

Document ref: C-02035-CALA-M1-LR-002

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20 August 2019

Parcel M1, Princess Royal Barracks, Deepcut, Surrey - Validation of clean Cover System in garden areas

Dear Adam,

We are writing to provide a summary of the validation of the clean Cover System implemented in the garden areas of Parcel M1 at Princess Royal Barracks, Deepcut, Surrey. This report details the works undertaken to date.

## 1. INTRODUCTION

Hydrock Consultants Limited was commissioned by CALA Homes (Thames) Ltd to undertake validation of the clean Cover System implemented across private gardens in the residential development at Parcel M1 of the above-mentioned site.

A site plan showing the proposed development layout is provided by Ashby Design Limited (00263-ASH-XX-TA-SP-3000\_T1) and presented in the appendix.

## 2. GARDEN VALIDATION

Validation works were carried out to confirm a minimum engineered capping thickness of 600mm was placed in the gardens (Cover System). As agreed with the Local Authority (Surrey Heath Borough Council) at least 150mm of soils within the Cover System should comprise topsoil over a minimum of 450mm subsoil. Where Made Ground is identified below the 600mm engineered capping material a geotextile membrane should be present to separate the materials. It is noted that the Local Authority have stipulated that no "man-made materials" should be present within the Cover System (e.g. brick, crushed concrete, glass etc). The minimum testing ratio at the site has been agreed as 40% of plots to be tested.

The Cover System was derived from site-won soils. The soils were tested prior to initial excavation, screened and tested again after placement in gardens.

The validation works were carried out in accordance with Hydrock's Remediation Method Statement (report ref: C14817-0019).

## 2.1 Site inspections

The site was visited to complete a plot inspection as detailed in Table 1.0 below. Hydrock will continue to visit the site when plots are ready for inspection as informed by CALA.

Table 1.0: Summary of site inspections for garden validation works

Date of inspection	Plots inspected
25/07/2019	23, 24, 25

A series of hand excavated trial pits were undertaken to a minimum depth of 0.6m in the rear garden areas of the plots to assess installation of the Cover System and inspect topsoil and subsoil materials present. Photographic records are presented in the Appendix.

Representative soil samples were obtained and scheduled for laboratory testing which incorporated a comprehensive soils suite. Laboratory test results are presented in the Appendix.

## 2.2 Soils Assessment

Laboratory results were compared to soil screening values for the residential with plant uptake land use scenario. The soil screening values used are generic assessment criteria (GAC). The Category 4 Screening Levels (C4SL) have been used for Benzo(a) Pyrene (5mg/kg) as agreed with the Local Authority. Statistical testing is used where data sets are suitable.

The results of the assessment are summarised below and screening tables are presented in the Appendix.

### 2.2.1 Topsoil results

From the comparison of topsoil test results against the relevant GAC's, the following comments apply:

- The screening exercise confirmed that topsoil samples obtained from the tested plots were not in exceedance of the relevant GAC's and deemed suitable.
- No asbestos was identified within the topsoil materials.
- A minimum of 150mm of topsoil was present, no significant "man-made materials" were encountered.

### 2.2.2 Subsoil results

From the comparison of subsoil test results against the relevant GAC's, the following comments apply:

- The screening exercise confirmed that subsoil samples obtained from the tested plots were not in exceedance of the relevant GAC's and deemed suitable.
- No asbestos was identified within the subsoil materials.
- A minimum of 450mm subsoil was present, no significant "man-made materials" were encountered.
- A geotextile membrane was encountered at depths ranging between 0.6 - 0.8m bgl.

### 3. Conclusions

Based on the remediation and verification works undertaken, the results of the plot inspections are outlined in Table 2.0 below. Those noted as "pass" are considered suitable for use and no further remedial works are required. Those noted as "fail" are subject to further remediation.

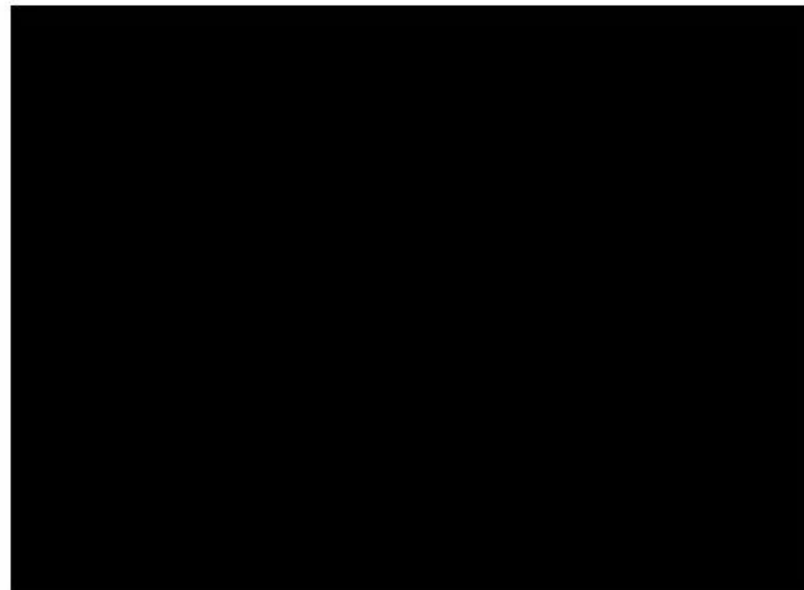
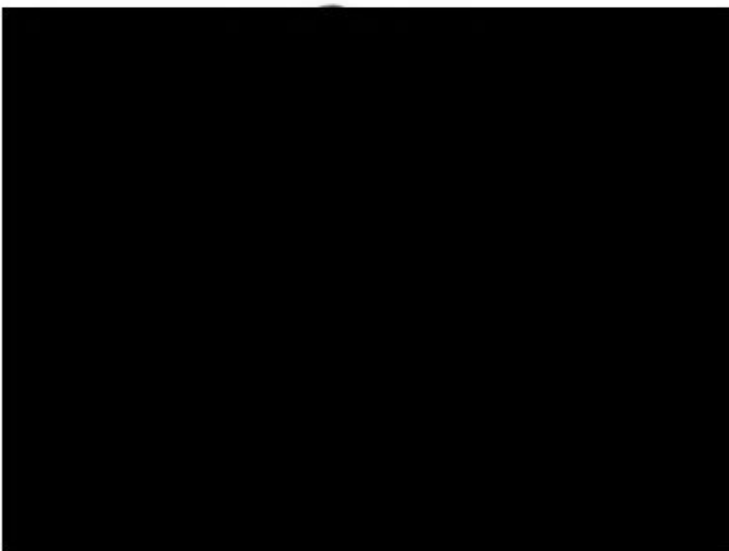
*Table 2.0: Summary of site inspections for garden validation works*

Plots Inspected	Recommendation	Notes
23	Pass	N/A
24	Pass	N/A
25	Pass	N/A

It is recommended that this summary report be passed to the relevant regulators (Local Authority and NHBC) for review.

Should you have any queries, please do not hesitate to contact the undersigned.

Yours faithfully



### Appendices

*Appendix A – Drawings*

*Appendix B – Site Visit Records*

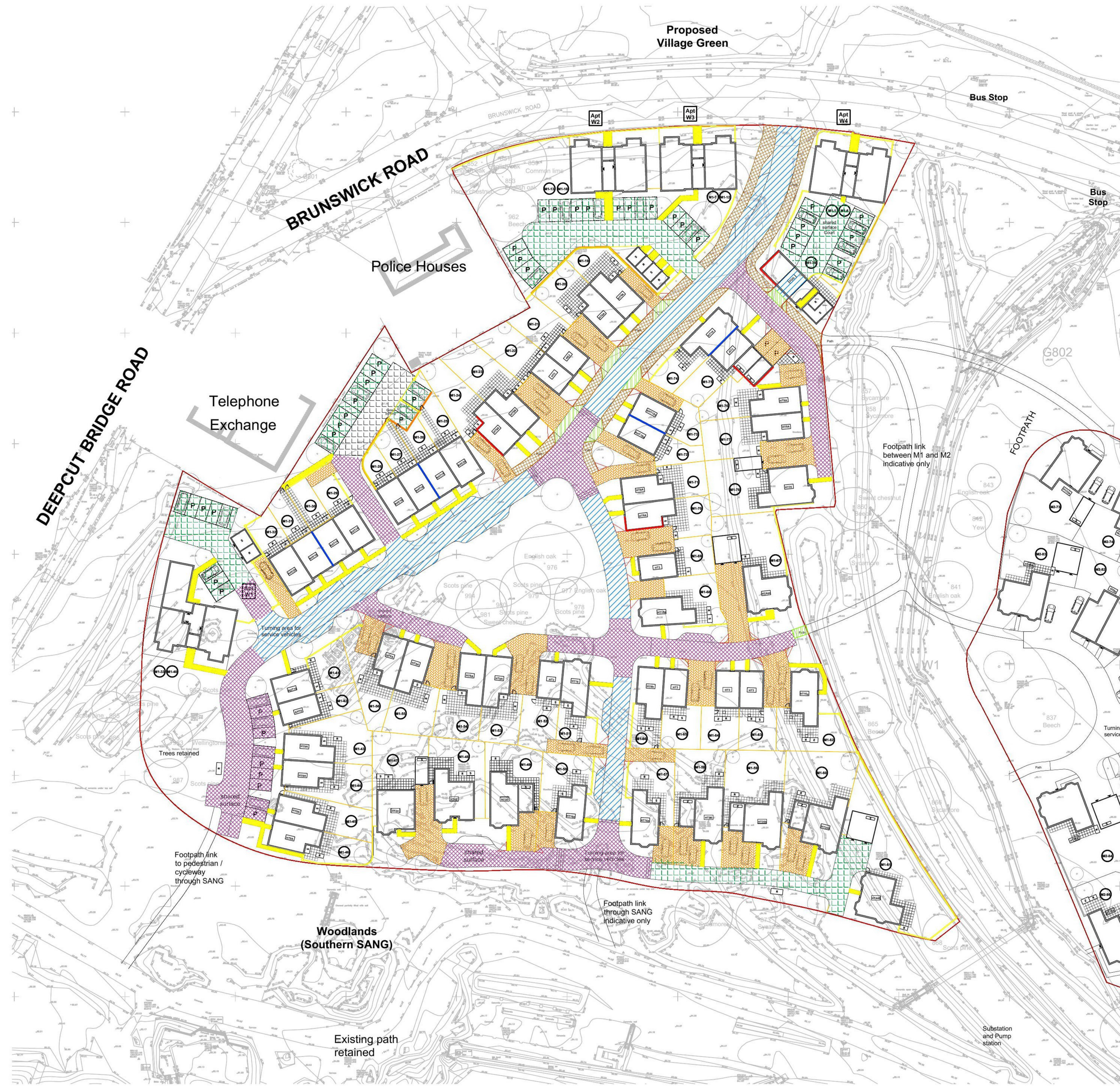
*Appendix C – Laboratory Results/ Testing Certificates*

*Appendix D – Screening Tables*

Appendix A

Drawings

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GENERAL KEY	
	CARRIAGEWAY - IMPERMEABLE BLOCKWORK (PAVEMENT TYPE B)
	PRIVATE DRIVE - BLOCK PAVING (PAVING TYPE A)
	PAVING - PERMEABLE BLOCKWORK (PAVEMENT TYPE E)
	PRIVATE FOOTPATH - INDIAN SANDSTONE (PAVEMENT TYPE C)
	ROAD - TARMAC (PAVEMENT TYPE D)
	PATIOS
	TARMAC FOOTPATH
	VEHICLE CROSSOVER
	SITE BOUNDARY
	BOUNDARY WALL - 1.8M HIGH WITH PIERS
	RETAINING WALL
	EXPOSED BRICK
	STEP BETWEEN FINISHED FLOOR LEVELS
	PARKING BAY
	VISIBILITY SPLAYS (2m x 2m)
	PROPOSED NEW TREE (TBC BY LANDSCAPE ARCHITECT)
	EXISTING TREE TO BE REMOVED (TBC BY LANDSCAPE ARCHITECT)
	DOOR ENTRANCE (LEVEL THRESHOLD)
	REFUSE
	CYCLE STORE

DRAWINGS TO BE READ IN CONJUNCTION WITH ENGINEERS' & LANDSCAPE ARCHITECTS UP TO DATE DRAWINGS & SPECIFICATION



**BRUNSWICK ROAD**

**ROAD**

**Police Houses**

**Telephone Exchange**

Footpath link between M1 and M2 indicative only



**KEY**

- Sample Location
- Plot covered by validation

**NOTES**

- All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
- This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.
- This drawing has been based on the following drawings and information:  
Topographic survey provided by Skanska Construction UK Limited on Sept 2016. Drawing Ref. DC1-SMS-EU-101-00-DR-05-T001 22/12/15
- Land use boundaries taken from JTP Drawing no: 00752\_SK030 Rev M 03/08/17.
- Layout based on unreferenced drawing supplied by the Client.

P2	SAMPLE LOCATIONS UPDATED	
SD	20/08/19 JB	20/08/19
P1	FIRST ISSUE	
SD	18/07/19 AJ	18/07/19
REV.	REVISION NOTES/COMMENTS	
DRAWN BY	DATE	CHECKED BY
	DATE	APPROVED BY
	DATE	

<p>Over Court Barrs Over Lane Almondsbury, Bristol BS32 4DF TEL: 01454 619 533 FAX: 01454 614 125 E-Mail: bristol@hydrock.com or visit www.hydrock.com</p>	
CLIENT	CALA Homes (Thames)
PROJECT	PRINCESS ROYAL BARRACKS, DEEPCUT

<p><b>Hydrock</b></p>	
TITLE	SAMPLE LOCATION PLAN (PARCEL M1)
HYDROCK PROJECT NO.	C-02035-C
SCALE	@ A3
PURPOSE OF ISSUE	SUITABLE FOR CO-ORDINATION
STATUS	S1
DRAWING NO. (PROJECT CODE-ORIGINATOR_ZONE-LEVEL-TYPE-ROLE-NUMBER)	02035-HYD-XX-ZZ-DR-GE-1001
REVISION	P2

<p>Over Court Barrs Over Lane Almondsbury, Bristol BS32 4DF TEL: 01454 619 533 FAX: 01454 614 125 E-Mail: bristol@hydrock.com or visit www.hydrock.com</p>	
CLIENT	CALA Homes (Thames)
PROJECT	PRINCESS ROYAL BARRACKS, DEEPCUT

Appendix B

Site Visit Records

SITE VISIT RECORD 003		SHEET NO: 1 of 3
Project: Princess Royal Barrack, Deepcut, Surrey		Date of Visit: 25.07.2019
Client: CALA Homes (Thames) Ltd	Weather Conditions: Sunny, dry	
Contract No.: C-02035-C		
Visit Carried Out By: Jane Baird		
Present: Hydrock Consultants		

Summary of Work Activities:
Validation sampling of garden plots 23, 24, 25.

Comments/Discussions:
<p>Geology descriptions of hand excavated pits comprised:</p> <p><b>Plot 23</b></p> <p>Ground level to 0.3m bgl comprised topsoil of dark greyish brown sandy slightly gravelly silt with roots and rootlets. Sand was fine to medium grained. Gravel was flint. Between 0.3m and 0.6m was dark greyish brown sandy slightly gravelly silt. Gravel was flint. Geotextile membrane was present at 0.6m.</p> <p><b>Plot 24</b></p> <p>Ground level to 0.3m bgl comprised topsoil of dark greyish brown sandy slightly gravelly silt with roots and rootlets. Sand was fine to medium grained. Gravel was flint. Between 0.3m and 0.7m was dark greyish brown sandy slightly gravelly silt. Gravel was flint. Geotextile membrane was present at 0.7m.</p> <p><b>Plot 25</b></p> <p>Ground level to 0.3m bgl comprised topsoil of dark greyish brown sandy slightly gravelly silt with roots and rootlets. Sand was fine to medium grained. Gravel was flint. Between 0.3m and 0.8m was dark greyish brown sandy slightly gravelly silt. Gravel was flint. Geotextile membrane was present at 0.8m.</p>



**SITE INSPECTION REPORT 003**

**SHEET NO: 2 of 3**



Plot 23 hand excavated pit



Plot 24 hand excavated pit

**SITE INSPECTION REPORT 003**

**SHEET NO: 3 of 3**



Plot 25 hand excavated pit

## Appendix C

### Laboratory Results/ Testing Certificates



**Joe**  
Hydrock Consultants Ltd  
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White Building  
1-4 Cumberland Place  
Southampton  
Hampshire  
SO15 2NP

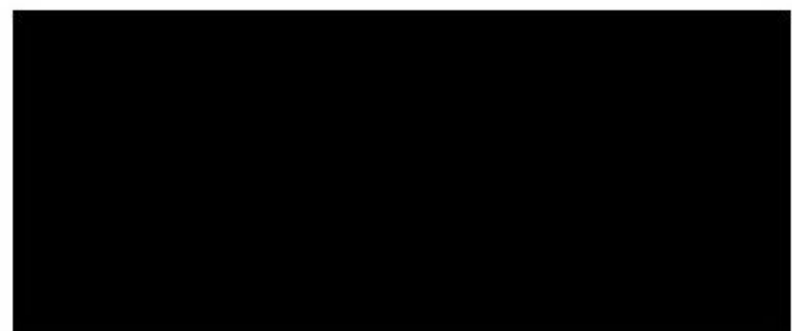
i2 Analytical Ltd.  
7 Woodshots Meadow,  
Croxley Green  
Business Park,  
Watford,  
Herts,  
WD18 8YS

**e:** southamptonresults@hydrock.com

**t:** 01923 225404  
**f:** 01923 237404  
**e:** reception@i2analytical.com

## **Analytical Report Number : 19-51641**

<b>Project / Site name:</b>	Deepcut	<b>Samples received on:</b>	25/07/2019
<b>Your job number:</b>	C-02035	<b>Samples instructed on:</b>	25/07/2019
<b>Your order number:</b>		<b>Analysis completed by:</b>	31/07/2019
<b>Report Issue Number:</b>	1	<b>Report issued on:</b>	31/07/2019
<b>Samples Analysed:</b>	6 soil samples		



Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Iss No 19-51641-1 Deepcut C-02035

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report are representative of the samples submitted for analysis.

Page 1 of 5

Analytical Report Number: 19-51641

Project / Site name: Deepcut

Lab Sample Number	1276702		1276703		1276704		1276705		1276706	
Sample Reference	Plot 23		Plot 23		Plot 24		Plot 24		Plot 25	
Sample Number	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	0.10		0.50		0.10		0.50		0.10	
Date Sampled	25/07/2019		25/07/2019		25/07/2019		25/07/2019		25/07/2019	
Time Taken	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status							
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	11	10	10	9.1	8.2		
Total mass of sample received	kg	0.001	NONE	1.0	1.2	1.1	1.3	1.2		

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected

#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.1	7.3	7.0	7.3	7.3
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.070	0.21	0.070	0.20	0.14
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.030	0.021	0.025	0.018	0.021

#### Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.84	0.40	0.68	0.37	0.54
Anthracene	mg/kg	0.05	MCERTS	0.19	0.09	0.16	0.09	0.15
Fluoranthene	mg/kg	0.05	MCERTS	2.7	1.4	2.5	1.3	1.9
Pyrene	mg/kg	0.05	MCERTS	2.2	1.2	2.1	1.1	1.6
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.3	0.80	1.4	0.69	1.1
Chrysene	mg/kg	0.05	MCERTS	1.3	0.77	1.3	0.61	0.89
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.6	0.87	1.5	0.96	1.2
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.71	0.41	0.82	0.29	0.54
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.3	0.77	1.5	0.75	1.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.69	0.38	0.71	0.35	0.52
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.25	< 0.05	0.22	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.1	0.59	1.1	0.57	0.78

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	14.2	7.68	13.9	7.03	10.3

#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.9	8.7	4.9	6.3	4.6
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.28	0.41	0.21	0.34	0.29
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1	0.9	0.8	0.8	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	12	15	7.0	12	12
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	15	7.3	12	13
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	23	12	23	29
Lead (aqua regia extractable)	mg/kg	1	MCERTS	74	37	43	31	44
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.5	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	7.8	7.8	5.0	6.2	7.5
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	17	22	14	19	15
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	64	56	45	41	53



4041



Analytical Report Number: 19-51641

Project / Site name: Deepcut

Lab Sample Number				1276707			
Sample Reference				Plot 25			
Sample Number				None Supplied			
Depth (m)				0.50			
Date Sampled				25/07/2019			
Time Taken				None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1			
Moisture Content	%	N/A	NONE	10			
Total mass of sample received	kg	0.001	NONE	1.2			

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected			
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**General Inorganics**

pH - Automated	pH Units	N/A	MCERTS	7.4			
Free Cyanide	mg/kg	1	MCERTS	< 1			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.21			
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.020			

**Total Phenols**

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0			
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**Speciated PAHs**

Naphthalene	mg/kg	0.05	MCERTS	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	0.67			
Anthracene	mg/kg	0.05	MCERTS	0.16			
Fluoranthene	mg/kg	0.05	MCERTS	2.4			
Pyrene	mg/kg	0.05	MCERTS	2.0			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.3			
Chrysene	mg/kg	0.05	MCERTS	1.1			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.8			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.89			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.5			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.68			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.0			

**Total PAH**

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	13.6			
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**Heavy Metals / Metalloids**

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.1			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.39			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2			
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2			
Chromium (III)	mg/kg	1	NONE	13			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	29			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	45			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	7.9			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	20			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	67			



**Analytical Report Number : 19-51641**

**Project / Site name: Deepcut**

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and topsoil/loam soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1276702	Plot 23	None Supplied	0.10	Grey loam and sand with gravel and vegetation.
1276703	Plot 23	None Supplied	0.50	Brown loam and sand with gravel and vegetation.
1276704	Plot 24	None Supplied	0.10	Brown loam and sand with gravel and vegetation.
1276705	Plot 24	None Supplied	0.50	Brown loam and sand with vegetation and gravel.
1276706	Plot 25	None Supplied	0.10	Brown loam and sand with gravel and vegetation.
1276707	Plot 25	None Supplied	0.50	Brown loam and sand with vegetation and gravel.

Analytical Report Number : 19-51641

Project / Site name: Deepcut

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L009-PL	D	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.



Appendix D

Screening Tables

# Assessment of Chemicals of Potential Concern to Human Health



Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	Result of Significance Test	Soil Type: SS										
								Location & Depth: Plot 23 0.5	Plot 25 0.5	Plot 24 0.5								
All values in mg/kg unless otherwise stated																		
Arsenic	1	3	6.3	8.7	0	37	POTENTIALLY SUITABLE FOR USE	8.7	6.3	7.1								
Beryllium	0.06	3	0.34	0.41	0	73	POTENTIALLY SUITABLE FOR USE	0.41	0.34	0.39								
Boron	0.2	3	0.7	0.9	0	300	POTENTIALLY SUITABLE FOR USE	0.9	0.8	0.7								
Cadmium	0.2	3	0.2	0.2	0	14	POTENTIALLY SUITABLE FOR USE	0.2	0.2	0.2								
Chromium (III)	1	3	12	15	0	890	POTENTIALLY SUITABLE FOR USE	15	12	13								
Chromium (VI)	1.2	3	1.2	1.2	0	6.1	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2								
Copper	1	3	23	29	0	2500	POTENTIALLY SUITABLE FOR USE	23	23	29								
Lead	2	3	31	45	0	200	POTENTIALLY SUITABLE FOR USE	37	31	45								
Mercury, inorganic	0.3	3	0.3	0.3	0	170	POTENTIALLY SUITABLE FOR USE	0.3	0.3	0.3								
Nickel	2	3	6.2	7.9	0	130	POTENTIALLY SUITABLE FOR USE	7.8	6.2	7.9								
Selenium	1	3	1	1	0	360	POTENTIALLY SUITABLE FOR USE	1	1	1								
Vanadium	1	3	19	22	0	410	POTENTIALLY SUITABLE FOR USE	22	19	20								
Zinc	2	3	41	67	0	3900	POTENTIALLY SUITABLE FOR USE	56	41	67								
Cyanide (free)	1	3	1	1	0	790	POTENTIALLY SUITABLE FOR USE	1	1	1								
Phenol (total)	2	3	1	1	0	290	POTENTIALLY SUITABLE FOR USE	1	1	1								
Acenaphthene	0.05	3	0.05	0.05	0	220	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05								
Acenaphthylene	0.05	3	0.05	0.05	0	180	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05								
Anthracene	0.05	3	0.09	0.16	0	2400	POTENTIALLY SUITABLE FOR USE	0.09	0.09	0.16								
Benzo(a)anthracene	0.05	3	0.69	1.3	0	4.2	POTENTIALLY SUITABLE FOR USE	0.8	0.69	1.3								
Benzo(a)pyrene	0.05	3	0.75	1.5	1	1.5	FURTHER ASSESSMENT REQUIRED	0.77	0.75	1.5								
Benzo(b)fluoranthene	0.05	3	0.87	1.8	0	7.6	POTENTIALLY SUITABLE FOR USE	0.87	0.96	1.8								
Benzo(ghi)perylene	0.05	3	0.57	1	0	64	POTENTIALLY SUITABLE FOR USE	0.59	0.57	1								
Benzo(k)fluoranthene	0.05	3	0.29	0.89	0	12	POTENTIALLY SUITABLE FOR USE	0.41	0.29	0.89								
Chrysene	0.05	3	0.61	1.1	0	7.7	POTENTIALLY SUITABLE FOR USE	0.77	0.61	1.1								
Dibenz(a,h)anthracene	0.05	3	0.05	0.05	0	1.1	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05								
Fluoranthene	0.05	3	1.3	2.4	0	290	POTENTIALLY SUITABLE FOR USE	1.4	1.3	2.4								
Fluorene	0.05	3	0.05	0.05	0	170	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05								
Indeno(1,2,3,cd)pyrene	0.05	3	0.35	0.68	0	4.3	POTENTIALLY SUITABLE FOR USE	0.38	0.35	0.68								
Naphthalene	0.05	3	0.05	0.05	0	2.2	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05								
Phenanthrene	0.05	3	0.37	0.67	0	97	POTENTIALLY SUITABLE FOR USE	0.4	0.37	0.67								
Pyrene	0.05	3	1.1	2	0	620	POTENTIALLY SUITABLE FOR USE	1.2	1.1	2								
Asbestos identified	Y/N							N	N	N								
FOC (dimensionless)	0.019667 (mean)							0.021	0.018	0.02								
SOM (calculated)	3.39% (mean)							3.62%	3.10%	3.45%								
pH (su)	7.3 (mean)							7.3	7.3	7.4								

**Risk parameter:** Human health - residential with plant uptake (1%SOM)

**Data set:** Subsoil

**Client:** CALA Homes Ltd

**Site:** Parcel M1 - Deepcut

**Job no.:** C-02035

**Lab. report no(s):** 19-51641

**Legend:** Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate. Values in red are equal to, or greater than, the generic assessment criterion (GAC). SS denotes Subsoil

## Assessment of Chemicals of Potential Concern to Plant Life

All values in mg/kg unless otherwise stated								Soil Type:	SS	SS	SS								
Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US <sub>95</sub>	Location & Depth:	Plot 23	Plot 25	Plot 24								
									0.5	0.5	0.5								
Arsenic	1	3	6.3	8.7	0	250	10.44279	POTENTIALLY SUITABLE FOR USE	8.7	6.3	7.1								
Boron	0.2	3	0.7	0.9	0	3	1.051725	POTENTIALLY SUITABLE FOR USE	0.9	0.8	0.7								
Chromium (III)	1	3	12	15	0	400	17.17849	POTENTIALLY SUITABLE FOR USE	15	12	13								
Chromium (VI)	1.2	3	1.2	1.2	0	25	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2								
Copper	1	3	23	29	0	135	33.72	POTENTIALLY SUITABLE FOR USE	23	23	29								
Nickel	2	3	6.2	7.9	0	75	9.701301	POTENTIALLY SUITABLE FOR USE	7.8	6.2	7.9								
Zinc	2	3	41	67	0	300	87.51972	POTENTIALLY SUITABLE FOR USE	56	41	67								
	<b>Mean</b>																		
pH (su)	7.3								7.3	7.3	7.4								

**Risk parameter:** Plant life pH 7

**Data set:** Subsoil

**Client:** CALA Homes Ltd

**Site:** Parcel M1 - Deepcut

**Job no.:** C-02035

**Lab. report no(s):** 19-51641

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# Assessment of Chemicals of Potential Concern to Human Health



Chemical of Potential Concern	All values in mg/kg unless otherwise stated					Soil Type: TS			Location & Depth:		
	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	Result of Significance Test	Plot 23	Plot 25	Plot 24	
								0.10	0.10	0.10	
Arsenic	1	3	4.6	5.9	0	37	POTENTIALLY SUITABLE FOR USE	5.9	4.9	4.6	
Beryllium	0.06	3	0.21	0.29	0	75	POTENTIALLY SUITABLE FOR USE	0.28	0.21	0.29	
Boron	0.2	3	0.8	1.1	0	300	POTENTIALLY SUITABLE FOR USE	1.1	0.8	0.8	
Cadmium	0.2	3	0.2	0.2	0	14	POTENTIALLY SUITABLE FOR USE	0.2	0.2	0.2	
Chromium (III)	1	3	7	12	0	890	POTENTIALLY SUITABLE FOR USE	12	7	12	
Chromium (VI)	1.2	3	1.2	1.2	0	8.1	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	
Copper	1	3	12	29	0	2500	POTENTIALLY SUITABLE FOR USE	17	12	29	
Lead	2	3	43	74	0	200	POTENTIALLY SUITABLE FOR USE	74	43	44	
Mercury, inorganic	0.3	3	0.3	0.5	0	170	POTENTIALLY SUITABLE FOR USE	0.3	0.5	0.3	
Nickel	2	3	7	7.3	0	130	POTENTIALLY SUITABLE FOR USE	7.3	7	7.3	
Selenium	1	3	1	1	0	360	POTENTIALLY SUITABLE FOR USE	1	1	1	
Vanadium	1	3	16	17	0	410	POTENTIALLY SUITABLE FOR USE	17	16	16	
Zinc	7	3	46	64	0	3900	POTENTIALLY SUITABLE FOR USE	64	46	53	
Cyanide (free)	1	3	1	1	0	750	POTENTIALLY SUITABLE FOR USE	1	1	1	
Phenol (total)	2	3	1	1	0	290	POTENTIALLY SUITABLE FOR USE	1	1	1	
Acephenanthrene	0.05	3	0.05	0.05	0	220	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05	
Acenaphthylene	0.05	3	0.05	0.05	0	180	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05	
Anthracene	0.05	3	0.15	0.19	0	2400	POTENTIALLY SUITABLE FOR USE	0.19	0.16	0.15	
Benzo(a)anthracene	0.05	3	1.1	1.4	0	4.2	POTENTIALLY SUITABLE FOR USE	1.3	1.4	1.1	
Benzo(a)pyrene	0.05	3	1.1	1.5	1	1.5	FURTHER ASSESSMENT REQUIRED	1.3	1.5	1.1	
Benzo(b)fluoranthene	0.05	3	1.2	1.6	0	7.6	POTENTIALLY SUITABLE FOR USE	1.6	1.5	1.2	
Benzo(k)fluoranthene	0.05	3	0.78	1.1	0	64	POTENTIALLY SUITABLE FOR USE	1.1	1.1	0.78	
Benzo(k)fluoranthene	0.05	3	0.54	0.62	0	12	POTENTIALLY SUITABLE FOR USE	0.71	0.62	0.54	
Chrysene	0.05	3	0.88	1.3	0	7.7	POTENTIALLY SUITABLE FOR USE	1.3	1.3	0.88	
Dibenz(a,h)anthracene	0.05	3	0.05	0.25	0	1.1	POTENTIALLY SUITABLE FOR USE	0.25	0.22	0.05	
Fluoranthene	0.05	3	1.9	2.7	0	260	POTENTIALLY SUITABLE FOR USE	2.7	2.5	1.9	
Fluorene	0.05	3	0.05	0.05	0	170	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05	
Indeno(1,2,3-cd)perylene	0.05	3	0.52	0.71	0	4.3	POTENTIALLY SUITABLE FOR USE	0.69	0.71	0.52	
Naphthalene	0.05	3	0.05	0.05	0	2.2	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05	
Phenanthrene	0.05	3	0.54	0.84	0	97	POTENTIALLY SUITABLE FOR USE	0.84	0.69	0.54	
Pyrene	0.05	3	1.6	2.2	0	620	POTENTIALLY SUITABLE FOR USE	2.2	2.1	1.6	
Asbestos (identified)	N/A							N	N	N	
FOC (dimensionless)	0.025333 (mean)							0.03	0.025	0.021	
SOM (calculated)	4.37% (mean)							5.17%	4.31%	3.62%	
pH (su)	7.1 (mean)							7.1	7	7.3	

**Risk parameter:** Human health - residential with plant uptake (1% SOM)

**Data set:** Topsoil

**Client:** CALA Homes Ltd

**Site:** Deepcut - Parcel M1

**Job no.:** C-02035

**Lab. report no(s):** 19-51641

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TS denotes Topsoil

## Assessment of Chemicals of Potential Concern to Plant Life

All values in mg/kg unless otherwise stated							Soil Type	TS	TS	TS								
Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	Result of Significance Test	Location & Depth	Plot 23	Plot 25	Plot 24							
								0.10	0.10	0.10								
Arsenic	1	3	4.6	5.9	0	250	POTENTIALLY SUITABLE FOR USE		5.9	4.9	4.6							
Boron	0.2	3	0.8	1.1	0	3	POTENTIALLY SUITABLE FOR USE		1.1	0.8	0.8							
Chromium (III)	1	3	7	12	0	400	POTENTIALLY SUITABLE FOR USE		12	7	12							
Chromium (VI)	1.2	3	1.2	1.2	0	25	POTENTIALLY SUITABLE FOR USE		1.2	1.2	1.2							
Copper	1	3	12	29	0	135	POTENTIALLY SUITABLE FOR USE		17	12	29							
Nickel	2	3	5	7.8	0	75	POTENTIALLY SUITABLE FOR USE		7.8	5	7.5							
Zinc	2	3	45	64	0	300	POTENTIALLY SUITABLE FOR USE		64	45	53							
	<b>Mean</b>																	
pH (su)	7.1								7.1	7	7.3							

**Risk parameter:** Plant life pH 7

**Data set:** Topsoil

**Client:** CALA Homes Ltd

**Site:** Deepcut - Parcel M1

**Job no.:** C-02035

**Lab. report no(s):** 19-51641

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