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Our Ref: TOHA/22/7762/SS  
Your Ref: see below

Dear Sirs

**Topsoil Analysis Report: Bury Hill Horsham Yard – Lawn Topsoil (PL)**

We have completed the analysis of the soil sample recently submitted, referenced *Lawn Topsoil (PL)* and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample specifically for use as a 'lawn topsoil' for high-performance amenity grass areas with good compaction resistance, high wear tolerance, and where supplementary irrigation is available.

This report presents the results of analysis for the sample submitted to our office, 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 or waste designation purposes, especially after the topsoil has left the Bury Hill Landscape Supplies Ltd site.

**SAMPLE EXAMINATION**

The sample was described as a dark yellowish brown (Munsell Colour 10YR 4/4), slightly moist, friable, non-calcareous SAND with a single grain structure. The stone content of the sample was very low and contained a moderate proportion of organic fines and it occasional woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

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Plate 1: Sample Lawn Topsoil (PL)

### **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;
- heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B);
- 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 *sand* texture class. Further detailed particle sized distribution found the sample to have a sufficiently narrow particle size distribution, and a predominance of *medium sand* (0.25-0.50mm), with a smaller proportion of *coarse sand* (0.50-1.0mm). This is acceptable for high-use grass areas as sufficient porosity levels are maintained in a compacted state and the risk of particle interpacking and surface smearing is minimised.

High sand content soils typically have good aeration, drainage and compaction-resistance properties, but can possess reduced water and nutrient retention capacities. As such, it will be important that the lawn be suitably maintained (seasonal fertiliser applications, irrigation, decompaction etc.) as part of an ongoing maintenance regime.

The sample was virtually stone-free and as such, stones will not restrict the use of the soil.

### **Saturated Hydraulic Conductivity**

The saturated hydraulic conductivity rate (49 mm/hr) recorded under a degree of consolidation was moderate and acceptable for many applications. However, it would not be considered 'fast-draining', where a rate of over 150 mm/hr is usually observed.

The combination of this drainage rate and the soil's particle size distribution should offer a good balance of water retention for plant uptake and drainage of surplus water over a period of time.

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

The sample was alkaline in reaction (pH 7.7). This pH value would be considered suitable for general landscape purposes provided grass species with a wide pH tolerance or those known to prefer alkaline soils are selected.

The electrical conductivity (salinity) values (water and CaSO<sub>4</sub> extract) were moderate, which indicates that soluble salts were not present at levels that would be harmful to plants.

### **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 landscape applications.

### **Potential Contaminants**

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 use as a topsoil for high-performance amenity grass / lawn areas.

From the soil examination and subsequent laboratory analysis, the sample was described as an alkaline, non-saline, non-calcareous 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 high-use lawn areas that are supported by irrigation.

A suitable maintenance regime should be implemented to support the establishment and continued growth of the grass sward (e.g. decompaction, aeration, fertiliser applications, etc.).

### **Soil Handling Recommendations**

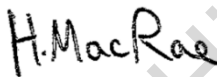
It is important to maintain the physical condition of the soil and avoid compaction during all phases of soil handling (e.g. stockpiling, respreading, cultivating, seeding or turfing). As a consequence, soil handling operations should be carried out when soil and the underlying ground is sufficiently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

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 ground has dried out. If the soil is compacted at any stage during the course of soiling or landscaping works, it should be decompacted appropriately.

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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



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Graduate Soil Scientist



**Matthew Heins**  
BSc (Hons) MSc SoilSci  
Senior Soil Scientist

For & on behalf of Tim O'Hare Associates LLP

