the site at 63 Sandycombe Road, Richmond ("the site"). The redevelopment comprises the construction of two mixed use buildings with limited external areas of soft landscaping. The most up-to-date plan detailing the proposed site layout, including areas of soft landscaping, is included as Figure 1.

This Validation Report provides documentary evidence that the proposed remedial measures have been implemented and that the site is suitable for the intended use in terms of risks associated with land contamination.

1.1 Background

Albury SI Ltd was commissioned to provide a Phase 2 Report for the site including a geotechnical appraisal of the site. The following reports should be considered together with this Validation Report:

- Phase 2 Report on a Site Investigation – Report Ref. 19/11527/KJC REV 1, issued April 2019.
- Remediation Method Statement – Report Ref. 20/11527/A/KJC, issued in November 2020.

The Phase 2 investigation revealed elevated levels of arsenic, lead and PAH's within the shallow made ground at 0.10m, 0.30m and 0.50m depth. Therefore, remedial measures are required in all areas of soft landscaping. The Remediation Method Statement provides a detailed breakdown of the proposed remedial measures and should be directly referred to when considering this validation document. They are also summarised below, however.

1.2 Remedial Measures

Based on the findings and conclusions of the earlier report it was proposed within soft landscaping areas to remove 600mm of soil to be replaced with a cover of clean topsoil and subsoil. It should be noted that these measures are not necessary beneath permanent hardstanding or buildings.

A total thickness of clean cover of 600mm should be incorporated within areas of soft landscaping. The impacted soils should be excavated to a depth of 600mm below formation level and a hi-visibility geotextile placed at the base. The excavated soils should then be replaced with 450mm of inert, clean (non-waste), subsoil and an upper layer comprising certified topsoil of 150mm thickness to act as a growing medium.

The final thickness of topsoil will be dependent upon the proposed landscape scheme and additional topsoil can be substituted for the subsoil as long as the total soil thickness is maintained. Greater thicknesses of topsoil or clean cover may be required for any proposed shrubs or trees. Allowances should be made for any subsequent settlement or compaction of the topsoil layer, which can occur following periods of heavy rainfall and foot traffic.

2 VALIDATION

2.1 Landscaped Areas

The Client has provided photographs of the areas of installed hardcover and the single area of proposed soft landscaping pre-remediation. These are included in Figures 2 and 3, respectively.

2.2 Waste

A photograph of the excavated area with the required membrane has been provided by the Client, presented as Figure 4. It is evident that the soils in the remediation area of soft landscaping have been removed. The presence of the wheelbarrow gives a perspective of the depth of excavation deemed to be the required 600mm. No “muckaway” or off-site disposal tickets have been made available.

2.3 Imported Materials

The landscaped area has been infilled with topsoil supplied by H. Sivyer (Transport) Ltd to its full depth above the placed membrane. A delivery ticket has been provided for the topsoil, 17.4 tonnes of TRU GROW, which is included in Appendix 1. The Client has confirmed that the membrane was obtained from Travis Perkins and comprises 4TRADE Heavy Duty Landscape Fabric.

A topsoil analysis certificate has been supplied by the Client for the imported topsoil and forms Appendix 2. A photograph of the completed remediation is included as Figure 5.

3 SUMMARY

It is considered that the information presented in the Appendices to this report confirms that the required remediation has been undertaken. The implementation of a cover system in areas of soft landscaping will break the dermal and ingestion exposure pathways between potential residual contamination and site receptors.

REFERENCES

- British Standards (2016). Methods of test for soils for civil engineering purposes, BS 1377-1:2016. *British Standard Institution, London.*

- British Standards (2011). Investigation of potentially contaminated sites. Code of Practice. BS 10175+A2:2017. *British Standard Institution, London.*

- British Standards (2013). Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs). BS 8576. *British Standard Institution, London.*

- British Standards (2015). Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings. BS 8485+A1:2019. *British Standard Institution, London.*

- British Standards (2015). Code of practice for ground investigations, BS 5930:2015. *British Standard Institution, London.*

- Building Research Establishment [BRE] (2004). *Cover systems for land regeneration: Thickness of cover systems for contaminated land (BR 465)*. BRE Watford, UK.

- Building Research Establishment [BRE] (2005). *Concrete in aggressive ground: Special Digest 1* (3rd Ed.). BRE Watford, UK.

- Building Research Establishment [BRE] (2015). *Guidance on protective measures for new buildings. (BR 212)*. BRE Watford, UK.

- Contaminated land: Applications in Real Environments. (2013). *SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Final Project Report.*

- Chartered Institute of Environmental Health and Contaminated Land: Applications in Real Environments (2008). *The Guidance on Comparing Soil Contamination Data with Critical Concentration.* London, UK.

- Environment Agency (2004). *Model Procedures for the Management of Contaminated Land.* Contaminated Land Report (CLR) 11, SC02000028, Environment Agency, Bristol, UK.

- Environment Agency (2015). Interpretation of the definition and classification of hazardous waste. 1st edition. Technical Guidance WM3. *Environment Agency, UK.*

- Nathanail, C.P., McCaffrey, C., Gillett, A.G., Ogden, R.C. and Nathanail, J.F. (2015). *The LQM/CIEH S4ULs for Human Health Risk Assessment.* Land Quality Press, Nottingham. Publication Number S4UL3073.

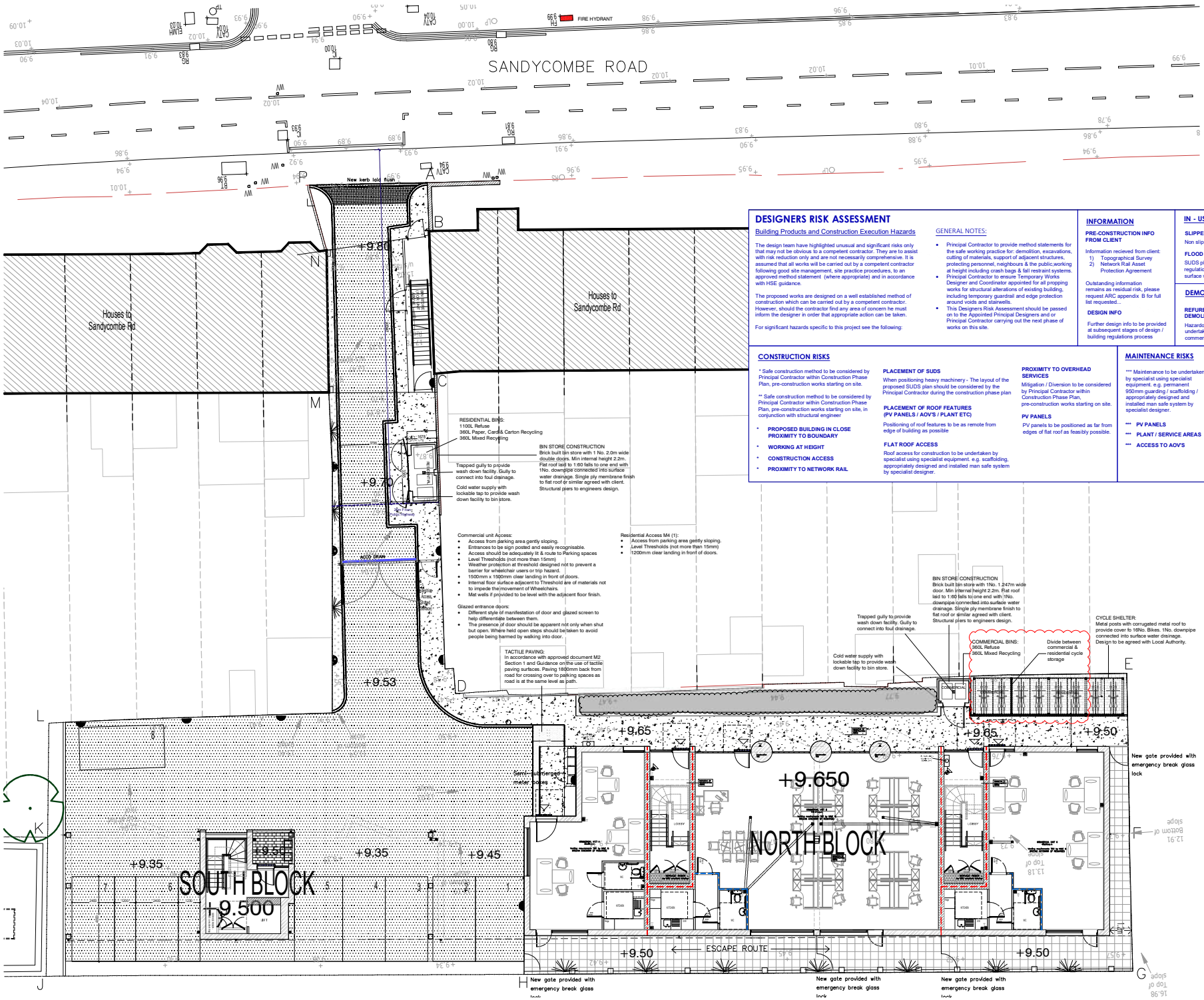
- Stroud, M. A. (1974). The standard penetration test in insensitive clays and soft rocks. *Proceedings of the European Symposium on Penetration Testing, Stockholm*, *2*, 367-375.

LIST OF ABBREVIATIONS

AOD	-	Above Ordnance Datum
ACM	-	Asbestos-containing Material
AST	-	Above-ground Storage Tank
BGS	-	British Geological Survey
BH	-	Borehole
BRE	-	Building Research Establishment
BSI	-	British Standards Institution
BS	-	British Standard
C4SL	-	Category Four Screening Level
CIRIA	-	Construction Industry Research and Information Association
CP	-	Cable Percussive
DPH	-	Dynamic Probing Heavy
DPSH	-	Dynamic Probing Super Heavy
EA	-	Environment Agency
GAC	-	Generic Assessment Criteria
LL	-	Liquid Limit
mAOD	-	Metres Above Ordnance Datum
mBGL	-	Metres Below Ground Level
mOD	-	Metres Ordnance Datum
OS	-	Ordnance Survey
PAH	-	Polycyclic Aromatic Hydrocarbons
PCB	-	Polychlorinated Biphenyl
PID	-	Photo Ionisation Detector
PL	-	Plastic Limit
PSD	-	Particle Size Distribution
SGV	-	Soil Guideline Value
SOM	-	Soil Organic Matter
SPT	-	Standard Penetration Test
SPZ	-	Source Protection Zone
SVOC	-	Semi-volatile Organic Compounds
TPH	-	Total Petroleum Hydrocarbon
UST	-	Underground Storage Tank
UXB	-	Unexploded Bombs
UXO	-	Unexploded Ordnance
VOC	-	Volatile Organic Compound

FIGURE 1

LATEST EXTERNAL LANDSCAPING PLAN



DESIGNERS RISK ASSESSMENT

Building Products and Construction Execution Hazards

The design team have highlighted unusual and significant risks only that may not be obvious to a competent contractor. They are to assist with risk reduction only and are not necessarily comprehensive. It is assumed that all works will be carried out by a competent contractor following good site management, site practice procedures, to an approved method statement (where appropriate) and in accordance with HSE guidance.

The proposed works are designed on a well established method of construction which can be carried out by a competent contractor. However, should the contractor find any area of concern he must inform the designer in order that appropriate action can be taken.

For significant hazards specific to this project see the following:

GENERAL NOTES:

- Principal Contractor to provide method statements for the safe working practice for: demolition, excavations, cutting of materials, support of adjacent structures, protecting personnel, neighbours & the public,working at height including crash bags & fall restraint systems.
- Principal Contractor to ensure Temporary Works Designer and Coordinator appointed for all propping works for structural alterations of existing building, including temporary guardrail and edge protection around voids and stairwells.
- This Designers Risk Assessment should be passed on to the Appointed Principal Designers and or Principal Contractor carrying out the next phase of works on this site.

INFORMATION

PRE-CONSTRUCTION INFO FROM CLIENT

Information recieved from client:
1) Topographical Survey
2) Network Rail Asset Protection Agreement

Outstanding information remains as residual risk, please request ARC appendix 'B for full list requested...

DESIGN INFO

Further design info to be provided at subsequent stages of design / building regulations process

IN - USE RISKS

SLIPPERY FLOORS balconies
Non slip floors to be specified

FLOOD RISK
SUDS plan to be designed at building regulations phase to provide excess surface water drainage

DEMOLITION RISKS

REFURBISHMENT AND DEMOLITION SURVEY

Hazardous material survey to undertaken prior to any on site works commencing - including stripping out.

CONSTRUCTION RISKS

* Safe construction method to be considered by Principal Contractor within Construction Phase Plan, pre-construction works starting on site.

** Safe construction method to be considered by Principal Contractor within Construction Phase Plan, pre-construction works starting on site, in conjunction with structural engineer

- **PROPOSED BUILDING IN CLOSE PROXIMITY TO BOUNDARY**
- **WORKING AT HEIGHT**
- **CONSTRUCTION ACCESS**
- **PROXIMITY TO NETWORK RAIL**

PLACEMENT OF SUDS
When positioning heavy machinery - The layout of the proposed SUDS plan should be considered by the Principal Contractor during the construction phase plan

PLACEMENT OF ROOF FEATURES (PV PANELS / AOV'S / PLANT ETC)
Positioning of roof features to be as remote from edge of building as possible

FLAT ROOF ACCESS
Roof access for construction to be undertaken by specialist using specialist equipment. e.g. scaffolding, appropriately designed and installed man safe system by specialist designer.

PROXIMITY TO OVERHEAD SERVICES
Mitigation / Diversion to be considered by Principal Contractor within Construction Phase Plan, pre-construction works starting on site.

PV PANELS
PV panels to be positioned as far from edges of flat roof as feasibly possible.

MAINTENANCE RISKS

*** Maintenance to be undertaken by specialist using specialist equipment. e.g. permanent 950mm guarding / scaffolding / appropriately designed and installed man safe system by specialist designer.

- *** **PV PANELS**
- *** **PLANT / SERVICE AREAS**
- *** **ACCESS TO AOV'S**

CLEANING WINDOWS
Windows and balcony glass above ground floor level to be cleaned from ground level by specialist using specialist equipment. e.g. long reach and clean systems.
Sliding glazing to balcony's can be cleaned from balcony

CLEANING GUTTERS
Gutters to be cleaned from ground level by specialist using specialist equipment. e.g. long reach and clean systems.

FLAT ROOF ACCESS
Plant or apparatus on the roof to be kept to a minimum

Roof access for maintenance to be undertaken by specialist using specialist equipment. e.g. permanent 950mm guarding / scaffolding / appropriately designed and installed man safe system by specialist designer.

NOTES

1. The contents of this drawing are copyright.
2. Do not scale. Figured dimensions only to be used.
3. Contractors must verify all dimensions and report any discrepancies before putting work in hand or making any shop drawings.
4. All flat roofs to be fitted with a man safe system to satisfy CDM 2015 regulations unless written confirmation from Principle Designer/ Principle Contractor is provided to show alternative compliance has been sought and approved.
5. Please note a domestic sprinkler system may be required - check with your building control inspector
6. Fixed shut fire safety glass windows may be required where windows are in close proximity to boundaries (subject to building regulations).
7. Stair design to be independently checked by stair fabricator for regs. compliance and sizing, prior to construction/ ordering. Dimensions to be checked before fabrication.
8. Mackerman waterproofing specialists (or simil ar company with relevant PI insurance) to be instructed and detail all basement waterproofing designs - ARC carry no responsibility for basement designs in terms of waterproofing or structure in any way.
9. "AS BUILT" drawings will only be issued upon request from the client/ contractor. All information within as built drawings is to be confirmed and provided by the client/ contractor. ARC Architecture do not perform regular site inspections to guarantee as built information so contractor or client must sign a letter from ARC to confirm compliance with our plans on site.
10. Any discrepancies between specification notes and details must be clarified for design intention with ARC before continuing with construction.
11. At Building Regulation stage our instruction is to gain a certificate of building regulations compliance from the chosen inspector (LA or Private)
12. To ensure compliance with EWS1 fire safety forms an independent and an appropriately qualified and insured fire consultant / engineer should be appointed by the client to ensure the finished project can be mortgaged.
13. A design and risk assessment should form part of our drawing package, if you have not received this from us by post, email or collection please contact us for a copy before moving forward with the project.
14. At planning stage planning drawings are to only to used for planning purposes.
15. Mechanical ventilation may be required to basement car parks and apartment lobbies

No.	Revision.	date	by
K	Divide added to commercial and residential cycle storage.	26.11.21	MT
J	Street unit added.	26.07.21	MT
I	Bin Stores amended	02.03.21	MT
H	Tactile paving amended.	12.02.21	MT
G	rwp moved on North block away from boiler flue.	09.02.21	MT
F	Commercial unit A entrance amended	08.02.21	MT
E	Access note amended to M4(1)	05.01.21	MT
D	Building Control Amendments	02.12.20	MT
C	Building Control Amendments	19.11.20	MT
B	Finish floor & external levels added.	04.11.20	MT
A	Bin & Cycle Stores amended.	22.10.20	MT

PROPOSED DEVELOPMENT,
63 SANDYCOMBE ROAD,
RICHMOND,
TW9 2EP

SITE PLAN

scale 1:100 @ A1	checked
date SEPTEMBER 2020	drawn MT

9314 / 100

A	B	C	D	E	F	G
H	I	J	K			

ARC Architecture ltd.
Chapel Studios, 14 Purewell,
Christchurch, Dorset, BH23 1EP
Tel: +44 (0)1202 479919
E-mail: enquiries@andersrobertscheer.co.uk
Web: www.andersrobertscheer.co.uk

FIGURE 2

PHOTOGRAPHS - HARD COVER

Title:	Site Photographs
Dwg No:	23/11527/B/1
Drawn by:	KJC
Client:	Woodcroft Developments
Contract:	Sandycombe Road, Richmond
Job Ref:	23/11527/B/KJC
Scale:	NTS
Revision:	0
Issue Date:	24/02/2023

ALBURY S.I. LTD

Miltons Yard, Petworth Rd,
Witley, Surrey GU8 5LH
www.alburysi.co.uk

FIGURE 3

PHOTOGRAPH - PRE-REMEDIATION

Title:	Site Photographs
Dwg No:	23/11527/B/2
Drawn by:	KJC
Client:	Woodcroft Developments
Contract:	Sandycombe Road, Richmond
Job Ref:	23/11527/B/KJC
Scale:	NTS
Revision:	0
Issue Date:	24/02/2023

ALBURY S.I. LTD

Miltons Yard, Petworth Rd,
Witley, Surrey GU8 5LH
www.alburysi.co.uk

FIGURE 4

PHOTOGRAPH - MEMBRANE

Title:	Site Photographs
Dwg No:	23/11527/B/3
Drawn by:	KJC
Client:	Woodcroft Developments
Contract:	Sandycombe Road, Richmond
Job Ref:	23/11527/B/KJC
Scale:	NTS
Revision:	0
Issue Date:	24/02/2023

ALBURY S.I. LTD

Miltons Yard, Petworth Rd,
Witley, Surrey GU8 5LH
www.alburysi.co.uk

FIGURE 5

PHOTOGRAPH - POST-REMEDIATION

Title:	Site Photographs
Dwg No:	23/11527/B/4
Drawn by:	KJC

Client:	Woodcroft Developments
Contract:	Sandycombe Road, Richmond
Job Ref:	23/11527/B/KJC
Scale:	NTS
Revision:	0
Issue Date:	24/02/2023

ALBURY S.I. LTD

Miltons Yard, Petworth Rd,
Witley, Surrey GU8 5LH
www.alburysi.co.uk

APPENDIX 1

TOPSOIL DELIVERY TICKET

H SIVYER
(TRANSPORT) LTD.
3 Herringham Road
Charlton
London
SE7 8NJ

Tel: 0208 778 1384
Fax: 0208 659 3185
Email: orders@hsivyer.com
Web:

Proof of Delivery

Ticket No: 1115378/1

Job Date: 18/02/23
Customer: TRAVIS PERKINS TRADING CO. LTD
Acc Code: TRA003
Order Number: 331090205

Driver: VALENTIN MITALA
Vehicle Reg: KS18JHU

Account: ✔ **Cheque:** ✘ **Cash:** ✘ **Card:** ✘

Remarks/Special Instructions:

Date: 18/02/2023 **Arrive:08:45** **Depart:09:00**

Address:
TRAVIS
63 SANDYCOMBE ROAD
RICHMOND
SURREY
TW9 2EP

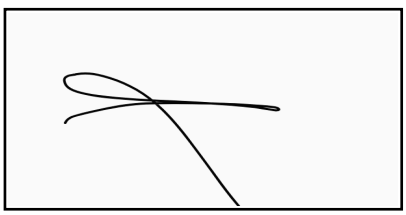
PRODUCTS DELIVERED

QUANTITY	UNIT	PRODUCT
17.40	TONNES	TRU GROW (BS3882)

Chargeable Waiting time: -mins

The above job has been completed satisfactorily. All materials supplied Conform to the required standards.
Customers ordering vehicles off the public highway do so at their own risk.
Please note waiting time is chargeable after 20 minutes on site

Collection Signature:



Print: traian

Delivery Signature

Print: gledy

APPENDIX 2

TOPSOIL ANALYSIS

TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

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

7th December 2022
Our Ref: TOHA/22/7760/SS
Your Ref: PO 181343

Dear Sirs

Planting Topsoil Analysis: Interpretive Report

We have completed the analysis of the soil sample recently submitted, referenced *Planting 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 3/2), moist, friable, very slightly calcareous LOAMY SAND with a weakly developed, very fine to coarse granular structure. The sample was slightly 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. 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

Registered in England No. OC324049 Registered Office: The Innovation Centre, Howbery Park, Wallingford, Oxfordshire OX10 8BA

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 *loamy sand* texture class and would be described as light in texture. Further detailed particle size analysis revealed the sample to have a sufficiently narrow particle size distribution and a predominance of *medium sand* (0.25-0.50mm). This is usually acceptable 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 strongly alkaline in reaction (pH 8.3). 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 $CaSO_4$ 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 adequate to well supplied with organic matter and most major plant nutrients.

The sample contained a level of extractable potassium (1668 mg/l) that slightly exceeded the maximum permissible value given in *BS3882:2015 – Table 1* (1500 mg/l).

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 a strongly alkaline, non-saline, very slightly calcareous loamy sand with a weakly developed structure and a low stone content. The sample was adequate to well supplied with organic matter and most 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, 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 sample was largely compliant with the requirements of the *British Standard for Topsoil (BS3882:2015 – Specification – Table 1, Multipurpose Topsoil)* with the exception of a slightly elevated extractable potassium content (1668 mg/l) which exceeded the maximum permissible value (1500 mg/l). On this occasion, this non-compliance is considered minor and insignificant when reviewed in the context of all the other results, and especially the pH and salinity levels which are still within range.

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, respreading, 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

Zoe Duffin
MBiol
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 Ltd**
Project	**Elite Landscapes, Grand Union Project - Planting Topsoil**
Job:	**Topsoil Analysis**
Date:	**07/12/2022**
Job Ref No:	**TOHA/22/7760/SS**

Sample Reference			**Planting Topsoil**
		Accreditation	
Clay (<0.002mm)	%	UKAS	10
Silt (0.002-0.05mm)	%	UKAS	4
Very Fine Sand (0.05-0.15mm)	%	UKAS	7
Fine Sand (0.15-0.25mm)	%	UKAS	12
Medium Sand (0.25-0.50mm)	%	UKAS	47
Coarse Sand (0.50-1.0mm)	%	UKAS	14
Very Coarse Sand (1.0-2.0mm)	%	UKAS	6
Total Sand (0.05-2.0mm			86
Texture Class (UK Classification)	--	UKAS	LS
Stones (2-20mm)	% DW	GLP	5
Stones (20-50mm)	% DW	GLP	1
Stones (>50mm)	% DW	GLP	0
Saturated Bulk Density	mg/cm^3	UKAS	1.76
pH Value (1:2.5 water extract)	units	UKAS	8.3
Calcium Carbonate	%	UKAS	1.6
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS	1153
Electrical Conductivity (1:2 $CaSO_4$ extract)	uS/cm	UKAS	3194
Exchangeable Sodium Percentage	%	UKAS	4.9
Organic Matter (LOI)	%	UKAS	4.1
Total Nitrogen (Dumas)	%	UKAS	0.25
C : N Ratio	ratio	UKAS	10
Extractable Phosphorus	mg/l	UKAS	83
Extractable Potassium	mg/l	UKAS	1668
Extractable Magnesium	mg/l	UKAS	143
Total Antimony	mg/kg	MCERTS	< 1.0
Total Arsenic (As)	mg/kg	MCERTS	7.9
Total Cadmium (Cd)	mg/kg	MCERTS	< 0.2
Total Chromium (Cr)	mg/kg	MCERTS	16
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS	< 1.8
Total Copper (Cu)	mg/kg	MCERTS	17
Total Lead (Pb)	mg/kg	MCERTS	32
Total Mercury (Hg)	mg/kg	MCERTS	< 0.3
Total Nickel (Ni)	mg/kg	MCERTS	14
Total Selenium (Se)	mg/kg	MCERTS	< 1.0
Total Zinc (Zn)	mg/kg	MCERTS	58
Water Soluble Boron (B)	mg/kg	MCERTS	1.4
Total Cyanide (CN)	mg/kg	MCERTS	< 1.0
Total (mono) Phenols	mg/kg	MCERTS	< 1.0
Naphthalene	mg/kg	MCERTS	< 0.05
Acenaphthylene	mg/kg	MCERTS	< 0.05
Acenaphthene	mg/kg	MCERTS	< 0.05
Fluorene	mg/kg	MCERTS	< 0.05
Phenanthrene	mg/kg	MCERTS	< 0.05
Anthracene	mg/kg	MCERTS	< 0.05
Fluoranthene	mg/kg	MCERTS	0.13
Pyrene	mg/kg	MCERTS	0.1
Benzo(a)anthracene	mg/kg	MCERTS	0.05
Chrysene	mg/kg	MCERTS	0.08
Benzo(b)fluoranthene	mg/kg	MCERTS	0.06
Benzo(k)fluoranthene	mg/kg	MCERTS	0.06
Benzo(a)pyrene	mg/kg	MCERTS	0.05
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS	< 0.05
Dibenzo(a,h)anthracene	mg/kg	MCERTS	< 0.05
Benzo(g,h,i)perylene	mg/kg	MCERTS	< 0.05
Total PAHs (sum USEPA16)	mg/kg	MCERTS	< 0.80
Aliphatic TPH >C5 - C6	mg/kg	MCERTS	< 0.001
Aliphatic TPH >C6 - C8	mg/kg	MCERTS	< 0.001
Aliphatic TPH >C8 - C10	mg/kg	MCERTS	< 0.001
Aliphatic TPH >C10 - C12	mg/kg	MCERTS	< 1.0
Aliphatic TPH >C12 - C16	mg/kg	MCERTS	< 2.0
Aliphatic TPH >C16 - C21	mg/kg	MCERTS	< 8.0
Aliphatic TPH >C21 - C35	mg/kg	MCERTS	< 8.0
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS	< 10
Aromatic TPH >C5 - C7	mg/kg	MCERTS	< 0.001
Aromatic TPH >C7 - C8	mg/kg	MCERTS	< 0.001
Aromatic TPH >C8 - C10	mg/kg	MCERTS	< 0.001
Aromatic TPH >C10 - C12	mg/kg	MCERTS	< 1.0
Aromatic TPH >C12 - C16	mg/kg	MCERTS	< 2.0
Aromatic TPH >C16 - C21	mg/kg	MCERTS	< 10
Aromatic TPH >C21 - C35	mg/kg	MCERTS	< 10
Aromatic TPH (C5 - C35)	mg/kg	MCERTS	< 10
Benzene	mg/kg	MCERTS	< 0.001
Toluene	mg/kg	MCERTS	< 0.001
Ethylbenzene	mg/kg	MCERTS	< 0.001
p & m-xylene	mg/kg	MCERTS	< 0.001
o-xylene	mg/kg	MCERTS	< 0.001
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS	< 0.001
Asbestos Screen	%	ISO 17025	Not Detected

LS = LOAMY SAND

Visual Examination

The sample was described as a very dark brown (Munsell Colour 10YR 3/2), moist, friable, very slightly calcareous LOAMY SAND with a weakly developed, very fine to coarse granular structure. The sample was slightly 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.

Zoe Duffin
MBiol
Graduate Soil Scientist