



Topsoil Analysis Report: Premium Grade Topsoil

We have completed the analysis of the soil sample recently submitted, referenced premium grade topsoil, 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 (BS3882:2007 – Specification for topsoil and requirements for use – Table 1, Multipurpose Topsoil).

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, especially after the topsoil has left the Bury Hill Landscape Supplies Ltd site.

SAMPLE EXAMINATION

The sample was described as a very dark brown (Munsell Colour 10YR 2/2), slightly moist, friable SANDY LOAM with a weakly developed, fine to medium granular structure*. The sample was virtually stone-free. 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(s). Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

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 absence of potential contaminants. The following parameters were determined:

- particle size analysis and stone content;
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn);
- soluble sulphate, elemental sulphur, acid volatile sulphide;
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos.

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 sandy loam texture class, which is usually considered suitable for general landscape applications provided the soil's physical condition is maintained.

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

pH and Electrical Conductivity Values

The sample was alkaline in reaction (pH 7.9). This pH value would be considered suitable for general landscape purposes providing 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 be present at levels that would be harmful to plants.

The electrical conductivity value by CaSO extract (BS3882 requirement) fell below the maximum specified value (2800 $\mu\text{S}/\text{cm}$) given in BS3882:2007 – Table 1.

Organic Matter and Fertility Status

The sample was 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 BS3882:2007 - Table 1: Notes 2, 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 of selected potential contaminants that affect human health have been assessed for residential end-use against the Soil Guideline Values (SGV) presented in the Contaminated Land Exposure Assessment (CLEA) (EA/DEFRA: 2009) and the CIEH/LQM Generic Assessment Criteria (GAC) (2nd Edition, 2009). Of the potential contaminants determined, none exceeded their respective SGV or GAC

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.

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 (BS3882:2007 – Specification for topsoil and requirements for use – Table 1, Multipurpose Topsoil).

From the soil examination and subsequent laboratory analysis, the sample was described as alkaline, non- saline sandy loam with a weak structure and low stone content. The organic



matter content and fertility status were adequate. Of the potential contaminants determined, none exceeded their respective SGV or GAC 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 the physical condition of the soil is satisfactory and plant species selected have a broad pH tolerance.

The topsoil was also fully compliant with the requirements of the British Standard for Topsoil (BS3882:2007 – Specification for topsoil and requirements for use – Table 1, Multipurpose Topsoil).

RECOMMENDATIONS

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 reasonably dry and 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.

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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For & on behalf of Tim O'Hare Associates LLP



Sample Reference		Accreditation	Contract 15
Clay (<0.002mm)	%	UKAS	13
Silt (0.002-0.063mm)	%	UKAS	10
Sand (0.063-2.0mm)	%	UKAS	77
Texture Class (UK Classification)	--	UKAS	SL
Stones (2-20mm)	% DW	GLP	1
Stones (20-50mm)	% DW	GLP	0
Stones (>50mm) % DW GLP 0	% DW	GLP	0
pH Value (1:2.5 water extract)	Units	UKAS	7.9
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS	736
Electrical Conductivity (1:2 CaSO4 extract)	uS/cm	UKAS	2628
Exchangeable Sodium Percentage	%	UKAS	2.7
Organic Matter (LOI)	%	UKAS	6.7
Total Nitrogen (Dumas)	%	UKAS	0.27
C : N Ratio	ratio	UKAS	14
Extractable Phosphorus	mg/l	UKAS	35
Extractable Potassium	mg/l	UKAS	825
Extractable Magnesium	mg/l	UKAS	104
Total Arsenic (As)	mg/kg	MCERTS	10
Total Cadmium (Cd)	mg/kg	MCERTS	< 0.2
Total Chromium (Cr) 10	mg/kg	MCERTS	15
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS	<4.0
Total Copper (Cu)	mg/kg	MCERTS	15
Total Lead (Pb)	mg/kg	MCERTS	53
Total Mercury (Hg)	mg/kg	MCERTS	<0.3
Total Nickel (Ni)	mg/kg	MCERTS	11
Total Selenium (Se)	mg/kg	MCERTS	<1.0
Total Zinc (Zn)	mg/kg	MCERTS	69
Water Soluble Boron (B)	mg/kg	MCERTS	1.4
Total Cyanide (CN)	mg/kg	MCERTS	<1.0
Total (mono) Phenols	mg/kg	MCERTS	<2
Elemental Sulphur (S)	mg/kg	MCERTS	<20
Acid Volatile Sulphide (S)	mg/kg	MCERTS	<1.0
Water Soluble Sulphate (SO 4)	g/l	MCERTS	0.21
Naphthalene mg/kg MCERTS < 0.05	mg/kg	MCERTS	<0.05
Acenaphthylene mg/kg MCERTS < 0.10	mg/kg	MCERTS	<0.1
Acenaphthene mg/kg MCERTS < 0.10	mg/kg	MCERTS	<0.1
Fluorene mg/kg MCERTS < 0.10	mg/kg	MCERTS	<0.1
Phenanthrene mg/kg MCERTS < 0.10	mg/kg	MCERTS	<0.1
Anthracene mg/kg MCERTS < 0.10	mg/kg	MCERTS	<0.1
Fluoranthene mg/kg MCERTS 0.29	mg/kg	MCERTS	<0.1
Pyrene mg/kg MCERTS 0.31	mg/kg	MCERTS	<0.1
Benzo(a)anthracene mg/kg MCERTS 0.23	mg/kg	MCERTS	<0.1
Chrysene mg/kg MCERTS 0.23	mg/kg	MCERTS	<0.05
Benzo(b)fluoranthene mg/kg MCERTS 0.31	mg/kg	MCERTS	<0.1
Benzo(k)fluoranthene mg/kg MCERTS 0.17	mg/kg	MCERTS	<0.1
Benzo(a)pyrene mg/kg MCERTS 0.28	mg/kg	MCERTS	<0.1
Indeno(1,2,3-cd)pyrene mg/kg MCERTS < 0.10	mg/kg	MCERTS	<0.1
Dibenzo(a,h)anthracene mg/kg MCERTS < 0.10	mg/kg	MCERTS	<0.1
Benzo(g,h,i)perylene mg/kg MCERTS < 0.05	mg/kg	MCERTS	<0.05
Total PAHs (sum USEPA16) mg/kg MCERTS 1.82	mg/kg	MCERTS	1.6
Aliphatic TPH >C5 - C6	mg/kg	MCERTS	<0.1
Aliphatic TPH >C6 - C8	mg/kg	MCERTS	<0.1
Aliphatic TPH >C8 - C10	mg/kg	MCERTS	<0.1
Aliphatic TPH >C10 - C12	mg/kg	MCERTS	<1
Aliphatic TPH >C12 - C16	mg/kg	MCERTS	<2
Aliphatic TPH >C16 - C21	mg/kg	MCERTS	<8
Aliphatic TPH >C21 - C35	mg/kg	MCERTS	16
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS	16
Aromatic TPH >C5 - C7	mg/kg	MCERTS	<0.1
Aromatic TPH >C7 - C8	mg/kg	MCERTS	<0.1
Aromatic TPH >C8 - C10	mg/kg	MCERTS	<0.1
Aromatic TPH >C10 - C12	mg/kg	MCERTS	<1
Aromatic TPH >C12 - C16	mg/kg	MCERTS	<2
Aromatic TPH >C16 - C21	mg/kg	MCERTS	<10
Aromatic TPH >C21 - C35	mg/kg	MCERTS	<10
Aromatic TPH (C5 - C35)	mg/kg	MCERTS	<10
Benzene	mg/kg	MCERTS	<0.001
Toluene	mg/kg	MCERTS	<0.001
Ethylbenzene	mg/kg	MCERTS	<0.001
o-xylene	mg/kg	MCERTS	<0.001
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS	<0.001
Asbestos	D/ND	ISO 17025	Not-detected