



RSK Unit 26
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Purley
Surrey
GU8 1AA
UK

Our Ref: 27621 L63 (00) / EC

14th February 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 241 – 244 & 263 – 267

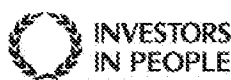
Dear Gary

1. BACKGROUND

RSK Environment Limited (RSK) was commissioned by CALA Homes (South Home Counties) Limited (CALA) to carry out garden validation testing of Plots 241 – 244 & 263 - 267 of the former West End Nursery site off Roundstone Lane, Angmering, BN16 4AX. The plot is located within the Phase 2B development area. The development boundary for Phase 2B 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, Phase 2A and Phase 2B) have been completed for the former West End Nursery site by RSK. The following reports contain information relevant to the Phase 2B development area:

- RSK, 2015a. Geo-environmental site investigation, report ref: 27621 R01 (02), May 2015;
- 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;



RSK Environment Ltd
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Registered in Scotland No. 116506
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- RSK, 2019. Post-remediation validation report – Phase 2A, report ref: 27621 R10 (00), February 2019; and
- RSK, 2019. Post remediation validation report - Phase 2B, report ref: 27621 R11 (00) May 2019.

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

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 2B, 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 2B, 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 21st November 2019, 14th January, 21st January, 28th January and 11th February 2020 to inspect and validate the capping layer (topsoil/subsoil) within the front and rear garden areas of Plots 241 – 244 & 263 - 267. 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 of the front and rear gardens of Plots 241 – 244 & 263 - 267. In accordance with the remedial strategy specification, validation pits were hand-excavated to a minimum depth of 450 mm below the existing ground level, to allow for sampling of soils. The inspection pit logs are presented in **Appendix C**.

The topsoil generally comprised at least 150 mm dark brown occasionally light brown slightly gravelly silty SAND with frequent organic matter, where gravel is subrounded fine to medium flint. The topsoil was followed by at least 300 mm of subsoil. The subsoil comprised orangish brown gravelly sandy CLAY, where sand is fine to coarse, and gravel is subangular to subrounded fine to coarse flint and chalk.

The depth of the capping layer within the front and rear gardens of Plots 241 – 244 & 263 - 267 was found to be at least 450 mm. It is considered that this demonstrates compliance of the specified capping layer remedial measures.

A plan showing the capping layer requirements for Phase 2B 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;
- 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 (m³)	Samples Tested	Material tested (Topsoil/Subsoil)
241	39.15	1	Subsoil
242	39.28	1	Subsoil
243	33.69	1	Subsoil
244	25.10	1	Subsoil
263	37.04	1	Subsoil
264	36.07	1	Subsoil
265	36.07	1	Subsoil
266	35.99	1	Subsoil
267	36.35	1	Subsoil

Nine validation samples were collected from Plots 241 – 244 & 263 - 267 in accordance with the remedial requirements for Phase 2B. Based upon the testing strategy of 1 sample per 50 m³ for private gardens 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 450 mm topsoil and subsoil in Plots 241 – 244 & 263 - 267. It is therefore considered that no further verification of the private garden areas of this plot 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

Emily Chissell

Geo-environmental Consultant

Kirsten Fairall

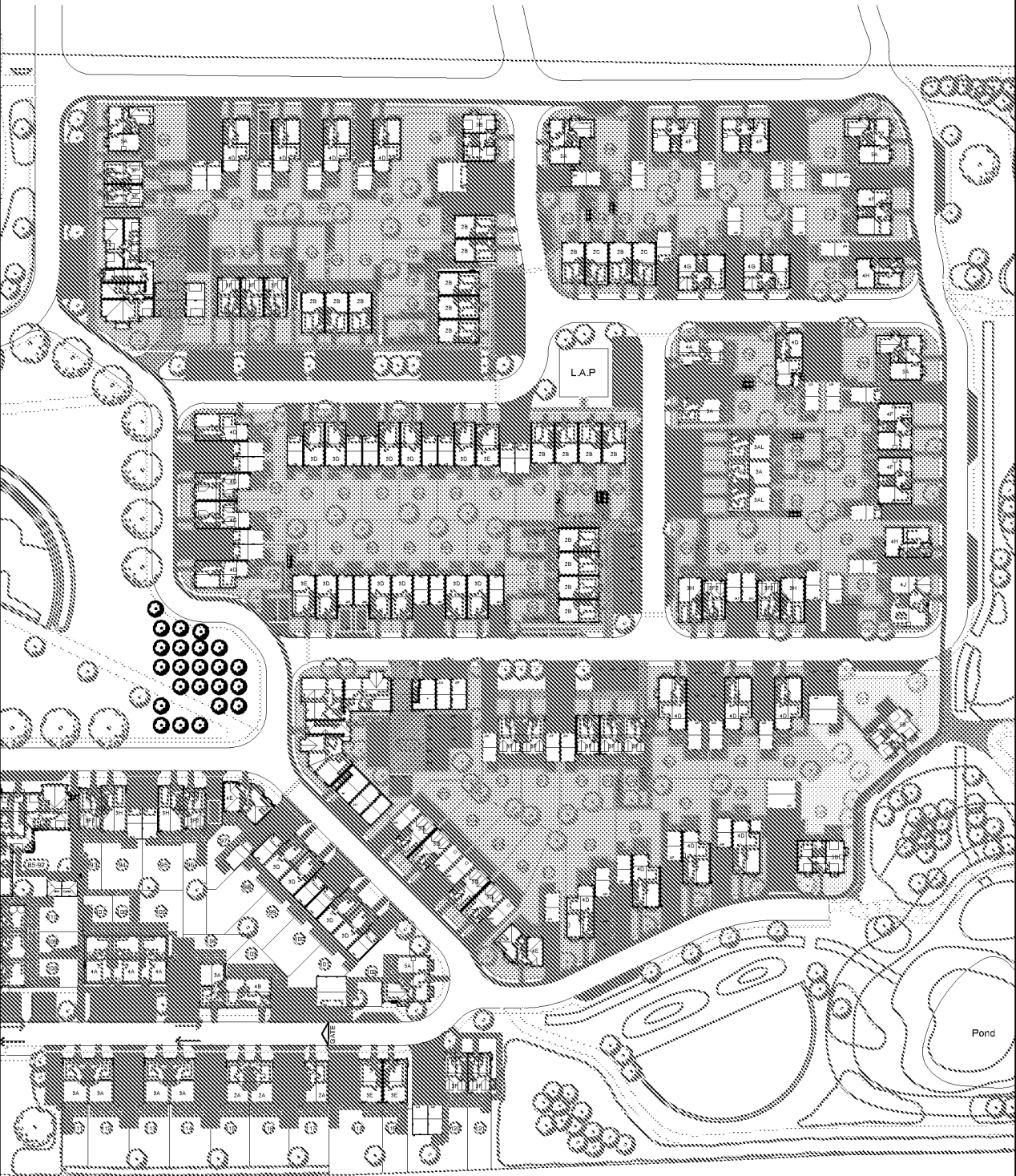
Principal Geo-environmental Consultant

Enc.

Figure 1	Capping layer requirements (Plots 201-307)
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

Plot Number	Front Garden		Back Garden	
	Area of Soft landscaping (m2)	Volume of Soft landscaping (m³)	Area of Soft landscaping (m²)	Volume of Soft landscaping (m³)
201	47.8958	21.5531	96.7770	43.5497
202	8.5204	3.8342	73.7954	33.2079
203	8.5191	3.8336	75.8054	34.1124
204	8.5222	3.8350	69.2427	31.1592
205	8.5203	3.8341	55.7169	25.0726
206-215	103.971	46.7870	151.712	68.2704
216	12.723	5.7254	66.7680	30.0456
217	12.723	5.7254	95.5160	42.9822
218	12.7134	5.7210	67.4091	30.3341
219	12.2334	5.5050	27.5722	12.4075
220	10.2472	4.6112	27.5444	12.3950
221	23.4928	10.5718	75.9051	34.1573
222	7.436	3.3462	72.1079	32.4486
223	7.484	3.3678	106.8155	48.0670
224	84.4886	50.6932	184.0475	110.4285
225	76.0368	45.6221	132.3372	79.4023
226	27.5904	12.4157	68.8486	30.9819
227	21.4533	9.6540	104.2210	46.8995
228	21.0532	9.4739	72.9661	32.8347
229	31.631	14.2340	134.4413	60.4986
230	23.2245	10.4510	50.7475	22.8364
231	21.2947	9.5826	30.8548	13.8847
232	23.2244	10.4510	34.3680	15.4656
233	15.8054	7.1124	72.3275	32.5474
234	21.7446	9.7851	65.4153	29.4369
235	8.5516	3.8482	47.0738	21.1832
236	42.8278	19.2725	65.5213	29.4846
237	49.0041	22.0518	79.6693	35.8512
238	48.8784	21.9953	83.8875	37.7494
239	19.8979	8.9541	110.0525	49.5236
240	22.558	10.1511	53.1923	23.9365
241	7.2451	3.2603	79.7658	35.8946
242	8.6957	3.9131	78.6007	35.3703
243	8.6957	3.9131	66.1688	29.7760
244	21.3958	9.6281	34.3887	15.4749
245	29.6693	13.3512	29.5044	13.2770
246	10.8532	4.8839	46.0891	20.7401
247	10.8526	4.8837	44.3193	19.9437
248	13.6772	6.1547	41.2352	18.5558
249	9.0525	4.0736	71.6325	32.2346
250	9.0425	4.0691	71.4519	32.1534
251	9.0425	4.0691	71.4519	32.1534
252	9.0425	4.0691	71.4519	32.1534
253	9.4174	4.2378	71.4519	32.1534
254	11.3761	5.1192	72.4682	32.6107
255	6.5237	2.9357	73.2321	32.9544
256	6.2926	2.8317	30.2264	13.6019
257	6.2826	2.8272	33.0887	14.8899
258	24.8887	11.1999	36.9659	16.6347
259	3.2962	1.4833	27.9555	12.5800
260	3.0281	1.3626	28.7854	12.9534
261	3.0281	1.3626	29.3637	13.2137
262	26.12	11.7540	26.7319	12.0294
263	10.701	4.8155	71.6208	32.2294
264	8.701	3.9155	71.4441	32.1498
265	8.701	3.9155	71.4444	32.1500
266	8.701	3.9155	71.1622	32.0230
267	9.0761	4.0842	71.7122	32.2705
268	18.7948	8.4577	48.3453	21.7554
269	19.268	8.6706	77.0251	34.6613
270	25.703	11.5664	84.3151	37.9418
271	26.233	11.8049	90.7502	40.8376
272	49.8775	22.4449	72.6283	32.6827
273	37.1127	16.7007	98.1503	44.1676
274	23.5936	10.6171	48.3071	21.7382
275	5.2975	2.3839	62.7447	28.2351
276	5.3354	2.4009	62.2289	28.0030
277	5.704	2.5668	54.9467	24.7260
278	6.4981	2.9241	35.6634	16.0485
279	5.704	2.5668	25.1608	11.3224
280	37.3445	16.8050	33.5633	15.1035
281-288	107.2601	48.2670	58.2851	26.2283
289	5.8129	2.6158	43.4586	19.5564
290	6.9334	3.1200	25.0980	11.2941
291	21.0366	9.4665	72.8110	32.7650
292	12.627	5.6822	61.1190	27.5036
293	12.0704	5.4317	71.8214	32.3196
294	11.5078	5.1785	71.8271	32.3222
295	9.5961	4.3182	64.9532	29.2289
296	37.6434	16.9395	143.2098	64.4444
297	11.5229	5.1853	84.4292	37.9931
298	19.3915	8.7262	55.9668	25.1851
299	6.9992	3.1496	52.0350	23.4158
300	6.4829	2.9173	29.7085	13.3688
301	6.693	3.0119	24.3019	10.9359
302	7.9045	3.5570	89.1964	40.1384
303	7.4565	3.3554	42.4706	19.1118
304	13.4241	6.0408	57.8408	26.0284
305	27.0514	12.1731	40.5700	18.2565
306	20.5691	9.2561	27.6705	12.4517
307	21.8642	9.8389	46.1200	20.7540



LEGEND

- Phase 2A Boundary
- 450mm Capping Layer Required
- 600mm Capping Layer Required

Rev.	Date	Amendment	Drawn	Chkd.	Appd.

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Hemel Hempstead
Hertfordshire
HPD 9RT
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Client

CALA HOMES (SOUTH HOME COUNTIES) LTD

Project Title

FORMER WEST END NURSERY, ANGMERING

Drawing Title

CAPPING LAYER REQUIRMENTS (PLOTS 201-307)

Drawn	Date	Checked	Date	Approved	Date
ASC	10.10.18	EH	10.10.18	CML	10.10.18

Scale	Orig Size	Dimensions
1:1250	A3	m

Project No.	Drawing File
27621 - T13	27621 (T13) Fig 2B

Drawing No.	Rev.
FIGURE 2B	P1



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 Home Counties) (the "Client") in accordance with the terms of a contract between RSK and the Client. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by an 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 are 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 scope 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.
- 10. The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.
- 11. Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works.
- 12. Unless stated otherwise, only preliminary geotechnical recommendations are presented in this report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed.

APPENDIX B

PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG

Site Location: Land at West End Nursery, Angmering

Photo No.
1

Date:
11/02/2020

Overview of
Plot 241 front
gardens



Photo No.
2

Date:
11/02/2020

View of hand
dug pit in
Plot 241 front
gardens



PHOTOGRAPHIC LOG

Site Location: Land at West End Nursery, Angmering

Photo No.
3

Date:
11/02/2020

View of the capping in Plot 241 front garden – at least 450 mm thick



Photo No.
4

Date:
28/01/2020

Overview of Plot 241 rear garden



PHOTOGRAPHIC LOG

Site Location: Land at West End Nursery, Angmering

Photo No.
5

Date:
09/12/2019

View of hand dug pit in the rear garden of Plot 241



Photo No.
6

Date:
09/12/2019

View of the capping in Plot 241 rear garden – at least 450 mm thick.



PHOTOGRAPHIC LOG

Site Location: Land at West End Nursery, Angmering

Photo No.
7

Date:
11/02/2020

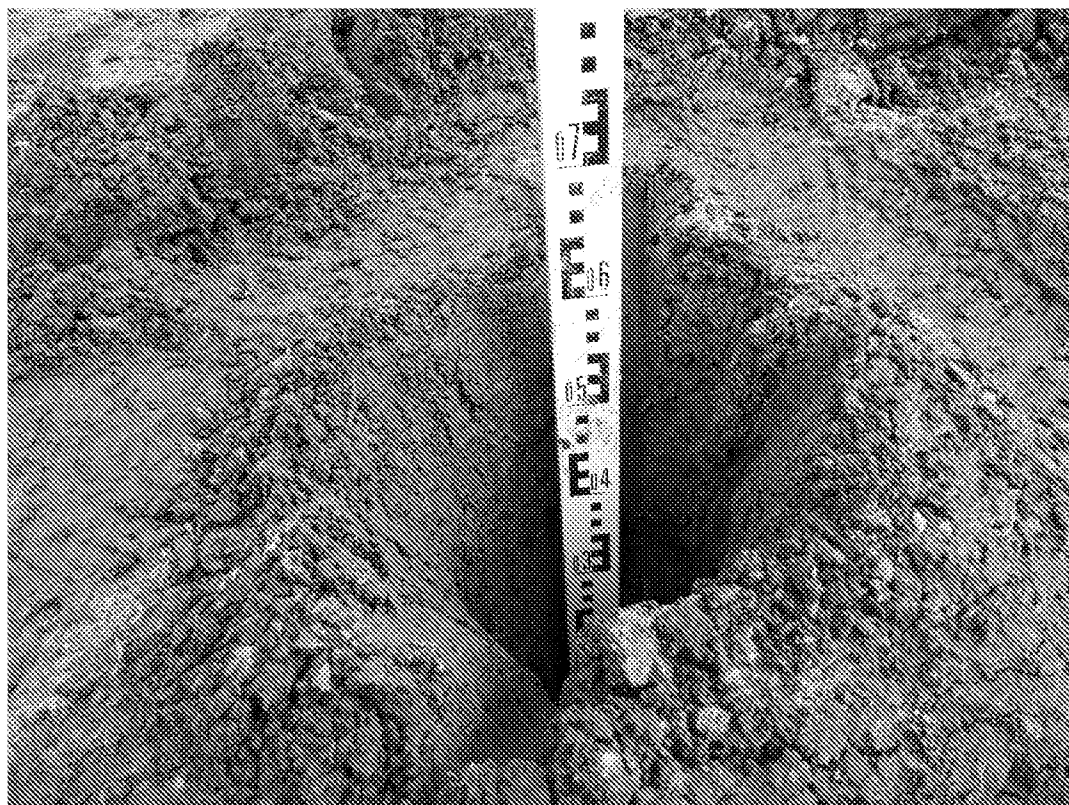
Overview of
Plot 242 front
garden



Photo No.
8

Date:
11/02/2020

View of the
capping in
Plot 242 front
garden – at
least 450 mm
thick



PHOTOGRAPHIC LOG

Site Location: Land at West End Nursery, Angmering

Photo No.
9

Date:
11/02/2020

View of the
capping in
Plot 242 front
garden

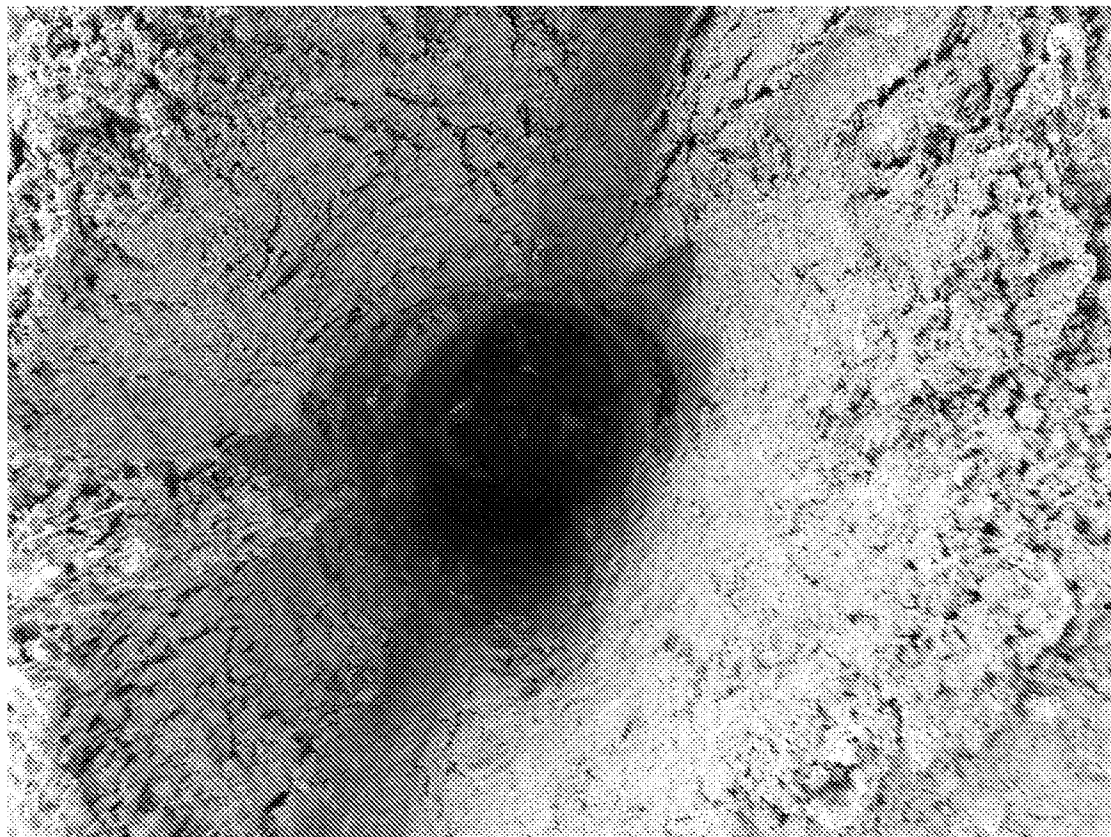


Photo No.
10

Date:
28/01/2020

Overview of
Plot 242 rear
garden

