

Our Ref JEC/15542VA/
Your Ref

ASHBURNHAM HOUSE
1 MAITLAND ROAD
LION BARN ESTATE
NEEDHAM MARKET
SUFFOLK
IP6 8NZ



28 March 2024

Redbourne Homes (Creeting) Ltd
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For the attention of Ralph Daff & Dominic Gravener

By Email only –



Dear Ralph and Dominic,

INSPECTION OF CLEAN COVER SOILS: ALDER MEADOW, FLORDON ROAD, CREETING ST MARY, SUFFOLK, IP6 8NH - PLOTS 46 AND 49 DEPTH CHECKS

1. Introduction

The proposed scheme comprises the construction of 52 residential properties, with access roads, hardstanding, communal soft landscaping and private gardens, as outlined in Babergh Mid Suffolk planning application 4188/15, dated 22 December 2015.

The condition relating to contaminated land, Condition 18 stated that:

- (iv) Any remediation work, as may be agreed, shall be carried out in its entirety in accordance with the approved Remediation Scheme and its timetable.
- (v) Following remediation, evidence shall be provided to the Local Planning Authority verifying that remediation has been carried out in accordance with the approved Remediation scheme

A previous Phase 1 Desk Study of the site was undertaken by RSA Geotechnics in April 2015 as part of the original planning application submission (Report Number 14173DS, April 2015). The desk study identified several significant potential sources of contamination, such as made ground, fuel and oil storage and adjacent landfill sites (ground gas). An intrusive Phase II Geotechnical and Geoenvironmental Investigation was recommended, comprising a mixture of shallow and deeper boreholes and trial pits. It was recommended that combined groundwater and ground gas monitoring wells were installed within some of the boreholes and that gas monitoring was undertaken to assess the gassing regime for the site from the potential on-site or off-site sources, as identified by the desk study.

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An initial phase of intrusive geotechnical ground investigation was carried out by Ground Technology Services in December 2018, based on a scope by Canham Consulting Ltd (Ground Technology Services Report No. GTS-18-095, December 2018). The investigation comprised five cable percussion boreholes, thirteen trial pits and fifteen in-situ CPTs with associated geotechnical testing. Geoenvironmental investigation and analysis were not considered in the investigation, but it was recommended that these were undertaken. Three of the exploratory holes undertaken (TP01, TP06 and BH5) recorded evidence of hydrocarbon contamination/odour but no testing was carried out.

A supplementary scope for further geoenvironmental investigation was outlined in a Site Contamination Investigation Strategy by Canham Consulting Ltd (Reference 212138) dated March 2019. The strategy recommended that the geoenvironmental investigations were undertaken once all works were terminated on the site and it had been cleared of machinery and storage units. It recommended installing gas/groundwater monitoring boreholes, undertaking gas and groundwater monitoring and testing for various suites of contaminants and compiling the results into an interpretative report, including a preliminary remediation strategy.

The supplementary intrusive geoenvironmental investigation, comprising a series of window sample boreholes and ground gas and groundwater monitoring installations was undertaken by RSA Geotechnics Ltd in January 2020, and reported in RSA Geotechnics Report Number 15542SI, dated 24 February 2020. The investigation found localised hydrocarbon and asbestos contamination in the shallow soils and slightly elevated concentrations of carbon dioxide from the gas monitoring and recommended that further investigation was undertaken.

A further phase of supplementary investigation (RSA Geotechnics Report Number 15542SI2, dated May 2020) was therefore undertaken, comprising three further rounds of ground gas monitoring and a 10 m grid of up to 57 shallow (1 -2 m deep) window sample boreholes across the northern part of the site (Area 2B and 2C), to determine the potential extent of the asbestos impact. Three locations were determined to have significant asbestos impact and were recommended to be remediated for the protection of groundworkers and end users of the development.

Following submission of reports to the Local Authority, it was determined by the Client's consulting engineer, Canham Consulting Limited, that their previously agreed drainage strategy, of stormwater discharge linking to an existing private drain (owned by Highways England) running west beneath the site from the A14, and discharging into the River Gipping via a series of drainage ditches at Alder Carr, was not acceptable to Highways England under the Highways Act 1980, and an alternative stormwater attenuation and soakaway drainage scheme under the SUDS hierarchy was going to have to be adopted.

The proposed stormwater attenuation and soakaway scheme involves the construction of two large crated soakaway attenuation chambers, with an overall area of 110 m² and an invert level of approximately 2.0 to 2.4 m below existing ground levels. The Flood and Water Engineer at Suffolk County Council was unable to accept the revised proposal in principle, as the change to the agreed surface water drainage strategy was significant, and they referred Canham Consulting Ltd back to the District Council Planning team, as the proposed changes could have other implications. Any soakaways deeper than 2.0 m would also need the acceptance of the Environment Agency as the site is located in a SPZ3 and Drinking Water Safeguard Area (Surface Water).

The Senior Environmental Management Officer at Babergh and Mid Suffolk District Councils subsequently had discussions with Canham Consulting Ltd, and expressed concern over any deeper contamination that could be present beneath the area of the proposed soakaway chamber, below the depths currently assessed by the existing investigations, with the potential for mobilisation of contaminants in the soils and groundwater.

Further investigation was therefore required (under Condition 18) as to the effect of the new scheme on the groundwater beneath the site and the suitability of the soils to accept stormwater via soakaways (under Condition 6).

RSA Geotechnics therefore undertook a further phase of supplementary intrusive investigation (RSA Geotechnics Report Number 15542GI, dated July 2020), the scope of which was agreed with Babergh and Mid-Suffolk District Council, comprising four trial pits at the proposed soakaway chamber locations to determine the thickness of the made ground at the locations and the presence of any contamination in the made ground and underlying deeper natural soils and three deep cable percussion boreholes to 20 m depth with full depth groundwater monitoring wells, with screened sections within the Chalk to obtain groundwater samples for laboratory testing and determine the groundwater flow direction.

No contamination considered to pose an unacceptable risk to Controlled Waters was recorded. A letter received from the Environment Agency, dated 23 October 2020 recommended discharge of the relevant part of Condition 18 in relation to Controlled Waters, based on their review of the submitted RSA Geotechnics Report (15542GI).

BRE DG365 soakage testing was also undertaken in three test pits, located at the locations of the proposed soakaway chambers, to determine the soil infiltration rates (RSA Geotechnics Report Number 15666LT, dated September 2020).

A Remediation Method Statement (RMS), comprising a statement of the remedial measures that were recommended for the proposed development, was prepared and submitted to the local authority for approval under Condition 18 Part iii (RSA Geotechnics Report Number 15542RS, dated December 2020).

Following on from the RMS it was recommended that the inspection of the soils beneath a number of above-ground fuel tanks was undertaken once the removal of the tanks permitted access (adjacent to earlier window sample borehole locations WS13, WS16, WS19), and at the location of a below-ground waste oil tank (adjacent to WS28). A potential hydrocarbon 'hot-spot' where marginally significant hydrocarbon impact was recorded in WS6 during the initial investigation was also to be investigated on a precautionary basis. The further inspections, sampling and testing undertaken at these locations was reported in RSA Geotechnics Letter Report 15542VA, dated 3 September 2020.

The recommendations of the RMS also included the inspection/validation of the three areas recording positive screens for asbestos, with quantifiable concentrations above 0.001% (WS1, WS4 and WS5). The further inspections, sampling and testing undertaken at these locations was reported in RSA Geotechnics Letter Report 15542VA, dated 22 February 2021. The hotspot at WS1 was not investigated as it was understood that ground levels were to be raised in this area, providing a break in pathway, prior to the installation of the additional 600 mm clean cover soil system.

This letter report describes validation depth checks of imported clean cover soils associated with soft landscaped areas of Plots 46 and 49 at the above site in March 2024. The material used for these plots was from the same stockpiles as those tested previously in RSA Geotechnics' Letter Reports 15542VA, dated 18 December 2023 (subsoil) and 12 March 2024 (topsoil).

The agreed remedial strategy for the site included the provision of a minimum clean cover soil thickness of 600 mm in all soft landscaped areas, including private gardens, over a suitable conspicuous, permeable and resilient 'deter to dig' geotextile barrier membrane, to provide a break in pathway between the residual site soils and end users.

This report has been prepared for the sole internal use and reliance of Redbourne Homes (Creeting) Ltd. This report shall not be relied upon by other parties without the express written authority of RSA Geotechnics Limited. If an unauthorised third party comes into possession of this report, they rely on it at their own risk and the authors owe them no duty of care and skill.

2. Fieldwork

A site visit was made on 19 March 2024 to inspect areas where previously tested topsoil and subsoil had been placed (Plots 46 and 49). The approximate locations of the validation inspection holes are illustrated on attached drawing number 15542VA/1 Ver.E. Photographs taken during the validation exercise have been attached to this letter report.

A summary of the clean cover system provided in these locations is summarised in Table 2.1.

Table 2.1 - Clean Cover Thickness Requirements and Inspection Results						
Location (Plot No.)	Topsoil Thickness (mm)	Subsoil Thickness (mm)	Total Thickness (mm)	Clean Cover Requirement (mm)	Membrane Present (Y/N)	Compliant (Y/N)
Plot 46	420	330	750	600	Y	Y
Plot 49	420	350	770		Y	Y

3. Sources of Placed Topsoil and Subsoil

Information relating to the imported topsoil and subsoil used within plots 46 and 49 was provided by Redbourne Homes (Creeting) Ltd for review:

- New Topsoil Source (Topsoil Stockpile 2 - TSSP2)

Brett Aggregates – Shrublands Park Quarry, Norwich Road, Coddendam, Ipswich, Suffolk, IP6 9QJ - Screened BS3882 Multipurpose Topsoil.

The topsoil compliance certificate dated 24 November 2023, was from Baileys of Norfolk, and showed that the material was a sandy loam, suitable for use as a multi-purpose topsoil.

- Subsoil Source

TARS (Total Aggregate Recycling Solutions Ltd) – Martins Farm, St Osyth, Essex CO16 8HN – Class 1B Quarried Sand Fill.

The topsoil was generally found to comprise soft brown silty sand with a little subangular to subrounded flint gravel and rare brick and glass fragments.

The subsoil was generally found to comprise light brown and orange-brown slightly silty fine to coarse sand with a little fine to coarse angular to subrounded flint gravel.

The results from previous laboratory analyses of stockpiled topsoil and subsoil samples recovered by RSA Geotechnics were compared against generic screening values for a ‘residential with homegrown produce’ end use, as appropriate for the private soft landscaped areas and adoptable/general hardstanding under consideration, with reference to current guidance.

All the topsoil and subsoil samples analysed from the referenced stockpiles above recorded concentrations below the derived Tier 1 screening values, and no asbestos was detected during the laboratory screening of recovered samples.

The analysis did not include testing for soil characteristics to BS 3882 or BS 8601. However, the phytotoxic determinands zinc, copper and nickel were compared with the screening values given in BS 3882 of 300, 200 and 110 mg/kg respectively (assuming pH value >7). None of the recorded concentrations exceeded these screening values.

4. Conclusions

Previous sampling and laboratory analysis of the imported soils by RSA Geotechnics Limited recorded concentrations of determinands to be below Tier 1 human health screening values with no asbestos detected, indicating that both the stockpiled topsoil and subsoil were chemically appropriate for use in the residential development as part of the clean cover soil system.

Inspection of the clean cover system placed in plots 46 and 49 confirmed the minimum thickness of 600mm cover over a membrane had been installed.

Samples will be retained for a period of three weeks from the date of this report.

We trust the above letter report will fulfil your present requirements, but should you need further advice or investigation, please contact us again.

Yours sincerely
RSA Geotechnics Ltd



Joanna Chapman, BSc, MSc
Senior Engineer



Adrian Phillips, FGS
Technical Director

Encs Photographs taken during inspection visit on 19 March 2024
 Validation Sample Location Plan – Drawing Number 15542SI/1 Ver.F



Plot 49 recording
770mm of clean cover.



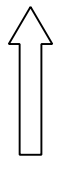
Plot 49 recording
presence of membrane
at base of clean cover
system.



Plot 46 recording
750mm of clean cover.



Plot 46 recording
presence of membrane
at base of clean cover
system.



<p>PLOTS 46 & 49 INSPECTION HOLE LOCATION PLAN (Based upon Wincer Kievenaar drawing number 5330.10.04 Rev B) "ALDER MEADOW", BREHENY'S YARD, FLORDON ROAD, CREETING ST MARY, IPSWICH, SUFFOLK IP6 8NH</p> <p>RSA GEOTECHNICS LIMITED</p>	<p>NOTE: All locations are approximate Date 5 APRIL 2024</p>
	<p>Scale NOT TO SCALE</p>
	<p>Drawing No 15542SI/1 Version F</p>