

Our reference: 065782-CUR-00-XX-RP-GE-0004-P03

21/01/2022

Chris Bates
John Sisk & Son Ltd
2410 Regents Court
The Crescent
Birmingham Business Park
B377YE

Dear Chris,

Re: Remediation Validation at Circle Square Plots 2, 3 and 4

1.0 Introduction and Background

In July 2017, Curtins issued a Remediation Strategy report in relation to Plots 2, 3 and 4 at the Circle Square Development, Manchester. This report was submitted as a part of the planning application (ref 111025/FO/2016/C1) and is assumed to have been accepted.

Condition 6 of the above Planning Application remains outstanding, and states that *'Prior to occupation and after completion of site works, a verification report to validate that the work undertaken (as detailed in condition 2) conforms to the remediation proposals shall be submitted to and agreed in writing by the City Council as Local Planning Authority'*.

The aforementioned Remediation Strategy (ref 065872-CUR-00-XX-RP-GE-002-V01, dated 21 July 2017), details one Remedial Action due to elevated PAHs recorded within the Made Ground and superficial soils during the intrusive investigation across the site:

- Engineered capping in areas of soft landscaping: a minimum 450mm clean capping comprising a minimum of 150mm topsoil over resultant depth of subsoil.

An interim validation report was issued in December 2020 however remediation had not been completed across the whole site at this time. We write to confirm that these works have now been undertaken and are broadly in line with the Remediation Specification provided and no potential contaminant linkages remain. Updated verification records are provided within.

2.0 Unexpected Contamination

John Sisk confirmed in a letter dated 25th September 2020 that no unexpected contamination was identified at the site during groundworks. This letter is enclosed as an appendix.

3.0 Imported Soils Validation

3.1 Subsoil

John Sisk provided source testing certificates for imported subsoil from 'Topscape Subsoil - Eaton Hall', considered a manufactured source. The soil was identified as a very pale brown, friable, fine sand. One sample was tested for the greenfield/manufactured environmental chemistry analysis suite in line with that recommended in Curtins Remediation Strategy (Table 5.2).



The Tim O'Hare testing results (ref. TOHA/19/9035/SS enclosed) were compared against 'Residential without Home grown Produce' Generic Assessment Criteria for 1% SOM (enclosed). No exceedances were recorded and therefore the soil was deemed suitable for import.

John Sisk stated approximately 340m³ of subsoil is to be imported for use on site. On this basis it was recommended that a minimum of three samples is tested once imported to site to ensure the testing frequency recommended in Curtins Remediation Strategy is met (Table 5.1).

Three samples were subsequently obtained for testing from a stockpile of the imported subsoil stored on the adjacent Circle Square Plot 12 site on 28th October 2020. Curtins drawing ref. 065782-CUR-00-XX-DR-GE-00002-V01 and Curtins photographic record enclosed shows the locations from which the samples were obtained. Samples were tested for the greenfield/manufactured environmental chemistry analysis suite recommended in Curtins Remediation Strategy (Table 5.2). Envirolab testing results (enclosed report ref. 20/09272/1 for samples SS1-SS3) were again compared against 'Residential without Home grown Produce' Generic Assessment Criteria for 1% SOM. No exceedances were recorded and therefore the subsoil may be considered 'clean' and 'suitable for use'.

3.2 Topsoil

Huperade Ltd Source

John Sisk provided source testing certificates for imported topsoil from 'Huperade Ltd' considered a manufactured source. The soil was identified as a brown sandy loam. Source testing was limited to texture, loss on ignition, stone content, nutrient and phytotoxic contaminant testing undertaken by Chemtest (results enclosed ref.20-02828-1).

John Sisk stated approximately 270m³ of topsoil is to be imported for use on site. On this basis it was recommended that a minimum of three samples is tested once imported to site to ensure the recommended on-site testing frequency is met.

Three samples (TS01-TS03) were obtained for testing on the 13th October 2020 from one of the tree pits where soils had already been deposited. Curtins drawing ref. 065782-CUR-00-XX-DR-GE-00002-V02 and Curtins photo enclosed shows the locations from which the samples were obtained. Samples were tested for the greenfield/manufactured environmental chemistry analysis suite recommended in Curtins Remediation Strategy (Table 5.2). Envirolab testing results (ref. 20-08744 enclosed) were compared against 'Residential without Home grown Produce' Generic Assessment Criteria for 2.5% SOM. No exceedances were recorded however asbestos was identified in one location, sample ref. TS1 ES1 at 0.05m bgl, identified as Chrysotile board. Quantification was undertaken and identified a percentage of 0.01% of asbestos in soil mass tested.

Further testing was recommended across the site to understand if this is an isolated occurrence. An additional five samples were obtained 28th October 2020 for testing (enclosed report ref. 20/09272/1) from the locations shown in Curtins drawing ref. 065782-CUR-00-XX-DR-GE-00002-V01. Sample ref. TS04 was taken from another tree pit and tested for the same greenfield/manufactured environmental testing suite. Samples ref. TS05-TS08 were taken from a stockpile of the soils stored on the adjacent Circle Square Plot 12 site and were screened for asbestos only. No exceedances of 'Residential without Home grown Produce' Generic Assessment Criteria were identified in TS04 and no asbestos was identified in any sample.

Given asbestos chrysotile board has been encountered in only one location it appears to be an isolated occurrence. Furthermore, it was encountered within a tree pit referenced 'D6-Tree Pit in Hard' by landscape architects Planit I.E Limited. Planit I.E Drawing ref. CS-PLA-ZZ-XX-DR-L-1402 S3 C02



shows that topsoil in these tree pits will be covered with circa 300mm loose pea gravel. This would act to break any potential pollutant linkage between the end user and asbestos in this tree pit should any further asbestos containing materials or fibres be present.

Astley Source

For the central lawn and raised terrace areas a different topsoil source was utilised, from Astley, Greater Manchester, identified as a dark brown loamy sand and understood to be a greenfield/manufactured source. One sample was tested by Freeland Horticulture for the greenfield/manufactured environmental chemistry analysis suite in line with that recommended in Curtins Remediation Strategy (Table 5.2).

The Freeland Horticulture results (ref. SLC-790-SA enclosed) were compared against 'Residential without Home grown Produce' Generic Assessment Criteria for 2.5% SOM (enclosed). No exceedances were recorded and therefore the soil was deemed suitable for import.

It was recommended that a minimum of three samples is tested once imported to site to ensure the testing frequency recommended in Curtins Remediation Strategy is met (Table 5.1).

Three samples (TS09-TS11) were obtained for testing on the 25th March 2021 from the raised terrace areas where they recently been deposited. Curtins drawing ref. 065782-CUR-00-XX-DR-GE-00002-V02 and photographic record enclosed shows the locations from which the samples were obtained. Samples were tested for the greenfield/manufactured environmental chemistry analysis suite recommended in Curtins Remediation Strategy (Table 5.2). Chemtest testing results (ref. 21-11153-1 enclosed) were compared against 'Residential without Home grown Produce' Generic Assessment Criteria for 2.5% SOM. No exceedances were recorded and therefore this source is considered suitable for use.

3.3 6F5 Capping

As further detailed in Section 4.0, depth validation revealed the thickness of topsoil in the central lawn area did not meet the requirements of the Remediation Strategy (circa 350-400mm rather than 450mm). The topsoil was underlain by an imported 6F5 material however no source testing results were made available.

Curtins recommended that this material is tested to confirm suitability as it now essentially forms part of the engineered capping layer. In line with the testing frequencies recommended in Curtins Remediation Strategy it was recommended that 6 no. samples were tested from this material to characterise.

Six samples (HD301-HD306) were tested for the brownfield/unknown environmental chemistry analysis suite recommended in Curtins Remediation Strategy (Table 5.2). Curtins drawing ref. 065782-CUR-00-XX-DR-GE-00002-V02 and Curtins Photographic record enclosed shows the locations from which the samples were obtained. Envirolab's testing results (ref. 21-13656 enclosed) were compared against 'Residential without Home grown Produce' Generic Assessment Criteria for 2.5% SOM. No exceedances were recorded and therefore this source is considered suitable for use.

4.0 Depth Validation

To ensure the requisite depth of clean soil is met, depth validation was required. Areas requiring validation include tree pits and the central lawn area. Where newly constructed basements and slabs underly soft landscaped areas the potential pollutant linkage between end users and existing made ground soils will be broken by the concrete hardstanding and therefore depth validation is not



considered necessary, this includes the central terrace areas, plastic crating and membranes also underly the soils in these areas.

4.1 Tree Pits

Planit I.E limited Landscaping and tree pit details have been provided (enclosed) which show the extent of proposed landscaped areas and proposed tree pit construction. In tree pits, 600mm of topsoil is proposed over 550mm subsoil, this far exceeds the required 450mm total thickness.

The thickness of soils in tree pits was further validated during tree pit placement on 12 November 2020. The tree pit excavation was witnessed in one location (HD201) by Curtins engineer with the location identified in Curtins drawing ref. 065782-CUR-00-XX-DR-GE-00002-V02 and photographic record enclosed. The pit was excavated to a depth of 1.20m bgl ahead of construction of structural soil cell and deposition of soils. The structural soil cell, as described in Planit I.E Drawing ref. CS-PLA-ZZ-XX-DR-L-1402 S3 C02, will act to further limit risk to end users and maintenance workers by preventing/limiting possible excavation. The presence of the structural soil cell was also witnessed in Curtins visit on 13th October 2020 as described in Section 3.0, where samples TS01-TS03 were obtained, as well as in photos provided by Sisk. Curtins and Sisk's photographic records are enclosed.

4.2 Central Lawn

Curtins visited site in March 2021 to collect samples of the topsoil to be deposited in the central lawn and terrace areas. The topsoil in the central lawn area had not been deposited at this time but from the reduced level dig it was evident that 450mm clean soil would not be included as specified, with thicknesses of around 330-420mm anticipated. At the base of the reduced level dig was either; plastic crating and insulation in areas above the basement areas, or in areas outside of the basements a grey clayey gravel was observed with gravel including concrete and brick. This material was an imported 6F5 material but no source testing results were available.

Curtins revisited site in December 2021 to confirm the thickness of topsoil through a series of hand dug trial pits (HD301-HD306) and to sample the 6F5 material for laboratory analysis and screening as further discussed in Section 3.3.

Thicknesses of 380-450mm of dark brown topsoil were observed overlying >100mm grey clayey gravel. Although some deviation from the agreed Remediation Strategy has been observed, as the grey clayey gravel at the base of the 6F5 has also been proven to be clean and suitable for use, this acts as a subsoil material and a sufficient capping thickness is therefore achieved.

The potential contamination linkage identified in the Remediation Strategy is considered to no longer exist, the risk to end users and future maintenance workers is now considered to be Low and the Remediation objectives have been achieved.

5.0 Conclusions and Closure

Remediation works have now been completed leaving a site which may be considered 'suitable' for proposed end use. Curtins conclusions are provided below:

- John Sisk Ltd confirmed that no unexpected contamination has been identified at the site during groundworks;
- Imported subsoil validation testing has confirmed it may be considered 'clean' and 'suitable for use';



- Imported topsoil validation testing has confirmed the majority of soils tested may be considered 'clean'. Asbestos chrysotile board was identified in one sample location, appearing to represent an isolated occurrence. It was encountered within a tree pit where topsoil will be covered with circa 300mm of loose pea gravel. This would act to break any potential pollutant linkage between the end user and asbestos. On this basis the imported topsoil may also be considered 'suitable for use';
- Imported 6F5 used beneath topsoil in the central lawn area is also considered 'clean' and 'suitable for use'.
- Landscaping Drawings show typically within tree pits 600mm of topsoil is proposed over 550mm subsoil, this far exceeds the required 450mm total thickness. This thickness was confirmed in tree pit excavation and soil cell construction works witnessed by Curtins with further records provided by John Sisk Ltd.
- In the central lawn area only 380-450mm topsoil was identified overlying a >100mm grey clayey gravel (imported 6F5 material). Although some deviation from the agreed Remediation Strategy has been observed, as the grey clayey gravel at the base of the 6F5 has also been proven to be clean and suitable, this acts as a subsoil material and a sufficient capping thickness is therefore achieved.
- The risk to end users and future maintenance workers is now considered to be Low and the Remediation objectives have been achieved.

Please don't hesitate to contact the undersigned with any queries.

Yours sincerely,

Niall Farnworth
Senior Geo-Environmental Engineer
For and on behalf of
Curtins Consulting Ltd
Enc.

John Sisk Letter Dated 25th September 2020.

Tim O Hare Subsoil Source Testing Certificates Ref. TOHA/19/9035/SS.

Chemtest Source Topsoil Source Testing Certificates Ref.20-02828-1.

Astley Topsoil Source Testing Results Freeland Horticulture Ref. SLC-790-SA.

Envirolab Report Ref. 20-8744.

Chemtest Report Ref.21-11153-1.

Envirolab Report Ref. 20/09272/1.

Envirolab Report Ref. 21-13656.

Curtins Sample Location Plan 065782-CUR-00-XX-DR-GE-00002-V02.

Curtins Photographic Record Sheet.

Planit I.E limited Landscaping and Tree Pit Details.

Curtins Generic Assessment Criteria 1% & 2.5% SOM.



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Michael Massey
Tarmac Topscape
Manchester Road
Congleton
Cheshire, CW12 2LU

4th June 2019
Our Ref: TOHA/19/9035/SS
Your Ref: PO00398486

Dear Sirs

Subsoil Analysis Report: Topscape Subsoil (Eaton Hall)

We have completed the analysis of the soil sample recently submitted, referenced *Topscape Subsoil (Eaton Hall)*, and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for use as subsoil in 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 Subsoil (*BS8601:2013 – Specification for subsoil and requirements for use – Table 1, Multipurpose Subsoil*).

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the subsoil 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 subsoil has left the Tarmac Topscape site.

SAMPLE EXAMINATION

The sample was described as a very pale brown (Munsell Colour 10YR 7/4), slightly moist, friable, non-calcareous fine 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.

*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.

Tim O'Hare Associates LLP
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www.toha.co.uk

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, 20-75mm, >75mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- organic matter content;
- 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

Detailed Particle Size Analysis and Stone Content

The sample fell into the *sand* texture class. Further detailed particle size analysis revealed the sample to have a sufficiently narrow particle size distribution and large proportion of sand falling into the *fine sand* (0.15-0.25mm) class, with smaller proportions of *very fine sand* (0.05-0.15mm). This would be considered suitable for subsoil in general landscape applications.

The total clay content (2%) fell below the recommended minimum value given in *BS8601:2013 – Table 1* (5%), and the total amount of sand (98%) exceeded the maximum specified value of 85%. However, the narrow particle size distribution of the sand should provide a good balance between water retention for plant uptake and drainage of surplus water.

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

The electrical conductivity (salinity) value (water extract) was very low, which indicates that soluble salts were not present at levels that would be harmful to plants.

The electrical conductivity value by CaSO₄ extract (*BS8601* requirement) fell below the maximum specified value (2800 µS/cm) given in *BS8601:2013 – Table 1*.

Organic Matter Content

The organic matter content was low (<0.5%) and compliant with *BS8601:2013 – Table 1*.

Potential Contaminants

With reference to *BS8601:2013 – Section 4.2: Note 2*, there is a recommendation to confirm levels of potential contaminants in relation to the subsoil'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 *BS8601:2013 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the sample for use as subsoil in 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 Subsoil (*BS8601:2013 – Specification for subsoil and requirements for use – Table 1, Multipurpose Subsoil*).

From the soil examination and subsequent laboratory analysis, the sample was described as a slightly alkaline, non-saline, stone-free sand with a single grained structure. The organic matter content was low and consistent with subsoil. Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

To conclude, based on our findings, the soil represented by this sample would be considered suitable as subsoil for general landscape purposes (trees, shrubs and amenity grass), provided the physical condition of the soil is satisfactory.

The soil was largely compliant with the requirements of the British Standard for Subsoil (*BS8601:2013 – Specification for subsoil and requirements for use – Table 1, Multipurpose Subsoil*) except for the total sand and clay content. These non-compliances are considered minor when viewed in conjunction with the other results.

Soil Handling Recommendations

Reference should be made to Section 6.0 of *BS8601:2013* with regard to the handling and management of the subsoil:

“Soils generally lose strength and become less resistant to damage as they become wetter; therefore, it is essential that they are stripped, handled and trafficked only in the appropriate conditions of weather and soil moisture, and with suitable machinery. If sustained heavy rainfall (e.g. >10 mm in 24 h) occurs during soil stripping operations, work should be suspended and not restarted until the ground has had at least one dry day or until a suitable moisture content has been reached. A soil can be considered to have a suitable moisture content for stripping and handling if the whole thickness of the subsoil layer being stripped and/or handled is at a moisture content below the plastic limit as determined in accordance with BS 1377-2:1990 (incorporating Amendment No. 1).

Machinery should be selected and routed to minimize soil compaction.”

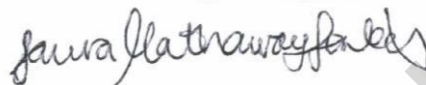
Further guidance is provided in Clauses 6.1–6.5.

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



Aaron Cross
BSc
Graduate Soil Scientist



Laura Hathaway-Jenkins
BSc MSc EngD MISOilSci
Senior Associate

For & on behalf of Tim O'Hare Associates LLP



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	Tarmac Topscope
Project:	Topscape Subsoil (Eaton Hall)
Job:	Subsoil Analysis - BS8601:2013
Date:	04/06/2019
Job Ref No:	TOHA/19/9035/SS

Sample Reference		
		Accreditation
Clay (<0.002mm)	%	UKAS
Silt (0.002-0.063mm)	%	UKAS
Very Fine Sand (0.063-0.15mm)	%	UKAS
Fine Sand (0.15-0.25mm)	%	UKAS
Medium Sand (0.25-0.50mm)	%	UKAS
Coarse Sand (0.50-1.0mm)	%	UKAS
Very Coarse Sand (1.0-2.0mm)	%	UKAS
Total Sand (0.063-2.0mm)	%	UKAS
Texture Class (UK Classification)	--	UKAS
Stones (2-20mm)	% DW	GLP
Stones (20-75mm)	% DW	GLP
Stones (>75mm)	% DW	GLP

pH Value (1:2.5 water extract)	units	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Electrical Conductivity (1:2 CaSO ₄ extract)	uS/cm	UKAS
Organic Matter (LOI)	%	UKAS
Exchangeable Sodium Percentage	%	UKAS

Total Arsenic (As)	mg/kg	MCERTS
Total Cadmium (Cd)	mg/kg	MCERTS
Total Chromium (Cr)	mg/kg	MCERTS
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS
Total Copper (Cu)	mg/kg	MCERTS
Total Lead (Pb)	mg/kg	MCERTS
Total Mercury (Hg)	mg/kg	MCERTS
Total Nickel (Ni)	mg/kg	MCERTS
Total Selenium (Se)	mg/kg	MCERTS
Total Zinc (Zn)	mg/kg	MCERTS
Water Soluble Boron (B)	mg/kg	MCERTS
Total Cyanide (CN)	mg/kg	MCERTS
Total (mono) Phenols	mg/kg	MCERTS

Naphthalene	mg/kg	MCERTS
Acenaphthylene	mg/kg	MCERTS
Acenaphthene	mg/kg	MCERTS
Fluorene	mg/kg	MCERTS
Phenanthrene	mg/kg	MCERTS
Anthracene	mg/kg	MCERTS
Fluoranthene	mg/kg	MCERTS
Pyrene	mg/kg	MCERTS
Benzo(a)anthracene	mg/kg	MCERTS
Chrysene	mg/kg	MCERTS
Benzo(b)fluoranthene	mg/kg	MCERTS
Benzo(k)fluoranthene	mg/kg	MCERTS
Benzo(a)pyrene	mg/kg	MCERTS
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS
Dibenzo(a,h)anthracene	mg/kg	MCERTS
Benzo(g,h,i)perylene	mg/kg	MCERTS
Total PAHs (sum USEPA16)	mg/kg	MCERTS

Aliphatic TPH >C5 - C6	mg/kg	MCERTS
Aliphatic TPH >C6 - C8	mg/kg	MCERTS
Aliphatic TPH >C8 - C10	mg/kg	MCERTS
Aliphatic TPH >C10 - C12	mg/kg	MCERTS
Aliphatic TPH >C12 - C16	mg/kg	MCERTS
Aliphatic TPH >C16 - C21	mg/kg	MCERTS
Aliphatic TPH >C21 - C35	mg/kg	MCERTS
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS
Aromatic TPH >C5 - C7	mg/kg	MCERTS
Aromatic TPH >C7 - C8	mg/kg	MCERTS
Aromatic TPH >C8 - C10	mg/kg	MCERTS
Aromatic TPH >C10 - C12	mg/kg	MCERTS
Aromatic TPH >C12 - C16	mg/kg	MCERTS
Aromatic TPH >C16 - C21	mg/kg	MCERTS
Aromatic TPH >C21 - C35	mg/kg	MCERTS
Aromatic TPH (C5 - C35)	mg/kg	MCERTS

Benzene	mg/kg	MCERTS
Toluene	mg/kg	MCERTS
Ethylbenzene	mg/kg	MCERTS
p & m-oxylenes	mg/kg	MCERTS
o-xylene	mg/kg	MCERTS
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS

Asbestos	--	ISO 17025
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S = SAND

Visual Examination

The sample was described as a very pale brown (Munsell Colour 10YR 7/4), slightly moist, friable, non-calcareous fine 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.

Topscape Subsoil (Eaton Hall)	
	2
	0
	10
	86
	2
	0
	0
	98
	S
	0
	0
	0

	7.1
	92
	2075
	<0.5
	1.6

	< 1.0
	< 0.2
	< 1.0
	< 4.0
	3.5
	2.5
	< 0.3
	2.5
	< 1.0
	5
	< 0.2
	< 1
	< 1.0

	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
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	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.05
	< 0.80

	< 0.001
	< 0.001
	< 0.001
	< 1.0
	< 2.0
	< 8.0
	< 8.0
	< 10
	< 0.001
	< 0.001
	< 1.0
	< 2.0
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	< 10

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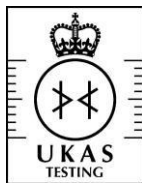
Not-detected

Aaron Cross

Aaron Cross
BSc
Graduate Soil Scientist

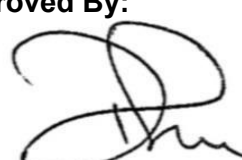
Results of analysis should be read in conjunction with the report they were issued with

The contents of this certificate shall not be reproduced without the express written permission of Tim O'Hare Associates LLP.



2183

Final Report

Report No.:	20-02828-1		
Initial Date of Issue:	05-Feb-2020		
Client	Huperade Ltd		
Client Address:	Bridge House Farm Brooks Drive Timperley Cheshire WA15 7DQ		
Contact(s):	Lesley Cox		
Project	Soil Analysis		
Quotation No.:		Date Received:	28-Jan-2020
Order No.:		Date Instructed:	29-Jan-2020
No. of Samples:	1		
Turnaround (Wkdays):	5	Results Due:	04-Feb-2020
Date Approved:	05-Feb-2020		
Approved By:			
Details:	Darrell Hall, Director		

Project: Soil Analysis

Client: Huperade Ltd	Chemtest Job No.:		20-02828		
Quotation No.:	Chemtest Sample ID.:		960922		
	Client Sample ID.:		1		
	Sample Type:		SOIL		
Determinand	Accred.	SOP	Units	LOD	
Moisture	N	2030	%	0.020	17

Results - Soil

Chemtest Job No.: 20-02828
Chemtest Sample ID.: 960922

Client Sample Ref.:

Sample Location:

Client Sample ID.: 1

Top Depth (m):

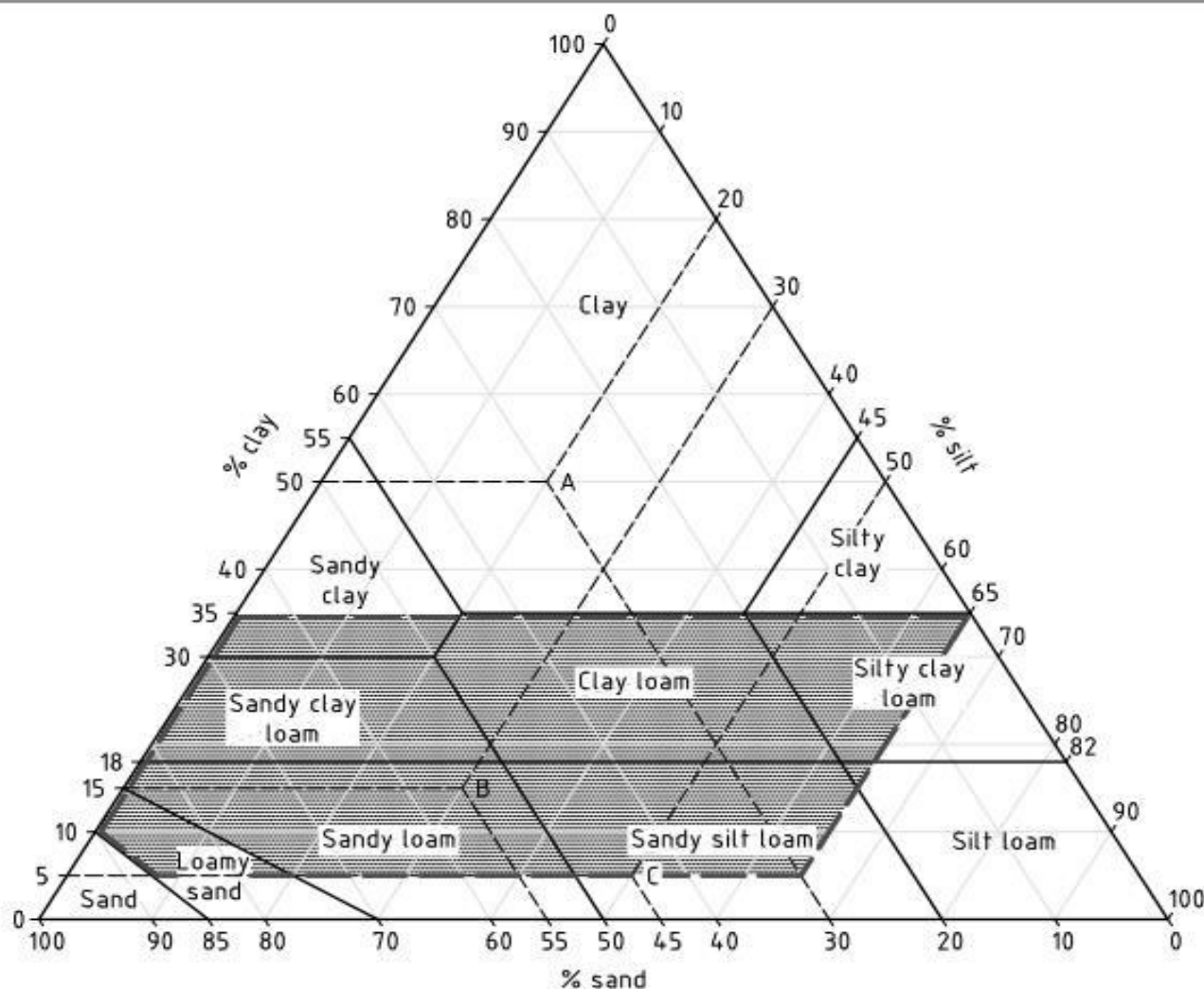
Bottom Depth (m):

Date Sampled:

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	%		16				
Silt content	%		13				
Sand content	%		71				
Soil texture class		See Attached Chart	Sandy Loam	YES			
Mass Loss on Ignition							
Clay 5-20%		3.0-20	4.1	YES	YES	YES	YES
Clay 20-35%		5.0-20					
Stone Content	% m/m						
>2mm		0-30	25	YES			
>20mm		0-10	< 0.020	YES			
>50mm		0	< 0.020	YES			
Soil pH value		5.5-8.5	[A] 8.0	YES	NO	YES	YES
Carbonate (Calcareous only)	%		< 0.10				NO
Electrical Conductivity	µS/cm	If >3300 do ESP	[A] 2100	YES			
Available Nutrient Content							
Nitrogen %		>0.15	0.25	YES	YES		YES
Extractable phosphorus	mg/l	16-140	28	YES	YES	NO	YES
Extractable potassium	mg/l	121-1500	120	NO	NO		NO
Extractable magnesium	mg/l	51-600	60	YES	YES		YES
Carbon : Nitrogen Ratio		<20:1	9.5/1	YES	YES	YES	YES
Exchangeable sodium	%	<15	0.29				
Available Calcium	mg/l		3800				
Available Sodium	mg/l		13				
Phytotoxic Contaminants (by soil pH)		< 6.0 6.0-7.0 > 7.0					
Zinc (Nitric Acid extract)	mg/kg	<200 <200 <300	80	YES			
Copper (Nitric Acid extract)	mg/kg	<100 <135 <200	71	YES			
Nickel (Nitric Acid extract)	mg/kg	<60 <75 <110	15	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			

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.

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British Standards can be obtained in PDF or hard copy formats from the BSI online shop: www.bsigroup.com/Shop or by contacting BSI Customer Services for hardcopies only: Tel: +44 (0)20 8996 9001, Email: cservices@bsigroup.com.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
960922		1			A	Plastic Bag

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	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 <37°C.
2115	Total Nitrogen in Soils	Nitrogen	Determination by elemental analyser
2260	Carbonate	Carbonate	Titration
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.
2620	LOI 440	LOI 440	Determination of the proportion by mass that is lost from a soil by ignition at 440°C.

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"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

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 TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°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

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 45 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

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 20/08744
Issue Number: 1
Date: 21 October, 2020

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: Niall Farnworth
Project Name: Circle Square, Plots 2,3,4, Topsoil Testing
Project Ref: B065782.001
Order No: EBMA2542
Date Samples Received: 14/10/20
Date Instructions Received: 15/10/20
Date Analysis Completed: 21/10/20

Prepared by:



Holly Neary-King
Client Services Supervisor

Approved by:



Sophie France
Client Service Manager

Envirolab Job Number: 20/08744

Client Project Name: Circle Square, Plots 2,3,4, Topsoil Testing

Client Project Ref: B065782.001

Lab Sample ID	20/08744/1	20/08744/2	20/08744/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TS01	TS02	TS03							
Depth to Top	0.05	0.05	0.05							
Depth To Bottom										
Date Sampled	12-Oct-20	12-Oct-20	12-Oct-20							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AE	6AE	6AE							
% Stones >10mm _A	<0.1	4.7	<0.1					% w/w	0.1	A-T-044
pH _D ^{M#}	7.80	7.71	7.64					pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.04	0.07	0.05					g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	<1	<1	<1					mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2					mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	4.3	3.8	4.5					% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	10	10	10					mg/kg	1	A-T-024s
Boron (water soluble) _D	<1.0	<1.0	<1.0					mg/kg	1	A-T-027s
Cadmium _D ^{M#}	0.6	0.7	0.7					mg/kg	0.5	A-T-024s
Copper _D ^{M#}	42	45	47					mg/kg	1	A-T-024s
Chromium _D ^{M#}	12	15	14					mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1					mg/kg	1	A-T-040s
Lead _D ^{M#}	92	94	99					mg/kg	1	A-T-024s
Mercury _D	0.36	0.31	0.25					mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	12	14	14					mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1					mg/kg	1	A-T-024s
Zinc _D ^{M#}	79	80	82					mg/kg	5	A-T-024s

Envirolab Job Number: 20/08744

Client Project Name: Circle Square, Plots 2,3,4, Topsoil Testing

Client Project Ref: B065782.001

Lab Sample ID	20/08744/1	20/08744/2	20/08744/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TS01	TS02	TS03							
Depth to Top	0.05	0.05	0.05							
Depth To Bottom										
Date Sampled	12-Oct-20	12-Oct-20	12-Oct-20							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AE	6AE	6AE							
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	Chrysotile	NAD	NAD							A-T-045
Asbestos Matrix (microscope) _D	Board	-	-							A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	No	N/A	N/A							A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing) _D	0.010	-	-					% w/w	0.001	A-T-054

Envirolab Job Number: 20/08744

Client Project Name: Circle Square, Plots 2,3,4, Topsoil Testing

Client Project Ref: B065782.001

Lab Sample ID	20/08744/1	20/08744/2	20/08744/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TS01	TS02	TS03							
Depth to Top	0.05	0.05	0.05							
Depth To Bottom										
Date Sampled	12-Oct-20	12-Oct-20	12-Oct-20							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AE	6AE	6AE							
PAH-16MS										
Acenaphthene _A ^{M#}	0.07	0.08	0.17					mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.01	0.01	0.02					mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.23	0.22	0.44					mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.99	1.03	1.53					mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	1.03	0.98	1.29					mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	1.32	1.24	1.64					mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.66	0.58	0.71					mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.48	0.46	0.65					mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	1.23	1.22	1.62					mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.11	0.11	0.14					mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	1.98	2.09	3.27					mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.06	0.05	0.15					mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.71	0.64	0.81					mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	0.16					mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.87	0.92	1.76					mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	1.91	1.94	2.98					mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	11.7	11.6	17.3					mg/kg	0.01	A-T-019s

Envirolab Job Number: 20/08744

Client Project Name: Circle Square, Plots 2,3,4, Topsoil Testing

Client Project Ref: B065782.001

Lab Sample ID	20/08744/1	20/08744/2	20/08744/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TS01	TS02	TS03							
Depth to Top	0.05	0.05	0.05							
Depth To Bottom										
Date Sampled	12-Oct-20	12-Oct-20	12-Oct-20							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AE	6AE	6AE							
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	<1	<1					mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	<1	<1					mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	1	1					mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	1	2	2					mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	10	13	15					mg/kg	1	A-T-055s
Total Aliphatics _A	11	16	18					mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1	1	1					mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	1	4					mg/kg	1	A-T-055s
Aro >C12-C16 _A	2	18	9					mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	12	55	39					mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	42	96	116					mg/kg	1	A-T-055s
Total Aromatics _A	56	171	169					mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	67	187	187					mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG	Project No:	20/08744
Project:	Circle Square, Plots 2,3,4, Topsoil Testing	Date Received:	15/10/2020 (am)
Clients Project No:	B065782.001	Cool Box Temperatures (°C):	13.6

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.



Final Report

Report No.: 21-11153-1
Initial Date of Issue: 15-Apr-2021
Client Curtins
Client Address: 17/19 Whitworth Street
Manchester
Manchester
M15 WG
Contact(s): Niall Farnworth
Project Plots 2,3,4 Verification Circle Sq
B065782
Quotation No.:
Order No.: EBMA2812
No. of Samples: 3
Turnaround (Wkdays): 5
Date Approved: 14-Apr-2021

Date Received: 08-Apr-2021

Date Instructed: 08-Apr-2021

Results Due: 14-Apr-2021

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: Plots 2,3,4 Verification Circle Sq B065782

Client: Curtins	Chemtest Job No.:				21-11153	21-11153	21-11153
Quotation No.:	Chemtest Sample ID.:				1175125	1175126	1175127
Order No.: EBMA2812	Client Sample Ref.:				TS09	TS10	TS11
	Client Sample ID.:				ES1	ES1	ES1
	Sample Location:				Topsoil	Topsoil	Topsoil
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				0.05	0.05	0.05
	Date Sampled:				25-Mar-2021	25-Mar-2021	25-Mar-2021
	Time Sampled:				12:00	12:00	12:00
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
ACM Type	U	2192		N/A	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-
Moisture	N	2030	%	0.020	16	16	15
pH	U	2010		4.0	8.0	8.0	8.0
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	1.3	1.4	1.5
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010		0.12	0.12
Sulphur (Elemental)	U	2180	mg/kg	1.0	2.2		
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	2.8		
Sulphate (Acid Soluble)	U	2430	%	0.010	0.044		
Arsenic	U	2450	mg/kg	1.0	4.2	4.0	4.7
Cadmium	U	2450	mg/kg	0.10	0.13	0.13	0.15
Chromium	U	2450	mg/kg	1.0	14	12	13
Copper	U	2450	mg/kg	0.50	15	12	15
Mercury	U	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	13	11	13
Lead	U	2450	mg/kg	0.50	12	13	14
Selenium	U	2450	mg/kg	0.20	< 0.20	< 0.20	< 0.20
Zinc	U	2450	mg/kg	0.50	37	36	41
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	2.9	3.8	2.9
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: Plots 2,3,4 Verification Circle Sq B065782

Client: Curtins	Chemtest Job No.:				21-11153	21-11153	21-11153
Quotation No.:	Chemtest Sample ID.:				1175125	1175126	1175127
Order No.: EBMA2812	Client Sample Ref.:				TS09	TS10	TS11
	Client Sample ID.:				ES1	ES1	ES1
	Sample Location:				Topsoil	Topsoil	Topsoil
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				0.05	0.05	0.05
	Date Sampled:				25-Mar-2021	25-Mar-2021	25-Mar-2021
	Time Sampled:				12:00	12:00	12:00
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0		< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0		< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0		< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0		< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0		< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.25
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.13
Fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.48
Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.47
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.37
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.35
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.40
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.28
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.39
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.36
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	0.28
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.38
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	4.1
Total Phenols	U	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
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 <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
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.
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.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5-C6, >C6-C8,>C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35- C44Aromatics: >C5-C7, >C7-C8, >C8- C10, >C10-C12, >C12-C16, >C16- C21, >C21- C35, >C35- C44	Dichloromethane 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.
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*; Dibenzo[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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

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 TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°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

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 45 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

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

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 20/09272
Issue Number: 1

Date: 06 November, 2020

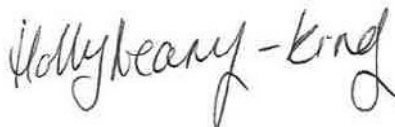
Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: EBMA/Niall Farnworth
Project Name: Circle Square, Plots 2,3,4
Project Ref: 065782.001
Order No: EBMA2566
Date Samples Received: 29/10/20
Date Instructions Received: 30/10/20
Date Analysis Completed: 05/11/20

Prepared by:


Melanie Marshall
Laboratory Coordinator

Approved by:


Holly Neary-King
Client Services Supervisor

Envirolab Job Number: 20/09272

Client Project Name: Circle Square, Plots 2,3,4

Client Project Ref: 065782.001

Lab Sample ID	20/09272/1	20/09272/2	20/09272/3	20/09272/4	20/09272/5	20/09272/6	20/09272/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SS01	SS02	SS03	TS04	TS05	TS06	TS07			
Depth to Top	0.10	0.10	0.10	0.05	0.10	0.10	0.10			
Depth To Bottom										
Date Sampled	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	1A	1A	1A	4AE	4AE	4AE	4AE			
% Stones >10mm _A	<0.1	<0.1	<0.1	11.8	-	-	-	% w/w	0.1	A-T-044
pH _D ^{M#}	8.90	8.90	8.64	6.93	-	-	-	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	<0.01	<0.01	0.04	-	-	-	g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	<1	<1	<1	<1	-	-	-	mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2	<0.2	-	-	-	mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	0.4	0.3	0.1	3.9	-	-	-	% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	<1	<1	<1	8	-	-	-	mg/kg	1	A-T-024s
Boron (water soluble) _D	<1.0	<1.0	<1.0	<1.0	-	-	-	mg/kg	1	A-T-027s
Cadmium _D ^{M#}	<0.5	<0.5	<0.5	0.5	-	-	-	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	2	2	1	43	-	-	-	mg/kg	1	A-T-024s
Chromium _D ^{M#}	2	2	2	14	-	-	-	mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	-	-	-	mg/kg	1	A-T-040s
Lead _D ^{M#}	3	2	2	93	-	-	-	mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	<0.17	-	-	-	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	3	2	2	15	-	-	-	mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1	<1	-	-	-	mg/kg	1	A-T-024s
Zinc _D ^{M#}	5	5	<5	83	-	-	-	mg/kg	5	A-T-024s

Envirolab Job Number: 20/09272

Client Project Name: Circle Square, Plots 2,3,4

Client Project Ref: 065782.001

Lab Sample ID	20/09272/1	20/09272/2	20/09272/3	20/09272/4	20/09272/5	20/09272/6	20/09272/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SS01	SS02	SS03	TS04	TS05	TS06	TS07			
Depth to Top	0.10	0.10	0.10	0.05	0.10	0.10	0.10			
Depth To Bottom										
Date Sampled	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	1A	1A	1A	4AE	4AE	4AE	4AE			
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	NAD	NAD	NAD	NAD			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045

Envirolab Job Number: 20/09272

Client Project Name: Circle Square, Plots 2,3,4

Client Project Ref: 065782.001

Lab Sample ID	20/09272/1	20/09272/2	20/09272/3	20/09272/4	20/09272/5	20/09272/6	20/09272/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SS01	SS02	SS03	TS04	TS05	TS06	TS07			
Depth to Top	0.10	0.10	0.10	0.05	0.10	0.10	0.10			
Depth To Bottom										
Date Sampled	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	1A	1A	1A	4AE	4AE	4AE	4AE			
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	0.02	<0.01	0.11	-	-	-	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01	0.03	-	-	-	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	0.02	<0.02	0.26	-	-	-	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	0.07	<0.04	1.11	-	-	-	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	0.07	<0.04	1.17	-	-	-	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	0.08	0.06	1.45	-	-	-	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	<0.05	<0.05	0.86	-	-	-	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07	0.55	-	-	-	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	<0.06	0.08	<0.06	1.27	-	-	-	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04	0.18	-	-	-	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08	0.16	<0.08	2.25	-	-	-	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	0.01	<0.01	0.08	-	-	-	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	0.05	0.03	0.88	-	-	-	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	0.08	-	-	-	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.03	0.11	<0.03	1.01	-	-	-	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	<0.07	0.15	<0.07	2.11	-	-	-	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	<0.08	0.82	0.09	13.4	-	-	-	mg/kg	0.01	A-T-019s

Envirolab Job Number: 20/09272

Client Project Name: Circle Square, Plots 2,3,4

Client Project Ref: 065782.001

Lab Sample ID	20/09272/1	20/09272/2	20/09272/3	20/09272/4	20/09272/5	20/09272/6	20/09272/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SS01	SS02	SS03	TS04	TS05	TS06	TS07			
Depth to Top	0.10	0.10	0.10	0.05	0.10	0.10	0.10			
Depth To Bottom										
Date Sampled	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20	28-Oct-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	1A	1A	1A	4AE	4AE	4AE	4AE			
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	<1	<1	<1	-	-	-	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	<1	<1	<1	-	-	-	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	<1	<1	2	-	-	-	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	<1	<1	<1	4	-	-	-	mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	1	1	<1	17	-	-	-	mg/kg	1	A-T-055s
Total Aliphatics _A	1	1	<1	23	-	-	-	mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1	<1	<1	1	-	-	-	mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	<1	<1	1	-	-	-	mg/kg	1	A-T-055s
Aro >C12-C16 _A	<1	1	<1	15	-	-	-	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	<1	5	<1	69	-	-	-	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	4	10	2	182	-	-	-	mg/kg	1	A-T-055s
Total Aromatics _A	4	16	2	268	-	-	-	mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	6	17	2	292	-	-	-	mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	0.01	A-T-022s

Envirolab Job Number: 20/09272

Client Project Name: Circle Square, Plots 2,3,4

Client Project Ref: 065782.001

Lab Sample ID	20/09272/8							Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TS08									
Depth to Top	0.10									
Depth To Bottom										
Date Sampled	28-Oct-20									
Sample Type	Soil - ES									
Sample Matrix Code	4AE									
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD									A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A									A-T-045

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG	Project No:	20/09272
Project:	Circle Square, Plots 2,3,4	Date Received:	30/10/2020 (am)
Clients Project No:	065782.001	Cool Box Temperatures (°C):	13.6

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/13656
Issue Number: 1

Date: 23 December, 2021

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: Niall Farnworth
Project Name: Circle Square, Plots 2, 3 & 4
Project Ref: 065782
Order No: EBMA3171
Date Samples Received: 16/12/21
Date Instructions Received: 17/12/21
Date Analysis Completed: 23/12/21

Approved by:



Holly Neary-King
Client Services Supervisor

Envirolab Job Number: 21/13656

Client Project Name: Circle Square, Plots 2, 3 & 4

Client Project Ref: 065782

Lab Sample ID	21/13656/1	21/13656/2	21/13656/3	21/13656/4	21/13656/5	21/13656/6		Units	Limit of Detection	Method ref
Client Sample No	1	1	1	1	1	1				
Client Sample ID	HD301	HD302	HD303	HD304	HD305	HD306				
Depth to Top	0.45	0.45	0.45	0.45	0.45	0.45				
Depth To Bottom										
Date Sampled	16-Dec-21	16-Dec-21	16-Dec-21	16-Dec-21	16-Dec-21	16-Dec-21				
Sample Type	Solid	Solid	Solid	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	7	7	7	6AB	6ABE	6ABE				
% Stones >10mm _A	<0.1	<0.1	<0.1	33.7	5.8	20.7		% w/w	0.1	A-T-044
pH _D ^{M#}	12.45	10.85	10.30	9.47	8.77	8.77		pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	0.22	0.17	0.28	0.28	0.07		g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	1.8	1.7	6.4	2.6	3.4	4.9		% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	1	2	2	2	5	5		mg/kg	1	A-T-024s
Boron (water soluble) _D	<1.0	<1.0	<1.0	<1.0	1.3	<1.0		mg/kg	1	A-T-027s
Cadmium _D ^{M#}	0.6	0.7	0.6	0.5	0.8	0.6		mg/kg	0.5	A-T-024s
Copper _D ^{M#}	22	34	15	31	50	48		mg/kg	1	A-T-024s
Chromium _D ^{M#}	17	20	14	14	17	13		mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-040s
Lead _D ^{M#}	27	37	25	64	137	117		mg/kg	1	A-T-024s
Mercury _D	2.76	1.47	1.19	0.55	0.98	0.90		mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	14	21	13	15	20	17		mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-024s
Zinc _D ^{M#}	61	71	51	77	136	110		mg/kg	5	A-T-024s

Envirolab Job Number: 21/13656

Client Project Name: Circle Square, Plots 2, 3 & 4

Client Project Ref: 065782

Lab Sample ID	21/13656/1	21/13656/2	21/13656/3	21/13656/4	21/13656/5	21/13656/6		Units	Limit of Detection	Method ref
Client Sample No	1	1	1	1	1	1				
Client Sample ID	HD301	HD302	HD303	HD304	HD305	HD306				
Depth to Top	0.45	0.45	0.45	0.45	0.45	0.45				
Depth To Bottom										
Date Sampled	16-Dec-21	16-Dec-21	16-Dec-21	16-Dec-21	16-Dec-21	16-Dec-21				
Sample Type	Solid	Solid	Solid	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	7	7	7	6AB	6ABE	6ABE				
Asbestos in Soil (inc. matrix)										
Asbestos in soil _D [#]	NAD	NAD	NAD	NAD	NAD	NAD				A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-	-				A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-	-	-				A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	N/A	N/A				A-T-045

Envirolab Job Number: 21/13656

Client Project Name: Circle Square, Plots 2, 3 & 4

Client Project Ref: 065782

Lab Sample ID	21/13656/1	21/13656/2	21/13656/3	21/13656/4	21/13656/5	21/13656/6		Units	Limit of Detection	Method ref
Client Sample No	1	1	1	1	1	1				
Client Sample ID	HD301	HD302	HD303	HD304	HD305	HD306				
Depth to Top	0.45	0.45	0.45	0.45	0.45	0.45				
Depth To Bottom										
Date Sampled	16-Dec-21	16-Dec-21	16-Dec-21	16-Dec-21	16-Dec-21	16-Dec-21				
Sample Type	Solid	Solid	Solid	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	7	7	7	6AB	6ABE	6ABE				
PAH-16MS										
Acenaphthene _A ^{M#}	0.04	0.12	0.22	0.33	0.23	0.29		mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	0.01	0.01	0.02	0.02	0.02		mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.11	0.23	0.47	0.52	0.43	0.47		mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.39	0.74	1.00	1.09	1.10	0.92		mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.42	0.74	0.81	0.89	0.90	0.73		mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.38	0.65	0.70	0.83	0.82	0.67		mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.24	0.36	0.41	0.43	0.45	0.33		mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.15	0.25	0.29	0.31	0.31	0.26		mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.40	0.74	0.90	1.00	0.97	0.85		mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.06	0.09	0.10	0.11	0.10	0.08		mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	0.74	1.45	2.34	2.63	2.43	2.24		mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.03	0.09	0.20	0.27	0.21	0.23		mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.27	0.43	0.48	0.52	0.54	0.39		mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	0.06	0.13	0.23	0.12	0.07		mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.40	0.89	1.96	2.13	1.84	1.93		mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.73	1.42	2.00	2.37	2.16	1.95		mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	4.36	8.27	12	13.7	12.6	11.4		mg/kg	0.01	A-T-019s

Envirolab Job Number: 21/13656

Client Project Name: Circle Square, Plots 2, 3 & 4

Client Project Ref: 065782

Lab Sample ID	21/13656/1	21/13656/2	21/13656/3	21/13656/4	21/13656/5	21/13656/6		Units	Limit of Detection	Method ref
Client Sample No	1	1	1	1	1	1				
Client Sample ID	HD301	HD302	HD303	HD304	HD305	HD306				
Depth to Top	0.45	0.45	0.45	0.45	0.45	0.45				
Depth To Bottom										
Date Sampled	16-Dec-21	16-Dec-21	16-Dec-21	16-Dec-21	16-Dec-21	16-Dec-21				
Sample Type	Solid	Solid	Solid	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	7	7	7	6AB	6ABE	6ABE				
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	1	3	2	2	<1		mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	1	3	5	3	3	<1		mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	28	51	89	13	29	3		mg/kg	1	A-T-055s
Total Aliphatics _A	29	55	98	18	35	3		mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	0.02	<0.01		mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<2	<2	<2	<2	<2	<2		mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	<1	2	11	2	<1		mg/kg	1	A-T-055s
Aro >C12-C16 _A	2	7	11	45	7	3		mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	8	31	25	105	20	7		mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	22	69	57	136	41	15		mg/kg	1	A-T-055s
Total Aromatics _A	34	107	97	297	70	25		mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	63	162	194	315	104	28		mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01	0.02	<0.01		mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG	Project No:	21/13656
Project:	Circle Square, Plots 2, 3 & 4	Date Received:	17/12/2021 (am)
Clients Project No:	065782	Cool Box Temperatures (°C):	8.6

NO DEVIATIONS IDENTIFIED

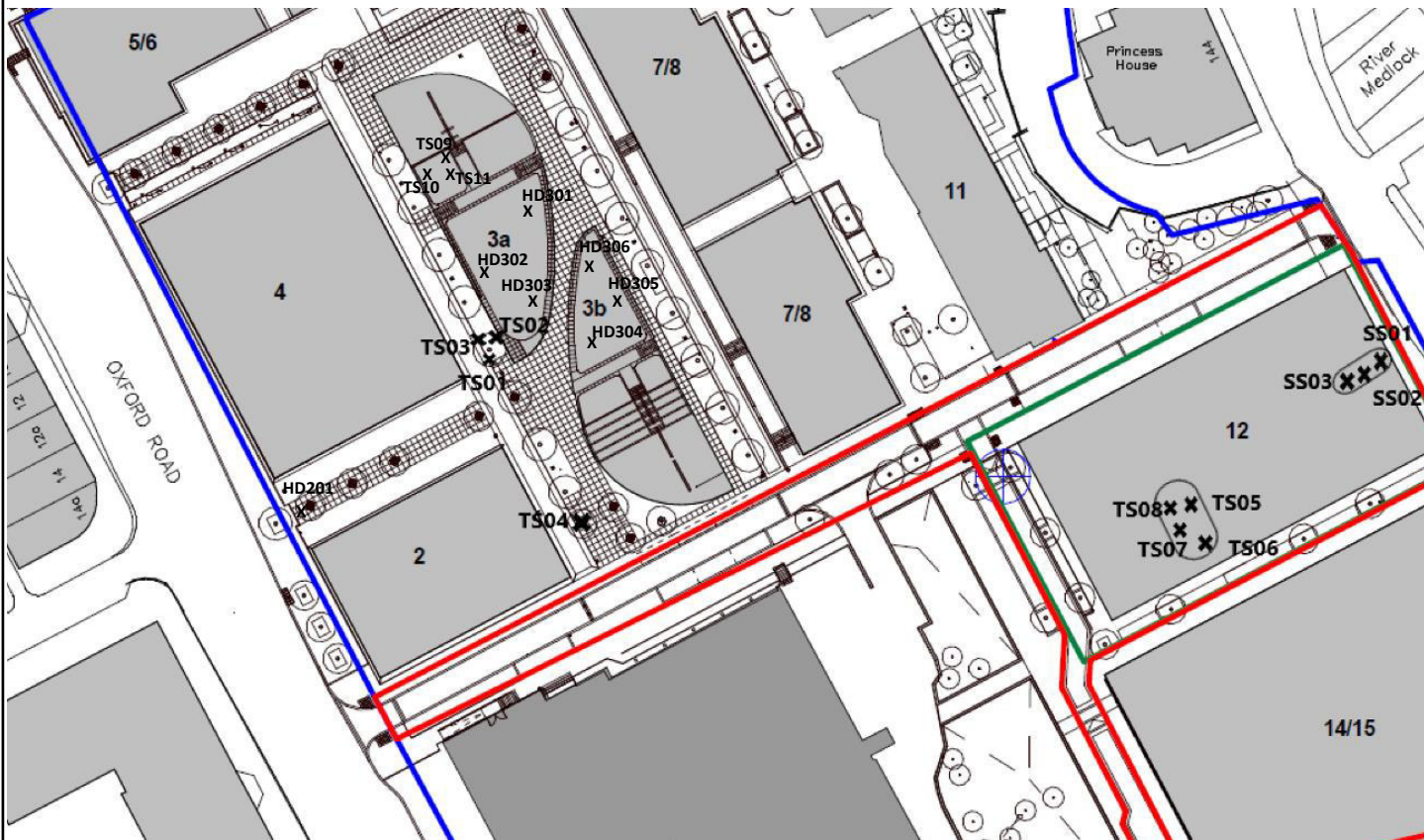
If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	21/13656/1	21/13656/2	21/13656/3	21/13656/4	21/13656/5	21/13656/6
Client Sample No	1	1	1	1	1	1
Client Sample ID/Depth	HD301 0.45m	HD302 0.45m	HD303 0.45m	HD304 0.45m	HD305 0.45m	HD306 0.45m
Date Sampled	16/12/21	16/12/21	16/12/21	16/12/21	16/12/21	16/12/21
A-T-019s	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021
A-T-022s	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021
A-T-024s	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021
A-T-026s	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021
A-T-027s	23/12/2021	23/12/2021	23/12/2021	23/12/2021	23/12/2021	23/12/2021
A-T-031s	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021
A-T-032 OM	23/12/2021	23/12/2021	23/12/2021	23/12/2021	23/12/2021	23/12/2021
A-T-040s	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021
A-T-042sTCN	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021
A-T-044	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021
A-T-045	20/12/2021	20/12/2021	20/12/2021	20/12/2021	20/12/2021	20/12/2021
A-T-050s	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021
A-T-055s	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021	22/12/2021

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report



Key:

- X** Hand Dug Trial Pit & Sample Location Plan
-  Approximate Stockpile Location



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Civils & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer
Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kental • Leeds • Liverpool • London • Manchester • Nottingham

Project: Circle Square Plots 2,3,4		Status: CONSTRUCTION	
Drg Title: Capping Thickness and Soil Verification Sample Location Plan		Drawn By: NF	Checked By: RA
		Designed By: NF	Date: 13/01/2022
		Scale: NTS	
Project No: Originator: Zone: Level: Type: Discipline: Category/Number: Rev:			
065782-CUR-00-XX-DR-GE-00002-V02			

GENERAL NOTES:

Rev:	Description:	Date:	By:
--			

Photographic Record of Tree Pit Inspection and topsoil sampling TS01 – TS03

Client Name: John Sisk & Son Ltd	Project Name: Circle Square Buildings 2,3 &4	Project No: 065782	Visit 1	Date: 12/10/2020
Photo of location TS01 – TS03		Excavation Location – TS01		
				
Excavation Location – TS02		Excavation Location – TS03		
				
Description				
Initial topsoil sampling TS01, TS02 and TS03 from a tree pit between Building 4 and Area 3a.				

Photographic Record of Subsoil and Topsoil Sampling SS01 – SS03 and TS04 – TS08

Client Name: John Sisk & Son Ltd	Project Name: Circle Square Buildings 2,3 &4	Project No: 065782	Visit 2	Date: 28/10/2020
Photo of location SS01 – SS03		Excavation Location – SS01		
				
Excavation Location – SS02		Excavation Location – SS03		
				
Description				
Subsoil sampling SS01, SS02 and SS03 from stockpile located onsite within Building area 12.				

Photo of location TS05 – TS08



Photo of Location of TS04



Sample Location – TS05

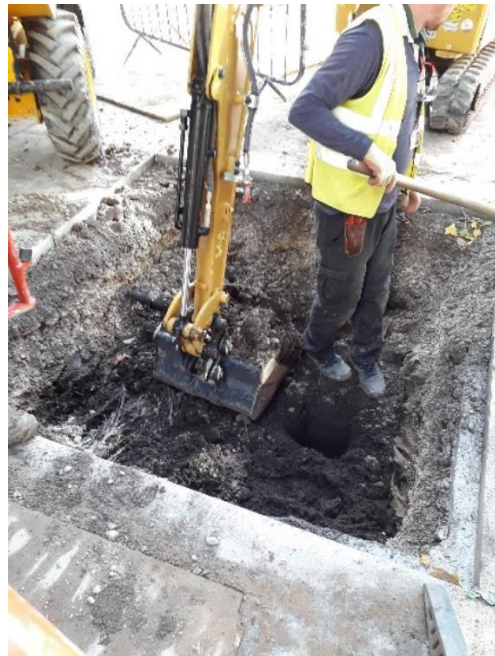


Sample Location – TS06



Sample Location – TS07	Sample Location – TS08
	
Description	
Additional topsoil sampling TS04, TS05, TS06, TS07 and TS08. TS04 obtained from tree pit on site and TS05-TS08 from stockpile on Plot 12.	

Photographic Record of HD201 Tree Pit

Client Name: John Sisk & Son Ltd	Project Name: Circle Square Buildings 2,3 &4	Project No: 065782	Visit 3	Date: 12/11/2020
Photo of location of HD201		Excavation Location – HD201		
				
Excavation Location – HD201		Excavation Location – HD201		
				
Description				
Excavation of tree pit location HD201, located between Building 2 and Building 4 area, recording a reduced level dig depth of 1200mm for construction of clean capping with tree pit.				

<i>Photo of location of Tree next to HD201</i>	<i>Description</i>
	Tree completed on arrival. Located next to HD201.
<i>Photo of location near TS04</i>	<i>Photo of location near TS04</i>
	
<i>Description</i>	
Photos of tree pit installation above received from Sisk located within the public open space between Building 2 and Building 7/8 near TS04.	

Photographic Record of the Central Lawn samples TS09 – TS11

Client Name: John Sisk & Son Ltd	Project Name: Circle Square Buildings 2,3 &4	Project No: 065782	Visit 4	Date: 25/03/2021
Photo of location TS09 – TS11		Central Lawn Depth Inspection		
				
Central Lawn Inspection		Above the basement		
				
Description				
Topsoil samples taken representative of new source (Astley), TS09, TS10 and TS11. Central lawn reduced level dig depth was inspected which allowed for an anticipated thickness of topsoil overlying was between 330mm to 420mm. Photo showing the membrane and plastic crates over the basement in terrace areas and part of lawn which would break any S-P-R linkage to end users and maintenance workers.				

Photographic Record of Hand Dug Pits within Area 3a and 3b (Central Lawn)

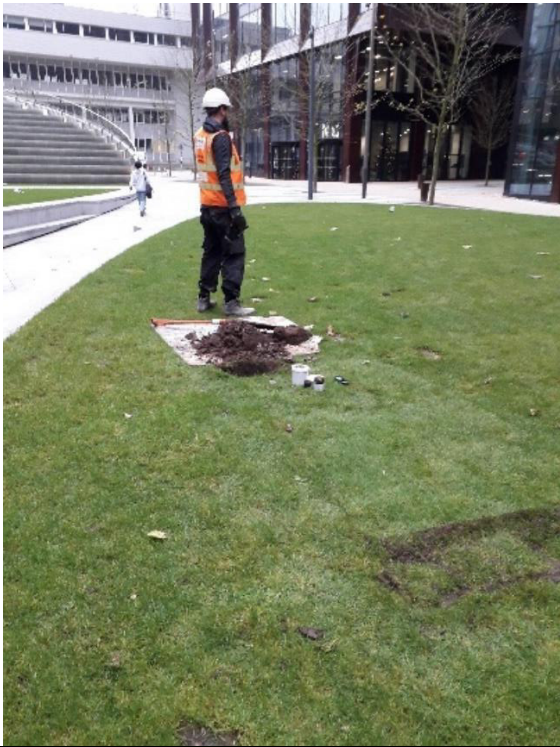
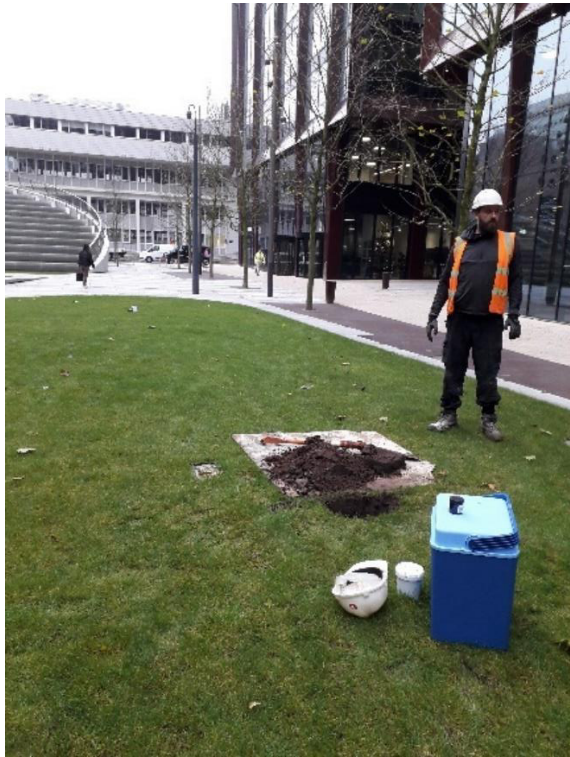
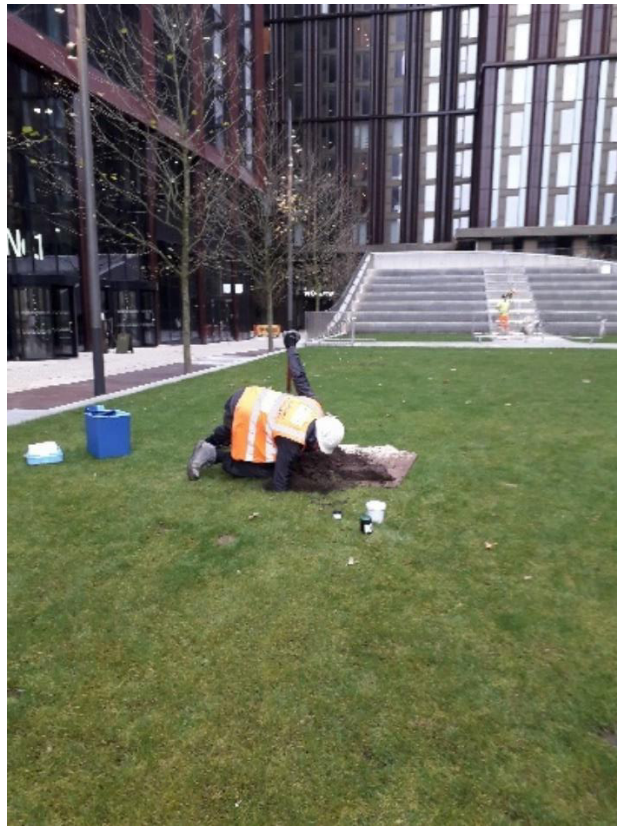
Client Name: John Sisk & Son Ltd	Project Name: Circle Square Buildings 2,3 &4	Project No: 065782	Visit 5	Date: 16/12/2021
Photo of location HD301		Excavation Location – HD301		
				
Photo of location HD302		Excavation Location – HD302		
				

Photo of location HD303



Excavation Location – HD303



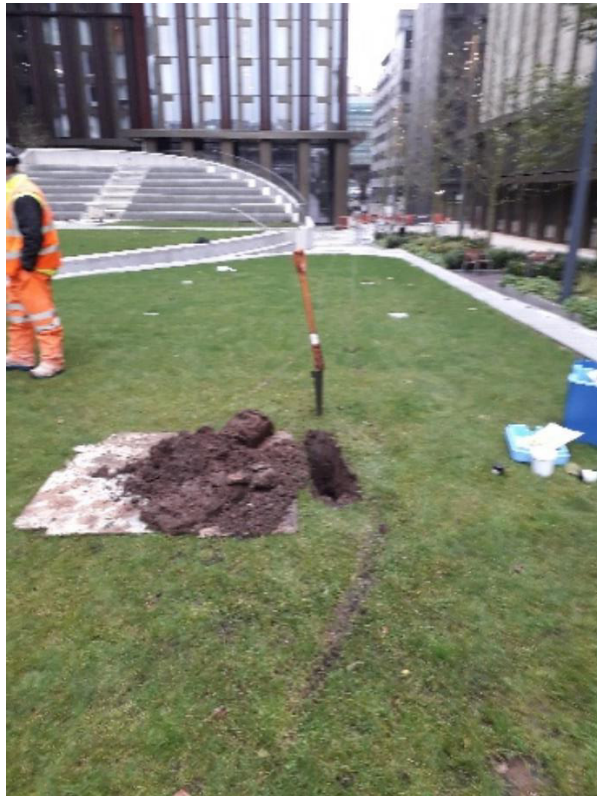
Photo of location HD304



Excavation Location – HD304



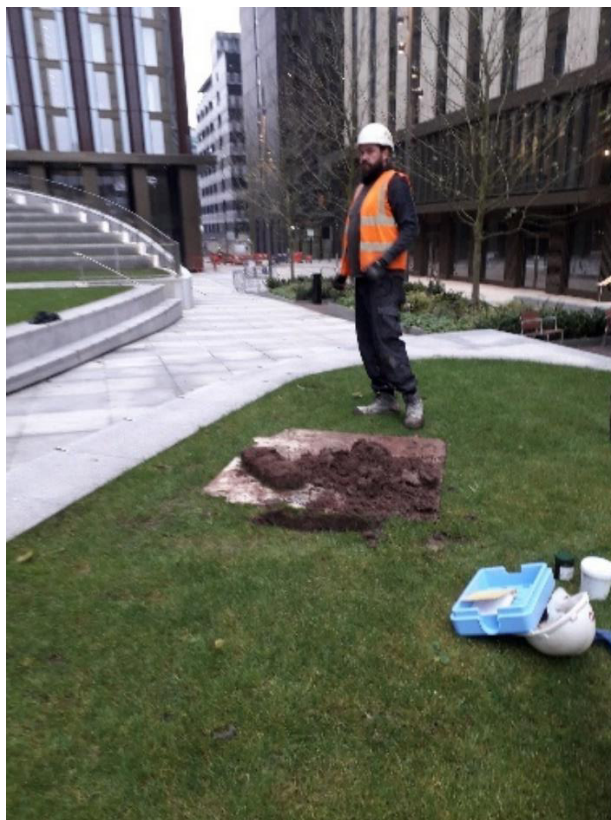
Photo of location HD305



Excavation Location – HD305



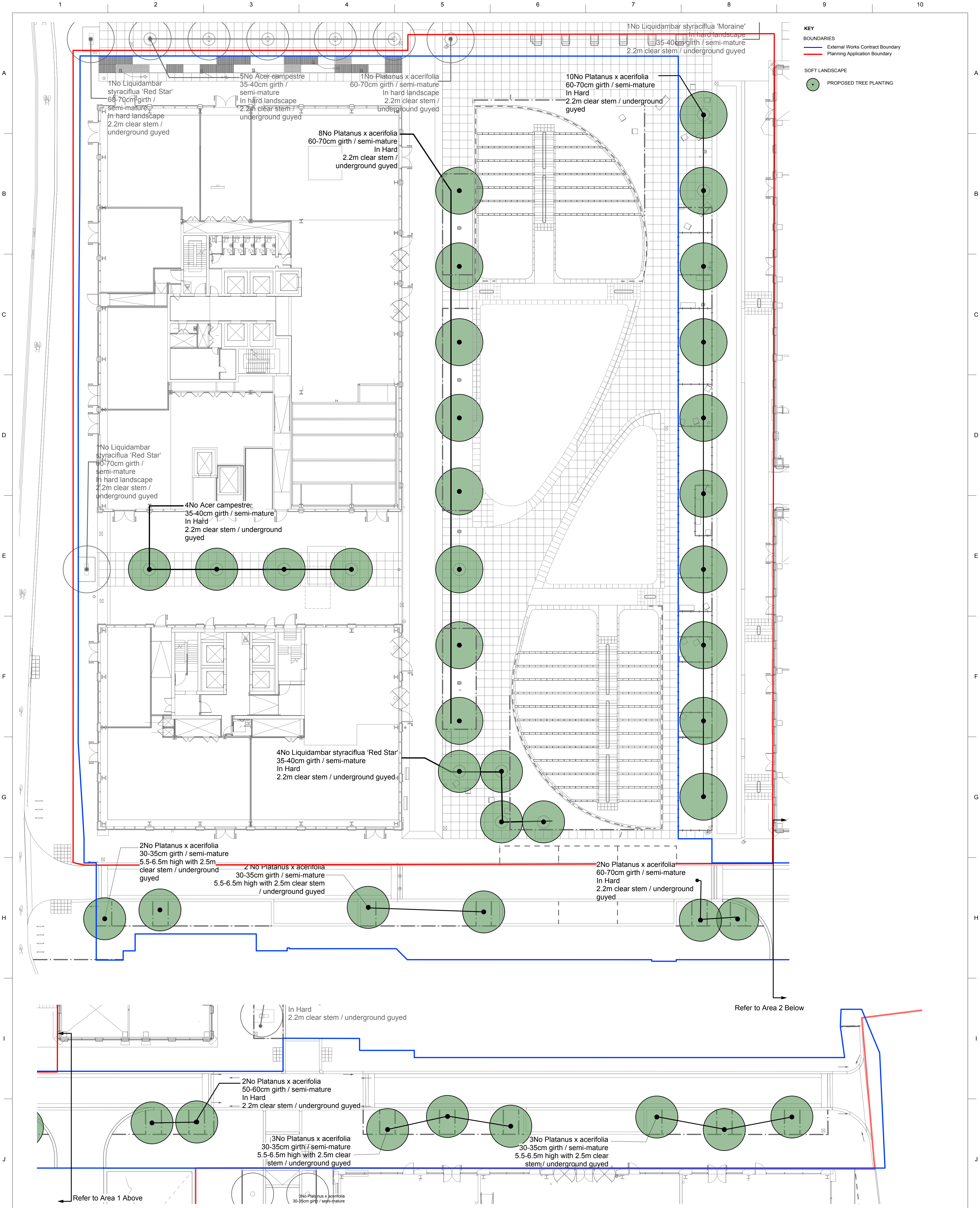
Photo of location HD306



Excavation Location – HD306



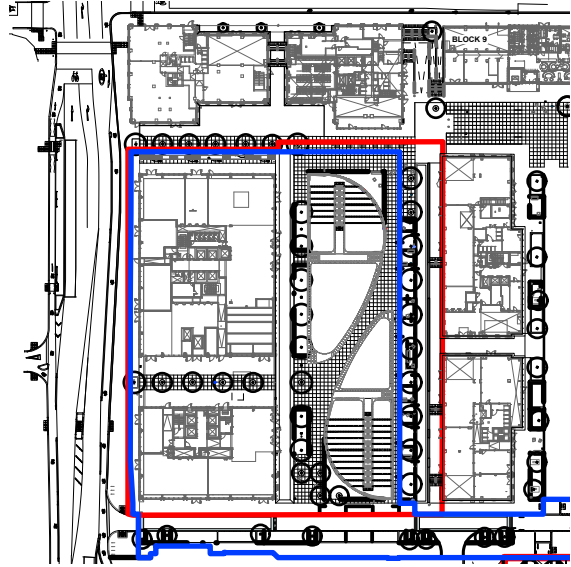
6F5 in HD306	Description
	Hand excavated pits within central lawn area/area 3a and 3b. Soft landscaping recorded clean capping depths of between 380mm to 450mm. 6F5 was recorded underneath the topsoil. A sample of this strata was taken to confirm if clean due to the slight shortfall in capping thickness.



Note: To be read in conjunction with CS-PLA-ZZ-XX-SK-L-0001 Planting Schedule plot 2,3,4.

Note: Greyed out trees to be delivered under other development plots

LOCATION PLAN



S3-C06	24-03-20	Drawing updated in line with E41.46 (additional water bollards) & E41.88 (omission of pop up power point)	VJ	FF
S3-C05	19-02-20	Planning application boundary added	FF	FF
S3-C04	29-01-20	3 Trees along Oxford Rd removed, number of door access posts removed	JTO	FF
S3-C03	01-08-19	CONSTRUCTION ISSUE	EG	FF
S3-C02	22-07-19	1. Mowing strip detail update 2. Tree Protection Hoops added 3. Updated Building Footprint	EG	FF
S3-P04	04-03-19	Services & tree location coordination	VE	RM
S3-P03	07-12-18	Drawing updates Stage 05	EG	RM
S4-P01	22-10-18	1. Trees in Revision Clouds have not yet been instructed 2. Tree Protection Hoops added	FF	RM
S3-P02	17-10-18	ISSUED FOR PLANNING UPDATE	EG	RM
S3-P01	12-09-18	Revision Clouds added	VE	RM
S2-P01	05-09-18	Stage 05 Issue	VE	RM
S2-P01	05-09-18	Stage 05 Issue	VE	RM

Client	John Sisk & Son Ltd		
Project	Circle Square Plots 2, 3 & 4		
Drg Title	Softworks - Trees		
Created on	20-08-18	Created by	FF
Approved by	RM	Stage	STAGE 05
Scale	1:200	Size	A1
Prev Drg No.	PL1502-234-T-201	Suitability	S3
Drg No.	CS-PLA-ZZ-XX-DR-L-0201	Revision	C06

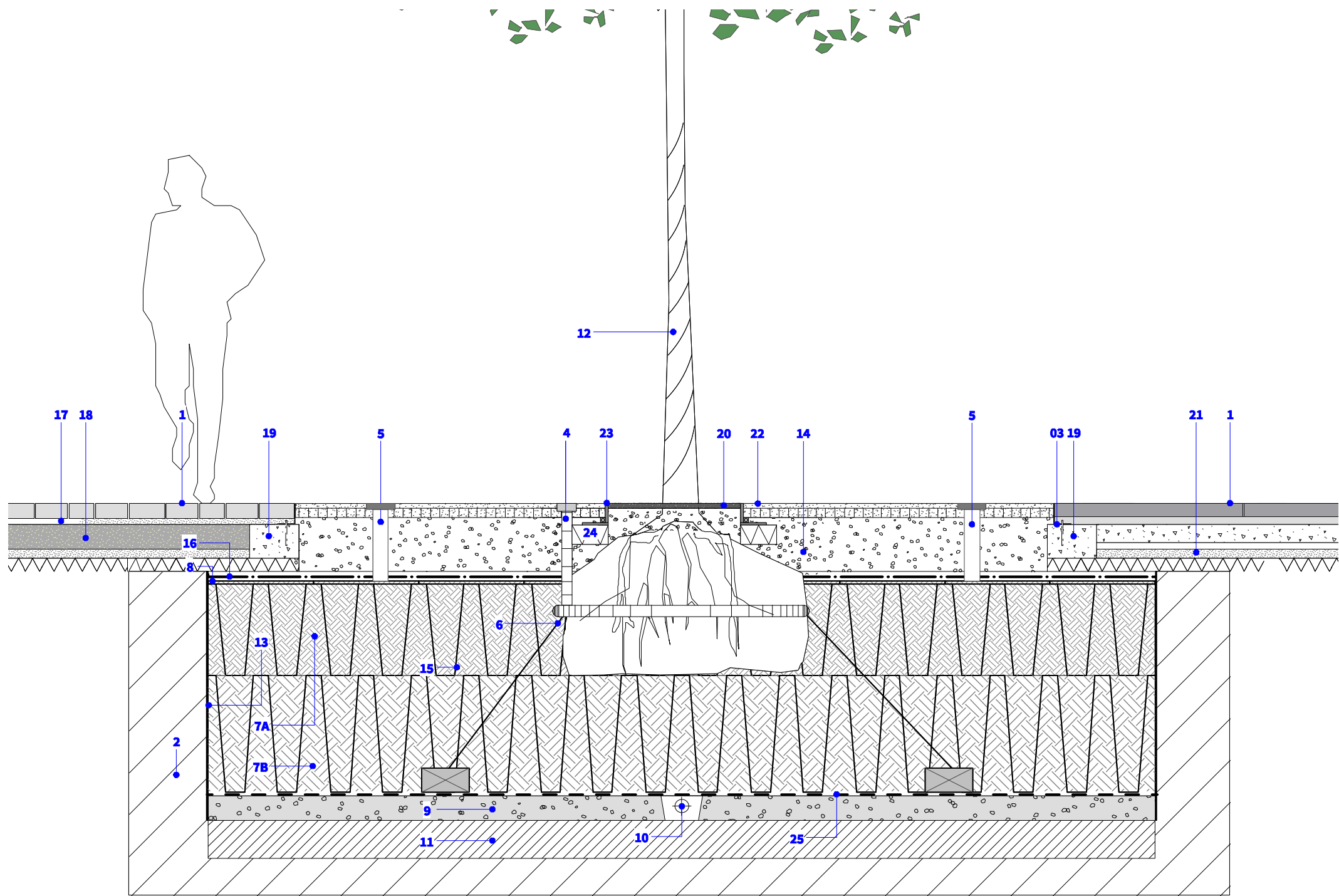


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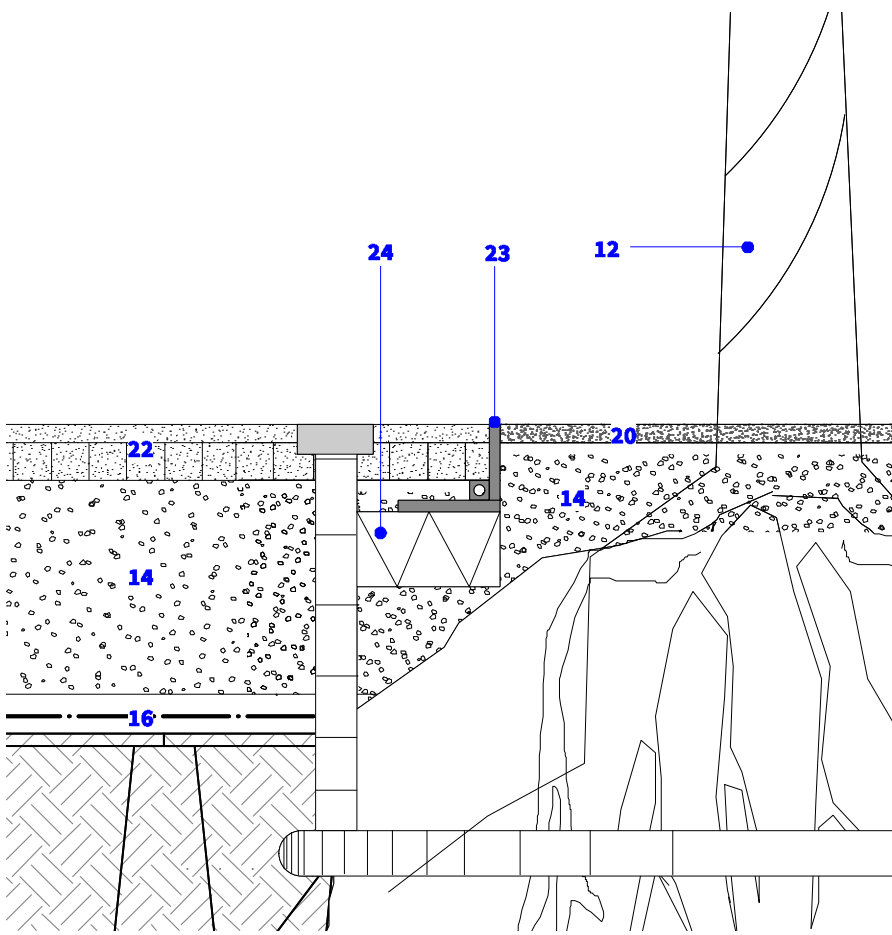
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- Order of construction and setting out to be agreed on site.

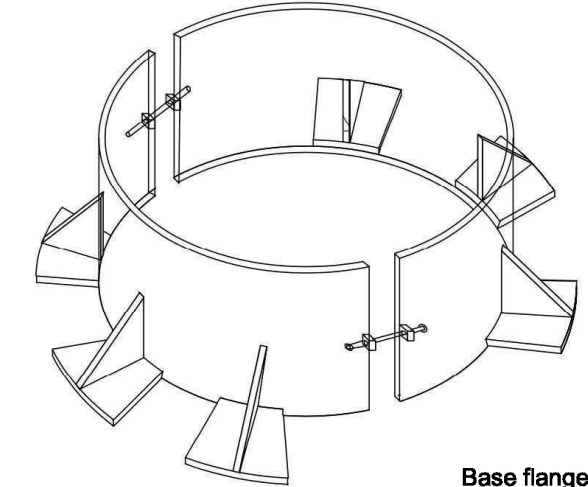


D6 Tree Pit IN HARD - Trench in Resin Bound (Re-enforced) Various cm Girth Trees with Tree Collar
Typical detail

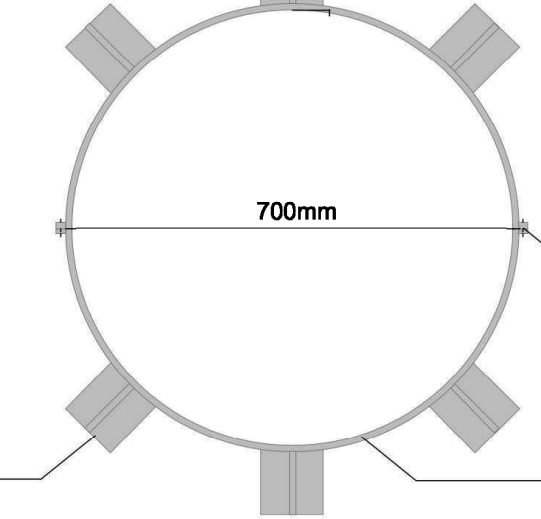


D6 Tree Pit IN HARD - Enlargement of Steel Collar Detail
1:10 @ A3

Concept Model



Plan



Flanges with stainless steel fixings

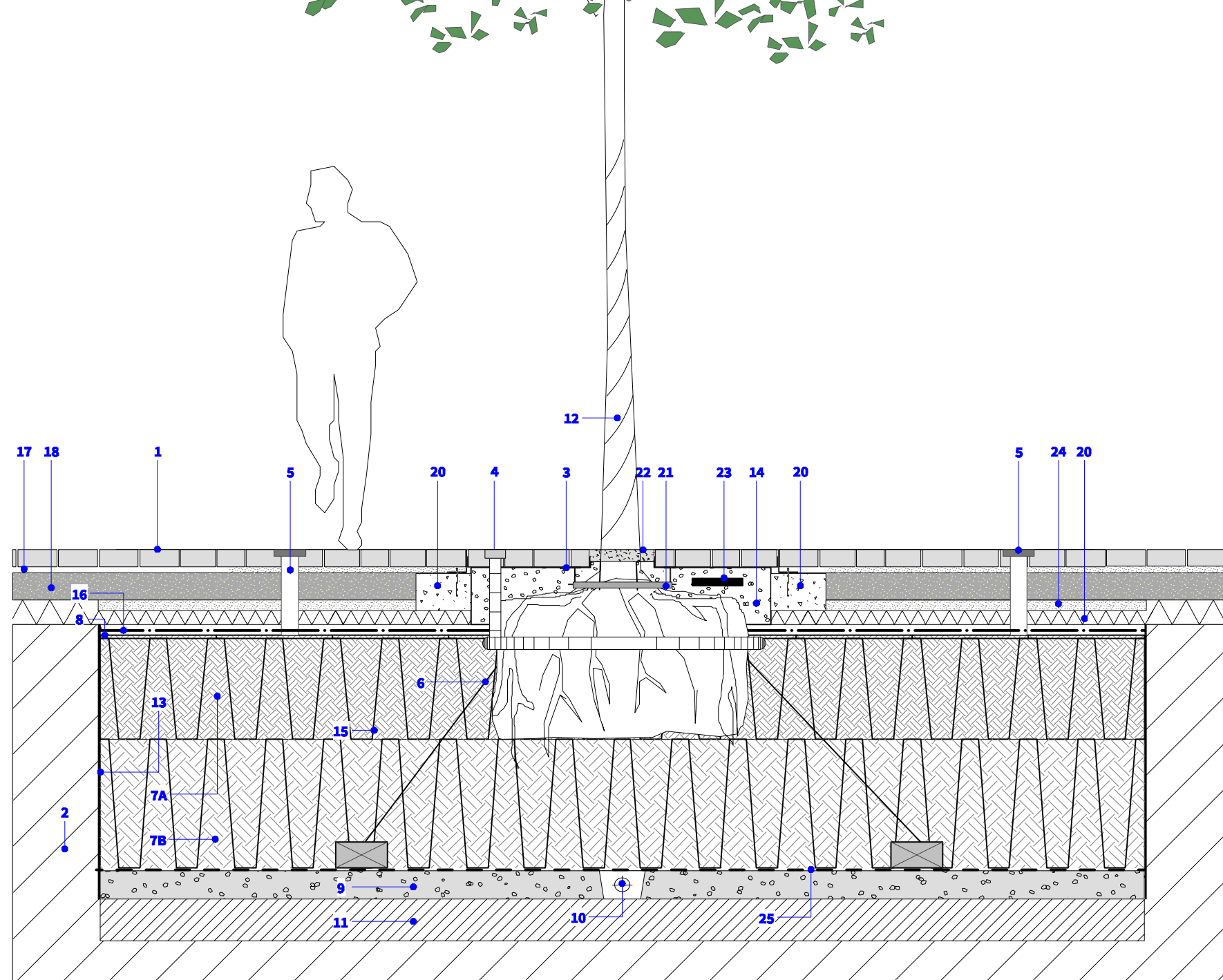
Collar 6 or 10mm thick. Fabricator to confirm

LEGEND D6

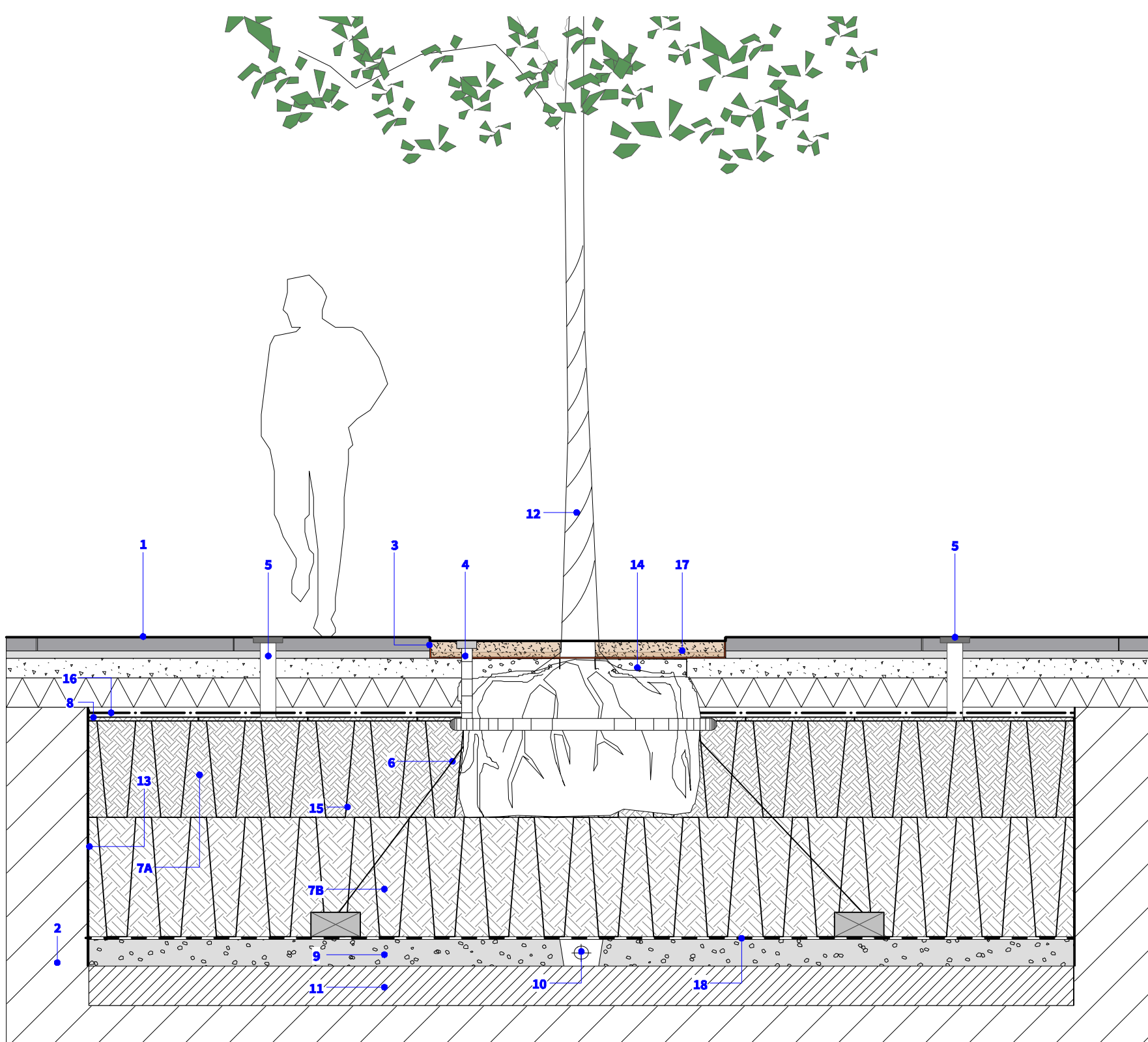
- Granite paved surface with buildups to engineer's buildup.
- Existing Ground
- Aluminium edging (Kinley systems or similar approved) Pinned into concrete haunch.
- Single inlet irrigation/aeration system. Cap to sit 10mm above surrounding surface material. Product: RootRain Civic by GreenBlueUrban Ltd or acceptable equivalent. 60mm diameter pipes.
- Aeration System (2 no per tree): RootRain ArborVent. With Square Hinged Locking Grate - 100mm. Stainless Steel, to sit flush to surface. To include Horizontal perforated HDPE pipe 100mm diam, Crushed limestone stone 16-32mm gauge (NO FINES) wrapped in Geotextile Membrane.
- Deadman guying system. AnchorPlate SASAPXA by GreenBlueUrban Ltd. or acceptable equivalent. Rootball to be protected from contact with supporting wires. Final guying detail to be agreed onsite.
- 800mm Topsoil - site manufactured/ blend to landscape specification Q28
- 550mm Subsoil - to landscape specification Q28
- Terram T700 geotextile sheet
- Crushed Granite aggregate to improve drainage. 14mm Gauge. NO FINES. Laid on a camber.
- 80mm pipe connected to positive drainage system. To Engineers details and results of infiltration tests
- Base of Pit broken up to improve drainage
- Semi-mature tree. With 1.5m minimum hessian wrapping to trunk, to remain in place during the first two growing seasons.
- High density polyethylene root barrier. Re-root 1000 or acceptable equivalent.
- Type 3 MOT, permeable no fines
- Structural Soil cell. Single module depth. RootSpace by GreenBlue Urban or acceptable equivalent. To include Airflow lids.
- Tensar Tri-Ax TX (Supplier - Tensar LTD)
- 30mm Bedding - refer to engineers specification
- 130mm Bitmac Base - refer to engineers specification
- Concrete footing for aluminium edging to fix to. To enginers details
- Gravel infill
- 50mm sand layer - to protect grate system during bitmac laying
- Resin bound gravel - Sure sett or similar approved. 18mm thick layer. Laid over sursell grid (50mm thick) back filled with Gravel as per manufacturers recommendations. (refer to hardworks details)
- Corten steel tree collar. (700mm diameter)
- Compacted hardcore footing - refer to engineer's specification.
- Hessian separation and filtration layer.

NOTE: At the commencement of each phase of works, all proposed tree pits within that phase should have a trial pit / slit trench (300mm wide) excavated to establish whether there are any service clashes and to allow trees to be relocated accordingly.

Percolation test to be carried out prior to back filling as per method outlined.



D9 Tree Pit IN HARD - Structural Soil Cell. Various cm girth trees
Typical detail



D10 Tree Pit IN HARD - Structural Soil Cell with Resin Bound filled tree grille, Various cm girth trees
Typical detail

LEGEND D9

- Granite paved surface with buildups to engineer's buildup.
- Existing Ground
- Recessed Tree Grille, Specification Clause Q10/305C. Bespoke sized Jones of Oswestry Arborlot Tree grille, or similar approved, with recessed paved inlay.
- To D400 loading class.
- Size: 2x1.5M
- to have integrated housing and draw pit for tree festoon lighting (refer to lighting plan for locations). Submit proposals once requirements are confirmed by lighting supplier/engineer
- threaded lifting points
- Galvanised.
- 600mm Diam opening for tree
- Structural steel frame to tree grille - to take occasional vehicular loading (BS EN 124 Class D400), anchored to concrete strip foundation. Exposed elements to be powdercoated finish to match tree grille.
- Single inlet irrigation/aeration system. Cap to sit 10mm above surrounding surface material. Product: RootRain Civic by GreenBlueUrban Ltd or acceptable equivalent. 60mm diameter pipes.
- Aeration System (2 no per tree): RootRain ArborVent. With Square Hinged Locking Grate - 100mm. Stainless Steel, to sit flush to surface. To include Horizontal perforated HDPE pipe 100mm diam, Crushed limestone stone 16-32mm gauge (NO FINES) wrapped in Geotextile Membrane.
- Deadman guying system. AnchorPlate SASAPXA by GreenBlueUrban Ltd. or acceptable equivalent. Rootball to be protected from contact with supporting wires. Final guying detail to be agreed onsite.
- 800mm Topsoil - site manufactured/ blend to landscape specification Q28
- 550mm Subsoil - to landscape specification Q28
- Terram T700 geotextile sheet
- Crushed Granite aggregate to improve drainage. 14mm Gauge. NO FINES. Laid on a camber.
- 80mm pipe connected to positive drainage system. To Engineers details and results of infiltration tests
- Base of Pit broken up to improve drainage
- Semi-mature tree. With 1.5m minimum hessian wrapping to trunk, to remain in place during the first two growing seasons.
- High density polyethylene root barrier. Re-root 1000 or acceptable equivalent.
- Loose pea gravel. Size: 6mm gauge
- Structural Soil cell. Single module depth. RootSpace by GreenBlue Urban or acceptable equivalent. To include Airflow lids.
- Tensar Tri-Ax TX (Supplier - Tensar LTD)
- 30mm Bedding - refer to engineers specification
- 130mm Bitmac Base - refer to engineers specification
- 170mm Sub-base - refer to engineers specification
- Concrete footing for tree grille to fix to. To enginers details
- Flatpau Strap Rootball RFI-15 - or similar approved. To assist tree resist high wind speeds. Fixed to 3no concrete kerbs laid in base of pit - Marshalls conservation kerb or similar.
- Gravel infill
- Lighting power supply to engineers details. Transformer box (244x71x37.5mm). To be located under grille
- 50mm sand layer - to protect grate system during bitmac laying.
- Hessian separation and filtration layer.

NOTES:

- Prior to tree planting a representative sample of the tree pits need to be excavated and completely filled with water. The percolation rates need to be recorded and adjustments made to the drainage detail as appropriate. It is ESSENTIAL that the Landscape Architects are consulted at this stage and approval given to proceed with planting.

- Drawing to be read in conjunction with following NBS Specification Clauses: Q28: Topsoiling, Q30: Seeding and turfing, Q31: External planting, Q35: Landscape maintenance

- At the commencement of each phase of works, all proposed tree pits within that phase should have a trial pit / slit trench (300mm wide) excavated to establish whether there are any service clashes and to allow trees to be relocated accordingly.

- Landscape Architect to be invited to inspect works

LEGEND D10

- Granite paved surface with buildups to engineer's buildup.
- Existing Ground
- Arborlot Recessed Metal Tree Frame. Refer to PL1544.1-VW-009/010 for sizes and locations.
- To load class BSEN124/B. Supplier: Jones of Oswestry or acceptable equivalent.
- Single inlet irrigation/aeration system. Cap to sit 10mm above surrounding surface material. Product: RootRain Civic by GreenBlueUrban Ltd or acceptable equivalent. 60mm diameter pipes.
- Aeration System (2 no per tree): RootRain ArborVent. With Square Hinged Locking Grate - 100mm. Stainless Steel, to sit flush to surface. To include Horizontal perforated HDPE pipe 100mm diam, Crushed limestone stone 16-32mm gauge (NO FINES) wrapped in Geotextile Membrane.
- Deadman guying system. AnchorPlate SASAPXA by GreenBlueUrban Ltd. or acceptable equivalent. Rootball to be protected from contact with supporting wires. Final guying detail to be agreed onsite.
- 800mm Topsoil - site manufactured/ blend to landscape specification Q28
- 550mm Subsoil - to landscape specification Q28
- Terram T700 geotextile sheet
- Crushed Granite aggregate to improve drainage. 14mm Gauge. NO FINES. Laid on a camber.
- 80mm pipe connected to positive drainage system. To Engineers details and results of infiltration tests
- Base of Pit broken up to improve drainage
- Semi-mature tree. With 1.5m minimum hessian wrapping to trunk, to remain in place during the first two growing seasons.
- High density polyethylene root barrier. Re-root 1000 or acceptable equivalent.
- Loose pea gravel. Size: 6mm gauge
- Structural Soil cell. Single module depth. RootSpace by GreenBlue Urban or acceptable equivalent. To include Airflow lids.
- Tensar Tri-Ax TX (Supplier - Tensar LTD)
- Resin bound gravel to tree pits, 50mm thick ontap of 18mm thick Sursell Matrix.
- Hessian separation and filtration layer.

NOTES:

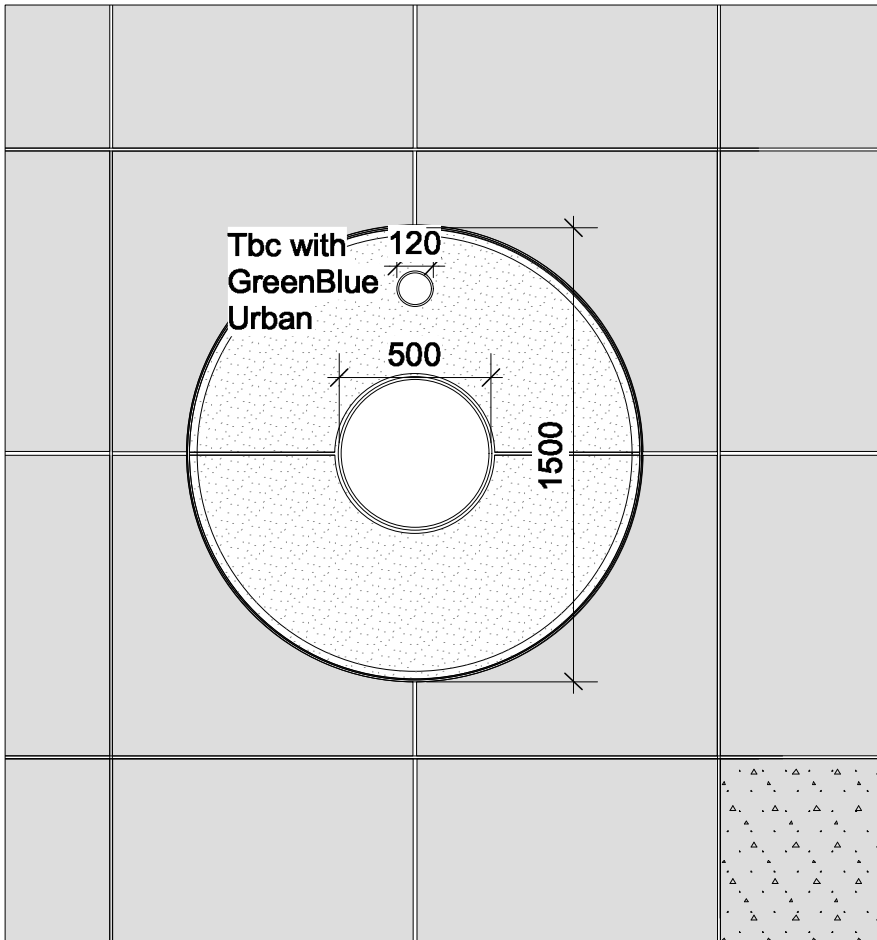
- Prior to tree planting a representative sample of the tree pits need to be excavated and completely filled with water. The percolation rates need to be recorded and adjustments made to the drainage detail as appropriate. It is ESSENTIAL that the Landscape Architects are consulted at this stage and approval given to proceed with planting.

- Drawing to be read in conjunction with following NBS Specification Clauses: Q28: Topsoiling, Q30: Seeding and turfing, Q31: External planting, Q35: Landscape maintenance

- At the commencement of each phase of works, all proposed tree pits within that phase should have a trial pit / slit trench (300mm wide) excavated to establish whether there are any service clashes and to allow trees to be relocated accordingly.

- Landscape Architect to be invited to inspect works

Plan
1:25



KEY

Instructions For Performing A Percolation Test:
1. With a spade or soil auger, dig a hole 45-60 cm deep at the bottom of the proposed tree pit. The hole diameter should be a minimum of 10 cm. The diameter of the hole should be uniform from top to bottom with the bottom being flat.
2. Pre-wetting: Fill hole with water to the top and allow to stand for at least an hour to pre-wet the soil.
3. Refill hole to within a 5 cm of the top. Don't overflow the hole.
4. To aid in measurement, place a stick across the top of the hole and use a ruler or measuring tape to mark periodic drops in water level.
5. Allow the hole to drain for at least one hour. A longer period of time (2 to 3 hours) will give a more accurate reading of average percolation rates.
6. Determine the average drop in water level per hour and refer to the table below to interpret results.

If water level in hole drops
- Less than 1.25 cm per hour: Poorly drained and suited to wet site species
- 1.25-2.50 cm per hour: Moderately well drained and acceptable for many species including wet site species
- More than 2.5 cm per hour: Well drained and suitable for all species including sensitive species
Please report the results to the landscape architect prior to filling the tree pit.

NOTE: All items above are the responsibility of the contractor of the tree procurement and planting contract. References to specification clauses refer to tree procurement and planting contract.
Main contractor to allow for site supervision.

LOCATION PLAN

S3-C02	14-05-20	Tree collar added to D6, detail amends	VJ	RM
S3-C01	05-06-19	Status update	VE	RM
S3-P04	15-01-19	Structural cell system added to resin bound trench detail.	FF	RM
1. Tree pit construction detail amended to include structural cell system as requested by MCC Planning				
S3-P03	12-09-18	Stage 05 Update	EG	RM
S3-P02	22-10-18	Revision cloud alterations - double cell system	EG	RM
S3-P01	12-09-18	Stage 05	EG	RM
S1-P01	xx-xx-xx	PLANNING	VE	RM
Revision	Date	Description	Drawn	Apprvd.

Client Oxford Property Trading Ltd

Project Circle Square
Phase 1B

Drg Title Trees in Hard
Trees in Hard

Created on 21/08/18

Created by VE

Approved by RM

Scale 1:25

Size A1

Workstage Stage 05

Drg No. CS-PLA-ZZ-XX-DR-L-1402

Suitability S3

Revision C02

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Adopted Soil Generic Assessment Criteria
Sandy loam with 6% SOM



Contaminants	Residential <u>with</u> home grown produce	Residential <u>without</u> home grown produce	Allotments	Commercial	Public open space near residential housing POS _{resi}	Public park POS _{park}
Metals						
Beryllium	1.7	1.7	35	12	2.2	63
Boron	290	11,000	45	240,000	21,000	46,000
Cadmium	10⁽¹³⁾ 22	85⁽¹³⁾ 150	1.8 3.9	230 410	120 220	560 880
Chromium III	910	910	18,000	8,600	1,500	33,000
Chromium VI	6 21	6 21	1.8 170	33 49	7.7 21	220 250
Lead	200	310	80	2,300	630	1,300
Mercury (<i>elemental</i>)	1	1	26	26	16	26⁽⁸⁾ [30]
Mercury (<i>inorganic</i>)	170	240	80	3600	120	240
Nickel	130⁽¹⁰⁾	180⁽¹⁰⁾	53⁽¹¹⁾	980⁽¹⁰⁾	230	800
Vanadium	410	1200	91	9000	2000	5000
Copper	2400	7100	520	68000	12000	44000
Zinc	3700	40000	620	730000	81000	170000
Semi-Metals and non-metals						
Arsenic	32⁽¹²⁾ 37	35⁽¹²⁾ 40	43⁽¹²⁾ 49	640⁽¹²⁾ 640	79 79	170 170
Antimony		550		7500	1500	3300
Selenium	350	600	120	13000	1100	1800
Inorganic chemicals						
Cyanide	34	34	34	34	34	34
Organic contaminants						
<i>Aliphatic risk banded hydrocarbons - TPHCWG method</i>						
EC ₅₋₅ - EC ₆	160	160	3900	12000	600000	180000
EC ₅₋₆ - EC ₈	530	530	13000	40000	620000	320000
EC ₅₋₈ - EC ₁₀	150	150	1700	11000	13000	21000
EC ₁₀₋₁₀ - EC ₁₂	760	770	7300	47000	13000	24000
EC ₁₂₋₁₂ - EC ₁₆	4300	4400	13000	90000	13000	26000
EC ₅₋₁₆ - EC ₃₅	110000	110000	270000	1800000	250000	490000
EC ₃₅₋₃₅ - EC ₄₄	110000	110000	270000	1800000	250000	490000
<i>Aromatic risk banded hydrocarbons - TPHCWG method</i>						
EC ₅₋₅ - EC ₇	300	1400	57	86000	56000	92000
EC ₅₋₇ - EC ₈	660	3900	120	180000	56000	100000
EC ₅₋₈ - EC ₁₀	190	270	51	17000	5000	9300
EC ₁₀₋₁₀ - EC ₁₂	380	1200	74	34000	5000	10000
EC ₁₂₋₁₂ - EC ₁₆	660	2500	130	38000	5000	10000
EC ₅₋₁₆ - EC ₂₁	930	1900	260	28000	3800	7800
EC ₂₁₋₂₁ - EC ₃₅	1700	1900	1600	28000	3800	7900
EC ₃₅₋₃₅ - EC ₄₄	1700	1900	1600	28000	3800	7900
Aliph + Arom EC >44-70	1900	1900	3000	28000	3800	7900
Aromatic						
Benzene	0.33 0.87	1.0 3.3	0.07 0.18	95 98	73 140	110 230
Ethyl benzene	350	840	90	2800⁽⁸⁾ [66000]	2800⁽⁸⁾ [25000]	2800⁽⁸⁾ [27000]
Toluene	610	2700	120	4400⁽⁸⁾ [190000]	4400⁽⁸⁾ [56000]	4400⁽⁸⁾ [100000]
Xylene ⁽⁹⁾	230	290	160	2600⁽⁸⁾ [32000]	2600⁽⁸⁾ [43000]	2600⁽⁸⁾ [31000]
Phenol	420	520	280	3200⁽¹⁴⁾ (38000)	3200⁽¹⁴⁾ (10000)	3200⁽¹⁴⁾ (9300)
Polycyclic Aromatic Hydrocarbons (PAH)						
Naphthalene	13	13	24	1100	4900	3000
Acenaphthylene	920	6000	160	100000	15000	30000
Acenaphthene	1100	6000	200	100000	15000	30000
Fluorene	860	4500	160	71000	9900	20000
Phenanthrene	440	1500	90	23000	3100	6300
Anthracene	11000	37000	2200	540000	74000	150000
Fluoranthene	890	1600	290	23000	3100	6400
Pyrene	2000	3800	620	54000	7400	15000
Benz(a)anthracene	13	15	13	180	29	62
Chrysene	27	32	19	350	57	120
Benzo(b)fluoranthene	3.7	4.0	3.9	45	7.2	16.0
Benzo(k)fluoranthene	100	110	130	1200	190	440
Benzo(a)pyrene	3.0 5.0	3.2 5.3	3.5 5.7	36 77	5.7 10	13 21
Indeno(123cd)pyrene	41	46	39	510	82	180
Dibenzo(ah)anthracene	0.3	0.32	0.43	3.6	0.58	1.4
Benzo(ghi)perylene	350	360	640	4000	640	1600
Chlorinated Aliphatic Hydrocarbons						
Vinyl chloride	0.0014	0.0015	0.0018	0.12	3.5	5.4
Trichloroethene (TCE)	0.075	0.08	0.21	5.7	120	120
1,1,1,2 Tetrachlorethane	6.4	8.2	4.4	560	1400	2100
Tetrachlorethane (PCE)	0.90	0.92	3.6	95	1400	1500
1,1,1 Trichlorethane	39	40	240	3000	140000	100000

Notes

- All values above are in mg/kg
- Numbers in bold are SGVs or GAC that are derived based on SGV report input parameters, numbers in italics are S4ULs, numbers in bold-italics are based on EIC/AGS/CL:AIRE numbers & input parameters and underlined numbers are C4SLs**
- Soil organic matter (SOM) is assumed to be 6% - DEFAULT VALUE
- Soil type is assumed to be sandy loam - DEFAULT SOIL TYPE
- For residential, the building type is conservatively assumed to be a small terrace house where the development includes bungalows change to more conservative bungalow setting in computer model
- For commercial, the building type is conservatively assumed to be a pre 1970s office building, where the proposed development comprises houses, flat with living spaces changes setting in model accordingly
- For classrooms consider increasing the dust loading factor in the 'Soil and Building Data' of the CLEA 1.04 model from 50 to 100µg m⁻³
- Based on vapour saturation limit as suggested by EA / [] model value
- Lowest of o-, m- and p-xylene
- Based on comparison of inhalation exposure with inhalation TDI
- Based on comparison of oral, dermal, and inhalation exposure with the oral TDI
- Based on a comparison of oral and dermal soil exposure with oral Index Dose only
- Averaged over and based on lifetime exposure
- Based on critical concentration for skin irritation in humans arising from contact with phenol in aqueous solution (number in brackets based on health effects following long term exposure for illustration)
- NA: Not applicable

Adopted Soil Generic Assessment Criteria
Sandy loam with 2.5% SOM



Contaminants	Residential <u>with</u> home grown produce	Residential <u>without</u> home grown produce	Allotments	Commercial	Public open space near residential housing POS _{resi}	Public park POS _{park}
Metals						
Beryllium	1.7	1.7	35	12	2.2	63
Boron	290	11,000	45	240,000	21,000	46,000
Cadmium	10⁽¹³⁾ 22	85⁽¹³⁾ 150	1.8 3.9	230 410	120 220	560 880
Chromium III	910	910	18,000	8,600	1,500	33,000
Chromium VI	6 <u>21</u>	6 <u>21</u>	1.8 <u>170</u>	33 <u>49</u>	7.7 <u>21</u>	220 <u>250</u>
Lead	<u>200</u>	<u>310</u>	<u>80</u>	<u>2,300</u>	<u>630</u>	<u>1,300</u>
Mercury (elemental)	1	1	26	26	16	26 ⁽⁸⁾ [30]
Mercury (inorganic)	170	240	80	3600	120	240
Nickel	130 ⁽¹⁰⁾	180 ⁽¹⁰⁾	53 ⁽¹¹⁾	980 ⁽¹⁰⁾	230	800
Vanadium	410	1200	91	9000	2000	5000
Copper	2400	7100	520	68000	12000	44000
Zinc	3700	40000	620	730000	81000	170000
Semi-Metals and non-metals						
Arsenic	32⁽¹²⁾ 37	35⁽¹²⁾ 40	43⁽¹²⁾ 49	640⁽¹²⁾ 640	79 <u>79</u>	170 <u>170</u>
Antimony		550		7500	1500	3300
Selenium	350	600	120	13000	1100	1800
Inorganic chemicals						
Cyanide	34	34	34	34	34	34
Organic contaminants						
<i>Aliphatic risk banded hydrocarbons - TPHCWG method</i>						
EC ₅ - EC ₆	78	78	1700	5900	590000	130000
EC ₆ - EC ₈	230	230	5600	17000	610000	220000
EC ₈ - EC ₁₀	65	65	770	4800	13000	18000
EC ₁₀ - EC ₁₂	330	330	4400	23000	13000	23000
EC ₁₂ - EC ₁₆	2400	2400	13000	82000	13000	25000
EC ₁₆ - EC ₃₅	92000	92000	270000	1700000	250000	480000
EC ₃₅ - EC ₄₄	92000	92000	270000	1700000	250000	480000
<i>Aromatic risk banded hydrocarbons - TPHCWG method</i>						
EC ₅ - EC ₇	140	690	27	46000	56000	84000
EC ₇ - EC ₈	290	1800	51	110000	56000	95000
EC ₈ - EC ₁₀	83	110	21	8100	5000	8500
EC ₁₀ - EC ₁₂	180	590	31	28000	5000	9700
EC ₁₂ - EC ₁₆	330	2300	57	37000	5100	10000
EC ₁₆ - EC ₂₁	540	1900	110	28000	3800	7700
EC ₂₁ - EC ₃₅	1500	1900	820	28000	3800	7800
EC ₃₅ - EC ₄₄	1500	1900	820	28000	3800	7800
Aliph + Arom EC >44-70	1800	1900	2100	28000	3800	7800
<i>Aromatic</i>						
Benzene	0.16	0.49	0.035	50	72	100
Ethyl benzene	150	380	39	1200⁽⁸⁾ [35000]	1200⁽⁸⁾ [24000]	1200⁽⁸⁾ [22000]
Toluene	270	1300	51	1900⁽⁸⁾ [110000]	1900⁽⁸⁾ [56000]	1900⁽⁸⁾ [95000]
Xylene ⁽⁹⁾	98	120	70	1200⁽⁸⁾ [14000]	1200⁽⁸⁾ [42000]	1200⁽⁸⁾ [23000]
Phenol	290	420	140	1500⁽¹⁴⁾ (35000)	1500⁽¹⁴⁾ (10000)	1500⁽¹⁴⁾ (8300)
<i>Polycyclic Aromatic Hydrocarbons (PAH)</i>						
Naphthalene	5.6	5.6	10	460	4900	1900
Acenaphthylene	420	4600	69	97000	15000	30000
Acenaphthene	510	4700	85	97000	15000	30000
Fluorene	400	3800	67	68000	9900	20000
Phenanthrene	220	1500	38	22000	3100	6200
Anthracene	5400	35000	950	540000	74000	150000
Fluoranthene	560	1600	130	23000	3100	6300
Pyrene	1200	3800	270	54000	7400	15000
Benz(a)anthracene	11	14	6.5	170	29	56
Chrysene	22	31	9.4	350	57	110
Benzo(b)fluoranthene	3.3	4.0	2.1	44	7.2	15
Benzo(k)fluoranthene	93	110	75	1200	190	410
Benzo(a)pyrene	2.7	3.2	2	35	5.7	12
Indeno(123cd)pyrene	36	46	21	510	82	170
Dibenzo(ah)anthracene	0.28	0.32	0.27	3.6	0.57	1.3
Benzo(ghi)perylene	340	360	470	4000	640	1500
Chlorinated Aliphatic Hydrocarbons						
Vinyl chloride	0.00087	0.001	0.001	0.077	3.5	5
Trichloroethene (TCE)	0.034	0.036	0.091	2.6	120	91
1,1,1,2 Tetrachlorethane	2.8	3.5	1.9	250	1400	1800
Tetrachlorethane (PCE)	0.39	0.4	1.5	42	1400	1100
1,1,1 Trichlorethane	18	18	110	1300	140000	76000

Notes

- All values above are in mg/kg
- Numbers in bold are SGVs or GAC that are derived based on SGV report input parameters, numbers in italics are S4ULs, numbers in bold-italics are based on EIC/AGS/CL:AIRE numbers & input parameters and underlined numbers are C4SLs
- Soil organic matter (SOM) is assumed to be 2.5% - DEFAULT VALUE
- Soil type is assumed to be sandy loam - DEFAULT SOIL TYPE
- For residential, the building type is conservatively assumed to be a small terrace house where the development includes bungalows change to more conservative bungalow setting in computer model
- For commercial, the building type is conservatively assumed to be a pre 1970s office building, where the proposed development comprises houses, flat with living spaces changes setting in model accordingly
- For classrooms consider increasing the dust loading factor in the 'Soil and Building Data' of the CLEA 1.04 model from 50 to 100µg m⁻³
- Based on vapour saturation limit as suggested by EA / [] model value
- Lowest of o-, m- and p-xylene
- Based on comparison of inhalation exposure with inhalation TDI
- Based on comparison of oral, dermal, and inhalation exposure with the oral TDI
- Based on a comparison of oral and dermal soil exposure with oral Index Dose only
- Averaged over and based on lifetime exposure
- Based on critical concentration for skin irritation in humans arising from contact with phenol in aqueous solution (number in brackets based on health effects following long term exposure for illustration)
- NA: Not applicable