



TIM O'HARE ASSOCIATES  
SOIL & LANDSCAPE CONSULTANCY

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13<sup>th</sup> February 2023  
Our Ref: TOHA/23/7802/8/SS  
Your Ref: see below

Dear Sirs

**Sand Analysis Report: Bury Hill Horsham Yard – Fine / Medium Washed Silica Sand (R)**

We have completed the analysis of the sand sample recently submitted, referenced *Fine / Medium Washed Silica Sand (R)* 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 use case should be reviewed and assessed prior to use, however this report indicates some possible cases 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 pale yellow (Munsell Colour, 2.5YR 8/3), 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: Fine / Medium Silica Washed Sand (R) 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);
- pH and electrical conductivity (1:2.5 water extract);
- saturated hydraulic conductivity;
- 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 Stone Content**

The sample had a total sand content of 99%. Further detailed particle size analysis revealed the sample to have contain a predominance of *medium sand* (0.25-0.50mm) and a lower proportion of *fine sand* (0.15-0.25mm).

If used as a subsoil for landscaping applications, it could be described as 'very free-draining' based on the high saturated hydraulic conductivity result (604 mm/hr).

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

### **pH and Electrical Conductivity Values**

The sample was slightly alkaline in reaction (pH 7.1), with a pH value that would be suitable for landscaping applications.

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
- Near neutral pH value and 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:

- 1) 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 subsoil in a 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);

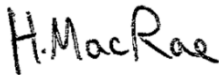
5) For blending with suitable ameliorants to produce high-permeability rootzones;

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.

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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**  
MSc BSc  
Graduate Soil Scientist



**Matthew Heins**  
BSc (Hons) MSc SoilSci  
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:	13/02/2023
Job Ref No:	TOHA/23/7802/8/SS

Sample Reference			Fine / Medium Washed Sand (R)
		Accreditation	
Clay (<0.002mm)	%	UKAS	0
Silt (0.002-0.05mm)	%	UKAS	1
Very Fine Sand (0.05-0.15mm)	%	UKAS	7
Fine Sand (0.15-0.25mm)	%	UKAS	30
Medium Sand (0.25-0.50mm)	%	UKAS	61
Coarse Sand (0.50-1.0mm)	%	UKAS	1
Very Coarse Sand (1.0-2.0mm)	%	UKAS	0
Total Sand (0.05-2mm)	%	UKAS	99
Texture Class (UK Classification)	--	UKAS	S
Stones (2-20mm)	% DW	GLP	0
Stones (20-75mm)	% DW	GLP	0
Stones (>75mm)	% DW	GLP	0
<b>Saturated Hydraulic Conductivity</b>			<b>604</b>
<b>pH Value (1:2.5 water extract)</b>			<b>7.1</b>
Calcium Carbonate	%	UKAS	< 1.0
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS	104
Electrical Conductivity (1:2 CaSO <sub>4</sub> extract)	uS/cm	UKAS	2283
Organic Matter (LOI)	%	UKAS	<0.5
Exchangeable Sodium Percentage	%	UKAS	1.1
<b>Visible Contaminants: Plastics &gt;2.00mm</b>			<b>0</b>
<b>Visible Contaminants: Sharps &gt;2.00mm</b>			<b>0</b>
<b>Total Antimony (Sb)</b>			<b>&lt;1.0</b>
<b>Total Arsenic (As)</b>			<b>1.7</b>
<b>Total Barium (Ba)</b>			<b>1.2</b>
<b>Total Beryllium (Be)</b>			<b>&lt; 0.06</b>
<b>Total Cadmium (Cd)</b>			<b>&lt; 0.2</b>
<b>Total Chromium (Cr)</b>			<b>1.6</b>
<b>Hexavalent Chromium (Cr VI)</b>			<b>&lt; 1.8</b>
<b>Total Copper (Cu)</b>			<b>1.5</b>
<b>Total Lead (Pb)</b>			<b>&lt; 1.0</b>
<b>Total Mercury (Hg)</b>			<b>&lt; 0.3</b>
<b>Total Nickel (Ni)</b>			<b>&lt; 1.0</b>
<b>Total Selenium (Se)</b>			<b>&lt; 1.0</b>
<b>Total Vanadium (V)</b>			<b>1.9</b>
<b>Total Zinc (Zn)</b>			<b>1.6</b>
<b>Water Soluble Boron (B)</b>			<b>&lt; 0.2</b>
<b>Total Cyanide (CN)</b>			<b>&lt; 1.0</b>
<b>Total (mono) Phenols</b>			<b>&lt; 1.0</b>
<b>Naphthalene</b>			<b>&lt; 0.05</b>
<b>Acenaphthylene</b>			<b>&lt; 0.05</b>
<b>Acenaphthene</b>			<b>&lt; 0.05</b>
<b>Fluorene</b>			<b>&lt; 0.05</b>
<b>Phenanthrene</b>			<b>&lt; 0.05</b>
<b>Anthracene</b>			<b>&lt; 0.05</b>
<b>Fluoranthene</b>			<b>&lt; 0.05</b>
<b>Pyrene</b>			<b>&lt; 0.05</b>
<b>Benz(a)anthracene</b>			<b>&lt; 0.05</b>
<b>Chrysene</b>			<b>&lt; 0.05</b>
<b>Benzo(b)fluoranthene</b>			<b>&lt; 0.05</b>
<b>Benzo(k)fluoranthene</b>			<b>&lt; 0.05</b>
<b>Benzo(a)pyrene</b>			<b>&lt; 0.05</b>
<b>Indeno(1,2,3-cd)pyrene</b>			<b>&lt; 0.05</b>
<b>Dibenzo(a,h)anthracene</b>			<b>&lt; 0.05</b>
<b>Benzo(g,h,i)perylene</b>			<b>&lt; 0.05</b>
<b>Total PAHs (sum USEPA16)</b>			<b>&lt; 0.80</b>
<b>Aliphatic TPH &gt;C5 - C6</b>			<b>&lt; 0.001</b>
<b>Aliphatic TPH &gt;C6 - C8</b>			<b>&lt; 0.001</b>
<b>Aliphatic TPH &gt;C8 - C10</b>			<b>&lt; 0.001</b>
<b>Aliphatic TPH &gt;C10 - C12</b>			<b>&lt; 1.0</b>
<b>Aliphatic TPH &gt;C12 - C16</b>			<b>&lt; 2.0</b>
<b>Aliphatic TPH &gt;C16 - C21</b>			<b>&lt; 8.0</b>
<b>Aliphatic TPH &gt;C21 - C35</b>			<b>&lt; 8.0</b>
<b>Aliphatic TPH (C5 - C35)</b>			<b>&lt; 10</b>
<b>Aromatic TPH &gt;C5 - C7</b>			<b>&lt; 0.001</b>
<b>Aromatic TPH &gt;C7 - C8</b>			<b>&lt; 0.001</b>
<b>Aromatic TPH &gt;C8 - C10</b>			<b>&lt; 0.001</b>
<b>Aromatic TPH &gt;C10 - C12</b>			<b>&lt; 1.0</b>
<b>Aromatic TPH &gt;C12 - C16</b>			<b>&lt; 2.0</b>
<b>Aromatic TPH &gt;C16 - C21</b>			<b>&lt; 10</b>
<b>Aromatic TPH &gt;C21 - C35</b>			<b>&lt; 10</b>
<b>Aromatic TPH (C5 - C35)</b>			<b>&lt; 10</b>
<b>Benzene</b>			<b>&lt; 0.005</b>
<b>Toluene</b>			<b>&lt; 0.005</b>
<b>Ethylbenzene</b>			<b>&lt; 0.005</b>
<b>p &amp; m-xylene</b>			<b>&lt; 0.005</b>
<b>o-xylene</b>			<b>&lt; 0.005</b>
<b>MTBE (Methyl Tertiary Butyl Ether)</b>			<b>&lt; 0.005</b>
<b>Asbestos</b>			<b>Not-detected</b>

S = SAND

**Visual Examination**  
The sample can be described as a pale yellow (Munsell Colour, 2.5YR 8/3), 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.

Results of analysis should be read in conjunction with the report they were issued with.

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Harriet MacRae  
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Graduate Soil Scientist