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Amended Report

Report No.:	25-02435-2		
Initial Date of Issue:	10-Feb-2025	**Date of Re-Issue:**	10-Feb-2025
Re-Issue Details:	This report has been revised and directly supersedes 25-02435-1 in its entirety		
Client	Springbridge Direct Ltd		
Client Address:	Oxford Road Denham Middlesex UB9 4DF		
Contact(s):	Tom Hawkins		
Project	Springbridge Yard		
Quotation No.:	Q25-37158	**Date Received:**	24-Jan-2025
Order No.:		**Date Instructed:**	24-Jan-2025
No. of Samples:	2		
Turnaround (Wkdays):	10	**Results Due:**	06-Feb-2025
Date Approved:	07-Feb-2025	**Subcon Results Due:**	06-Feb-2025

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd			**Chemtest Job No.:**			25-02435
Quotation No.: Q25-37158			**Chemtest Sample ID.:**			1922378
Order No.:			Client Sample Ref.:			Topsoil
			Client Sample ID.:			Top
			Sample Type:			SOIL
			Date Sampled:			22-Jan-2025
			Time Sampled:			11:26
			Asbestos Lab:			DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type		U	2192		N/A	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected
Moisture		N	2030	%	0.020	17
Soil Colour		N	2040		N/A	Brown
Other Material		N	2040		N/A	Stones
Soil Texture		N	2040		N/A	Sand
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	1.1
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50
Arsenic		M	2455	mg/kg	0.5	1.4
Cadmium		M	2455	mg/kg	0.10	< 0.10
Chromium		M	2455	mg/kg	0.5	3.2
Copper		M	2455	mg/kg	0.50	3.2
Mercury		M	2455	mg/kg	0.05	< 0.05
Nickel		M	2455	mg/kg	0.50	2.0
Lead		M	2455	mg/kg	0.50	6.0
Selenium		M	2455	mg/kg	0.25	< 0.25
Zinc		M	2455	mg/kg	0.50	14
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50

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Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**	
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	< 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	3.5
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	25
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	17
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	30
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	47
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0

Results - Soil

Project: Springbridge Yard

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				Time Sampled:		11:26
				Asbestos Lab:		DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**	
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	11
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	6.0
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	31
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	17
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	48
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	47
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	95
Benzene		M	2760	µg/kg	1.0	< 1.0
Toluene		M	2760	µg/kg	1.0	< 1.0
Ethylbenzene		M	2760	µg/kg	1.0	< 1.0
m & p-Xylene		M	2760	µg/kg	1.0	< 1.0
o-Xylene		M	2760	µg/kg	1.0	< 1.0
Nitrogen (Total)		SN	2790	%	0.10	0.23
Naphthalene		M	2800	mg/kg	0.10	< 0.10
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10
Acenaphthene		M	2800	mg/kg	0.10	< 0.10

Results - Soil

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				Asbestos Lab:		DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**	
Fluorene		M	2800	mg/kg	0.10	< 0.10
Phenanthrene		M	2800	mg/kg	0.10	< 0.10
Anthracene		M	2800	mg/kg	0.10	< 0.10
Fluoranthene		M	2800	mg/kg	0.10	< 0.10
Pyrene		M	2800	mg/kg	0.10	< 0.10
Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10
Chrysene		M	2800	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10
Total Of 16 PAH's		N	2800	mg/kg	2.0	< 2.0
Total Phenols		M	2920	mg/kg	0.10	< 0.10

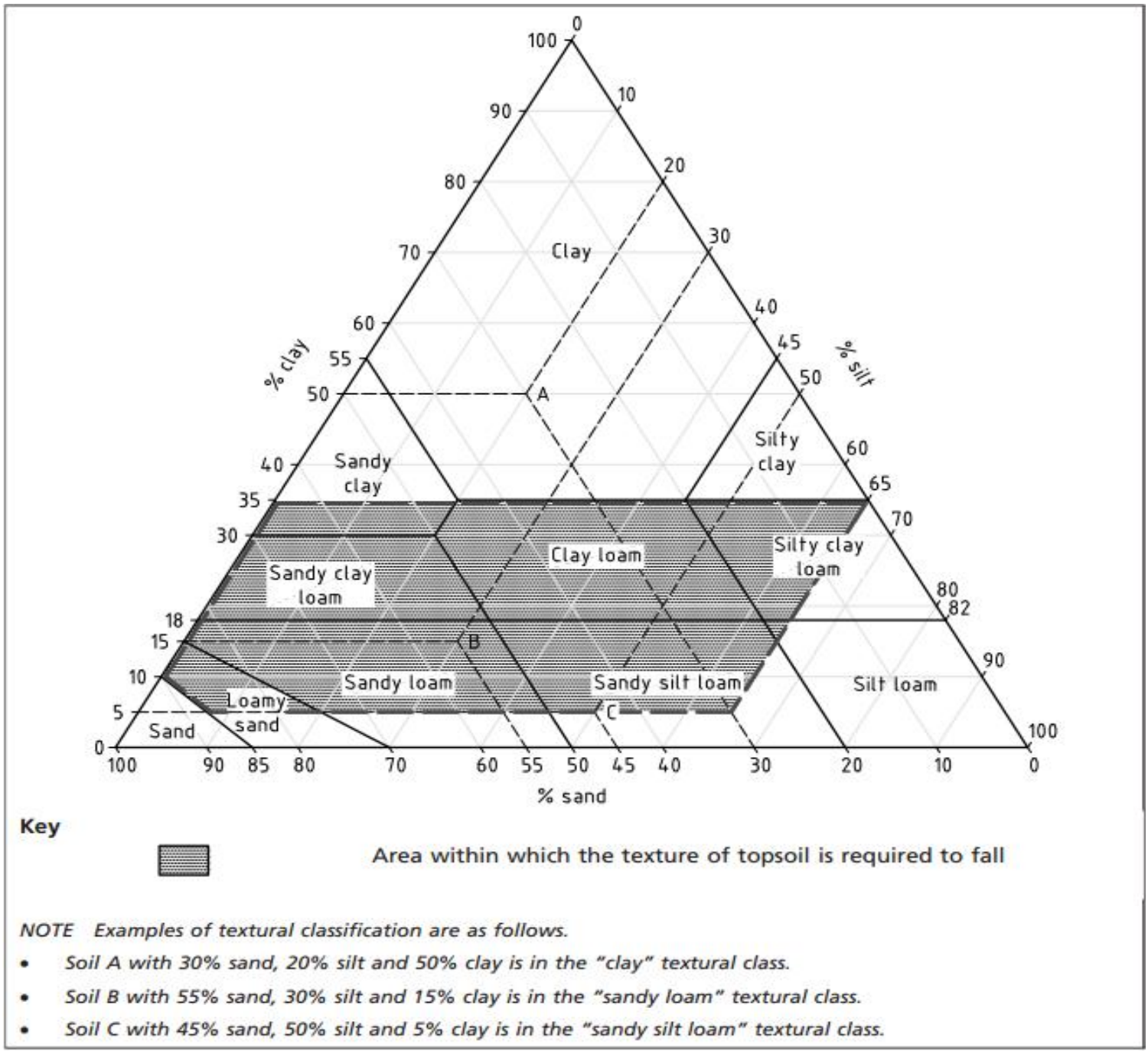
Results - Topsoil Report

BS3882:2015

Chemtest Job No.: 25-02435
Chemtest Sample ID.: 1922378
Client Sample Ref.: Topsoil
Sample Location:
Client Sample ID.: Top
Top Depth (m):
Bottom Depth (m):
Date Sampled: 22-Jan-2025
Time Sampled:

Parameter	Units	Multipurpose Range			Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)		
Texture							**Acid**	**Low F**	**Calc.**
Clay content (Sub Contracted)	%				6.0				
Silt content (Sub Contracted)	%				11.0				
Sand content (Sub Contracted)	%				84				
Soil texture class		See Attached Chart			Loamy Sand	YES			
Mass Loss on Ignition									
Clay 5-20%		3.0-20			3.1	YES	YES	YES	YES
Clay 20-35%		5.0-20							
Stone Content	**% m/m**								
>2mm (Sub Contracted)		0-30			4.2	YES			
>20mm (Sub Contracted)		0-10			0.70	YES			
>50mm (Sub Contracted)		0			< 0.10	YES			
Soil pH value		5.5-8.5			8.2	YES	NO	YES	YES
Carbonate (Calcareous only)	%				1.2				YES
Electrical Conductivity	µS/cm	If >3300 do ESP			3200	YES			
Available Nutrient Content									
Nitrogen %		>0.15			0.23	YES	YES		YES
Extractable phosphorus	mg/l	16-140			110	YES	YES	NO	YES
Extractable potassium	mg/l	121-1500			1400	YES	YES		YES
Extractable magnesium	mg/l	51-600			220	YES	YES		YES
Carbon : Nitrogen Ratio		<20:1			7.4/1	YES	YES	YES	YES
Exchangeable sodium	**%**	<15			4.2				
Available Calcium	mg/l				1700				
Available Sodium	mg/l				160				
Phytotoxic Contaminants (by soil pH)		**< 6.0**	**6.0-7.0**	**> 7.0**					
Zinc (Nitric Acid extract)	mg/kg	<200	<200	<300	38	YES			
Copper (Nitric Acid extract)	mg/kg	<100	<135	<200	8.6	YES			
Nickel (Nitric Acid extract)	mg/kg	<60	<75	<110	5.4	YES			
Visible Contaminants	**% mm**								
>2mm		<0.5			0.000	YES			
….. of which plastics		<0.25			0.000	YES			
….. man-made sharps		zero in 1kg			0.000	YES			

Topsoil: BS3882:2015
Texture Classification Chart



Key

Area within which the texture of topsoil is required to fall

NOTE Examples of textural classification are as follows.

- *Soil A with 30% sand, 20% silt and 50% clay is in the "clay" textural class.*
- *Soil B with 55% sand, 30% silt and 15% clay is in the "sandy loam" textural class.*
- *Soil C with 45% sand, 50% silt and 5% clay is in the "sandy silt loam" textural class.*

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2115	Total Nitrogen in Soils	Nitrogen	Determination by elemental analyser	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2260	Carbonate	Carbonate	Titration	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2400	Cations	Cations	ICP-MS	
2420	Phosphate	Phosphate	Spectrophotometry - Discrete analyser	
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.	
2620	LOI 440	LOI 440 Trommel Fines	Determination of the proportion by mass that is lost from a soil by ignition at 440°C.	
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

Report Information

Key	
U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at ≤ 30°C prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

Report Information

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Jason Lock
Boughton Loam Ltd
Telford Way Industrial Estate
Telford Way
Kettering
Northamptonshire NN16 8UN

15th January 2025
Our Ref: TOHA/25/1658/1/SS
Your Ref: PO 9765

Dear Sirs

Topsoil Analysis Report: Intensive Roof Garden Substrate

We have completed the analysis of the soil sample recently submitted, referenced *IN1 Green Roof Substrate,* and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the material for use as an intensive lightweight substrate in a rooftop or podium garden environment.

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 Boughton Loam Ltd site.

SAMPLE EXAMINATION

The sample was described as a dark brown (Munsell Colour 10YR 3/3), dry, friable to non-plastic, slightly calcareous SAND with a single grain structure. The sample was free of stone-sized material, with the exception of frequent lightweight expanded clay aggregates (leca) particles. The sample contained a moderate proportion of organic fines and occasional woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Plate 1: IN1 Green Roof Substrate 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 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;
- bulk density (as received, saturated @ field capacity);
- 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).

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 less than 2mm fraction fell into the *sand* texture class, with a predominance of medium sand (0.25-0.50mm). This indicates a narrow overall particle size distribution, which is beneficial for roof garden environments as good porosity levels are usually maintained in a consolidated state and the risk of particle interpacking is minimised.

The 'stone' sized fraction (>2mm) of the sample was very low (by mass), and comprised entirely of lightweight expanded clay aggregate (leca) up to 20mm in diameter. The proportion of stone sized particles recorded would be considered acceptable for an intensive roof garden substrate.

Saturated Hydraulic Conductivity and Bulk Density

The saturated hydraulic conductivity of the sample was high (143 mm/hour) and the soil would be described as 'free-draining'. This indicates that the substrate is sufficiently permeable and should demonstrate adequate drainage performance for use in rooftop or podium garden environments. Soils used in these environments need to have satisfactory drainage performance to avoid stagnation (and therefore excess weight) and to enable efficient conveyance of water into the drainage system. The soil is free-draining and may therefore benefit from additional irrigation input in dry periods, depending on the nature of the recipient scheme.

The sample displayed a bulk density at Field Capacity of 1.55 Mg/m^3, which is reasonably low compared to that of standard topsoil. The suitability of the bulk density result should be confirmed by the project engineer for the recipient site.

pH and Electrical Conductivity Values

The sample was strongly alkaline in reaction (pH 8.3). 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 moderately high; however, the exchangeable sodium percentage was low, indicating low sodium risk. The source of the elevated soluble salts in this instance is likely to be from soluble potassium (see comments below).

The electrical conductivity value by $CaSO_4$ extract (3833 µS/cm) exceeded our maximum recommended value (3300 µS/cm).

Organic Matter and Fertility Status

The sample was adequate to well supplied with organic matter and major plant nutrients. The sample contained a high level of extractable potassium (2158 mg/l) that exceed our recommended value (1500 mg/l).

High potassium levels such as that found in this sample can also have an antagonistic effect on other soil nutrients, particularly magnesium. This can reduce nutrient uptake, leading to plant stress, particularly for establishing specimens.

Potential Contaminants

With reference to *BS3882:2015 - Table 1*: Notes 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 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 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 material for use as an intensive lightweight substrate in a roof garden or podium landscape environment.

From the soil examination and subsequent laboratory analysis, the sample was described as a strongly alkaline, saline, slightly calcareous sand with a weakly developed structure and frequent 'leca' particles. The sample was found to be free draining. The sample was adequately to well supplied with organic matter and major plant nutrients, with a high level of extractable potassium. Of the potential contaminants determined, none exceeded their respective guideline values.

Based on our findings, the substrate represented by this sample appears to be a little rich on account of its high potassium content and slightly elevated electrical conductivity. The source of the elevated potassium content could be associated with the proportion and/or the type of compost in the blend. Potassium is highly soluble, and the level is likely to fall when the material is wetted by rain or irrigation water. However, in this instance we recommend reviewing the quality and quantity of compost that has been used.

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

H.MacRae

A.Cross

Harriet MacRae
BSc MSc
Soil Scientist

Aaron Cross
BSc MSc MISoilSci
Senior Soil Scientist

For & on behalf of Tim O'Hare Associates LLP

TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	**Boughton Loam Ltd**
Project:	**Intensive Roof Garden Substrate**
Job:	**Topsoil Analysis**
Date:	**15/01/2025**
Job Ref No:	**TOHA/25/1658/1/SS**

Sample Reference			**IN1 Green Roof Substrate**
		Accreditation	
Clay (<0.002mm)	%	UKAS	4
Silt (0.002-0.063mm)	%	UKAS	7
Very Fine Sand (0.05-0.15mm)	%	UKAS	7
Fine Sand (0.15-0.25mm)	%	UKAS	20
Medium Sand (0.25-0.50mm)	%	UKAS	45
Coarse Sand (0.50-1.0mm)	%	UKAS	15
Very Coarse Sand (1.0-2.0mm)	%	UKAS	2
Total Sand (0.05-2.0mm)	%	UKAS	89
Texture Class (UK Classification)	--	UKAS	S
Stones (2-20mm)	% DW	GLP	0
Stones (20-50mm)	% DW	GLP	0
Stones (>50mm)	% DW	GLP	0
Saturated Hydraulic Conductivity (m)	mm/hr	A2LA	143
Bulk Density (as Received)	Mg/m^3	UKAS	1.29
Bulk Density (Saturated @ Field Capacity)	Mg/m^3	UKAS	1.55
pH Value (1:2.5 water extract)	units	UKAS	8.3
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS	1576
Electrical Conductivity (1:2 $CaSO_4$ extract)	uS/cm	UKAS	3833
Exchangeable Sodium Percentage	%	UKAS	3.2
Organic Matter (LOI)	%	UKAS	5.4
Total Nitrogen (Dumas)	%	UKAS	0.20
C : N Ratio	ratio	UKAS	16
Extractable Phosphorus	mg/l	UKAS	93
Extractable Potassium	mg/l	UKAS	2158
Extractable Magnesium	mg/l	UKAS	143
Total Arsenic (As)	mg/kg	MCERTS	22
Total Cadmium (Cd)	mg/kg	MCERTS	< 0.2
Total Chromium (Cr)	mg/kg	MCERTS	33
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS	< 1.8
Total Copper (Cu)	mg/kg	MCERTS	5
Total Lead (Pb)	mg/kg	MCERTS	7
Total Mercury (Hg)	mg/kg	MCERTS	< 0.3
Total Nickel (Ni)	mg/kg	MCERTS	12
Total Selenium (Se)	mg/kg	MCERTS	< 1.0
Total Zinc (Zn)	mg/kg	MCERTS	38
Water Soluble Boron (B)	mg/kg	MCERTS	3.3
Total Cyanide (CN)	mg/kg	MCERTS	< 1.0
Total (mono) Phenols	mg/kg	MCERTS	< 1.0
Naphthalene	mg/kg	MCERTS	< 0.05
Acenaphthylene	mg/kg	MCERTS	< 0.05
Acenaphthene	mg/kg	MCERTS	< 0.05
Fluorene	mg/kg	MCERTS	< 0.05
Phenanthrene	mg/kg	MCERTS	< 0.05
Anthracene	mg/kg	MCERTS	< 0.05
Fluoranthene	mg/kg	MCERTS	0.06
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	mg/kg	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS	< 0.05
Dibenzo(a,h)anthracene	mg/kg	MCERTS	< 0.05
Benzo(g,h,i)perylene	mg/kg	MCERTS	< 0.05
Total PAHs (sum USEPA16)	mg/kg	MCERTS	< 0.80
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	< 0.010
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	5
Aromatic TPH >C16 - C21	mg/kg	MCERTS	11
Aromatic TPH >C21 - C35	mg/kg	MCERTS	< 10
Aromatic TPH (C5 - C35)	mg/kg	MCERTS	16
Benzene	mg/kg	MCERTS	< 0.005
Toluene	mg/kg	MCERTS	< 0.005
Ethylbenzene	mg/kg	MCERTS	< 0.005
p & m-xylene	mg/kg	MCERTS	< 0.008
o-xylene	mg/kg	MCERTS	< 0.005
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS	< 0.005

S = SAND

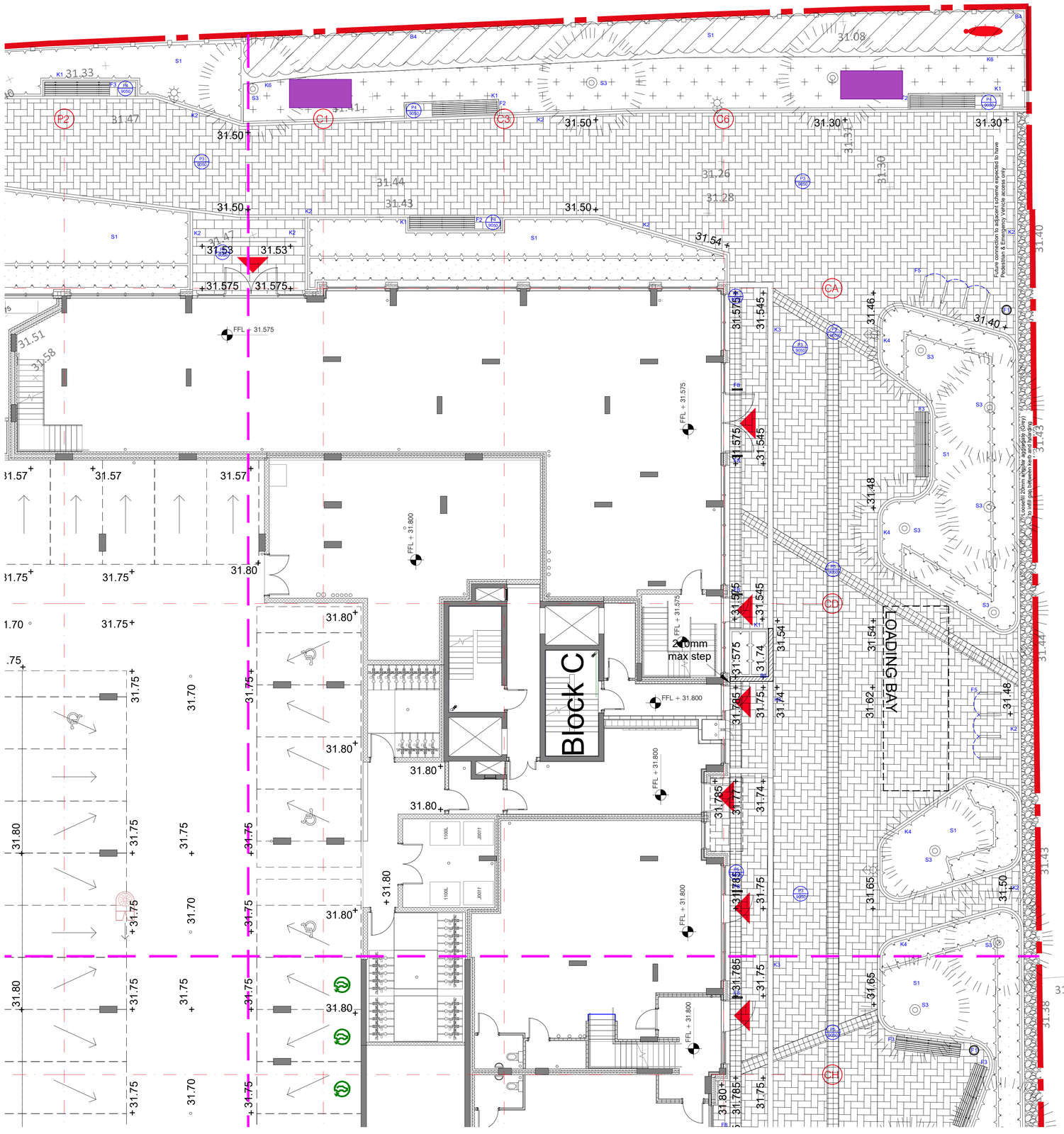
Visual Examination

The sample was described as a dark brown (Munsell Colour 10YR 3/3), dry, friable to non-plastic, slightly calcareous SAND with a single grain structure. The sample was free of stone-sized material, with the exception of frequent lightweight expanded clay aggregates (leca) particles. The sample contained a moderate proportion of organic fines and occasional woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

H.MacRae

Harriet MacRae
BSc MSc
Soil Scientist

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



KEY

Site Boundary

Adoptable Highway Boundary

Proposed tree (with paving - filled tree grille)
(Refer to Planting Plans for spec.)
Extent of below-ground geogrid root-crate system and vents indicated for hard landscaped areas

Proposed tree in soft landscape
(Refer to Planting Plans for spec.)

Proposed hedge planting with mulch layer

Proposed shrub planting with mulch layer

Proposed turf to Courtyard / Open Space

Proposed Wildflower Meadow

Hard Landscape *(For paving details below refer to CTC-LDA-XX-XX-DR-L-09050 / 09051)*

P1 - Vehicular carriageway.
Ref: Proposed Black DBM to Adoptable Standards.

P2 - Pedestrian carriageway.
Ref: Proposed Black DBM to Adoptable Standards.

P3 - PCC aggregate block for vehicle & pedestrian areas (permeable) -
Ref: Hydropave Fusion; Size: 200×100×80mm; 90° Herringbone
Colour: Silver (50%), Mid Grey (50%)

P4 - PCC aggregate block for vehicle thoroughfares & focal entrance areas (permeable) -
Ref: Hydropave Fusion; Size: 200×100×80mm; 90° Herringbone; Colour: Graphite

P5 - PCC Textured Sett to Decorative Banding with mortar bed & joints -
Ref: Hydropave Fusion; Size: 200×100×80mm; Staggered 50/50;
Colour: Silver (border), Mid Grey (middle)

P6 - PCC aggregate pavers to private frontages (non-permeable) -
Ref: Fusion Size: 600×300×60mm; Staggered stretcher 50/50
Colour: Silver (50%), Mid Grey (50%)

P7 - Resin bound gravel to railway 'aggregate' element
Ref: Addaset; Colour: 'Midnight Grey 6mm'

P8- Rubber mulch play surface to Central Play Courtyard
Ref: Rhino Mulch; Colour: 'Earth Tone'

P9 - Resin bound gravel to railway 'sleeper' element
Ref: Addaset; Colour: 'XXX 6mm'

Kerbs *(For all details below refer to CTC-LDA-XX-XX-DR-L-09052)*

K1 - PCC textured kerb - 75mm - (flush - transitions soft/hard, hard/hard)
K2 - PCC textured kerb - 125mm - (flush - transitions soft/hard, hard/hard)
K3 - PCC textured kerb - 255mm - (flush - transitions along vehicular routes)
K4 - PCC textured kerb - 125mm - (125mm upstand for planters)
K5 - PCC textured kerb - 255mm - (25mm upstand along car park access routes)
K6 - Timber edge to soft planting and grassed area
K7 - Bespoke Corten faux rail edge to railway feature.
PCC textured kerb colour to be silver, black specked

Boundary treatments *(For all details below refer to CTC-LDA-XX-XX-DR-L-09053)*

B1 - Metal railing to private frontages (1.2m high)
B2 - Secure railing & gate to semi-private space north of block A (2.1m high)
B3 - Metal gate to private frontages (1.2m high)
B4 - Timber post and 3 rail fence to canal edge (1.2m high)
B5 - Brick retaining wall (max. 450mm)

Street Furniture *(For all details below refer to CTC-LDA-XX-XX-DR-L-09054)*

F1 - Litter Bin: Powercoated galvanised steel (80ø) *(Ref. S45 TA Litter Bin by OMOS)*
F2 - Timber bench to communal seating area (10no), 3m wide *(Ref. QUAY by Factory Furniture)*
F3 - Timber seat to communal seating area (12no), 3m wide *(Ref. QUAY by Factory Furniture)*
F4 - Timber cube bollard (informal seat) *(Ref. Timber cube by Woodscape)*
F5 - Sheffield style cycle hoop (21no) *(Ref. Sheffield stand by Broxap, PCC RAL 9004)*
F6 - Removable bollard (12no) *(Ref. Autopa, Removable Bollard 101mm)*
F7 - Static bollard (15no) *(Ref. Autopa, Fixed Bollard 114mm)*
F8 - Door guard (16no) *(Ref. Root fixed, PCC RAL 9004)*

Indicative Lighting (To be designed by Specialist Lighting Consultant)

Lighting columns (4m post)

Play Items *(For all details below refer to CTC-LDA-XX-XX-DR-L-09057 / 09058)*

R1 - Obstacle Course Climbing Wall by HAGS
R2 - Equilibra Natural by HAGS
R3 - Somersault Volta by HAGS
R4 - Inclusive Roundabout Spinnee by HAGS
R5 - Swing Goro by HAGS
R6 - Clamber Stack 3 by HAGS

Ecological Enhancements at ground level
(Refer to Middlemarch Environmental Ltd Preliminary Ecological Appraisal - RT-MME-129768-01)

Partially buried, upstanding logs in a cluster for deadwood habitat for the benefit of invertebrates (3nos)

Note.
Site levels to Infrastructure Design Ltd design (Jan 2025)
Ref: CTC-ISS-XX-XX-DR-C-923051 C02

Levels shown alongside Clayton Road as per approved 5278 drawing by LTP (July 2023)
Ref: LTP 3770 C2 01 01 REV E 11 07 23 Setting Out

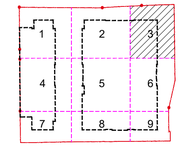
CDM Regulations 2015

ALL current drawings and specifications for the project must be read in conjunction with the Designer's Hazard and Environmental Assessment Record.

notes

- The contractor is responsible for checking dimensions, tolerances and references.
- Any discrepancy to be verified with the Architect before proceeding with the works.
- Where an item is covered by drawings to different scales the larger scale drawing is to be worked to.
- Do not scale drawing. Figured dimensions to be worked to in all cases.

4 3 2 1 0 2 4 6m



FINAL	FINAL CONSTRUCTION ISSUE	16.05.25
C02	UPDATED ARCHITECT PLAN & HIGHWAYS PLAN RECEIVED	21.02.25
C01	ISSUED FOR CONSTRUCTION	14.02.25
P01	ISSUED FOR TEAM COORDINATION	15.12.23
REV	AMENDMENT	DATE

Client:
GREYSTAR™
The Global Leader in Rental Housing

Project:
CROWN TRADING CENTRE,
HAYES, LONDON

Title:
GENERAL ARRANGEMENT 03

Scale:
1 : 100 | A1

Date SEPT 2023
Drawn DT
Checked PW

L.D.A
LANDSCAPE DESIGN ARCHITECTURE
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Drawing no.
CTC-LDA-XX-XX-DR-L-09013

LDA Job no. L1115

Revision. FINAL