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Document ref: C-02035-CALA-M2-LR-017-P1

Derric Heyden
CALA Homes (Thames) Ltd
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26 March 2021

Parcel M2, Princess Royal Barracks, Deepcut, Surrey - Validation of clean Cover System in rear 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 M2 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 M2 of the above-mentioned site.

A site plan showing the proposed development layout is provided by Odyssey Consult (17-154-E-0000-006) and presented in appendix A.

2. GARDEN VALIDATION

The watching brief was 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. 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 subsoil and imported topsoil which was supplied with certification from the source, as presented in Appendix F and tested after placement in gardens.

The validation works were carried out in accordance with Hydrock's Remediation Method Statement (report ref: C14817-0019, dated 10/07/2018).

2.1 Watching Brief

A watching brief was carried out as detailed in Table 1.0 below. Hydrock will continue to visit the site when plots are ready for placement of the Cover System as informed by CALA.

Table 1.0: Summary of site inspections for garden validation works

Watching Brief Days	Plots
07-21/01/2021	172 - 177 and POS near 174

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

2.2 Discussion - Surrey Heath Borough Council

Following the initial verification works undertaken in 2019, a site visit was undertaken by Garry Carter of Surrey Heath Borough Council (SHBC) in early January 2020. Garry identified a significant issue with presence of man-made materials in Plot 61. Following this visit, a site meeting was held between Hydrock, SHBC and CALA to discuss a way forward, summarised in Garden Validation Report 08 (ref: C-02035-CALA-M1-LR-008).

In July 2020 further meetings were held to discuss methods to improve the validation method to ensure that man-made material, and in particular glass fragments, within the Cover System were no more frequent than 'rare' in occurrence. It was deemed that inspection pits did not assess enough of the Cover System to have confidence of this. To increase the robustness of the Cover System validation of site-won soils, in terms of man-made material occurrence, a full-time Watching Brief method was proposed.

The Watching Brief method is detailed within Houlihan & Co (the groundworks main contractor) Method Statement Revision 5 (dated 14/08/20, see Appendix E) and the Hydrock Watching Brief daily record for 13/08/20 (see Appendix B).

Within the Watching Brief method, imported topsoil will be used above site-won subsoil that is extensively screened and raked by Houlihan & Co when it is placed in garden plots, to remove all man-made materials encountered. Hydrock will be present for the placement of all subsoil to witness the screening process and take samples for lab analysis at a 40% testing ratio.

Houlihan & Co have provided an updated method statement to include the above changes in Section 19.0, included in Appendix E for reference.

The method of subsoil placement was agreed with Hydrock on site on 13/08/2020, as recorded in the relevant Watching Brief Report, and included below for information:

- *Formation depth of the plot is checked by Houlihan, with a minimum of 600mm required*
- *A geotextile membrane is installed by Houlihan if required*
- *Excavator places site won subsoil in approx. 100mm thick layers*
- *Excavator rakes layers with bucket teeth producing approx. 100mm deep furrows*
- *Any visible man-made material is removed by Houlihan groundworkers*
- *Houlihan groundworkers manually rake through the furrows and remove any man made material encountered*
- *The next layer is then added*
- *Layers are added and tracked in by excavator until a 150mm space remains for topsoil*

Photographs and Watching Brief daily records are presented in Appendix B for information.

2.3 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 assessment tables are presented in the Appendix C and D respectively.

2.3.1 Topsoil results

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

- Lab testing confirmed that topsoil and subsoil samples obtained from all plots were not in exceedance of the relevant GAC's.
- No asbestos was identified within the topsoil materials.
- A minimum of 150mm of topsoil was present, no significant "man-made materials" were encountered.

2.3.2 Subsoil results

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

- Lab testing confirmed that subsoil samples obtained from the tested plots were not in exceedance of the relevant GAC's.
- No asbestos was identified within the subsoil materials.
- A minimum of 450mm subsoil was present, no man-made materials were identified following the screening process.
- A geotextile was installed in all plots where Made Ground was identified beneath the cover system.

3. Conclusions

Based on the 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
172	Pass	
173	Pass	
174	Pass	
175	Pass	
176	Pass	
177	Pass	
POS near 174	Pass	

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

[redacted]

[redacted]

Appendices

Appendix A – Drawings

Appendix B – Site Visit Record

Appendix C – Laboratory Results / Test Certificates

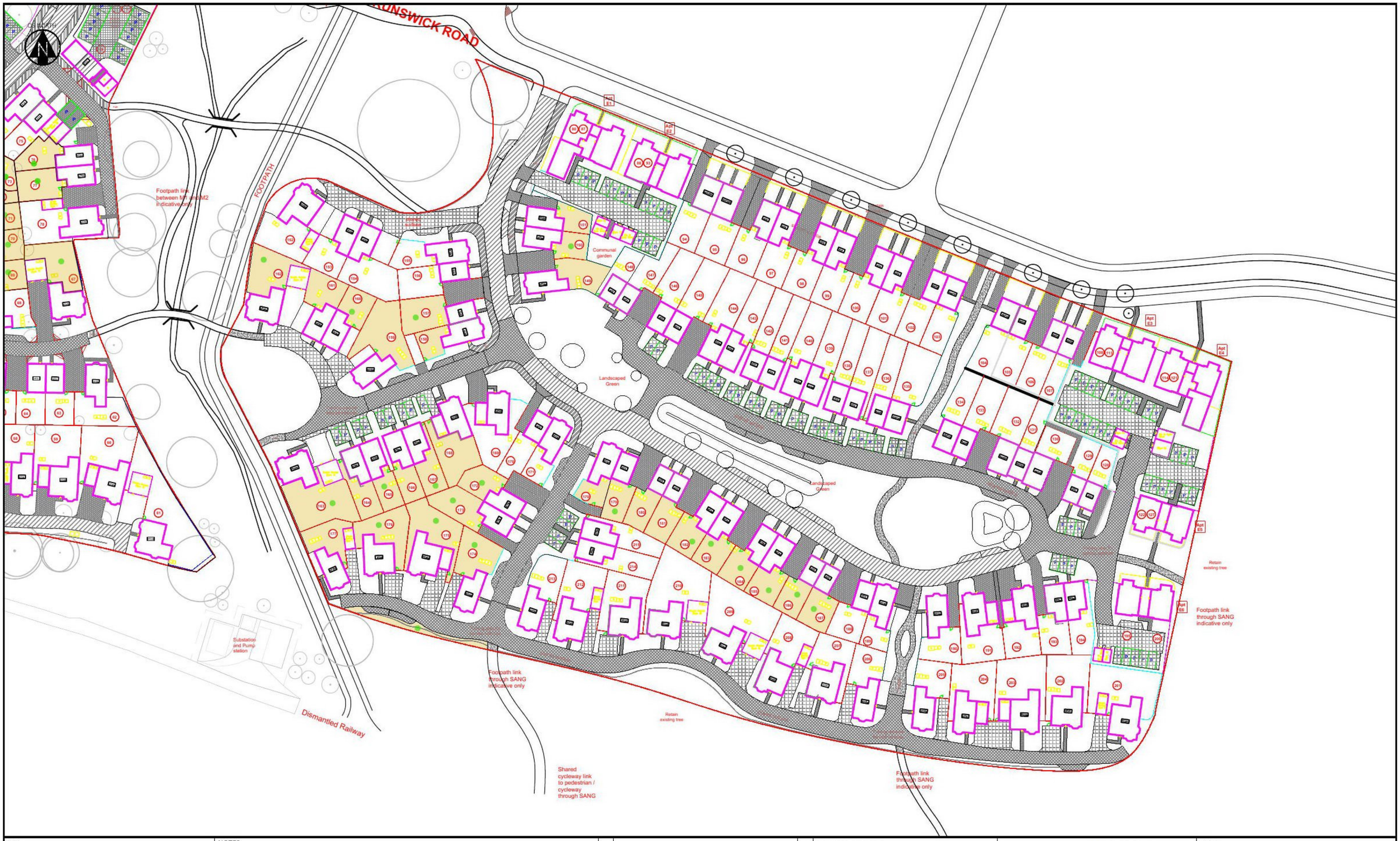
Appendix D – Screening Tables

Appendix E – Houlihan & Co Method Statement

Appendix F - Imported Soil Certifications

Appendix A

Drawings



KEY

- Sample Location
- Plots covered by validation

NOTES

1. 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.

2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

3. 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

4. Land use boundaries taken from JTP Drawing no: 00752_SK030 Rev M 03/08/17.

5. Layout based on unreferenced drawing supplied by the Client.

REV.						
P8	SAMPLE LOCATIONS UPDATED	MR	19/03/21	AI	19/03/21	AI	19/03/21
P7	SAMPLE LOCATIONS UPDATED	MR	12/03/21	AI	12/03/21	AI	12/03/21
P6	SAMPLE LOCATIONS UPDATED	MR	19/09/20	AI	19/09/20	AI	19/09/20
P5	SAMPLE LOCATIONS ADDED	SD	17/12/19	AI	19/09/20	AI	19/09/20
P4	SAMPLE LOCATIONS ADDED	SD	17/10/19	JB	17/10/19	AI	17/10/19
P3	SAMPLE LOCATIONS ADDED	SD	07/10/19	JB	07/10/19	AI	07/10/19
P2	SAMPLE LOCATIONS UPDATED	SD	20/08/19	JB	20/08/19	AI	20/08/19
P1	FIRST ISSUE	SD	18/07/19	AJ	18/07/19	AI	18/07/19
REV.	REVISION NOTES/COMMENTS	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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CLIENT
CALA Homes (Thames)

PROJECT
PRINCESS ROYAL BARRACKS, DEEPCUT

TITLE
SAMPLE LOCATION PLAN (PARCEL M2)

HYDROCK PROJECT NO.
C-02035-C

SCALE @ A3
1:1000

PURPOSE OF ISSUE
SUITABLE FOR CO-ORDINATION

STATUS
S1

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)
02035-HYD-XX-ZZ-DR-GE-1001

REVISION
P8

Appendix B

Site Visit Record

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M2 Validation Watching Brief		SHEET NO: 1 of 3
Project: Princess Royal Barrack, Deepcut, Surrey		Date of Visit: 14.01.2021
Client: CALA Homes (Thames) Ltd	**Weather Conditions:** Wet with minus temperatures	
Contract No.: C-02035-C		
Present: Hydrock Consultants – Katie Timkey, Cala Homes – Alastair Campbell, Houlihans – Graham Knight		

Summary of Work Activities:

M2 Rear Garden Validation Watching Brief for rear gardens of plot 174.

Comments/Discussions:

Progress:

08:00 – 10:00

Excavation of Plot 174 to formation (600mm below final ground level) measured from top of patio level and pegged out levels on opposite side of rear garden. Membrane was then placed and first layer of subsoil placed and inspected.

10:30 – 16:30

Further layers of subsoil placed across the garden area in circa 100mm uplifts, inspected and handpicked as necessary.

By the end of the day Plot 174 had been bought up to 150mm below formation ready for topsoil placement.

Geological Notes:

Subsoil consisted of very soft to soft (wet), light to dark brown, slightly sandy, slightly gravelly clayey silt. Gravel consisted of fine to coarse subrounded to angular flint. Occasional roots and rootlets. Rare gravel sized fragments of brick.

Topsoil consisted of very soft, dark brown, slightly gravelly, sandy clayey silt with common roots and rootlets. Gravel was fine to course, rounded to angular flint.

Samples Taken:

A sample was taken from 200mm below formation in Plot 174 subsoil.

Samples were taken 100mm from the topsoil for Plots 172, 173 and the POS near Plot 172. Topsoil consisted of soft, light to dark brown, slightly gravelly, sandy clayey silt with common roots, rootlets and plant stems. The gravel was fine to course, rounded to angular flint.

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M2 Validation Watching Brief	SHEET NO: 2 of 3

Placement of membrane and measuring 600mm for Plot 174

Placement of subsoil on membrane for Plot 174

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M2 Validation Watching Brief

SHEET NO: 3 of 3

Placement of subsoil on membrane for Plot 174

450mm of subsoil placed across Plot 174

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M2 Validation Watching Brief		SHEET NO: 1 of 3
Project: Princess Royal Barrack, Deepcut, Surrey		Date of Visit: 13.01.2021
Client: CALA Homes (Thames) Ltd	**Weather Conditions:** Wet with minus temperatures	
Contract No.: C-02035-C		
Present: Hydrock Consultants – Katie Timkey, Cala Homes – Alastair Campbell, Houlihans – Graham Knight		

Summary of Work Activities:
M2 Rear Garden Validation Watching Brief for rear gardens of plots 175 and 176.

Comments/Discussions:

Progress:

08:00 – 10:00

Excavation of plots to formation (600mm below final ground level) measured from top of patio level and pegged out levels on opposite side of rear garden. Membrane was then placed and first layer of subsoil placed and inspected.

10:30 – 16:30

Further layers of subsoil placed across the garden area in circa 100mm uplifts, inspected and handpicked as necessary.

By the end of the day plots 175 and 176 had been bought up to 150mm below formation ready for topsoil placement.

Geological Notes:

Subsoil consisted of damp, very soft to soft, light to dark brown, slightly sandy, slightly gravelly clayey silt. Gravel consisted of fine to coarse subrounded to angular flint. Occasional roots and rootlets. Rare gravel sized fragments of brick.

Samples Taken:

Samples were taken from 200mm below formation in plot 175 and 176 for subsoil.

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M2 Validation Watching Brief

Placement of membrane in Plots 175 and 176

Correct depth being measured for subsoil on plots

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Placement of subsoil on membrane for plots 175 and 176

450mm of subsoil placed across Plots 175 and 176

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M2 Validation Watching Brief		SHEET NO: 1 of 3
Project: Princess Royal Barrack, Deepcut, Surrey		Date of Visit: 08.01.2021
Client: CALA Homes (Thames) Ltd	**Weather Conditions:** Sunny	
Contract No.: C-02035-C		
Present: Hydrock Consultants – Katie Timkey, Cala Homes – Alastair Campbell, Houlihans – Graham Knight		

Summary of Work Activities:
M2 POS Validation Watching Brief for POS near Plot 174 - 177.

Comments/Discussions:

Progress:

12:00 – 13:00

Excavation of POS to formation (450mm below final ground level) measured from top of concrete level and pegged out levels on opposite side of area. Membrane was then placed across the POS area and first layer of subsoil placed, and inspected.

13:30 – 16:00

Further layers of subsoil placed across the POS area in circa 100mm uplifts and inspected.

150mm of topsoil was laid on top of 450mm of subsoil.

By the end of the day the area was completed.

Geological Notes:

Subsoil consisted of dry, very soft to soft, yellow brown, slightly sandy, slightly gravelly clayey silt. Gravel consisted of fine to coarse subrounded to angular flint. Occasional roots and rootlets. Rare gravel sized fragments of brick.

Topsoil consists of very dark brown clayey slit with occasional roots and rootlets.

Samples Taken:

None.

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M2 Validation Watching Brief

POS area at the start

Placement of membrane and measuring depth to 600mm

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M2 Validation Watching Brief

SHEET NO: 3 of 3

Membrane with layer of subsoil on

POS finished with Topsoil

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M2 Validation Watching Brief		SHEET NO: 1 of 3
Project: Princess Royal Barrack, Deepcut, Surrey		Date of Visit: 07.01.2021
Client: CALA Homes (Thames) Ltd	**Weather Conditions:** Sunny with minus temperatures	
Contract No.: C-02035-C		
Present: Hydrock Consultants – Katie Timkey, Mike Rudd, Cala Homes – Alastair Campbell, Houlihans – Graham Knight		

Summary of Work Activities:
M2 Rear Garden Validation Watching Brief for rear gardens of plots 172 and 173.

Comments/Discussions:

Progress:

08:00 – 09:00

Excavation of plots to formation (600mm below final ground level) measured from top of patio level and pegged out levels on opposite site of rear garden. Membrane was then placed across garden area closest to houses and first layer of subsoil placed, inspected and handpicked as necessary.

09:00 – 16:30

Further layers of subsoil placed across the garden area in circa 100mm uplifts, inspected and handpicked as necessary.

By the end of the day plots 172 and 173 had been bought up to 150mm below formation ready for topsoil placement.

Geological Notes:

Subsoil consisted of dry, very soft to soft, light to dark brown, slightly sandy, slightly gravelly clayey silt. Gravel consisted of fine to coarse subrounded to angular flint. Occasional roots and rootlets. Rare gravel sized fragments of brick.

Samples Taken:

Samples were taken from 200mm below formation in plot 172 and 173 for subsoil.

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M2 Validation Watching Brief

Placement of membrane in Plots 172 and 173

Placement of subsoil on membrane

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M2 Validation Watching Brief	SHEET NO: 3 of 3

Measurement of subsoil for plots 172 and 173

450mm of subsoil placed across Plots 172 and 173

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M2 Validation Watching Brief		SHEET NO: 1 of 3
Project: Princess Royal Barrack, Deepcut, Surrey		Date of Visit: 21.01.2021
Client: CALA Homes (Thames) Ltd	**Weather Conditions:** Light showers and overcast	
Contract No.: C-02035-C		
Present: Hydrock Consultants – Katie Timkey, Cala Homes – Alastair Campbell, Houlihans – Graham Knight		

Summary of Work Activities:
M2 Rear Garden Validation Watching Brief for rear gardens of Plot 177.

Comments/Discussions:

Progress:

08:00 – 17:00

Continued placement of subsoil in Plot 177 in circa 100mm uplifts that were inspected and handpicked as necessary.

By the end of the day Plot 177 had been bought up to 150mm below formation and was subsequently topsoiled.

Geological Notes:

Subsoil consisted of orange yellow and grey slightly clayey to clayey SAND with occasional roots and inclusions of dark brown silt and organic material up to 10mm across, Gravel fine to coarse subrounded flint.

Topsoil consists of dark brown slightly gravelly, sandy clayey silt with common roots, rootlets and plant stems. The gravel was fine to course, rounded to angular flint.

Samples Taken:

No Sample taken.

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M2 Validation Watching Brief	SHEET NO: 2 of 3

Subsoil completed in Plot 177

Placement of subsoil in plot and string lining to ensure correct depth in Plot 177

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M2 Validation Watching Brief	SHEET NO: 3 of 3

Topsoil completed in Plot 177

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M2 Validation Watching Brief		SHEET NO: 1 of 3
Project: Princess Royal Barrack, Deepcut, Surrey		Date of Visit: 20.01.2021
Client: CALA Homes (Thames) Ltd	**Weather Conditions:** Light showers and overcast	
Contract No.: C-02035-C		
Present: Hydrock Consultants – Katie Timkey, Cala Homes – Alastair Campbell, Houlihans – Graham Knight		

Summary of Work Activities:
M2 Rear Garden Validation Watching Brief for rear gardens of Plot 177.

Comments/Discussions:

Progress:

08:00 – 10:00

Excavation of plot to formation (600mm below final ground level) measured from top of patio level and pegged out levels on opposite side of rear garden. Placement of membrane and subsoil layers in circa 100mm uplifts. Subsoil carefully inspected and handpicked as necessary.

10:30 – 17:00

Further layers placed across the garden area in circa 100mm uplifts inspected and handpicked as necessary.

Geological Notes:

Subsoil consisted of orange yellow and grey slightly clayey to clayey SAND with occasional roots and inclusions of dark brown silt and organic material up to 10mm across, Gravel fine to coarse subrounded flint.

Samples Taken:

No Samples taken.

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M2 Validation Watching Brief

Laying and placement of membrane and formation measuring depth in Plot 177

Placement of subsoil in Plot 177

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M2 Validation Watching Brief

Placement of finely raked subsoil in Plot 177

Placement of subsoil in plot and string lining to ensure correct depth in Plot 177

Appendix C

Laboratory Result Certificates

Katie Timkey
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e: Group Southampton cc engineer

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

Analytical Report Number : 21-50054

Project / Site name:	Deepcut	**Samples received on:**	08/01/2021
Your job number:	C-02035	**Samples instructed on/ Analysis started on:**	08/01/2021
Your order number:	PO04309	**Analysis completed by:**	13/01/2021
Report Issue Number:	1	**Report issued on:**	13/01/2021
Samples Analysed:	2 soil samples		

Signed [redacted]

Zina Abdul Razzak
Senior Quality Specialist
For & on behalf of i2 Analytical Ltd.

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.

Analytical Report Number: 21-50054
Project / Site name: Deepcut
Your Order No: PO04309

Lab Sample Number				1732510	1732511
Sample Reference				P172-SS-0.2	POS-SS-0.2
Sample Number				None Supplied	None Supplied
Depth (m)				0.20	0.20
Date Sampled				07/01/2021	07/01/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	14
Total mass of sample received	kg	0.001	NONE	0.9	0.9
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected
General Inorganics					
pH - Automated	pH Units	N/A	MCERTS	10	8.4
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.26	0.12
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.0024	0.0029
Total Phenols					
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
Speciated PAHs					
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Total PAH					
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7	6.4
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.48	0.4
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	19	16
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	14	15
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	6.3	5.4
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	31	27
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	50	35

Analytical Report Number: 21-50054
Project / Site name: Deepcut
Your Order No: PO04309

Lab Sample Number				1732510	1732511
Sample Reference				P172-SS-0.2	POS-SS-0.2
Sample Number				None Supplied	None Supplied
Depth (m)				0.20	0.20
Date Sampled				07/01/2021	07/01/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Monoaromatics & Oxygenates					
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0
Petroleum Hydrocarbons					
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-50054
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 loam (MCERTS) 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 *
1732510	P172-SS-0.2	None Supplied	0.2	Brown clay and sand with gravel and vegetation.
1732511	POS-SS-0.2	None Supplied	0.2	Brown clay and sand with gravel and vegetation.

Analytical Report Number : 21-50054
Project / Site name: Deepcut

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

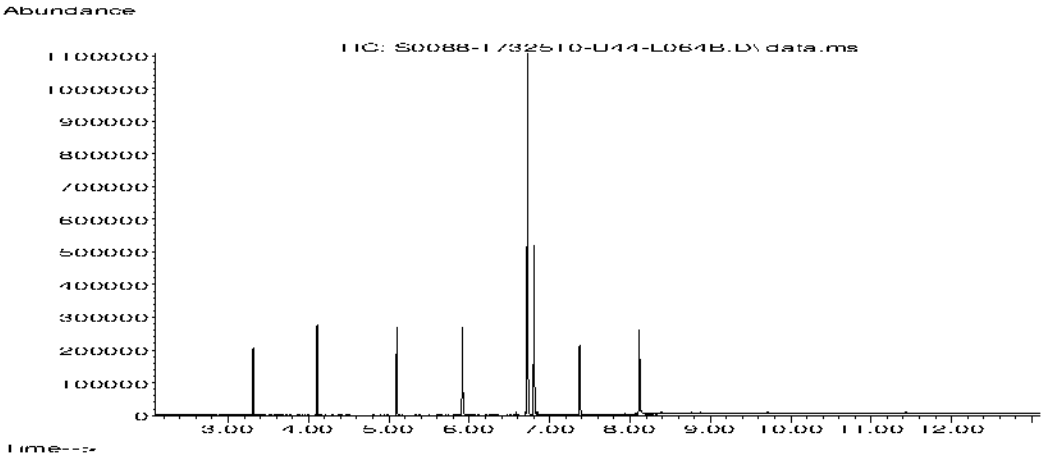
Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	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
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
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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
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.	L009-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	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
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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-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
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPH Chromatogram in Soil	TPH Chromatogram in Soil.	In-house method	L064-PL	D	NONE
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 21-50054
Project / Site name: Deepcut

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	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 30oC.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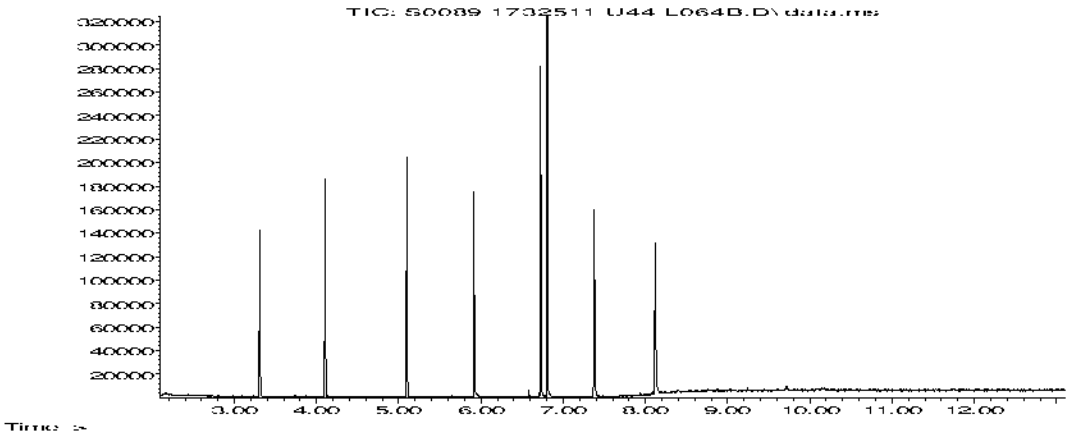
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Analytical Report Number : 21-53799

Project / Site name:	Deepcut	**Samples received on:**	15/01/2021
Your job number:	C-02035	**Samples instructed on/ Analysis started on:**	27/01/2021
Your order number:	PO04725	**Analysis completed by:**	01/02/2021
Report Issue Number:	1	**Report issued on:**	01/02/2021
Samples Analysed:	4 soil samples		

Signed: [redacted]

Zina Abdul Razzak
Senior Quality Specialist
For & on behalf of i2 Analytical Ltd.

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

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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.

Analytical Report Number: 21-53799
Project / Site name: Deepcut
Your Order No: PO04725

Lab Sample Number				1752238	1752239	1752240	1752241
Sample Reference				P176-SS	POS-TS	P174-SS	P172-TS
Sample Number				1	1	1	1
Depth (m)				0.20	0.10	0.20	0.10
Date Sampled				13/01/2021	14/01/2021	14/01/2021	14/01/2021
Time Taken				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
Moisture Content	%	0.01	NONE	8.7	33	11	36
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.2	1.2
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.3	8.4	8	8.3
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivale	g/l	0.00125	MCERTS	0.28	0.044	0.29	0.037
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.0067	0.03	0.0067	0.026

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.25	< 0.05	0.35	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.53	< 0.05	0.75	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.6	< 0.05	0.72	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.29	< 0.05	0.44	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.24	< 0.05	0.34	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.56	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.22	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.45	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.25	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.27	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	1.91	< 0.80	4.35	< 0.80

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.4	5.3	6.6	5.4
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.3	0.24	0.37	0.23
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	2.7	1.8	3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	12	9.5	13	8.1
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	9.5	13	8.1
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8	13	8.2	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	26	22	26	18
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	5.8	4.3	6.6	3.8
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	19	11	22	11
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	46	46	50	41

Monoaromatics & Oxygenates

Analytical Report Number: 21-53799
Project / Site name: Deepcut
Your Order No: PO04725

Lab Sample Number				1752238	1752239	1752240	1752241
Sample Reference				P176-SS	POS-TS	P174-SS	P172-TS
Sample Number				1	1	1	1
Depth (m)				0.20	0.10	0.20	0.10
Date Sampled				13/01/2021	14/01/2021	14/01/2021	14/01/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	2.3	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	3.8	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	18	19	< 10	12
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-53799
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 loam (MCERTS) 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 *
1752238	P176-SS	1	0.2	Brown clay and loam with gravel.
1752239	POS-TS	1	0.1	Brown loam and clay with vegetation and gravel
1752240	P174-SS	1	0.2	Brown clay and loam with gravel.
1752241	P172-TS	1	0.1	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 21-53799
Project / Site name: Deepcut

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

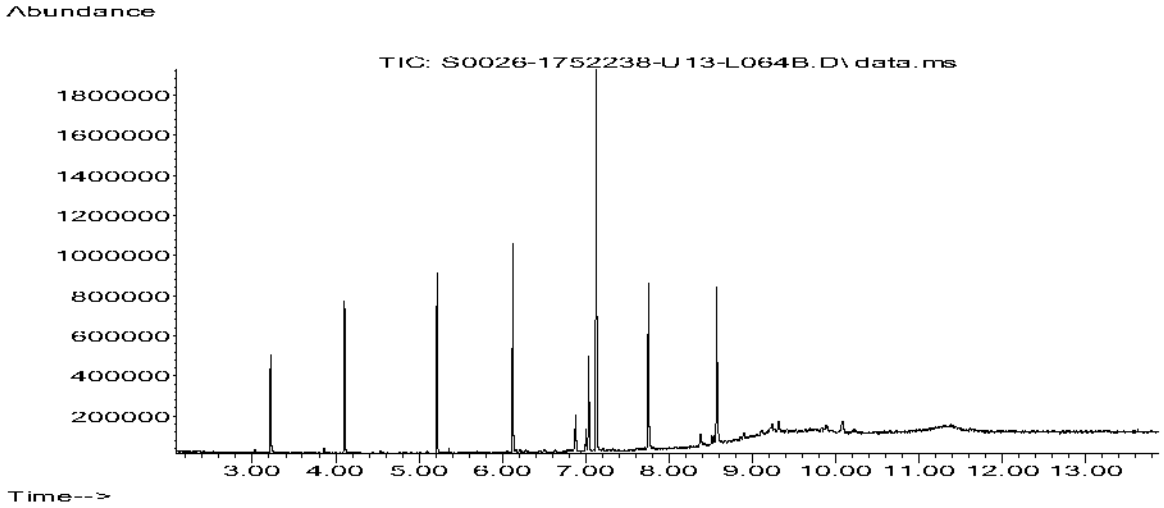
Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	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
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
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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
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.	L009-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	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
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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-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
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPH Chromatogram in Soil	TPH Chromatogram in Soil.	In-house method	L064-PL	D	NONE
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 21-53799
Project / Site name: Deepcut

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

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 30oC.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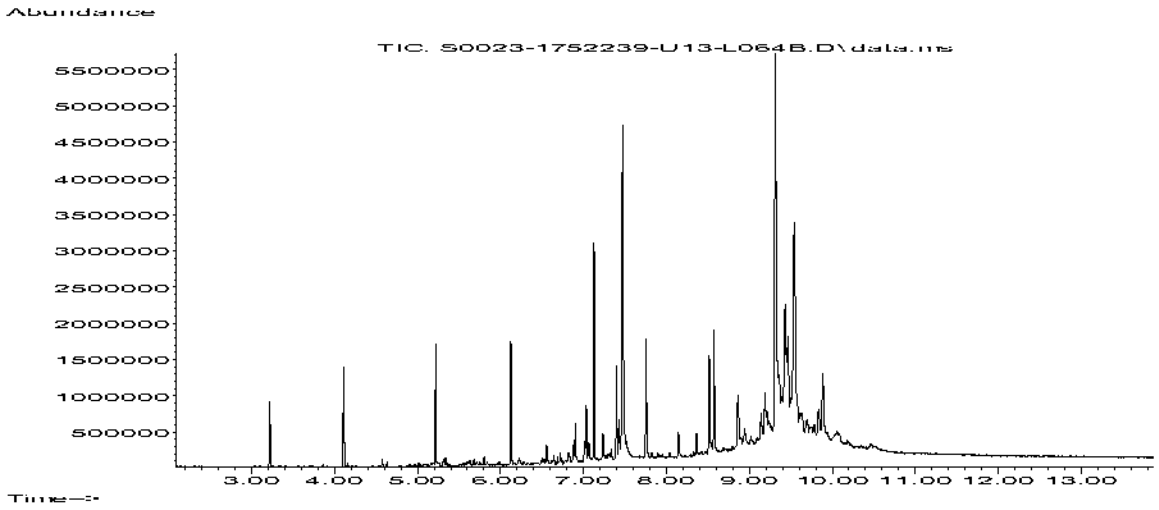
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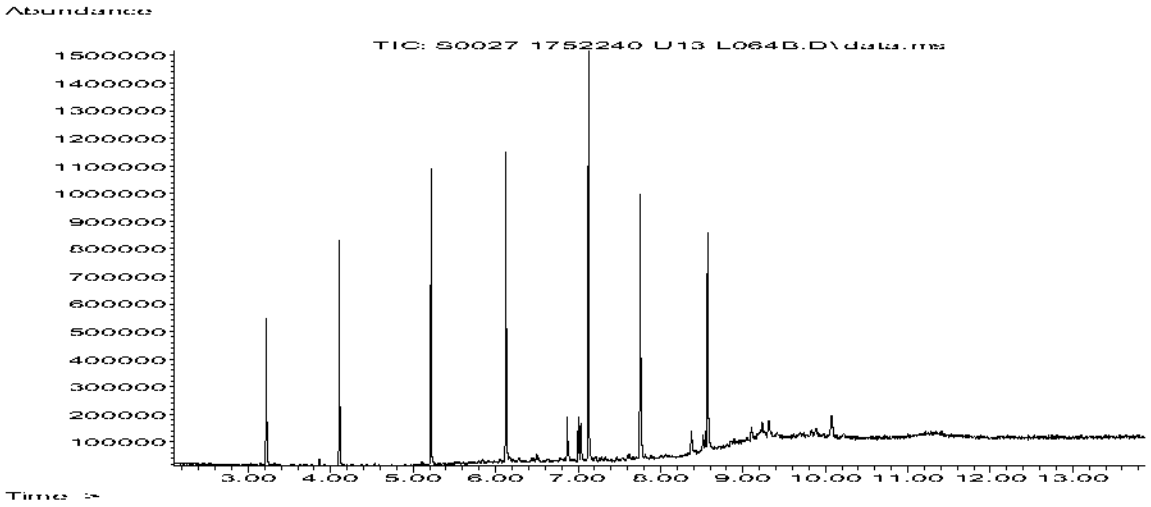
Time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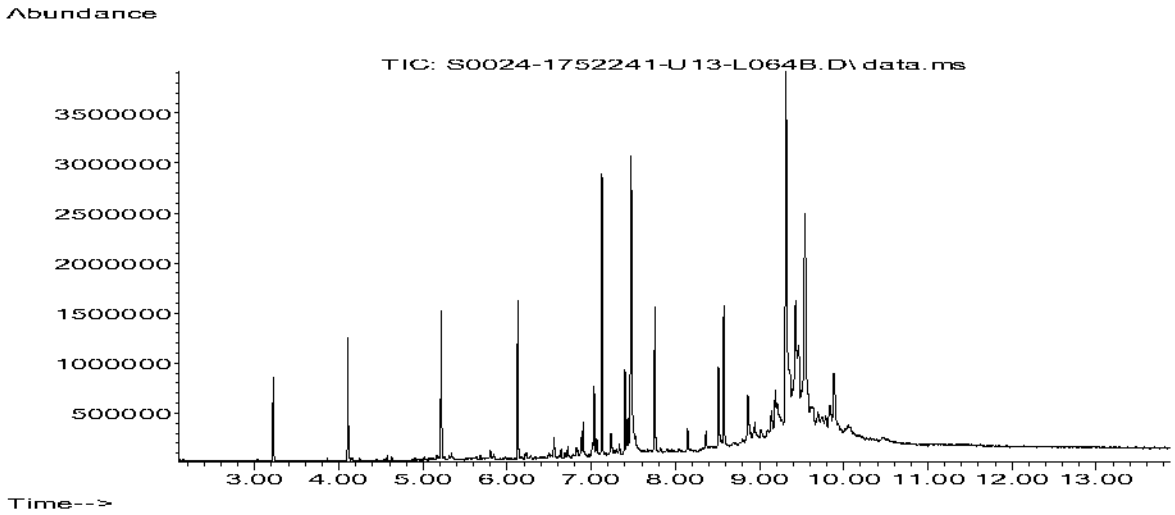
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Time-->

Sample Deviation Report

Analytical Report Number : 21-53799
Project / Site name: Deepcut

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
P172-TS	1	S	1752241	c	Free cyanide in soil	L080-PL	c
P172-TS	1	S	1752241	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
P172-TS	1	S	1752241	c	TPH in (Soil)	L076-PL	c
P174-SS	1	S	1752240	c	Free cyanide in soil	L080-PL	c
P174-SS	1	S	1752240	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
P174-SS	1	S	1752240	c	TPH in (Soil)	L076-PL	c
P176-SS	1	S	1752238	c	Free cyanide in soil	L080-PL	c
P176-SS	1	S	1752238	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
P176-SS	1	S	1752238	c	TPH in (Soil)	L076-PL	c
POS-TS	1	S	1752239	c	Free cyanide in soil	L080-PL	c
POS-TS	1	S	1752239	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
POS-TS	1	S	1752239	c	TPH in (Soil)	L076-PL	c

Key: **a** - No sampling date **b** - Incorrect container
c - Holding time **d** - Headspace **e** - Temperature

Appendix D

Soil Assessment Tables

Assessment of Chemicals of Potential Concern to Human Health

Hydrock

							Soil Type	TS	TS
	All values in mg/kg unless otherwise stated						Location & Depth	POS-TS	P172-TS
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**		**0.1m**	**0.1m**
Arsenic	1	2	5.3	5.4	0	37		5.3	5.4
Beryllium	0.06	2	0.23	0.24	0	73		0.24	0.23
Boron	0.2	2	2.7	3	0	300		2.7	3
Cadmium	0.2	2	0.2	0.2	0	14		0.2	0.2
Chromium (III)	1	2	8.1	9.5	0	890		9.5	8.1
Chromium (VI)	1.2	2	1.2	1.2	0	6.1		1.2	1.2
Copper	1	2	12	13	0	2500		13	12
Lead	2	2	18	22	0	200		22	18
Mercury, inorganic	0.3	2	0.3	0.3	0	170		0.3	0.3
Nickel	2	2	3.8	4.3	0	130		4.3	3.8
Selenium	1	2	1	1	0	360		1	1
Vanadium	1	2	11	11	0	410		11	11
Zinc	2	2	41	46	0	3900		46	41
Cyanide (free)	1	2	1	1	0	790		1	1
Phenol (total)	1	2	1	1	0	560		1	1
Acenaphthene	0.05	2	0.05	0.05	0	520		0.05	0.05
Acenaphthylene	0.05	2	0.05	0.05	0	430		0.05	0.05
Anthracene	0.05	2	0.05	0.05	0	5500		0.05	0.05
Benz(a)anthracene	0.05	2	0.05	0.05	0	6.7		0.05	0.05
Benzo(a)pyrene	0.05	2	0.05	0.05	0	1.5		0.05	0.05
Benzo(b)fluoranthene	0.05	2	0.05	0.05	0	9.4		0.05	0.05
Benzo(ghi)perylene	0.05	2	0.05	0.05	0	69		0.05	0.05
Benzo(k)fluoranthene	0.05	2	0.05	0.05	0	14		0.05	0.05
Chrysene	0.05	2	0.05	0.05	0	11		0.05	0.05
Dibenz(a,h)anthracene	0.05	2	0.05	0.05	0	1.3		0.05	0.05
Fluoranthene	0.05	2	0.05	0.05	0	560		0.05	0.05
Fluorene	0.05	2	0.05	0.05	0	410		0.05	0.05
Indeno(1,2,3,cd)pyrene	0.05	2	0.05	0.05	0	5.5		0.05	0.05
Naphthalene	0.05	2	0.05	0.05	0	5.2		0.05	0.05
Phenanthrene	0.05	2	0.05	0.05	0	220		0.05	0.05
Pyrene	0.05	2	0.05	0.05	0	1200		0.05	0.05
Asbestos identified	Y/N							N	N
FOC (dimensionless)	0.028	**(mean)**						0.03	0.026
SOM (calculated)	4.83%	**(mean)**						5.17%	4.48%
pH (su)	8.4	**(mean)**						8.4	8.3

Risk parameter: Human health - residential with plant uptake (2.5%SOM)
Data set: Topsoil
Client: CALA Homes Ltd
Site: Deepcut - Parcel M2
Job no.: C02035
Lab. report no(s).: 21-53799

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).
MG denotes Made Ground
NAT denotes natural ground

Assessment of Chemicals of Potential Concern to Human Health

Hydrock

							Soil Type	SS	SS	SS	SS
	All values in mg/kg unless otherwise stated						Location & Depth	P172-SS-0.2	POS-SS-0.2	P176-SS	P174-SS
								0.2m	0.2m	0.2m	0.2m
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**					
Arsenic	1	3	6.4	7	0	37		7	6.4	6.4	6.6
Beryllium	0.06	3	0.3	0.48	0	73		0.48	0.4	0.3	0.37
Boron	0.2	3	0.4	1.8	0	300		0.4	0.4	0.8	1.8
Cadmium	0.2	3	0.2	0.2	0	14		0.2	0.2	0.2	0.2
Chromium (III)	1	3	12	19	0	890		19	16	12	13
Chromium (VI)	1.2	3	1.2	1.2	0	6.1		1.2	1.2	1.2	1.2
Copper	1	3	8	17	0	2500		17	11	8	8.2
Lead	2	3	14	26	0	200		14	15	26	26
Mercury, inorganic	0.3	3	0.3	0.3	0	170		0.3	0.3	0.3	0.3
Nickel	2	3	5.8	6.6	0	130		6.3	5.4	5.8	6.6
Selenium	1	3	1	1	0	360		1	1	1	1
Vanadium	1	3	19	31	0	410		31	27	19	22
Zinc	2	3	46	50	0	3900		50	35	46	50
Cyanide (free)	1	3	1	1	0	790		1	1	1	1
Phenol (total)	1	3	1	1	0	290		1	1	1	1
Acenaphthene	0.05	3	0.05	0.05	0	220		0.05	0.05	0.05	0.05
Acenaphthylene	0.05	3	0.05	0.05	0	180		0.05	0.05	0.05	0.05
Anthracene	0.05	3	0.05	0.05	0	2400		0.05	0.05	0.05	0.05
Benz(a)anthracene	0.05	3	0.05	0.44	0	4.2		0.05	0.05	0.29	0.44
Benzo(a)pyrene	0.05	3	0.05	0.45	0	1.5		0.05	0.05	0.05	0.45
Benzo(b)fluoranthene	0.05	3	0.05	0.56	0	7.6		0.05	0.05	0.05	0.56
Benzo(ghi)perylene	0.05	3	0.05	0.27	0	64		0.05	0.05	0.05	0.27
Benzo(k)fluoranthene	0.05	3	0.05	0.22	0	12		0.05	0.05	0.05	0.22
Chrysene	0.05	3	0.05	0.34	0	7.7		0.05	0.05	0.24	0.34
Dibenz(a,h)anthracene	0.05	3	0.05	0.05	0	1.1		0.05	0.05	0.05	0.05
Fluoranthene	0.05	3	0.05	0.75	0	290		0.05	0.05	0.53	0.75
Fluorene	0.05	3	0.05	0.05	0	170		0.05	0.05	0.05	0.05
Indeno(1,2,3,cd)pyrene	0.05	3	0.05	0.25	0	4.3		0.05	0.05	0.05	0.25
Naphthalene	0.05	3	0.05	0.05	0	2.2		0.05	0.05	0.05	0.05
Phenanthrene	0.05	3	0.05	0.35	0	97		0.05	0.05	0.25	0.35
Pyrene	0.05	3	0.05	0.72	0	620		0.05	0.05	0.6	0.72
Asbestos identified	Y/N							N	N	N	N
FOC (dimensionless)	0.004675	**(mean)**						0.0024	0.0029	0.0067	0.0067
SOM (calculated)	0.81%	**(mean)**						0.41%	0.50%	1.16%	1.16%
pH (su)	8.7	**(mean)**						10	8.4	8.3	8

Risk parameter: Human health - residential with plant uptake (1%SOM)
Data set: Subsoils
Client: CALA Homes Ltd
Site: Deepcut - Parcel M2
Job no.: C02035
Lab. report no(s).: 21-50054 21-53799

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).
MG denotes Made Ground
NAT denotes natural ground

Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

							Soil Type	TS	TS
	All values in mg/kg unless otherwise stated						Location & Depth	POS-TS	P172-TS
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**		**0.1m**	**0.1m**
Arsenic	1	2	5.3	5.4	0	250		5.3	5.4
Boron	0.2	2	2.7	3	1	3		2.7	3
Chromium (III)	1	2	8.1	9.5	0	400		9.5	8.1
Chromium (VI)	1.2	2	1.2	1.2	0	25		1.2	1.2
Copper	1	2	12	13	0	200		13	12
Nickel	2	2	3.8	4.3	0	110		4.3	3.8
Zinc	2	2	41	46	0	300		46	41
	Mean								
pH (su)	8.4							8.4	8.3

Risk parameter: Plant life pH >7
Data set: Topsoil
Client: CALA Homes Ltd
Site: Deepcut - Parcel M2
Job no.: C02035
Lab. report no(s).: 21-53799

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).
MG denotes Made Ground
NAT denotes natural ground

Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

							Soil Type	SS	SS	SS	SS
	All values in mg/kg unless otherwise stated						Location & Depth	P172-SS-0.2	POS-SS-0.2	P176-SS	P174-SS
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**		**0.2m**	**0.2m**	**0.2m**	**0.2m**
Arsenic	1	3	6.4	7	0	250		7	6.4	6.4	6.6
Boron	0.2	3	0.4	1.8	0	3		0.4	0.4	0.8	1.8
Chromium (III)	1	3	12	19	0	400		19	16	12	13
Chromium (VI)	1.2	3	1.2	1.2	0	25		1.2	1.2	1.2	1.2
Copper	1	3	8	17	0	200		17	11	8	8.2
Nickel	2	3	5.8	6.6	0	110		6.3	5.4	5.8	6.6
Zinc	2	3	46	50	0	300		50	35	46	50
	Mean										
pH (su)	8.7							10	8.4	8.3	8

Risk parameter: Plant life pH >7
Data set: Subsoils
Client: CALA Homes Ltd
Site: Deepcut - Parcel M2
Job no.: C02035
Lab. report no(s).: 21-50054 21-53799

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).
MG denotes Made Ground
NAT denotes natural ground

Appendix E

Houlihan & Co. Method Statement

17.0	Methodology: Substructure to Building	Foundation Excavations: **Strip footings** • Carry out CAT scan of the area. • Identify the extent of the individual plots foundation by marking out with spray paint. • The control of the reduced level dig will be carried out using a horizontal laser level. • Excavate the foundation to the designed formation level, using a tracked 360⁰ excavator. Strip footings: Steel mesh reinforcement is required in the top & bottom of the footings; bottom layer of mesh, with chairs attached will be lowered from ground level by looping rope around the mesh and lowering it down, the rope can be withdrawn once the mesh has been placed avoiding man entry. The personnel involved in lowering in the mesh will stand on MGF trench crossing platforms placed to avoid lsurcharging the edge of the excavation and avoiding standing at the edge of the ends of the excavation where the trench is deeper than 1.2m.. The top layer of mesh can be carefully placed from ground level by hand and pressed in to achieve 50mm cover via a rake. • Offer excavation for inspection & approval. • Bank concrete delivery lorries to a safe distance from the excavation and place concrete by either discharging directly from the lorry (using 3 chutes) or by discharging into the excavator bucket and placing by machine. • Brickwork and blockwork footings will then be carried out as required to the standards and requirements contained within the contract drawings, specifications and supplier's recommendations. **Beam & Block Floors :** • Once all the services have been installed, the internal course of blockwork will be built to the underside of the beam and block floors. • Once the blockwork has cured, the precast concrete beams will be lifted into position with the 360 Tracked Excavators. • Beams will be located and slung into position in preparation for the placement of the infill blockwork. • Design attached along with installation guidelines.

18.0	Methodology: Domestic Drainage	Excavations are generally at or below 1.2m.b.g.l. and typically 100mmØ – 150mmØ plastic pipe runs are typically described below: • Set out the extent of the run/s, ideally commencing from the terminal connection or lowest point. • Conduct existing survey investigations as previously described. • Identify access, movement and storage areas and erect safety exclusion fencing to enclose the works. • Place shingle bedding using the excavator bucket or by a site dumper being banked to the point of discharge. Note that during the placement of any material to trenches that all operatives will evacuate the excavation. • Manually place pipes of 150∅ or below and align using either a string line or pipe laser, as appropriate. • Test the section prior to placing shingle protection as noted above. • Backfill in the appropriate layers using excavated material and compacting with a trench or standard vibrating plate compactor. • Manhole excavations will be conducted and either supported via a propitiatory manhole box or stepped/battered sufficiently; the non-man entry chamber sections placed by a qualified general construction worker. • On completion, the run will be marked on the as-built record drawing together with dates of test & inspections.

19.0	Methodology: External Work Slabs/Block Paving Topsoil	**PCC Slabs & Block paviour areas** • Set out Positions of Slabs& blocks to be laid. Set out any grid lines for the control of Paving Line and Level. • Protection: If working adjacent to the finished units, fix Plywood protection to any finished facias, seek advice from site manager. • Care to be taken to protect the slabs and edgings already placed prior to works commencing. • Works area to have all debris, grass, topsoil removed and stripped down to formation. • Stone will then be imported and compacted as per designed drawings (sub- base depth to be confirmed). • Screed rails shall then be set to the correct level to allow sand layer. • Lay the slabs & block paving by Hand onto the sand layer. • All materials to be stacked at 2 m away from the leading edge to ensure that the paving is not pushed down at the leading edge. Where paviour blocks are to be used they are to be laid on bedding layer type 2/6.3 • Once the paving has been laid, the area will be offered for inspection prior to sanding. • Sand area and hand over. • Remove all barriers and proceed to the next work area. **Back/front gardens landscape topsoil finish** • Works for placing subsoil and topsoil on the back gardens must take place before the fences have been installed to the houses, to have clear access for excavator and dumper. • Levels will be check and made sure the area in back garden or area for landscape is at least 600mm below finish level. • Hydrock will be checking the formation prior subsoil placement. It will be to their discretion if there will be used a separation membrane. If need will be placing a membrane before start placing subsoil. Membrane will be overlapping at least 300mm. • Hydrock will be carrying out watch and brief during all the process of placing subsoil and topsoil on the back gardens. It will start from the

		moment loading the dumpers from the spoil heaps, emptying them and while it is being placed on back gardens. • Subsoil we will be loaded and placed on small amounts to the guidance of the Hydrock. It will be placed on layers and raked for the Hydrock representative to have a clear view. • Once the area is finished with subsoil it will be ready to place the topsoil. • **Topsoil for the other plots will be imported on site.** • Topsoil will be brought again using a dumper. • Excavator will start again in the far corner and work its way towards access point. • Topsoil will be placed and levelled by an excavator at height of 150mm to the required finish level. • Then an operative will make good at uniform finish level using a rake. • **For the other plots we will be using subsoil stripped from M1 and placed on spoil heap on M2. This subsoil will be screened and will be place by watch and brief from Hydrock, Watch and brief will take place to eliminate presence of glasses and sharps from subsoil.**
20.0	Methodology: Works on / near Underground Services	• Pre-tender information and Construction Phase Plan will be used and considered in light of additional information from utilities' plan drawings, section drawings from utility companies recording depth of services and commissioned ground probing radar surveys as necessary. A full survey of the perimeter has been recommended in the Cala PCI ("It is imperative a full survey around the entire site and its perimeter for underground and overhead services is carried out prior to the start of any ground penetration works.") but this has not been seen. • Any on-site service disconnections should be confirmed by Cala prior to the commencement of construction. It is not clear if the proposed disconnections to the cottages have taken place. We will assume they have not happened until we can see proof otherwise. • The only drawings provided are for gas and water. The PCI notes "There is also an existing MOD foul rising main that crosses parcel M2, this will require diversion by Skanska prior to commencement within that parcel." We are unaware if this has happened. "The development is within the area served by Scottish and Southern Energy (SSE), and there are SSE services present both in the vicinity of the site, and within the site itself. Below ground 11kV cables are present to the south of the site, just outside the site boundary." PCI • The assumption that live working can be avoided as the default position is set out above and a full justification of any live working must be set out before this is considered. A method statement for live working will be required as live working is not considered to be properly controlled by any permit to work system. HSG47, rev. Feb.2014, states "Where new services such as electrical or gas supplies are being installed, it may be possible to reduce risks by not installing or commissioning them until other groundworks and work on the installation have been completed. This should be considered early in the design process to allow the works to be sequenced accordingly." • A cable avoidance tool in conjunction with a transmitter will be used by a competent person, prior to the commencement and during any work, to identify all services and ducts. The intention will be to bring up to date records of existing services and to supplement these records where they are deficient. Services found will be clearly identified to avoid the risk of damage and where necessary, we will hand dig around them to expose the services prior to full excavation. Hand digging will require the use of air picks to expose services, starting immediately under the hard cover. Record drawings will be red-lined to show the most up to date information, held available on site for consultation and details communicated at inductions, tool box talks and in careful briefing on site prior to excavation. • As each service is exposed, it will be photographed and sketched with off sets noted to inform future re-visits. • Back fill will be with self-compacting granular material to a level where compaction is acceptable and then in suitable material, including selected as dug, which must be possible to excavate with the air pick in future: i.e. dense cohesive material like clay must NOT be used. If suitable backfill material as described is not available, the excavation should not proceed. • Warning tape will always be placed, and if it has not been provided by the utility, we will have rolls to use. If physical protection is specified, then the backfill will not be completed until the protection is in place. • Great care will be taken to establish what is meant by "terminations" or "diversions" and any assertion that there are "no" services will be treated with caution. • Techniques using ground penetrating radar will be considered where information is clearly deficient, and services are congested. • We will comply with the Principal Contractor's Permit to Dig system.

21.0	Methodology: Spoil Heaps	There will be a need to stockpile separately different categories of material whether it eventually goes to landfill or can be recycled or re-used. • Stockpiles will be constructed using dumpers climbing 1:5 / 20° ramps twice as wide as the dumper wheel spread (minimum 6tonne dumper) • The dumper will tip material until an excavator is required to grade off the sides to a compacted batter throwing off rainwater, and dressing the top likewise. • Dumpers must not tip on-top of a uneven heap all tipping operations must be undertaken on level firm ground. • The sides and end of the spoil heap must be bunded (at least 1.0m(H)1.0m(W)) • The stockpile will be monitored for slippage and damped down if any dust becomes airborne. • The angle of repose will be estimated for different materials, with 45° an accepted average unless there is evidence of slippage. • Stockpiles of topsoil will be no higher than 2.0m as this would prevent aerobic action in the heap and render the topsoil sterile. • Notify the H&S department to arrange inspection within 24 hours of the formed spoil heap. **Standard detail below:**

Appendix F

Imported Soil Certifications

Certificate of Analysis

Client: LITTLE BUSHYWARREN
(J118) COMPOSTING SITE
VEOLIA ENVIRONMENTAL SERV
LITTLE BUSHYWARREN COPSE
HERRIARD
BASINGSTOKE RG25 2NS

Originator: STEVE PRITCHARD
SOIL

Lab ID: 13218 - 482674
Sample ID: 60 40 V
Sample Weight: 2669g

Date Received: 30/06/2020
Date Reported: 06/07/2020

BS 3882 : 2015 SPECIFICATION FOR TOPSOIL
Multipurpose Grade

		Unit	Result		Compliant with range (Y/N) Multi-P	Acid	Calc	Low-F	Low-F Acid	Low-F Calc
Texture:	Clay	% w/w	11							
	Silt	% w/w	4			*See area of permitted soil textural classes in Fig. 1.*				
	Sand	% w/w	85							
	Textural Class		Loamy Sand		Y	Y	Y	Y	Y	Y
Organic Matter:		% w/w	6.0		Y	Y	Y	Y	Y	Y
Coarse	>2 mm	% w/w	0.1		Y	Y	Y	Y	Y	Y
Fragment	>20 mm	% w/w	0.0		Y	Y	Y	Y	Y	Y
Content:	>50 mm	% w/w	0.0		Y	Y	Y	Y	Y	Y
Soil pH:			7.9		Y	N	Y	Y	N	Y
Carbonate:		% w/w	<1				N			N
Available	Nitrogen	% w/w	0.235		Y	Y	Y			
Plant	Phosphorus	mg/l	44.2	(3)*	Y	Y	Y	N	N	N
Nutrients:	Potassium	mg/l	815.8	(5)*	Y	Y	Y			
	Magnesium	mg/l	148.6	(3)*	Y	Y	Y			
Carbon:Nitrogen Ratio:		:1	14.8		Y	Y	Y	Y	Y	Y
Exchangeable Sodium Percentage:		%	3.3							
Phytotoxic	Total Zinc	mg/kg	40.0		Y	Y	Y	Y	Y	Y
Contaminants:	Total Copper	mg/kg	9.5		Y	Y	Y	Y	Y	Y
	Total Nickel	mg/kg	<10		Y	Y	Y	Y	Y	Y
Visible	> 2mm	% w/w	0.00		Y	Y	Y	Y	Y	Y
Contaminants:	Plastics	% w/w	0.00		Y	Y	Y	Y	Y	Y
	Number of Sharps		0		Y	Y	Y	Y	Y	Y
Additional	Available Sodium	mg/l	66.5							
Analysis:	Available Calcium	mg/l	1020.0							
	Conductivity	uS/cm	2561		Y					
Compliancy:					**Y**	**N**	**N**	**N**	**N**	**N**

Results are expressed on a dry matter basis.
* Soil indices from RB209

Released by: *Darren Whitbread* **Date: 06/07/2020**

DECLARATION: I certify that this sample has been analysed by NRM in accordance with BS 3882 Specification for Topsoil (2015).

NRM Coopers Bridge, Braziers Lane, Bracknell, Berkshire RG42 6NS
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Analytical Report

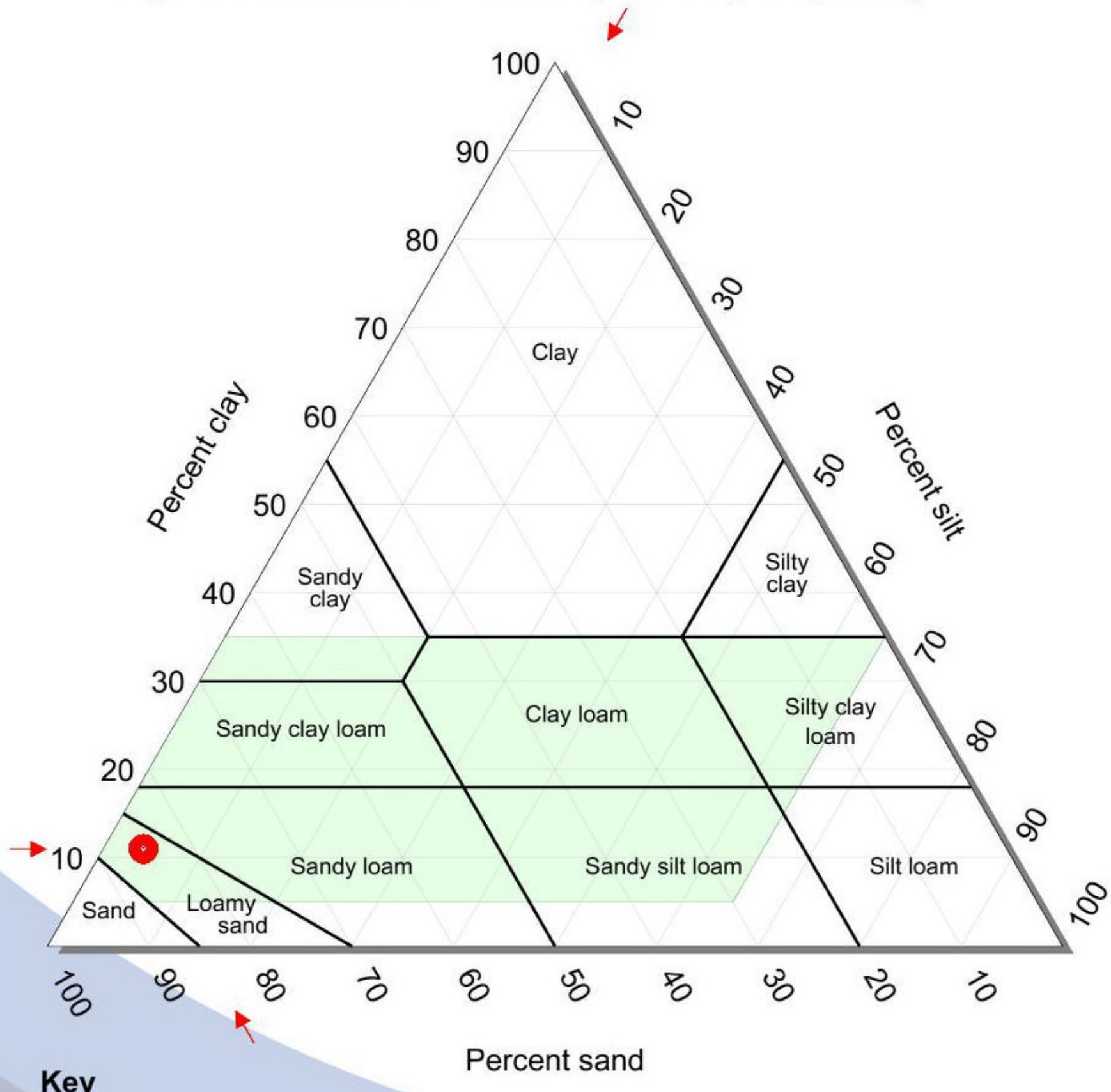
Client: LITTLE BUSHYWARREN
(J118) COMPOSTING SITE
VEOLIA ENVIRONMENTAL SERV
LITTLE BUSHYWARREN COPSE
HERRIARD
BASINGSTOKE RG25 2NS

Originator: STEVE PRITCHARD
SOIL

Lab ID: 13218 - 482674
Sample ID: 60 40 V
Sample Weight: 2669g

Date Received: 30/06/2020
Date Reported: 06/07/2020

Fig. 1. Textural Class: Loamy Sand (compliant)



Key

Area within which texture of topsoil is required to fall.

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