TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

MB Soils & Groundworks Limited

Mr Mark Bennett
MB Soils & Groundworks Limited
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Wigan
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13th September 2024
Our Ref: TOHA/24/1533/SS
Your Ref: see below

Dear Sirs

Topsoil Analysis Report: Heapey, Chorley

We have completed the analysis of the soil sample recently submitted, referenced *Heapey 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, the sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil *(BS3882:2015 – Specification for Topsoil - 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 testing, validation testing or waste designation purposes.

SAMPLE EXAMINATION

The sample was described as a greyish brown (Munsell Colour 10YR 3/2), slightly moist, non-plastic, non-calcareous CLAY LOAM with a well developed, very fine to medium granular and sub-angular blocky structure. The sample was virtually stone-free. No unusual odours or deleterious materials were observed.

*This appraisal of soil structure was made from examination of a disturbed sample. 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 concentration of selected potential contaminants. The following parameters were determined:

- particle size analysis (sand, silt, clay);
- stone content (2-20mm, 20-50mm, >50mm);
- 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);
- 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 *clay loam* texture class, which is usually considered suitable for general landscape applications provided the soil's physical condition is maintained.

Such soils usually have good water and nutrient retention capacities, but they are also prone to structural degradation and compaction during handling, and especially when plastic in consistency. Any damage to the structural condition of this soil is likely to reduce its drainage and aeration properties.

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 strongly acid in reaction (pH 5.1), with a pH value that would be considered unsuitable for general landscape purposes. Unless acid-loving species (calcifuges) have been selected, this soil would benefit from further amelioration to raise its pH (e.g. lime application).

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 $CaSO_4$ extract (*BS3882* requirement) fell below the maximum specified value (3300 µS/cm) given in *BS3882:2015 – Table 1*.

Organic Matter and Fertility Status

The sample was adequately supplied with organic matter, total nitrogen, extractable phosphorus and extractable magnesium but was deficient in extractable potassium. This deficiency can be remedied by a suitable compost application.

The C:N ratio of the sample was acceptable for general landscape purposes.

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Potential Contaminants

With reference to *BS3882:2015 - Table 1*: Notes 3 and 4, there is a recommendation 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 that affect human health have been compared with the *residential with home-grown 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 was found at levels that exceeded their 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 topsoil sample for general landscape purposes. The analysis has also been undertaken to determine the sample's compliance with the requirements of the British Standard for Topsoil *(BS3882:2015 – Specification for Topsoil - Table 1, Multipurpose Topsoil).*

From the soil examination and subsequent laboratory analysis, the sample was described as a strongly acid, non-saline, non-calcareous, virtually stone-free clay loam with a well-developed structure. The sample was adequately supplied with organic matter and most major plant nutrients. However, deficient in extractable potassium. Of the potential contaminants determined, none exceeded their respective guideline values.

Based on our findings, the topsoil represented by this sample would be considered suitable for general landscape purposes provided the extractable potassium deficiency is addressed and the soil's physical condition is maintained.

The sample was largely compliant with the requirements of the British Standard for Topsoil *(BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil),* with the exception of the deficiency in extractable potassium. On this occasion, this non-compliance is considered minor when reviewed in the context of all the other results, provided the nutrient deficiency is remedied by a suitable compost application.

RECOMMENDATIONS

Compost for Planting

For tree and shrub planting, we recommend applying and incorporating suitable compost (e.g. PAS100:2018 /Landscape Institute/WRAP grade (10mm screened) green compost) into the upper 200mm of topsoil (ensuring the soil is dry and friable) at a rate of **15%** by volume. This application should address the extractable potassium deficiency.

Fertiliser for Amenity Grass Establishment

To address the extractable potassium deficiency and to help promote effective grass establishment, we recommend applying and incorporating the pre-seeding grass fertiliser *ICL Sportsmaster Pre-seeder* (8%N:12%P_2O_5:8%K_2O+3%MgO) prior to seeding or turfing at a rate of 35 g/m^2 and to a depth of 100mm.

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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 sufficiently dry to be non-plastic (friable) in consistency.

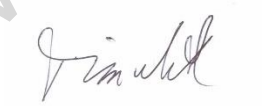
It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the soil is friable in consistency. If the soil is structurally damaged and compacted at any 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.

Further details on soil handling are provided in Annex A of *BS3882:2015.*

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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Soil Scientist

Tim White
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Senior Associate

For & on behalf of Tim O'Hare Associates LLP

MB Soils & Groundworks Limited

TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	**MB Soils & Groundworks Ltd**
Project:	**Heapey, Chorley**
Job:	**Topsoil Analysis - BS3882:2015**
Date:	**13/09/2024**
Job Ref No:	**TOHA/24/1533/SS**

Sample Reference			**Heapey Topsoil**
		Accreditation	
Clay (<0.002mm)	%	UKAS	21
Silt (0.002-0.063mm)	%	UKAS	32
Sand (0.063-2.0mm)	%	UKAS	47
Texture Class (UK Classification)	--	UKAS	CL
Stones (2-20mm)	% DW	GLP	1
Stones (20-50mm)	% DW	GLP	0
Stones (>50mm)	% DW	GLP	0
pH Value (1:2.5 water extract)	units	UKAS	5.1
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS	818
Electrical Conductivity (1:2 $CaSO_4$ extract)	uS/cm	UKAS	2494
Exchangeable Sodium Percentage	%	UKAS	1.1
Organic Matter (LOI)	%	UKAS	7.5
Total Nitrogen (Dumas)	%	UKAS	0.47
C : N Ratio	ratio	UKAS	9
Extractable Phosphorus	mg/l	UKAS	29
Extractable Potassium	mg/l	UKAS	106
Extractable Magnesium	mg/l	UKAS	76
Total Arsenic (As)	mg/kg	MCERTS	14
Total Cadmium (Cd)	mg/kg	MCERTS	0.5
Total Chromium (Cr)	mg/kg	MCERTS	23
Total Copper (Cu)	mg/kg	MCERTS	33
Total Lead (Pb)	mg/kg	MCERTS	170
Total Mercury (Hg)	mg/kg	MCERTS	< 0.3
Total Nickel (Ni)	mg/kg	MCERTS	16
Total Selenium (Se)	mg/kg	MCERTS	< 1.0
Total Zinc (Zn)	mg/kg	MCERTS	88
Water Soluble Boron (B)	mg/kg	MCERTS	0.8
Total Cyanide (CN)	mg/kg	MCERTS	< 1.0
Total (mono) Phenols	mg/kg	MCERTS	< 1.0
Naphthalene	mg/kg	MCERTS	0.08
Acenaphthylene	mg/kg	MCERTS	< 0.05
Acenaphthene	mg/kg	MCERTS	0.06
Fluorene	mg/kg	MCERTS	< 0.05
Phenanthrene	mg/kg	MCERTS	0.49
Anthracene	mg/kg	MCERTS	< 0.05
Fluoranthene	mg/kg	MCERTS	1.20
Pyrene	mg/kg	MCERTS	1.10
Benz(a)anthracene	mg/kg	MCERTS	0.52
Chrysene	mg/kg	MCERTS	0.62
Benzo(b)fluoranthene	mg/kg	MCERTS	0.75
Benzo(k)fluoranthene	mg/kg	MCERTS	0.40
Benzo(a)pyrene	mg/kg	MCERTS	0.71
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS	0.33
Dibenzo(a,h)anthracene	mg/kg	MCERTS	< 0.05
Benzo(g,h,i)perylene	mg/kg	MCERTS	0.34
Total PAHs (sum USEPA16)	mg/kg	MCERTS	6.6
Aliphatic TPH >C5 - C6	mg/kg	MCERTS	< 0.010
Aliphatic TPH >C6 - C8	mg/kg	MCERTS	< 0.010
Aliphatic TPH >C8 - C10	mg/kg	MCERTS	< 0.010
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	< 8.0
Aliphatic TPH >C21 - C35	mg/kg	MCERTS	< 8.0
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS	< 10
Aromatic TPH >C5 - C7	mg/kg	MCERTS	< 0.010
Aromatic TPH >C7 - C8	mg/kg	MCERTS	0.0
Aromatic TPH >C8 - C10	mg/kg	MCERTS	< 0.020
Aromatic TPH >C10 - C12	mg/kg	MCERTS	< 1.0
Aromatic TPH >C12 - C16	mg/kg	MCERTS	4.4
Aromatic TPH >C16 - C21	mg/kg	MCERTS	< 10
Aromatic TPH >C21 - C35	mg/kg	MCERTS	18
Aromatic TPH (C5 - C35)	mg/kg	MCERTS	23
Benzene	mg/kg	MCERTS	< 0.005
Toluene	mg/kg	MCERTS	0
Ethylbenzene	mg/kg	MCERTS	< 0.005
p & m-xylene	mg/kg	MCERTS	< 0.005
o-xylene	mg/kg	MCERTS	< 0.005
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS	< 0.005
Asbestos Screen	ND/D	ISO 17025	Not-detected

CL = CLAY LOAM

Visual Examination

The sample was described as a greyish brown (Munsell Colour 10YR 3/2), slightly moist, non-plastic, non-calcareous CLAY LOAM with a well developed, very fine to medium granular and sub-angular blocky structure. The sample was virtually stone-free. No unusual odours or deleterious materials were observed.

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

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