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Our Ref: 27621 L46 (00) / MG

13th May 2019

CALA Homes (South Home Counties) Limited
Tilford House
Farnham Business Park
Weydon Lane
Farnham
Surrey
GU9 8QT

FAO: Mr Gary Biggs

RE: Former West End Nursery, Angmering - Validation Plots 312 to 315

Dear Gary,

1. BACKGROUND

RSK Environment Limited (RSK) was commissioned by CALA Homes (South Home Counties) Limited (CALA) to carry out garden validation testing of Plots 312 to 315 of the former West End Nursery site off Roundstone Lane, Angmering, BN16 4AX. The plots are located within the Phase 2A development area. The development boundary for Phase 2A is presented on **Figure 1**. The site was previously occupied by a commercial nursery.

Several phases of site investigation, risk assessments, remedial strategies and post remediation verification reports (Phase 1A, Phase 1B and Phase 2A) have been completed for the former West End Nursery site by RSK. The following reports contain information relevant to the Phase 2A development area:

- RSK, 2015a. Geo-environmental site investigation, report ref: 27621 R01 (02), May 2016;
- RSK, 2015b. Additional geo-environmental site investigation and remediation, report ref: 27621 R02 (00), June 2015;
- RSK, 2016a. Remedial Strategy, report ref: 27621 R03 (02), August 2017 (previous issue 01 dated January 2016);
- RSK, 2016b. Supplementary geo-environmental site assessment, report ref: 27621 R04 (01), June 2016;
- RSK 2016c. Tank validation, report ref: 27621 L01/ad, August 2016;
- RSK 2017c. Downgrading of ground gas regime, report ref: 27621-L19-dbj, November 2017;
- RSK 2018a. Supplementary site investigation and remedial strategy – South east landscaped area, report ref. 27621 R08 (00), January 2018; and
- RSK, 2019. Post-remediation validation report – Phase 2A, report ref: 27621 R10 (00), February 2019.

A number of impacted areas were found previously across the site including elevated concentrations of pesticides (one location), hydrocarbons, asbestos and metals.



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A first phase of remediation was undertaken at the site by Keltbray in accordance with recommendations contained within the approved remedial strategy for the site (RSK report ref: 27621 R03 (02), August 2017). The remedial works undertaken by Keltbray were documented in the Keltbray Completion Report, ref: 6033.CR.LH.08072016V3, dated August 2016.

Throughout the Keltbray remedial works RSK attended site on an ad hoc basis to verify the works carried out. Validation works completed by RSK are detailed within the post-remediation validation report produced for Phase 2A, report ref: 27621 R10 (00), dated February 2019.

It is noted since development works commenced at the site, that RSK have collected a significant amount of additional data pertaining to ground gas risk assessment. A letter report issued on 20th November 2017 by RSK, reference 27621-L19-dbj was compiled reviewing this data. In summary, the report recommended that following on from an extended period of sub floor void monitoring that the gas regime at the site could be downgraded from Amber 1/CS2 to Green/CS1. The downgrading of the gas regime means that no gas protection measures or verification by RSK are now required. This conclusion was approved by Arun District Council by email on 21st November 2017 and by the NHBC by email on 4th December 2017. Copies of these emails can be made available on request.

Based upon the remedial works carried out to date within Phase 2A, it is considered that the area is suitable for the proposed residential end use subject to the garden/soft landscaping verification works being completed. Validation of the topsoil and subsoil is ongoing, with RSK inspecting the completed gardens/soft landscaping for the presence of geo-membrane where applicable and cover layer thickness of subsoil and topsoil.

2. CAPPING LAYER REMEDIAL REQUIREMENTS

On the basis of the impacts previously identified at the site, it was recommended that a capping layer be incorporated into private garden areas to minimise risk to human health from any impacted soils. The specification for the capping layer, agreed with Arun District Council is as follows:

The capping layer in areas of identified impact (remaining bund materials, pesticide hotspot and made ground containing asbestos) and in the central and south eastern landscaped areas should be 600 mm thick to include a minimum of 150 mm clean imported topsoil and 450 mm clean imported/site-won subsoil with a geo- marker membrane at the base, which will act as a physical break layer. In lower risk areas (i.e. no impacts identified during the previous phases of works) the capping layer should be 450 mm to include a minimum of 150 mm clean imported topsoil and 300 mm clean imported/site-won subsoil.

Validation of the capping layer should consist of the following:

- In private gardens, testing should be carried out on the basis of one sample for every 50 m³ area of garden; and
- In communal soft landscaping areas, testing should be carried out on the basis of one sample for every 250 m³ of soft landscaping.

Based upon the recommendations above, this letter report represents a verification of the appropriate implementation of capping layer construction at relevant plots within the completed development.

The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work, on the results of laboratory analysis on soil samples and on available information. All works undertaken at the site are in accordance with the RSK service constraints presented in **Appendix A**.

3. SITE INSPECTION

RSK attended site on 4th, 9th and 25th April and 3rd May 2019 to inspect and validate the capping layer (topsoil/subsoil) within the front and rear garden areas of Plots 312 to 315. Repeated visits were required due to the staggered installation of the capping layer across the gardens. Photographs from the site inspection works are presented in **Appendix B**.

One hand-excavated inspection pit was completed in each front and rear garden of Plots 312 to 315. In accordance with the remedial strategy specification, validation pits were hand-excavated to a minimum depth of 600 mm below the existing ground level, to allow for sampling of soils and the inspection of the underlying marker membrane. The inspection pit logs are presented in **Appendix C**.

The topsoil generally comprised at least 150 mm dark brown silty fine SAND. The topsoil was followed by at least 450 mm of subsoil. The subsoil comprised light brown slightly sandy gravelly CLAY, where gravel is subangular to subrounded fine to medium flint.

The depth of the capping layer within the front and rear gardens of Plots 312 to 315 was found to be at least 600 mm underlain by a geotextile marker layer. It is considered that this demonstrates compliance of the specified capping layer remedial measures.

A plan showing the capping layer requirements for Phase 2A is presented as **Figure 1**. The validation certificates for the imported topsoil are presented in **Appendix D**.

4. VERIFICATION TESTING

Soil samples were submitted for chemical laboratory testing comprising a standard suite of potential contaminants. Soil samples were submitted for the following suite of analysis:

- Selected heavy/semi/non-metals (including chromium VI);
- pH and sulphate;
- Speciated Total Petroleum Hydrocarbons (TPH)- with Criteria Working Group banding with Benzene, Toluene, Ethyl Benzene and Xylene (BTEX) and Methyl Tert Butyl Ether (MTBE) determination;
- Speciated Polycyclic Aromatic Hydrocarbons (PAH); and
- Asbestos screen.

A summary of the capping layer volumes is presented in **Table 1**.

Table 1: Summary of capping layer volumes

Plot Number	Combined topsoil/subsoil volume - front and rear (m ³)	Samples Tested	Material tested (Topsoil/Subsoil)
312	49.06	1	Subsoil
313	50.81	2	Topsoil + Subsoil
314	23.04	1	Subsoil
315	53.21	2	Subsoil

A total of 4 No. validation samples were collected from Plots 312 to 315 in accordance with the remedial requirements for Phase 2A. Based upon the testing strategy of 1 sample per 50 m³ it is considered that an appropriate number of samples have been obtained. The chemical results are presented in **Appendix E** and indicate that concentrations of analytes are below the RSK GAC presented in **Appendix F**.

5. CONCLUSIONS

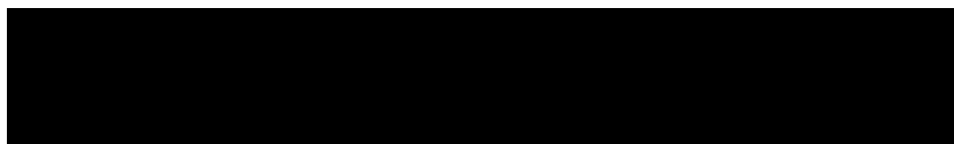
The results of the site inspection and laboratory testing have demonstrated that the topsoil and subsoil are chemically suitable for the proposed residential end-use and the capping layer has been completed to the required specification, comprising at least 600 mm underlain by a geotextile marker in Plots 312 to 315. It is therefore considered that no further verification of the private garden areas of these plots is required.

It is considered that the inspection data for the garden areas are sufficient and that this letter report may be submitted to the NHBC, so that the appropriate land quality condition can be discharged based on the information provided.

We trust that the information discussed above is acceptable and recommend this report be submitted to the NHBC and Local Authority accordingly. Should you require RSK to submit this information on your behalf, please do not hesitate to contact us.

Yours sincerely,

For RSK Environment Limited



Marc Grenow

Graduate Geo-environmental Engineer

Cathy Cussell

Principal Geo-environmental Consultant

Enc.

Figure 1 Capping layer requirements (Plots 308-325)

Appendix A Service Constraints

Appendix B Photographic Log

Appendix C Hand pit logs

Appendix D Topsoil Validation Certificates

Appendix E Laboratory Certificates

Appendix F RSK Generic Assessment Criteria

FIGURES

LEGEND

- Phase 2A Boundary
- 600mm Capping Layer Required

Rev.	Date	Amendment	Drawn	Chkd.	Appd.



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Client
CALA HOMES (SOUTH HOME COUNTIES) LTD

Project Title
**FORMER WEST END NURSERY,
ANGMERING**

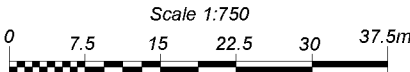
Drawing Title
**CAPPING LAYER REQUIRMENTS
(PLOTS 308-325)**

Drawn	Date	Checked	Date	Approved	Date
ASC	04.10.18	EH	04.10.18	CML	04.10.18

Scale	Orig Size	Dimensions
1:750	A3	m

Project No.	Drawing File
27621	27621 Fig 2A

Drawing No.	Rev.
FIGURE 2A	P1



Plot Number	Front Garden		Back Garden	
	Area of Soft landscaping (m2)	Volume of Soft landscaping (m ³)	Area of Soft landscaping (m ²)	Volume of Soft landscaping (m ³)
308	22.7518	13.6511	131.3669	78.8201
309	16.3929	9.8357	25.4853	15.2912
310	13.4505	8.0703	69.2950	41.5770
311	12.9150	7.7490	69.2950	41.5770
312	12.4757	7.4854	69.2950	41.5770
313	13.3507	8.0104	71.3239	42.7943
314	13.2221	7.9333	25.1793	15.1076
315	56.3563	33.8138	32.3182	19.3909
316	7.4318	4.4591	86.8361	52.1017
317	6.6758	4.0055	34.0508	20.4305
318	6.6441	3.9865	35.5869	21.3521
319	28.8537	17.3122	28.9532	17.3719
320	12.9314	7.7588	31.2788	18.7673
321	6.6443	3.9866	28.4107	17.0464
322	6.6443	3.9866	32.7652	19.6591
323	7.4044	4.4426	34.5200	20.7120
324	142.2873	85.3724	123.1772	73.9063
325	126.8948	76.1369	101.9089	61.1453

APPENDIX A

SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Cala Homes (Southern Counties) (the "client") in accordance with the terms of a contract [RSK Group Standard Terms and Conditions] between RSK and the "client". The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.
2. Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials, unless specifically identified in the Services.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of information, including documentation, obtained from third parties and from the client on the history and usage of the site, unless specifically identified in the Services or accreditation system (such as UKAS ISO 17020:2012 clause 7.1.6):
 - a. the Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely
 - b. the Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection
 - c. the Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing



of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.

8. The intrusive environmental site investigation aspects of the Services is a limited sampling of the site at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on-site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information,] and it should not be inferred that other chemical species are not present.
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on-site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.

APPENDIX B

PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG

Site Location: Land at West End Nursery, Angmering

Photo No.
1

Date:
25/04/2019

Overview of
Plot 312 front
gardens



Photo No.
2

Date:
25/04/2019

View of hand
dug pit in
Plot 312 front
gardens,
capping layer
observed to
be 600 mm
thick.



PHOTOGRAPHIC LOG

Site Location: Land at West End Nursery, Angmering

Photo No.
3

Date:
25/04/2019

View of the capping in Plot 312 front garden – at least 600 mm thick with marker membrane underneath



Photo No.
4

Date:
09/04/2019

Overview of Plot 312 rear garden



PHOTOGRAPHIC LOG

Site Location: Land at West End Nursery, Angmering

Photo No.
5

Date:
09/04/2019

View of hand dug pit in the rear garden of Plot 312, capping layer observed to be greater than 600 mm thick.



Photo No.
6

Date:
09/04/2019

View of the capping in Plot 312 rear garden – at least 600 mm thick with marker membrane underneath



PHOTOGRAPHIC LOG

Site Location: Land at West End Nursery, Angmering

Photo No.
7

Date:
25/04/2019

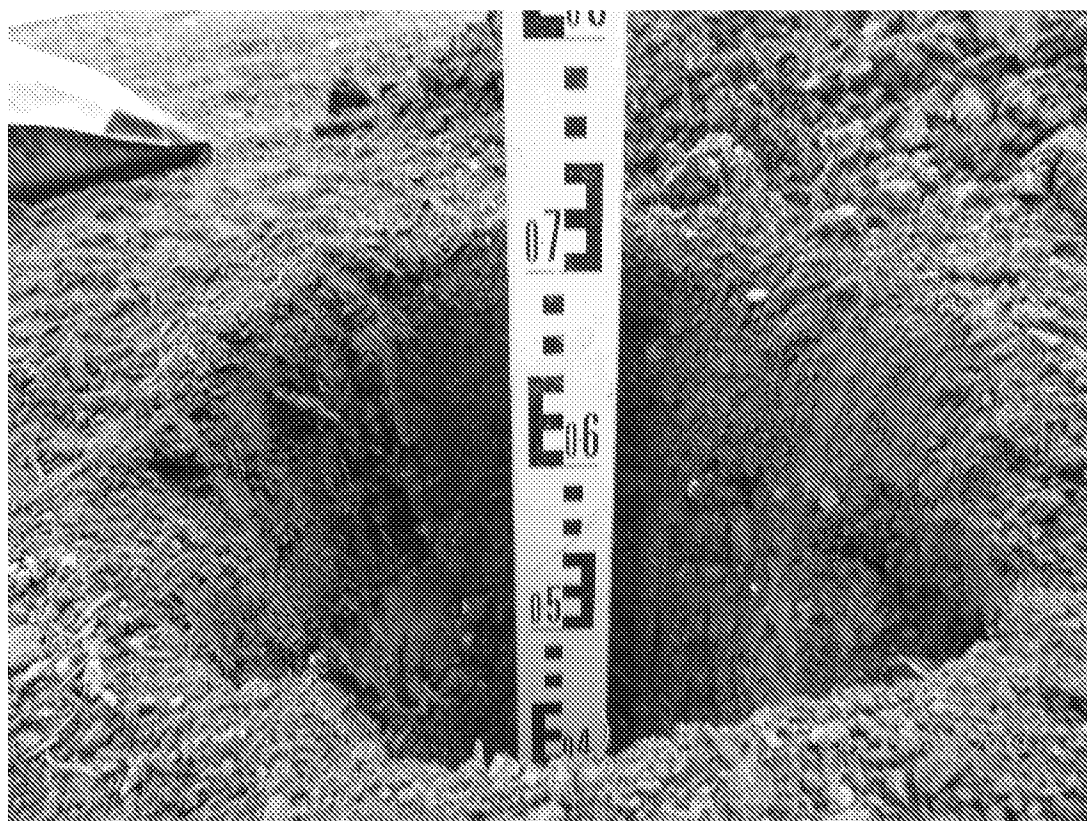
Overview of
Plot 313 front
garden



Photo No.
8

Date:
25/04/2019

View of hand
dug pit in
Plot 313 front
garden,
capping layer
observed to
be greater
than 600 mm
thick.



PHOTOGRAPHIC LOG

Site Location: Land at West End Nursery, Angmering

Photo No.
9

Date:
25/04/2019

View of the capping in Plot 313 front garden – at least 600 mm thick with marker membrane underneath

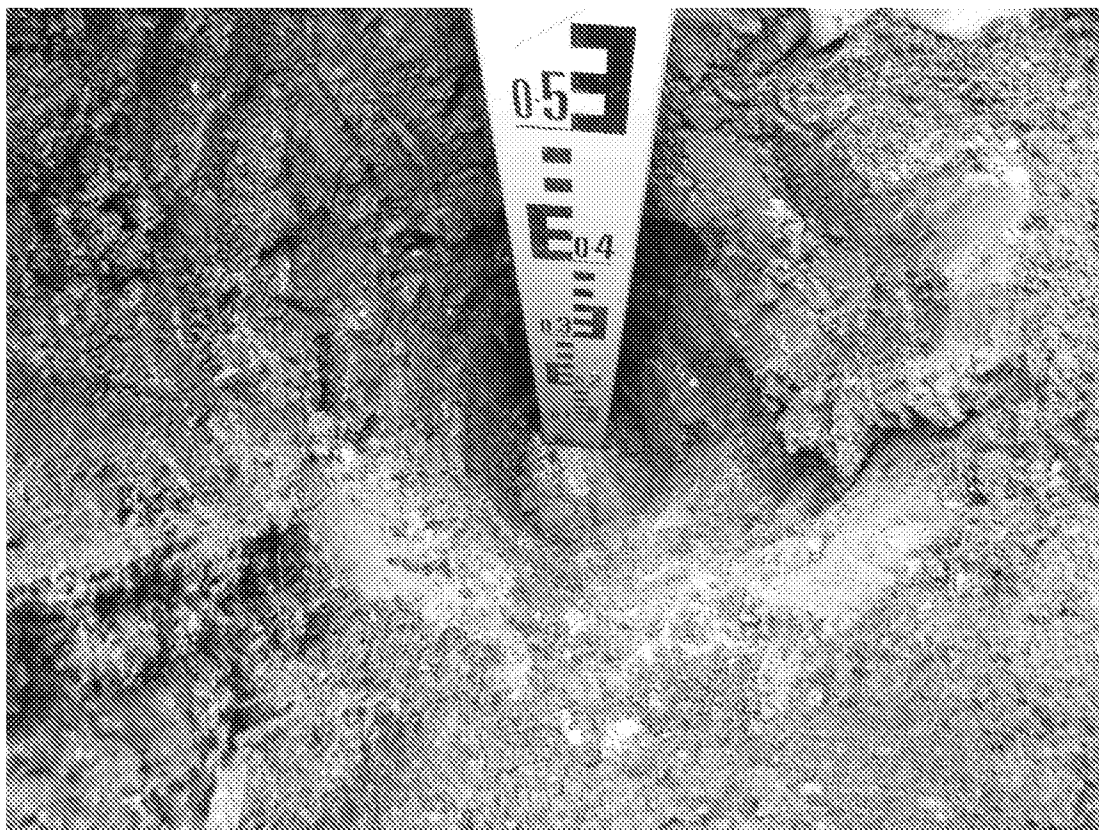


Photo No.
10

Date:
09/04/2019

Overview of Plot 313 rear garden



PHOTOGRAPHIC LOG

Site Location: Land at West End Nursery, Angmering

Photo No.
11

Date:
09/04/2019

View of hand dug pit in the rear garden of Plot 313, capping layer observed to be 600 mm thick.



Photo No.
12

Date:
09/04/2019

View of the capping in Plot 313 rear garden – at least 600 mm thick with marker membrane underneath

