

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

2nd March 2023 Our Ref: TOHA/23/7858/SS

Your Ref: see below

Dear Sirs

Sand Analysis Report: Bury Hill Horsham Yard - Kent Medium / Coarse Contract Sand

We have completed the analysis of the sand sample recently submitted, referenced *Kent Medium / Coarse Contract Sand*, 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 relied upon by any third parties.

SAMPLE EXAMINATION

The sample can be described as a yellowish brown (Munsell Colour, 10YR 5/8), 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.



Plate 1: Kent Medium / Coarse Contract Sand 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.

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RESULTS OF ANALYSIS

Particle Size Analysis and Saturated Hydraulic Conductivity

The sample had a total sand content of 96%. 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 'free-draining' which is confirmed by the high saturated hydraulic conductivity result (258 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 acid in reaction (pH 6.8), 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 CaSO₄ 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 acid 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).

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- 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

Harriet MacRae BSc MSc

Graduate Soil Scientist

H.MacRae

Matthew Heins BSc (Hons) MISoilSci Senior Soil Scientist

For & on behalf of Tim O'Hare Associates LLP

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Client:	Bury Hill Landscape Supplies Ltd
Project	Bury Hill Horsham Yard
Job:	Sand Analysis
Date:	02/03/2023
Job Ref No:	TOHA/23/7858/SS

Sample Reference				Kent Medium / Coarse Contract Sand	
		Accreditation	_		
Clay (<0.002mm)	%	UKAS		2	
Silt (0.002-0.05mm)	%	UKAS	-	2	
Very Fine Sand (0.05-0.15mm)	%	UKAS	-	4 10	
Fine Sand (0.15-0.25mm) Medium Sand (0.25-0.50mm)	%	UKAS UKAS	-	47	
Coarse Sand (0.50-1.0mm)	%	UKAS	+	31	
Very Coarse Sand (1.0-2.0mm)	%	UKAS	-	4	
Total Sand (0.05-2mm)	%	UKAS	1	96	
Texture Class (UK Classification)		UKAS	1 1	S	
Stones (2-20mm)	% DW	GLP		0	
Stones (20-75mm)	% DW	GLP		0	
Stones (>75mm)	% DW	GLP		0	X
Saturated Hydraulic Conductivity	mm/hr	A2LA	<u> </u>	258	
pH Value (1:2.5 water extract)	units	UKAS	-	6.8	
Calcium Carbonate	% C/am	UKAS	-	< 1.0	
Electrical Conductivity (1:2.5 water extract) Electrical Conductivity (1:2 CaSO ₄ extract)	uS/cm uS/cm	UKAS UKAS	-	42 2111	
Organic Matter (LOI)	% %	UKAS	+	<0.5	
Exchangeable Sodium Percentage	%	UKAS	-	1.6	*. (/)
Exoriarigeable coalain i creentage	, ,,	01010	J L	1.0	
Visible Contaminants: Plastics >2.00mm	%	UKAS	1 [0	
Visible Contaminants: Sharps >2.00mm	%	UKAS	1 F	0	
		•	- -		7
Total Antimony (Sb)	mg/kg	MCERTS		< 0.1	
Total Arsenic (As)	mg/kg	MCERTS	j [1.2	
Total Barium (Ba)	mg/kg	MCERTS	1 [5	~
Total Beryllium (Be)	mg/kg	MCERTS	4 <u> </u>	< 0.06	
Total Cadmium (Cd)	mg/kg	MCERTS		< 0.2	
Total Chromium (Cr)	mg/kg	MCERTS	-	6.7	
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS	- 4	< 1.8	
Total Copper (Cu)	mg/kg	MCERTS	1	4.1	
Total Lead (Pb)	mg/kg	MCERTS	4	< 1.0	
Total Mercury (Hg)	mg/kg	MCERTS		< 0.3	
Total Nickel (Ni)	mg/kg	MCERTS		3	
Total Selenium (Se)	mg/kg	MCERTS		< 1.0	
Total Vanadium (V)	mg/kg	MCERTS		4.4	
Total Zinc (Zn) Water Soluble Boron (B)	mg/kg	MCERTS MCERTS	-)	4.9 < 0.2	
Total Cyanide (CN)	mg/kg mg/kg	MCERTS		< 1.0	
Total (mono) Phenols	mg/kg	MCERTS	-	< 1.0	
Total (mone) i noncio	i ingring	, mozavio	J , L	11.0	
Naphthalene	mg/kg	MCERTS	1 [< 0.05	
Acenaphthylene	mg/kg	MCERTS		< 0.05	
Acenaphthene	mg/kg	MCERTS	Ī	< 0.05	
Fluorene	mg/kg	MCERTS		< 0.05	
Phenanthrene	mg/kg	MCERTS		< 0.05	
Anthracene	mg/kg	MCERTS] _	< 0.05	
Fluoranthene	mg/kg	MCERTS		< 0.05	
Pyrene	mg/kg	MCERTS	.	< 0.05	
Benz(a)anthracene	mg/kg	MCERTS	.	< 0.05	
Chrysene	mg/kg	MCERTS	-	< 0.05	
Benzo(b)fluoranthene	mg/kg	MCERTS	-	< 0.05	
Benzo(k)fluoranthene	mg/kg	MCERTS		< 0.05	
Benzo(a)pyrene Indeno(1,2,3-cd)pyrene	mg/kg mg/kg	MCERTS MCERTS	-	< 0.05 < 0.05	
Dibenzo(a,h)anthracene	mg/kg mg/kg	MCERTS	- - -	< 0.05	
Benzo(g,h,i)perylene	mg/kg	MCERTS	1	< 0.05	
Total PAHs (sum USEPA16)	mg/kg	MCERTS	1	< 0.80	
			. L	. 5.00	
Aliphatic TPH >C5 - C6	mg/kg	MCERTS] Γ	< 0.001	
Aliphatic TPH >C6 - C8	mg/kg	MCERTS] l	< 0.001	
Aliphatic TPH >C8 - C10	mg/kg	MCERTS	j [< 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	1 [< 8.0	
Aliphatic TPH >C21 - C35	mg/kg	MCERTS	4 <u> </u>	< 8.0	
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS	4 <u> </u>	< 10	
Aromatic TPH >C5 - C7	mg/kg	MCERTS	4	< 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	4	< 1.0	
Aromatic TPH >C12 - C16 Aromatic TPH >C16 - C21	mg/kg	MCERTS MCERTS	-	< 2.0 < 10	
Aromatic TPH >C16 - C21 Aromatic TPH >C21 - C35	mg/kg mg/kg	MCERTS	- - -	< 10	
Aromatic TPH (C5 - C35)	mg/kg	MCERTS	- - -	< 10	
,	i iig/ng	MOLITIO	J L	> 10	
Benzene	mg/kg	MCERTS	7	< 0.005	
Toluene	mg/kg	MCERTS	1	< 0.005	
Ethylbenzene	mg/kg	MCERTS	1 F	< 0.005	
p & m-xylene	mg/kg	MCERTS	1 F	< 0.005	
o-xylene	mg/kg	MCERTS	1 F	< 0.005	
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS]	< 0.005	
			-		
Asbestos	D/ND	ISO 17025	J [Not-detected	
			_	· 	

S = SAND

Visual Examination
The sample can be described as a yellowish brown (Munsell Colour, 10YR 5/8), 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

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