

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

> 2nd January 2025 Our Ref: TOHA/25/1641/1/SS

Your Ref: see below

Dear Sirs

Topsoil Analysis Report: Bury Hill Horsham Yard - GP10 Topsoil (S)

We have completed the analysis of the soil sample recently collected, referenced *GP10 Topsoil (S)*, 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 site on 02/12/2024, 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 a very dark greyish brown (Munsell Colour 10YR 3/2), slightly moist, friable, non-calcareous LOAMY SAND with a weakly developed, very fine to medium granular structure*. The soil was virtually stone-free 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.



Plate 1: Sample GP10 Topsoil (S)

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);
- saturated hydraulic conductivity;
- 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.

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RESULTS OF ANALYSIS

Particle Size Analysis and Stone Content

The sample fell into the *loamy sand* texture class. Further detailed particle size analysis revealed the sample to have a reasonably narrow particle size distribution, with a predominance of *medium sand* (0.25-0.50mm) followed by *fine sand* (0.05-0.15mm) and *coarse sand* (0.50-1.0mm). This is acceptable for topsoil in general landscape applications as sufficient porosity levels can be maintained in a consolidated state and the risk of particle interpacking is reduced. This type of grading therefore normally provides adequate water attenuation, drainage and aeration properties for general landscape applications.

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

Saturated Hydraulic Conductivity

The saturated hydraulic conductivity test is designed to test the sample's drainage potential under a reasonable degree of compaction. The saturated hydraulic conductivity result (34 mm/hr) was moderate and would be considered suitable for general landscape purposes.

pH and Electrical Conductivity Values

The sample was strongly alkaline in reaction (pH 8.5). 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 should not 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 adequate to well 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.

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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 a strongly alkaline, non-saline, non-calcareous loamy sand with an adequate 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 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 also 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.

Rebecca Roberts

BSc MSc MISoilSci

Yours faithfully

Harriet MacRae BSc MSc

Soil Scientist

For & on behalf of Tim O'Hare Associates LLP

Senior Soil Scientist

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Client:	Bury Hill Landscape Supplies Ltd
Project	Bury Hill Horsham Yard
Job:	Topsoil Analysis - BS3882:2015
Date:	02/01/2025
Job Ref No:	TOHA/24/1641/1/SS

Sample Reference	GP10 Topsoil (S)				
		Accreditation			
Clay (<0.002mm) Silt (0.002-0.05mm)	%	UKAS UKAS	<u> </u>		
Very Fine Sand (0.05-0.15mm)	%	UKAS	6		
Fine Sand (0.15-0.25mm)	%	UKAS UKAS	20 39		
Medium Sand (0.25-0.50mm) Coarse Sand (0.50-1.0mm)	%	UKAS	18		
Very Coarse Sand (1.0-2.0mm)	%	UKAS	4		
Total Sand (0.05-2.0mm) Texture Class (UK Classification)	%	UKAS UKAS	87 LS		
Stones (2-20mm)	% DW	GLP	1		
Stones (20-50mm)	% DW % DW	GLP GLP	0		
Stones (>50mm)	% DVV	GLP			
Saturated Hydraulic Conductivity (m)	mm/hr	A2LA	34		
pH Value (1:2.5 water extract)	units	UKAS	8.5		
Calcium Carbonate Electrical Conductivity (1:2.5 water extract)	% uS/cm	UKAS UKAS	< 1.0 821		
Electrical Conductivity (1:2:3 water extract) Electrical Conductivity (1:2 CaSO ₄ extract)	uS/cm	UKAS	2891		
Exchangeable Sodium Percentage	%	UKAS	5.2		
Organic Matter (LOI)	%	UKAS	3.0		
Total Nitrogen (Dumas)	%	UKAS	0.22		
C : N Ratio	ratio	UKAS	8 4		
Extractable Phosphorus Extractable Potassium	mg/l mg/l	UKAS UKAS	76 1063		
Extractable Magnesium	mg/l	UKAS	91		
Visible Contaminants: Plastics >2.00mm	%	UKAS	0		
Visible Contaminants: Plastics >2.00mm Visible Contaminants: Sharps >2.00mm	% %	UKAS	0		
Total Antimony (Sb)	ma/ka	MCERTS	< 1.0		
Total Antimony (Sb) Total Arsenic (As)	mg/kg mg/kg	MCERTS	2.0		
Total Barium (Ba)	mg/kg	MCERTS	7.9		
Total Beryllium (Be)	mg/kg	MCERTS MCERTS	0.07		
Total Cadmium (Cd) Total Chromium (Cr)	mg/kg mg/kg	MCERTS	< 0.2 5.6		
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS	< 1.8		
Total Copper (Cu)	mg/kg	MCERTS	4.7		
Total Lead (Pb) Total Mercury (Hq)	mg/kg mg/kg	MCERTS MCERTS	4.6 < 0.3		
Total Nickel (Ni)	mg/kg	MCERTS	2.0		
Total Selenium (Se)	mg/kg	MCERTS	< 1.0		
Total Vanadium (V) Total Zinc (Zn)	mg/kg mg/kg	MCERTS MCERTS	5.9 11		
Water Soluble Boron (B)	mg/kg	MCERTS	1.5		
Total Cyanide (CN) Total (mono) Phenols	mg/kg mg/kg	MCERTS MCERTS	< 1.0 < 1.0		
Total (IIIOIIO) FITEITOIS	< 1.0				
Naphthalene	mg/kg	MCERTS	< 0.05		
Acenaphthylene Acenaphthene	mg/kg mg/kg	MCERTS MCERTS	< 0.05 < 0.05		
Fluorene	mg/kg	MCERTS	< 0.05		
Phenanthrene	mg/kg	MCERTS	< 0.05		
Anthracene Fluoranthene	mg/kg mg/kg	MCERTS MCERTS	< 0.05 < 0.05		
Pyrene	mg/kg	MCERTS	< 0.05		
Benzo(a)anthracene	mg/kg	MCERTS	< 0.05		
Chrysene Benzo(b)fluoranthene	mg/kg mg/kg	MCERTS MCERTS	< 0.05 < 0.05		
Benzo(k)fluoranthene	mg/kg	MCERTS	< 0.05		
Benzo(a)pyrene	mg/kg	MCERTS MCERTS	< 0.05		
Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene	mg/kg mg/kg	MCERTS MCERTS	< 0.05 < 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	< 0.010		
Aliphatic TPH (C6-C8)	mg/kg	MCERTS	< 0.010		
Aliphatic TPH (C8-C10) Aliphatic TPH (C10-C12)	mg/kg mg/kg	MCERTS MCERTS	< 0.010 < 1.0		
Aliphatic TPH (C12-C16)	mg/kg	MCERTS	< 2.0		
Aliphatic TPH (C16-C21) Aliphatic TPH (C21-C35)	mg/kg	MCERTS MCERTS	< 8.0		
Aliphatic TPH (C21-C35) Aliphatic TPH (C5-C35)	mg/kg mg/kg	MCERTS MCERTS	9.2		
Aromatic TPH (C5-C7)	mg/kg	MCERTS	< 0.010		
Aromatic TPH (C7-C8)	mg/kg	MCERTS MCERTS	< 0.010		
Aromatic TPH (C8-C10) Aromatic TPH (C10-C12)	mg/kg mg/kg	MCERTS MCERTS	< 0.020 < 1.0		
Aromatic TPH (C12-C16)	mg/kg	MCERTS	< 2.0		
Aromatic TPH (C16-C21)	mg/kg	MCERTS	< 10		
Aromatic TPH (C21-C35) Aromatic TPH (C5-C35)	mg/kg mg/kg	MCERTS MCERTS	< 10 < 10		
Benzene Toluene	mg/kg mg/kg	MCERTS MCERTS	< 0.005 < 0.005		
Ethylbenzene	mg/kg	MCERTS	< 0.005		
p & m-xylene	mg/kg	MCERTS	< 0.008		
o-xylene	mg/kg	MCERTS	< 0.005		
Asbestos	ND/D	ISO17025	Not-detected		

LS = LOAMY SAND

Visual Examination

The soil was described as a very dark greyish brown (Munsell Colour 10YR 3/2), slightly moist, friable, non-calcareous LOAMY SAND with a weakly developed, very fine to medium granular structure. The soil was virtually stone-free 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 Soil Scientist