

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

> 6<sup>th</sup> October 2023 Our Ref: TOHA/23/1112/7/SS Your Ref: see below

Dear Sirs

### Sand Analysis Report: Bury Hill Horsham Yard – Sussex Medium/Coarse Sand (Y)

We have completed the analysis of the sand sample recently submitted, referenced *Sussex Medium/Coarse Sand* (Y) and have pleasure reporting our findings.

The purpose of the analysis was to assess selected physical and chemical properties of the sand in order to determine its potential for use in a range of landscape applications. The ultimate suitability of the sand for any specific use or project should be reviewed and assessed in advance. However, this report offers some possible applications where the sand may be appropriate.

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the sand source. The report and results should therefore not be relied upon by any third parties.

# SAMPLE EXAMINATION

The sample can be described as a reddish yellow (Munsell Colour, 7.5YR 6/6), slightly moist, friable, non-calcareous SAND with a single grained structure. The sample was stone free and no unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

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Plate 1: Sussex Medium/Coarse Sand (Y) 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 of the sand. The following parameters were determined:

- detailed particle size analysis (5 sands, silt, clay);
- stone content (2-20mm, 20-75mm, >75mm);
- saturated hydraulic conductivity;
- pH and electrical conductivity (1:2.5 water extract);
- exchangeable sodium percentage;
- calcium carbonate;
- organic matter content;
- 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 Saturated Hydraulic Conductivity

The sample had a total sand content of 95%. Further detailed particle size analysis revealed the sample to have a narrow particle size distribution, with a predominance of *medium sand* (0.25-0.50mm) and lower proportions of *coarse sand* (0.5-1.0mm).

If used as a subsoil for landscaping applications, it could be described as 'very free-draining' which is confirmed by the high saturated hydraulic conductivity result (673 mm/hr).

#### Stone Content

The sample was stone-free and, as such, stones should not restrict the use of the sand for landscape applications.

#### pH and Electrical Conductivity Values

The sample was slightly alkaline in reaction (pH 7.3), with a low calcium carbonate (lime) content. This pH value should not restrict the use of the soil for most landscape purposes.

The electrical conductivity (salinity) values (water and CaSO<sub>4</sub> extract) were low, which indicates that soluble salts were not present at elevated levels.

#### **Organic Matter Content**

The organic matter content of the sand was very low (<0.5%).

#### **Potential Contaminants**

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 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 recommended levels.

### COMMENTS

The sand represented by this sample has the following properties:

- Narrow particle size distribution
- Low fines content
- High drainage rate
- Slightly alkaline pH value
- Low lime content
- Non-saline
- Inorganic

Based on these characteristics, the sand represented by this sample may have potential for use in a number of landscape application, examples of which could include:

- A free-draining, compaction resistant subsoil for landscape environments where a higher level of permeability and porosity in the subsoil layer is required, e.g. when planting larger rootballed trees, for podium landscapes, or formal / high-use grass lawns;
- 2) For use as a filter medium for bioretention systems and rain gardens that may be included within Sustainable Drainage Systems (SuDS).

- 3) For use as a surface ameliorant / topdressing to improve amenity grass / sports pitch surfaces;
- 4) For use in sports pitch drainage where a free-draining sand may be required (e.g. sand grooves);
- 5) For blending with suitable ameliorants to produce high-permeability rootzones;

The suitability of this sand for any specific project or product should be carefully checked by further testing as necessary and should be approved by any project's designer / manager before use.

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

H.MacRae

Harriet MacRae BSc MSc Graduate Soil Scientist

Matthew Heins BSc (Hons) MISoilSci Senior Soil Scientist

For & on behalf of Tim O'Hare Associates LLP



Client:	Bury Hill Landscape Supplies Ltd
Project	Bury Hill Horsham Yard
Job:	Sand Analysis
Date:	06/10/2023
Job Ref No:	TOHA/23/1112/7/SS

nple 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) Very Coarse Sand (1.0-2.0mm)	%	UKAS UKAS
Total Sand (0.05-2mm)	%	UKAS
Texture Class (UK Classification)		UKAS
Stones (2-20mm)	% DW	GLP
Stones (20-75mm)	% DW	GLP
Stones (>75mm)	% DW	GLP
Saturated Hydraulic Conductivity	mm/hr	A2LA
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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 <sub>4</sub> extract) Organic Matter (LOI)	uS/cm %	UKAS UKAS
Organic Matter (LOI) Exchangeable Sodium Percentage	%	UKAS
Visible Contaminants: Plastics >2.00mm	%	UKAS 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) Total Chromium (Cr)	mg/kg	MCERTS
Total Chromium (Cr) Hexavalent Chromium (Cr VI)	mg/kg mg/kg	MCERTS MCERTS
Total Copper (Cu)	mg/kg 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 Ponz(a) opthrocopo	mg/kg	MCERTS MCERTS
Benz(a)anthracene Chrysene	mg/kg 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 Aromatic TPH >C21 - C35	mg/kg	MCERTS MCERTS
Alumanu 1PH >021 - 030	mg/kg mg/kg	MCERTS
Aromatic TPH (C5 - C35)		
Benzene	mg/kg	MCERTS
Benzene Toluene	mg/kg mg/kg	MCERTS
Aromatic TPH (C5 - C35)           Benzene           Toluene           Ethylbenzene           p & m-xylene	mg/kg	

and (Y)         4         1         2         4         56         29         4         95         S         0         1.8         <1.0         <1.0         <1.0         <1.0         <0.05      <0.05      <0.05																																																														
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&lt;0.05</pre>	< 1.0 < 0.05 < 0.010 < 0.10 < 0.10 < 1.0 < 2.0	<ul> <li>&lt; 0.05</li> <li>&lt; 0.10</li> <li>&lt; 1.0</li> <li>&lt; 2.0</li> </ul>	<ul> <li>&lt; 0.05</li> <li>&lt; 0.10</li> <li>&lt; 1.0</li> <li>&lt; 2.0</li> </ul>	<ul> <li>&lt; 0.05</li> <li>&lt; 0.10</li> <li>&lt; 1.0</li> <li>&lt; 2.0</li> </ul>	<pre>&lt; 0.05 &lt; 0.05 &lt;&lt; 0.05 <!-- 0.05 </ 0.05 </ 0.05 </ 0.05 </ 0.05 </ 0.05 </ 0.05 </p--></pre>	<pre>&lt; 0.05 &lt; 0.05 &lt;&lt; 0.10 &lt;&lt; 0.10 &lt;&lt; 1.0 &lt;&lt; 2.0 </pre>	<ul> <li>&lt; 0.05</li> <li>&lt; 0.10</li> <li>&lt; 1.0</li> <li>&lt; 2.0</li> </ul>	<pre>&lt; 0.05 &lt; 0.10 &lt; 0.10 &lt; 1.0 &lt; 2.0</pre>	<ul> <li>&lt; 0.05</li> <li>&lt; 0.10</li> <li>&lt; 0.10</li> <li>&lt; 1.0</li> <li>&lt; 2.0</li> </ul>	<pre>&lt; 0.05 &lt; 0.010 &lt; 0.10 &lt; 0.10 &lt; 0.10 &lt; 0.10 &lt; 0.10 &lt; 0.20 &lt; 0.10 &lt; 0.20 &lt; 0.20</pre>	<pre>&lt; 0.05 &lt; 0.010 &lt; 0.10 &lt; 0.10 &lt; 1.0 &lt; 2.0</pre>	<ul> <li>&lt; 0.05</li> <li>&lt; 0.10</li> 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Not-detected

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Asbestos S = SAND

o-xylene MTBE (Methyl Tertiary Butyl Ether)

Visual Examination The sample can be described as a reddish yellow (Munsell Colour, 7.5YR 6/6), slightly moist, friable, non-calcareous SAND with a single grained structure. The sample was stone free and no unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

mg/kg mg/kg

D/ND

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

MCERTS

MCERT

ISO 17025