



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr John Coles
Bury Hill Landscape Supplies Ltd
The Estate Office
Old Bury Hill
Westcott
Nr Dorking
Surrey, RH4 3JU

4th October 2024
Our Ref: TOHA/24/1558/2/SS
Your Ref: see below

Dear Sirs

Topsoil Analysis Report: Bury Hill Horsham Yard – Bury Hill Black

We have completed the analysis of the soil sample recently collected, referenced *Bury Hill Black* and have pleasure reporting our findings.

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

This report presents the results of analysis for the sample collected from the production facility on 16/09/2024 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, waste designation purposes or for any project-specific application, especially after the topsoil has left the Bury Hill Landscape Supplies Ltd site.

SOIL EXAMINATION

The soil was described as very dark greyish brown (Munsell Colour 10YR 3/2), moist, friable, slightly calcareous LOAMY SAND with a weakly developed, very fine to fine, granular structure*. The soil was virtually stone-free and contained a high proportion of organic fines, with occasional woody fragments recorded. 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.

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Plate 1: Bury Hill Black 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);
- stone content (2-20mm, 20-50mm, >50mm);
- pH and electrical conductivity values;
- calcium carbonate;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- visible contaminants;
- heavy metals (Sb, As, B, Ba, Be, Cd, Cr, Cu, Pb, Hg, Ni, Se, V, Zn);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

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. Further detailed particle size analysis found the sample to comprise predominantly *fine sand* (0.15-0.25mm), followed by *very fine sand* (0.05-0.15mm). Fine textured topsoil such as this can be prone to self-compaction when initially placed in a landscape environment, which can lead to limited drainage and poor aeration, particularly if the soil has no developed structure. To reduce this risk, 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 very low and, as such, stones should not restrict the use of the soil for general landscape applications.

pH and Electrical Conductivity Values

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

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

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

Organic Matter and Fertility Status

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

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

Potential Contaminants

With reference to *BS3882:2015 - Table 1*: Notes 3 and 4, there is a requirement to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific 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 exceeded their respective guideline values.

Phytotoxic Contaminants

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

CONCLUSION

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for 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, non-calcareous loamy sand, with a weakly developed structure and very low stone content. The sample contained sufficient reserves of organic matter and all major plant nutrients. Of the potential contaminants determined, none exceeded their respective 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 the species with a wide pH tolerance or known to prefer alkaline soil conditions are selected and the physical condition of the soil is satisfactory.

We recommend placing this soil to a maximum depth of 300mm.

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

Soil Handling Recommendations

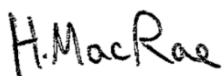
It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, respreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is sufficiently dry to be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



Harriet MacRae
BSc MSc
Soil Scientist



Ceri Spears
BSc MSc MISoilSci
Senior Associate

For & on behalf of Tim O'Hare Associates LLP



Client:	Bury Hill Landscape Supplies Ltd
Project:	Bury Hill Horsham Yard
Job:	Topsoil Analysis
Date:	04/10/2024
Job Ref No:	TOHA/24/1558/2/SS

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

pH Value (1:2.5 water extract)	units	UKAS
Calcium Carbonate	%	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

Visible Contaminants: Plastics >2.00mm	%	UKAS
Visible Contaminants: Sharps >2.00mm	%	UKAS

Total Antimony (Sb)	mg/kg	MCERTS
Total Arsenic (As)	mg/kg	MCERTS
Total Barium (Ba)	mg/kg	MCERTS
Total Beryllium (Be)	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 Vanadium (V)	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

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

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

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

Asbestos	ND/D	ISO17025
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LS = LOAMY SAND

Visual Examination

The soil was described as very dark greyish brown (Munsell Colour 10YR 3/2), moist, friable, slightly calcareous LOAMY SAND with a weakly developed, very fine to fine, granular structure. The soil was virtually stone-free and contained a high proportion of organic fines, with occasional woody fragments recorded. 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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Bury Hill Black	
	6
	14
	22
	35
	17
	4
	2
	80
	LS
	2
	0
	0

	7.6
	1.4
	621
	2492
	4.0

	5.2
	0.24
	13
	27
	815
	99

	0
	0

	< 1.0
	6
	24
	0.2
	< 0.2
	11
	< 1.8
	15
	22
	< 0.3
	4
	< 1.0
	16
	40
	1.3
	< 1.0
	< 1.0

	< 0.05
	< 0.05
	< 0.05
	< 0.05
	0.07
	< 0.05
	0.24
	0.23
	0.13
	0.12
	0.20
	0.09
	0.16
	0.08
	< 0.05
	0.09
	1.43

	< 0.010
	< 0.010
	< 0.010
	1
	< 2.0
	< 8.0
	< 8.0
	< 10
	< 0.010
	< 0.010
	< 0.020
	< 1.0
	< 2.0
	< 10
	< 10

	< 0.005
	< 0.005
	< 0.005
	< 0.005
	< 0.005

	Not-detected
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H.MacRae

Harriet MacRae
BSc MSc
Soil Scientist